

A Comparative Evaluation of Data Quality in Thirty-Eight World Fertility Surveys



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NOTE

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The term "country" as used in the text of this publication also refers, as appropriate, to territories or areas.

PREFACE

This study, undertaken by the Population Division of the Department of International Economic and Social Affairs of the United Nations Secretariat, is one in a series dealing with findings from World Fertility Survey data. As a revised and expanded version of Fertility Levels and Trends as Assessed from Twenty World Fertility Surveys (United Nations publication, 1983, ST/ESA/SER.R/50), it covers 38 World Fertility Surveys and emphasizes the assessment of data quality. A full discussion of comparative levels and trends in fertility based on the quality assessment provided here can be found in chapter 2 of Fertility Behaviour in the Context of Development: Evidence from the World Fertility Survey (United Nations publication, Sales No. 86.XIII.5). Conclusions about levels and trends in fertility are based on that comparative assessment of the WFS data.

This study is part of the final stage of a programme of international comparative analysis of data from the World Fertility Survey which is being undertaken by the Population Division in fulfillment of recommendations made by the Population Commission and with the financial support of the United Nations Fund for Population Activities.

The availability of comparable survey data from so many developing countries has provided the Population Division with a unique opportunity to develop a simple series of data quality checks which can be used to assess age and date reporting. Those checks involve both internal data comparisons as well as comparisons with other sources of data. They can easily be applied to similar surveys in the future. The assessment presented here provides a baseline for comparison when successive surveys are undertaken in all those countries participating in the World Fertility Survey programme whose data are reviewed here. In addition, surveys undertaken in other countries can be examined by using the data checks developed here, and their assessment can benefit from the experience gained in this analysis - in particular, the documentation of common types of non-sampling errors that recur in countries which share similar cultural traditions and/or similar levels of socio-economic development.

EXPLANATORY NOTES

The following symbols have been used in the tables throughout the report, unless otherwise specified:

Two dots (...) indicate that data are not available or are not separately reported.

A dash (--) indicates that the amount is nil or negligible.

A blank indicates that the item is not applicable.

A minus sign (-) before a number indicates a deficit or decrease, except as indicated.

Details and percentages in tables do not necessarily add to totals, because of rounding.

The following apply throughout the text and tables:

A full stop (.) is used to indicate decimals.

A comma (,) is used to distinguish thousands and millions.

A slash (/) indicates a 12-month period extending from one year to the next, e.g., 1970/71.

A hyphen (-) between dates representing years, e.g., 1971-1973, signifies the full period involved, including the beginning and end years.

#

The following abbreviations have been used in the text and tables:

WFS: World Fertility Survey

ISI: International Statistical Institute

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Part one

COMPARATIVE ASSESSMENT OF DATA QUALITY

INTRODUCTION

The World Fertility Survey (WFS) has been for demographers a rich source of data which can be used to assess levels of and trends in fertility in selected developing countries. In the 38 countries considered in this report,^{1/} 17 surveys were conducted between 1974 and 1976, 10 between 1977 and 1978 and nine between 1979 and 1981. The countries are roughly evenly divided between the three regions, with 12 from Africa, and 13 each from Latin America and Asia. In some countries, these data provide the first reasonable estimate of recent levels and trends, whereas in others, they provide greater insight into already available estimates from past censuses and surveys and, in many cases as well, from reasonably complete vital registration data. However, despite the high degree of comparability in the initial design of the questionnaires, differences between individual countries in the design and execution of the surveys and in the socio-cultural contexts within which they were administered preclude simple cross-country comparisons. In addition, problems relating to the omission and misdating of events, which plague all retrospective fertility surveys, may appear to different degrees in each WFS, thus confounding the interpretation of fertility trends in a comparative context. Therefore, any presentation of findings on fertility levels and trends from WFS data cannot proceed without an assessment of the quality of each country's data, using a set of consistent criteria.

Fertility estimates based on WFS data from individual countries have already been published in the first country reports and in the WFS Comparative Studies series (Hananberg, 1980, and Ashurst, Balkaran and Casterline, 1984), as have detailed evaluations of the data quality of individual surveys in the WFS Scientific Reports series. In addition, as part of the final assessment of the contribution of the World Fertility Survey Programme, an overview of data quality for 41 surveys has been published (Goldman, Rutstein and Singh, 1985). However, the material from these published reports, although presented with a consistent format, does not provide the basis from which systematically comparable indices of data quality for each country can be calculated and from which data quality rankings and country groupings can be formed. The comparative evaluation of data quality presented here builds upon a common framework for the analysis of each country's data and applies consistent internal and external checks to the age, marriage and birth history data so that each country's data can be rated both with respect to alternative sources of data within the country and with respect to the WFS data from all other countries considered in this report. The conclusions drawn from this assessment provide the context within which estimates of fertility levels and trends can be interpreted.

The data for each country are ranked in one of three categories (A, B or C) according to the confidence that can be placed in the estimate, with category A being the group of estimates for which there is the most certainty and category C being the group for which there is the least. Attention will be drawn in particular to those WFS surveys which provide more recent and/or improved estimates of fertility levels and trends for particular countries. For countries with a tradition of reliable fertility data, the WFS estimates, if rated as of good quality, may not do more than confirm previous estimates but this will, none the less, be a useful conclusion, since it

provides strong support for research findings relating to many other topics which may emerge from the WFS data collected in these countries.

It must be stressed that a rating of C applied to recent fertility levels or trends usually does not indicate that the rates or trends are necessarily incorrect, but rather that the data show sufficient problems that it would be risky to accept the estimates at face value and that the estimates could not be confirmed by reference to reliable external sources. Similarly, a rating of B means that some defects were noted, but that they were not so serious as for rates labelled C, while a rating of A implies the absence of serious defects evidenced through the quality checks employed. It is possible that the accretion of evidence from future censuses, surveys and other sources may reveal that some of the estimates, which have been treated with some skepticism here, have in fact been accurate, while some of the estimates given higher ratings, primarily on the basis of internal checks, may later appear to have been deficient.

Some of the major findings with respect to fertility levels and trends are summarized in table 1. The quality of recent fertility estimates from WFS (based on the 0-4 years before the Survey) was found to be high for the large majority of countries, with only 11 countries (six from Africa and five from Asia) having estimates which were rated in the C group.

A current estimate of the total fertility rate (TFR) from a source other than the World Fertility Survey is available for all but eight of the 38 countries included here. However, the calendar year on which the other estimate is based in each case does not usually correspond to the period of time covered by the country fertility estimate presented in table 1. Below, when the quality of recent enumeration of births is assessed, WFS fertility estimates based on comparable calendar years are presented alongside other published estimates (see table 7). Because of rapid recent fertility declines in many countries, direct comparisons with the estimates presented in table 1 can be misleading. Certain conclusions based on the specific calendar year comparisons presented in table 7 can be summarized here. For Benin, the Dominican Republic, Ghana, Jamaica, Morocco, Pakistan, the Philippines and Senegal, the WFS estimate is the only estimate available for the period 0-4 years before the Survey. In the case of Colombia, Côte d'Ivoire, Fiji, Guyana and Sudan, WFS estimates show fertility to be at least 10 per cent higher than other estimates. WFS estimates are also slightly higher than other estimates in the case of Cameroon, Haiti, Mauritania, Mexico, Paraguay, Peru, Tunisia and Yemen. For most of the other countries, WFS fertility estimates are remarkably similar to other estimates. In the case of Ecuador, Indonesia, Nepal and Venezuela, the rates are slightly lower, and in Bangladesh they are about one child lower. However, in three of the five cases where WFS estimates appear low, the fertility rates used for comparison have been adjusted upwards. Thus, overall it can be said that, with only three exceptions, WFS estimates show fertility to be as high or higher than other recent estimates.

Table 1. Recent estimates of total fertility rates and trends
in total fertility rates, specific countries

Region and country	Quality of recent estimate a/ (1)	TFR (0-4 years before the Survey) (2)	Quality of 10-year trend estimates a/ (3)	Percentage decline (10-14) to (0-4) years before the Survey (4)	Percentage decline (5-9) to (0-4) years before the Survey (5)	Percentage decline (10-14) to (5-9) years before the Survey (6)
Africa						
Benin	C	7.1	C	+ 1.5	+ 1.5	0.0
Cameroon	B	6.4	C	+ 8.8	- 1.6	+10.5
Cote d'Ivoire	C	7.4	C	- 4.0	- 6.6	+ 2.7
Egypt	B	5.3	C	-20.0	- 5.4	-15.4
Ghana	C	6.5	C	-10.1	- 7.5	- 2.9
Kenya	B	8.3	C	- 9.2	- 7.1	- 2.3
Lesotho	B	5.8	B	0.0	+ 3.7	- 3.6
Mauritania	C	6.2	C	- 9.1	-14.3	+ 6.1
Morocco	B	5.9	B	-15.9	-13.4	- 2.9
Senegal	C	7.2	C	- 6.7	- 4.1	- 2.7
Sudan	C	5.9	C	-14.7	-15.9	+ 1.5
Tunisia	A	5.8	A	-18.6	- 6.6	-12.9
Asia and Oceania						
Bangladesh	C	6.1	C	-22.1	-25.9	+ 5.2
Fiji	A	4.2	A	-38.1	-23.0	-19.6
Indonesia	C	4.7	C	-19.3	-16.4	- 3.5
Jordan	B	7.6	C	-14.8	-10.7	- 4.6
Malaysia	A	4.7	A	-24.8	-14.5	-12.1
Nepal	C	6.0	C	- 4.8	- 4.8	0.0
Pakistan	C	6.3	C	-12.7	-11.4	- 1.4
Philippines	A	5.3	A	-23.2	-18.9	- 5.2
Republic of Korea	A	4.3	A	-23.0	- 9.6	-14.9
Sri Lanka	B	3.8	B	-33.2	-21.5	-14.9
Syrian Arab Republic	A	7.5	B	-12.0	- 4.0	- 8.4
Thailand	B	4.6	B	-31.1	-23.7	- 9.6
Yemen	C	8.5	C	+ 5.2	- 2.4	+ 7.8
Latin America and the Caribbean						
Colombia	A	4.7	A	-36.0	-25.4	-14.2
Costa Rica	A	3.8	A	-46.3	-30.6	-22.7
Dominican Republic	B	5.7	C	-25.3	-20.0	- 6.7
Ecuador	B	5.3	B	-23.5	-16.1	- 8.8
Guyana	A	4.9	B	-29.7	-20.4	-11.8
Haiti	B	5.5	C	-14.8	- 7.1	- 8.2
Jamaica	A	5.0	B	-24.5	-16.0	-10.1
Mexico	A	6.2	A	-16.8	-11.8	- 5.8
Panama	B	4.5	C	-25.0	-18.2	- 8.3
Paraguay	B	5.0	B	-19.7	-12.5	- 8.2
Peru	A	5.6	A	-18.4	-13.8	- 5.4
Trinidad and Tobago	A	3.4	B	-37.7	-17.5	-24.5
Venezuela	B	4.6 b/	B	-25.0	-19.6	- 6.7

Sources: Columns (1) and (3): tables 8 and 10.

Columns (2), (4), (5), and (6): World Fertility Survey standard recode tapes.

Notes: a/ A: Rates assessed as being of good quality

B: Rates assessed as being of acceptable quality

C: Rates assessed as being less reliable

b/ The fertility rate for the age group 45-49 is the same as that from the birth registration data for the period 1972-1976. Women aged 45-49 were not included in the individual questionnaire for Venezuela.

The monitoring and assessment of fertility levels and trends has been a continuing function of the Population Division for many years^{2/} and in this report that tradition complements one aspect of the research programme of the United Nations Working Group on Comparative Analysis of World Fertility Survey Data.^{3/} The approach adopted here has evolved from earlier working papers on this topic presented to the Working Group.^{4/}

The present report is divided into two major parts, with part one reporting on findings in a comparative context for all 38 countries relating to the quality of estimates of fertility levels and trends, and part two providing the country chapters on which the findings are based.^{5/} The first section of part one provides necessary background information about the alternative sources of fertility data for individual countries as well as certain characteristics of the WFS data which relate to fertility estimates. The next section discusses the criteria chosen to assess the relative quality of fertility data and then summarizes for all 38 countries the findings with respect to data quality. As part of the assessment, other estimates of recent fertility levels and trends are presented, when available. A full discussion of the actual fertility levels and trends in the light of this quality assessment is included as chapter two in the forthcoming United Nations publication, Fertility Levels, Patterns and Differentials: A Comparative Analysis Using WFS Data.

The crucial background for the conclusions presented in part one are provided in the form of country chapters. The country chapters do not provide the basis for a complete evaluation of the data or, in most cases, for adjustment of deficient estimates, but it is hoped that these chapters contain enough detail to distinguish the weaker data sets from the others. Much of the material in the country chapters has been drawn from evaluation studies published by the World Fertility Survey which provide additional evidence and lengthier discussion. Limitations of time and resources precluded a thorough evaluation of all data sources for these countries, although in a number of cases the present study was able to draw upon recent assessments which did evaluate all sources.

A standard format has been devised to assess the data from each country and all the information on which the conclusions of the report are based can be found in these individual chapters of part two. The country chapters themselves do not contain any conclusions about the relative quality of each country's data but just attempt to provide an accurate description of some of its observed characteristics. Conclusions based on these chapters are summarized in the tables and text in chapter II of part one. Each country chapter is organized into four parts:

(a) A description of the country's World Fertility Survey in the context of its other data sources;

(b) A discussion of the female age data;

(c) A discussion of the data on the timing of first unions and the current proportions ever married;

(d) A discussion of the birth history data.

In each of the three major parts, the same features of the data are discussed, thus permitting subsequent comparisons. Tables and figures are used to examine the data both for internal consistency and in comparison to external sources of information.

Chapter I

BACKGROUND INFORMATION

The countries covered in this report display a wide spectrum of demographic characteristics and of data collection experience. The WFS surveys, roughly half of which took place in the mid 1970s and half of which took place in the late 1970s and early 1980s, are an important source of information on fertility. For about 20 per cent of the countries, WFS data represent the only source for fertility estimates for the period around the time of the survey, and for roughly one third, WFS provides, through its retrospective maternity history, the only measure of recent trends. In most cases, although other estimates exist, the estimates of recent fertility derived from WFS data provide a means for checking and evaluating alternative estimates for a given country in order to assess the relative quality of available estimates. In addition they provide a crucial link in the chain of estimates needed to assess trends.

Table 2 summarizes much of the relevant information on alternative data sources for fertility estimates in these countries. The countries for which WFS data are currently available range in population size from less than 1 million inhabitants (Fiji and Guyana) to some of the biggest countries in the world (Bangladesh, Indonesia, Mexico and Pakistan). In most cases, it is the countries with the smallest populations which have complete civil registration. The exceptions are Egypt and Mexico. Although Mexico has registration which is about 95 per cent complete, certain policy changes with respect to consensual unions and the enumeration of their children have made it impossible to examine fertility trends in the 1970s from registration data.^{6/} An estimate of under-registration in Egypt was made using the CAPMAS Survey of 1974-1975 which placed under-registration in urban areas at 5.2 per cent, in rural areas at 17.5 per cent and for the whole country at 13.1 per cent. However, in an examination of recent levels and trends of fertility in Egypt, Bucht (1986) estimated under-registration for all of Egypt to be between 8 and 13 per cent. The majority of Latin American countries have reasonably complete registration, but only three of the Asian countries participating in the WFS (Fiji, Peninsular Malaysia and Sri Lanka) and two from the African region (Egypt and Tunisia) were recorded as having complete registration.

Before the date of their WFS survey, the large majority of Asian countries can be seen to have had earlier experience with national fertility surveys (table 2). In Latin America, national fertility surveys were a relatively new phenomenon in the mid 1970s^{7/} but in 10 of these 13 countries, the WFS has been followed by even more recent national surveys, suggesting that such surveys have been found useful, even in countries where registration is estimated to be reasonably complete. While nine of the African countries had had previous survey experience, most of them dated back to the 1960s.

Table 2. Sources of data for national fertility estimates, specific countries

Region and country	WFS year of inquiry	Birth registration data a/	Recent census dates			Recent national survey data available for comparison (dates)	
			1960s	1970s	1980s	Before WFS	After WFS
Africa							
Benin	1982	U		1979		1961	
Cameroon	1978	U		1976			
Cote d'Ivoire	1980	U		1975	1986	1970 PES, 1978/79	
Egypt	1980	C		1976		1974/75	1982
Ghana	1979/80	U	1960	1970	1984	1960 PES, 1968/69	
Kenya	1977/78	U	1962, 1969	1979		1973, 1977/78	
Lesotho	1977	U		1976		1967/68	
Mauritania	1981	U		1976/77			
Morocco	1979/80	U	1960	1971	1982	1961-1963, 1972/73	1983/84
Senegal	1978	U		1976		1960/61, 1970/71	
Sudan	1978/79	U		1973	1983		PES
Tunisia	1978	C	1966	1975		1968/69	1980
Asia and Oceania							
Bangladesh	1975/76	U	1961	1974	1981	1962-1965, 1968/69, 1974	PES
Fiji	1974	C	1966	1976			PES
Indonesia	1976	U	1961	1971	1980	1976	PES
Jordan	1976	U	1961	1979 b/		1972	1981
Malaysia	1974	C		1970	1980	1966/67	1976/77
Nepal	1976	U	1961	1971	1981	1974/75, 1976	
Pakistan	1975	U	1961	1972	1981	1962-1965, 1968-1971	1979/80
Philippines	1978	U	1960	1970, 1975	1980	1968, 1973	1983
Republic of Korea	1974	U	1966	1970, 1975	1980	1966, 1971, 1973	1976
Sri Lanka	1975	C	1963	1971	1981		
Syrian Arab Republic	1978	U	1960	1970, 1976	1981	1976-1979	
Thailand	1975	U	1960	1970	1980	1964-1967, 1969/70, 1972/73, 1974-1976	1979
Yemen	1979	U		1975			1981
Latin America and the Caribbean							
Colombia	1976	U	1964	1973		1969	1978
Costa Rica	1976	C	1963	1973	1984	1964	1978
Dominican Republic	1975	U	1960	1970	1981		1980 (WFS)
Ecuador	1979	U	1962	1974	1982		1982
Guyana	1975	C	1960	1970	1980		
Haiti	1977	U		1971	1982	1971-1975	1983
Jamaica	1975/76	C	1960		1982		1983
Mexico	1976	C	1960	1970	1980		1978, 1979, 1982
Panama	1975/76	C	1960	1970	1980		1975-1977
Paraguay	1979	U	1962	1972	1982	1977	
Peru	1977/78	U	1961	1972	1981	1974-1976	PES, 1981
Trinidad and Tobago	1977	C	1960	1970	1980	1970	
Venezuela	1977	C		1971	1981	1974	1979

Sources: See the country chapters in part two, below.

Note: PES: Post-enumeration survey conducted by WFS.

a/ This assessment is based on evidence provided in country chapters. Malaysia is rated as complete because only Peninsular Malaysia was sampled by the World Fertility Survey. These ratings do not always correspond with the official count ratings published by the United Nations, U= less than 90 per cent complete, C= at least 90 per cent complete.

b/ East Bank

Table 3. Characteristics of population and sample covered by the World Fertility Survey

Region and country	1975 population estimate (millions) (1)	Sample domain target coverage (percentage) (2)	Sample size of the individual survey (3)	Eligibility for individual survey	
				Age (4)	Marital status (5)
Africa					
Benin	3.0	100	4,018	15-49	ALL
Cameroon	7.6	100	8,219	15-54	ALL
Cote d'Ivoire	6.8	100	5,764	15-50	ALL
Egypt	36.3	100	8,788	to 49	EM
Ghana	9.8	100	6,125	15-49	ALL
Kenya	13.7	95	8,100	15-50	ALL
Lesotho	1.2	100	3,603	15-49	EM
Mauritania	1.4	70	3,504	12-50	EM
Morocco	17.3	99	5,801	15-50	ALL
Senegal	4.8	100	3,985	15-49	ALL
Sudan	16.0	70	3,115	to 50	EM
Tunisia	5.6	100	4,123	15-49	EM
Asia and Oceania					
Bangladesh	76.6	100	6,513	to 49	EM
Fiji	0.6	96	4,298	15-49	EM
Indonesia	135.7	67	9,155	to 50	EM
Jordan	1.7 c/	71	3,612	15-49	EM
Malaysia	12.4	85	6,316	to 50	EM
Nepal	12.7	98	5,940	to 49	EM
Pakistan	75.5	93	4,996	15-49	EM
Philippines	43.1	100	9,268	to 50	EM
Republic of Korea	35.3	99	5,430	15-49	EM
Sri Lanka	13.6	100	6,812	to 49	EM
Syrian Arab Republic	7.4	100	4,487	to 49	EM
Thailand	41.9	100	3,778	to 49	EM
Yemen	5.3	94	2,605	to 50	EM
Latin America and the Caribbean					
Colombia	23.2	99	5,378	15-49	ALL
Costa Rica	2.0	97	3,935	20-49	ALL
Dominican Republic	4.9	100	3,115	15-49	ALL
Ecuador	6.9	96	6,797	15-49	ALL
Guyana	0.8	92	4,642	15-49	ALL c/
Haiti	5.2	100	3,365	15-49	ALL
Jamaica	2.0	100	3,096	15-49	ALL c/
Mexico	60.2	100	7,310	20-49 b/	ALL
Panama	1.7	90	3,701	20-49	ALL
Paraguay	2.7	94	4,682	15-49	ALL
Peru	15.2	100	5,640	15-49	EM
Trinidad and Tobago	1.1	100	4,359	15-49	ALL c/
Venezuela	13.1	98	4,361	15-44	ALL

Sources: For column (1), World Population Prospects: Estimates and Projections as Assessed in 1982, Population Studies, No. 86 (United Nations publication, Sales No. E.83.XIII.5); for columns (2), (4), and (5), Chris Scott and Trudy Harphan, "Major issues of survey and sample design", paper prepared for the WFS Symposium held in 1984; for column (3), Trudy Harphan and Chris Scott, "Implementation of sample designs", paper prepared for the WFS Symposium held in 1984, table 7.

Note: EM : Ever-married
ALL: All women

a/ United Nations Population Division estimate for Jordan based on the 1979 census.
b/ Also includes women aged 15-19 who have either had a baby or have been in a union.
c/ Excluding full-time school girls aged 15-19.

In each country, a representative household survey was conducted prior to the detailed individual survey in order to identify women eligible for a detailed individual interview (see table 3); eligibility was determined by age or age and marital status, depending on the country. In most cases the eligible ages ranged from 15 to 49. Indonesia, Malaysia and the Sudan were the only countries where a notable proportion of the country's population was not included in the coverage of the sample design.^{8/} In the case of Jordan, the population living under occupation in the West Bank was excluded as well. Only a minority of the household surveys included questions on recent and lifetime fertility, so that all of the fertility estimates presented here are based on the birth history data from the individual questionnaires.

The coverage of the individual questionnaire varied to some extent by region. In Asia only ever-married women were included in the individual interview, because child-bearing outside marriage is relatively rare, whereas in most of Latin America (with the exception of Peru) and much of Africa (with the exception of Egypt, Lesotho, Mauritania, the Sudan and Tunisia) all women deemed eligible in terms of age were interviewed. Thus, in those countries where only ever-married women were interviewed, the estimation of age-specific fertility rates required information on the proportion married by age from the household data so that fertility estimates were in fact pieced together from both the individual and household surveys. In addition, certain Latin American countries deviated from the guidelines for eligibility according to age by excluding some or all women aged 15-19. In Costa Rica and Panama only women aged 20-49 were interviewed, whereas in Guyana and Jamaica, full-time school girls aged 15-19 were not included. In Mexico, women 15-19 were eligible for the interview only if they had a baby or had been in a union. In the case of Guyana, Jamaica and Mexico, fertility rates for the 15-19-year-old group are based on the births recorded in the individual interview and the proportion of the household population eligible for the individual interview. In Panama and Costa Rica the recent rates for 15-19-year-olds were taken from vital registration data because the WFS estimates are biased upwards by the fact that the oldest women in the age group contribute a disproportionate amount of exposure time during the period 0-4 years before the survey. In Venezuela, the eligible age range was from 15-44 years.

The samples from which birth history information has been drawn vary in size from 2,605 in Yemen to 9,268 in the Philippines. The designs of the samples varied as well. Rather than simple random sampling, complex sampling designs were applied with two or more areal stages and stratification at each stage. In addition, in some countries unequal probabilities of selection were applied to different strata of the population. The sample size as well as the sample design affect the calculation of sample errors. Unfortunately, estimates of sampling error for age-specific and total fertility rates could not be calculated for all countries in this report because, for countries with ever-married samples, the household data are required but are not yet available on tape, and, for most countries with all woman samples, the individual data as currently constituted do not provide the necessary information on sample clustering which is an integral part of any estimates. However, sample errors for age-specific fertility rates have been calculated for five countries (Colombia, Kenya, Nepal, Pakistan, Sri Lanka), which cover a wide range of fertility levels and sample designs and can be usefully

examined here for purposes of illustration (Little, 1982). Expressing the estimated standard error as a percentage of the age-specific fertility rates averaged over five-year age groups 15-44 and averaged over five countries, the percentage error was 8.26 per cent using a reference period of one year before the interview and fell to 4.32 per cent for a five-year reference period with the greatest improvement taking place between a one-year and a three-year reference period. This represented a considerable range across the countries from 5.84 (Kenya) to 10.25 (Colombia) per cent for a one-year reference period and from 3.05 (Kenya) to 6.11 (Colombia) per cent for a five-year reference period. The total fertility rate had a lower relative error than the average of the age-specific rates, ranging from 1.3 per cent for Pakistan to 3.4 per cent for Nepal, using a five-year reference period. The relative errors for age-specific rates were lowest for the 20-24 and 25-29 age groups and highest for fertility estimates based on women over the age of 40.

The age-specific fertility rates and the marital age-specific fertility rates derived from these data are based on the birth and marriage history provided by each respondent in the individual interview. Each respondent was queried about the month and year of each live birth and the month and year for the beginning and termination of each marriage. Where month and year could not be provided, the age of the child was always requested and a computer programme was used to impute months randomly. In countries where eligibility for the individual interview was determined by marital status or school enrolment at the time of the survey, the calculation of age-specific fertility rates also included proportions in union at the time of the survey by single years of age at the time of the survey.

The fertility estimates to be presented in this report are based on the five-year period before the interview.^{9/} This means that the estimate is centred roughly 2.5 years before each survey. Although the country estimates are not centred on the calendar year for each country, there are certain advantages to the approach chosen here. First, no exposure time or births are lost by deleting information for the fraction of a year in which the interview was conducted. Secondly, because of certain problems with the omissions and displacement of births, which are often closely linked to the number of years prior to the interview, a single calendar year for each country, such as 1973 or 1974, for which all countries have data, would represent potentially different problems with respect to the displacement of births. Finally, as can be observed by examining figure V in each of the country chapters, many surveys show what appears to be a dip in fertility one or two years before the survey, followed by a partial "recovery" in the year immediately preceding the interview. Such a pattern may indicate displacement forwards or backwards in time of births that occurred one or two years before the survey. A five-year reference period was chosen for the fertility rates, taking into account sampling error of the estimates, the desire to present current rates, and considerations relating to probable displacement of recent births. It is hoped that these five-year estimates will give the best possible picture of fertility in these countries as of the early to middle 1970s.

Chapter II

ASSESSMENT OF DATA QUALITY

The purpose of assessing the quality of fertility levels and trends from WFS data in a comparative context is to be able to rank the quality of the fertility estimates derived from WFS data, taking into account the individual country situations. Much work has already been done by the World Fertility Survey organization itself on many of these countries with respect to the assessment of WFS data quality.^{10/} Each of the WFS evaluation reports has capitalized on all the available material for that country in order to assess the quality of WFS data in comparison with alternative data sources for the same country. In addition, as part of the final assessment of the contribution of the World Fertility Survey Programme, an overview of data quality for all the surveys was completed.^{11/} However, no attempt has been made within the WFS reports to offer overall conclusions about the quality of the WFS survey for one country in contrast to other WFS surveys or to assess the overall quality of the data with respect to some external standard of quality. For example, the quality of the WFS data for a particular country may be far superior to those of any previous fertility data for that country but may none the less be poor relative to those derived from other WFS surveys or relative to certain externally imposed standards of quality with respect to fertility estimates.

An assessment of levels and trends in age-specific fertility rates and marital fertility rates requires an evaluation of the quality of the data with respect to women's age, their union status at the time of the survey and their birth and union histories. Each aspect of data quality can be assessed using both internal and external checks. Good age-reporting is a crucial prerequisite for accurate estimates of age-specific fertility rates, which relate births to the age of the mother at the time of the birth. If women's ages are misstated, even an accurate enumeration of the total births by each woman will result in distortions in age-specific fertility rates and, if age misreporting is systematically related in any way to marital status and/or parity, there will be systematic biases in fertility estimates. In addition, if a particular cohort includes women who are either too young or too old, there may be systematic biases in trend estimates when cohort rates are compared for comparable ages. In the WFS, special efforts were made to obtain reports of age as accurately as possible. Special probe questions, historical events charts and age-events charts were used in several countries to obtain dates of events. A detailed description of imputation procedures for dates and the instruments used is given in Chidambaram and Sathar (1984).

The current marital or union status by age is an important input into fertility estimates in the case of samples which were restricted to ever-married women. In addition, an accurate dating of the first union is necessary in order to estimate the proper exposure time for each woman in the case of marital fertility rates.

The complete enumeration of births is essential but not sufficient to assure accurate fertility estimates. When the period of time is an important dimension of the analysis, the accurate placement of births in the past is

crucial to the correct measurement of trends as well as to the estimate of levels averaged over a period of years prior to the survey. When distant births are systematically displaced towards the survey date or recent births displaced back in time, or both, trends will be exaggerated. In addition, when the reporting of recent births is displaced back in time, recent levels will be underestimated.

Each country chapter in part two of this report provides data required for an assessment of the quality of the age, marriage history and birth history data with respect to certain standard indicators so that systematic cross-country comparisons can be made. Therefore, the conclusions drawn here will be based entirely on the material presented in those chapters. With respect to the assessment of age-reporting, internal checks for data quality include the Myer's index computed from the household data, the percentage of individual respondents providing a complete report on month and year of birth, and a comparison of the male and female age distribution from the household data. The only external check consisted of a comparison of the female age distribution from WFS with the most recent census or survey. In the assessment of the marriage data, internal checks included the percentage of respondents reporting both the month and year of first union and the percentage distribution of years since first marriage for all women in the individual survey ever in union. The external check consisted of a comparison, for the three youngest five-year age groups (15-19, 20-24, 25-29), of the percentage ever married as calculated from WFS for times in the past with similar percentages from either censuses and surveys.

An evaluation of the birth history data included as internal checks the percentage of all births reported with a month and a year, an examination of cohort-period fertility rates for five-year periods before the survey, and an examination of age-specific fertility rates for single years before the survey. The external checks included a comparison of parity from WFS and other sources and a comparison of age-specific fertility rates from censuses, other surveys or birth registration with the WFS data for comparable calendar years in the past.

The tables and figures included in the country chapters were chosen for their practicality and simplicity and were deliberately restricted in number. One type of statistic that is not presented is the "P/F" ratio. Originally intended to yield improved estimates of age-specific fertility for populations where constant recent fertility could be assumed (United Nations, 1983), P/F ratios have also been employed recently to highlight certain reporting patterns in birth history data, even where it is not thought appropriate to use the ratios as adjustment factors for fertility estimates. For the purpose of this report graphical displays and visual inspection of the fertility rates and parities calculated from birth histories were considered adequate to indicate the existence of patterns that suggest serious data problems. P/F ratios based on several types of fertility rates are, however, readily available for most countries from other publications,^{12/} and the country-specific studies cited above contain more detailed tabulations and discussions than those included here. Though some of the indices used in this approach do make assumptions about constant or monotonic linear declines, they

are not used in and by themselves. Rather, they are viewed in relation to other tests on the data as well as country-specific situations.

In the presentation below, the conclusions with respect to each aspect of data quality have been laid out in summary form in large cross-national tables so that certain problems with the data that recur in several countries can be highlighted and discussed. It should be noted that year-to-year irregularities in the number of respondents grouped by single years of age, in the number of marriages and in birth rates are taken account of in the assessment despite the fact that the fertility estimates ultimately presented are based on five-year age groups and five-year intervals before the survey. With estimates based on small samples, random year-to-year irregularity in rates is to be expected and is not serious, but the concern here relates to the possible existence of non-random irregularities caused by a preference for or the avoidance of certain digits or calendar years in the past. Although the forming of five-year averages reduces the potential effect of such irregularities, it cannot be assumed that shifts between five-year age groups or periods in the past will necessarily cancel out. In categorizing the evidence relating to some suspected distortions in the data which have implications for fertility estimates, descriptive words such as "some" and "a lot" have been chosen to provide a rough guide as to the potential seriousness of the problem.^{13/} Usually it is not known whether a particular distortion in the data has, in fact, biased fertility estimates or not because the cause of the distortion is not known, but the existence of the distortion raises the level of doubt surrounding the estimate. Thus the final quality assessment reflects the degree of doubt attached to the fertility estimate rather than a measure of its inaccuracy. It may be found in a subsequent census or survey that a fertility estimate rated here as less reliable or C was in fact accurate due to the fact that certain data deficiencies had countervailing effects.

Age reporting

The quality of the age reporting in both the household and the individual surveys is an important input into the assessment of overall age reporting. In the household survey, the age or date of birth was asked of the family spokesperson for all members of the household and in the individual survey the month and year of her own birth was asked of each respondent. Table 4 presents a summary of the findings on the age data from the individual country chapters.

One important index of age reporting is the percentage of respondents in the individual survey who gave complete birth date information in the form of a month and year of birth, and that is presented in column 1. With the exception of the Dominican Republic, the percentage of respondents giving complete birth date information in Latin America is above 90 per cent. In the case of Costa Rica and Venezuela, the completeness of date reporting is not known. In Asia and Africa, the proportions are variable and much lower on average, with Benin, Mauritania, Bangladesh, Pakistan and Yemen having less than 10 per cent, and only Tunisia, the Philippines, the Republic of Korea and Thailand having more than 75 per cent.

A preference for certain digits will distort the single-year age distributions and often the five-year distributions as well. The Myer's index has been developed to measure digit preference and is shown in column 2. The method yields an index of preference for each individual digit (0-9) representing the deviation from 10 per cent of the proportion of the population reporting on the given digit. The summary measure is one half of the absolute sum of the deviations from 10 per cent; if there were no digit preference, the index would be zero (Shryock and Siegel, 1963). In this report the index was based on the household age distribution. In general, it has been found that, when single year age distributions have been compared between the household and individual surveys, the degree of digit preference is more severe in the household than in the individual survey but the nature of the preference is similar (Chidambaram, Cleland and Verma, 1980). For the purpose of international comparisons, the use of the household data for the calculation of Myer's Index requires the assumption that the ranking of countries would not change if the individual data could have been used instead. Again, there is much more variability displayed in Asia and Africa, with indices ranging from 1.9 in the Republic of Korea to 41.8 in Yemen and from 3.7 in Senegal to 28.5 in Sudan. In Latin America, Haiti has the highest index, 9.9, and Trinidad and Tobago has the lowest, 2.1.

In addition to these overall indices of data quality and reliability, it is important to examine the five-year age distribution for any distortions in age reporting which may arise. Age-specific fertility rates are based on five-year groups and may be distorted if women's ages are misreported in systematic ways. This could arise if the enumerators had an incentive to record women's ages as outside the eligible range in order to avoid a lengthy individual interview, or if respondents themselves avoid ages 40 and above. Columns 3-6 summarize the findings on the possibility of such distortions. In all three regions it was found that the shifting of women to age group 50-54 was much more prevalent than shifting at the younger end of the eligible age range. The over-representation of 35-39 year-old women is particularly characteristic of Latin America but also occurs in some African and Asian countries. If, on the other hand, the ages of women within the reproductive group are accurately reported but certain groups are under-enumerated, the sampling variability of the fertility estimate will be affected.

Both internal and external checks can be applied to the five-year age distribution to check for the types of problems mentioned above. Because of the importance of examining the effect of eligibility for the individual interview on the age distribution, the household age distribution is examined. In each country chapter, figure I compares the male and female age distribution in five-year groups from the household survey, and figure II compares the female age distribution with the most recent census or survey. Except in so far as reflected in the Myer's index, features of the age distribution outside the reproductive and immediately adjacent five-year age groups have not entered into the rating, given that the age distribution outside the reproductive ages does not directly affect the fertility rates, which are of ultimate interest in the present study.

Table 4. Indicators of the quality of World Fertility Survey age data

Region and country	Month and year reported by women interviewed (percentage) (1)	Myer's Index household data estimates for females ranging from 0 to 90 years (2)	Shifting out of eligible ages		Eligible age groups over-represented (5)	Extent of over-representation g/ (6)	Overall quality (7)
			To younger a/ (3)	To older b/ (4)			
Africa							
Benin.....	9	17.5	d/	Some	20-24, 25-29	A lot, a lot	C
Cameroon.....	28	15.4	d/	A lot	30-34, 40-44	Some, a lot	C
Cote d'Ivoire g/.....	20	7.1	d/	A lot	20-24, 40-44	Some, some	C
Egypt.....	26	17.5	d/	d/	d/	d/	B
Ghana.....	52	16.7	d/	A lot	d/	d/	B
Kenya.....	34	7.6	Some	d/	25-29, 35-39	A lot, some	C
Lesotho.....	72	6.2	d/	d/	d/ 40-44	A lot	B
Mauritania.....	4	25.5	d/	A lot	d/	d/	C
Morocco.....	22	17.8	d/	Some	d/	d/	B
Senegal.....	38	3.7	d/	Some	30-34 f/	Some	B
Sudan.....	22	28.5	d/	d/	25-29, 35-39, 45-49	A lot, a lot, A lot	C
Tunisia.....	88	6.8	d/	A lot	d/	d/	A
Latin America and the Caribbean							
Colombia.....	97	5.7	d/	d/	35-39	A lot	B
Costa Rica.....	..	2.8	Some g/	Some	d/	d/	A
Dominican Republic.....	86	8.5	d/	d/	35-39	A lot	B
Ecuador.....	100	6.0	d/	Some	d/	d/	A
Guyana.....	98 h/	4.8 1/	..	..	d/	d/	A
Haiti.....	92	9.9	d/	A lot	30-34 f/, 20-24, 40-44 f/j/	Some, some, some	B
Jamaica.....	95	4.7	d/	A lot	d/	d/	A
Mexico.....	95	6.6	d/	d/	35-39	A lot	B
Panama.....	99	3.7	Some g/	A lot	30-34	Some	A
Paraguay.....	100	..	d/	Some	35-39	Some	A
Peru.....	95	6.5	d/	d/	35-39	Some	B
Trinidad and Tobago.....	98	2.1	d/	A lot	15-19, 25-29 f/, 40-44 j/	Some, a lot, a lot	B
Venezuela.....	..	4.7	d/	Some k/	35-39	Some	A

Table 4. continued

Table 4. (continued)

Region and country	Month and year reported by women interviewed (percentage) (1)	Myer's Index household data estimates for females ranging from 0 to 90 years (2)	Shifting out of eligible ages		Eligible age groups over-represented (5)	Extent of over-representation c/ (6)	Overall quality (7)
			To younger a/ (3)	To older b/ (4)			
Asia and Oceania							
Bangladesh.....	1	7.8	Some	d/	25-29, 45-49	Some, some	C
Fiji.....	68	5.1	d/	A lot	d/	d/	B
Indonesia.....	22	11.6	d/	A lot	d/ 35-39	Some	C
Jordan.....	30	24.3	d/	Some	d/ 35-39	Some	C
Malaysia.....	57	8.5	d/	d/	d/	d/	B
Nepal.....	13	16.3	Some	A lot	20-29, 40-44	Some, a lot	C
Pakistan.....	7	12.1	d/	d/	25-34, 40-44	Some, a lot	C
Philippines.....	97	2.4	d/	Some	d/ 35-39	Some	A
Republic of Korea	100	1.9	d/	d/	d/	d/	A
Sri Lanka.....	67	8.8	d/	d/	35-39, 45-49	Some, a lot	B
Syrian Arab Republic	57	9.2	d/	A lot	20-24 f/, 25-29 f/, 30-34 f/j/	Some, a lot, Some	B
Thailand.....	85	2.5	d/	d/	d/	d/	A
Yemen.....	0	41.8	d/	A lot	25-29	A lot	C

Sources: Standard recode tapes and country chapters in the present publication; for column (1), except for Columbia and Mexico, V.C. Chidambaram and B.A. Sathar, "Age and date reporting", WFS Comparative Studies, No. 5 (Voorburg, Netherlands, International Statistical Institute/World Fertility Survey, August 1984); for column (2), Myer's Index from S. Rutstein, "Assessment of the quality of age reports for eligibility and analysis" in N. Goldman, S. Rutstein and S. Singh, Assessment of the Quality of Data in 41 WFS Surveys: A Comparative Approach, WFS Comparative Studies, No. 44 (Voorburg, Netherlands, International Statistical Institute/World Fertility Survey, 1985).

Note: Age data assessed as: A = good quality; B = acceptable quality; C = less reliable.

a/ If $2P_{15-19} / (P_{10-14} + P_{20-24})$ is less than 0.90 and greater than 0.75, "some" evidence of shifting to younger ages is said to exist. If the ratio is less than 0.75 then "a lot" of shifting to younger ages is said to exist.

b/ If $2P_{50-54} / (P_{45-49} + P_{55-59})$ is greater than 1.10 and less than 1.30 then "some" evidence of shifting to older ages is said to exist. If the ratio is greater than 1.30 then "a lot" of shifting to older ages is said to exist.

c/ If the ratio of two times the over-represented age group to the sum of the adjacent age groups is greater than 1.05 and less than 1.15, "some" over-representation is said to exist. If the ratio is greater than 1.15, "a lot" of over-representation is said to exist. A stricter criteria than for a/ and b/ is used since these age groups are within child-bearing ages and therefore a greater impact on fertility rates is expected.

d/ The characteristic referred to does not exist to a significant degree according to the criteria mentioned above.

e/ Formerly called the Ivory Coast.

f/ Under-represented

g/ Ages 15-19.

h/ Women in the individual questionnaire only.

i/ Based on ages 20-49.

j/ Migration distorts the age distribution.

k/ The oldest eligible age group was 40-44 years.

Column 7 of table 4 presents a summary of findings based on the criteria chosen for the evaluation of the age data. Eleven of the 20 countries (one from Africa, seven from Latin America and three from Asia), were rated as having relatively reliable age data and were assigned a quality rating of A. Most of the 11 ranked in the top third with respect to the Myer's index and the percentage reporting month and year.^{14/} Four of the 11 (Panama, Paraguay, the Philippines and Venezuela) had some over-representation of certain eligible age groups but the degree of possible age shifting appeared very slight, as indicated in the table. Three data sets (Jamaica, Panama and Tunisia) showed a large excess of women aged 50-54. If this was caused by interviewers' reluctance to interview older women of high parity, the fertility of the cohort aged 45-49 will be underestimated throughout the birth history. However, given the fact that fertility of women of that cohort in the recent past has relatively little weight on total fertility, the problem was not seen as sufficient to downgrade the quality of the age data if all other criteria appeared to be good. In the case of Panama the tendency to shift younger and older eligible women out of the eligible ages into the 15-19- and 50-54-year-old groups may have caused the apparent over-representation of women 30-34.

Thirteen countries (five from Africa, six from Latin America and four from Asia) were judged to have age data of acceptable quality and were put in the B group. All except Colombia, Fiji, Senegal and Trinidad and Tobago had a Myer's index of 6.0 or higher. Fiji and Senegal, despite better-than-average Myer's indices, had worse-than-average reporting of month and year of birth. All the countries in the group also had either less than 70 per cent reporting month and year or notable over-representation of certain age groups. In addition, Colombia, Mexico and Peru showed a common pattern of over-representation of age group 35-39. That appears to result from a reluctance of women to report an age over 40 and is a familiar pattern in Latin American data (Ewbank, 1981). Trinidad and Tobago, despite doing so well on the percentage reporting month and year (98 per cent) and on the Myer's index (2.1), showed some serious distortions in the age distribution within the reproductive age range. Since it is not certain whether the distortion was caused by reporting errors or the result of migration patterns in the Caribbean, Trinidad and Tobago was assigned to the B group. Similar distortions are also seen in the age distribution for Haiti. A repeat survey in the Dominican Republic confirmed the possibility that some women in the 40-44 cohort were transferred downwards into the 35-39 cohort.

Twelve countries were assessed as having less reliable age data (six in Africa and six in Asia) and were put in the C group. Only Kenya and Jordan had 30 per cent or more of respondents reporting month and year of birth, and the Myer's index in the group ranges from 7.1 in Côte d'Ivoire to 41.8 for Yemen. Most of the 12 showed some marked distortions in the five-year age distribution within the eligible ages. In those cases where the age distribution distortions were less marked (Côte d'Ivoire, Mauritania, Bangladesh, Indonesia and Jordan), the percentage reporting of month and year was exceedingly low and/or the Myer's index was exceedingly high.

Another index of data quality - the consistency of birth date information - is currently available from Post Enumeration Surveys (PES) for four of the

countries included in table 4: Bangladesh, Fiji, Indonesia and Peru. Two additional countries (Pakistan and the Philippines) conducted such surveys, but the results were not available (Singh and Platrides, 1980). In those surveys, a sub-sample of the original sample was reinterviewed and responses compared. The statistic quoted in the individual country chapters in part two is the percentage of women re-interviewed in PES who, at the two interviews, gave dates of birth that were consistent within one year. In Fiji and Peru, 64 and 66 per cent respectively, gave consistent responses, whereas in Bangladesh and Indonesia, the percentage with consistent responses was only 39 and 43, respectively. The results for the four countries are crudely consistent with the quality rating derived in table 4 from other measures. Fiji and Peru were placed in group B and Bangladesh and Indonesia in group C with respect to the quality of grouped age data. However, some of the ratings might be affected if the same information were to be available for all countries.

Marriage histories

The quality of the marriage history data from the individual survey is a crucial aspect of the quality of marital fertility rate estimates, and, in addition, the quality of current marital status reporting by single years of age from the household survey is crucial to estimates of age-specific fertility for those countries that included only ever-married women in their individual surveys. In the Latin American countries and some African countries where the marital state was defined to include non-legal unions, it is particularly difficult to assess the accuracy of WFS data on marital status because census data are often less inclusive. In particular, many Latin American countries routinely count women separated from consensual or more casual unions as single rather than separated in their censuses and, thus, they would not be included among the women ever in a union. The nuances of WFS definitions of marriage are discussed elsewhere.^{15/} Suffice it to say that the inclusion of non-legal unions, while likely to increase the precision with which relevant exposure time is measured, brings with it the problem of non-comparability with external sources.

With only a few exceptions (Pakistan and Thailand), the current marital status (the percentage ever married by age) appears roughly consistent with recent census estimates. This is particularly important for all the Asian countries, five countries in Africa (Lesotho, Egypt, Mauritania, Sudan and Tunisia) and Peru, which only interviewed ever-married women. In those countries the percentage ever married by age was combined with the fertility rates of eligible women by age to derive an estimate of age-specific fertility rates. Results of the survey in Pakistan yielded an estimated proportion ever married among women ages 15-19 which was roughly 10 percentage points higher than that recorded in the 1972 census. On the other hand, in Thailand, the current proportion ever married for women aged 15-19 and 20-24 appears at least 5 percentage points too low when compared to the 1975 SPC survey from which the WFS sample was drawn. The reasons for such discrepancies are not clear but may indicate that the sample was not representative of the population. Thus, for Pakistan, estimates of fertility rates for the affected age group may be slightly too high and for Thailand, slightly too low. For the other countries with ever-married samples, the quality of age-specific

fertility estimates is not seen to be affected by the reporting of current marital status because current marital status as reported in WFS was found to be remarkably consistent with that reported in a recent census or survey.

The quality of marital fertility rate estimates depends ultimately on the quality of the marriage histories themselves, because the rates take into account only years of exposure since first marriage or union and births that were dated as occurring within that measured exposure time. Thus, if early marriages are not reported, exposure time will be under-estimated but, if marital duration is exaggerated, exposure time will be over-estimated and marital fertility rates may be estimated as too low at certain periods in the past.

One possible pattern of marriage date reporting is the exaggeration of years since first marriage of those marrying relatively recently. It is of particular concern because it could distort recent trends in marital fertility. It is difficult to diagnose, but, if true, would cause an apparent acceleration over the past five years in the decline in the percentage ever in union at each age. In many of the countries considered here, there has been a long-term trend towards rising age of marriage and in certain cases it is not implausible that that trend has accelerated in recent years. However, signs of the pattern appeared in about half the countries, and it is implausible that the pattern is correct for all of them. Date shifting might also cause the distribution of ever-married women by years since first marriage to appear too flat in the years immediately prior to the survey, showing an apparent deficit in marriages in the recent period.

Also, it is often found that the proportions ever in a union are lower 25-30 years before the survey than 15-20 years before the survey. The phenomenon is quite common in Latin American countries and African countries and can also be observed in Fiji and the Philippines. It could be caused by the omission of early unions, the misdating of unions by older women or age misstatement.

Table 5 provides a summary of those aspects of the information contained in the country chapters which can be clearly measured or identified. A first crude index of the quality of marriage date reporting is the percentage of all respondents reporting month and year of first union.^{16/} It ranges from 100 per cent in Trinidad and Tobago and the Republic of Korea to 5 per cent in Benin.

In each country chapter, figure III shows the distribution by single years before the survey of years since first union. In order to measure the smoothness of the distribution over the period 0-14 years prior to the survey, a duration index was devised which measures the average of the absolute deviations from 1 of a ratio of the actual number of first marriages in each year to the average number based on the actual year as well as prior year and subsequent year. That index, shown in column 2, ranged from a low of .048 for Indonesia to a high of .169 in Benin and Nepal. The annual fluctuations are sometimes caused by a preference for a particular year or years in the historical past, like 1960 or 1970, or an important historical event such as the year of independence, in Guyana, Jamaica, Malaysia and Pakistan. In

Tunisia, for example, the effects of changes in the marriage laws are quite clearly reflected in the data. More often, clear preferences are shown for certain digits in terms of number of years ago. Fluctuations caused by small sample-size is also a possibility. Therefore, only countries with indices that fall into the higher ranges are considered to have potential problems. Column 3 indicates the possibility of a deficit of marriages in the 0-4 years before the survey which might affect the quality of recent estimates of marital fertility rates. The typical pattern observed is a decline in the number of marriages with increasing years before the survey, when women aged 15-49 were interviewed.^{17/} A deficit is indicated when the proportion of marriages taking place in the last five years is equal to or less than the number in the five years earlier.

In certain countries, it is obvious that proportions ever-married for one cohort (defined in terms of age at the time of the survey) are too high in relationship to neighbouring cohorts at each age (see fig. IV in each country chapter). That is more likely to be due to age misreporting than misreporting of the date of first union, but it may cause serious distortion in trends in age-specific fertility rates as well as marital age-specific fertility rates. When the proportions married are systematically too high for one cohort at each period in the past, it is likely that that cohort includes older women who have understated their age at marriage. That is noted in column 4 of table 5.

Finally, it is important to compare trends in proportions married at each age with information derived from censuses and other surveys. In most cases where trends are inconsistent, WFS suggests a more rapid decline in proportions ever in union at each age than outside sources or alternatively a trend where none is suggested by other sources.^{18/} The discrepancies in the trend could be due to the backdating of marriage dates and/or changes in the quality of age-reporting over time in population censuses such that there was a greater overestimation of women's ages in earlier censuses.^{19/} Serious overstatement of age can cause proportions married in younger age groups to appear too low (Van de Walle, 1968). In Latin America where this type of age exaggeration is not typical, it is possible that the absence of a trend recorded in census data could be true or could reflect the fact that earlier censuses took less full account of consensual or more casual unions. Thus, there are alternative and equally plausible explanations for the inconsistencies in trends in first union when taken from different sources. Without a detailed evaluation of prior censuses, it is difficult to sort out the alternative explanations. In the final analysis, almost every country for which external data were available for comparison shows some inconsistencies in trends for some age groups, and it is never possible to be sure whether any or all of them can be explained by distortions in the WFS marriage histories. At the same time, confidence in the survey data is increased if the apparent trend in age at marriage can be confirmed by reference to independent sources. Marital histories of countries for which trends agreed with those implied by external sources were given higher quality ratings, reflecting the greater confidence placed in those data sets.

Table 5. Indicators of the quality of the World Fertility Survey marital history data
(0-14 years prior to the survey)

Region and country	Percentage of first unions reported by month and year (1)	Distribution by years since first union		Trend in proportions ever married		Overall quality rating (6)
		Duration index a/ (2)	Deficit of unions 0-4 years prior to survey b/ (3)	Cohort proportion overestimated c/ (4)	Age group for which trend inconsistent with external sources (5)	
Africa						
Benin.....	5	0.169	d/-	(25-29)(35-39) e/	..	C
Cameroon.....	21	0.103	d/-	d/	..	C
Cote d'Ivoire g/.....	12	0.075	d/-	(25-29) f/ (35-39)	(15-29)	C
Egypt.....	37	0.076	d/-	(25-29) f/	d/	B
Ghana.....	40	0.071	d/-	(20-24)(35-39)	..	C
Kenya.....	69	0.102	d/-	(30-34)	d/	B
Lesotho.....	88	0.080	d/-	d/	(15-19)	A
Mauritania.....	7	0.105	Yes	(25-29)(35-39)	(15-29)	C
Morocco.....	35	0.071	d/-	(35-39)	d/	B
Senegal.....	69	0.119	d/-	(30-34)	(15-29)	C
Sudan.....	41	0.146	Yes	(35-39)	..	C
Tunisia.....	53	0.086 h/				A
Latin America and the Caribbean						
Colombia.....	97 l/	0.060	d/	(30-34)	(15-19)	B
Costa Rica.....	..	0.060	l/	(30-34)	(15-29)	B
Dominican Republic.....	73	0.142	d/	(35-39)	(15-19)	C
Ecuador.....	67	0.078	d/-	(25-29) f/	(15-29)	B
Guyana.....	79 k/	0.153	d/-	(30-34)	d/	C
Haiti.....	93	0.105	Yes	d/	d/	C
Jamaica.....	53 k/	0.163	Yes	d/	d/	C
Mexico.....	94	0.077	d/	(40-44)	(15-19)	A
Panama.....	100	0.114	l/	d/	(15-24)	B
Paraguay.....	98	0.125	d/	(40-44)	(15-29)	B
Peru.....	81	0.109	Yes	(40-44)	(15-29)	C
Trinidad and Tobago.....	100	0.094	Yes	d/	..	B
Venezuela.....	..	0.099	d/	(35-39)	(25-29)	B

Table 5. continued

Table 5. (continued)

Region and country	Percentage of first unions reported by month and year (1)	Distribution by years since first union		Trend in proportions ever married		Overall quality rating (6)
		Duration index a/ (2)	Deficit of unions 0-4 years prior to survey b/_ (3)	Cohort proportion overestimated c/ (4)	Age group for which trend inconsistent with external sources (5)	
Asia and Oceania						
Bangladesh.....	11 k/	0.080	d/	d/	(15-19)	C
Fiji	85	0.064	d/	d/	(15-24)	A
Indonesia.....	46 k/	0.048	d/	d/	(15-19)	C
Jordan.....	58 k/	0.101	d/	(35-39)	(15-29)	C
Malaysia.....	62	0.064	d/	d/	d/	A
Nepal.....	27	0.169	Yes	d/	(15-24)	C
Pakistan.....	73	0.117	d/	d/	(15-24)	C
Philippines.....	96	0.084	Yes	(40-44)	(20-29)	B
Republic of Korea	100	0.077	d/	d/	d/	A
Sri Lanka.....	70	0.094	d/	d/	(15-24)	B
Syrian Arab Republic	79	0.062	d/	(30-34)	(15-19)	B
Thailand.....	75	0.102	d/	(40-44)	(15-29)	B
Yemen.....	8	0.140	d/	(25-29) f/ (30-34) g/	..	C

Sources: Standard recode tapes and figures III and IV in each country chapter; for column (1), V.C. Chidambaram and B.A. Sathar, "Age and date reporting", *WFS Comparative Studies*, No. 5 (Voorburg, Netherlands, International Statistical Institute/World Fertility Survey, August 1984).

Notes: Marriage data assessed as: A = good quality; B = acceptable quality; C = less reliable.

a/ This index is based on the period 0-14 years prior to the survey and is designed to measure fluctuations in annual rates. The index is similar in concept to the age ratio score and is derived from the ratio of the actual number of marriages in year x to the average number of marriages in year x-1, x and x+1. The index is the average over 15 years of the ratio's absolute deviations from 1.

b/ There was considered to be a deficit of unions reported in the recent period if the numbers of marriages taking place 0-4 years prior to the survey was less than or equal to the number occurring 5-9 years before the survey.

c/ The cohort named in this column showed a proportion married at each age (see figure IV in each country chapter) which was too high in relationship to the observed trend for that age.

d/ The characteristic referred to does not exist to a significant degree.

e/ Excess in most recent period among all cohorts.

f/ Underestimated.

g/ Formerly called the Ivory Coast.

h/ Fluctuations in Tunisia caused by changes in marriage laws.

i/ Based on current marriages. The percentage reporting month and year of former marriage was 80 per cent for Costa Rica.

j/ The deficit observed in the case of Costa Rica and Panama can be explained by the fact that only women aged 20 years and older were eligible for interview.

k/ Some responses were given in the form of age at union: Guyana, 15 per cent; Jamaica, 47 per cent; Bangladesh, 67 per cent; Indonesia, 41 per cent; Jordan, 21 per cent.

Of the 38 countries for which marital history data are assessed here, there are only six countries for which the data have been assessed as reliable and given an A rating. They are Fiji, Lesotho, Malaysia, Mexico, the Republic of Korea and Tunisia. Only the Republic of Korea's data appear free of problems. For none of the six countries is there evidence of a recent deficit of marriages and for all there are relatively low duration indices indicating a comparatively smooth distribution of eligible women by years since first union. Despite the fact that only 62 per cent of the Malaysian sample reported month and year of first union, the marriage trends are consistent with external sources, and age reporting does not appear to have affected the marital status distribution in any way. Tunisia also had only 53 per cent of respondents reporting month and year of first marriage, and while age reporting may have affected the marital status distribution slightly, it is unlikely to have affected trends for the period 15 years before the survey. Fiji shows some inconsistencies with marital trends from external sources while Mexico's inconsistencies appear very minor and unlikely to affect the 15-year trend. That may be due to the fact that non-legal unions are statistically less important in Mexico than in the other Latin American countries (United Nations, 1983).

Fourteen countries were rated as having marital history data of reasonably reliable quality and given a B rating (three from Africa, seven from Latin America and four from Asia). Generally, marriage data for those countries showed, to a moderate degree, one or more internal features that were regarded with suspicion and, in addition, usually showed trends which disagreed with or at least could not be confirmed by reference to external sources.^{20/} The severity of the possible defects was not, however, judged to be as great as that for countries given the less reliable rating of C. Colombia and Costa Rica were included in the B group because both showed some distortion for the cohort aged 30-34 which may affect the interpretation of trends. Census data with a less inclusive definition of marriage showed no trends. Other Latin American countries were included in the B group because of a very irregular distribution of years since first union and because of a recent deficit of unions in Trinidad and Tobago. The other countries whose data were rated in the B group as of acceptable reliability all had inconsistencies with respect to trends and/or some distortion with respect to one particular cohort and had middling ratings with respect to the imputation of months and the index of smoothness of the distribution of first marriages. The Philippines and Trinidad and Tobago, despite good ratings on several indices, showed a possible deficit of marriages in the recent period.

Eighteen countries were rated as having less reliable data: seven from Africa, five from Latin America and six from Asia. All of them ranked poorly with respect to the percentage of months imputed and/or the duration index. In addition, all showed some inconsistencies with respect to trends and/or some distortion with respect to one particular cohort.^{21/} In addition, six of the countries showed signs of a deficit of marriages in the recent period. Jamaica, Guyana and Haiti present unique problems of evaluation because the definition of union there was expanded by WFS to include visiting unions in addition to consensual unions.^{22/} The expanded definition of unions makes it difficult to assess trends because no comparable external data are available. Greater doubt must therefore be attached to those estimates,

although it is quite possible that future surveys will be able to confirm the implied trends.

The post-enumeration surveys for Bangladesh, Fiji, Indonesia and Peru provide information on the percentage of women reinterviewed who provided responses consistent with the original individual interview. In Fiji, 67 per cent of women gave a response on age at first marriage that was consistent within one year. For Indonesia the per cent was 38 and for Peru, 46. For Bangladesh, comparable data from PES is not available, but it is known that 53 per cent of the small sample reinterviewed reported the age at which their current union occurred within one year of the age given at the original interview. The degree of consistency was roughly comparable with that for age for Fiji and Indonesia, but in the case of Peru, consistency was significantly less. That was a factor in rating the nuptiality data for Peru as relatively less reliable. The improved consistency for the data from Bangladesh may be related to the fact that the data were based on current marriage.

Birth history data

The final and most crucial step of the data evaluation is an assessment of the quality of the birth histories themselves. It must be accomplished in two parts: an assessment of recent levels (in the 0-4 years before the survey) and an assessment of trends in births over the 0-14 year period before the survey. A final assessment of age-specific fertility rates and marital fertility rates will depend not only on the quality of birth enumeration but also on the quality of the age distributions and the marital history data.

Table 6 summarizes all the factors taken into account in assessing the enumeration of recent births. Despite problems already noted with respect to age distribution and the marriage history, overall the WFS data receive high marks with respect to the enumeration of recent births. Only 10 of the 38 countries were rated as having less reliable data in that regard. Many factors were taken into account in this assessment. Internal checks included the percentage of live births reported with a month and year, the volatility of recent annual fertility rates and any evidence of shifting of births away from the interview date to the period (5-9) years before the survey, a bias that would cause an underestimate of recent fertility. External checks included a comparison of WFS parity with a recent source and a comparison of the total fertility rate from WFS with a recent estimate from another source. The final check was not possible in the case of seven countries (Benin, Ghana, Jamaica, Mauritania, Morocco, Nepal and Pakistan) because no alternative fertility estimates were available for the mid 1970s. For the Dominican Republic, although no period total fertility rate comparison could be presented in table 6, a comparison of cohort-period fertility rates from a subsequent survey in 1980 is commented upon in the country chapter.

The percentages of all live births reported with a month and calendar year are indicated in column 1 of table 6. In the large majority of cases they are exceedingly high; they are at least 90 per cent in all the Latin American countries.^{23/} In Asia, only in Bangladesh, Indonesia and Yemen were fewer than 50 per cent of the dates reported in that form. In Africa,

Table 6. Overall quality of enumeration of recent births from the World Fertility Survey
(0-4 years prior to the survey)

Region and country	Percentage of live births reported by month and year	Parity comparison			Recent fertility (total fertility rate) comparison					Deficit in births in years 1-2 before survey a/	Index of irregularity in recent annual average fertility rates b/	Overall quality
		Year of WFS	Other source date	WFS higher than other source for age groups	WFS		Other source					
					Date	Level	Date	Type of data a/	Level			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Africa												
Benin.....	12 c/	..	..	..	1975-1977	6.4	1976	C	6.0	A lot	0.038	C
Cameroon.....	41	..	..	..	1977-1979	7.5	1978-1979	S	6.8	d/	0.012	B
Cote d'Ivoire g/	28 c/	1980/81	1978/79	35-49	1975-1977	5.5	1975-1977	BR	5.4	A lot	0.054	C
Egypt.....	41 c/	1976	1976	15-49	1975-1977	5.5	1975-1977	BR	5.4	A lot	0.035	B
Ghana.....	64 c/	1970	1970	Lower	1975-1977	5.9	1976	C	5.9	A lot	0.045	C
Kenya.....	75 c/	1977/78	1977	35-49	1976-1978	8.0	1977/78	S	8.1	Some	0.016	B
Lesotho.....	90	1977	1976	15-49	1975-1977	6.9	1976	C	6.6	d/	0.065	B
Mauritania.....	12 c/	..	..	..	1975-1977	6.9	1976	C	6.6	A lot	0.067	C
Morocco.....	60 c/	1972/73	1972/73	15-39	..	..	..	..	..	d/	0.023	B
Senegal.....	99 c/	..	..	..	1972-1974	6.8	1973	C	5.3	Some	0.054	C
Sudan.....	63 c/	1973	1973	15-44	1974-1978	5.9	1974-1978	BR	5.6	A lot	0.054	C
Tunisia.....	70	1978	1975	Lower	1974-1978	5.9	1974-1978	BR	5.6	d/	0.025	A
Latin America and the Caribbean												
Colombia.....	91	1976	1973	40-49 f/	1970-1974	4.9	1972-1973	C	4.4	d/	0.035	A
Costa Rica.....	..	1976	1973	Lower	1970-1974	4.3	1970-1974	BR	4.3	d/	0.018	A
Dominican Republic	91	1975	1970	35-49	1976-1979	5.3	1976-1979	S	5.7 g/	d/	0.025	B
Ecuador.....	78	1974	1974	25-44	1970-1974	5.1	1970-1974	BR	4.5	Some	0.026	B
Guyana.....	91	1975	1970	40-49	1972-1974	5.5	1973	S	5.1	d/	0.029	A
Haiti.....	94 c/	1971	1971	30-34	1972-1974	5.5	1973	S	5.1	Some	0.025	B
Jamaica.....	91	1975-1976	1970	35-49	1971-1972	6.5	1971-1972	BR	6.3 h/	d/	0.037	A
Mexico.....	99	1976	1970	35-49	1971-1975	4.5	1971-1975	BR	4.6	d/	0.010	A
Panama.....	98	1975/76	1971	40-49	1975-1978	4.9	1976-1977	S	4.7	Some	0.064	B
Paraguay.....	100	1979	1977	20-24	1974-1976	5.5	1975	S	5.3	Some	0.033	B
Peru.....	93	1975/76	1975/76	35-49	1972-1976	3.4	1972-1976	BR	3.3	d/	0.014	A
Trinidad and Tobago.....	94	1970	1970	15-44	1972-1976	4.7	1972-1976	BR	5.0	Some	0.025	A
Venezuela.....	..	1977	1981	25-44	1972-1976	4.7	1972-1976	BR	5.0	Some	0.024	B

Table 6. continued

Table 6. (continued)

Region and country	Percentage of live births reported by month and year (1)	Parity comparison			Recent fertility (total fertility rate) comparison					Deficit in births in years 1-2 before survey a/ (10)	Index of irregularity in recent annual average fertility rates b/ (11)	Overall quality (12)
		Year of the WFS (2)	Other source date (3)	WFS higher than other source for age groups (4)	WFS		Other Source					
					date (5)	level (6)	date (7)	type of data a/ (8)	level (9)			
Asia and Oceania												
Bangladesh.....	12	1975	1974	15-49	1971-1975	6.3	1974	S	7.2	A lot 1/	0.031	C
Fiji.....	86	1974	1976	20-49	1970-1974	4.1	1970-1974	BR	3.6	d/	0.036	A
Indonesia.....	46 c/	1976	1976	Lower	1971-1976	4.7	1971-1975	S	4.9	A lot	0.042	C
Jordan.....	66	1976	1972	40-49	1971-1976	7.8	1972-1976	S	7.8 1/	d/	0.036	B
Malaysia.....	86	1974	1970	40-49	1970-1974	4.7	1970-1974	BR	4.7	d/	0.013	A
Nepal.....	k/	1976	1971	20-49	1971-1975	6.0	1974-1976	S	6.3 1/	d/	0.036	B
Pakistan.....	80	1975	1971	20-49	..	..	..	..	..	A lot	0.040	C
Philippines.....	96	1975	1975	20-49	..	..	..	..	..	d/	0.022	A
Republic of Korea	100 c/	1974	1975	30-49	1972-1974	4.0	1972-1974	C	3.9	d/	0.014	A
Sri Lanka.....	73	1975	1971	40-49	1972-1974	3.6	1972-1974	BR	3.7	Some	0.034	B
Syria.....	83 c/	1978	1976	20-34	1975-1977	7.4	1977-1978	S	7.4	m/	0.006	A
Thailand.....	84	1975	1970	45-49	1970-1974	4.8	1970-1974	S	4.9	A Tot	0.032	B
Yemen.....	11 c/	1979	1981	45-49	1976-1978	8.1	1981	S	7.9	A lot	0.041	C

Sources: Standard recode tapes and country chapters; for column (1), V.C. Chidambaram and B.A. Sathar (1984), "Age and date reporting", WFS Comparative Studies, No. 5 (Voorburg, Netherlands, WFS/ISI, August 1984).

Notes: Recent births data assessed as: A = good quality; B = acceptable quality; C = less reliable.

WFS = World Fertility Survey.

For type of data: S = estimated from result of survey; BR = based on birth registration data; C = estimated from population census data.

a/ Deficit in births in years 1-2 before the survey is measured as "a lot" if $(P_0 + P_3) / (P_1 + P_2)$ is less than 0.90 and "some" if the ratio is less than 0.95 and greater than or equal to 0.90. P_1 is defined as the number of births 1 years before the survey. In cases coded "a lot", backward shifting of births from 0-4 to 5-9 years before the survey is strongly suspected.

b/ This index is based on the average fertility rate, P_1 (defined as births to women of all ages divided by total exposure) for the period 0-4 years prior to the survey. The index is defined as the average absolute deviation from 1.0 of the ratio of average fertility rate to a 3-year moving average centered on the rate:

$$\frac{1}{4} \frac{P_4 - E}{1 - 3P_1 / (P_{-1} + P_1 + P_{+1})}$$

c/ Used event chart.

d/ Index greater than 0.95.

e/ Formerly called the Ivory Coast.

f/ However, parity at ages 45-49 is shown to be higher in the 1978 Contraceptive Prevalence Survey.

g/ Cohort-period rates from a subsequent survey in 1980 allowed a comparison of recent rates in the country chapter.

h/ Registered vital statistics have not been published since 1964.

i/ Although the index of Bangladesh is greater than 0.95, back-dating of births from 0-4 to 5-9 years before the survey is strongly suspected, as shown in the country chapter below.

j/ This is not really an independent estimate, because it is based on the parity changes between the 1972 survey and World Fertility Survey, to permit a comparison with the period 0-4 years prior to the survey.

k/ The birth history automatically imputes only calendar year for all births.

l/ An average of estimates from 1974/1975 survey and the 1976 survey.

m/ There is a deficit for the period 4-5 years prior to the survey.

less than 50 per cent reported month and year in Benin, Cameroon, Egypt, Côte d'Ivoire, and Mauritania.

All WFS surveys recorded higher parity than recent census or surveys except those of Costa Rica, Ghana, Indonesia and Tunisia. In Indonesia, the large household survey (SUPAS I) taken in the same year as WFS, from which the smaller WFS sample was drawn for the household interview, recorded higher parity at most ages. The case of Costa Rica is peculiar but could be partially explained by a recent rapid fertility decline in that country.^{24/} In Ghana, the 1970 census recorded higher parity for all age groups but the youngest. Differences were not large and were on the order of 0.2 children among women of 40-44 years. Differences were also not large in the case of Tunisia. Among women of 45-49 years, the difference was about 0.1 children. As the comparison was between the 1975 census and the WFS in 1978, fertility decline could possibly account for some of the difference in Tunisia. The comparisons can be seen in columns 2-4 of table 6.

It was possible to compare WFS fertility estimates with recent vital statistics figures for 11 countries whose registration coverage was assessed to be at least 90 per cent complete (table 1). The comparisons are summarized in columns 5-9 of table 6. For Costa Rica, Egypt, Malaysia, Panama, Sri Lanka and Trinidad and Tobago, the estimates are essentially identical, whereas in Fiji and Guyana the WFS show higher estimates, confirming that in those two countries birth registration was only roughly 90 per cent complete (and possibly slightly less at the time of the survey). In Mexico and Tunisia, the WFS estimate is slightly higher than the estimate from vital registration (6.5 vs. 6.3 and 5.9 vs. 5.6). For Venezuela, the WFS estimate was lower than the estimate based on registration data.

For 13 cases, recent comparisons were only possible using other survey data whose quality had not been assessed. In the case of Côte d'Ivoire, Haiti, Paraguay, Peru and Yemen, the WFS data showed a higher fertility rate than another recent survey, with the differences being particularly striking in the case of Côte d'Ivoire and Haiti. In the case of Jordan, Kenya, Syrian Arab Republic and Thailand, the estimates are close but in Bangladesh, Ecuador, Indonesia and Nepal, other recent surveys show higher total fertility rates. In the comparison with an external source, Ecuador, Indonesia and Nepal were only slightly lower. The estimates from the other sources for Indonesia and Nepal were adjusted. In the case of comparisons with census estimates (which were made for six of the countries), WFS showed notably higher fertility for Cameroon, Mauritania, Sudan and Colombia, with roughly 30 per cent higher estimate in the case of the Sudan.

The tendency to exaggerate the ages of children aged 0-4 which has been documented, particularly in Africa and South Asia in household surveys (Ewbank, 1981), could be a potential problem for the accurate estimation of fertility levels if the shifting also occurs when children's dates of births are solicited in an individual interview seeking retrospective birth histories. In a comparison of fertility trends estimated alternatively from birth histories and own children, Retherford and Alam (1985) found evidence that recent dates of births obtained from birth histories often tend to be pushed backward from rather than towards the survey date. That possibility

has been examined in figure VI of each country chapter where recent trends in annual age-specific rates are examined. The feature of recent fertility that is regarded in this study as suggesting such a problem is an apparent deficit of children aged one year or aged one and two (actually a deficit of births one and two years before the survey). A relative deficit at ages 1 and 2 is quantified in column 10 of table 6 in a crude index measuring the degree to which the average fertility rate^{25/} for years one and two deviates from the average rate for years 0 and 3 before the survey. If fertility shows a steady decline or if rates are constant, the ratio should be approximately 1.0. In most cases, the value is quite close to 1.0, but it falls below .95 for two countries in Africa, five in Latin America and one in Asia and below .90 for six countries in Africa and four in Asia. Sampling error or genuine fluctuations in fertility may be responsible for some of the fluctuations, although so far as is known, there is no reason for thinking that they are real. It is unclear from this sort of evidence whether there has been net transfer across five-year boundaries, but the appearance of age-heaping in the birth history must increase the degree of caution in accepting the recent fertility trends as accurate and also casts doubt on the reliability of the rates for the most recent period. Where there are suggestions of age-heaping in the birth history, it is considered more likely that some births have been shifted out of the 0-4 year-period before the survey than that there has been a net shift in the other direction, because that is the type of misreporting of young children's ages that has been observed most often in deficient data from Africa and parts of Asia.

Bangladesh is a special case, not only because the typical pattern of age misstatement of young children may differ from that assumed in table 6 (Baeragi and others, 1982), but also because there are grounds for expecting a pronounced drop in fertility in the year immediately prior to the survey as a reaction to a famine in that year and a temporary decline in the aftermath of the 1971 War of Liberation. Indeed, a temporary dip in calendar year 1972 and a much larger drop between 1975 and 1976 can be observed (Chidambaram and Pullum, 1981), but the data show additional features suggestive of age misstatement: an apparent pronounced fertility decline beginning about six years before the survey continues in years not affected by crises, which is considered unlikely, and pronounced heaping on even-numbered calendar years for older children.

In many countries, either because of a small sample and/or underreporting of births in the one and two years before the survey, the age-specific rates in the period 0-4 years before the survey are extremely volatile. Column 11 shows an index of volatility based on the average fertility rate by single years for the 0-4 years prior to the survey. The principle of the index is the same as the marriage duration index discussed in the section above. The index measures the average of the absolute deviations from 1 of a ratio of the actual average fertility rate for each year to the three-year average of the average fertility rate based on the actual year as well as the prior and subsequent year. It ranged from a low of .006 in Syria to a high of .067 in Mauritania.

After considering all factors, the quality of the enumeration of recent births was found to be very reliable in 13 of the 38 countries and was rated A

(one from Africa, seven from Latin America and five from Asia). All 13 countries had at least 70 per cent of live births reported with month and year, and none had any sign of a recent deficit in births.^{26/} Although Colombia, Fiji and Jamaica all had relatively high indices of irregularity of recent fertility rates, there was no other evidence which raised serious doubts about the data. In the case of the Syrian Arab Republic, all indices ranked rather high, and the comparison of recent fertility level with an external source was good. Therefore, although a deficit of births was observed 4-5 years before the survey date, that country was assigned an A rating.

Fifteen countries were rated as having data of reasonable quality and were included in the B group (five in Africa, six in Latin America and four in Asia). Each of the countries whose recent birth history data were ranked in that group had at least one potentially serious problem (either because of a lower percentage reporting month and year, some evidence of a deficit in recent births, or an unusually high irregularity index). All showed recent fertility within a plausible range when evaluated against external sources. Lesotho and Panama had high indices of irregularity in recent fertility rates, and Egypt and Thailand had strong evidence of a recent deficit in births, while six Latin American countries and Sri Lanka had some evidence of a deficit. In the case of the Dominican Republic, a comparison of cohort-period fertility rates with a subsequent survey in 1980 also suggests the possibility of some deficit in births for the most recent period. Cameroon, Egypt, Jordan and Morocco had relatively less complete reporting of month and year of live births (less than 70 per cent). Nepal is a difficult case because relatively little is known from other sources about recent fertility and even the completeness of reporting of birth dates cannot be assessed because of the way dates were recorded by the interviewer. Because of the degree of doubt surrounding the estimates for Nepal, no better than a B rating seemed advisable.

All 10 countries whose data were rated as less reliable and which were therefore included in the C group had evidence of heaping of children's birth dates in the recent period both in terms of a recent deficit of births and in terms of a high degree of irregularity in annual rates. In addition, in six of those countries less than 50 per cent of respondents reported month and year of birth. In the case of Bangladesh recent rates were implausibly low, even taking into account recent famines and floods. In the case of Senegal, the lack of external sources and the implausibly high percentage reporting month and year of birth increased the uncertainty surrounding the rate despite the milder recent deficit, and resulted in its inclusion in the C group.

Again, the results of the four available post-enumeration surveys are roughly consistent with these findings. In Fiji and Peru, 74 and 71 per cent, respectively, of individuals reinterviewed gave a date for their first birth which was consistent - that is, within one year of that given in the main survey. In Bangladesh and Indonesia, only 32 and 37 per cent of first births, respectively, were given a consistent date. It can be seen that in Fiji and Peru the reporting of birth dates of children was better than the reporting of the respondents' own date of birth or the date of first marriage. Again, these results are roughly consistent with the ranking established in table 6

where Fiji and Peru were placed in group A and Bangladesh and Indonesia in group C .

The final rating of recent fertility rates requires not just the assessment of recent enumeration of births in table 6 but also information on the quality of age and nuptiality reporting. In table 7, those assessments are summarized. In the case of age-specific rates, the quality of the age data is relevant as well as the accuracy of the proportions ever-married at the time of the survey, for those countries with ever-married samples. As can be seen in column 3, the quality of recent age-specific fertility rates was given a lower rating than the recent birth data for Nepal. Nepal's estimates were rated in the C group despite a B rating on recent births because of the inadequate nature of the age-reporting. Thus, in the case of recent age-specific fertility rate estimates, 13 countries were found to have estimates of very reliable quality (A), 14 to have estimates of reliable quality (B) and 11 to have estimates which were of less reliable quality (C).

Estimates of recent marital age-specific fertility require an estimate of marital exposure time in the period 0-4 years before the survey. In certain countries recent exposure may have been overestimated due to a deficit in recent marriages, as shown in column 3 of table 5. Because of the deficit noted in table 5, the ratings for marital fertility estimates for Guyana, Jamaica, Peru, and the Philippines were downgraded to B. In the case of recent marital age-specific fertility rate estimates, 9 countries were rated in the A group, 18 in the B group and 11 in the C group. The changes reflect some of the difficulties found in the marital history data, particularly in Latin America. Overall, the enumeration and dating of recent births were considerably more accurate in many countries than the dating of recent marriages.

The quality of trend estimates from WFS can be assessed using both internal and external checks. However, if the quality of recent fertility estimates has been found to be less reliable, then estimates of trends will also necessarily be less reliable for that particular survey. The major problem with retrospective birth history data is that omissions of births and displacement of birth dates can distort the measurement of trends. Those problems are difficult to diagnose.

Omission of births is most likely to affect fertility at young ages for older cohorts (Brass and Rashad, 1980). Serious omissions can be detected most simply by examining how parity changes with age and comparing achieved parity at a given age for different cohorts. Omissions are less likely to distort trends in the 0-14 year period before the survey. Of much greater concern for the proper interpretation of recent trends is the placement of birth dates in the historical past. The possibility of backdating of recent births has already been discussed above, because it directly affects the quality of recent fertility estimates. It is also possible that the dating of more distant births may be distorted, given that older women in particular may not remember the date at which the birth history begins.

Table 7. Overall quality of recent age-specific fertility rates and recent marital age-specific fertility rates

Region and country	Quality of recent births (1)	Quality of age distribution (2)	Quality of recent age-specific rates (3)	Quality of marital history a/ (4)	Quality of recent marital age-specific rates (5)
Africa					
Benin.....	C	C	C	C	C
Cameroon.....	B	C	B	C	B
Cote d'Ivoire b/	C	C	C	C	C
Egypt.....	B	B	B	B	B
Ghana.....	C	B	C	C	C
Kenya.....	B	C	B	B	B
Lesotho.....	B	B	B	A	B
Mauritania.....	C	C	C	C	C
Morocco.....	B	B	B	B	B
Senegal.....	C	B	C	C	C
Sudan.....	C	C	C	C	C
Tunisia.....	A	A	A	A	A
Latin America and the Caribbean					
Colombia.....	A	B	A	B	A
Costa Rica.....	A	A	A	B	A
Dominican Republic	B	B	B	C	B
Ecuador.....	B	A	B	B	B
Guyana.....	A	A	A	C	B c/
Haiti.....	B	B	B	C	B
Jamaica.....	A	A	A	C	B c/
Mexico.....	A	B	A	A	A
Panama.....	B	A	B	B	B
Paraguay.....	B	A	B	B	B
Peru.....	A	B	A	C	B c/
Trinidad and Tobago	A	B	A	B	A
Venezuela.....	B	A	B	B	B
Asia and Oceania					
Bangladesh.....	C	C	C	C	C
Fiji.....	A	B	A	A	A
Indonesia.....	C	C	C	C	C
Jordan.....	B	C	B	C	B
Malaysia.....	A	B	A	A	A
Nepal.....	B	C	C d/	C	C
Pakistan.....	C	C	C	C	C
Philippines.....	A	A	A	B	B c/
Republic of Korea	A	A	A	A	A
Sri Lanka.....	B	B	B	B	B
Syrian Arab Republic	A	B	A	B	A
Thailand.....	B	A	B	B	B
Yemen.....	C	C	C	C	C

Source: Standard recode tapes and country chapters in part two of the present publication.

Notes: Rates assessed as: A = good quality; B = acceptable quality; C = less reliable.

a/ Current marital status consistent except for Pakistan, age group 15-19; and and Thailand, age group 15-24.

b/ Formerly called the Ivory Coast.

c/ Change from column (4).

d/ Change from column (1).

A model of birth dating has been proposed in which it is assumed that recent events are reported accurately and more distant events less accurately (Potter, 1977). Moreover, birth dates in the distant past are held to be recollected in terms of intervals from the first birth rather than as independent dates, whereas the dates of the more recent births are located independently of the dates attached to earlier births. The result of that pattern of reporting can cause successively older cohorts to report successively older patterns of fertility through the forward shifting of birth dates, thus causing an apparent increase in fertility in the more distant past and, therefore, an exaggerated decline in fertility in the recent past. Thus trends can be exaggerated because of a back-dating of recent births as discussed above, and/or a forward displacement of more distant births. An effective way to detect the possibility of a forward shifting of birth dates is to analyse cohort fertility profiles for the older cohorts to see whether the rates at young ages appear lower for the oldest cohorts than for somewhat younger cohorts and the shape of the profile is progressively older, the older the cohort.

Age misstatement can also bias estimates of fertility trends, because a cohort whose fertility is systematically too high or too low will distort the trends in fertility for each age group in a different period in the historical past. At those ages (20-29) where fertility rates are particularly high, a bias for one cohort may cause an under-estimate or over-estimate of fertility trends.

Where other sources of data are of good quality, estimated trends can be compared and assessed. Unfortunately, the quality of other sources is not always known, so that inconsistency between two sources cannot be considered necessarily a sign that the data are of less reliable quality; in fact, the opposite may be true. From table 7, it can be seen that 11 countries have been rated as having good estimates of fertility trends (one from Africa, five from Asia and five from Latin America). This is based on an assessment which found those 11 countries to have no evidence of serious date misstatement and a reasonable level of consistency with trends estimated from an external source. Nine countries were rated as having trend estimates of reasonable quality (i.e., B group) (two from Africa, five from Latin America and two from Asia). That rating implies somewhat less certainty about the exact extent of fertility decline, either because of some evidence of date misplacement and/or some inconsistency with other sources. In the 18 countries where trend estimates are rated as less reliable (nine in Africa, three in Latin America and six in Asia) there is evidence of date distortion and/or a high level of variability in single-year fertility rates in addition to some forward displacement of births and inconsistent trends.

In table 8, all the criteria used to develop those assessments have been included. The first column shows the assessment of the quality of recent birth enumeration. If it has received a C rating, then regardless of other factors, the trend data must be placed in the C category as well. If it is rated as A or B, then all the criteria are weighed before an assessment is reached, with the constraint that B rating in column 1 precludes an A rating on trends. Column 2 shows the index of annual fluctuations in the average fertility rate, which varies from a low of .014 in the Syrian Arab Republic to

Table 8. Overall quality of trends in births from the World Fertility Survey
(From 0-4 to 10-14 years prior to the survey)

Region and country	Quality of birth data a/ (0-4 years) (1)	Index of irregularity in average fertility rate a/ (2)	Omissions		Displacement in age profile of cohort fertility c/ (5)	Recent trend comparison (total fertility rate)				Trends consistent by age of mother d/ (11)	Overall quality trends, (0-4) to (10-14) years (12)
			P40-44 more than P45-49			World Fertility Survey		Other source			
			At survey (3)	At age 40-44 b/ (4)		Dates (6)	Percentage change (7)	Dates (8)	Percentage change (9)			Type of data (10)
Africa											
Benin.....	C	0.053	e/	Yes	A lot	67/71-77/81	+ 1	..	..	..	C
Cameroon.....	B	0.024	Yes	Yes	e/	64/68-74/78	- 5	..	..	..	B
Cote d'Ivoire f/	C	0.030	e/	Yes	Some	66/70-76/80	- 1	..	..	..	C
Egypt.....	B	0.047	e/	e/	e/	65/67-75/77	-26	66-75/77	-13	S/BR	C
Ghana.....	C	0.043	e/	e/	e/	65/69-75/79	- 6	..	..	..	C
Kenya.....	A	0.035	e/	Yes	A lot	68/70-76/78	-11	69-77/78	+ 7	C/S	C
Lesotho.....	B	0.056	e/	Yes	e/	71/73-75/77	+ 7	71/73-76	+ 4	S/C	C
Mauritania....	C	0.047	e/	Yes	A lot	67/71-77/81	- 4	..	..	..	C
Morocco.....	B	0.027	Same	Yes	e/	61/63-71/73	- 7	61/63-72	0	S/S	B
Senegal.....	C	0.039	e/	e/	A lot	64/68-74/78	- 4	..	..	..	C
Sudan.....	C	0.037	e/	Yes	A lot	64/68-74/78	-14	..	..	..	C
Tunisia.....	A	0.021	e/	e/	Some	65/67-74/78	-19	66-74/78	-21	BR	A
Latin America and the Caribbean											
Colombia.....	A	0.024	e/	g/	Some	66/69-71/74	-21	67/68-72/73	-27	S/C	A
Costa Rica.....	A	0.026	e/	e/	e/	60/64-70/74	-39	60/64-70/74	-39	BR	A
Dominican Republic	B	0.021	e/	Yes	A lot h/	61/65-71/75	-24	..	..	..	C
Ecuador.....	B	0.020	e/	e/	Some	67/70-76/79	-22	67/70-76/79	-21	S/S	B
Guyana.....	A	0.026	e/	Same	Some	60/64-70/74	-23	60/64-70/74	-26	BR	B
Haiti.....	B	0.050	e/	Yes	A lot	63/66-73/76	-12	..	..	..	C
Jamaica.....	A	0.032	e/	Same	A lot	60/64-69/71	- 8	60/64-70	- 4	BR/C	B
Mexico.....	A	0.021	e/	Yes	Some	66/70-74/76	-15	66/70-78	-18	BR/C	A
Panama.....	B	0.044	e/	Same	e/	59/61-71/75	-20	59/61-71/75	-14	BR	C
Paraguay.....	B	0.031	e/	e/	Some	65/69-75/79	-17	..	..	..	B
Peru.....	A	0.024	e/	e/	e/	67/69-74/76	-18	67/68-75	-20	S	A
Trinidad and Tobago.....	A	0.034	e/	e/	e/	62/66-72/76	-38	62/66-72/76	-30	BR	A
Venezuela.....	B	0.046	e/	k/	e/	67/71-72/76	-19	67/71-72/76	-12	BR	B

Table 8. continued

Table 8. (continued)

Region and country	Quality of birth data a/ (0-4 years) (1)	Index of irregularity in average fertility rate a/ (2)	Omissions		Displacement in age profile of cohort fertility c/ (5)	Recent trend comparison (total fertility rate)					Trends Consistent by age of mother d/ (11)	Overall quality trends, (0-4) to (10-14) years (12)
			P40-44 more than P45-49			World Fertility Survey		Other source				
			At survey (3)	At age 40-44 b/ (4)		Dates (6)	Percentage change (7)	Dates (8)	Percentage change (9)	Type of data (10)		
Asia and Oceania												
Bangladesh....	C	0.029	Yes	Yes	A lot	63/65-71/75	-21	63/65-74	+ 3	S	e/	C
Fiji	A	0.023	e/	e/	Some	60/64-70/74	-38	60/64-70/74	-33	BR	Yes	A
Indonesia.....	C	0.064	Yes	Yes	A lot	67/70-71/76	-16	67/70-71/75	- 6	S	e/	C
Jordan.....	B	0.030	e/	Yes	Some	60/62-71/76	- 7	61-72/76	+ 5	C/S	e/	C
Malaysia.....	A	0.020	e/	e/	Some	66/69-70/74	-10	66/69-70/74	-10	BR	Yes	A
Nepal.....	B	0.038	e/	Same	e/	62/66-72/76	9					C
Pakistan.....	C	0.051	Yes	Yes	A lot	63/65-68/71	- 1	63/65-68/71	-14	S	e/	C
Philippines...	A	0.017	e/	Yes	Some	64/66-69/71	- 2	63/67-60/72	- 6	S	e/	A
Republic of Korea	A	0.020	e/	e/	Some	59/61-72/74	-35	60-72/74	-35	C	Yes	A
Sri Lanka.....	B	0.026	e/	e/	e/	64/66-72/74	-27	65-72/74	-23	BR	e/	B
Syrian Arab Republic	A	0.014	e/	Same	Some	69/71-75/77	- 5	70-77/78	- 8	C/S	Yes	A
Thailand.....	B	0.031	e/	e/	e/	60/64-70/74	-27	60/64-70/74	-25	C/S	Yes	B
Yemen.....	C	0.064	e/	Yes	A lot	65/69-75/79	+12					C

Source: Standard recode tapes and country chapters in part two of the present publication.

Notes: Trend data assessed as: A = good quality; B = acceptable quality; C = less reliable.

For type of data: S = estimated from results of survey; BR = based on birth registration data; C = estimated from population census data.

For dates, 63/65-71/75, for example, indicates the period from 1963-1965 to 1971-1975.

a/ This index is defined in the same manner as that for the period 0-4 years prior to the survey (table 6 but includes the period 0-14 years prior the survey.

b/ P40-44 is the parity of the 40-44 cohort and P45-49, the parity of the 45-49 cohort.

c/ "A lot" of displacement occurred if the age profile of cohort fertility (figure V of country chapters became progressively older for the older cohorts; that is, the age group at which fertility peaks moved from younger to older age groups as the cohorts got older. "Some" displacement occurred if only the oldest cohort (45-49) showed an older pattern of fertility. The displacement in the age pattern indicates the extent to which forward-dating of births from the distant past occurred (the Potter-type effect).

d/ Trends by age are available in each country chapter. Trends were rated as consistent and given a "yes" if all age groups showed similar trends or if all age groups but the 15-19 group showed similar trends.

e/ The characteristic referred to does not exist to a significant degree according to the criteria mentioned above.

f/ Formerly called the Ivory Coast.

g/ Comparisons with a 1978 Contraceptive Prevalence Survey suggest the possibility of some omissions among women aged 45-49.

h/ The 35-39 cohort shows unusually high fertility at ages 25 and 30, which somewhat masks the effect of displacement using the criteria above.

i/ Not for age groups 15-19 and 25-29.

j/ Time periods are not the same.

k/ Parity compared is that of the 40-44 and 35-39 cohorts.

a high of .064 in Indonesia and Yemen. Volatility in the rates could result from a small sample size and/or a systematic preference for certain digits or calendar dates. Omissions have been noted in columns 3 and 4, using two criteria: column 3 compares parity of 40-44- and 45-49-year-old women at the time of the survey, and column 4 compares the parity of the two oldest cohorts at ages 40-44. Both tests are weak, in that omissions may exist but may not be of sufficient size to fail the two tests. If there has been a recent fertility decline among older women, which is likely to have occurred in most of the countries considered here, the parity of 45-49-year-old women may be higher than the parity of 40-44-year-old women but may none the less still be underestimated due to omissions. Thus, columns 3 and 4 only note those countries where omissions are most obvious.

In column 5, evidence of forward (towards the survey date) displacement of birth dates is noted, based on an examination of figure V in the country chapters. Figure V compares the age pattern of fertility for four cohorts (30-34, 35-39, 40-44 and 45-49). "Some" forward birth date displacement is noted if the 45-49 cohort shows an older fertility profile than the 40-44 cohort, but the other profiles fall entirely within the 40-44 profile. The displacement effect was categorized as "a lot" if the age profile of cohort fertility becomes progressively older for the older cohorts. Only 13 countries showed little or no effect.^{27/} It should be noted that omissions of distant births may contribute to the pattern and that genuine increases in age at marriage would tend to make this type of defect less obvious, since, in that case, true fertility at young ages is likely to have been higher for the oldest women than for younger cohorts. It is also possible that fertility genuinely increased in some countries before the onset of recent declines.

Columns 6-10 summarize a comparison of trends in TFR (total fertility rates) from WFS data and from an outside source, if available. The periods indicated for each country were dictated by the availability of data, and thus a comparison of trends was possible in only 26 countries. In the remaining 12 countries no comparisons were possible. A rough consistency in the rates of decline of total fertility rates does not necessarily imply that the age pattern of decline was also consistent. Only those countries indicated in column 11 showed rates of decline roughly consistent by age, and they could only be compared for age groups 15-39. Thus, consistent trends in fertility rates through age 39 are not necessarily inconsistent with displacement evidenced in column 5 for the oldest women. In the case of Mexico, an exact comparison of trends was not possible because the most recent outside source was available only for a more recent date than WFS and thus, a larger estimated decline is expected from the outside source, given the evidence of a fertility decline.

Those countries with an A rating on trends included those with roughly consistent patterns by age (that is, Costa Rica, Fiji, Guyana, Malaysia, Mexico, Peru, Republic of Korea, Syrian Arab Republic, Tunisia and Trinidad and Tobago). If other aspects of the birth histories were found relatively free of problems and the age-specific rates of decline were plausible in and of themselves, despite some discrepancies for particular age groups with the outside source, the country's data were also rated in the A group. Those included Colombia and the Philippines.

The countries rated in the B group are, in general, only slightly less reliable. In the cases of Thailand and Venezuela, recent birth data (see table 6) were rated in the B group (column 1), so despite consistent trends and no evidence of forward date displacement, a B rating was necessitated for trends. Other countries in the group included Cameroon and Paraguay, for which no external comparison was available, and Ecuador, Morocco and Sri Lanka, all of which showed reasonably plausible rates based on a thorough examination of the data. Jamaica is a more serious case because a lot of forward date displacement was noted. The overall consistency of trends, despite some exaggeration in the WFS estimates, however, suggested that a B rating would be appropriate.

Not all of the countries rated as having less reliable trend data are classified in the C group, for the same reasons. Of the 18 countries in that group, 10 were automatically included because of their C rating in table 6 with respect to their recent fertility levels. Seven of them (mostly in Africa) lacked any external source with which trends implied by the WFS data could be compared. Of the eight countries whose trend rating represented a downgrading from the rating for recent levels, five showed evidence of strong displacement of dates and omissions among older women and/or inconsistencies with trends implied by external sources. In Egypt, Lesotho and Panama, the index of irregularity was also quite high.

The Dominican Republic, Haiti and Nepal were difficult cases because no outside estimate of fertility rate trends was available. In the case of the Dominican Republic, the distortion of the data owing to higher fertility for the 35-39 cohort and the evidence of exaggeration of fertility decline in the recent period, based on cohort-period rate comparisons, necessitated a C rating. Nepal had highly volatile annual rates, an acceptable rating on recent birth enumeration and some evidence of omissions and distortions whose relative size are difficult to diagnose. The high level of uncertainty attached to those data makes their quality difficult to assess accurately. In the case of Haiti, strong internal evidence of omissions and displacement as well as highly irregular annual rates made a C rating appropriate.

Table 9 presents a final assessment of the quality of trend estimates in fertility rates once the quality of the age distribution and the quality of the marital history have been included in the assessment. In three cases (Cameroon, Trinidad and Tobago and Syrian Arab Republic) the quality ratings of trends in age-specific rates as listed in column 3 were downgraded from the ratings in column 1 because of the lower quality of age reporting. The quality of trends in marital age-specific rates is even more problematic because poor marital history data will distort estimated exposure time so that rates based on relatively good birth history data will not be reliable. Six countries received a worse rating on the quality of marital fertility rate trends than on age-specific fertility rate trends. Only three Asian countries, one Latin American and one African country were considered to have very reliable estimates of marital fertility trends. Eleven countries were rated as having trend estimates of reasonably reliable quality. Guyana, Jamaica and Peru were added to the list of countries with a less reliable ratings on the quality of marital fertility trends because their marital history data was rated in the C group.

Table 9. Overall quality of 15 year trends in age-specific fertility rates and marital age-specific fertility rates

Region and country	Quality of birth trends (1)	Quality of age distribution (2)	Quality of trends in age-specific rates (3)	Quality of marital history (4)	Quality of trends in marital age-specific rates (5)
Africa					
Benin.....	C	C	C	C	C
Cameroon.....	B	C	C a/	C	C
Cote d'Ivoire b/	C	C	C	C	C
Egypt.....	C	B	C	B	C
Ghana.....	C	B	C	B	C
Kenya.....	C	C	C	B	C
Lesotho.....	C	B	C	A	C
Mauritania.....	C	C	C	C	C
Morocco.....	B	B	B	B	B
Senegal.....	C	B	C	C	C
Sudan.....	C	C	C	C	C
Tunisia.....	A	A	A	A	A
Latin America and the Caribbean					
Colombia.....	A	B	A	B	B c/
Costa Rica.....	A	A	A	B	B c/
Dominican Republic	C	C	C	C	C
Ecuador.....	B	A	B	C	B
Guyana.....	B	A	B	C	C c/
Haiti.....	C	B	C	C	C
Jamaica.....	B	A	B	C	C c/
Mexico.....	A	B	A	A	A
Panama.....	C	A	C	B	C
Paraguay.....	B	A	B	B	B
Peru.....	A	B	A	C	C c/
Trinidad and Tobago.....	A	B	B a/	B	B
Venezuela.....	B	A	B	B	B
Asia and Oceania					
Bangladesh.....	C	C	C	C	C
Fiji.....	A	B	A	A	A
Indonesia.....	C	C	C	C	C
Jordan.....	C	C	C	C	C
Malaysia.....	A	B	A	A	A
Nepal.....	C	C	C	C	C
Pakistan.....	C	C	C	C	C
Philippines....	A	A	A	B	B c/
Republic of Korea..	A	A	A	A	A
Sri Lanka.....	B	C	B	B	B
Syrian Arab Republic	A	B	B a/	B	B
Thailand.....	B	A	B	B	B
Yemen.....	C	C	C	C	C

Source: Tables 4, 5, and 8.

Notes: Rates assessed as: A = of good quality; B = acceptable quality; C = less reliable

a/ Change from column (1).
b/ Formerly called the Ivory Coast.
c/ Change from column (3).

Chapter III

CONCLUSION

This report has highlighted certain basic findings with respect to the reliability of estimates of fertility levels and trends that have emerged from the WFS data for the developing countries. The 38 countries represented here had survey data for dates ranging from 1974 to 1981. Seventeen of the countries included are among the 35 most populous developing countries, to which much concern has been directed in the debate about prospects and programmes for fertility reduction.^{28/} The availability of reliable fertility estimates for those countries is of great importance, especially in those that do not have estimates of fertility from other sources.

The quality of estimates of recent fertility were assessed as being reasonably reliable in at least 27 of the 38 countries: six in Africa, 13 in Latin America and the Caribbean and eight in Asia. Fertility trends were assessed as being reliable for 10 countries in Latin America and the Caribbean and seven countries in Asia but for only three countries in Africa (Lesotho, Morocco and Tunisia). Of the 11 countries for which WFS failed to provide reliable estimates of recent fertility, three (Bangladesh, Indonesia and Pakistan) were the most populous of all 38 countries, and nine had total fertility rates of six or more children. In the case of trend information, of the 18 countries for which trend estimates were assessed as being not reliable, seven were among the most populous countries and 12 had recent total fertility rates of six and above.

Unfortunately, it was in the very countries where the greatest attention and concern have been directed that the WFS survey, carefully designed to take account of past survey experience, failed to provide reliable estimates of fertility levels and trends. They include not only some of the most populous countries noted above but also many of the sub-Saharan African countries for which relatively little data on fertility were previously available. For at least five of the nine sub-Saharan African countries, there is evidence of the possibility that recent levels may in fact be under-estimated. Countries with the most difficult population problems to tackle remain the most disadvantaged when it comes to the collection of basic demographic information.

The quality of WFS data has been assessed as a source of reliable estimates of fertility levels and trends in the context of alternative data sources of several types. The measures chosen for internal and external consistency checks provide a simple approach, and one which is easily replicable in other contexts, to the assessment of data quality in countries experiencing fertility decline. The approach does not rely on indirect techniques. It has been possible to document certain typical problems with household survey information and data based on birth and marriage histories within a cross-national frame of reference. The crucial importance of good age reporting for accurate fertility estimates has been highlighted.

Certain relatively well-known patterns of age and birth-date misstatement appear to have recurred in the WFS data collection experience. Less well-known problems related to the collection of marriage history information

have been thoroughly documented as well and the problems have been found to be remarkably similar to the more familiar problems characteristic of birth history data. However, because the onset of regular sexual exposure in the form of a socially recognized union is so much more difficult to define than the birth of a child in many societies, the quality of the resulting marriage history data was found in general to be considerably less reliable than the birth history data.

When contrasted with recent censuses and surveys, the WFS data have a good record with respect to the enumeration of children ever born, particularly with respect to older women who are more likely to omit children. Nonetheless, there is the strong suggestion of a deficit of children aged 1 and 2 for many countries, leading to the possibility that for a number of countries recent birth rate estimates may still be too low. That would be particularly true of fertility estimates based on the most recent three years (0-2 years prior to the survey) and is a reason why the rates presented here are based on a five-year average.

Evidence of possible backdating of recent births and forward displacement of births from the more distant past to more recent past leads to the likelihood that estimates of recent declines in birth rates have been exaggerated for many countries. In certain cases, where no decline or an increase was implied by the data, it is likely that an increase actually occurred. That is expected to be particularly true of those countries which show evidence of both types of dating distortions. Of the countries with the strongest evidence of both such distortions, it is likely that fertility has actually increased in Benin, Côte d'Ivoire, Mauritania and Yemen, whereas it is surely true that declines have been exaggerated for Bangladesh, Indonesia, Pakistan and the Sudan. The large majority of countries (32) show some evidence of at least one of those distortions, and 12 showed at least some evidence of both.

The impact of the biases on fertility rates themselves has not been assessed in this report, and adjustment of rates is beyond its scope. However the systematic evaluation of the data from all of the countries in a comparative context highlights some of the problems in data collection that are not specific to any one country but general problems of survey and questionnaire design that need to be addressed. The simple series of data quality checks directed at the assessment of age and data reporting developed in this report can easily be applied to similar surveys in the future and can serve as guidelines particularly when comparing the data quality of successive surveys.

Notes

1/ Bangladesh, Benin, Cameroon, Colombia, Costa Rica, Côte d'Ivoire, Dominican Republic, Ecuador, Egypt, Fiji, Ghana, Guyana, Haiti, Indonesia, Jamaica, Jordan, Kenya, Lesotho, Malaysia, Mauritania, Mexico, Morocco, Nepal, Pakistan, Panama, Paraguay, Peru, Philippines, Republic of Korea, Senegal, Sri Lanka, Sudan, Syria, Thailand, Trinidad and Tobago, Tunisia, Venezuela and Yemen.

2/ Among its publications, see, Population Bulletin of the United Nations, No. 7 (1963), (United Nations publication, Sales No. 64.XIII.2); World Population Trends and Policies, 1977 Monitoring Report, vol. I, Population Trends (United Nations publication, Sales No. E.78.XIII.3), World Population Trends and Policies, 1979 Monitoring Report, vol. I, Population Trends (United Nations publication, Sales No. E.79.XIII.4); World Population Trends and Policies; 1981 Monitoring Report, vol. I, Population Trends (United Nations publication, Sales No. E.82.XIII.2) and World Population Trends and Policies; 1983 Monitoring Report, vol. I, Population Trends (United Nations publication, Sales No. E.84.XIII.10).

3/ For information about this Working Group and its research programme, see United Nations Fund for Population Activities, The United Nations Programme for Comparative Analysis of World Fertility Survey Data (New York, 1980), pp. 1-2.

4/ James McCarthy, "Fertility levels and trends: an assessment of WFS data for 19 countries" (UN/UNFPA/WFS.IV/12); George T. Acsádi, "New findings and hypotheses from the comparative analysis of WFS data in the developing countries" (UN/UNFPA/WFS.IV/6); "Levels and trends of fertility in the ESCAP region: comparative analysis of world fertility survey data" (UN/UNFPA/WFS.IV/13); and "Levels and trends of fertility in the ECLA region" (UN/UNFPA/WFS.IV/11).

5/ The 20 country chapters previously published in Fertility Levels and Trends as Assessed from 20 World Fertility Surveys (ST/ESA/SER.R/50) have been republished here.

6/ See the country chapter for Mexico.

7/ The KAP surveys in Latin America sponsored in the 1960s by the Latin American Demographic Centre (CELADE) are not included here because they were not national in scope.

8/ In Malaysia, only Peninsular Malaysia was included. In Indonesia, only the islands of Java and Bali were included, and in the Sudan, only the northern part of the country was covered.

9/ Fertility rates previously published by the World Fertility Survey are based on a three-year reference period. See R. Hanenberg, "Current fertility", Comparative Studies, Cross National Summaries, No. 11 (Voorburg, Netherlands, International Statistical Institute/World Fertility Survey, May 1980).

10/ A WFS data evaluation report is available in published form or in draft for almost all countries:

Bangladesh: W. Brass and H. Rashad, "Evaluation of levels and trends in fertility from WFS data: Bangladesh" in M. R. Khan, ed., Fertility and Mortality Trends in Bangladesh (Dacca, Bangladesh Institute for Development Studies, 1981).

Cameroon: G. Santow and A. Bioumla, "An evaluation of the Cameroon Fertility Survey, 1978", Scientific Reports, No. 64 (Voorburg, Netherlands, International Statistical Institute/World Fertility Survey, December 1984).

Colombia: John N. Hobcraft, "Illustrative analysis: evaluating fertility levels and trends in Colombia", Scientific Reports, No. 15 (Voorburg, Netherlands, International Statistical Institute/World Fertility Survey, May 1980); Carmen E. Florez and Noreen Goldman, "An analysis of nuptiality data in the Colombia national fertility survey", Scientific Reports, No. 11 (Voorburg, Netherlands, International Statistical Institute/World Fertility Survey, May 1980).

Costa Rica: "Evaluación de la historia de embarazos en la Encuesta Nacional de Fecundidad, Costa Rica, 1976" (San José, Centro Latinoamericano de Demografía, 1980).

Côte d'Ivoire: S. N'Cho, "Evaluation de l'Enquête Ivoirienne sur la Fécondité" 1984 World Fertility Survey (unpublished).

Dominican Republic: J. M. Guzman, "Evaluation of the Dominican Republic National Fertility Survey, 1975", Scientific Reports, No. 14 (Voorburg, Netherlands, International Statistical Institute/World Fertility Survey, May 1980).

Ecuador: M. Ines Herrera de Rivadeneira, "Evaluación de la Encuesta Nacional de Fecundidad de 1979 de Ecuador", Scientific Reports, No. 51 (Voorburg, Netherlands, International Statistical Institute/World Fertility Survey, September 1984).

Egypt: B. El-Deeb, "Evaluation of the Egyptian Fertility Survey 1980" Cairo: CAPMAS (unpublished) 1984.

Fiji: Joseph Potter, "Methods of detecting errors in WFS data and application to the Fiji Fertility Survey", Paper prepared for the International Population Conference, Mexico 1977 (IUSSP).

Ghana: J. Y. Owusu, "Evaluation of the Ghana Fertility Survey", Scientific Reports, No. 69 (Voorburg, Netherlands, International Statistical Institute/World Fertility Survey, December 1984).

Guyana: S. Balkaran, "Evaluation of the Guyana Fertility Survey, 1975", Scientific Reports, No. 26 (Voorburg, Netherlands, International Statistical Institute/World Fertility Survey, February 1982).

Haiti: C. Tardieu, "Evaluation des données de l'Enquête Haitienne sur la Fécondité", Scientific Reports, No. 50 (Voorburg, Netherlands, International Statistical Institute/World Fertility Survey, August 1984).

Indonesia: Bondan Supraptilah, "Evaluation of the Indonesia Fertility Survey, 1976", Scientific Reports, No. 38 (Voorburg, Netherlands, International Statistical Institute/World Fertility Survey, December 1982).

Jamaica: Susheela Singh, "Evaluation of the Jamaica Fertility Survey, 1975-1976", Scientific Reports, No. 34 (Voorburg, Netherlands, International Statistical Institute/World Fertility Survey, July 1982).

Jordan: Abdallah Abdel-Aziz, "Evaluation of the Jordan Fertility Survey, 1976" Scientific Reports, No. 42 (Voorburg, Netherlands, International Statistical Institute/World Fertility Survey, March 1983).

Kenya: Roushdi Henin, Ailsa Korten and Linda Werner, "Evaluation of birth histories: a case study of Kenya", Scientific Reports, No. 36 (Voorburg, Netherlands, International Statistical Institute/World Fertility Survey, October 1982).

Lesotho: I. Timaeus and K. Balasubramaniam, "Evaluation of the Lesotho Fertility Survey" Scientific Reports, No. 58 (Voorburg, Netherlands, International Statistical Institute/World Fertility Survey, August 1984).

Malaysia: Masitah Mohd Yatim, "Evaluation of the Malaysian Fertility and Family Survey, 1974" Scientific Reports, No. 27 (Voorburg, Netherlands, International Statistical Institute/World Fertility Survey, February 1982).

Mauritania: S. A. Sheikh "Evaluation de l'Enquête Fécondité Mauritanie, 1981-82" 1984 World Fertility Survey (unpublished).

Mexico: Manuel Ordica and Joseph Potter, "Evaluation of the Mexican Fertility Survey, 1976-1977", Scientific Reports, No. 21 (Voorburg, Netherlands, International Statistical Institute/World Fertility Survey, December 1981).

Morocco: A. El-Gandassi "Evaluation de l'Enquête Fécondité au Maroc" 1984 World Fertility Survey (unpublished).

Nepal: Noreen Goldman, Ansley J. Coale and Maxine Weinstein, "The quality of data in the Nepal Fertility Survey", Scientific Reports, No. 6 (Voorburg, Netherlands, International Statistical Institute/World Fertility Survey, December 1979).

Pakistan: Heather Booth and Iqbal Alam, "Survey methodology and quality of data", in I. Alam ed., Studies in the Demography of Pakistan; an In-Depth Analysis of Pakistan Fertility Survey, 1979 (forthcoming).

Paraguay: J. F. Schoemaker, "Evaluación de la Encuesta Nacional de Fecundidad del Paraguay de 1979" Scientific Reports, No. 62 (Voorburg, Netherlands, International Statistical Institute/World Fertility Survey, October 1984).

Peru: Yolanda Cespedes, "Evaluation of the National Fertility Survey of Peru, 1977-78", Scientific Reports, No. 33 (Voorburg, Netherlands, International Statistical Institute/World Fertility Survey, November 1982).

Philippines: Florentina Reyes, "Evaluation of the Republic of the Philippines Fertility Survey, 1978", Scientific Reports, No. 19 (Voorburg, Netherlands, International Statistical Institute/World Fertility Survey, March 1981).

Senegal: L. Gueye, "Enquête Sénégalaise sur la Fécondité: Rapport d'évaluation", Scientific Reports, No. 49 (Voorburg, Netherlands, International Statistical Institute/World Fertility Survey, December 1984).

Sri Lanka: I. Alam and J. Cleland, "Illustrative analysis: Recent fertility trends in Sri Lanka", November 1981, Scientific Reports, No. 25 (Voorburg, Netherlands, International Statistical Institute/World Fertility Survey, 1982).

Sudan: M. Riggalla, "Evaluation of the Sudan Fertility Survey, 1978-79" Scientific Reports, No. 72 (Voorburg, Netherlands, International Statistical Institute/World Fertility Survey, July 1985).

Trinidad and Tobago: D. Hunte, "Evaluation of the Trinidad and Tobago Fertility Survey, 1977" Scientific Reports, No. 44 (Voorburg, Netherlands, International Statistical Institute/World Fertility Survey, September 1983).

Tunisia: H. Jemai, "Evaluation of the Tunisian Fertility Survey, 1978" 1984 World Fertility Survey (unpublished).

Venezuela: A. Vielma "Evaluation of the Venezuela Fertility Survey, 1977" Scientific Reports, No. 35 (Voorburg, Netherlands, International Statistical Institute/World Fertility Survey, September 1982).

Yemen: Abdel-Malik Al-Tohamy and I. Kalule-Sabili "Evaluation of the Yemen Arab Republic Fertility Survey, 1979" Scientific Reports, No. 76 (Voorburg, Netherlands, International Statistical Institute/World Fertility Survey, July 1985).

11/ N. Goldman, S. Rutstein and S. Singh, "Assessment of the quality of data in 41 WFS surveys: a comparative approach", Comparative Studies, Cross National Summaries, No. 44 (Voorburg, Netherlands, International Statistical Institute/World Fertility Survey, 1985).

12/ J. Hobcraft, N. Goldman, and V. C. Chidambaram, "Advances in the P/F ratio method for the analysis of birth histories", Population Studies, vol. 36(2), pp. 291-316; and N. Goldman and J. Hobcraft, "Birth histories", Comparative Studies, No. 17 (Voorburg, Netherlands, International Statistical Institute/World Fertility Survey, December 1981).

13/ When such terminology is applied, care is taken to provide an exact quantitative definition for the measures.

14/ However, in the case of the year and month reported, information was unavailable for Costa Rica and Venezuela, and while Thailand was not in the top third, it was close and showed no other age distortions. In the case of the Myer's Index, while not ranked in the top third, Tunisia was in the top half and had no evidence of distortions in the reproductive age groups, and Paraguay, while no data on the Myer's index were available, scored reasonably well on all other indices.

15/ "Nuptiality: selected findings from the World Fertility Survey data" (ESA/P/WP.92), and S. Singh, "Comparability of questionnaires: 41 WFS countries", Comparative Studies, No. 32 (Voorburg, Netherlands, International Statistical Institute/World Fertility Survey, June 1984).

16/ This information is unavailable for Costa Rica and Venezuela. Costa Rica is presumed to have roughly 100 per cent reporting.

17/ The shape of the distribution of years since first union will depend on the age distribution, the mean age at first union and changes in the mean age at first union. With no change in the age at union, the shape of the distribution should be primarily determined by the age distribution. An increasing age at first union will flatten the distribution, but even in countries such as Malaysia and the Republic of Korea, with rapid changes in the age at union, the distribution is observed to slope down gently.

18/ The only exception is Jamaica, which shows an increase in proportions at each age. External sources for Jamaica show roughly comparable trends.

19/ This was noted as a common problem in Africa and some Asian countries in Methods of Estimating Basic Demographic Measures from Incomplete Data, Manual IV, Population Studies, No. 42 (United Nations publication, Sales No. E.67.XIII.2).

20/ In the cases of Egypt, Kenya and Morocco, where a comparison with external sources shows apparently consistent trends, Egypt and Morocco have less than 50 per cent of respondents reporting the first marriage data with a month and year, and in Kenya the duration index is higher than average.

21/ In the case of Cameroon, external trends could not be evaluated; in Jamaica there was evidence of a recent deficit, despite consistent trends.

22/ In Guyana, Jamaica and Trinidad and Tobago, the different types of unions were categorised as common law (i.e., consensual), visiting (i.e., sexual union with a steady partner, but not living in the same house), and married. In Haiti, the corresponding categories were rinmin, fiancée, and viv-a-vek (which are all types of visiting unions), placée (common law), and mariée (legally or religiously sanctioned marriage) (Singh, 1984).

23/ Data are not available for Costa Rica, Nepal and Venezuela.

24/ It should be noted that although the WFS parity is lower than that recorded for the census for ages 20-44, it is the same at ages 45-49.

25/ The average fertility rate is measured as total births divided by total woman-years of exposure for each year. This is not a total fertility rate.

26/ In the case of the Syrian Arab Republic, there was a deficit for the period 4-5 years before the survey.

27/ A peak in period fertility roughly 10 years before the survey (with the effects of age and duration removed from the data) was found for Bangladesh, Colombia, Indonesia, Jamaica, Jordan, Kenya, Mexico, the Republic of Korea and Sri Lanka, by John Hobcraft and John Casterline in "Speed of reproduction", Population Studies (forthcoming). The diversity of countries represented strongly suggests that the nature of the questionnaire (as hypothesized by Potter) may have played a role in producing the apparent distortion. Of the countries listed, Sri Lanka showed the mildest effect.

28/ B. Berelson, "Prospects and programs for fertility reduction: what? where?", Population and Development Review, vol. 4, No. 4 (December 1978), pp. 579-616. The 35 countries represent 90 per cent of the population in the developing world; see World Population Prospects: Estimates and Projections As Assessed in 1982 (United Nations publication, Sales No. E.83.XIII.5). The 17 countries are Bangladesh, Colombia, Egypt, Indonesia, Kenya, Malaysia, Mexico, Morocco, Nepal, Pakistan, Peru, Philippines, Republic of Korea, Sri Lanka, Sudan, Thailand and Venezuela.

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Part two

COUNTRY ANALYSIS

TECHNICAL INTRODUCTION

The conclusions drawn in part one of this report are based entirely on the material presented in the country chapters below. In order to assess the quality of the WFS fertility estimates, a simple set of measures and comparisons were chosen which could be applied in every country and which were sufficient in scope to permit a relatively unambiguous categorization of data quality. A general discussion of the types of measures used and data problems encountered can be found in chapter II of part one. This technical introduction is intended as a more detailed guide to the data chosen for presentation in each country chapter. Section by section (age, marriage history data and birth history data), the rationale behind the design of each figure and table is explained, and data sources common to all countries are noted.

Age data

Two general indices of the overall quality of age reporting were chosen: the percentage of respondents supplying a month and calendar year for their date of birth from the individual interview; and the Myer's index of digital preference based on the single-year age distribution from the household survey. The first statistic measures the degree to which women have accurate knowledge of calendar dates in the past and the second measures the degree of heaping on preferred digits. It can be interpreted as an estimate of the minimum proportion of persons in the population for whom an age with an incorrect final digit is reported.^{1/} Although the household age distribution is not always used directly in the estimation of age-specific fertility rates,^{2/} it can be used as an index of data quality if it is assumed that the relative ranking of countries with respect to the degree of digit preference in the household schedule is similar to their ranking in the individual schedule.

The household age distribution of females was examined carefully for evidence of possible shifting of women out of the eligible ages and also for evidence of possible over-representation of certain age groups within the eligible (that is, reproductive) age range. Figure I in each country chapter compares the female age distribution by five-year age groups to the male age distribution from the household survey and figure II compares the female age distribution with the most recent census. Measures of the existence and extent of possible shifting and over-representation of the eligible age groups are presented in table 4 in part one.

An assumption of linearity is made in the criteria used to measure shifting and over-representation of age groups. For example, to measure the degree of over-representation of an age group within the eligible age range, the ratio of two times the over-represented age group to the sum of the

adjacent age groups is examined. If that ratio is greater than 1.05 and less than 1.15 then "some" over-representation is said to exist. If the ratio is greater than 1.15 then "a lot" of over-representation is said to exist. In each of the detailed country chapters, the female age distribution by five-year age groups is compared to the male age distribution and the female age distribution from a recent external source. Any country peculiarities that exist, which violate the assumption of linearity, are noted and taken into account in making the quality assessments.

Marriage history data

Again, the percentage of first unions reported with a month and year was used as a crude index of the quality of date reporting. It was supplemented by figure III in each country chapter, which shows the distribution, by single years since the Survey, of years since first union for all women ever in a union. That provides evidence of preference for digits and calendar years as well as evidence of possible back-dating of recent unions. An index measuring the degree of annual fluctuation in marital duration provides one summary measure of the quality of marriage-date reporting derived from figure III which is presented in table 5 in part one. Figure IV presents useful information on trends in proportions ever married at five-year intervals as implied by WFS data, with any comparable census or survey information for dates in the past provided for purposes of comparison. Systematic misreporting of age, resulting in the over-representation of one age group in the eligible age range, sometimes has the effect of distorting the trend in proportions married by age with the distortion occurring further back in time the younger the age group for which trends are being measured. That can easily be detected by examining figure IV. In addition, any discrepancies in trends between the World Fertility Survey and other sources can be noted. Trends in WFS data may be distorted either due to the omission of early unions or the misdating of first unions but, on the other hand, trends in proportions ever married from the census data may be affected by changes in the quality of age misreporting over time as well as, in the case of Latin America, changing definitions of consensual unions. Thus, the possible conclusions to be drawn from the comparison of trends in proportions ever married depend very much on the country and the quality of other data sources.

Recent birth history data

The first index of the quality of birth reporting is the percentage of all live births recorded that were reported with a month and a year. The relative completeness of birth enumeration from WFS was evaluated by comparing parity at the time of the Survey with parity from a recent census or survey. That is shown in table 1 of each country chapter. If the most recent external data for comparison do not fall within three years of the WFS survey data, then WFS parity is estimated for the date for which the external data are available. It was not possible to measure parity on a comparable basis (that is, per woman or per ever-married woman) for all countries, but the comparisons are always consistent within countries.

The possibility of omissions and displacements was examined in table 2 which presents cohort-period rates and cumulative cohort fertility by age at

the time of the Survey. Reading from left to right across the first panel of the table, one can see trends in fertility by age, whereas the fertility of a particular cohort can be found by reading along the diagonal. These are missing cells because only women aged 15-49 were interviewed. In the lower panel of the table, fertility rates are cumulated from past periods and are derived from the rates presented in the first panel. For example, from table 2 for Bangladesh the cumulative fertility for the cohort aged 25-29 at the time of the Survey is 4.200, which is 5 times the sum of $.281 + .364 + .185 + .010$, the fertility rates taken from panel 1 of the table for successive periods in the past (along the diagonal). They are not conventional fertility rates because the births are not counted by the age at which birth occurred but by the age of the woman at the time of the Survey. However, it is a convenient way to look at trends across periods for specific age groups, while at the same time having information on fertility over the life cycle for different cohorts. Panel 2 is useful as a tool for the identification of possible omissions whereas comparison of cohort fertility profiles from the first panel, as depicted in figure V, can be used to diagnose the possibility of forward displacement of births.

Figure VI shows annual fluctuations in age-specific fertility rates for age groups 15-19, 20-24, 25-29, 30-34, as well as for the average fertility rate which is measured as total births in each year, divided by total woman-years of exposure. That was primarily useful as a tool for assessing the possibility of a deficit in births 1-2 years before the Survey, which, if serious enough, could indicate a displacement of births out of the most recent period (0-4 years before the Survey). It was also useful for detecting any evidence of digit or year preferences or other evidence of irregular patterns.

Table 3 presents age-specific fertility rates from vital registration or from other sources if registration is not complete, for dates within the 0-14 years prior to the date of the WFS data. For purposes of comparison, the WFS data are always based on an average of a minimum of three calendar years (because of sampling errors), and whenever possible are centred on the dates of outside data sources. Trends in age-specific rates can be compared between the two sources of data, and evidence of possible backward or forward displacement of births in the WFS data can be detected.

Conclusions based on the findings in each country chapter are systematized and summarized in tables 4-9 of part one. All the external sources of data are fully cited in the country chapters, thus providing a self-contained reference within the framework of the paper. The country chapters are published for the convenience of those who are interested in further details on the individual countries covered in this report.

Notes

1/ Shryock, Henry S. and others. The Methods and Materials of Demography, vol. I (Washington, D.C., United States Department of Commerce), p. 207.

2/ The age-by-marital-status distribution, however, does enter into the calculation of age-specific fertility rates for surveys which sampled ever-married women for the individual interview.

BANGLADESH

The Bangladesh Fertility Survey (BFS) was carried out between December 1975 and March 1976 as part of the World Fertility Survey programme. The Bangladesh Fertility Survey is part of a long history of data collection in East Pakistan (now, Bangladesh). Censuses were taken in 1951, 1961 and, several years after the War of Liberation, in 1974. The first major survey was the Population Growth Estimation Experiment (PGE) conducted in both East and West Pakistan from 1962 to 1965. It was followed in 1968-1969 by a National Impact Survey. At the time of the 1974 census, the Bangladesh Retrospective Survey of Fertility and Mortality (BRSFM) was conducted as part of a census post-enumeration check. Although a system of birth registration does exist, the coverage is so incomplete that it cannot be considered a serious source of fertility estimates.

Other sources of data are also available which are not based on a nationally representative sample. In Matlabthana of Comilla district, a longitudinal demographic surveillance system was set up in 1966 which combined registration of vital events with periodic censuses. More recently, a comparable surveillance was set up in another region but the data are still too recent to analyse (National Research Council, 1981).

Age data

Only 1.4 per cent of all respondents gave month and year of birth. For 98 per cent, the response was in the form of "years ago" (Chidambaram and Sathar, 1984). The Myer's index of digital preferences is 7.9, which ranks relatively high (Rutstein, 1984). There is a particularly strong preference shown for digits 2, 5 and 8, and lesser preference for 0 and 6. Given the problems with age reporting in Bangladesh, the index is lower than might have been expected, possibly due to the smoothing effect of extensive imputation. Of 353 women reinterviewed in the Post Enumeration Survey, only 15 per cent reported a date of birth which was consistent within one year (World Fertility Survey, 1978).

An examination of the age distribution from the household survey shows heaping at ages 5-9 and/or a severe deficit at ages 0-4. In addition, there appears to be some slight heaping at 25-29 and 45-49 (fig. I). There does not seem to be any obvious tendency for ages to be shifted on either end of the included age groups for the individual questionnaire. The existence of migration in Bangladesh, both at the time of independence and in connection with the 1971 war, make it difficult to compare the age distribution with a stable population. However, a comparison with the 1974 census (fig. II) does show that the BFS data are characterized, in general, by a smoother distribution.

Marriage history data

The marriage history is based on a sample of 6,515 ever-married women; 11.4 per cent of respondents gave the month and year of first marriage, 2.2 per cent gave the year only, 66.8 per cent gave age at first marriage and 19.6 per cent gave years ago (Chidambaram and Sathar, 1984). Thus, 88.6 per cent of the sample required an imputation of month. In the Post Enumeration Survey, only 23 per cent of the 344 currently married women reinterviewed recalled their age at the date of their current marriage within a year of the age originally recorded (World Fertility Survey, 1978).

Figure III presents a distribution of years since first marriage, showing a high percentage of the sample marrying in the year of the Survey. This may partially reflect a recuperation from the previous year's famine. There is no strong bunching on preferred years, which may be explained by the large proportion of the sample who reported age at marriage rather than year of marriage.

Figure IV compares the marriage history from the World Fertility Survey with the marriage history taken from previous censuses. There is clear evidence of a decline in proportions ever-married in the 10-14 and 15-19 group, at least for the 10 years before the survey. The census and the BFS conform for that period of time quite well. The trends further back are uncertain, but neither the census nor the BFS looks entirely plausible.

Birth history data

Only 12.3 per cent of all births were recorded with a month and year and 2.5 per cent with the year only (Chidambaram and Sathar, 1984). Thus, roughly 88 per cent required an imputation of month and year. Of the 317 first births recorded in the Post Enumeration Survey, only 32 per cent were recorded with dates consistent within one year of the individual interview (World Fertility Survey, 1978).

When comparing the enumeration of children ever born from the fertility survey with other recent sources, including the 1974 census and the Bangladesh Retrospective Survey of Fertility and Mortality (BRSFM), one can see that the number of children enumerated in the fertility survey exceeds the number enumerated for each age group from the other sources of data. That may suggest some improvement in enumeration (table 1) in the BFS.

The cohort-period rates provide strong evidence for omissions, particularly among the older cohorts (table 2). The parity of 45-49-year-old women is lower than the parity of 40-44-year-olds, despite five additional years of exposure. If one compares the cumulative fertility of different cohorts at the same age, for women 35 and older, one can see that parity is lower, the older the cohort for any particular age. Figure V shows the combined effect of omissions and displacements on the age-fertility profile of the four oldest cohorts. Fertility rates by age are progressively higher, the younger the cohort through age 25. A comparison of fertility rates after age 30 show evidence of displacement of births from the distant to the more recent past.

Interpretation of the BFS birth history data is complicated by the fact that a 1974 famine probably led to a temporary reduction of fertility in 1975, and areas heavily involved in fighting during the 1971 War of Liberation may have exhibited reduced fertility in 1972. However, the apparent trend between the periods 5-9 and 0-4 years before the survey is not attributable to sharp deficits at single years (approximately 0-3 years before the survey); rather, fertility for approximately years 6-12 before the survey appears substantially higher than for any more recent year (figure VI). That is consistent with the apparent under-enumeration of children aged 0-4 in the household survey or, alternatively, the shifting of birth dates away from the interview.

Table 3 compares estimated age-specific fertility rates from different sources. The PGE and BRSFM rates were adjusted using Brass techniques, assuming constant fertility, to take account of possible reference period error. Non-BFS estimates from the mid 1960s and mid 1970s show essentially unchanged fertility over this period. In addition, the total fertility rate for 1963-1965 from the BFS greatly exceeds any estimate of completed parity (table 1). This reinforces the view that births have been displaced both away from the date of the interview and from the distant to the more recent past.

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Table 1. Children ever born per ever married woman from the Demographic Survey of East Pakistan, the census, the Bangladesh Restrospective Survey of Fertility and Mortality, and the BFS: Bangladesh

Age group	1961-62 DSEP	1961 census	1974 census	1974 BRSFM	1975 BFS
15-19	0.6	0.8	0.7	0.6	0.8
20-24	2.3	2.2	1.9	1.9	2.4
25-29	3.9	3.5	3.3	3.5	4.2
30-34	5.1	4.6	4.6	5.0	5.7
35-39	5.9	5.2	5.5	5.9	6.7
40-44	6.1	5.5	5.8	6.2	7.1
45-49	6.2	5.7	6.0	6.1	6.7

Source: National Research Council, Committee on Population and Demography, Panel on Bangladesh, Estimation of Recent Trends in Fertility and Mortality in Bangladesh, Report No. 5 (Washington, D.C., National Academy of Sciences, 1981), p44, table 15.

Table 2. Cohort period rates and cumulative cohort fertility by age at survey: Bangladesh, 1975

Age group of cohort at end of period	Number of women in cohort	Years prior to survey						
		0-4	5-9	10-14	15-19	20-24	25-29	30-34
Cohort-period fertility rates								
10-14	263	0.001	0.008	0.012	0.010	0.015	0.011	0.012
15-19	1 198	0.110	0.173	0.185	0.177	0.168	0.152	0.134
20-24	1 335	0.272	0.364	0.349	0.299	0.295	0.263	
25-29	1 124	0.281	0.352	0.347	0.307	0.284		
30-34	784	0.235	0.337	0.304	0.257			
35-39	679	0.177	0.237	0.226				
40-44	630	0.106	0.145					
45-49	494	0.037						
Cumulative fertility of cohorts at end of period								
15-19		0.595	0.925	0.973	0.960	0.898	0.818	0.736
20-24		2.287	2.794	2.705	2.392	2.292	2.051	
25-29		4.200	4.465	4.128	3.828	3.469		
30-34		5.639	5.814	5.346	4.755			
35-39		6.696	6.529	5.886				
40-44		7.057	6.609					
45-49		6.794						

Source: S. Singh, "Birth histories", WFS Comparative Studies, Cross-national Summaries: Additional Tables (Voorburg, Netherlands, ISI/WFS, 1984).

Table 3. Age-specific fertility rates for selected periods from
PGE, BRSFM, and WFS data: Bangladesh

Age group	1963-1965		1974	1971-1975	Percentage change	
	PGE (1)	WFS (2)	BRSFM (3)	WFS (4)	WFS (2) - (4)	Outside source (1) - (3)
15-19	0.263	0.321	0.229	0.224	-30.2	-12.9
20-24	0.342	0.366	0.337	0.308	-15.9	- 1.5
25-29	0.339	0.349	0.310	0.266	-23.8	- 8.6
30-34	0.248	0.284	0.256	0.216	-23.9	3.2
35-39	0.143	0.206	0.178	0.144	-30.1	24.5
40-44	0.053	..	0.086	0.066	..	62.3
45-49	0.021	..	0.041	0.036	..	95.2
TFR	7.0	8.0 a/	7.2	6.3	-21.3	2.9

Source: National Research Council, Committee on Population and Demography, Panel on Bangladesh, "Estimation of recent trends in fertility and mortality in Bangladesh", Report No. 5 (Washington, D.C., National Academy of Sciences, 1981), p. 35, table 13.

Notes:

PGE : Population Growth Estimation Experiment. Rates are adjusted.

BRSFM: Bangladesh Retrospective Survey of Fertility and Mortality. Rates are adjusted.

a/ For the purpose of calculating a total fertility rate, the age-specific fertility rates from the PGE for 40-44 and 45-49 were assumed.

Figure I. Distribution of males and females as a percentage of the total population by five-year age groups: Bangladesh

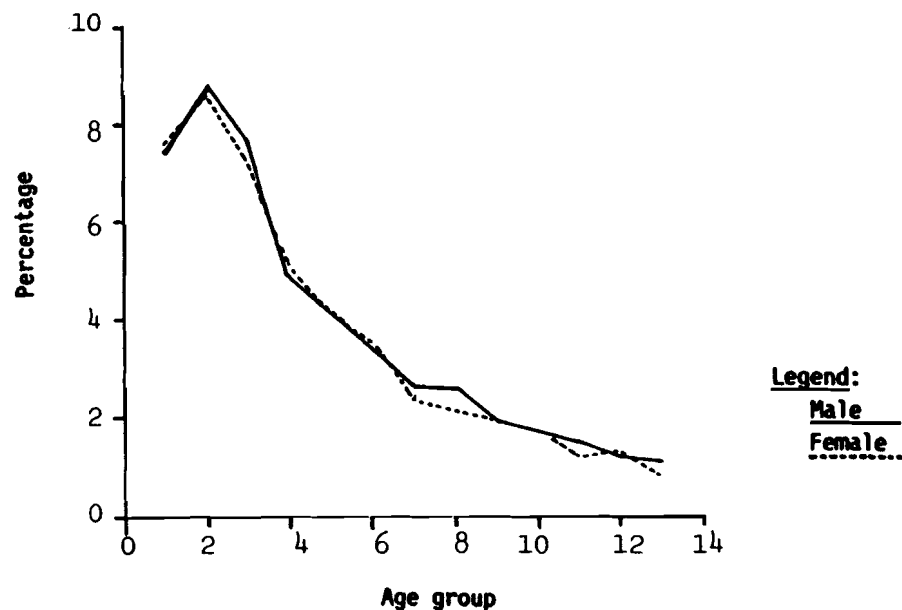
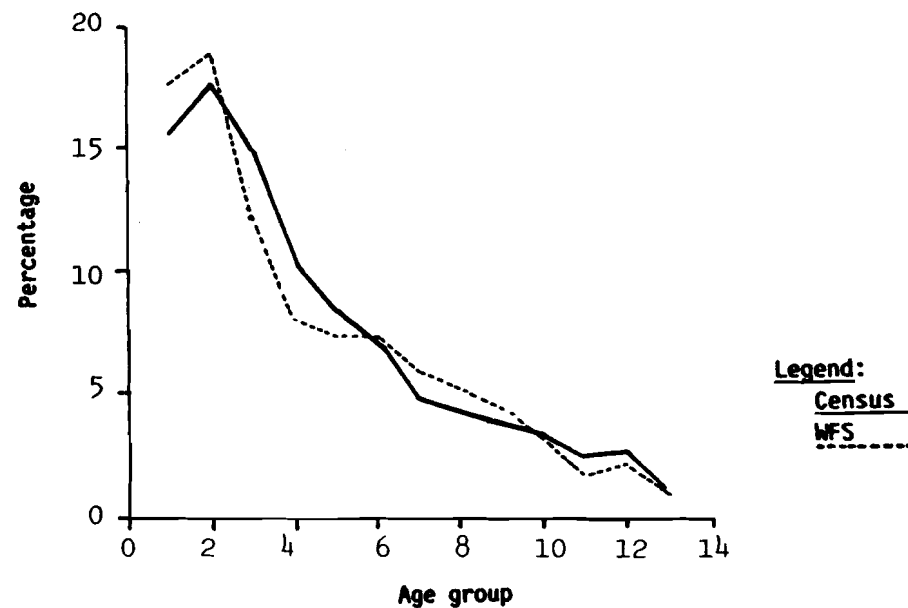


Figure II. Distribution of the female population by five-year age groups: World Fertility Survey (1975) and 1974 census: Bangladesh



Source: Census (1974); World Fertility Survey, Bangladesh Fertility Survey, 1975: First Report (Bangladesh, Ministry of Health and Population Control, December 1978), p. 12.

**Figure III. Distribution of ever-married women aged 15-49
by years since first married: Bangladesh**

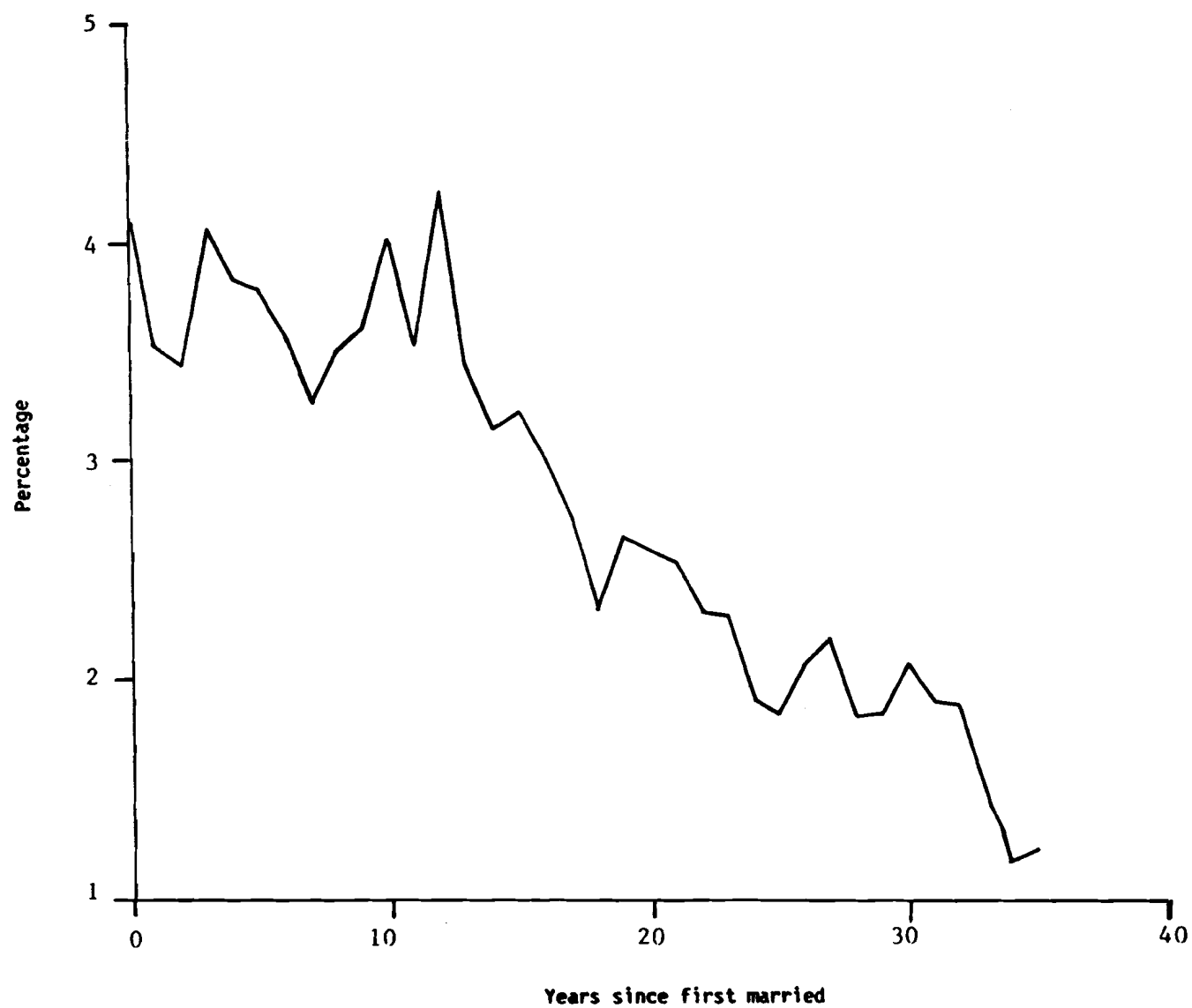
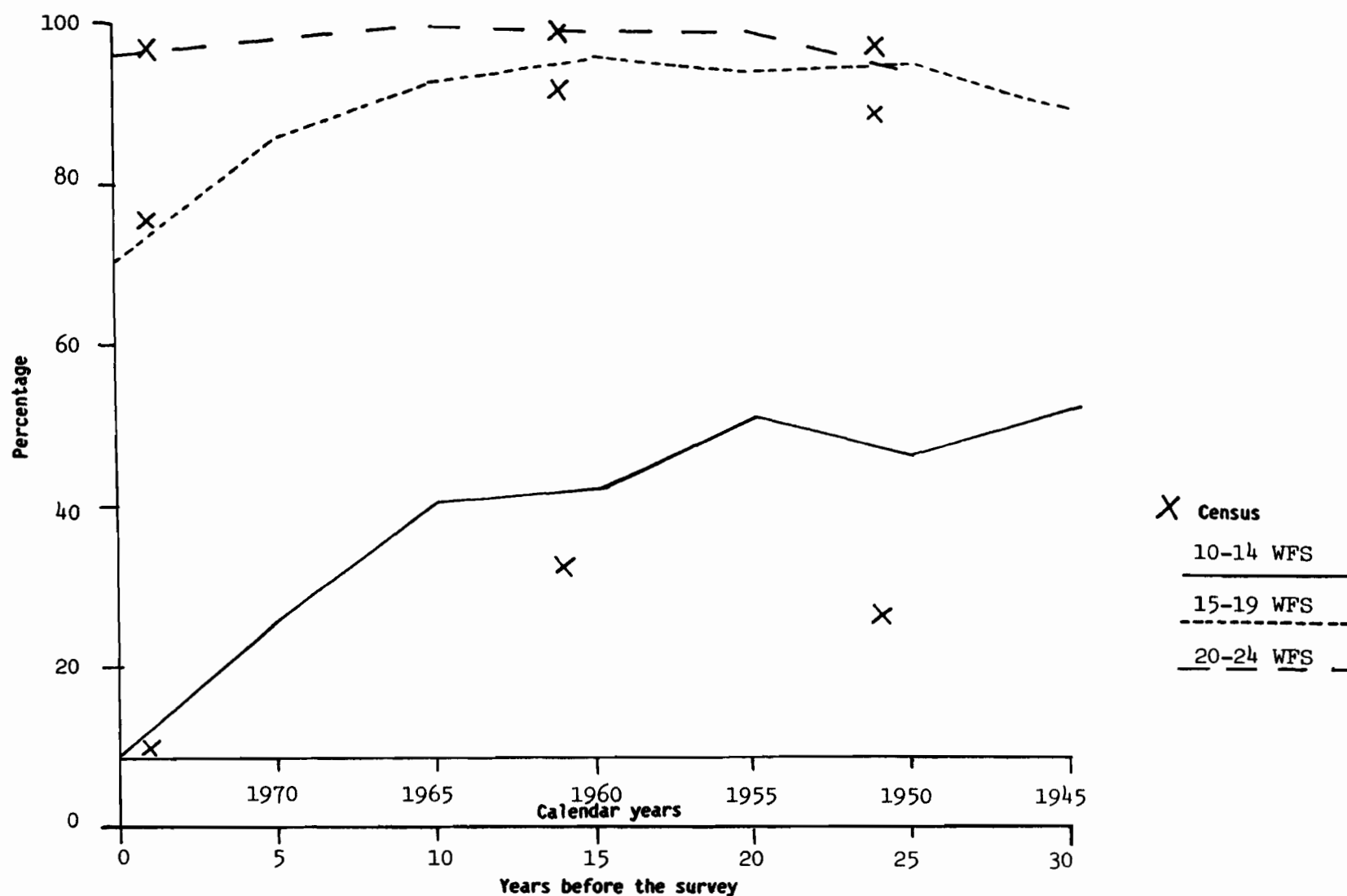
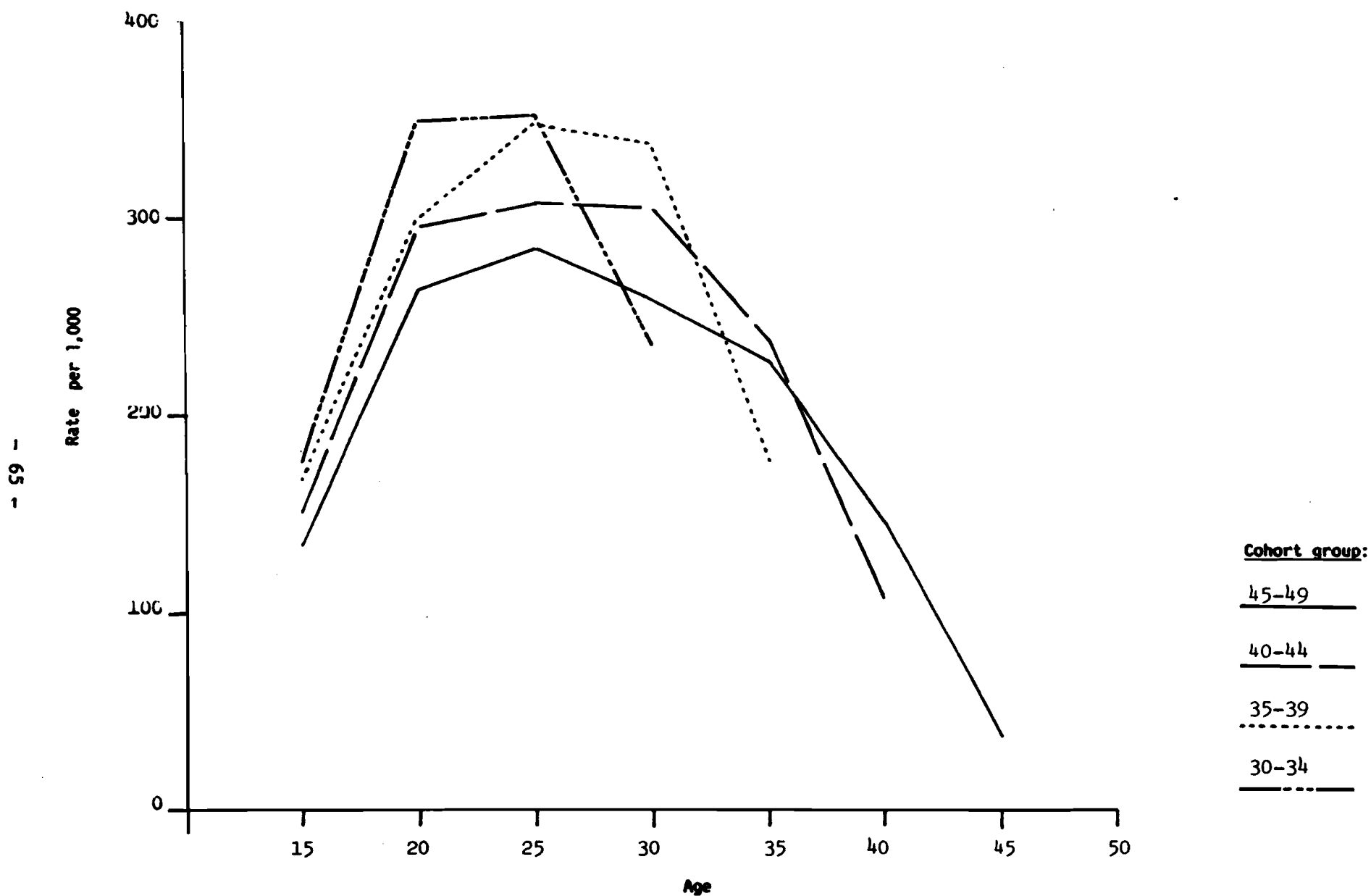


Figure IV. Proportions ever-married at designated periods prior to the survey for selected age groups: World Fertility Survey data and other sources: Bangladesh

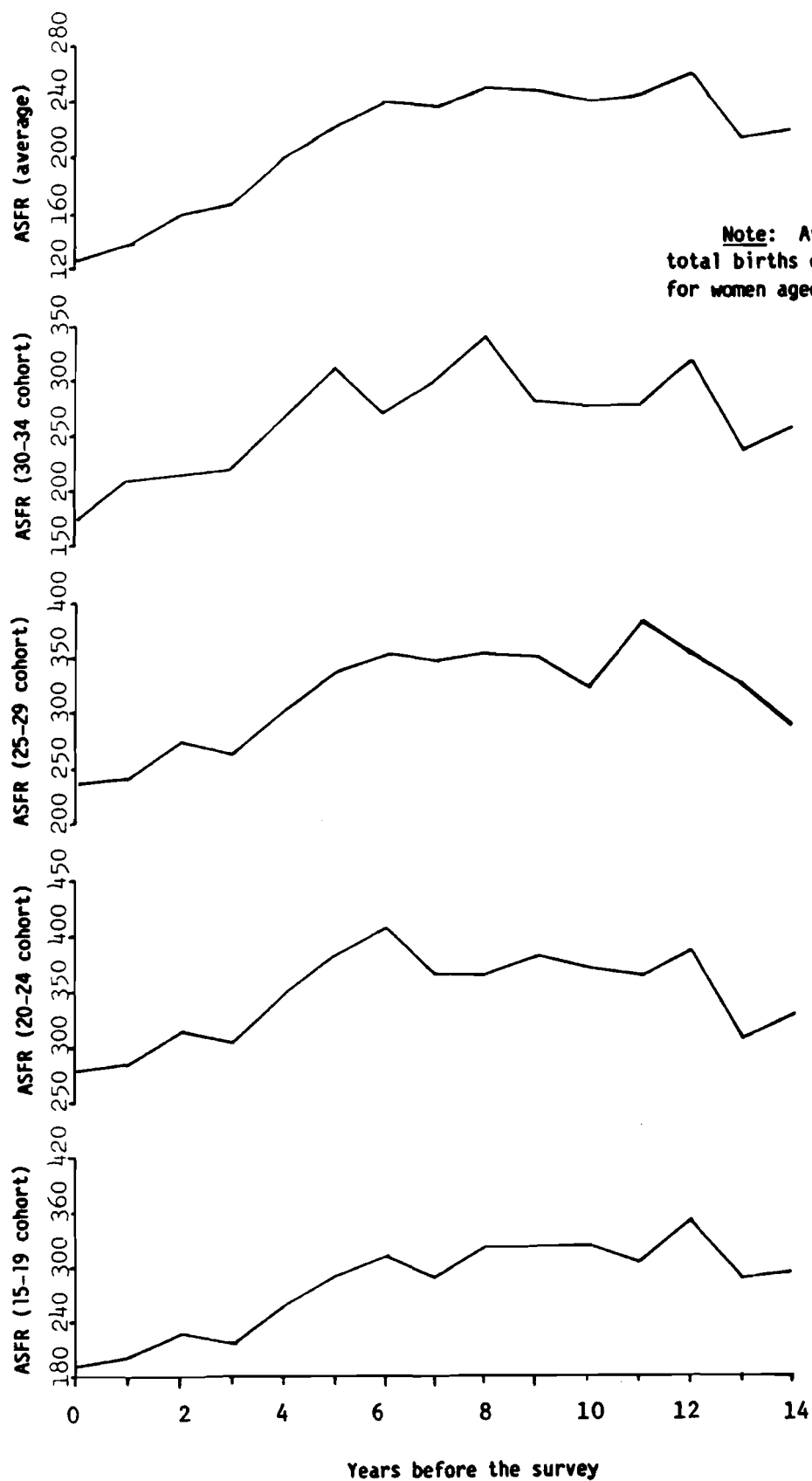


Source: Committee on Population and Demography, "Estimation of recent trends in fertility and mortality in Bangladesh", Report No. 5 (Washington, D.C., National Academy of Sciences, 1981), p. 54.

**Figure V. Cohort-period fertility rates for women aged 30-49 at interview:
Bangladesh**



**Figure VI. Age-specific fertility rates for selected cohorts and average fertility rate for single years before the survey:
Bangladesh**



BENIN

The Benin Fertility Survey (Enquête sur la fécondité au Bénin - EFB) was carried out between January and September 1982. The household questionnaire of the EFB was also the first round of a continuous National Demographic Survey (Bureau central du recensement, no date) which was conceived as a post-census operation consisting of three rounds. In 1961, a demographic survey was carried out, from which data will be used for comparison here. Data from the 1979 census on population and housing are also available for comparison.

Age data

Among all women interviewed in the individual survey, only 9.2 per cent knew the month and year of birth and 90 per cent knew only the calendar year (Chidambaram and Sathar, 1984). Myer's index of digital heaping was 17.5 among females enumerated in the household schedule (Rutstein, 1984). The male and female age distribution from the household survey is shown in figure I. The most glaring feature in the age distribution is the excessive heaping among women on age groups 20-24 and 25-29 and corresponding deficit in the 10-14 and 15-19 age groups. The male distribution also has heaping on the 25-29 age group, but it is far less pronounced. The tendency to overestimate the age of girls who have passed puberty and are married, especially if they have children, has been observed by researchers studying African age data, and the tendency is probably reflected here in the EFB data as well. The 1979 census age distribution (fig. II) shows similar heaping on ages 20-24 and 25-29 among females.

Marriage history data

Of the 3,577 ever-married women, only 4.9 per cent knew the month and year of their first union, while 86.0 per cent knew only the calendar year (Chidambaram and Sathar, 1984). The percentage distribution of ever-married women by years since first married (fig. III) shows a marked deficit of marriages 8 and 13 years before the survey, with corresponding peaks 9 and 14 years before the survey. There does not appear to be a deficit of marriages in the recent period.

Figure IV, which shows the proportions ever-married at designated periods prior to the survey, shows increasing proportions married among all age groups up to the most recent period. If dates of first marriage have been recorded correctly, that would imply decreasing age-at-marriage among young women. However, it could also be the effect of older women shifting their date of marriage towards the survey date. In the absence of external data for comparison, it is not possible to say if age-at-marriage decreased in Benin.

Birth history data

Of all births recorded, 12.4 per cent were recorded with the month and year of birth, 85.4 per cent with only the calendar year and for 2.2 per cent of births, there was no information on the date of birth (Chidambaram and Sathar, 1984). Data on children ever born from the EFB are presented in

table 1. The mean number of children ever born increases monotonically by age up to age 45-49 at which age women had on average 6.3 children and thus, there does not appear to be any serious omission of births among older women. The parity distribution from the EFB for 1982 is compared with that from the demographic survey of 1961. Unlike parity comparisons with external sources for other countries, the parity distribution for 1961 from the EFB was not reconstructed using the EFB birth history because that would mean the data would not be available for at least four five-year age groups (30-49), since the oldest woman aged 50 at the time of the survey would only be 30 years old in 1961. However, the direct comparison between 1961 and 1982 shows very little change in the mean number of children ever born to ever-married women up to about age 35. Among older women, the EFB recorded higher parity, which could be the result of better enumeration in the EFB.

An examination of cohort-period fertility rates for five-year periods before the survey date (table 2) shows increases in fertility rates up to the most recent period among most age groups. From the table alone it is not possible to ascertain if the increase is real or a result of forward displacement of births that occurred a long time ago. The age pattern of fertility of the various cohorts (fig. V) show some evidence of date misplacement towards the survey date. The fertility profile of the oldest cohort has an older age pattern of fertility than the younger cohorts and fertility of the older cohorts at young ages is lower than that of the younger cohorts. The average fertility rate for single years before the survey date (fig. VI) also shows a steady increase in rates over the 14-year period before the survey date from the past up to the current period. However, the increase in the year before the survey seems implausibly large - from 212 births per thousand women to 270 births per thousand women. An examination of those rates by age groups shows that among 15-19 and 20-24 year olds, fertility remained fairly constant over the years (except for the year preceding the survey, when there was a large increase). The same is true of women in the 25-29 age group, although the rates fluctuate a lot and appear to be higher in the five-year period before the survey date. Among the 30-34 age group, the increase in fertility in the recent period appears marked.

Comparison with an external source of age-specific fertility rates is, unfortunately, only possible for 1961 - about 20 years from the survey date (table 3). At that point time reconstructed birth history is only available for the three youngest age groups; nevertheless, the comparison is presented. The 1961 demographic survey recorded higher fertility in all three age groups, compared with the reconstructed EFB rates. Indeed, the 1961 demographic survey rates are comparable with the EFB rates for the 1977-1981 period, their respective total fertility rates being 6.9 and 7.0. If the rates for both periods are taken as being fairly accurate, then fertility can be said to have been constant over the 20-year period. The age pattern of fertility from the two sources, however, does not match as well. The 1961 survey produced a narrow, early peak pattern, while that from the EFB is somewhat flatter.

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Table 1. Children ever born per ever-married woman from the demographic survey of 1961 and EFB: Benin

Age group	Demographic survey	EFB
15-19	0.5	0.6
20-24	1.9	1.7
25-29	3.3	3.2
30-34	4.5	4.7
35-39	5.1	5.8
40-44	5.7	6.1
45-49	5.8	6.3

Source: demographic survey: Gouvernement du Benin, Enquete sur la fecondite au Benin, 1982. Rapport national, vol. I (Bureau central du recensement), table 5.5.

Table 2. Cohort period rates and cumulative cohort fertility by age at survey: Benin

Age group of cohort at end of period	Number of women in cohort	Years prior to survey						
		0-4	5-9	10-14	15-19	20-24	25-29	30-34
Cohort-period fertility rates								
10-14	0	0.000	0.002	0.001	0.002	0.004	0.005	0.002
15-19	608	0.056	0.052	0.062	0.069	0.069	0.040	0.035
20-24	853	0.252	0.233	0.248	0.240	0.227	0.204	
25-29	830	0.327	0.314	0.303	0.301	0.267		
30-34	596	0.309	0.293	0.282	0.283			
35-39	466	0.239	0.215	0.223				
40-44	382	0.147	0.174					
45-49	283	0.068						
Cumulative fertility of cohorts at end of period								
10-14		0.000	0.008	0.007	0.012	0.020	0.026	0.010
15-19		0.288	0.267	0.323	0.364	0.371	0.209	0.180
20-24		1.526	1.488	1.606	1.573	1.346	1.198	
25-29		3.123	3.176	3.086	2.848	2.534		
30-34		4.720	4.549	4.257	3.947			
35-39		5.747	5.330	5.064				
40-44		6.063	5.933					
45-49		6.272						

Source: S. Singh, "Birth histories", WFS Comparative Studies. Cross-national Summaries: Additional Tables (Voorburg, Netherlands, ISI/WFS, 1984), p.3

Table 3. Age-specific fertility rates
for selected periods from the
demographic survey of 1961 and
EFB, 1982: Benin

Age group	Demographic survey	EFB	
		1960-1962	1977-1981
15-19	0.197	0.183	0.150
20-24	0.336	0.288	0.314
25-29	0.306	0.287	0.323
30-34	0.254	..	0.270
35-39	0.166	..	0.191
40-44	0.086	..	0.100
45-49	0.026	..	0.053
TFR	6.9	6.4	7.0

Source for the demographic survey: Gouvernement
du Benin, Enquete sur la fecondite au Benin, 1982.
Rapport national. Vol. I (Bureau central du recensement),
table 5.11.

Figure I. Distribution of males and females as a percentage of the total population by five-year age groups: Benin

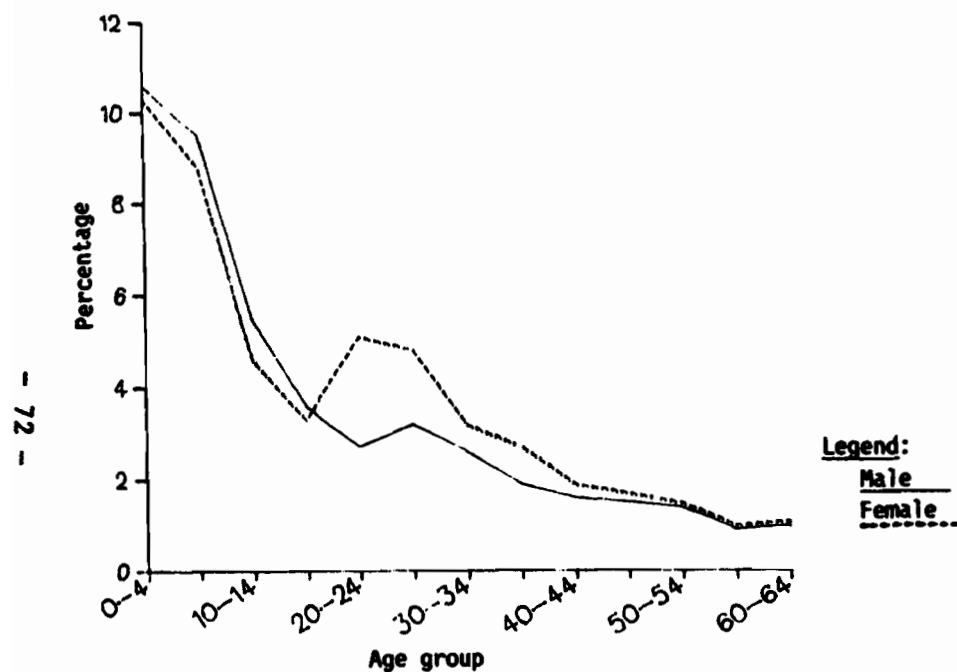
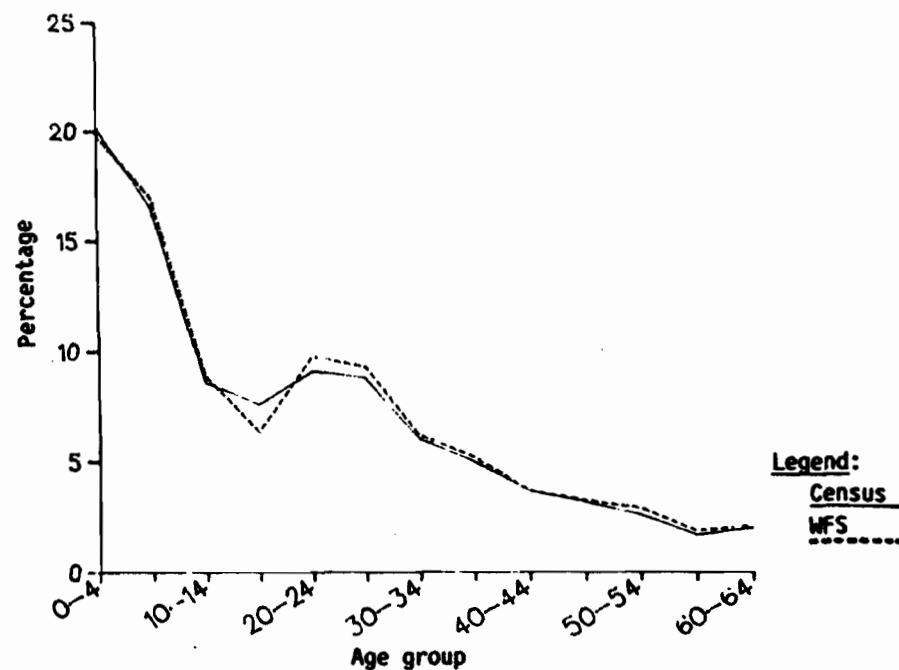


Figure II. Distribution of the female population by five-year age groups: World Fertility Survey (1981/82) and 1979 census: Benin



Sources for the 1979 census: *Demographic Yearbook 1983* (United Nations publication, Sales No. E/F.84.XIII.1), p. 188, table 7; Government of Benin, *Enquête sur la fécondité au Bénin, 1982. Rapport national*. Vol. I. *Analyse des principaux résultats* (Institut national de la statistique et de l'analyse économique, Bureau central du recensement), p. 17, tableau 3.1.

**Figure III. Distribution of ever-married women aged 15-49
by years since first married: Benin**

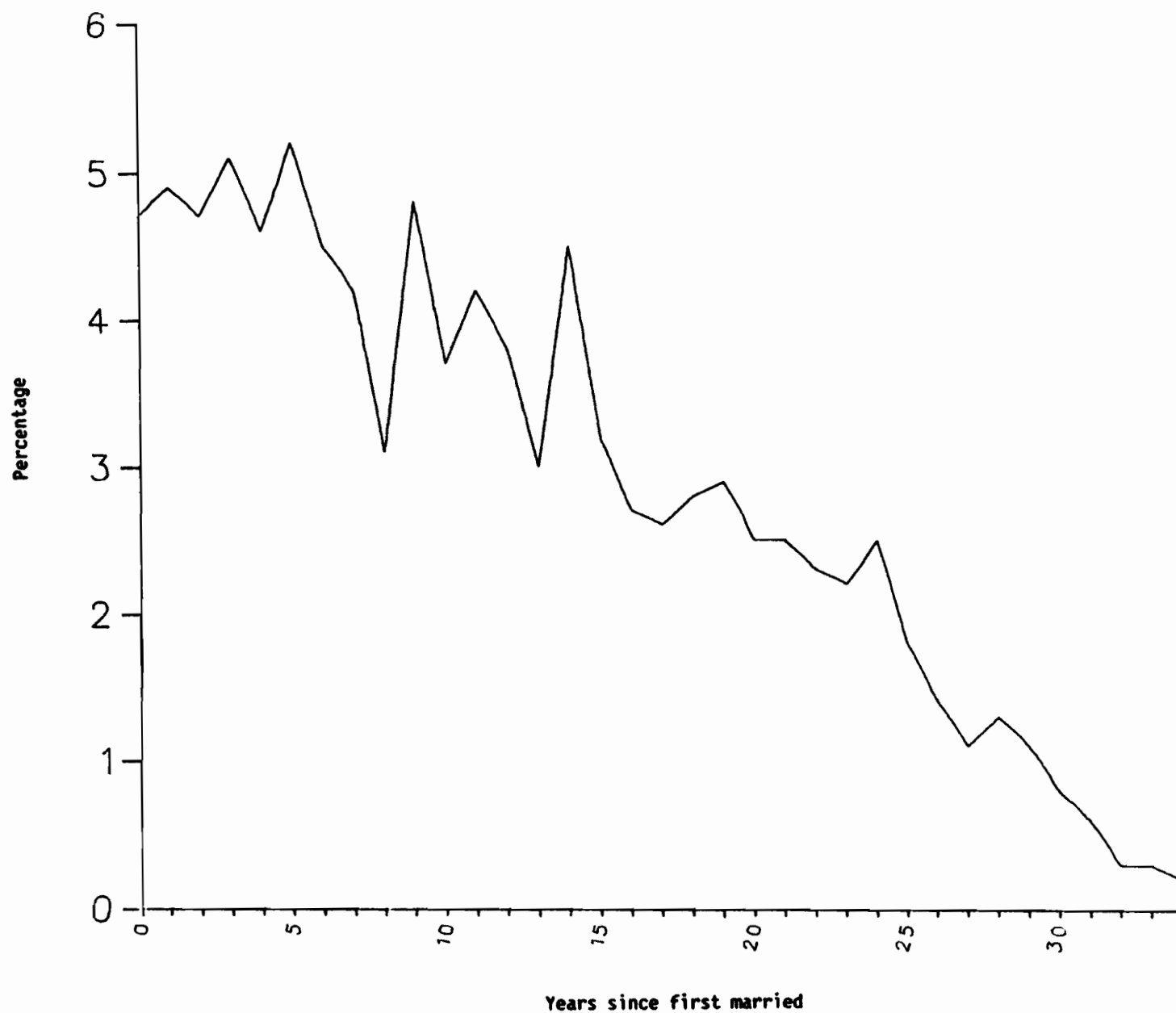
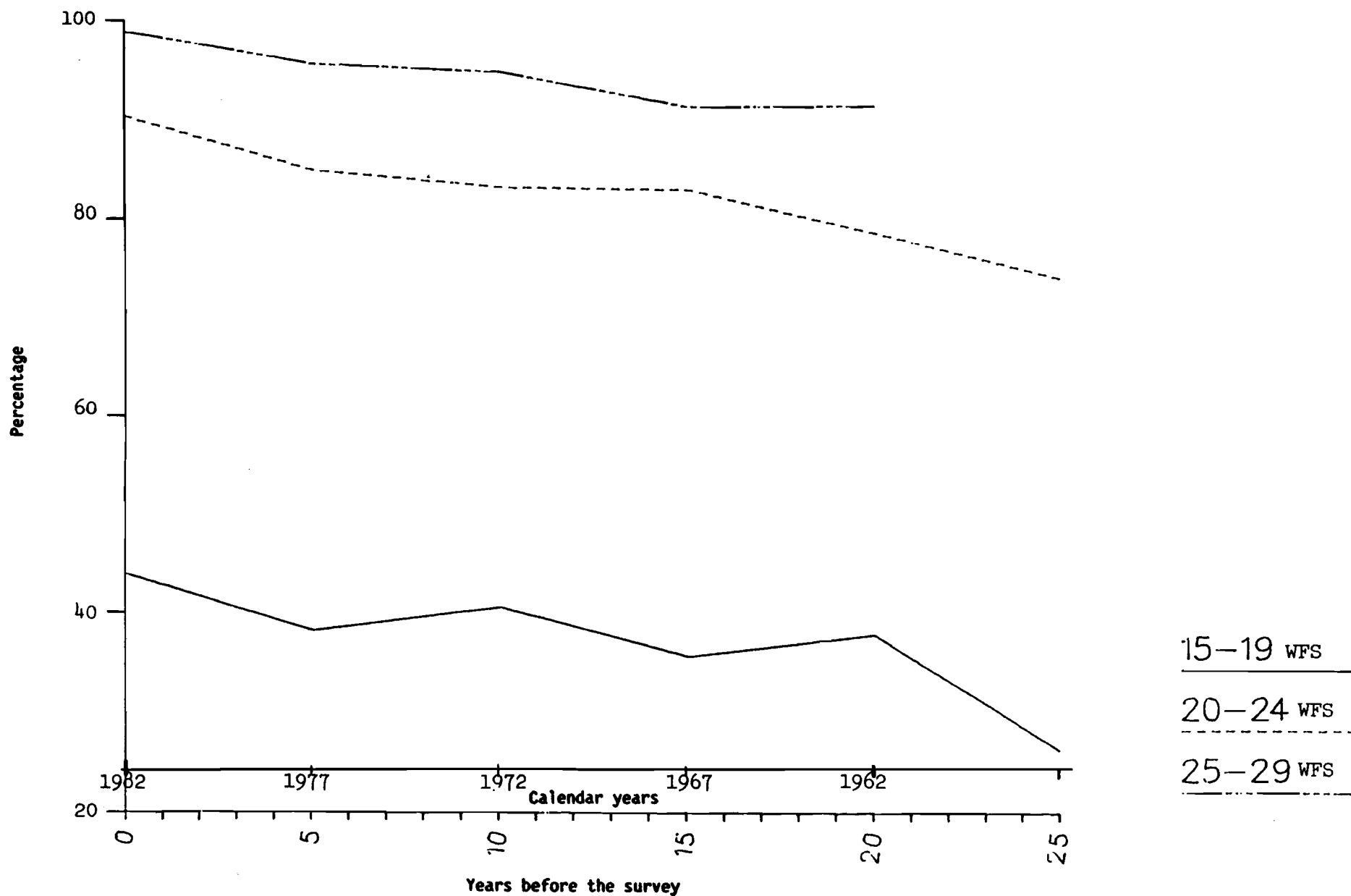


Figure IV. Proportions ever-married at designated periods prior to the survey for selected age groups: World Fertility Survey data and other sources: Benin



**Figure V. Cohort-period fertility rates for women aged 30-49 at interview:
Benin**

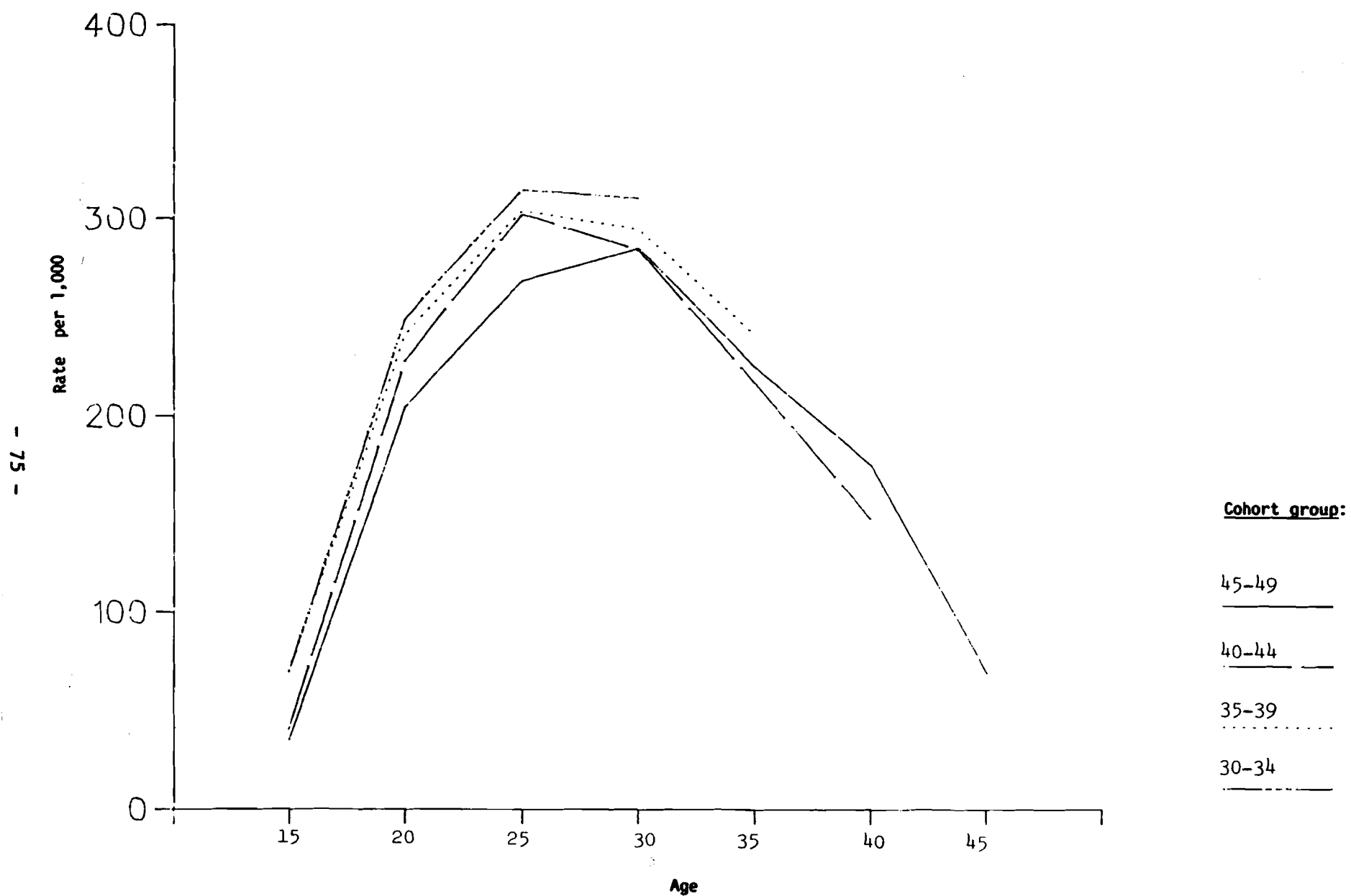
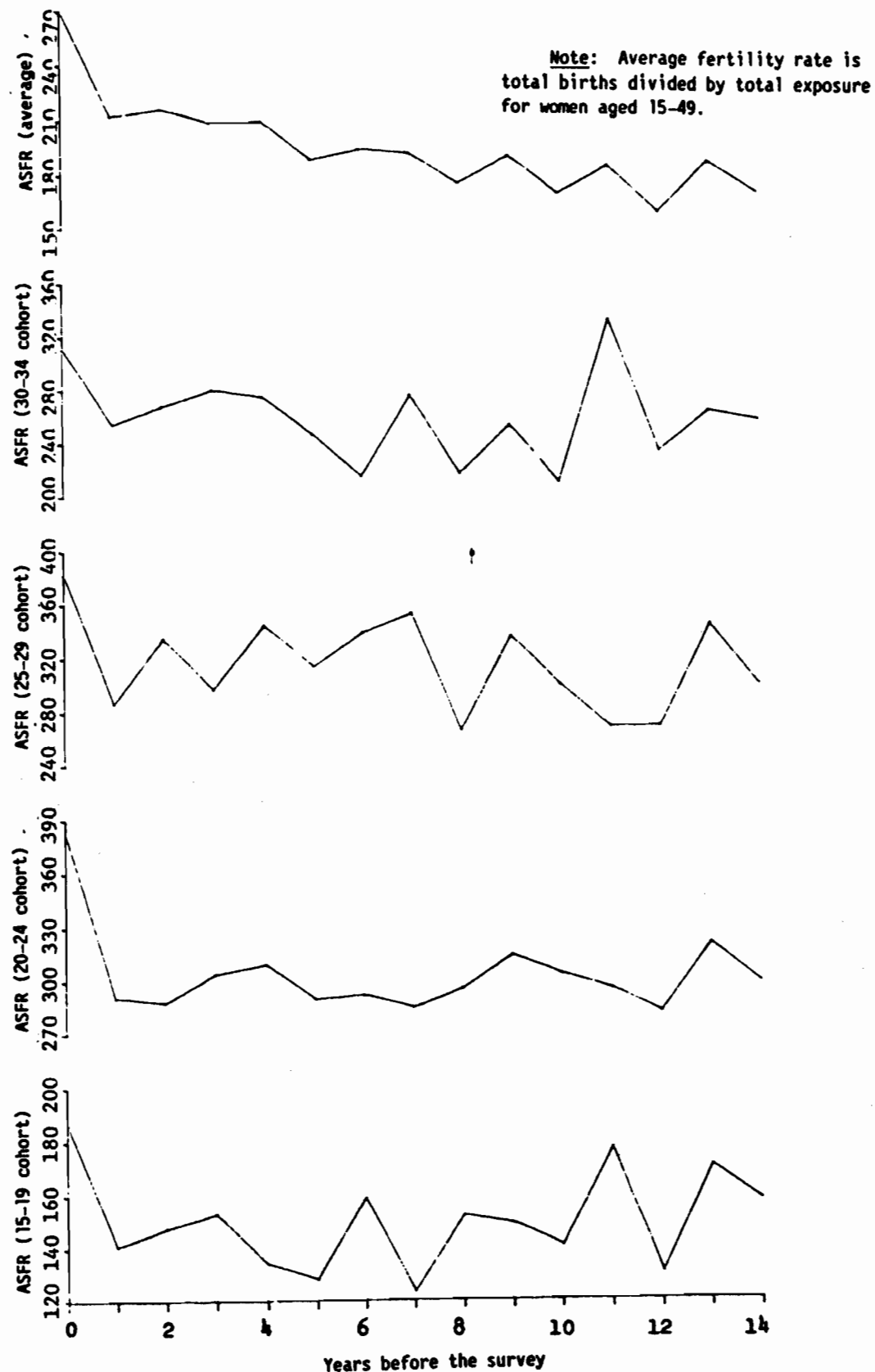


Figure VI. Age-specific fertility rates for selected cohorts and average fertility rate for single years before the survey: Benin



CAMEROON

The Cameroon Fertility Survey (ENF), conducted in 1978, was the first nation-wide in-depth fertility survey in that country. A series of demographic surveys took place between 1960 and 1965 in different regions of the country, but the data are of uncertain quality and comparisons would be difficult. Instead, data from a population and housing census conducted in 1976 will be used as a source of external comparisons. Civil registration in Cameroon is recent and not complete. Cameroon shows diversity among regions both in fertility and in data quality. An evaluation done by Santow and Bioumla (1983) shows that the north had the worst age-reporting and the lowest fertility. The centre/south had the best age-reporting and moderate fertility, while the west had moderately bad age-reporting with high fertility. Because of the regional diversity, care must be taken in the interpretation of Cameroonian data at the national level.

Age data

Age-reporting from the household survey shows heaping on digits ending with 0 and, to a lesser extent, 5. Digits ending with 2 and 8 were also popular, which could be the result of respondents reporting a rounded calendar year of birth. Since the survey was in 1978, the resulting completed age (depending on the imputed month of birth) would end in 7 or 8. Myer's index of age heaping was 15.4 among females in the ENF (Rutstein, 1984) but was 18.9 among females enumerated in the 1976 census. About two thirds (68.3 per cent) of respondents reported only their calendar year of birth, while 28.3 per cent reported both the month and year of birth. Only 3.4 per cent reported in terms of completed years (Chidambaram and Sathar, 1984).

An examination of the male and female age distribution (fig. I) shows small peaks among both males and females at age groups 5-9, 30-34, and 40-44 years. The peaks are not evident in the 1976 census female age distribution (fig. II), although the census distribution also has some irregularities. Obvious over-reporting of women aged 55-59 is evident from an examination of sex-ratios and from figure I. The upper age limit for inclusion in the individual survey was 54 years, and interviewers most likely shifted women out of the 50-54 age group into the 55-59 age group in order to avoid the individual questionnaire. An examination of proportions childless by age between the household and individual surveys reveals that the shifting from age group 50-54 to 55-59 might indeed be parity dependent (Santow and Bioumla, 1983), fertile women being more likely to be shifted out.

Marriage history data

The marriage history was based on a sample of 7,073 ever-married women, of whom 21 per cent reported both the month and year of first marriage, 58.8 per cent reported only the calendar year, while 20.1 per cent (including 0.9 per cent for whom no information was reported) reported in the form of "years ago" or age at marriage (Chidambaram and Sathar, 1984).

Marriage in Cameroon takes place over a period of time depending on how long it takes for the bride-price payments to be made, and sexual activity

frequently takes place outside of the conventional stable union. Among never-married women, 44 per cent had experienced sexual relations; 33 per cent of ever-married women reported pre-marital sex (Santow and Bioumla, 1983). The fertility rates that are presented here include births that occurred outside of marriage, but marital fertility rates only take into account births after the first union.

The distribution of ever-married women by duration of marriage (fig. III) shows an irregular decline from the most recent period up to 35 years before the survey. Pronounced peaks are evident for marriage durations 6, 9 and 14 years before the survey.

The marital status distribution for specific periods in the past was reconstructed using the WFS marriage history (fig. IV). Only three age groups, the 15-19, 20-24 and 25-29, are presented. An increase in the proportions married at each five-year period before the survey up to the most recent period is observed, which implies a decline in the age at first marriage over the past 25 years. However, the proportions married among 15-19 year olds appears relatively constant, the increase being very small. It is likely that age at union has not really changed much, but the increase in proportions married is the result of women not reporting early unions, which may not have been stable unions, and of the more complete reporting of those unions in the more recent period. Comparison with the marital status distribution from the 1976 census (fig. III) shows that the proportions recorded in the census are somewhat lower than those from the WFS. In the individual survey, a great effort was made to include all unions, whereas in the census it is likely that informal unions were not included. A comparison of the marital status distribution from the household and individual surveys also shows a higher proportion of unions in the individual survey (Direction de la statistique et de la comptabilité nationale, 1983), reflecting possibly the more complete reporting of unions in the individual survey.

Birth history data

The year and month was reported for 40.9 per cent of the 27,078 births. The calendar year (but no month) was given for 48.4 per cent, while for 10.7 per cent, dates were reported in terms of "years ago" or age (Chidambaram and Sathar, 1984).

Unfortunately children ever born data are not available from the 1976 census, but a comparison of the household and individual interview responses showed a shifting of high parity women from the 50-54 to the 55-59 age group (Santow and Bioumla, 1983). The average number of children ever born per woman increases monotonically up to age group 40-44 and then declines slightly among women 45-49 years (table 1).

An examination of table 2 which shows cohort-period fertility rates for five-year periods preceding the surveys, shows an increase in fertility rates from the past to the more recent period among all age groups up to 35-39 years. Increases are not small; for example, in the 20-24 age group, fertility rates increased from .202 children per woman 15-19 years before the survey to .250 children per woman 0-4 years before the survey. The observed

increase in fertility could be real, or it could be the result of date misreporting and omission among older women, or a mixture of both.

Some omission of births by older women and selective omission of high-parity women in the older age groups from the sample probably occurred. Panel 2 of table 2 shows some evidence of omission of births among older women. Women from the 45-49 year cohort had fewer births than the 40-44-year cohort in the 40-44 age group (4.78 compared with 5.20). There does not seem to be much evidence of date misplacement by older women as seen from the age pattern of cohort fertility (fig. V), although the age pattern for the oldest cohort (45-49) appears distorted at age 35-39 years.

It is likely that there was some real increase in fertility. There is some evidence that there has been a decline in primary sterility, although the trend may be exaggerated by age misreporting. Further, it has been observed that the fertility of fertile women has remained relatively unchanged, so that it is likely that an increase in fertility is caused by a decline in the number of sterile women (Santow and Bioumla, 1983).

Age-specific fertility rates from the 1976 census are compared with those obtained from the ENF in table 3. The census rates were calculated using births in the previous year and have been adjusted. The rates from ENF are slightly higher in all age groups, except among women aged 45-49 years. The age pattern of fertility from the two sources are similar, with the peak age at child-bearing being among women aged 20-24 years.

Age-specific fertility rates for single years before the survey (fig. VI) shows a fairly smooth, slightly increasing trend up to the most recent period in the average fertility rates, except for a deficit in the period 10 and 11 years before the survey. That "trough" is reflected in the rates for the age groups 15-19, 20-24, 25-29 and 30-34. Rates for the age group 15-19 shows peaks at 1, 3, 5, 9 and 12 years before the survey. Among the 20-24 age group, rates peaked at 4 and 8 years before the survey, while among the 25-29 age group, the peaks were at 2, 6 and 8 years before the survey. The rates among the 30-34 age group appeared fairly smooth up to 8 years before the survey. For periods further in the past, the rates fluctuate from year to year.

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Table 1. Children ever born per woman
from the WFS, 1978: Cameroon

Age group	WFS 1978
15-19	0.41
20-24	1.63
25-29	3.00
30-34	4.16
35-39	4.87
40-44	5.20
45-49	5.18

Source: Gouvernement du Cameroun, Enquête nationale sur la fécondité du Cameroun, 1978, Rapport principal, vol. I (Direction de la statistique et de la comptabilité nationale, 1983), p. 63.

Table 2. Cohort period rates and cumulative cohort fertility
by age at survey: Cameroon

Age group of cohort at end of period	Number of women in cohort	Years prior to survey						
		0-4	5-9	10-14	15-19	20-24	25-29	30-34
Cohort-period fertility rates								
10-14	0	0.000	0.002	0.002	0.001	0.004	0.004	0.001
15-19	1 483	0.079	0.074	0.065	0.074	0.068	0.058	0.043
20-24	1 496	0.250	0.241	0.226	0.204	0.188	0.173	
25-29	1 297	0.292	0.280	0.250	0.243	0.212		
30-34	1 132	0.247	0.252	0.235	0.202			
35-39	960	0.196	0.190	0.170				
40-44	877	0.125	0.158					
45-49	599	0.076						
Cumulative fertility of cohorts at end of period								
10-14		0.000	0.011	0.008	0.006	0.021	0.018	0.007
15-19		0.407	0.380	0.330	0.390	0.357	0.296	0.221
20-24		1.628	1.535	1.521	1.380	1.238	1.086	
25-29		2.996	2.919	2.628	2.454	2.147		
30-34		4.156	3.886	3.630	3.154			
35-39		4.867	4.580	4.007				
40-44		5.203	4.795					
45-49		5.176						

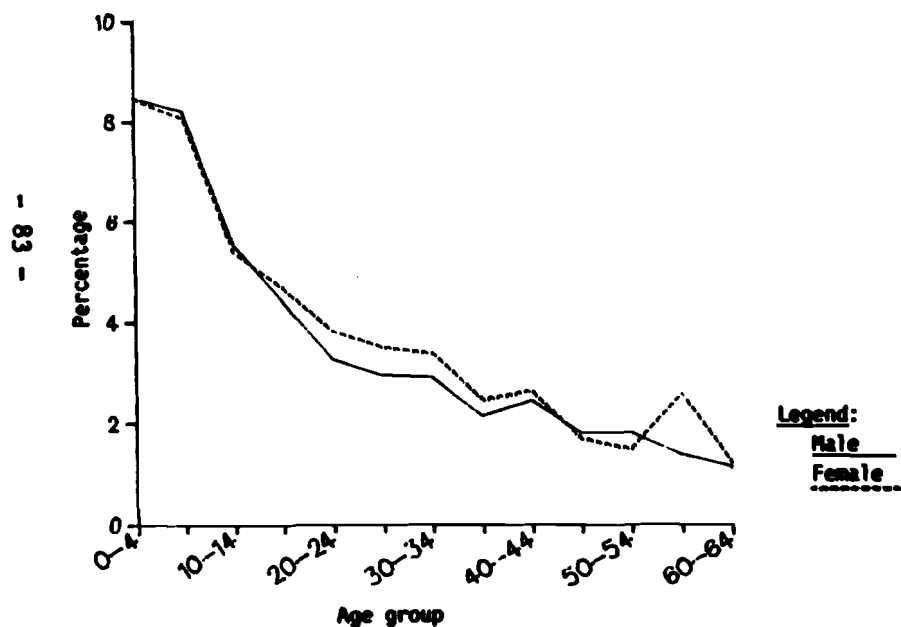
Source: S. Singh, "Birth histories", WFS Comparative Studies, Cross-national Summaries: Additional Tables (Voorburg, Netherlands, ISI/WFS, 1984), p. 8.

**Table 3. Age-specific fertility rates
for selected periods from
1976 census and WFS: Cameroon**

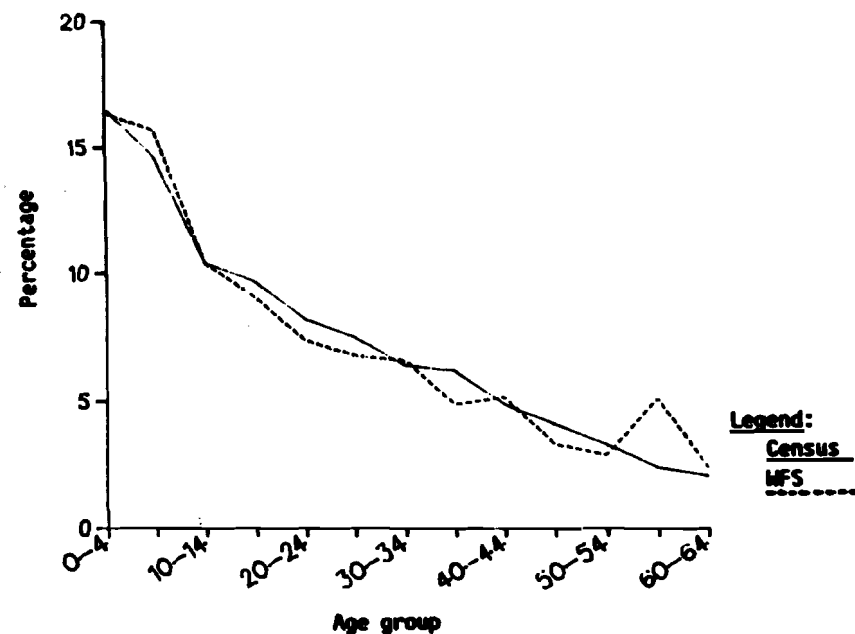
Age group	1976 census, adjusted	1975-1977 WFS
15-19	163	192
20-24	291	297
25-29	262	279
30-34	200	222
35-39	154	154
40-44	73	95
45-49	54	37
TFR	6.0	6.4

Source for the 1976 census (adjusted):
Gouvernement du Cameroun, Enquête
nationale sur la fécondité du Cameroun,
1978. Rapport Principal. Vol. I
(Ministère de l'économie et du plan,
1983), table 5.11.

**Figure I. Distribution of males and females
as a percentage of the total population
by five-year age groups: Cameroon**



**Figure II. Distribution of the female
population by five-year age groups:
World Fertility Survey (1978) and
1976 census: Cameroon**



Source: Gouvernement du Cameroun, Enquête nationale sur la fécondité du Cameroun, 1978. Rapport principale, vol. I (Ministère de l'économie et du plan, Direction de la statistique et de la comptabilité nationale, Avril 1983), p. 28, tableau 3.1.

**Figure III. Distribution of ever-married women aged 15-49
by years since first married: Cameroon**

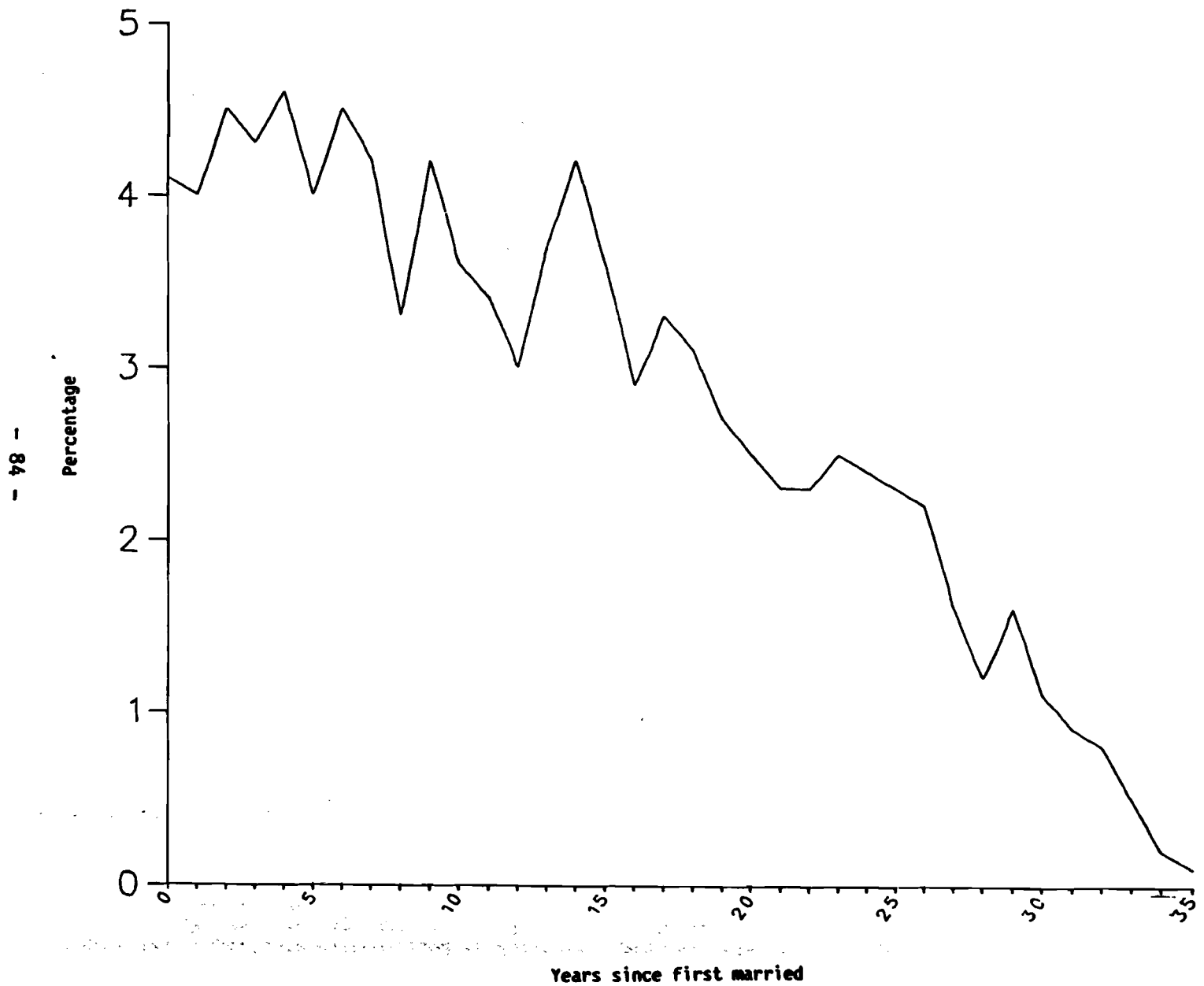
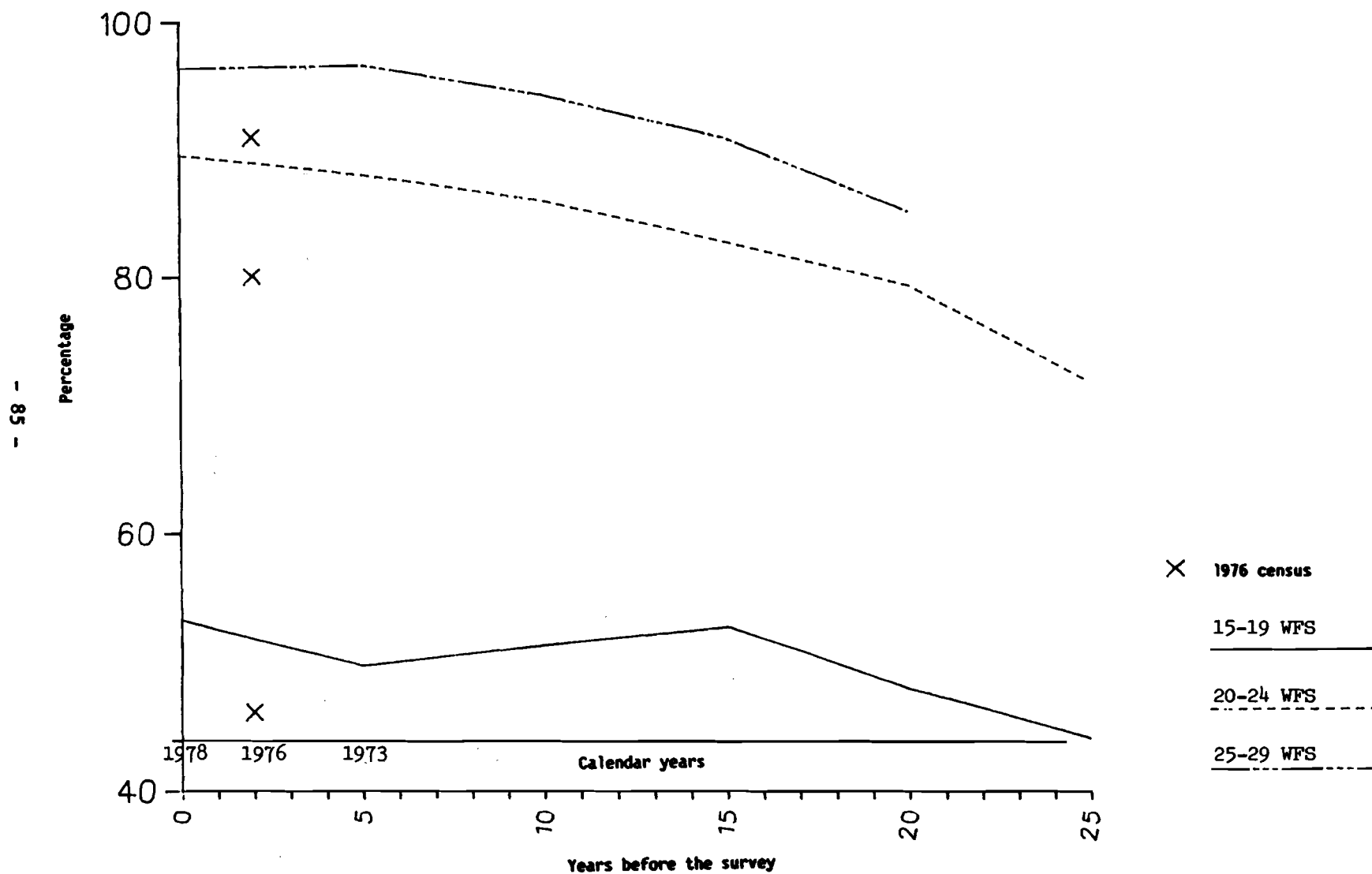


Figure IV. Proportions ever-married at designated periods prior to the survey for selected age groups: World Fertility Survey data and 1976 census: Cameroon



Source: Gouvernement du Cameroun, Enquête nationale sur la fécondité du Cameroun, 1978, Rapport principale, vol. I (Direction de la statistique et de la comptabilité nationale, Avril 1983), p. 56.

**Figure V. Cohort-period fertility rates for women aged 30-49 at interview:
Cameroon**

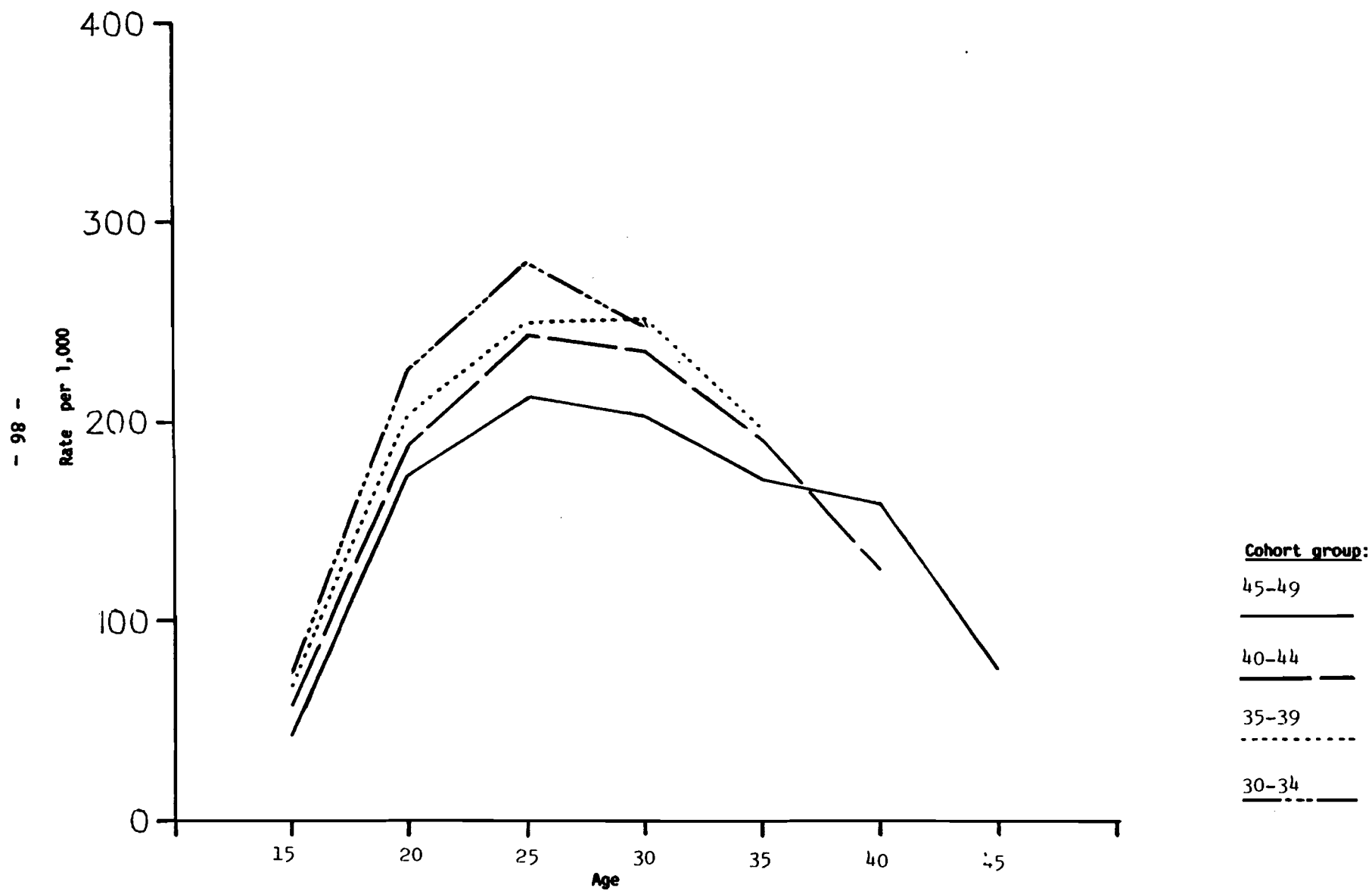
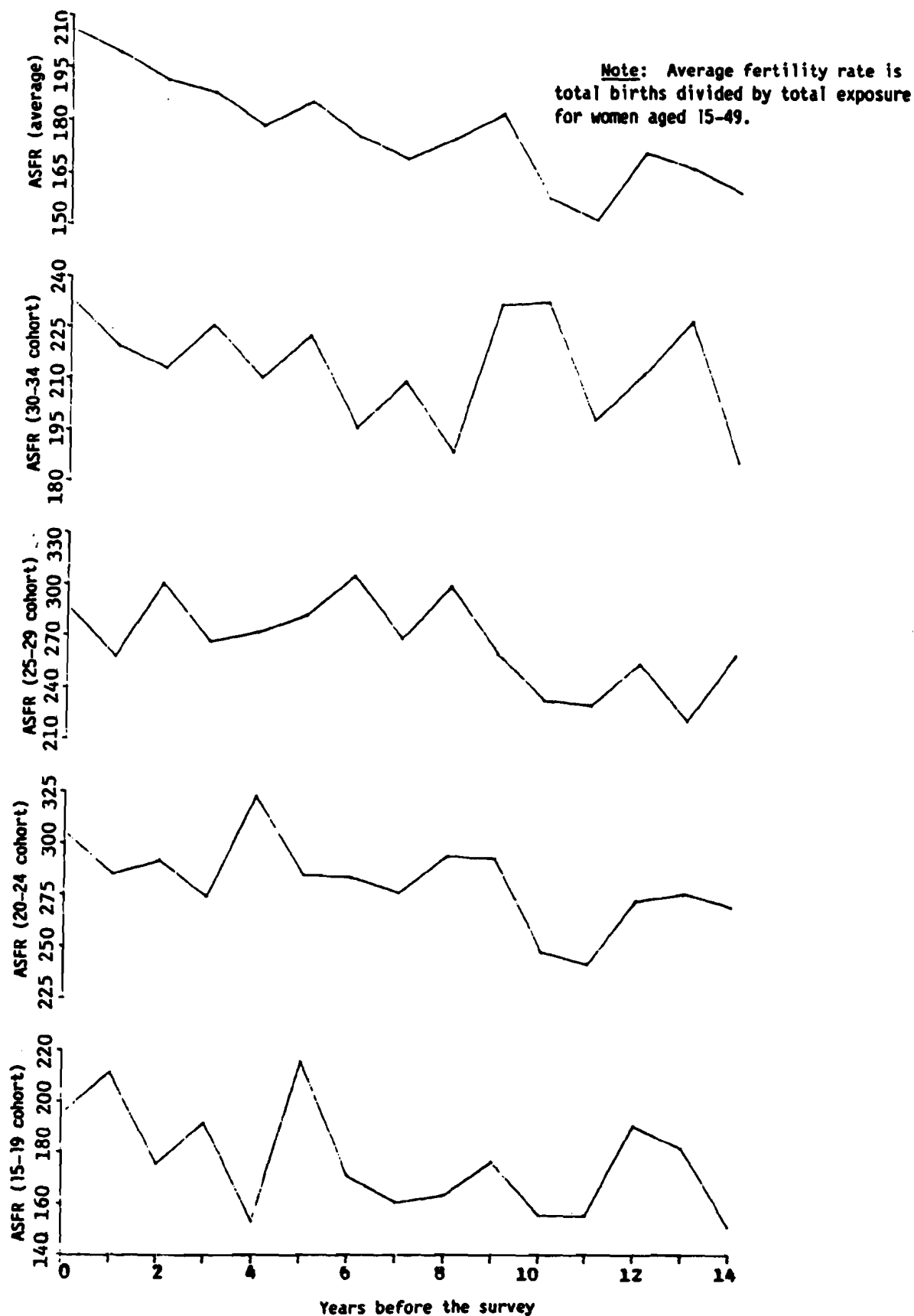


Figure VI. Age-specific fertility rates for selected cohorts and average fertility rate for single years before the survey: Cameroon



COLOMBIA

Field work for the WFS survey in Colombia (the Encuesta Nacional de Fecundidad de Colombia - ENFC) took place between May and September of 1976. The Colombian Fertility Survey data were made the subject of two illustrative analyses (Flórez and Goldman, 1980; Hobcraft, 1980) upon which this summary draws. The studies compared ENFC nuptiality and fertility data with those obtained in the 1951, 1964 and 1973 censuses and with an earlier survey, the 1969 ENF. Subsequently, an evaluation of all national-level demographic data, including some gathered after the ENFC, was published (Zlotnik, 1982). The ENFC can thus be considered to have received especially detailed scrutiny. Although a survey as well as the 1973 census provide independent information about fertility levels and trends, civil registration is still too incomplete to yield reliable estimates (Zlotnik, 1982).

Age data

In the individual survey 96.6 per cent of women gave both the year and the month of their birth (Flórez and Goldman, 1980). Myer's index of age heaping calculated for women in the household survey was 5.7. The survey showed less severe age heaping than did the 1964 and 1973 censuses (Rutstein, 1984; Flórez and Goldman, 1980).

The pattern of sex ratios by age and the relative sizes of adjacent five-year groups of women suggest that there has been some systematic misreporting of age (see fig. I) although heavier outmigration by males and differential enumeration may affect the sex ratios (United States Bureau of the Census, 1979). A general surplus of women in their 20s and a notable excess in age group 35-39, which may represent a downward transfer from age group 40-44, have been noted in other Latin American countries (United Nations, 1967), and those features are apparent in the ENFC data in figure I and when compared with the 1973 census (see fig. II). It is also likely that there has been some omission and/or age misstatement for children 0-4.^{1/}

When records from the individual interview were matched with those from the household survey, it was found that women tended to report older ages at the individual interview than those recorded in the household; the difference is presumably due to the reporting of date (year and month) of birth in the individual interview, versus age in the household survey. Sixty-one per cent had the same single year of age in both interviews, and 88 per cent were placed in the same five-year age group (Flórez and Goldman, 1980).

Marriage history data

The marriage history is based on a sample of 3,362 ever-married women. Only 2.7 per cent of women did not report the year and month the current union began. Dates of former unions were less completely reported: in 6.4 per cent of such cases, only the year was given, and 13.8 per cent of responses were in terms of the woman's age at the time.^{2/}

The marriage duration data in figure III shows an irregular pattern, with peaks occurring in 1969/70 and 1960 as well as 10 and 20 years before the

survey. There are a relatively large number of first unions contracted in the 0-6 years before the survey.

The marital-status distribution implied by the ENFC union history was calculated for periods in the past and compared to the distribution recorded at the 1951, 1964 and 1973 censuses and the 1969 fertility survey (see fig. IV). The ENFC marriage history data shows a high level of agreement with the 1969 survey but showed higher proportions ever-married (higher proportions in common-law unions, and higher proportions widowed, divorced or separated) than did the censuses (Flórez and Goldman, 1980). It seems likely that the discrepancies between the ENFC and the censuses reflect a tendency of census data to underestimate the number of women in common law unions and the number who had once been in such unions. Therefore, it can be assumed that the current proportions married are reasonably accurate, and disagreement with the censuses does not reliably indicate problems with the marriage history data.

Age at marriage has apparently changed only slightly during at least the past 20 years. The ENFC marriage history data show a small recent increase in marriage age after what at face value seems to have been a slight decline in the more distant past. This latter feature may be due to omissions of early casual unions by older women, though this is unclear. The series of three censuses shows essentially no trend, but the possibility of a slight recent increase in marriage age cannot be ruled out on the basis of this evidence, especially as a comparison of the ENFC with the proportions married as of the 1969 survey also suggests that there has been some change.

Birth history data

The year and month was reported for 91.2 per cent of all births. Dates of 7.0 per cent of births were reported as "years ago", and for 1.8 per cent, a calendar year but no month was given.^{3/}

Reliability of reports of children ever born and date of the last live birth were examined by matching household and individual-interview responses. For current purposes, the case in which the respondent was the same woman at both interviews is of most interest. Different numbers of live births were given in the two interviews by 11-12 per cent of women aged 40-49; for lower ages, agreement was better (Hobcraft, 1980).

The series of parity estimates for younger women (table 1) shows evidence of a substantial fertility decline over time; for older women, the ENFC evidently obtained a better enumeration of children ever born than did either the 1969 ENF or the 1973 census. The 1978 contraceptive prevalence survey shows even higher parity than does the ENFC for ages 45 to 49, but since the 1978 survey involved a relatively small sample, and as other recent surveys (not shown here) indicate completed family size comparable to that found in the ENFC for approximately the same birth cohort,^{4/} it cannot be concluded that the ENFC suffered from a serious underenumeration of births to older women. The pattern of rates in the birth histories (table 2 and fig. V do, however, suggest a minor degree of omission, date shifting, or both. The cohort-period fertility rates from the WFS birth histories (table 2) that are centred on ages 15, 20 and 25 show an increase from the period most distant

from the survey, reach a maximum 15-19 or 10-14 years before the survey^{5/} and then (along with rates for older ages) decline sharply during the period immediately before the interview. Comparisons with independent sources do not go back far enough to tell whether the earlier increase in rates at younger ages might have been genuine. Such a pattern is often taken to indicate omissions of births by older cohorts or a displacement of birth dates towards the interview.

A more detailed inspection of annual fluctuations in age-specific fertility for the younger age groups from ENFC (see fig. VI) shows no preference for particular years but does show low rates for the period 0 and 2-3 years before the interview for age group 20-24.

Table 3 shows period fertility estimates for 1967-1968 from birth histories collected in 1969 ENF and for 1972-1973 calculated from reports about births in the year preceding the census; they can be compared with estimates derived from the ENFC birth histories. However, a variety of evidence, besides disagreement with the ENFC, suggests that the census estimate is too low (Zlotnik, 1982). Potentially serious defects have also been noted in the 1969 survey data, although for the years shown in table 3 the ENF and WFS estimates are in fairly good agreement as to the overall level of fertility; the agreement for specific ages, particularly 35-39, is less good. In addition to the rates given in table 2, own-children estimates derived from the census and own-children and other estimates from surveys have been evaluated and compared with ENFC estimates by Zlotnik (1982). All evidence indicates a rapid decline in fertility. For the first of the periods for which ENFC estimates are given in table 3, agreement with Zlotnik's final estimates is almost exact, while for the period 1971-1974 the WFS estimate is somewhat lower (a TFR of 4.9, as opposed to 5.2).

Notes

1/ The differences for young ages are too large to be attributable to recent fertility decline. The census data used for comparison have been adjusted but it is not known in what ways. However, an alternate adjusted 1973 age distribution derived through the application of indirect techniques shows an even higher proportion under age 5 than does the census distribution in fig. II, and also shows lower proportions aged 10-24 than does the survey.

2/ Colombia Standard Recode File, Data Documentation. WFS/TECH. 923 (November 1978), mimeo.

3/ Colombia Standard Recode File. WFS/TECH. 923 (November 1978), p.3.

4/ H. Zlotnik, (1982), pp. 117-166; Colombia, Corporación Centro Regional de Población, Second Contraceptive Prevalence Survey, Colombia 1980, General Results (Bogotá, 1982).

5/ These patterns are reflected in another measure - the reported age at first birth, which is 22.5 for women aged 45-49, 22.0 for those aged 40-44 and 21.7 for those aged 35-39 (Chidambaram and others, 1980).

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Table 1. Children ever born per woman, from 1969 and 1978 surveys, the 1973 census, and the WFS: Colombia

Age group	1969 survey	1973 census	1976 WFS	1978 survey a/
15-19	0.2	0.1	0.2	0.2
20-24	1.3	1.0	1.1	1.0
25-29	2.9	2.4	2.4	2.8
30-34	4.4	3.9	4.0	3.8
35-39	5.8	5.0	5.0	5.2
40-44	6.6 a/	5.8	6.1	6.0
45-49	6.3 a/	6.0 b/	6.7	7.5

Source: J. Hobcraft, "Illustrative analysis: evaluating fertility levels and trends in Colombia", WFS Scientific Reports, No. 15, (Voorburg, Netherlands, ISI/WFS 1980), p. 50, table 3.11.

a/ Colombia, Ministerio Central de Salud, Corporación Centro Regional de Población, Encuesta Nacional de Prevalencia del Uso de Anticonceptivo: Colombia 1978 (Bogotá, 1979), p. 44, table 4.6.

b/ Demographic Yearbook, Historical Supplement: Special Issue (United Nations publication, Sales No. E/F.79.XIII.8), p. 508, table 7.

Table 2. Cohort period rates and cumulative cohort fertility by age at survey: Colombia, 1976

Age group of cohort at end of period	Number of women in cohort	Years prior to survey						
		0-4	5-9	10-14	15-19	20-24	25-29	30-34
Cohort-period fertility rates								
10-14	0	0.000	0.001	0.001	0.002	0.001	0.002	0.002
15-19	1 423	0.033	0.041	0.054	0.056	0.056	0.051	0.047
20-24	1 051	0.178	0.207	0.239	0.237	0.214	0.199	
25-29	842	0.224	0.312	0.311	0.328	0.311		
30-34	599	0.202	0.248	0.313	0.327			
35-39	579	0.153	0.210	0.272				
40-44	476	0.098	0.154					
45-49	406	0.039						
Cumulative fertility of cohorts at end of period								
10-14		0.000	0.003	0.004	0.012	0.003	0.012	0.011
15-19		0.167	0.210	0.284	0.284	0.294	0.267	0.241
20-24		1.101	1.318	1.481	1.478	1.336	1.234	
25-29		2.437	3.038	3.033	2.975	2.788		
30-34		4.048	4.271	4.540	4.421			
35-39		5.036	5.590	5.781				
40-44		6.080	6.552					
45-49		6.746						

Source: WFS standard recode tapes.

Table 3. Age-specific fertility rates for selected periods from WFS, ENF, and census data: Colombia

Age group	1967-1968 ENF a/ (1)	1966-1969 WFS (2)	1972-1973 census (3)	1971-1974 WFS (4)	Percentage change	
					WFS (2) - (4)	Outside source (1) - (3)
15-19	0.110	0.114	0.077	0.106	- 7.0	-30.0
20-24	0.270	0.289	0.207	0.242	-16.3	-23.3
25-29	0.278	0.288	0.205	0.226	-21.5	-26.3
30-34	0.277	0.252	0.172	0.177	-29.8	-37.9
35-39	0.176	0.200	0.130	0.129	-35.5	-26.1
40-44	0.085	..	0.063	0.073	..	-25.9
45-49	0.010	..	0.019	..	..	90.0
TFR	6.0	6.2 a/	4.4	4.9 a/	-21.0	-26.7

Source: John N. Hobcraft, "Illustrative analysis: Evaluating fertility levels and trends in Colombia", *Scientific Reports*, No. 15 (ISI/WFS, Voorburg, Netherlands, May 1980), p. 50; for the 1972-1973 Census: Joseph E. Potter and Myrian Ordonez, "The completeness of enumeration in the 1973 census of population of Colombia", *Population Index*, vol. 42 (July 1976), p. 386. Figures were adjusted by authors for reference period error and invalid responses.

Note: ENF: Encuesta Nacional de Fecundidad.

a/ For the purpose of calculating a total fertility rate, the age-specific fertility rates from the ENF and the Census were used when the age-specific fertility rate for the WFS was not available.

Figure I. Distribution of males and females as a percentage of the total population by five-year age groups: Colombia

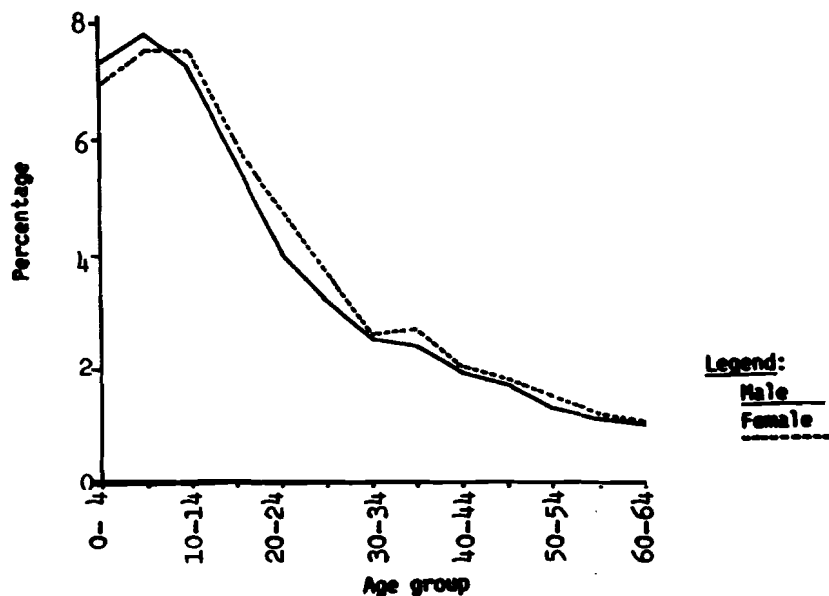
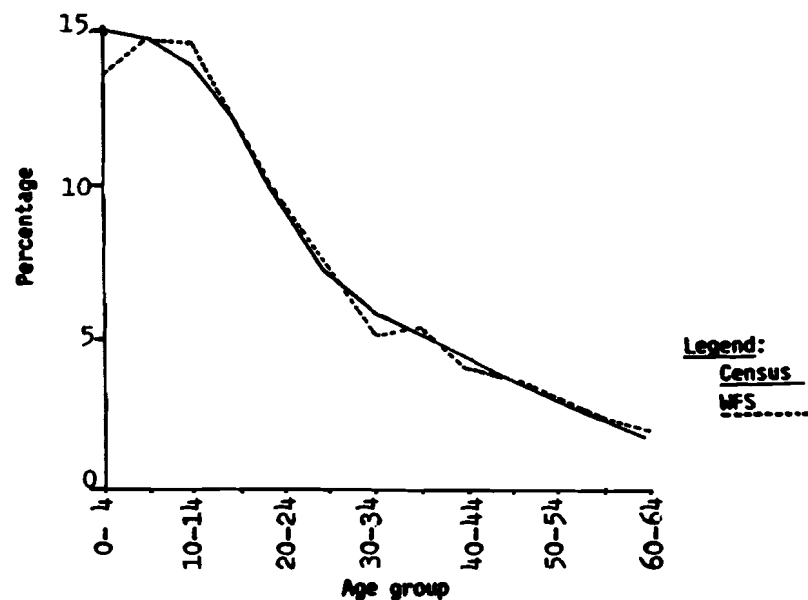


Figure II. Distribution of the female population by five-year age groups: World Fertility Survey (1976) and 1973 census: Colombia



Source for the census of 1973: Demographic Yearbook, Historical Supplement: Special Issue (United Nations publication, Sales No. E/P.79.XIII.8), table 3.

**Figure III. Distribution of ever-married women aged 15-49
by years since first married: Colombia**

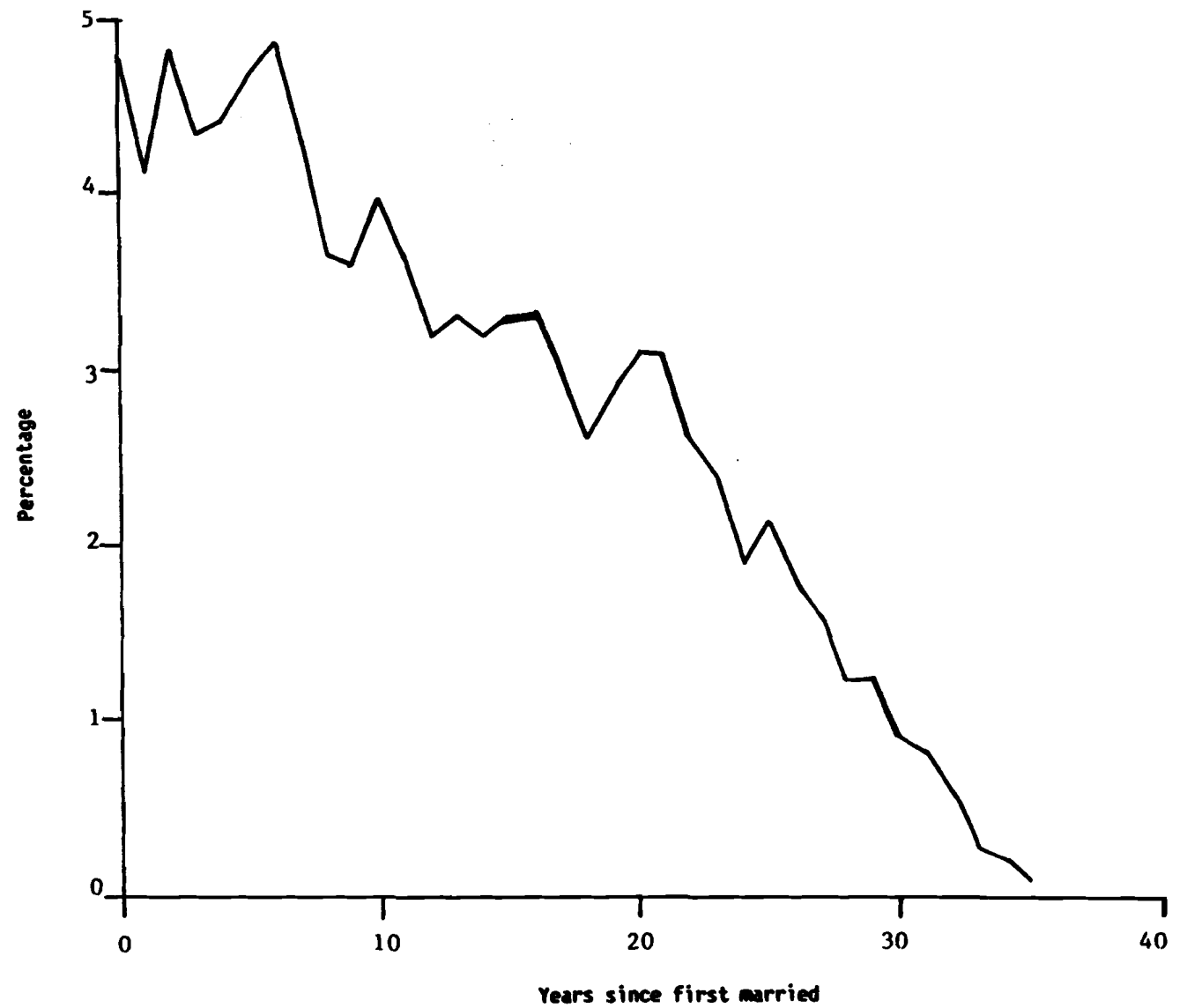
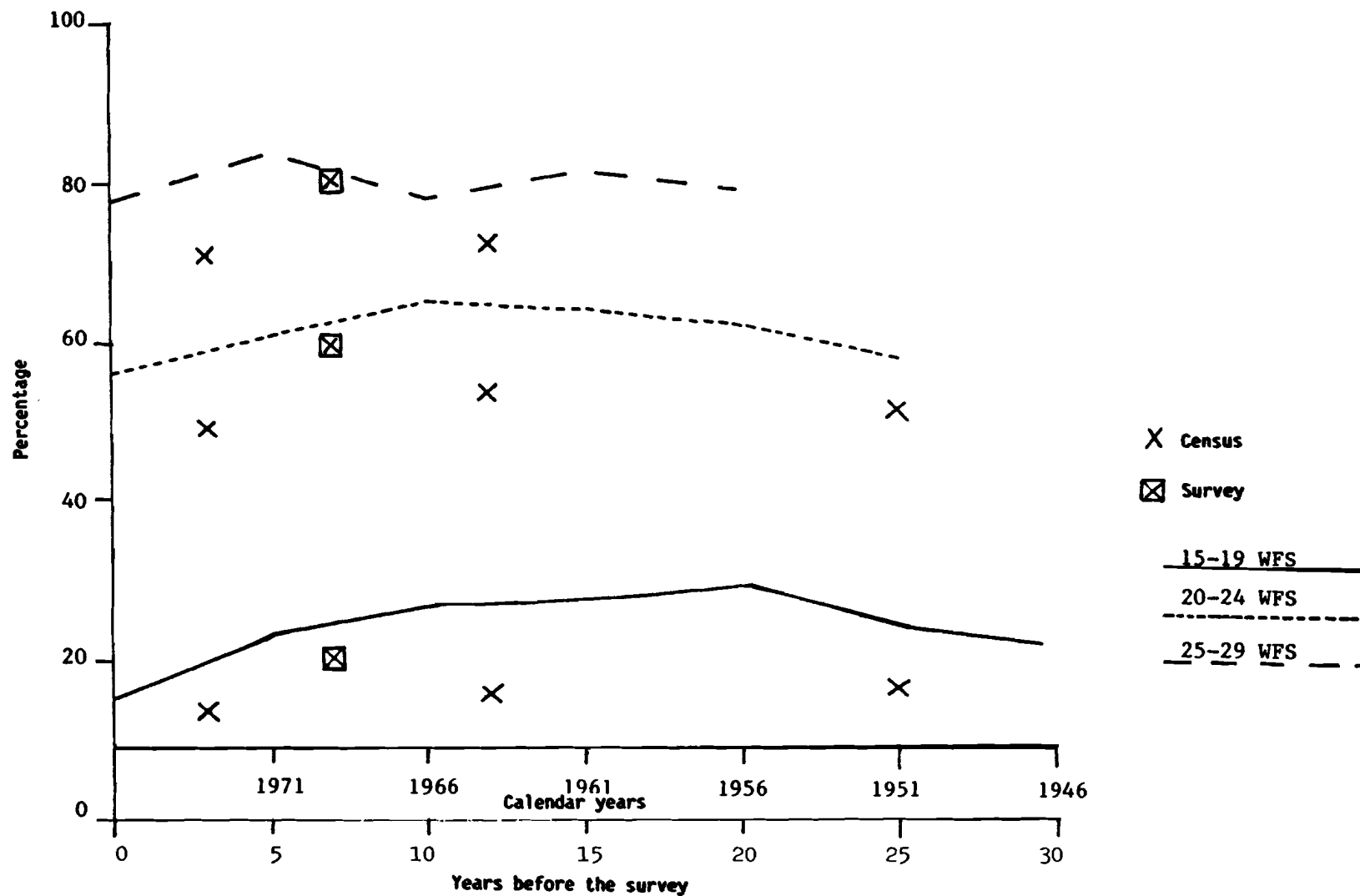


Figure IV. Proportions ever-married at designated periods prior to the survey for selected age groups: World Fertility Survey data and other sources: Colombia



Source: C.G. Flores and N. Goldman, "An analysis of nuptiality data in the Colombia National Fertility Survey", *WFS Scientific Reports*, No. 11 (Voorburg, Netherlands, ISI/WFS, May 1980).

Figure V. Cohort-period fertility rates for women aged 30-49 at interview:
Colombia

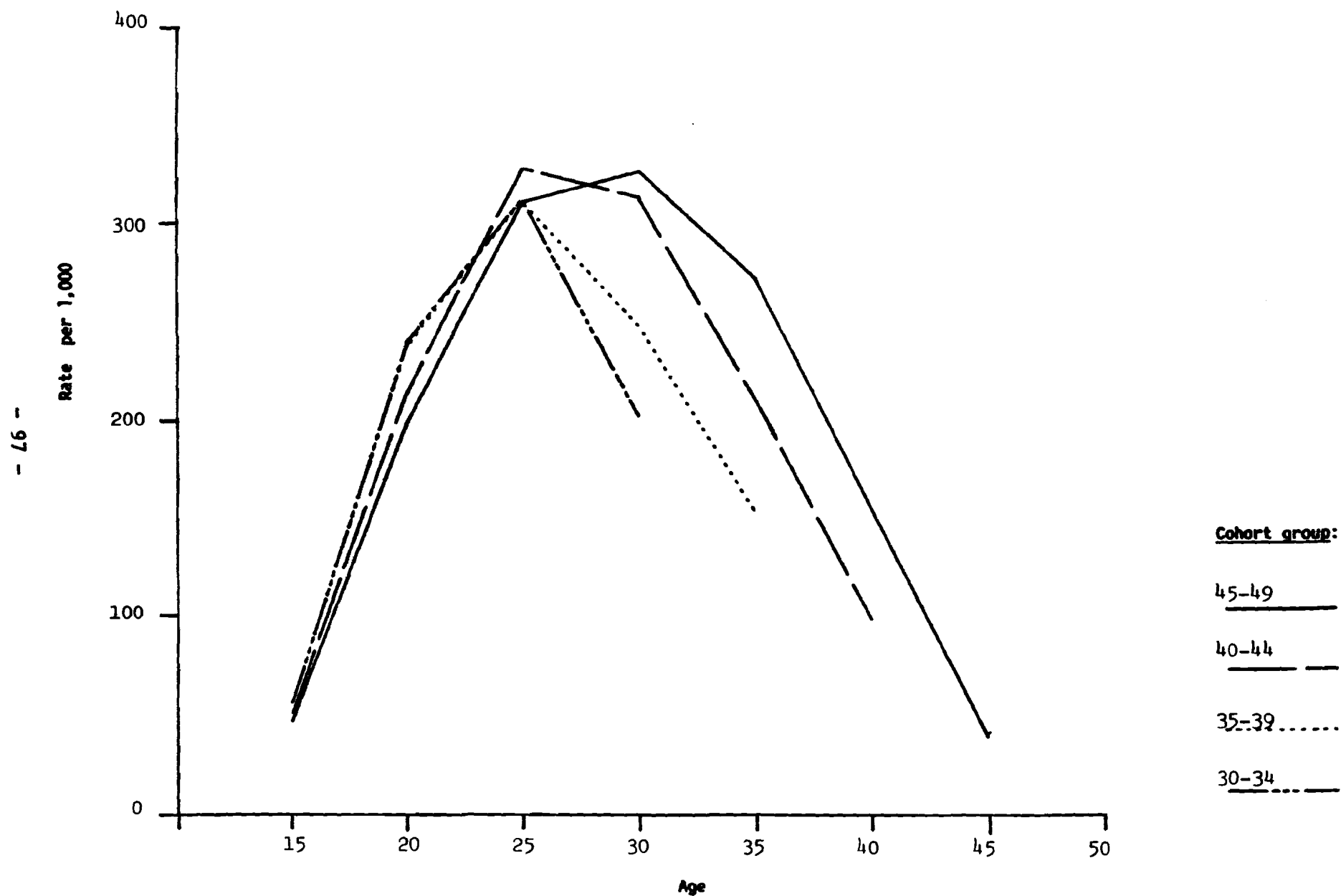
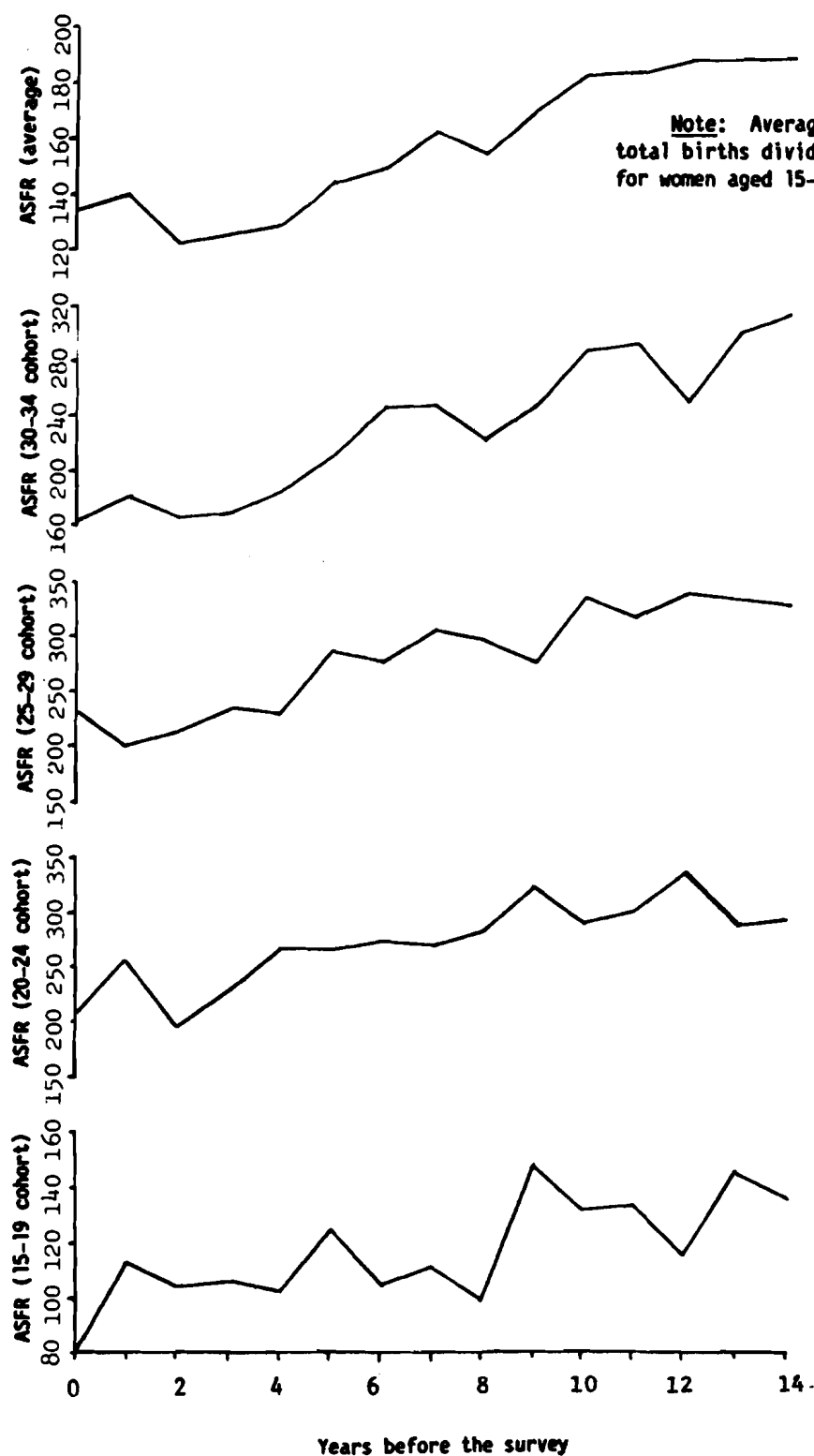


Figure VI. Age-specific fertility rates for selected cohorts and average fertility rate for single years before the survey: Colombia



COSTA RICA

Demographic information for Costa Rica is generally considered to be of high quality, with census and vital registration information available throughout the current century. Coverage of vital registration has approached 100 per cent in recent years, and registration has been accurate, although there is some evidence of delays in the registration of births (Dirección General de Estadística y Censos, 1978). The most recent census was taken in 1973. The first fertility survey in Costa Rica took place in 1964 under the auspices of the Centro Latinoamericano de Demografía (CELADE) covering the metropolitan area of San José (Dirección General de Estadística y Censos, 1966). A second survey in 1969, also under the auspices of CELADE, was undertaken to cover the rural areas of the country (Dirección General de Estadística y Censos, 1971). From July to December 1976, the Directorate of Census and Statistics carried out the National Fertility Survey (Encuesta Nacional de Fecundidad, or ENF) as part of the World Fertility Survey programme. The individual interview was restricted to all women aged 20-49. Demographic information (besides the vital statistics) after the ENF is available in the form of a contraceptive prevalence survey which took place in 1978 with a sample of 3,400 women of ages 15-49 (Asociación de Demografía Costarricense, 1978). The combination of censuses, surveys and vital registration permits a close scrutiny of the quality of information coming from the ENF.

Age data

Age reporting from the household surveys shows a digit preference for 0 and 5, and to a lesser degree, 8 and 2 (Guzmán, 1980). However, the extent of the preference is mild, especially when compared with other WFS countries, as seen by the low Myer's index value of 2.8 (Rutstein, 1984). The population distribution by age and sex in figure I shows that women 50-54 are over-represented, possibly due to shifting of women 45-49 in order to avoid the interview. The difference at young ages between the age distribution at the 1973 census and at the ENF partly reflects rapid fertility decline, but there may be some undercount or age misstatement of young children and perhaps a slight overcount of 15-19, which is consistent with the survey design, by which women were eligible for the interview at age 20. It is also worth noting that the age heaping in WFS is somewhat improved over the census, which showed a Myer's index of 4.6 for women aged 10-69.

Marriage history data

The marriage history is based on a sample of 3,037 ever-married women. The degree of imputation that was necessary for the nuptiality data is minimal, and all indications are that the information is quite accurate (Dirección General de Estadística y Censos, 1978). Aspects of the marriage history data are shown in figures III and IV. The distribution by single years since first union shows a peak in the first years prior to the survey which is not connected in any way with an important historical event. This can probably be explained by the restriction of the sample to women 20 and older, which results in an unusually large number of marriages in the three to six years before the survey. The current proportion ever in union from the

census is reasonably comparable although slightly lower at each age than that recorded in the ENF. It is likely that some women separated from consensual unions were counted as never-married in the census. There is little evidence of strong trends. The increases in proportions ever in union from the distant to the more recent past seen in figure IV are likely due to omissions of early and more casual unions among older women. The increases and decreases shown for the 20-24 and 25-29 year-old group in the recent past may be due to some systematic distortion caused by the cohort 30-34.

Birth history data

It is assumed that birth history data for Costa Rica were virtually complete with respect to the reporting of month and year of each birth, but no information is available on the extent of the imputations. A comparison of parity at the time of the census (1973) with parity for the same year calculated from the survey (see table 1) shows correspondence at most age groups but lower parity at ages 35-39 and substantially higher parity at 40-44 for the ENF.

An examination of table 2 which shows the cohort-period rates suggests that omissions of births are not a major problem because the parity for the 45-49 group is somewhat higher than that for the 40-44 group. From figure V, it does not appear likely that birth dates have been displaced towards the survey from the most distant past to a large degree. A comparison of these cohort-period rates with data from the vital registration was presented in the ENF evaluation study and showed only some relatively small discrepancies (Guzmán, 1980). The ENF has slightly under-estimated fertility for each period for the 35-39 year-old cohort which probably contains, as discussed above, some women who were actually older. The fertility of the 40-44 year olds appears over-estimated, which could be due to the fact that women aged 40-44 were those with the highest fertility. However, none of these effects is statistically large (Guzmán, 1980).

Table 3 shows evidence of a sharp decline in birth rates in Costa Rica since 1960, with the decline being sharpest for age groups 25-39. The ENF fertility estimates for women aged 20-24 appear slightly low in the recent period, but the trends overall are remarkably consistent with those of the civil registration.

Figure VI shows age-specific fertility rates by single years before the survey. The pattern for age groups 15-19 is peculiar because women were only eligible for interview at age 20, so the average age of the 15-19-year-old women is declining as one moves away from the survey date for the first five years. There is no strong evidence of a preference for years or of a displacement from the present to the past of recent births.

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Table 1. Children ever born per woman, from
WFS and the 1973 census: Costa Rica

Age group	1973 census	1973 WFS	1976 WFS
20-24	1.1	0.9	1.0
25-29	2.5	2.6	2.0
30-34	4.1	4.0	3.5
35-39	5.5	5.2	4.8
40-44	6.4	6.9	6.1
45-49	6.7	..	6.7

Source: 1973 census: Costa Rica, Dirección General de Estadística y Censos, Censo de Población de 1973, tomo I (San José, 1974), cuadro 25.

Table 2. Cohort period rates and cumulative cohort fertility
by age at survey: Costa Rica, 1976

Age group of cohort at end of period	Number of women in cohort	Years prior to survey						
		0-4	5-9	10-14	15-19	20-24	25-29	30-34
Cohort-period fertility rates								
10-14	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000
15-19	0	0.031	0.031	0.042	0.042	0.049	0.042	0.025
20-24	986	0.164	0.173	0.235	0.245	0.243	0.185	
25-29	839	0.184	0.268	0.330	0.337	0.354		
30-34	653	0.158	0.223	0.315	0.323			
35-39	583	0.111	0.200	0.277				
40-44	448	0.080	0.146					
45-49	426	0.030						
Cumulative fertility of cohorts at end of period								
10-14		0.000	0.000	0.001	0.000	0.000	0.000	0.000
15-19		0.154	0.155	0.211	0.210	0.244	0.210	0.124
20-24		0.977	1.076	1.383	1.468	1.424	1.047	
25-29		1.995	2.724	3.118	3.112	2.815		
30-34		3.515	4.233	4.688	4.427			
35-39		4.791	5.690	5.812				
40-44		6.092	6.542					
45-49		6.692						

Source: WFS standard recode tapes.

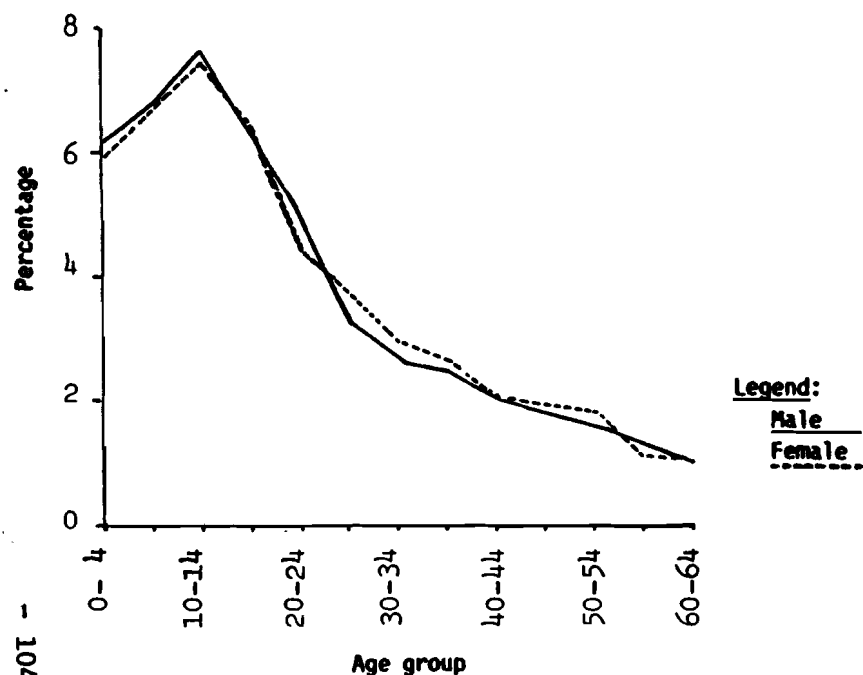
Table 3. Age-specific fertility rates for selected periods from WFS and birth registration data: Costa Rica

Age group	1960-1964		1965-1969		1970-1974		Per cent change	
	BR (1)	WFS (2)	BR (3)	WFS (4)	BR (5)	WFS (6)	WFS (2) - (6)	Outside (1) - (5)
15-19	0.117	0.129	0.106	0.098	0.100	...	...	-14.5
20-24	0.336	0.317	0.278	0.289	0.220	0.201	-36.6	-34.5
25-29	0.340	0.341	0.282	0.273	0.202	0.203	-40.5	-40.6
30-34	0.284	0.308	0.228	0.260	0.159	0.157	-49.0	-44.0
35-39	0.222	...	0.191	0.214	0.120	0.118	...	-46.0
40-44	0.093	...	0.082	...	0.057	0.070	...	-38.7
45-49	0.016	...	0.014	...	0.010	...	...	-37.5
TFR	7.0	7.1 a/	5.9	6.2 a/	4.3	4.3 a/	-39.4	-38.6

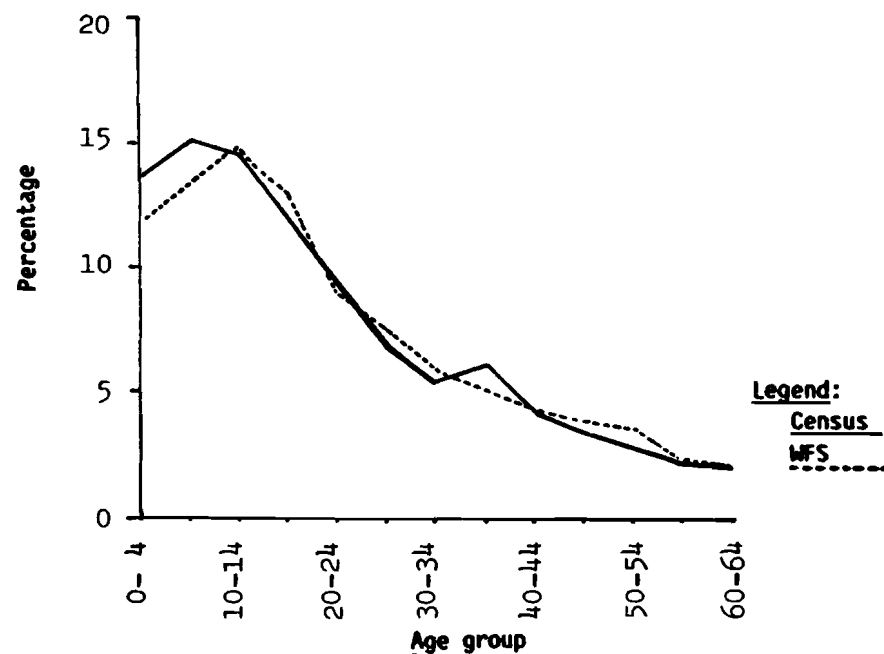
Source: BR: J.M. Guzman, Evaluacion de la historia de embarazos en la Encuesta Nacional de Fecundidad, Costa Rica, 1976 (San José, Centro Latinoamericano de Demografia, 1980), pp. 80 and 81.

a/ For the purpose of calculating a total fertility rate, the age-specific fertility rates from the registration data were used when the age-specific fertility rate from WFS was not available.

**Figure I. Distribution of males and females
as a percentage of the total population
by five-year age groups: Costa Rica**



**Figure II. Distribution of the female
population by five-year age groups:
World Fertility Survey (1976) and
1973 census: Costa Rica**



Source for the census of 1973: Demographic Yearbook, Historical Supplement: Special Issue (United Nations publication, Sales No. E/F.79.XIII.8), table 3.

**Figure III. Distribution of ever-married women aged 15-49
by years since first married: Costa Rica**

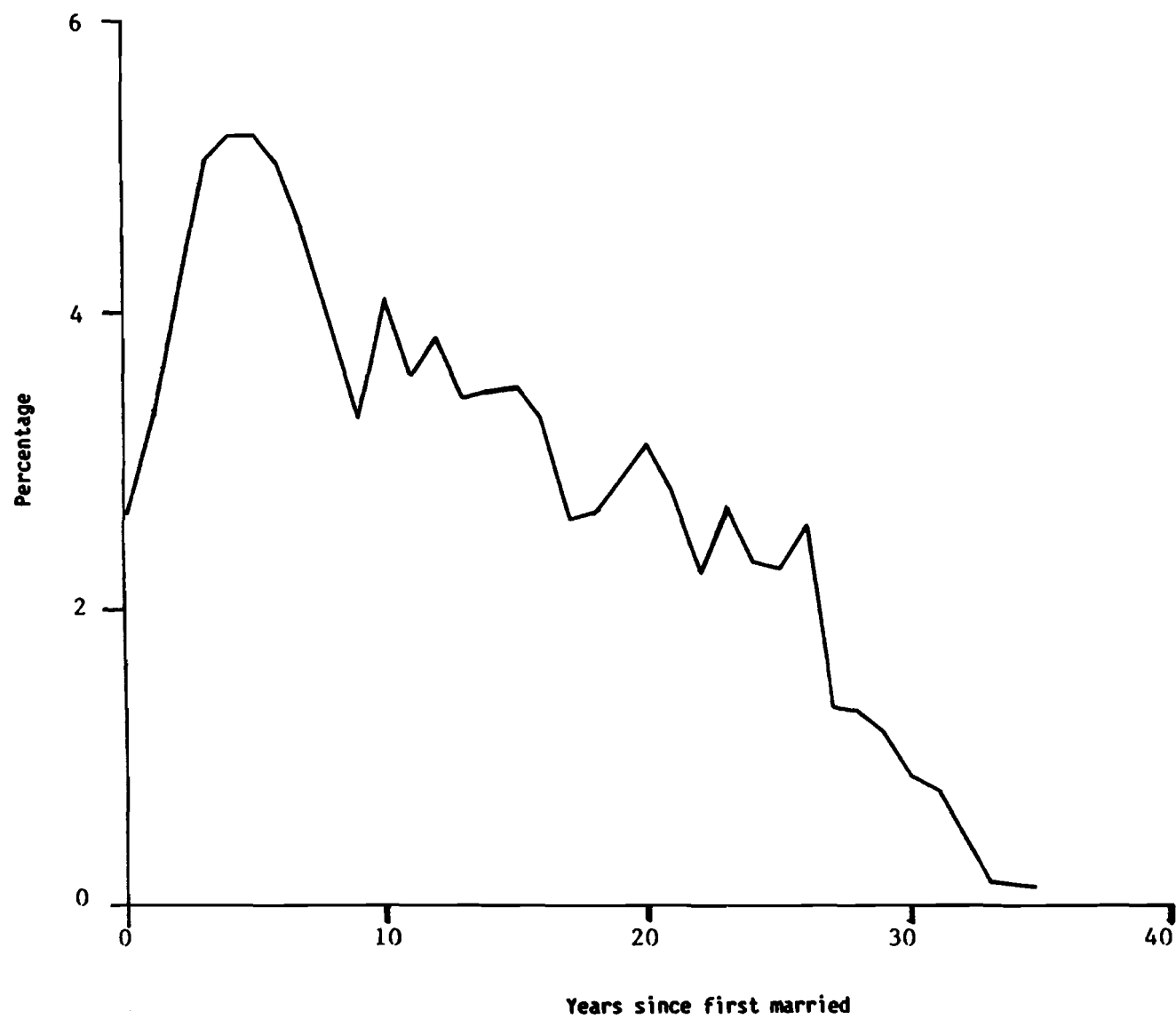
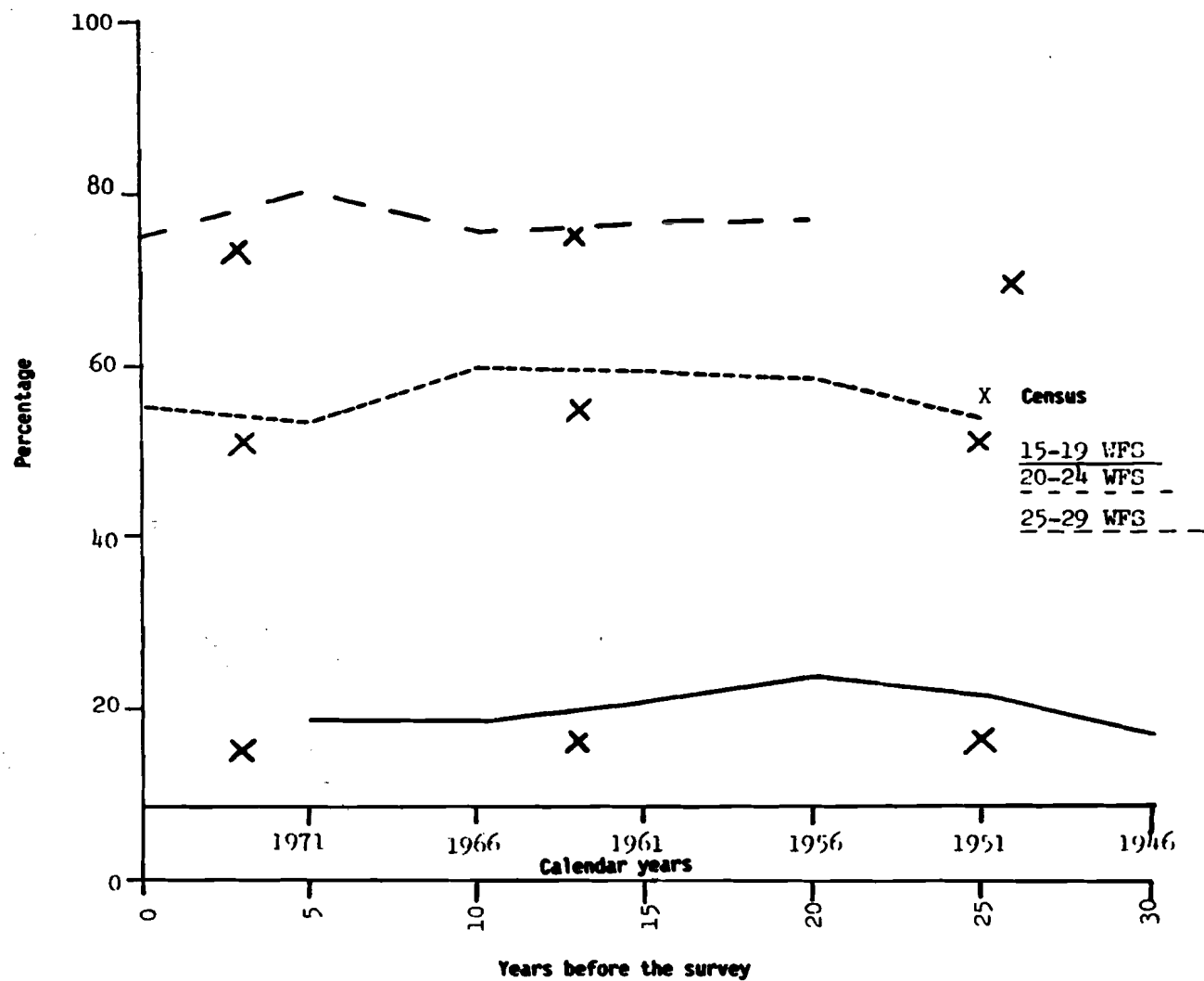
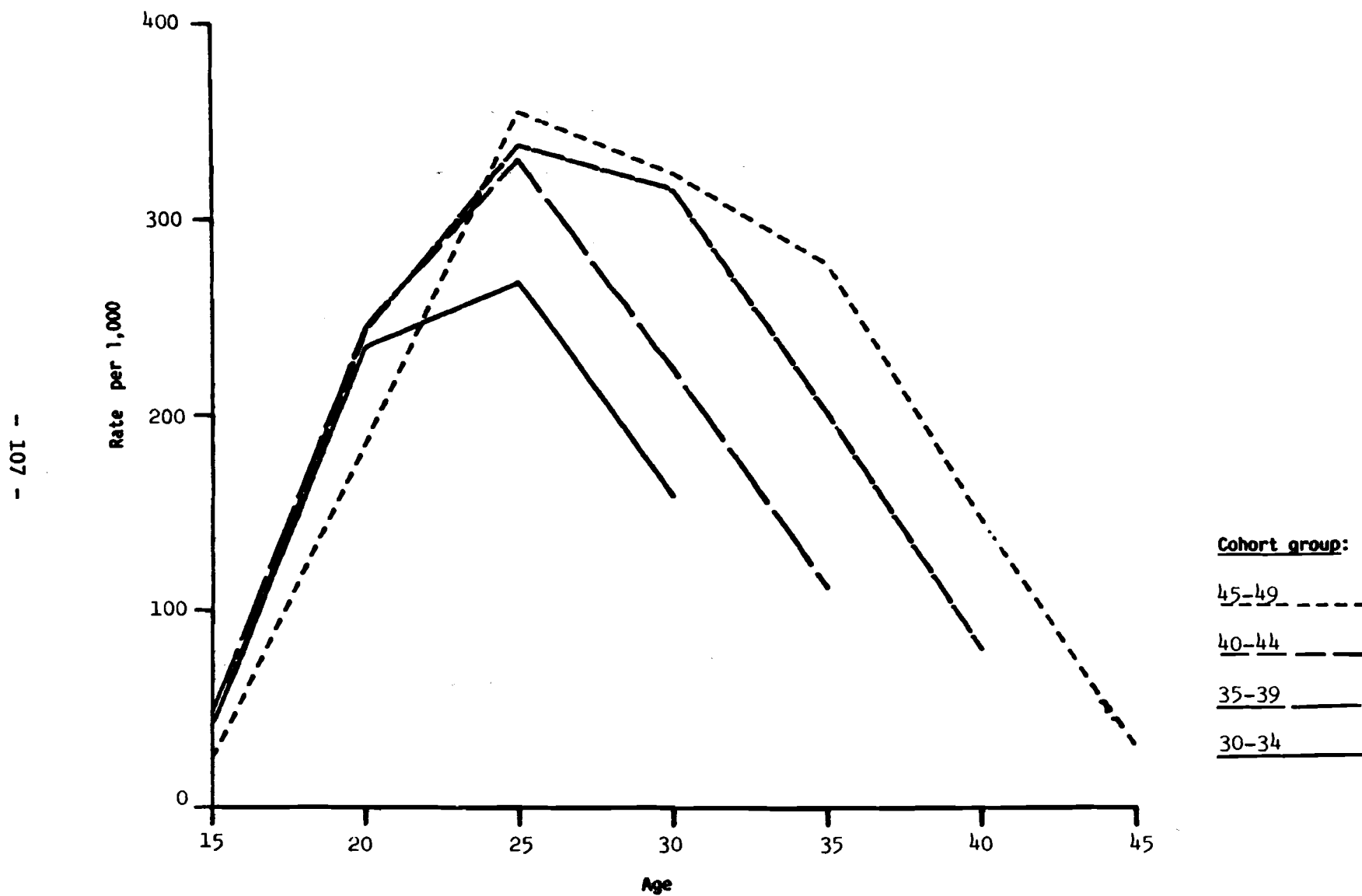


Figure IV. Proportions ever-married at designated periods prior to the survey for selected age groups: World Fertility Survey data and other sources: Costa Rica

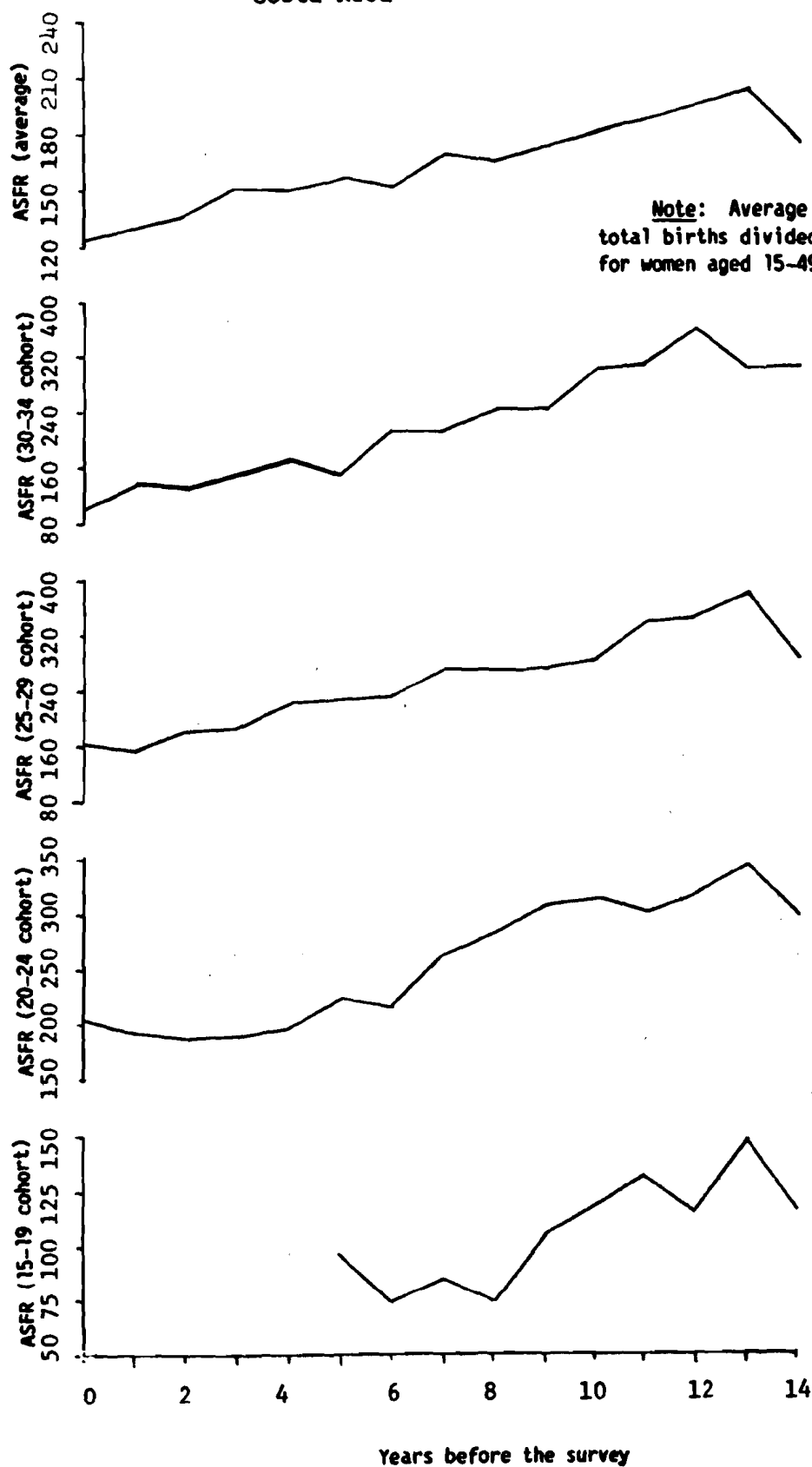


Source: Demographic Yearbook, Historical Supplement: Special Issue (United Nations publication, Sales No. E/P.79.XIII.8),

Figure V. Cohort-period fertility rates for women aged 30-49 at interview:
Costa Rica



**Figure VI. Age-specific fertility rates for selected cohorts and average fertility rate for single years before the survey:
Costa Rica**



COTE D'IVOIRE

The Côte d'Ivoire Fertility Survey (CIFS) was conducted in 1980. A census was conducted in 1975 which recorded a total of 6.7 million people (Direction de la statistique, 1984). Unfortunately, the census did not collect information on any of the fertility measures, such as children ever born. Birth registration in Côte d'Ivoire is quite deficient and therefore data on fertility for comparison with the CIFS are from other surveys. Between 1962 and 1964 a series of regional studies on fertility was undertaken from which national estimates for the 1962-1964 period were obtained. Between 1978 and 1979 a multiround survey (L'enquête démographique à passages répétés (EPR)), which included questions on fertility, mortality and migration, was carried out. A special problem in Côte d'Ivoire is the extent of labour-related migration into the country. About 25 per cent of the enumerated population in Côte d'Ivoire in 1975 were estimated to be in-migrants (Côte D'Ivoire, 1984).

Age distribution

Of all respondents in the individual survey, 20.3 per cent knew the month and year of their birth, 56.5 per cent knew only the year, and the remaining 23.2 per cent responded in terms of completed age at the time of the survey (Chidambaram and Sathar, 1984). Myer's index of digital preference for the household age distribution was 7.1 among females. A preference for digits ending in 0, 2 and 5 and to a lesser extent 6 and 8 was apparent among females. The reporting of ages in the CIFS was an improvement over the 1975 census for which Myer's index among females was 13.4 (Rutstein, 1984).

A comparison of the male and female household age distribution (fig. I) and an examination of sex ratios by age show a marked excess of females aged 15-19 and 20-24 and among older women aged 50-54 and a pronounced deficit among women aged 45-49 years. Among older women, the deficit of women 45-49 years appears to be the result of shifting of women out of the eligible age groups - that is, from 45-49 to 50-54 years. The excess of females aged 20-24 could also be the result of age shifting from the adjacent age groups. A tendency has been observed to over-estimate the age of young girls who have passed puberty, especially if they are married, and this could be the case in Côte d'Ivoire (Coale, 1983). As migrants are a large component of the population in Côte d'Ivoire, the excess of males in ages 30-44 probably reflects the presence of a large number of male migrants.

The female age distribution from the 1975 census is compared with that from the CIFS in figure II. The comparison is not easy, since both distributions appear to have marked fluctuations. Some common features however, are apparent - for one, a deficit of young females aged about 10-14 years. Some of the peaks and troughs seem to parallel each other but are five years later for the CIFS. In the CIFS, as noted in the comparison with the male age distribution, there is an excess of females aged 50-54 years.

Marriage history data

Of the 4,990 ever-married women interviewed, only 12.2 per cent knew the month and year of their first marriage, 79.8 per cent knew only the calendar year, and 8.6 per cent reported in terms of "years ago" or age at marriage (Chidambaram and Sathar, 1984). The distribution of ever-married women by years since their first union (fig. III) does not show any deficit in unions in the recent period prior to the survey. However, a sharp drop in the percentage of unions occurs from 7 to 13 years before the survey.

Data from the marriage histories imply (fig. IV) an increasing proportion married from the past to the most recent period. The increase is not smooth. From the figure, it appears that the 35-39 cohort might have over-stated proportions married while the 25-29 cohort might have under-stated proportions married. Comparison with the 1975 census and the 1978-79 multiphase survey shows higher proportions ever married in the CIFS. It is likely that the CIFS was more successful in covering all marriages, since a special effort was made to make the CIFS definition of marriage more inclusive. The data from the two external sources also show no trend in proportions married over the four-year period, while the CIFS shows an increasing trend over the same period.

Birth history data

The month and year of births was reported for 28.4 per cent of births, while the calendar year only was reported for the remaining 71.6 per cent of births (Chidambaram and Sathar, 1984). The event chart was used to obtain dates. Parity distribution from the ICFS is compared with that obtained from the multiphase survey of 1978-1979 (table 1). The mean number of children ever born from the two sources is remarkably close up to age 39, but among women aged 40 and over, the CIFS recorded higher means. Some omission of births to older women probably occurred in the multiphase survey.

The cohort-period rates from the CIFS for selected periods in the past (table 2 and fig. V) show lower rates among the older cohorts at distant periods in the past. This suggests omission of births or displacement of birth dates towards the survey date for those births that occurred long ago. Comparison of the cumulative fertility of cohorts at periods prior to the survey (table 2, lower panel) shows possible omission of births among the oldest cohorts by a comparison of cumulative fertility of the 45-49 cohort at the end of the 5-9 period before the survey - that is, when those women were aged 40-44 with that of the 40-44 cohort in the recent period - 6.4-6.7 children, respectively. The age pattern of cohort fertility (fig. V) suggests some displacement of the age pattern at the young ages among the oldest cohort. Table 2 also shows that while among the youngest two cohorts, fertility increased in the most recent period, sharp declines were reported for the same period by older cohorts.

Age-specific fertility rates for single years before the survey date (fig. IV) show considerable fluctuations from year to year, especially among women aged 15-19 and 25-29 years in the period 5-14 years before the survey. In the more recent period, however, all age groups show a "trough" in rates in the period 1-2 years before the survey, with pronounced heaping at 0 and 3

years before the survey. Overall, the average rates are fairly constant in the more distant period, increasing slightly towards the more recent period where pronounced heaping at 3 and 0 years increase the rates even more.

Rates derived from the CIFS birth history are compared with those obtained from an external source - the EPR of 1978-1979 - in table 3. Although the EPR rates have been adjusted using the Brass method with data on births in the past 12 months, the CIFS rates for the same period are somewhat higher, especially among older women. In figure VI it was noted that the rates in the most recent period from the CIFS was somewhat high; on the other hand, the parity distribution from the EPR showed some omission of births, especially among older women. It is therefore most likely that the true rates lie between those estimated by the EPR and the CIFS. In a detailed evaluation of the birth history data, Sombo (1985) concluded that date misreporting probably accounted for the observed increase in fertility in the recent period and that fertility probably did not vary over the past 5-10 years.

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Table 1. Children ever born per woman
from CIFS, 1980-1981 and the
multiphase survey of 1978-1979:
Cote d'Ivoire

Age group	Multiphase survey 1978-1979	CIFS 1980-1981
15-19	0.6	0.5
20-24	1.9	1.9
25-29	3.4	3.3
30-34	4.7	4.7
35-39	5.7	5.9
40-44	6.0	6.7
45-49	6.1	6.9

Sources: Survey: Cote d'Ivoire
"Enquete demographique a passages repetes,
1978-1979", Direction de la statistique
(no date); CIFS: S.Singh, "Birth histories",
WFS Comparative Studies, Cross National Summaries:
Additional Tables (Voorburg, Netherlands, ISI/WFS,
1984).

Table 2. Cohort period rates and cumulative cohort
fertility by age at survey: Ivory Coast

Age group of cohort at end of period	Number of women in cohort	Years prior to survey						
		0-4	5-9	10-14	15-19	20-24	25-29	30-34
Cohort-period fertility rates								
10-14	0	0.000	0.002	0.002	0.003	0.002	0.002	0.000
15-19	1 321	0.100	0.095	0.078	0.085	0.072	0.070	0.060
20-24	1 255	0.285	0.271	0.265	0.257	0.238	0.223	
25-29	962	0.315	0.320	0.316	0.309	0.291		
30-34	747	0.276	0.306	0.295	0.272			
35-39	587	0.221	0.264	0.249				
40-44	493	0.170	0.185					
45-49	329	0.091						
Cumulative fertility of cohorts at end of period								
10-14		0.000	0.008	0.010	0.016	0.008	0.009	0.002
15-19		0.506	0.485	0.406	0.434	0.366	0.351	0.301
20-24		1.910	1.762	1.758	1.651	1.542	1.416	
25-29		3.338	3.360	3.230	3.087	2.872		
30-34		4.742	4.761	4.560	4.231			
35-39		5.865	5.878	5.474				
40-44		6.726	6.401					
45-49		6.857						

Source: S. Singh, "Birth histories", WFS Comparative Studies,
Cross-national Summaries: Additional Tables (Voorburg, Netherlands,
ISI/WFS, 1984).

Table 3. Age-specific fertility rates for selected periods from CIFS and EPR (1978-1979): Cote d'Ivoire

Age group	EPR 1978-1979	CIFS 1977-1980
15-19	0.217	0.215
20-24	0.297	0.304
25-29	0.287	0.296
30-34	0.241	0.243
35-39	0.176	0.203
40-44	0.091	0.134
45-49	0.041	0.070
TFR	6.8	7.3

Source: Cote d'Ivoire "Enquete demographique a passages repetes 1978-1979", Direction de la statistique (Abidjan, no date), table 4.3, Adjusted rates from births in the previous 12 months.

Figure I. Distribution of males and females as a percentage of the total population by five-year age groups: Côte d'Ivoire

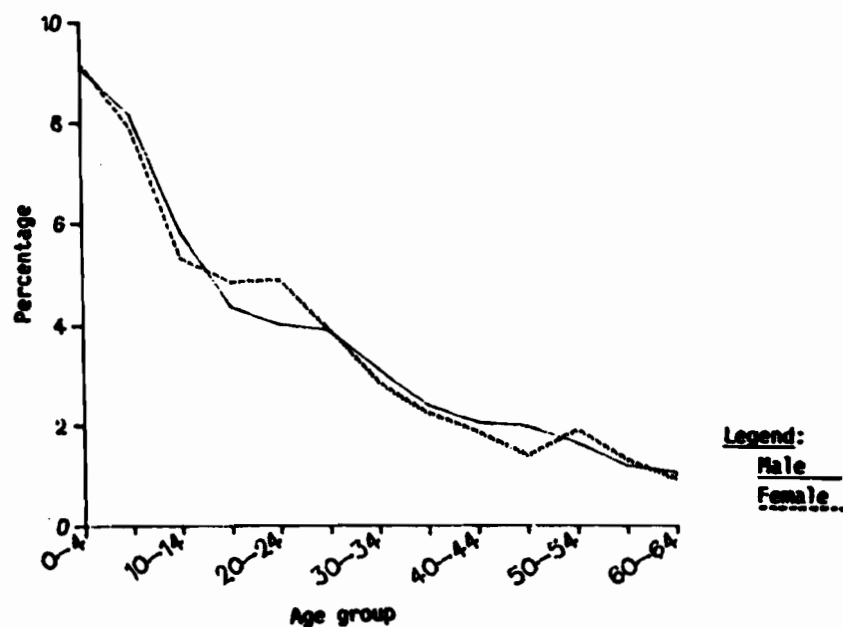
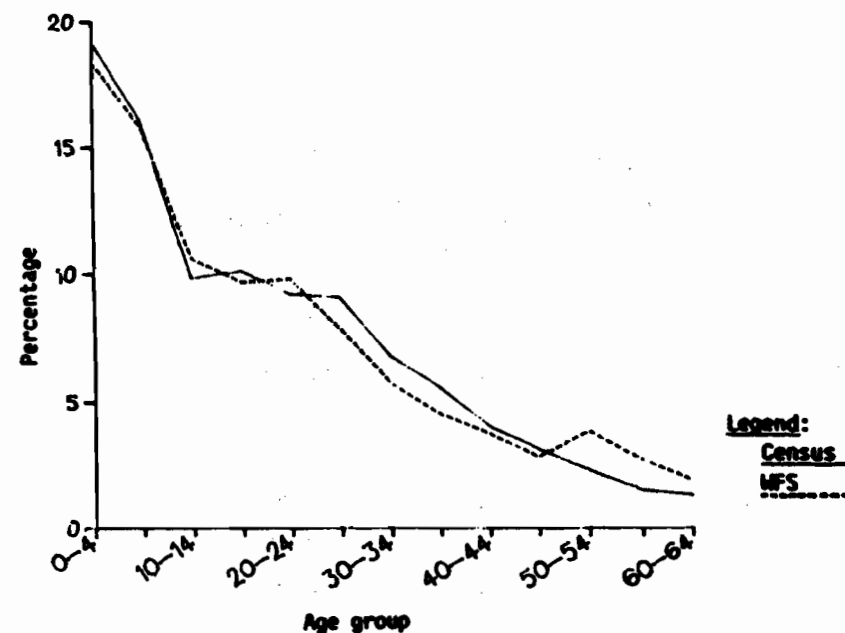


Figure II. Distribution of the female population by five-year age groups: World Fertility Survey (1980) and 1975 census: Côte d'Ivoire



Source: for the male and female distribution, from the 1980 World Fertility Survey: Enquête Ivoirienne sur la Fécondité, 1980-1981, Rapport principal, vol. I (Ministère de l'économie et des finances, Direction de la statistique, Abidjan, 1984), p. 47, table 3.5; for the 1975 census: E. Ahonzo, B. Barrere, P. Kopylov, "Population de la Côte d'Ivoire: analyse des données démographiques disponibles" (Direction de la statistique, Abidjan, 1984), p. 298, annexe 1.

Figure III. Distribution of ever-married women aged 15-49
by years since first married: Côte d'Ivoire

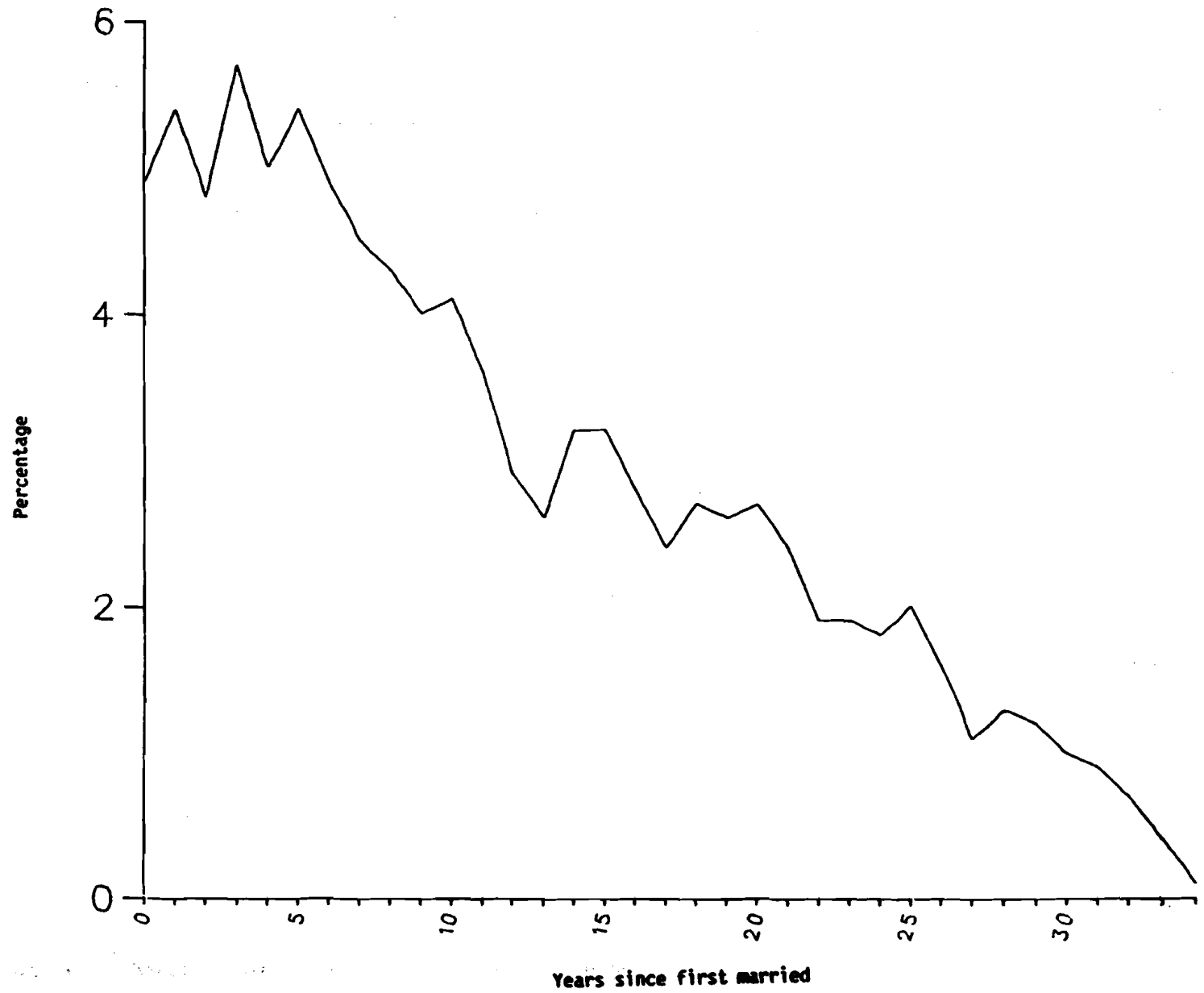
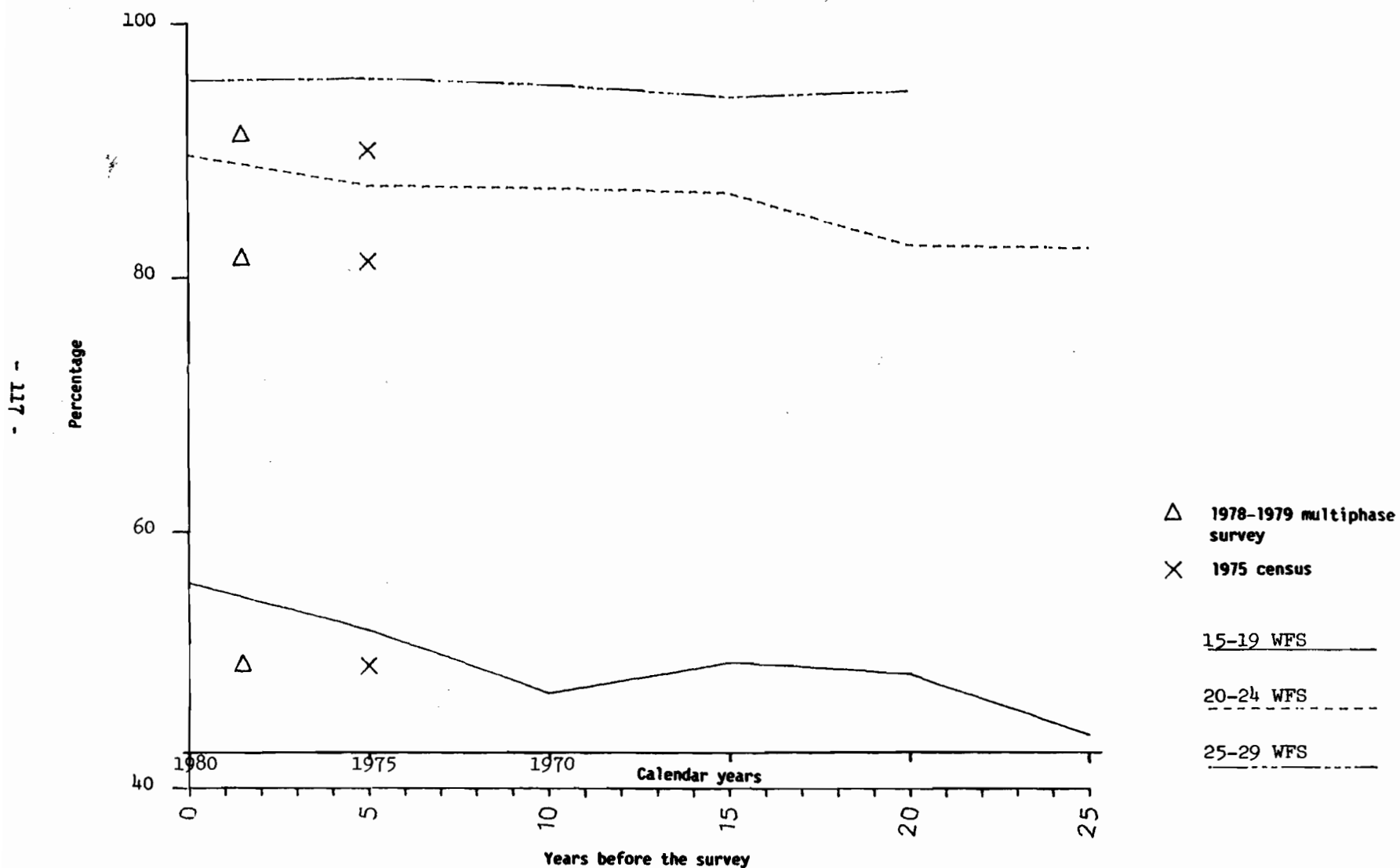
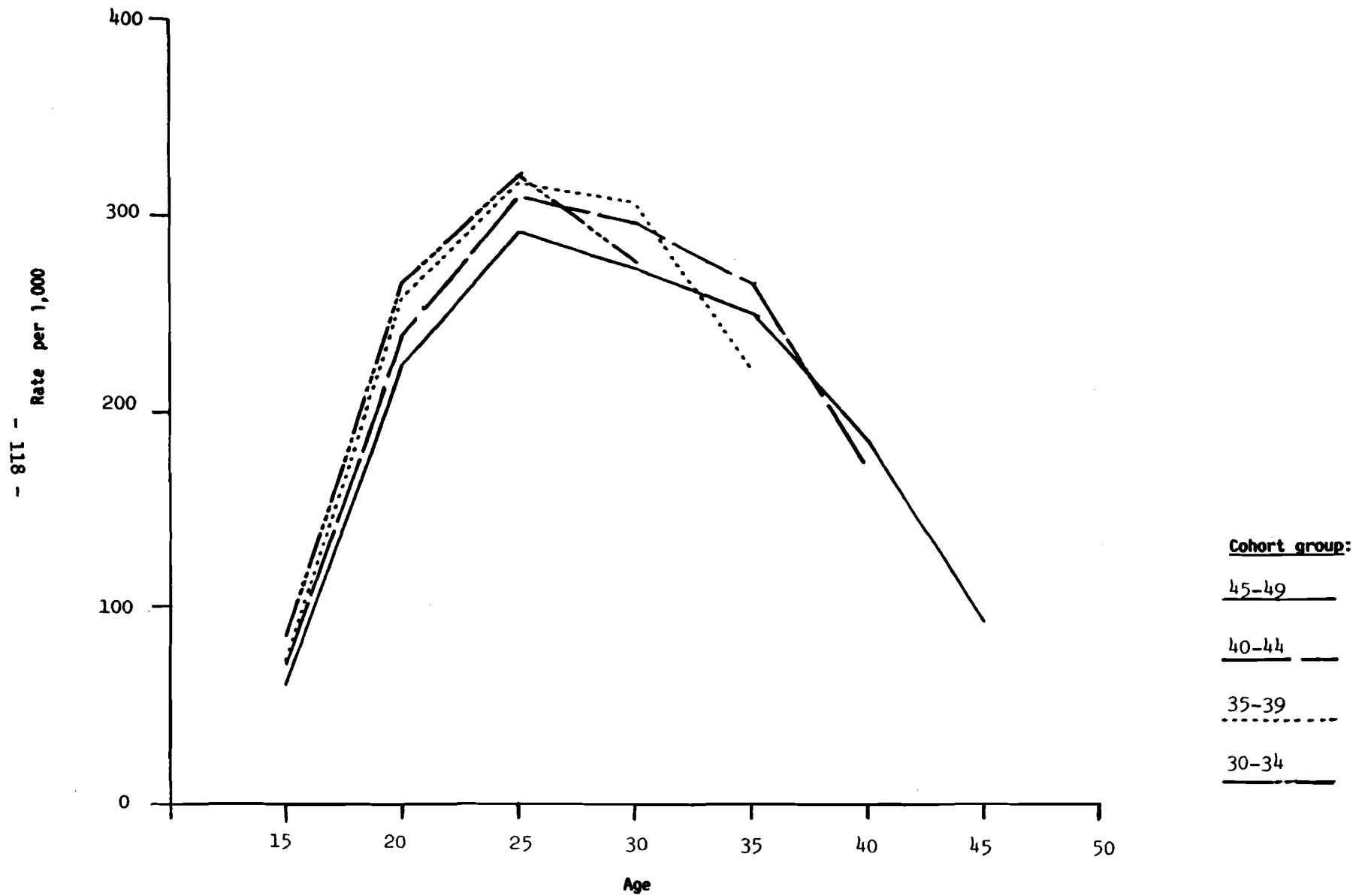


Figure IV. Proportions ever-married at designated periods prior to the survey
for selected age groups: Côte d'Ivoire

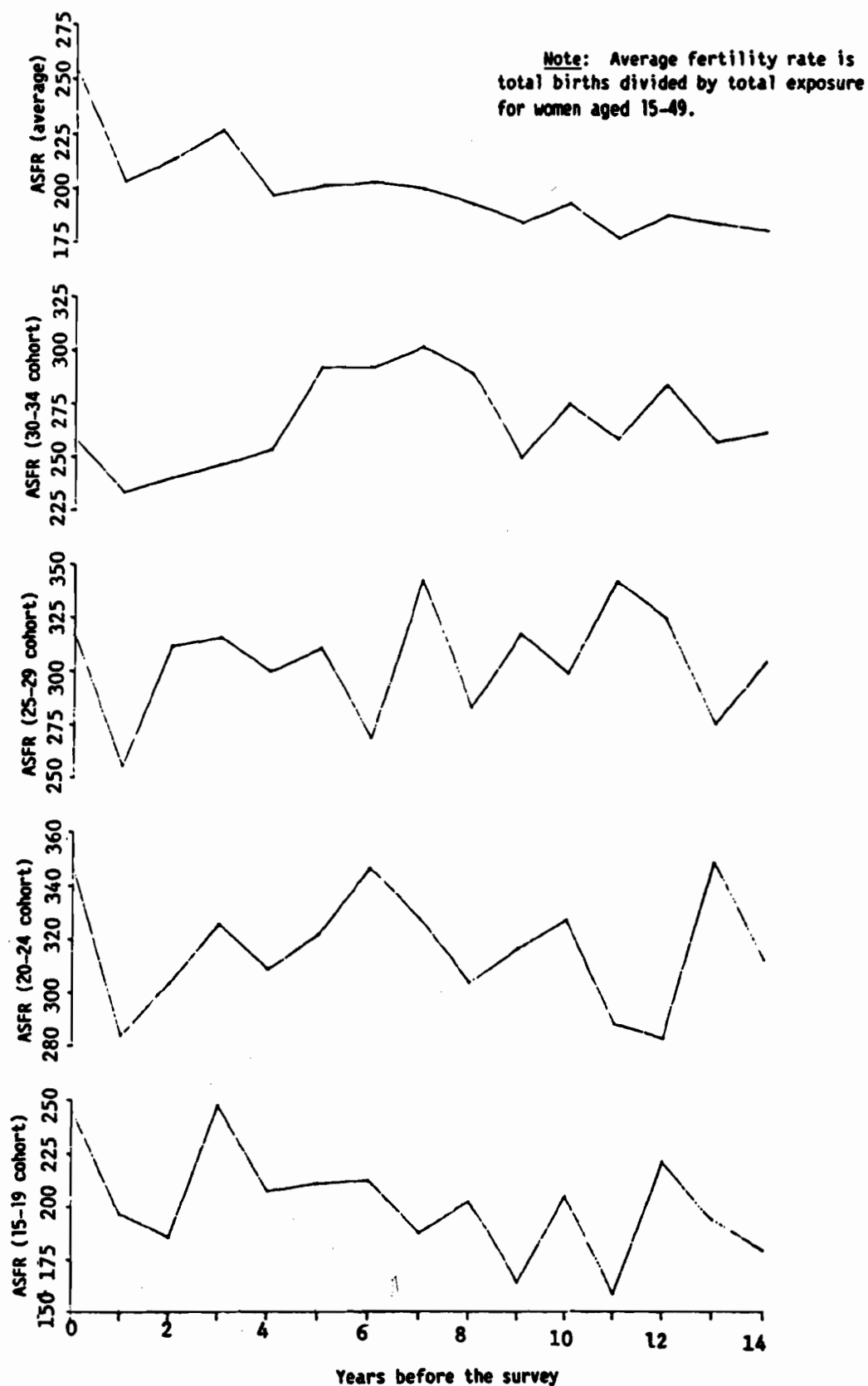


Source: *Enquête Ivoirienne sur la Fécondité, 1980-1981, Rapport principal*, vol. I (Ministère de l'économie et des finances, Direction de la statistique, Abidjan, 1984), p. 70, table 4.3.

Figure V. Cohort-period fertility rates for women aged 30-49 at interview:
Côte d'Ivoire



**Figure VI. Age-specific fertility rates for selected cohorts and average fertility rate for single years before the survey:
Côte d'Ivoire**



DOMINICAN REPUBLIC

The Dominican Republic was the first Latin American country to participate in the World Fertility Survey. The field work for the Dominican Republic Survey (ENFDR), which took place between April and July 1975 provides an important new source of data on fertility levels and trends. Census data from 1950, 1960 and 1970 are available, and the extent of omissions in the birth registration data has been roughly estimated at 25 per cent (Guzmán, 1980). In 1979, the National Council on Population and Family (CONAPOFA) decided to undertake a second national fertility survey based on their 1975 WFS experience. That assessment of the quality of the 1975 ENFDR data will take advantage of the later data to gain some insights into observed patterns in the 1975 birth history data.

Age data

In the individual questionnaire, 14.1 per cent of respondents did not report the month of birth; about 86 per cent reported their date of birth with complete month and year (Chidambaram and Sathar, 1984). There is a strong digit preference for ages ending with 0 or 5 or, to a lesser extent, 8. Myer's index, although not as high as in the 1970 census, remains at the relatively high level of 8.5 (Rutstein, 1984).

When the male and female age distributions by five-year groups from the ENFDR are compared (see fig. I), it is clear that the percentage of females reported 35-39 is too high. In figure II, the female age distribution is compared with the 1970 census, which suggests that women aged 30-34 and 40-44 have been shifted to the 35-39 age group. Despite some improvement in age reporting from the household to the individual questionnaire,^{1/} the over-reporting of women aged 35-39 represents a potentially serious distortion of the data.^{2/}

Marriage history data

Marriage history is based on a very small sample of 2,257 ever-married women. Of all the ever-married women interviewed, 73 per cent reported both the month and year of their first union (Chidambaram and Sathar, 1984). Ninety-three per cent of women reported their marital status consistently in both the household and individual questionnaires. A comparison of the marital status distribution in the household and individual questionnaires gives no evidence of bias in the selection of women for the individual interview. The distribution of ever-married women by years since first marriage is very erratic, with clear preference for even digits except for five years before the survey (see fig. III).

In order to compare the marital status distribution with the 1970 census, the marriage history data has been used to calculate the marital status distribution from ENFDR at the time of the census. Not surprisingly, the percentage of non-single women is higher in ENFDR for two reasons: the census included as single all women separated from consensual unions; and non-legal unions were under-counted.

An examination of the percentage of women ever in union for years before the survey suggests some trend in the proportions ever-married, particularly among the 15-19 group (see fig. IV). Trends have been distorted due to a slight exaggeration of the proportion ever in union for the 35-39 cohort throughout their marriage history. There is also some suggestion of misdating of first union among the oldest cohort whose proportions married by each age are lower than those of the adjacent cohort. A comparison of those trends with census data confirms modest declines, although the census proportions are always much lower, as noted above.

Birth history data

Only 9 per cent of all births required a month imputation (Chidambaram and Sathar, 1984). In a comparison of reported parity by age for five years before the survey and the 1970 census (see table 1), there is evidence of 5-8 per cent higher parity levels from the survey, which might be the result of more complete enumeration. However, the parity of 30-34-year-olds estimated from the ENFDR survey for 1970 was 15 per cent higher than parity recorded for that cohort in the 1970 census, suggesting that fertility for the cohort aged 35-39 at the time of the survey was probably over-estimated.

An examination of cohort fertility rates by five-year periods before the survey can be used for evidence of possible omissions and displacements of events which would affect the interpretation of fertility trends (see table 2). The parity of 45-49-year-old women five years ago (when those women were 40-44) is lower than that of women aged 40-44 at the survey, suggesting that omission of births among older women is a problem. There is also evidence throughout the birth history that the fertility of the 35-39 cohort has been exaggerated. In all but the earliest periods, their fertility is higher than that of women at similar ages in the years immediately before and after. This may cause the recent decline in fertility recorded for the 30-34 and 25-29 year-old women to be exaggerated. In addition, the birth history appears to suggest the displacement of early births towards the survey date with the 45-49 cohort showing an older age-specific fertility schedule than the 40-44 cohort (see fig. V).

These two factors suggest the possibility that fertility in the 10-14-year period may be exaggerated and the trend overestimated. If cohort fertility rates are compared for 10-14 and 15-19 years before the survey, there appears to have been an increase in fertility, possibly due to a displacement of earlier births towards the survey (Guzmán, 1980). Additional evidence available from the 1980 follow-up survey provides some support for the view that there was a fertility peak in 1960-1964 (Hobcraft and Rodriguez, 1982). Both surveys show the peak occurring at the same point in the past, whereas a pattern of date displacement would be expected to show a peak occurring five years later for the 1979 survey. The level of fertility for the period 1960-1964 appears roughly similar between the two surveys (table 3). However, the 1980 data show higher fertility in 1970-1974, suggesting that the recent trends as estimated from the first survey may be exaggerated. Both surveys, however, do show recent fertility declines.

An examination in figure VI of age-specific fertility rates for single years shows no strong evidence of displacement of recent births from the 0-4 to 5-9 years before the survey.

Notes

1/ When the household and individual data were matched, it was found that nearly 20 per cent of women aged 40-44 in the individual questionnaire were reported as being 35-39 in the household questionnaire.

2/ This misreporting of the 35-39 age group appears to be due to two factors: a reluctance to report being over 40, and a tendency on the part of the interviewer to over-estimate the age of high-parity women aged 30-34. See Guzmán (1980).

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Table 1. Children ever born per woman
from WFS and the 1970 census:
Dominican Republic

Age group	Census 1970	WFS 1970	WFS 1975
15-19	0.2	0.3	0.2
20-24	1.6	1.7	1.3
25-29	3.3	3.4	3.0
30-34	4.6	5.3	4.6
35-39	5.6	6.1	6.3
40-44	5.8	6.3	6.4
45-49	6.0	..	6.5

Source: J.M. Guzman, "Evaluation of the Dominican Republic National Fertility Survey, 1975", *Scientific Reports*, No. 14 (Voorburg, Netherlands, ISI/WFS, 1980), p. 31.

Table 2. Cohort period rates and cumulative cohort fertility
by age at survey: Dominican Republic, 1975

Age group of cohort at end of period	Number of women in cohort	Years prior to survey						
		0-4	5-9	10-14	15-19	20-24	25-29	30-34
Cohort-period fertility rates								
10-14	0	0.000	0.001	0.002	0.002	0.004	0.003	0.004
15-19	833	0.042	0.051	0.078	0.066	0.080	0.089	0.068
20-24	659	0.215	0.251	0.271	0.271	0.245	0.228	
25-29	465	0.277	0.332	0.388	0.313	0.299		
30-34	331	0.251	0.319	0.299	0.287			
35-39	354	0.209	0.226	0.252				
40-44	240	0.110	0.142					
45-49	233	0.028						
Cumulative fertility of cohorts at end of period								
10-14		0.000	0.004	0.012	0.011	0.018	0.017	0.021
15-19		0.212	0.267	0.402	0.350	0.418	0.467	0.348
20-24		1.343	1.658	1.704	1.771	1.692	1.489	
25-29		3.045	3.366	3.709	3.254	2.983		
30-34		4.622	5.302	4.750	4.416			
35-39		6.347	5.879	5.678				
40-44		6.429	6.391					
45-49		6.532						

Source: WFS standard recode tapes.

Table 3. Cohort-period rates from the 1980 and the 1975 National Fertility Surveys: Dominican Republic

Age group	1960-1964		1965-1969		1970-1974		Percentage change	
	1975 (1)	1980 (2)	1975 (3)	1980 (4)	1975 (5)	1980 (6)	1975 (1) - (5)	1980 (2) - (6)
15-19	0.007	0.007	0.006	0.007	0.004	0.005	42.9	28.6
20-24	0.027	0.028	0.026	0.025	0.021	0.023	22.2	19.9
25-29	0.039	0.034	0.034	0.034	0.028	0.029	28.2	14.7
30-34	0.029	0.033	0.033	0.030	0.026	0.026	10.3	21.1
35-39	0.024	..	0.024	0.024	0.020	0.022	16.7	..
40-44	..	..	0.014	..	0.010	0.011	..	..
45-49	..	..	..	..	0.002	..	..	..
TFR	6.3 a/	6.3 a/	6.8 b/	6.7 b/	5.6	5.9 c/	21.4 d/	16.7 d/

Source: Census: J. Hobcraft and G. Rodriguez, "The analysis of repeat fertility survey: examples from the Dominican Republic", *Scientific Reports*, No. 29 (Voorburg, Netherlands, ISI/WFS, 1982).

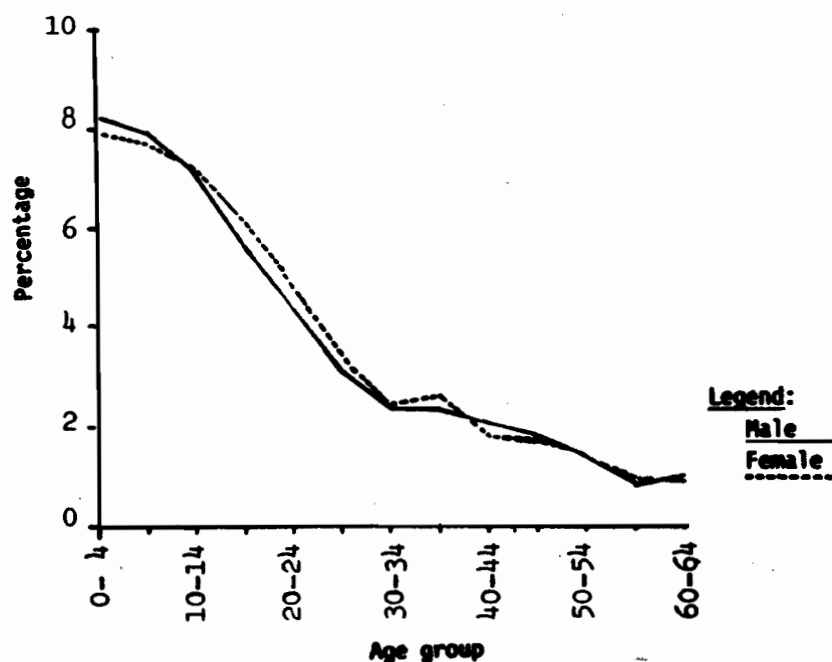
a/ Total cohort-period rate was calculated up to age group 35-39 only. The age specific cohort-period rate for 1975 was used when the rate for 1980 was not available.

b/ Total cohort-period rate was calculated up to age group 40-44 only. The age specific cohort-period rate for 1975 was used when the rate for 1980 was not available.

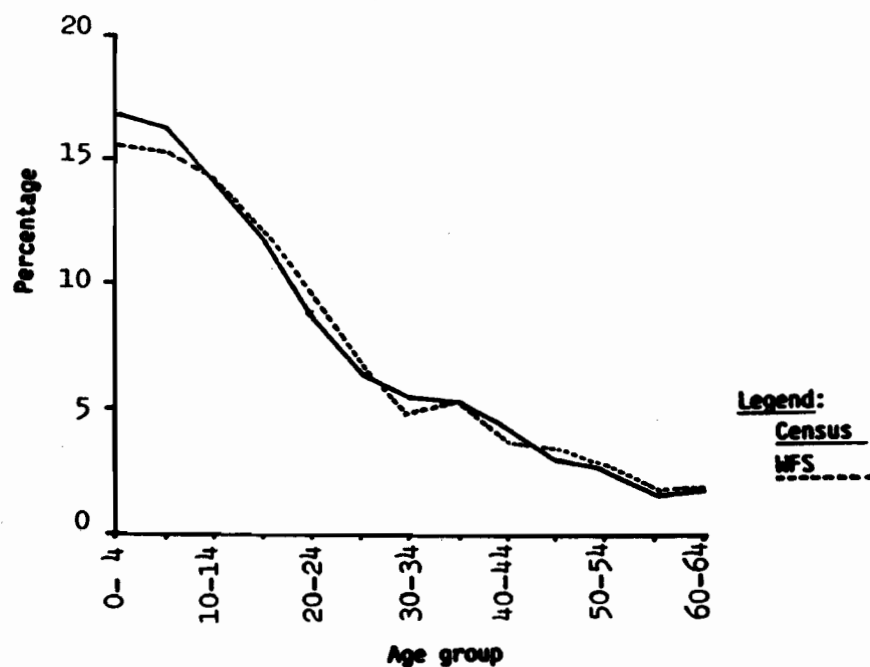
c/ The age-specific cohort-period rate for 1975 was used when the rate for 1980 was not available.

d/ Percentage change in total cohort-period rates refers to age groups up to 35-39 only.

**Figure I. Distribution of males and females
as a percentage of the total population
by five-year age groups: Dominican Republic**



**Figure II. Distribution of the female
population by five-year age groups:
World Fertility Survey (1976) and
1970 census: Dominican Republic**



Source for the 1970 census: Demographic Yearbook, Historical Supplement: Special Issue (United Nations publication, Sales No. E/P.79.XIII:8), table 3.

**Figure III. Distribution of ever-married women aged 15-49
by years since first married: Dominican Republic**

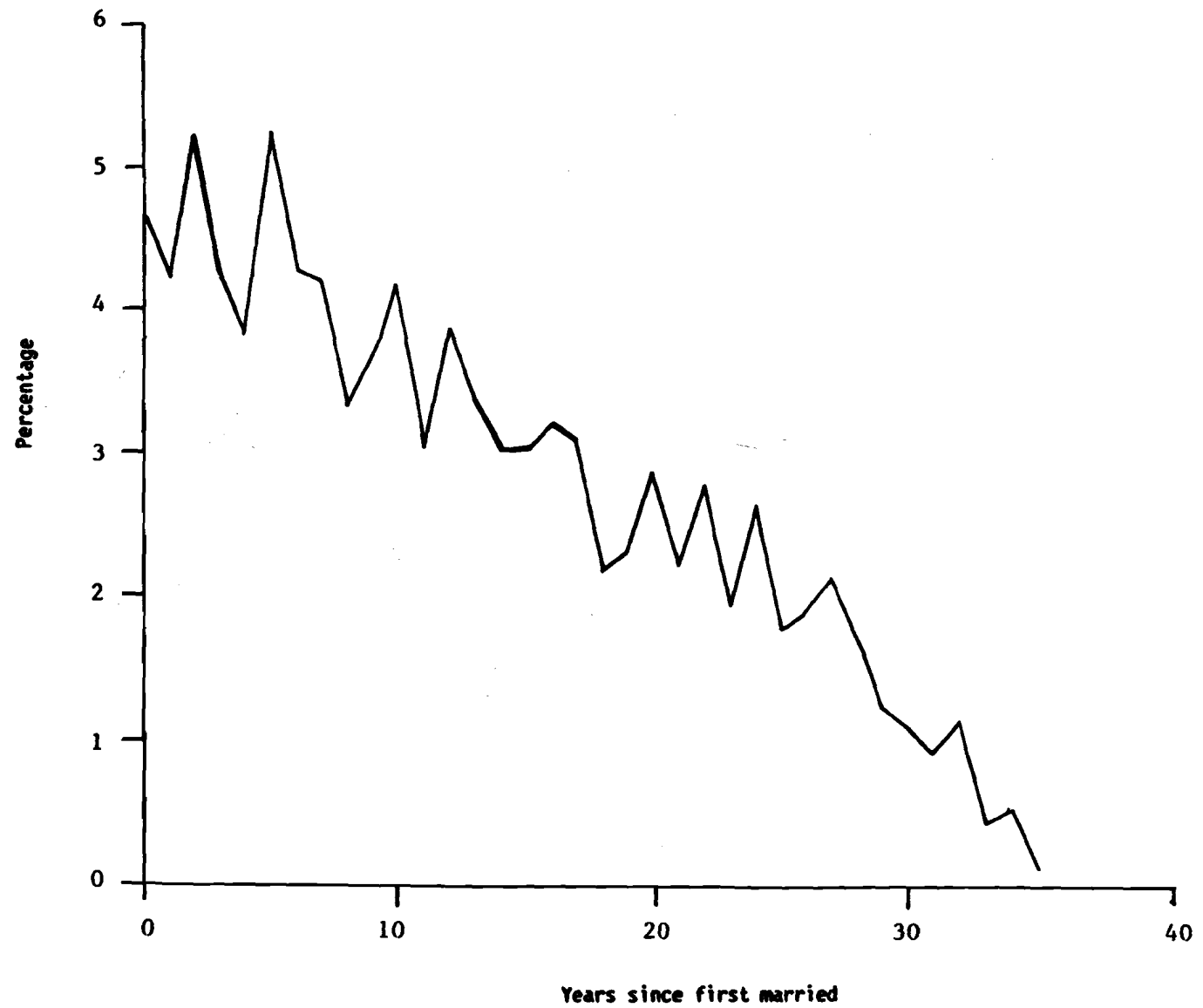
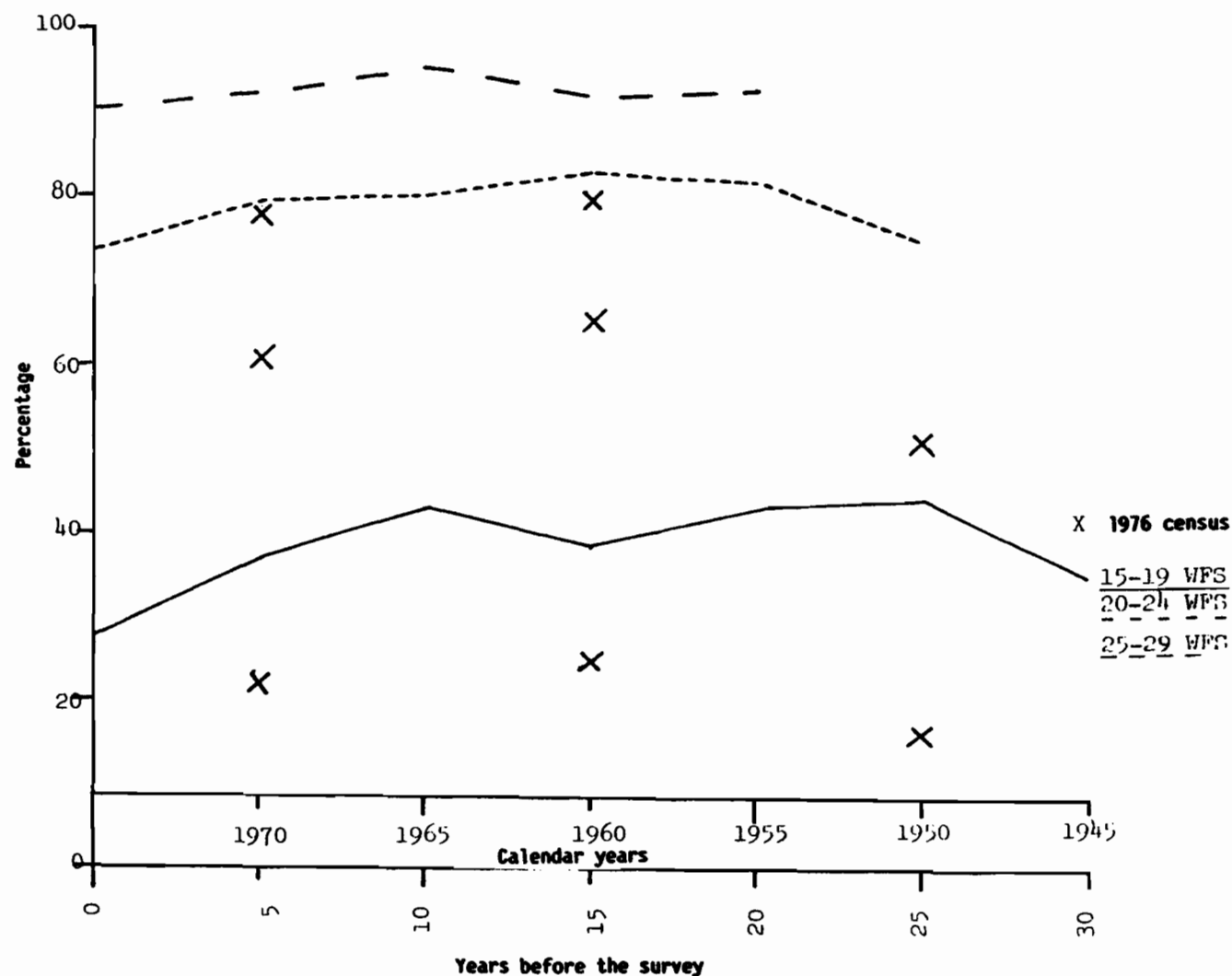
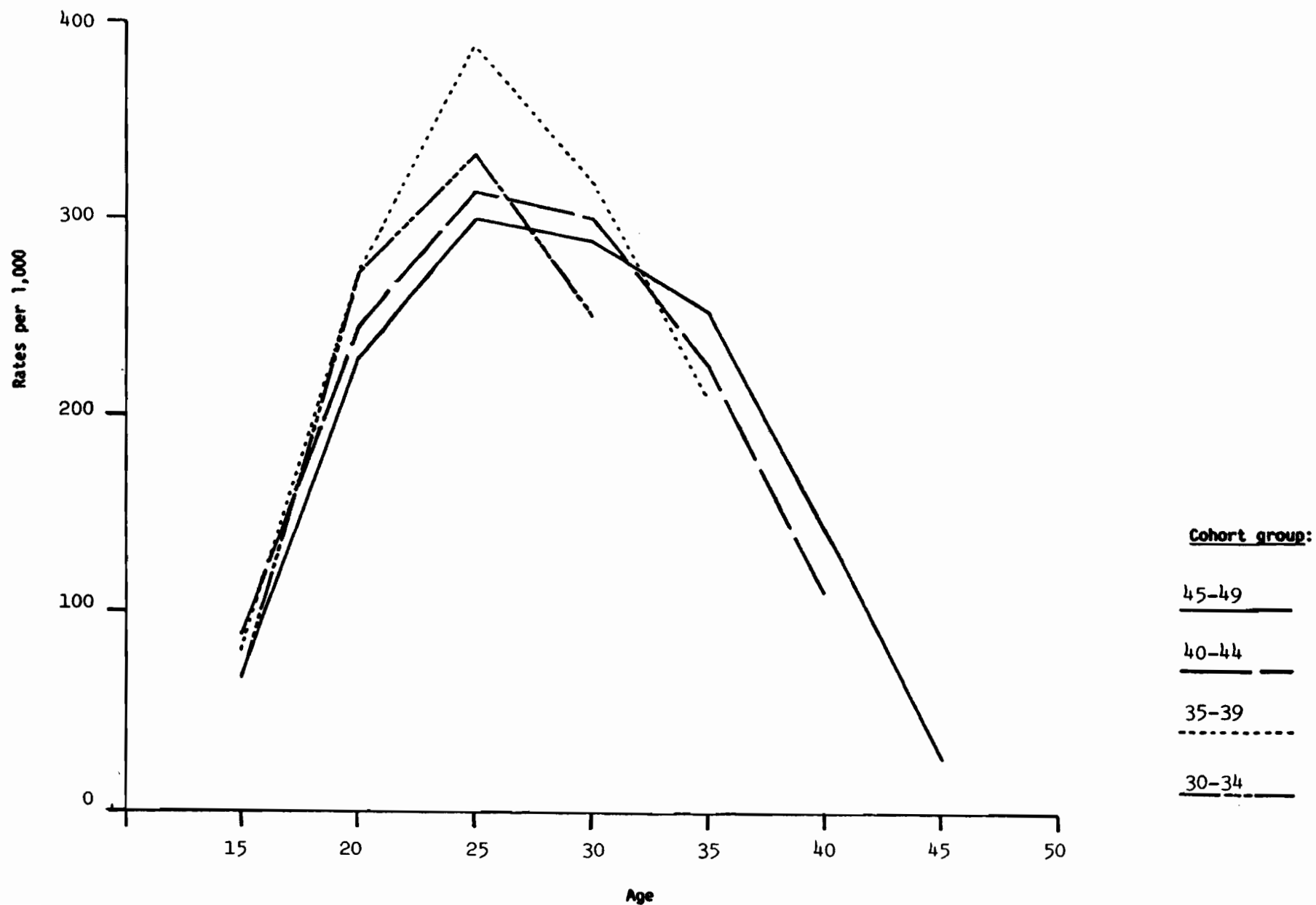


Figure IV. Proportions ever-married at designated periods prior to the survey for selected age groups: World Fertility Survey data and other sources: Dominican Republic

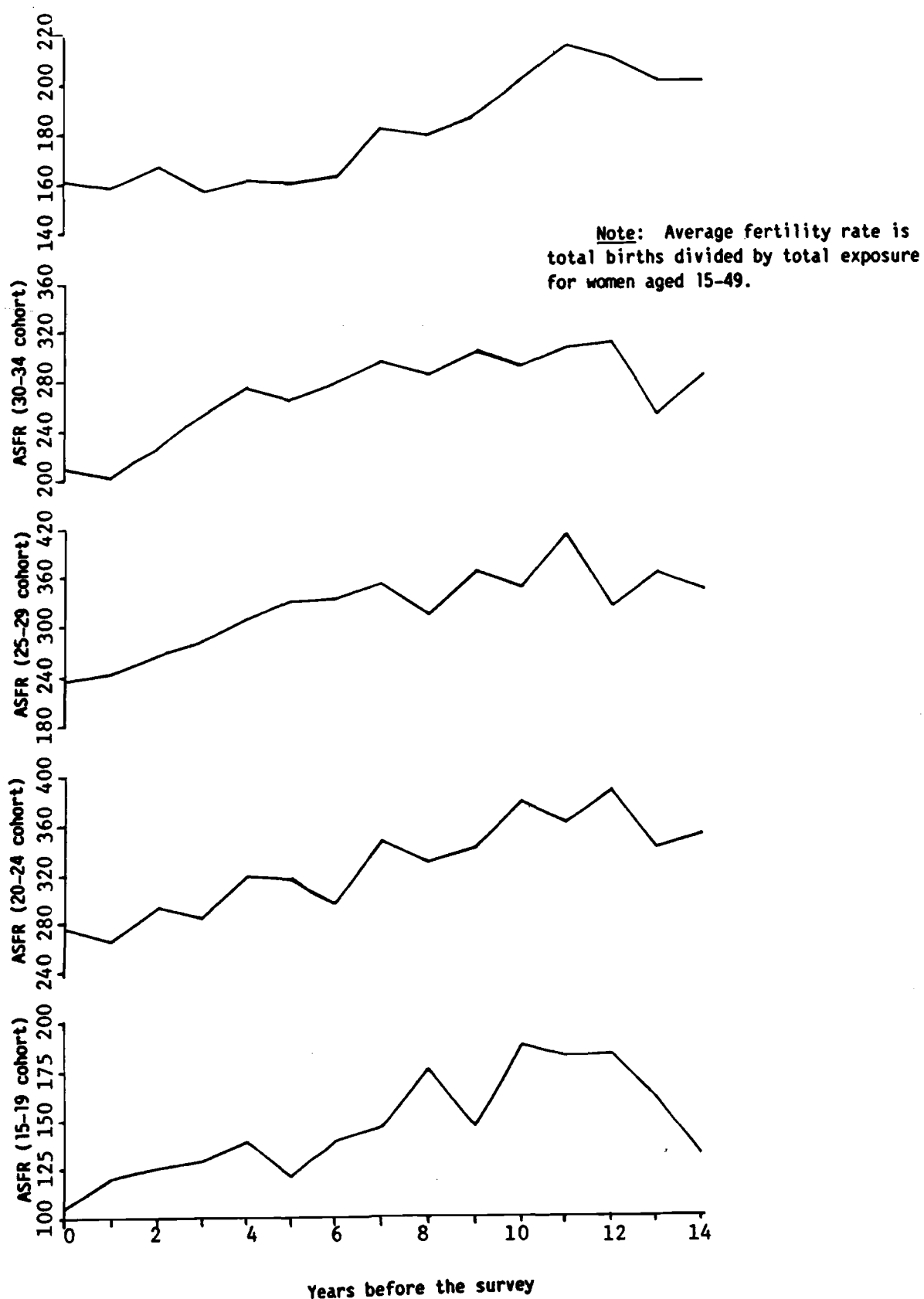


Source: Demographic Yearbook, Historical Supplement: Special Issue
(United Nations publication, Sales No. E/P.79.XIII.8), table 12.

**Figure V. Cohort-period fertility rates for women aged 30-49 at interview:
Dominican Republic**



**Figure VI. Age-specific fertility rates for selected cohorts and average fertility rate for single years before the survey:
Dominican Republic**



ECUADOR

The Ecuador Fertility Survey (Encuesta Nacional de Fecundidad Ecuador - ENF) was conducted between July and December 1979. Censuses taken in 1962 and 1974 provide some data for comparison with the ENF. Ecuador has a vital registration system which, unfortunately, is incomplete and therefore cannot be used as a check on the estimates from the ENF. After the ENF, in 1982 a contraceptive prevalence survey called the Encuesta Nacional de Salud Materno Infantil y Variables Demográficas (ESMIVD) was conducted, followed by the 1983 census. Data from those two sources are available for some of the comparisons.

Age data

Nearly all (99.9 per cent) of the women interviewed in the individual survey knew the month and year of their birth (Chidambaram and Sathar, 1984). An examination of the single-year female household age distributions shows preference for digits ending in 0-5 (Instituto Nacional de Estadística y Censos, 1984). Myer's index of digital preference among females was 6.0 (Rutstein, 1984), which is a slight improvement over that for the 1974 census, which was 7.4 (Ines Herrera de Rivadeneira, 1984). A comparison of the male and female age distribution from the household data (fig. I) shows a slight excess of both sexes in the age group 50-54 years but, otherwise, the distributions appear smooth. Comparison with the 1974 census female age distribution (fig. II) shows very little difference between the two except at age group 50-54 years where the ENF distribution shows some evidence of heaping. This is most likely caused by the shifting of women out of eligible age groups in order to avoid the individual interview.

Marriage history data

Of all the ever-married women interviewed, 67 per cent knew both the year and month of their first union (Chidambaram and Sathar, 1984). The distribution of ever-married women by years since their first union (fig. II) is rather irregular from one year to the next but shows an overall increase in number of unions from the past to the present. In the 0 and 1 year periods before the survey, however, there appears to be a marked deficit of unions.

A comparison of nuptiality data from the household and individual questionnaire showed remarkable consistency at all ages (Ines Herrera de Rivadeneira, 1984). The marital status distribution for periods in the past was estimated from the marriage history of the ENF (fig. IV). The data show a slight decline in proportions married among 15-19- and 20-24-year olds with an acceleration of the decline in the most recent period. Marital status distributions from the 1962, 1974 and 1982 censuses and the ESMIVD of 1982, if all taken as correct, do not show any decline in the proportions married over the period from 1962 to 1982. The proportion married from the 1962 and 1974 censuses are considerably lower than that from the ENF marriage history. It is possible that those censuses did not capture all of the unions women were in. Data for the most recent period, however, compare well with those from external sources.

Birth history data

Seventy-eight per cent of all births to women were reported with both the month and year of birth (Chidambaram and Sathar, 1984). Parity distributions from the ENF and the 1974 census and the 1982 ESMIVD are shown in table 1. The distribution from all sources, including the 1974 ENF distribution reconstructed from the ENF birth history, are very similar, showing no change from 1974 to 1982.

An examination of the cohort-period rates for five-year periods prior to the survey (table 2) and of the cohort age patterns of fertility (fig. V) shows some omission or misplacement of birth dates among the oldest cohort for the periods more than 20 years before the survey. Among the other cohorts, however, there is no evidence of omissions or date misplacement. An examination of mean parity, by single years of age, showed a deficit from age 47 on, which might have been caused either by omissions or by a selective age misreporting that transferred high parity women to ages 50 or more (Ines Herrera de Rivadeneira, 1984).

A detailed inspection of annual fluctuations in age-specific fertility rates (fig. VI) shows a fairly smooth distribution in average rates, with a slight declining trend over the 14-year period. The average rates "bottom-out" from two to four years before the survey and increase again up to the survey date. Some shifting of birth dates during that period probably occurred. An analysis of sex ratios of births showed a slight deficit of male births affecting the period 0-4 years before the survey (Ines Herrera de Rivadeneira, 1984). The two youngest age groups, 15-19 and 20-24, do not show much year-to-year fluctuation except for some heaping four years before to the survey among 15-19-year olds, and 8 and 13 years before the survey among 20-24-year olds.

Comparisons of age-specific rates from the ENF with an outside source proved rather difficult, since civil registration data on births are incomplete. However, estimates from the 1974 census and the 1982 ESMIVD are available for comparisons (Instituto Nacional de Investigaciones Nutricionales y Médico Sociales, 1984), although, they have their own biases and errors. Own-children estimates from the 1974 census for the period from 1971-1974 were considered to be under-estimates of fertility at that period so, in our comparisons, own-children estimates from the 1982 ESMIVD are used. Table 3 shows that, although fertility declined about 20 per cent over the period from 1967-1970 to 1976-1979 for both sources of data, own-children estimates from the ESMIVD show fertility declining from 7.2 to 5.7 children over the period, while estimates from the ENF birth history show fertility declining from 6.8 to 5.3 children over the same period. Data from the ESMIVD for the 1967-1970 period were evaluated as being over-estimates of fertility (Instituto Nacional de Investigaciones Nutricionales y Médico Sociales, 1984). In the more recent period, the ESMIVD estimates are higher than the ENF estimates (5.7 compared with 5.3 children, respectively). Since own-children estimates are heavily dependent on the age distribution of young children, date displacement away from the survey date would make that estimate higher than the true level because the estimates are for the period 3-6 years before the survey. On the other hand, birth date displacement in the ENF could make the ENF estimate

lower than the true level because the recent estimate in table 3 is for the 0-2 years before the survey. With both those possibilities, it is difficult to tell which of the estimates - 5.3 or 5.7 - is the more likely one.

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Table 1. Children ever born per woman from EFS, 1974 census and 1982 ESMIVD: Ecuador

Age group	1974		1982	1979
	Census	EFS	ESMIVD	EFS
15-19	0.2	0.2	0.1	0.2
20-24	1.3	1.2	1.2	1.2
25-29	2.8	3.0	2.6	2.5
30-34	4.3	4.5	3.8	4.0
35-39	5.6	5.7	5.2	5.5
40-44	6.4	6.6	6.3	6.4
45-49	6.7	..	6.8	6.8

Sources: 1974 census and EFS: Instituto Nacional de Estadística y Censos "Encuesta Nacional de Fecundidad, Ecuador, 1979" (Quito, 1984), Table 6.1; 1982 ESMIVD: Instituto Nacional de Investigaciones Nutricionales y Médico Sociales, "Encuesta Nacional de Salud Materno Infantil y Variables Demográficas", tomo II (Quito, Ministerio de Salud Pública, 1984), table 5.4.

Table 2. Cohort period rates and cumulative cohort fertility by age at survey: Ecuador

Age group of cohort at end of period	Number of women in cohort	Years prior to survey						
		0-4	5-9	10-14	15-19	20-24	25-29	30-34
Cohort-period fertility rates								
10-14	0	0.000	0.000	0.001	0.001	0.002	0.002	0.001
15-19	1 680	0.034	0.045	0.045	0.058	0.061	0.068	0.043
20-24	1 377	0.184	0.198	0.228	0.237	0.240	0.207	
25-29	1 074	0.254	0.298	0.323	0.317	0.327		
30-34	883	0.223	0.279	0.295	0.327			
35-39	717	0.189	0.230	0.252				
40-44	586	0.121	0.152					
45-49	480	0.047						
Cumulative fertility of cohorts at end of period								
10-14		0.000	0.002	0.003	0.006	0.008	0.011	0.007
15-19		0.171	0.230	0.228	0.297	0.315	0.345	0.219
20-24		1.151	1.216	1.438	1.498	1.544	1.254	
25-29		2.488	2.926	3.113	3.131	2.892		
30-34		4.041	4.510	4.606	4.529			
35-39		5.457	5.756	5.790				
40-44		6.362	6.548					
45-49		6.781						

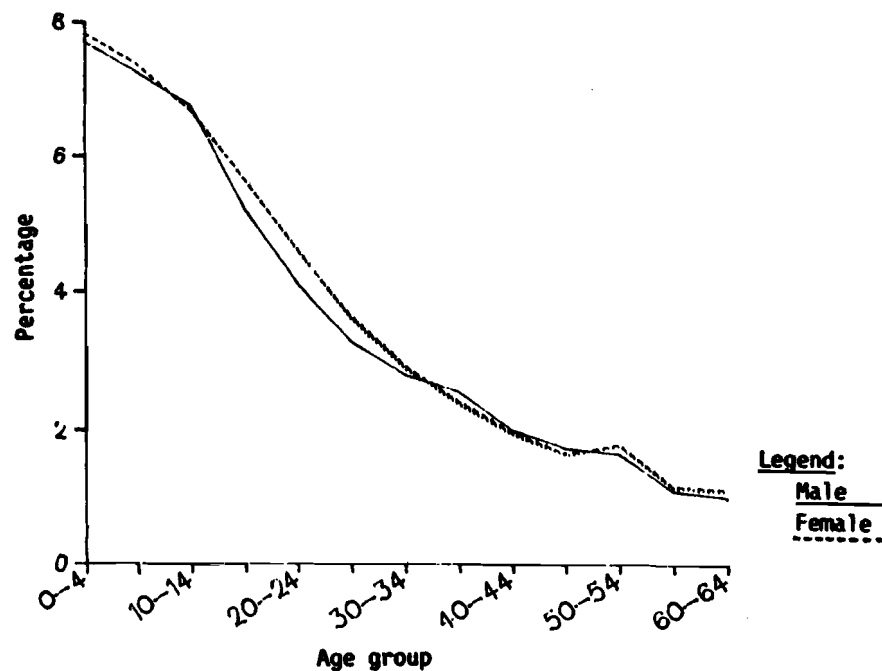
Source: S. Singh, "Birth histories", WFS Comparative Studies, Cross-national Summaries: Additional Tables (Voorburg, Netherlands, ISI/WFS, 1984), p. 73.

Table 3. Age-specific fertility rates for selected periods, from EFS and ESMIVD own-children estimates: Ecuador

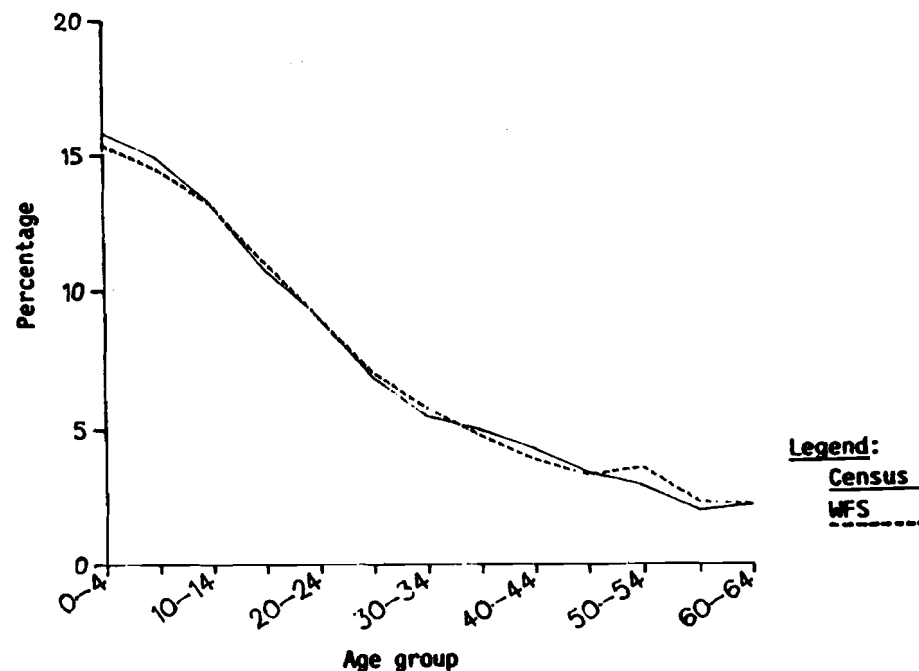
Age group	1967-1970		1970-1973		1973-1976		1976-1979		Percentage change	
	ESMIVD	EFS	ESMIVD	EFS	ESMIVD	EFS	ESMIVD	EFS	ESMIVD	EFS
15-19	0.122	0.122	0.124	0.113	0.136	0.109	0.117	0.099	- 4.1	-18.8
20-24	0.320	0.294	0.288	0.276	0.276	0.249	0.272	0.239	-15.0	-18.7
25-29	0.336	0.300	0.310	0.297	0.281	0.269	0.258	0.259	-23.2	-13.7
30-34	0.306	0.275	0.254	0.251	0.246	0.224	0.221	0.201	-27.8	-26.9
35-39	0.219	0.213	0.184	0.203	0.197	0.181	0.170	0.158	-22.4	-25.8
40-44	0.121	..	0.096	0.128	0.098	0.092	0.075	0.081	-38.0	..
45-49	0.026	..	0.025	..	0.024	..	0.020	0.019	-23.1	..
TFR	7.2	6.8	6.4	6.5	6.3	5.7	5.7	5.3	-20.8	-22.1

Source: For the ESMIVD own-children estimates: Instituto Nacional de Investigaciones Nutricionales y Médico Sociales, "Encuesta Nacional de Salud Materno Infantil y Variables Demográficas". tomo 11 (Quito, Ministerio de Salud Pública, 1984), table 5.12.

**Figure I. Distribution of males and females
as a percentage of the total population
by five-year age groups: Ecuador**



**Figure II. Distribution of the female
population by five-year age groups:
World Fertility Survey (1979/1980) and
1974 census: Ecuador**



Source for the census of 1974: Demographic Yearbook, 1979 (United Nations publication, Sales No. E/F.80.XIII.1), p. 220, table 7; for the 1979/1980 World Fertility Survey: Encuesta Nacional de Fecundidad (Quito, Instituto nacional de estadística y censos, 1979).

**Figure III. Distribution of ever-married women aged 15-49
by years since first married: Ecuador**

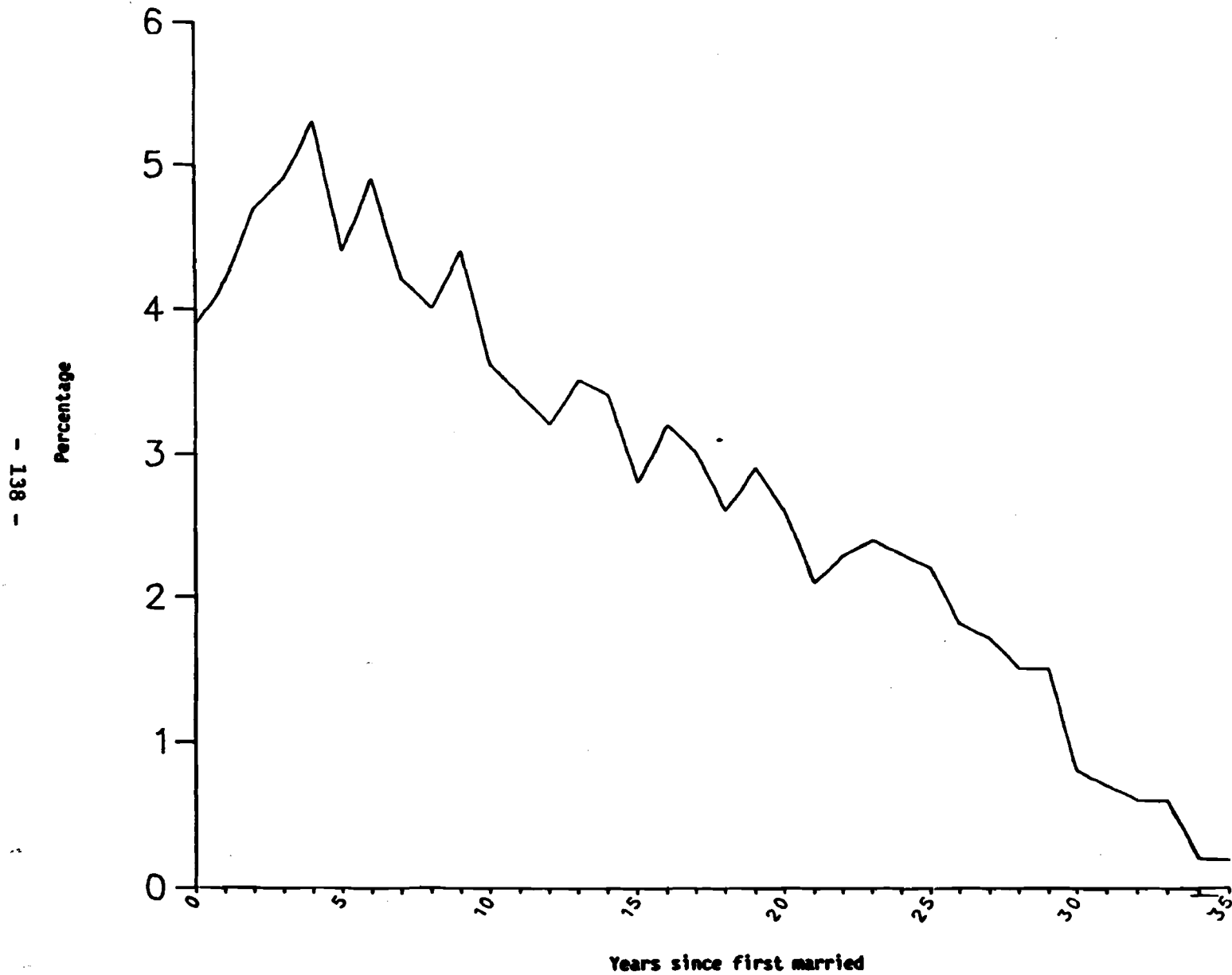
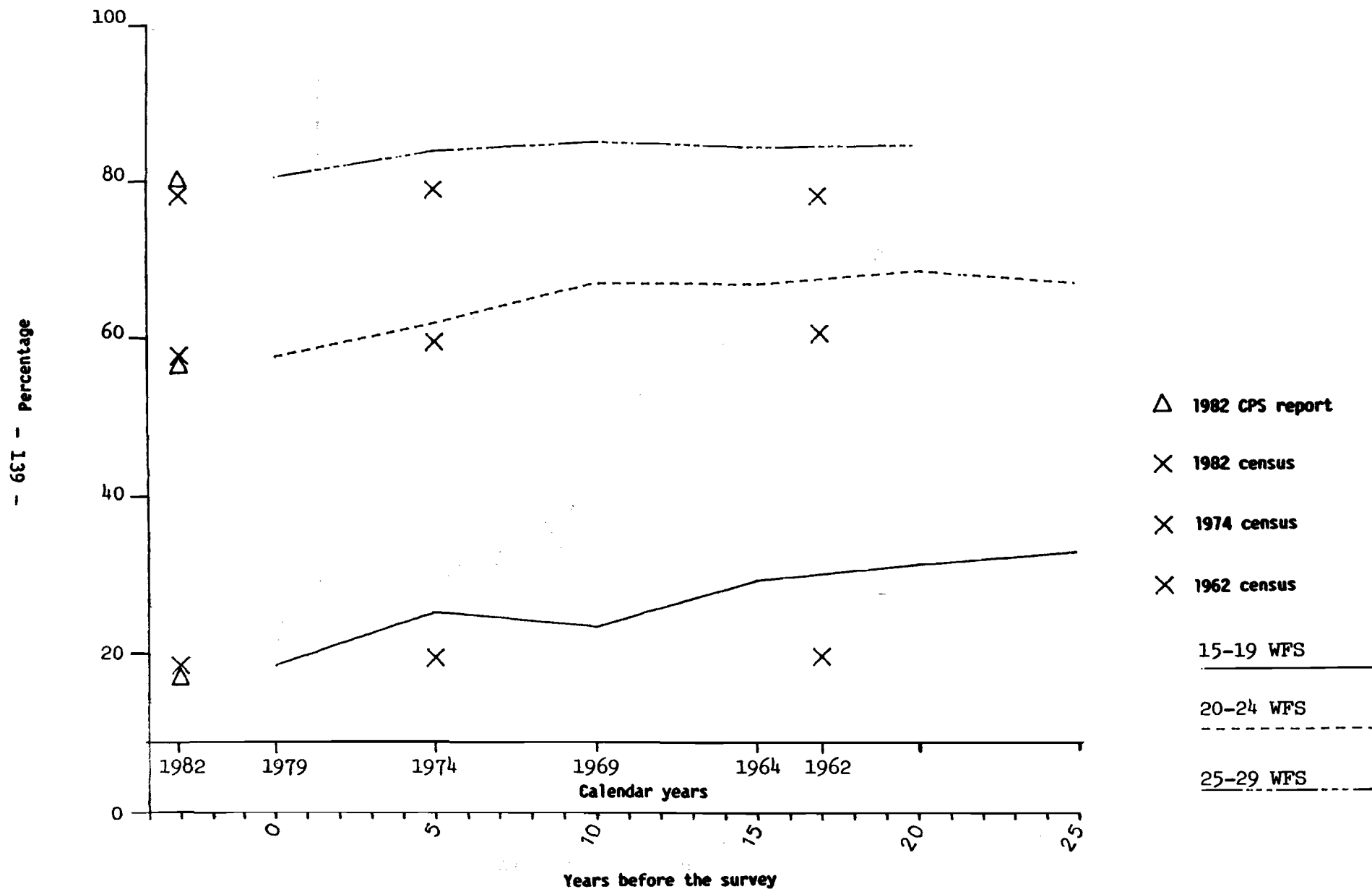
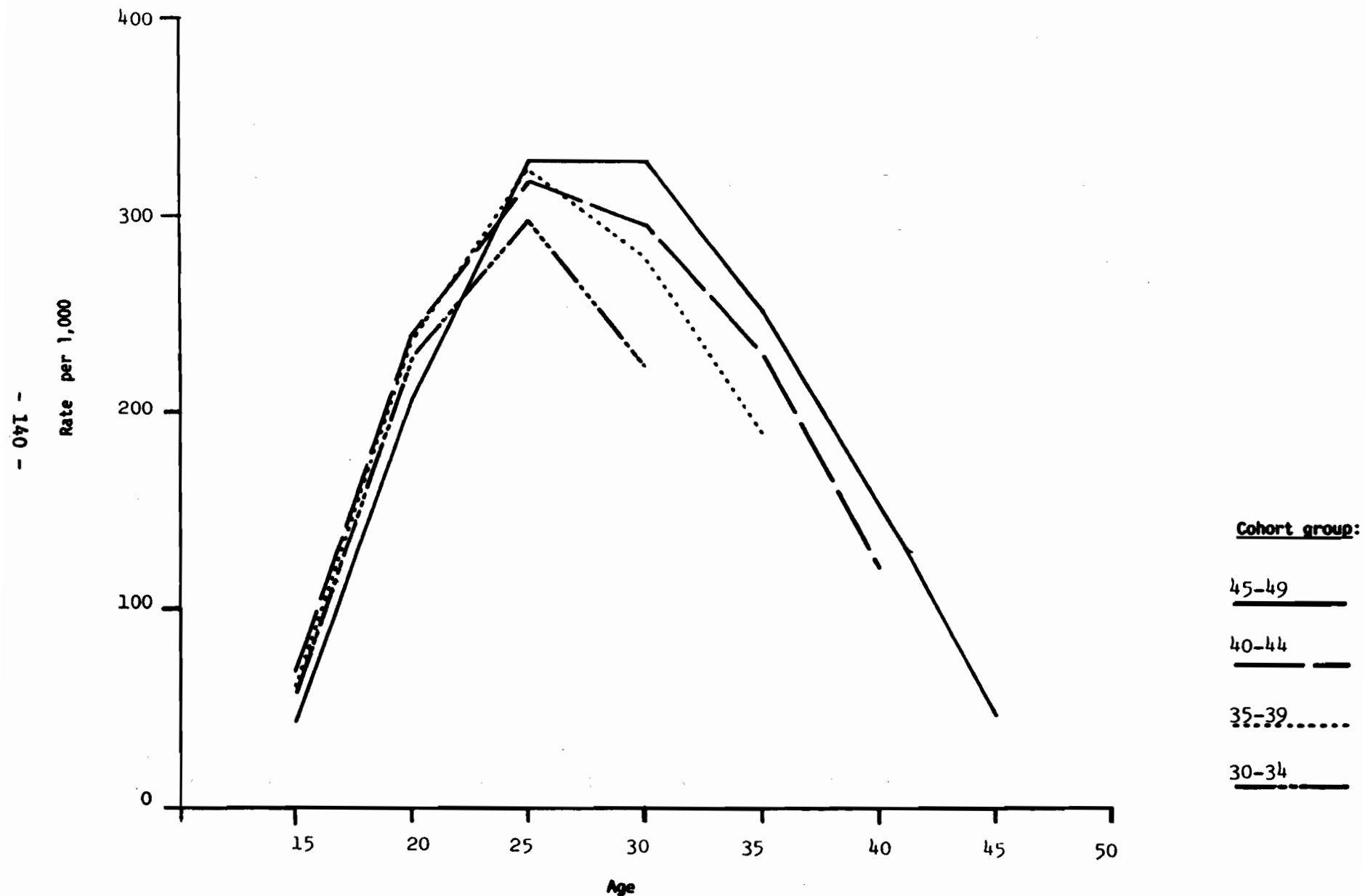


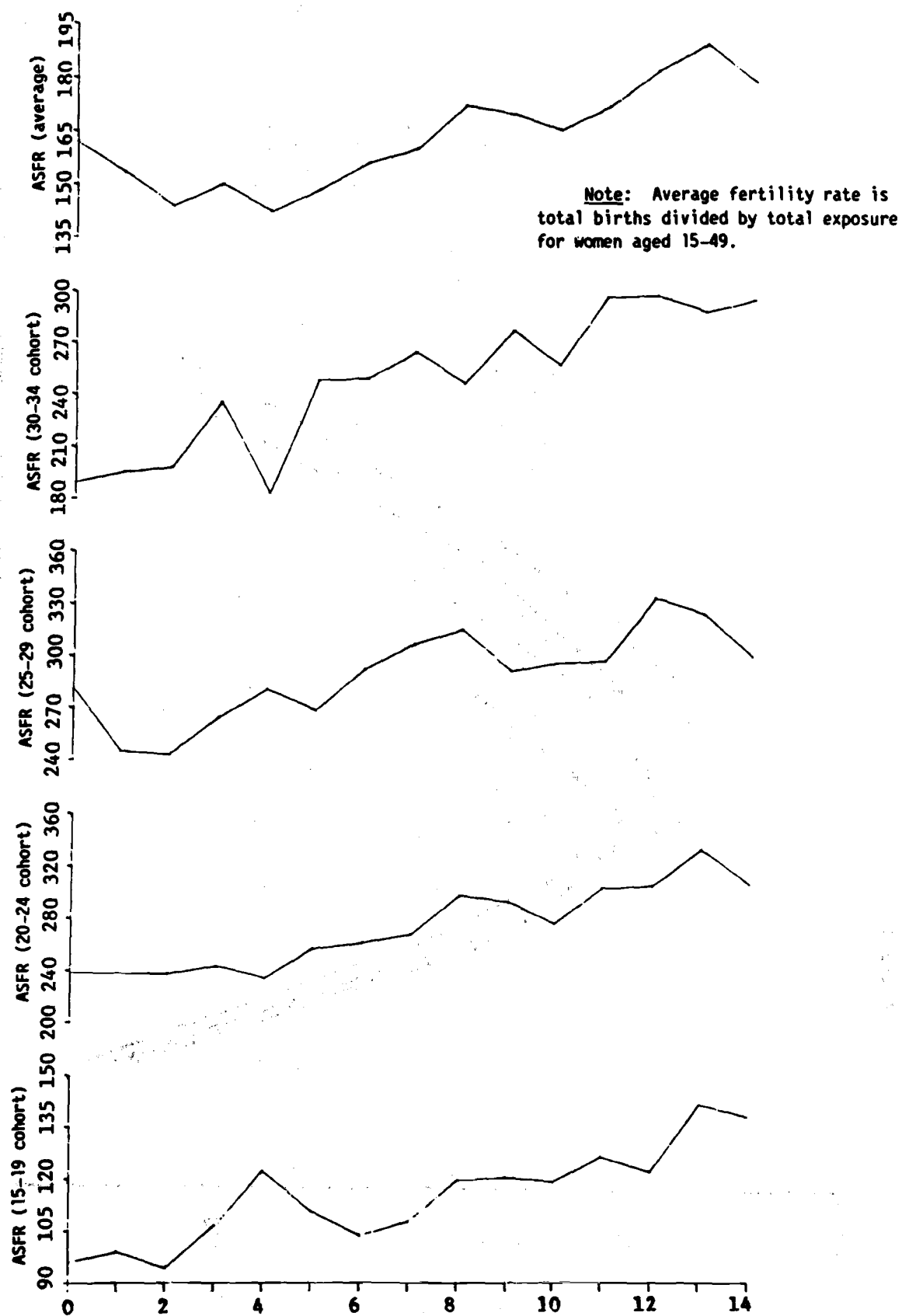
Figure IV. Proportions ever-married at designated periods prior to the survey for selected age groups: World Fertility Survey data and other sources: Ecuador



**Figure V. Cohort-period fertility rates for women aged 30-49 at interview:
Ecuador**



**Figure VI. Age-specific fertility rates for selected cohorts and average fertility rate for single years before the survey:
Ecuador**



EGYPT

The Egyptian Fertility Survey (EFS) was conducted in 1980, field-work started in the month of February. Other national fertility surveys in Egypt include the National Fertility Survey in 1974/75, from which data are available for comparison with the EFS. A population census conducted in 1976 estimated the population of Egypt to be 36.6 million, with about 1.4 million Egyptians living outside Egypt. The census included information on children ever born and those data and the age distribution from the census will be used in comparisons with those from the EFS. Egypt has had compulsory birth registration since 1912 (Central Agency for Public Mobilization and Statistics, 1983) which has recently been estimated to be under-registered by somewhere between 8 and 13 per cent (Bucht, 1986).

Age data

The month and year of birth was reported by 26.2 per cent of women in the individual interview. About two thirds of women reported their date of birth in terms of age, while the remaining 6.4 per cent reported only the calendar year of birth (Chidambaram and Sathar, 1984). The Myer's index, calculated for the female household population, was 17.5 (Rutstein, 1984) which is a considerable improvement over the index for the 1976 census, which was 28.5 (Rutstein, 1984). Nonetheless, considerable heaping is evident in the EFS for digits ending with 0 or 5.

A comparison of the male and female age distribution from the household survey (fig. 1) and the distribution of sex ratios by age show an excess of males over females at ages below 19 years and at ages 45 to 49 years. The population shown in the figure is the de jure population and not the de facto population, which is probably the reason why the sex ratios in the child-bearing age groups are not as low as in other Middle Eastern countries - for example, the Syrian Arab Republic and Yemen, which have heavy labour emigration. The slight excess of males over females in age groups 40-49 years could be caused by a shifting out of those age groups into higher age groups of females in order to avoid the individual interview. It is also possible that there was some downward shifting into the younger age groups. This is less likely as the sex ratio in the 30-39 age group is not uncommonly low. The proportion aged 5-9 years appears low in comparison with the adjacent age groups, both among males and females, and there appears to be some degree of heaping in the 10-19 age groups among males and females. Rapid decline in fertility in the 1960s followed by a stagnation in fertility rates could be one explanation for the dip in the proportion aged 5-9 years among both males and females (Bucht, 1986). Among those aged 10-19, the sex ratio appears to be very much in favour of males (111 and 110 males per 100 females in the 10-19 and 15-19 age groups, respectively). The expected value based on a normal sex ratio at birth and sex differentials of mortality following birth would be about 103-105 at these ages. One explanation for the high sex ratios put forward by Coale is the commonly observed tendency to over-estimate the age of girls 10-14 who have passed puberty, especially if they are married (Coale, 1983). However, although some shifting might have occurred to the older ages, it cannot be of great magnitude since the sex ratio in the 20-24 age group does not appear uncommonly low.

Comparison with the 1976 census female age distribution (fig. II) shows lower proportions in the EFS among women aged 30-54 years, whereas the proportion aged 15-19 and 20-24 were higher in the EFS. Some age-shifting might be occurring in one or both of the distributions. The hump observed in the 10-14 age group in the 1976 census gives further support to the presumption that past trends in fertility caused the dip in the 5-9 age group followed by the hump in the 10-19 age group which is observed in the EFS age distribution.

Marriage history data

Of ever-married women, 8,806 were interviewed, of whom 36.8 per cent knew the month and year of their first union and 6.3 per cent knew only the year. For more than half (56.9 per cent), the date of first union was reported in terms of "years ago" or age at marriage (Chidambaram and Sathar, 1984).

The percentage distribution of ever-married women by years since marriage (fig. III) is irregular, with sharp peaks at 3, 10 and 16 years durations. Corresponding troughs occur at 8 and 11-13 years duration. Reconstructed proportions ever-married from the EFS marriage history for periods in the past (fig. IV) show declines in proportions married over the past 20 years. Declines are quite substantial among 15-19 and 20-24 year olds. There appears to be a slight over-estimation in the proportion married among the 20-24 and 30 to 34 cohorts. Alternatively, it is possible that the 25-29 cohort under-estimated the proportion married. Comparison with the 1976 census marital status distribution shows higher proportions ever-married recorded in the EFS for each age group, though differences are not large. Data from the EFS and the external sources show considerable declines in proportions married.

Birth history data

Of all births, 41.4 per cent were reported with both the month and year of births, 7.5 per cent with only the year, and slightly more than half (51.1 per cent) were reported in terms of age or "years ago" (Chidambaram and Sathar, 1984). The number of children ever born to all women at the time of the survey increases monotonically up to the 45-49 age group, at which point the average number of children ever born was 6.8 (table 1). Comparison with the 1976 census parity distribution shows the EFS reconstructed distribution to be considerably higher. The completed family size from the census distribution was 5.1, compared with 7.0 children from the EFS. Undercount of children most likely occurred in the 1976 census, particularly among older women.

Examination of cohort-period fertility rates reconstructed from birth history information (table 2) shows declines in fertility over the past 20 years. In the most recent period, however, a slight increase in fertility is noted among the 30-34-year age group. The age pattern of cohort fertility (fig. V) does not show any evidence of misplacement of birth dates towards the survey date, although the age pattern of fertility of the 35-39 cohort appears displaced relative to the adjacent cohorts. Cumulated rates by cohort and period (lower panel of table 2) do not show any evidence of omission of births by older cohorts.

Trends in single year age-specific rates appear rather erratic, but an overall declining trend is seen, especially among 15-19 and 20-24-year-olds (fig. VI). Noticeable troughs appear in periods 1 and 7 years (and 3 years in the case of the 25-29 age group) from the survey date and a peak 12 years before the survey.

Comparison of age-specific fertility rates from the EFS birth history with external sources of information (table 3) shows that although the total fertility rates from the 1976 census and the 1975-1977 civil registration are similar to the one obtained from the EFS (5.6, 5.4 and 5.5 children per woman, respectively), the age pattern of fertility from the three sources differ considerably. The EFS has a young age pattern compared with the pattern from the 1976 census, while that from the registration lies in between. For example, at age 20-24 years, the rates for EFS, registration and census were .265, .233 and .187, respectively, while at ages 35-39, the rates were .130, .170 and .205, respectively. Differences are probably caused by the reporting of ages of women and children in the census and survey and the reporting of births by age of mother in the civil registration.

An estimate of age-specific rates for 1966 (based on the 1966 census) is compared with data from the EFS birth history (columns (1) and (2) of table 3). The rates from the EFS appear to be considerably higher than those from the estimate. As a result, the decline in TFR from the EFS is higher than that recorded from external sources (25.7 per cent compared with 12.9 per cent). Large differences in the decline by age group (for those age groups where a comparison was possible) occur in the 20-24 age group, in the EFS the decline being 19.7 per cent while there was hardly any decline as recorded by external sources.

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Table 1. Children ever born per woman, from
EFS and 1976 census: Egypt

Age group	1976		1980 EFS
	census	EFS	
15-19	0.09	0.24	0.16
20-24	0.79	1.30	1.16
25-29	2.06	3.07	2.68
30-34	3.34	4.68	4.43
35-39	4.29	5.94	5.68
40-44	4.66	6.49	6.36
45-49	4.90	7.01	6.80

Source: Bothaina El Deeb, "Evaluation of
Egyptian Fertility Survey, 1980" unpublished
manuscript, pp. 79 and 53.

Table 2. Cohort period rates and cumulative cohort fertility
by age at survey: Egypt

Age group of cohort at end of period	Number of women in cohort	Years prior to survey						
		0-4	5-9	10-14	15-19	20-24	25-29	30-34
Cohort-period fertility rates								
10-14	23	0.000	0.001	0.001	0.002	0.002	0.004	0.002
15-19	655	0.029	0.044	0.055	0.075	0.085	0.085	0.081
20-24	1 598	0.191	0.198	0.257	0.282	0.270	0.274	
25-29	1 696	0.276	0.292	0.329	0.342	0.331		
30-34	1 523	0.263	0.253	0.290	0.315			
35-39	1 329	0.181	0.181	0.215				
40-44	1 061	0.093	0.104					
45-49	903	0.031						
Cumulative fertility of cohorts at end of period								
10-14		0.000	0.004	0.004	0.008	0.009	0.018	0.010
15-19		0.147	0.223	0.283	0.384	0.442	0.435	0.412
20-24		1.178	1.275	1.672	1.850	1.787	1.785	
25-29		2.653	3.132	3.494	3.499	3.437		
30-34		4.447	4.760	4.948	5.010			
35-39		5.664	5.851	6.086				
40-44		6.315	6.608					
45-49		6.764						

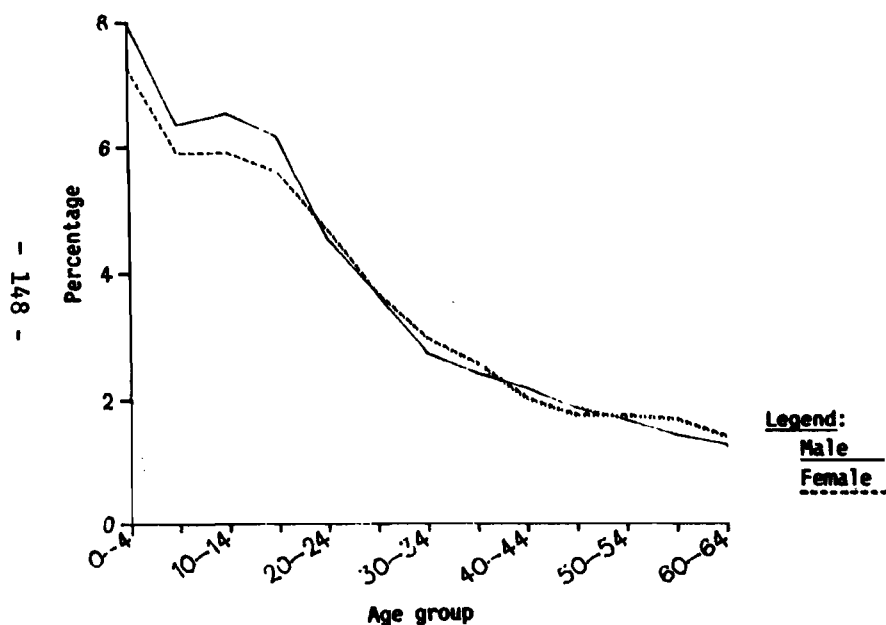
Source: S. Singh, "Birth histories", WFS Comparative Studies,
Cross-national Summaries: Additional Tables (Voorburg, Netherlands,
ISI/WFS, 1984), p. 38.

Table 3. Age-specific fertility rates for selected periods from the 1976 census and vital registration and the EFS: Egypt

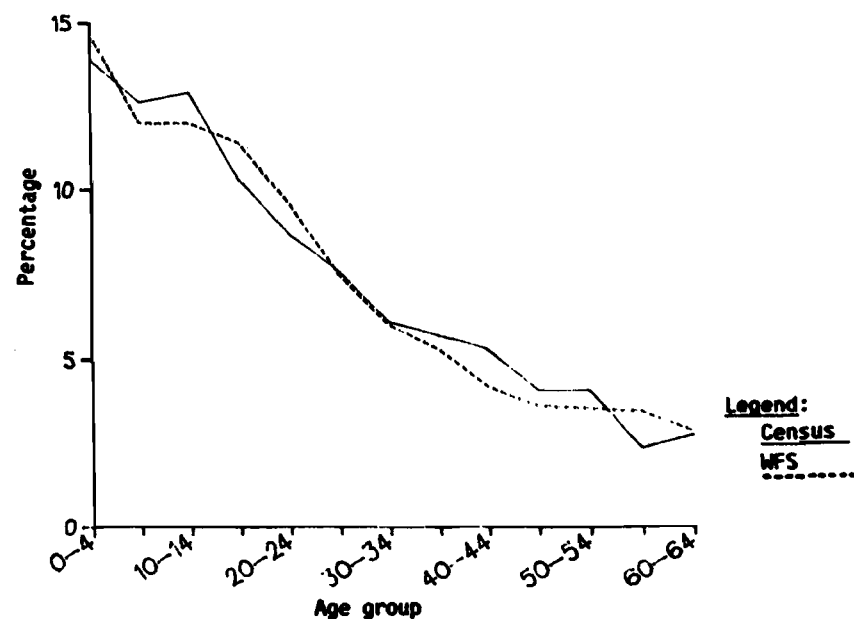
Age group	1966 estimate	1965-1967 EFS	1976 census	1975-1977		Percentage change	
				EFS	Vital registration	EFS	Outside
15-19	0.043	0.186	0.021	0.109	0.025	-41.4	-41.9
20-24	0.235	0.330	0.187	0.265	0.233	-19.7	- 0.1
25-29	0.276	0.329	0.308	0.300	0.279	- 8.8	1.1
30-34	0.290	0.273	0.273	0.231	0.248	-15.4	-14.5
35-39	0.216	0.187	0.205	0.130	0.170	-30.5	-21.3
40-44	0.118	..	0.088	0.050	0.093	..	-21.2
45-49	0.055	..	0.048	0.023	0.042	..	-23.6
TFR	6.2	7.4	5.6	5.5	5.4	-25.7	-12.9

Source: for the 1966 estimate: CAPMAS Population Studies and Researches, vol. I, No. 1 (1971), as cited in A.M. Khalifa, "The population of the Arab Republic of Egypt", CICRED Series (Cairo, 1973); for the 1976 census: Bothaina El Deeb, "Evaluation of Egyptian Fertility Survey, 1980", unpublished manuscript, table 18.

**Figure I. Distribution of males and females
as a percentage of the total population
by five-year age groups: Egypt**



**Figure II. Distribution of the female
population by five-year age groups:
World Fertility Survey (1980) and
1976 census: Egypt**



Source for the census of 1976: Demographic Yearbook, 1982 (United Nations publication, Sales No. E/P.83.XIII.1), p. 178, table 7; for the 1980 EFS: Egyptian Fertility Survey, 1980, vol. II, Fertility and Family Planning (Cairo, Central Agency for Public Mobilisation and Statistics, 1983), p. 7, table 2.1.

Figure III. Distribution of ever-married women aged 15-49
by years since first married: Egypt

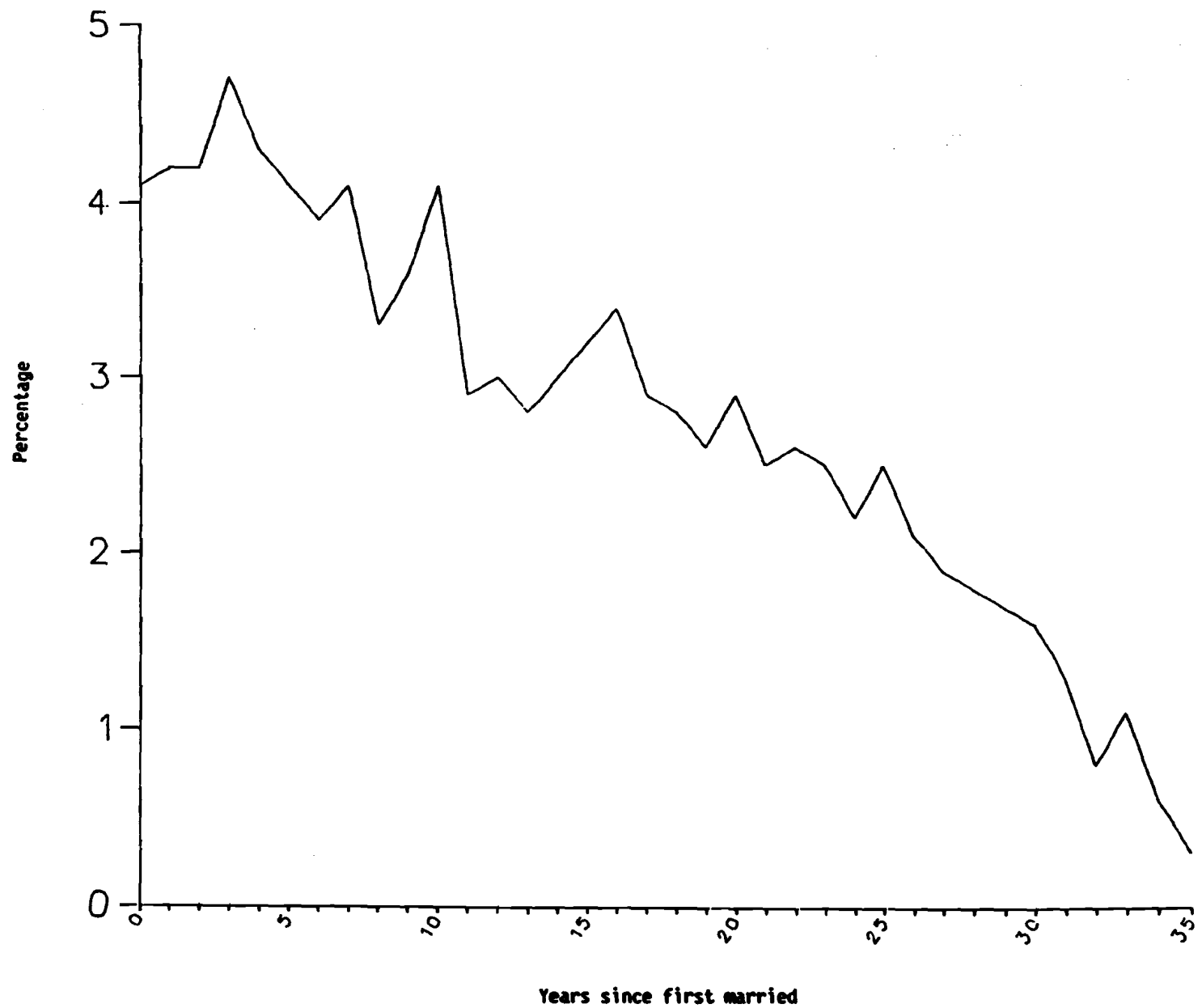
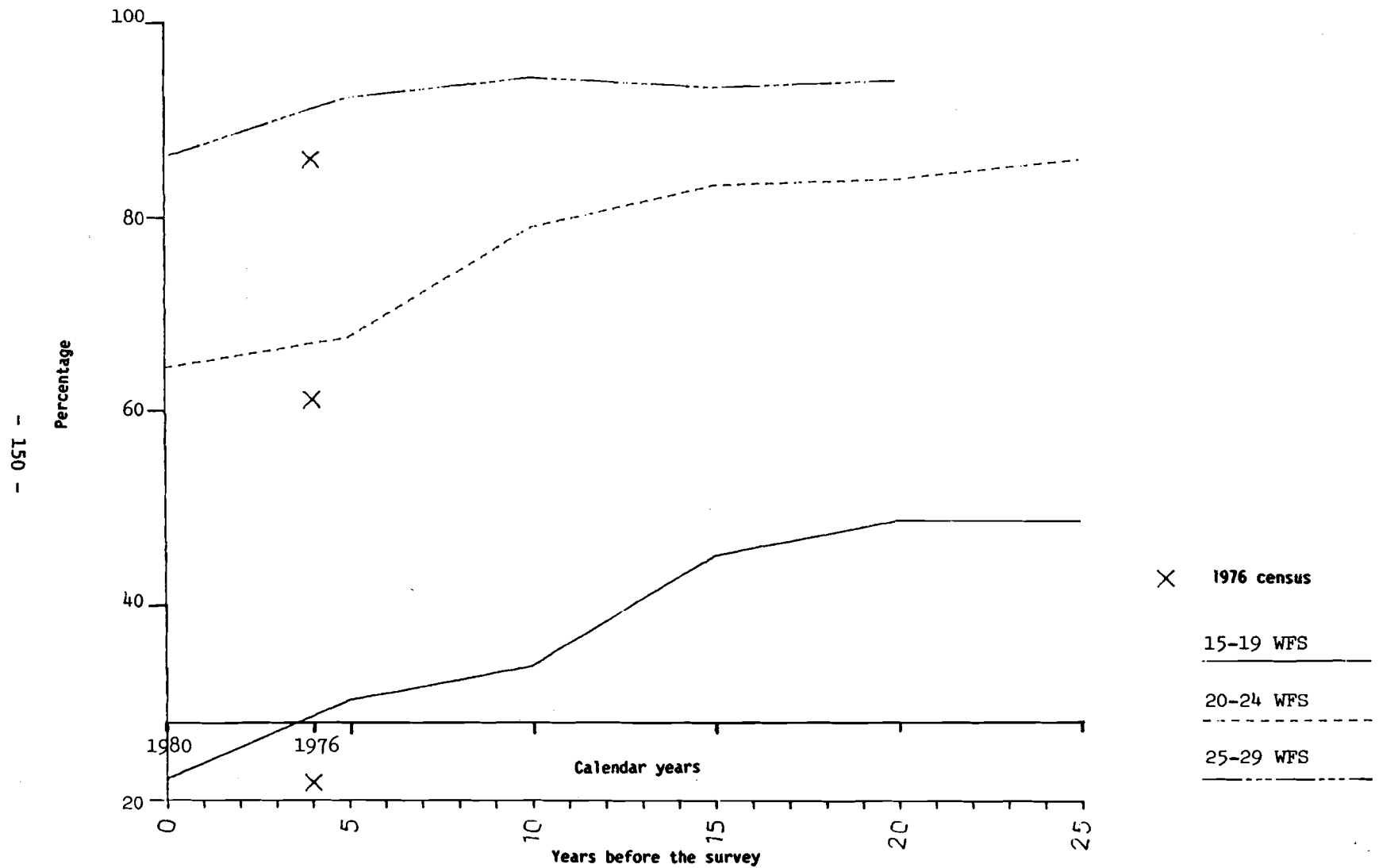


Figure IV. Proportions ever-married at designated periods prior to the survey for selected age groups: World Fertility Survey data and 1976 census data: Egypt



Source for the 1980 Egyptian Fertility Survey data: Bothaina El Deeb, "Evaluation of Egyptian Fertility Survey, 1980", unpublished manuscript, tables 7 and 11.

Figure V. Cohort-period fertility rates for women aged 30-49 at interview:
Egypt

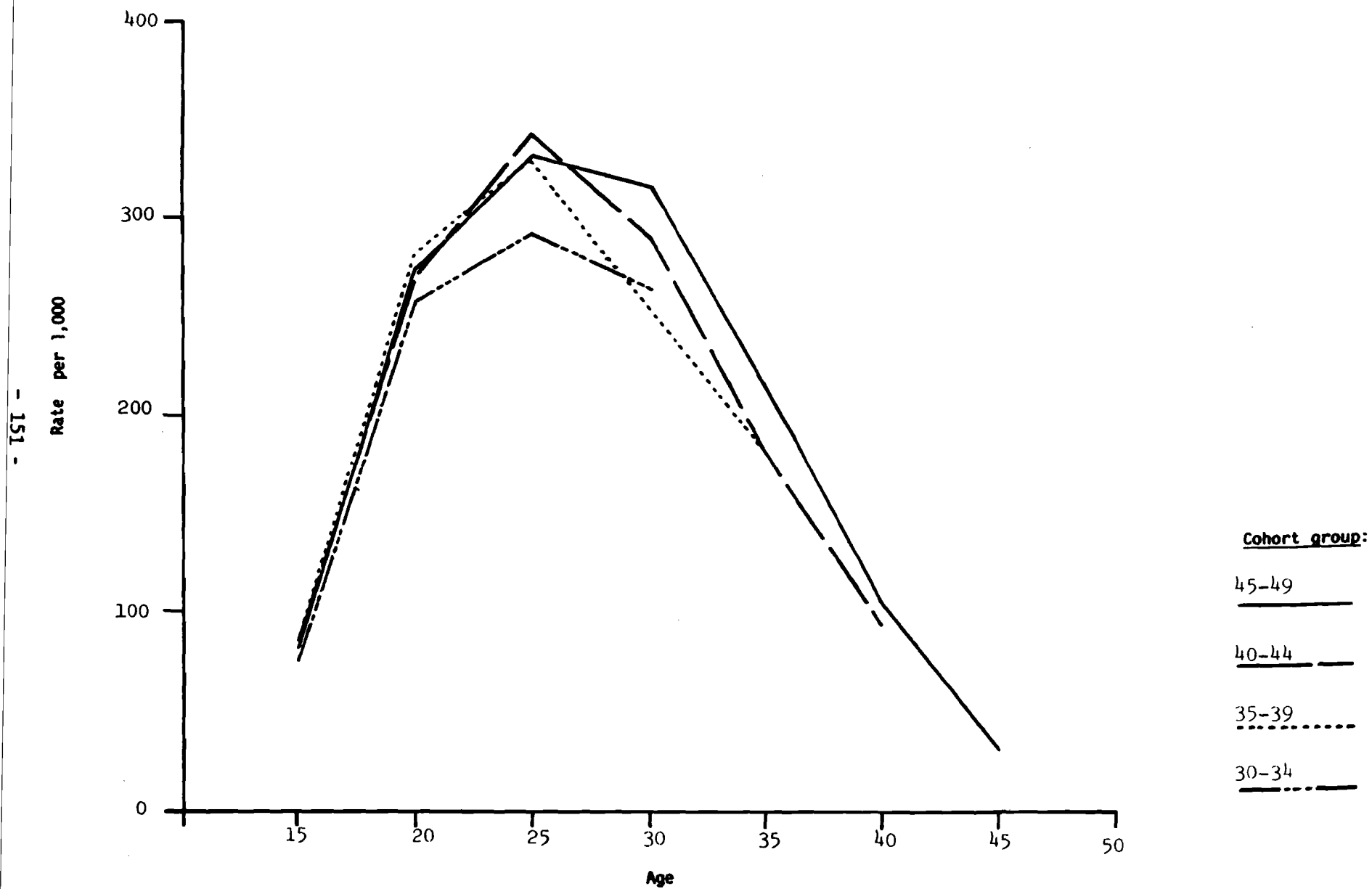
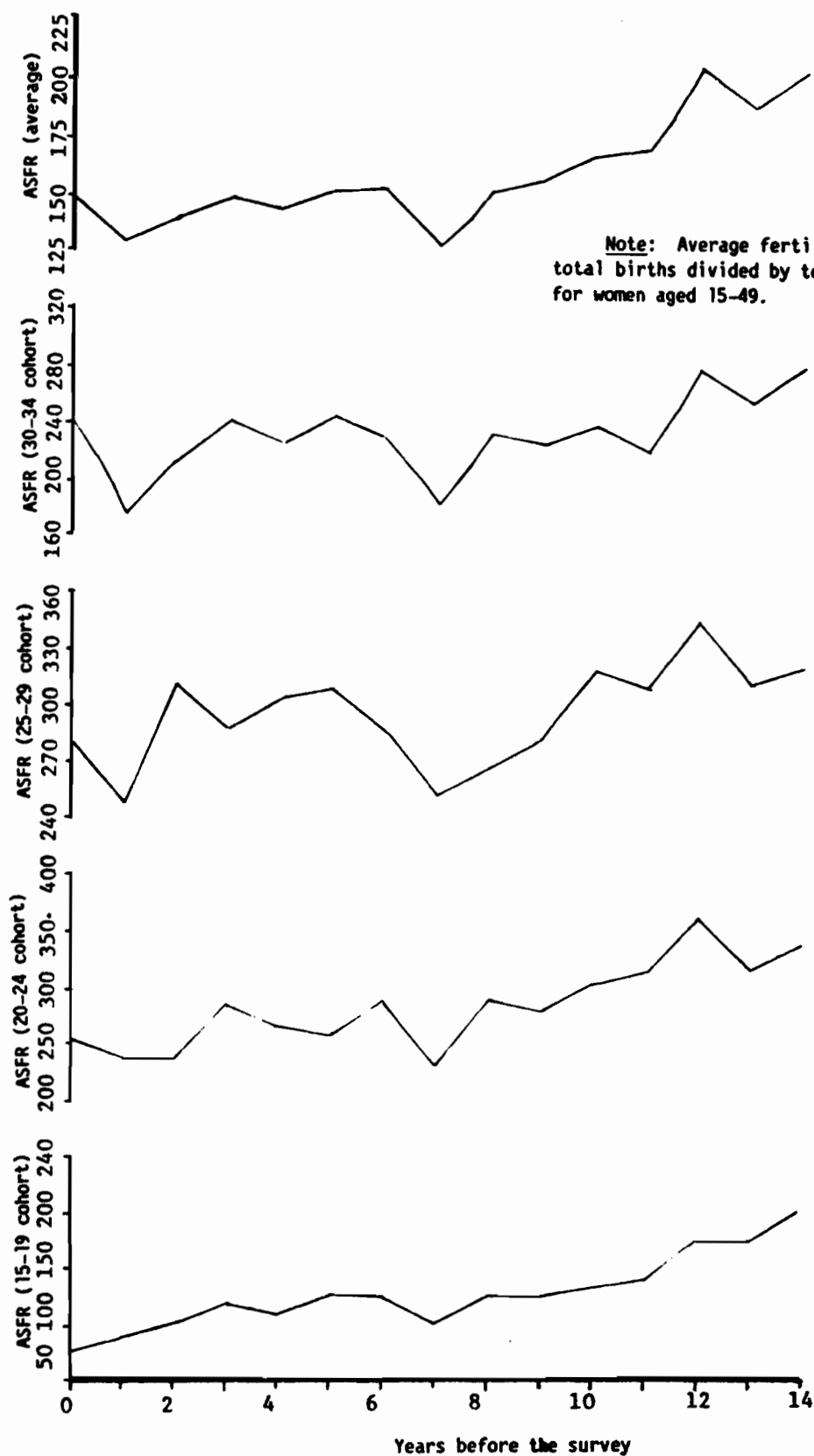


Figure VI. Age-specific fertility rates for selected cohorts and average fertility rate for single years before the survey: Egypt



FIJI

Fiji was the first country to participate in the World Fertility Survey. Field work for the Fiji Fertility Survey (FFS) covered February to July 1974. Because it was the first, the Fiji survey was subjected to special evaluation focusing on problems with field work, and it was also one of the few WFS countries in which a post-enumeration survey (PES) was carried out. Recent censuses were conducted in Fiji in 1946, 1956, 1966 and 1976. Birth registration has been estimated to be 90 per cent complete. (World Fertility Survey, 1976).

Age data

Respondents to the individual interview reported their year and month of birth in 67.6 per cent of the cases (Chidambaram and Sathar, 1984). Only the year was reported in 28.6 per cent of the interviews, and in the remaining 4.0 per cent, "years ago" was the form given. Myer's index of digital preference is 5.1 (Rutstein, 1984).

Examination both of the age of distribution of women and of the difference between the male and female distributions by five-year age groups (fig. I) suggests too few women were in the 45-49 age group, with a corresponding excess at ages 50-54. This is a result of the shifting of women beyond the age of eligibility in order to avoid the individual interview. Further information about age reporting is available from the PES. Sixty-four per cent of reinterviewed women reported a date of birth which was consistent within one year (Potter, 1977). This shows that there may be considerable unreliability in date reporting, even in countries in which most women are able to supply their date of birth.

Comparison of the FFS age distribution with the census age distribution (fig. II) shows some discrepancy in the very young age groups and in the 50-54 age group. At ages below 14 years, females in the 1976 census appear to be under-enumerated relative to the survey.

Marriage history data

The marriage history data are based on a sample of 4,928 ever-married women. The year and month of first marriage were reported in 85.3 per cent of individual interviews; only the calendar year was recorded in the other 14.7 per cent (Chidambaram and Sathar, 1984). Sixty-seven per cent of reinterviewed women in PES reported dates within 12 months of those reported in the main interview (Potter, 1977). All women were asked their ages as well as the dates of their birth, while, in the case of marriage dates, there was no probe about the age at the event, and interviewers were expected to estimate a calendar year if a woman could not supply one.

Non-formalized unions are common among the indigenous Fijian population (roughly 45 per cent of the total at the time of the interview), and although, the date of union is not shown in the coding, de facto unions (any period of cohabitation) were to be counted as "marriage" when considering eligibility for the individual survey in the coding of the household survey. The

occurrence of informal unions can be expected to complicate the gathering of information about the dates unions began, and enumerators reported considerable difficulty in obtaining those dates. The questionnaire asked explicitly the date the couple began living together (rather than the date of formal marriage) for current marriages, but for former marriages, the question was more vaguely worded and was given in English as: "When did your (first, second, ...) marriage begin?" (World Fertility Survey, 1976).

The percentage distribution of ever-married women by single year duration of marriage (fig. III) shows some heaping around 1970 and 1960 and also around 5, 20 and 25 years duration of marriage. Age at marriage has been increasing in Fiji, as indicated by a comparison of the proportion of women ever-married at various censuses (fig. IV). However, the FFS marriage history implied that somewhat higher proportions of 15-19 and 20-24-year-old women were married at the time of the 1956 and 1966 censuses than the census data show. Data from 1976 census became available after completion of the various FFS data-evaluation efforts. There is an anomaly in the census data. The same proportion of 15-19-year olds was reported to have been married in 1976 as in 1966, although the proportion ever-married at ages 20-24 continued the decline observed between 1956 and 1966. The 1976 census also shows about 4 per cent more of 15-19-year olds to have been married than did the FFS survey, although for other age groups, the 1976 census shows slightly lower proportions ever-married than did the 1974 survey. This is consistent with a continuation of the trend for age groups 20-24 and possibly for 25-29, combined with slightly higher proportion classified as ever-married at higher ages in the survey as compared with all the censuses. Thus, there seems no reason to doubt seriously the current marital status distribution of the Fiji survey. However, the marriage history data may have over-estimated the extent of the upward trend in age at marriage.

Birth history data

Of all births reported, 86.3 per cent were reported with a year and month (Chidambaram and Sathar, 1984). All dates were reported as calendar years; there was no probe about age of the child. Comparisons between the date of the first live birth as reported in PES and in the main interview showed agreement within one year in 74 per cent of the cases (Potter, 1977). Consistency was somewhat higher for dates of the most recent birth, and overall dates of live births were reported more reliably than was the date of first marriage or the woman's own date of birth. In 90 per cent of the cases covered by PES, the same number of live births was reported in both interviews. Discrepancies between the two interviews mainly involved children who had died. The reported number of children ever born is essentially the same in the household and individual interviews. Parity increases steadily up to age 50, so that there are no obvious deficiencies in reporting (World Fertility Survey, 1976). Comparisons of children ever born in 1974 with similar data from the 1966 census show a higher estimate for women aged 45-49 suggesting, perhaps, a more complete reporting of parity at the survey (table 1). The World Fertility Survey also shows substantially higher parity at most ages than the 1976 census, again suggesting possibly better enumeration in the survey.

The complete fertility history of cohort-period rates (see table 2) shows a decline in fertility at all ages from the period about 15-19 years prior to the survey. Fertility rates in the distant past show a slight increase from the period 30-34 years up to about 15-19 years prior to the survey, which could reflect a slight increase in fertility in that period, a shifting of births among older women towards the survey data, or omissions by older women. Figure V suggests some forward displacement of births by the oldest cohort of women. Examination of figure VI, which shows age-specific fertility rates by single years, does not show any marked preference for particular years of children's ages.

Trends implied by the birth histories may be compared with trends indicated by rates based on birth registration which has fairly complete coverage. Table 3 shows age-specific fertility rates from birth registration (five-year averages) compared with five-year average age-specific fertility rates computed from the FFS birth histories. The FFS data show consistently higher rates for all age groups except the age group 45-49 in the five years preceding the survey. The percentage decline over the roughly 10-year period shown is slightly greater overall in FFS (38 per cent decline) than in the vital registration statistics (33 per cent). Agreement between sources is good for ages 20-29. The registration statistics imply less change at ages 15-19, and between 1960-1964 and 1965-1969, at ages 30-39.

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Table 1. Children ever born per woman, from 1966 and 1976 censuses and the WFS: Fiji

Age group	1966 census	1974 WFS	1976 census
15-19	0.1	0.1	0.1
20-24	1.3	1.0	0.9
25-29	3.0	2.5	2.2
30-34	4.5	4.1	3.5
35-39	5.7	5.0	4.6
40-44	6.2	6.1	5.4
45-49	6.3	6.5	6.1

Source: 1966 and 1976 censuses: Demographic Yearbook, Historical Supplement: Special Issue (United Nations publication, Sales No. E/E.79.XIII.8), table 7.

Table 2. Cohort period rates and cumulative cohort fertility by age at survey: Fiji, 1974

Age group of cohort at end of period	Number of women in cohort	Years prior to survey						
		0-4	5-9	10-14	15-19	20-24	25-29	30-34
Cohort-period fertility rates								
10-14	0	0.000	0.000	0.001	0.003	0.004	0.003	0.005
15-19	228	0.013	0.024	0.051	0.064	0.075	0.072	0.070
20-24	907	0.167	0.203	0.261	0.257	0.259	0.232	
25-29	1 049	0.238	0.288	0.315	0.335	0.309		
30-34	953	0.197	0.226	0.297	0.296			
35-39	735	0.128	0.178	0.239				
40-44	616	0.062	0.121					
45-49	440	0.027						
Cumulative fertility of cohorts at end of period								
10-14		0.000	0.000	0.003	0.014	0.020	0.013	0.024
15-19		0.063	0.124	0.271	0.341	0.388	0.386	0.371
20-24		0.960	1.284	1.645	1.672	1.683	1.528	
25-29		2.477	3.085	3.248	3.357	3.075		
30-34		4.071	4.378	4.839	4.556			
35-39		5.019	5.731	5.750				
40-44		6.039	6.354					
45-49		6.491						

Source: WFS standard recode tapes.

Table 3. Age-specific fertility rates for selected periods from WFS and birth registration data: Fiji

Age group	1960-1964		1965-1969		1970-1974		Percentage change	
	BR (1)	WFS (2)	BR (3)	WFS (4)	BR (5)	WFS (6)	WFS (2) - (6)	Outside (1) - (5)
15-19	0.090	0.142	0.060	0.087	0.049	0.058	-59.2	-45.6
20-24	0.305	0.326	0.256	0.278	0.226	0.248	-23.9	-25.9
25-29	0.288	0.308	0.238	0.250	0.206	0.215	-30.2	-28.5
30-34	0.192	0.272	0.160	0.185	0.124	0.162	-40.4	-35.4
35-39	0.141	0.204	0.116	0.133	0.079	0.090	-55.9	-44.0
40-44	0.055	..	0.048	0.077	0.029	0.043	..	-47.3
45-49	0.018	..	0.016	..	0.014	0.010	..	-22.2
TFR	5.4	6.6 a/	4.5	5.1 a/	3.6	4.1	-37.9	-33.3

Source: Birth Registration: Demographic Yearbook, Historical Supplement: Special Issue (United Nations publication, Sales No. E/F.79.XIII.8), p. 485, table 6.

a/ For the purpose of calculating a total fertility rate, the age-specific fertility rates from the registration data were used when the age-specific fertility rate from WFS was not available.

Figure I. Distribution of males and females
as a percentage of the total population
five-year age groups: Fiji

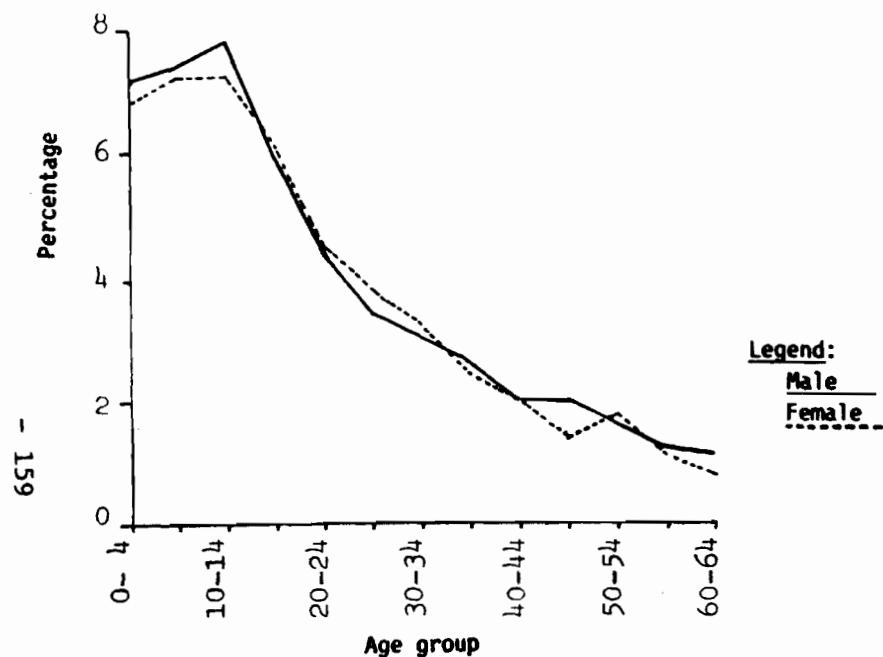
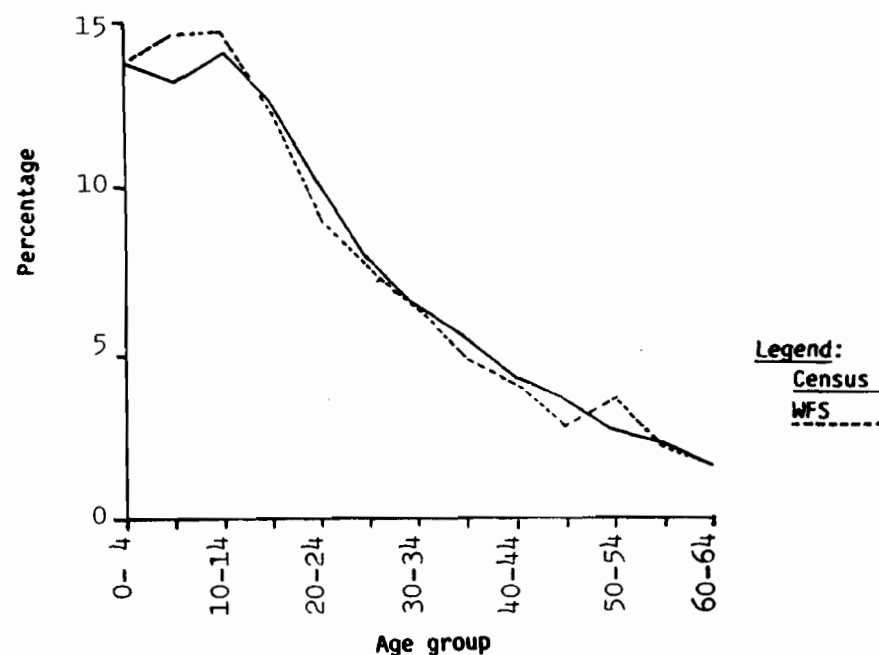


Figure II. Distribution of the female
population by five-year age groups:
World Fertility Survey (1974) and
1976 census: Fiji



Source for the census of 1976: *Demographic Yearbook, Historical Supplement: Special Issue* (United Nations publication, Sales No. E/F.79.XIII.8), pp. 276-277, table 3.

**Figure III. Distribution of ever-married women aged 15-49
by years since first married: Fiji**

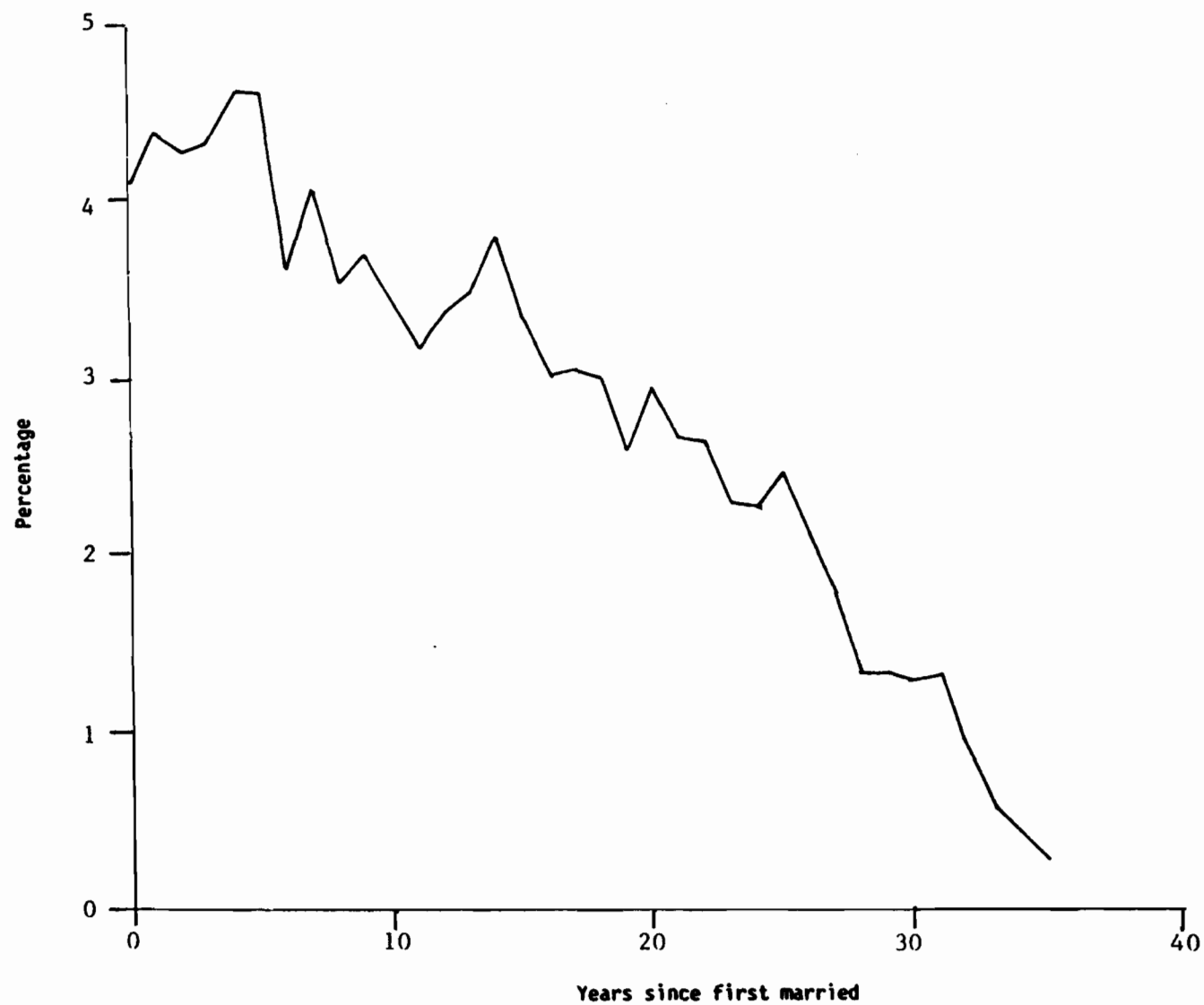
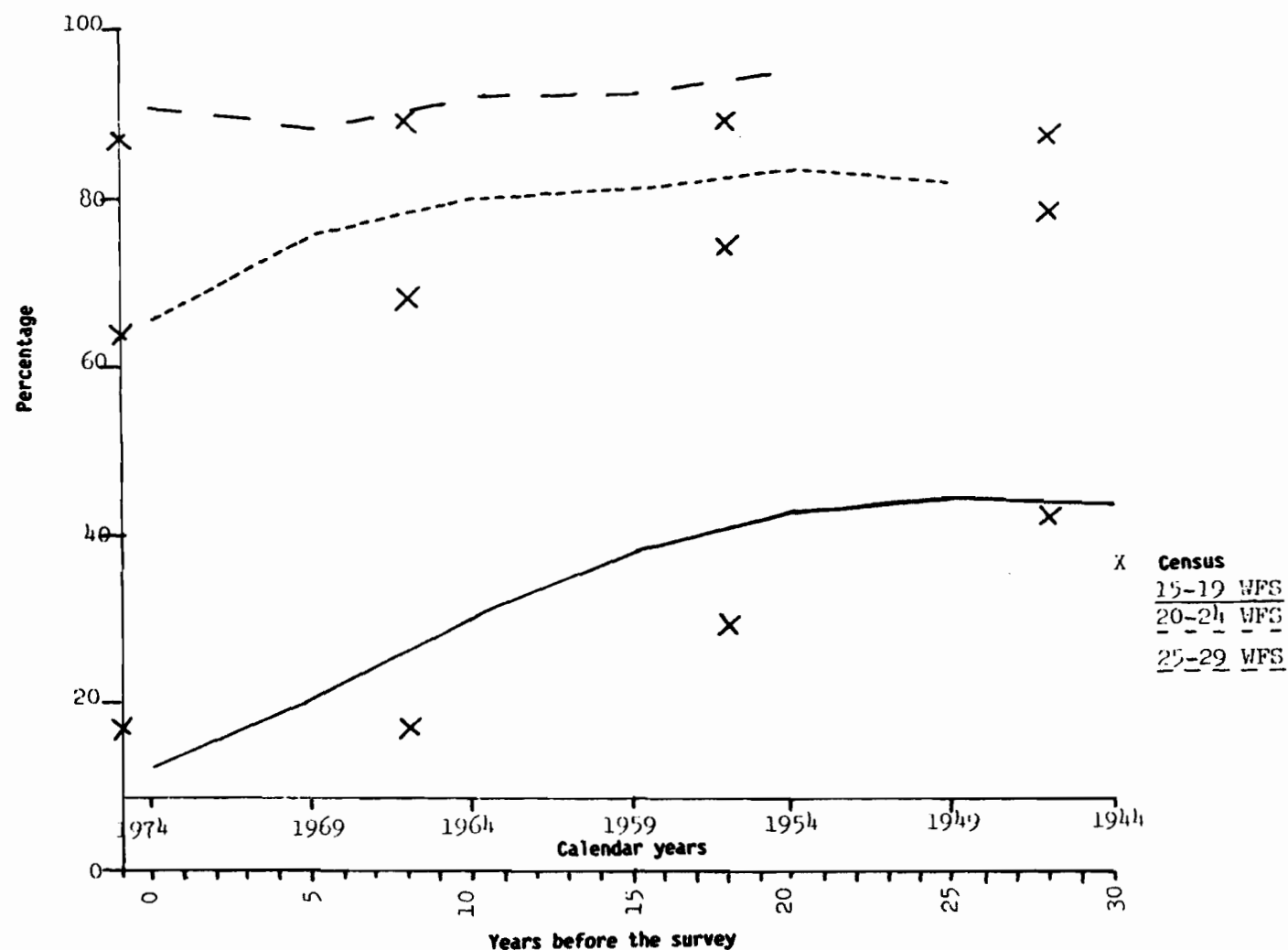


Figure IV. Proportions ever-married at designated periods prior to the survey for selected age groups: World Fertility Survey data and other sources: Fiji



Source: Demographic Yearbook, Historical Supplement: Special Issue
(United Nations publication, Sales No. E/P.79.XIII.9), table 12.

Figure V. Cohort-period fertility rates for women aged 30-49 at interview:
Fiji

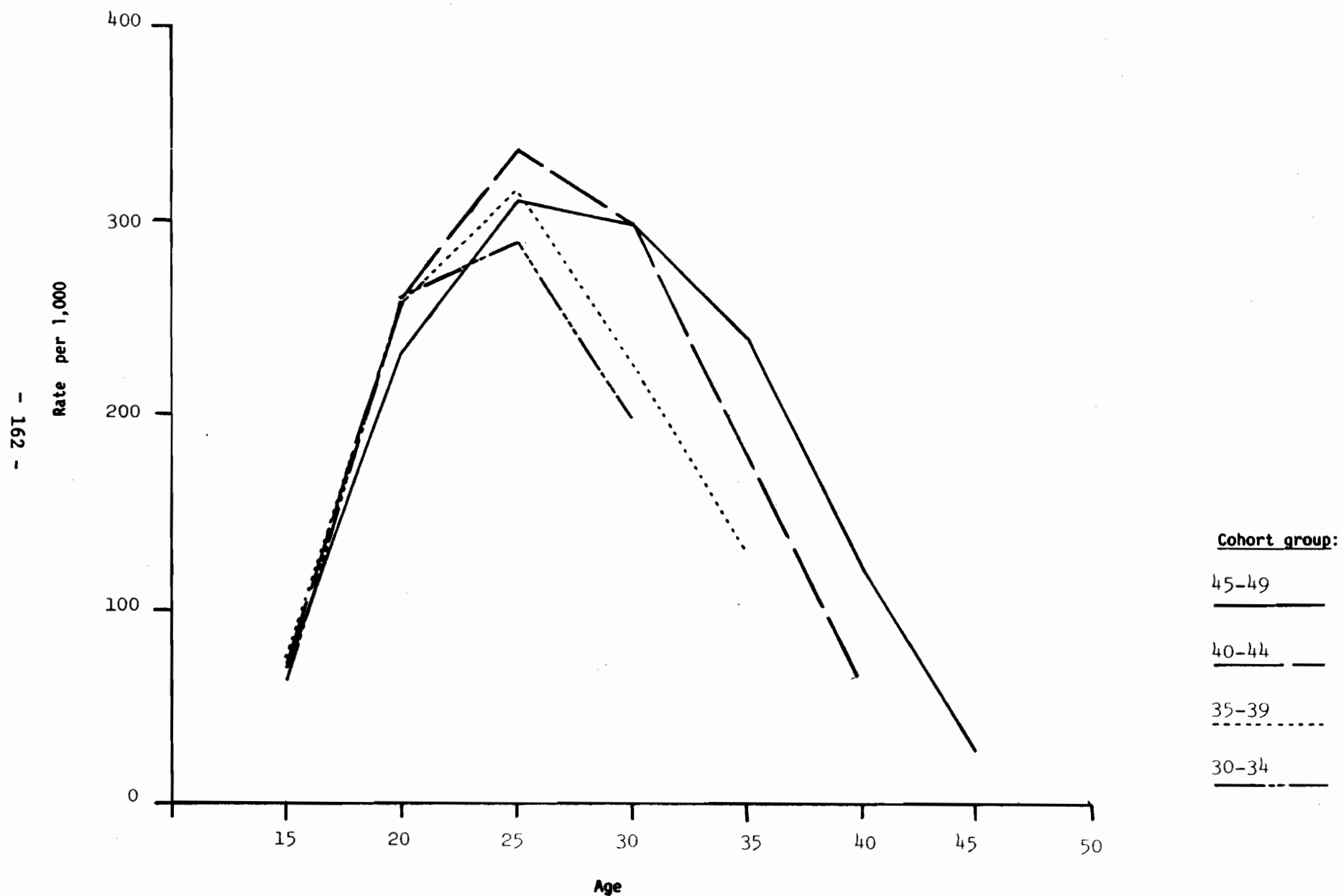
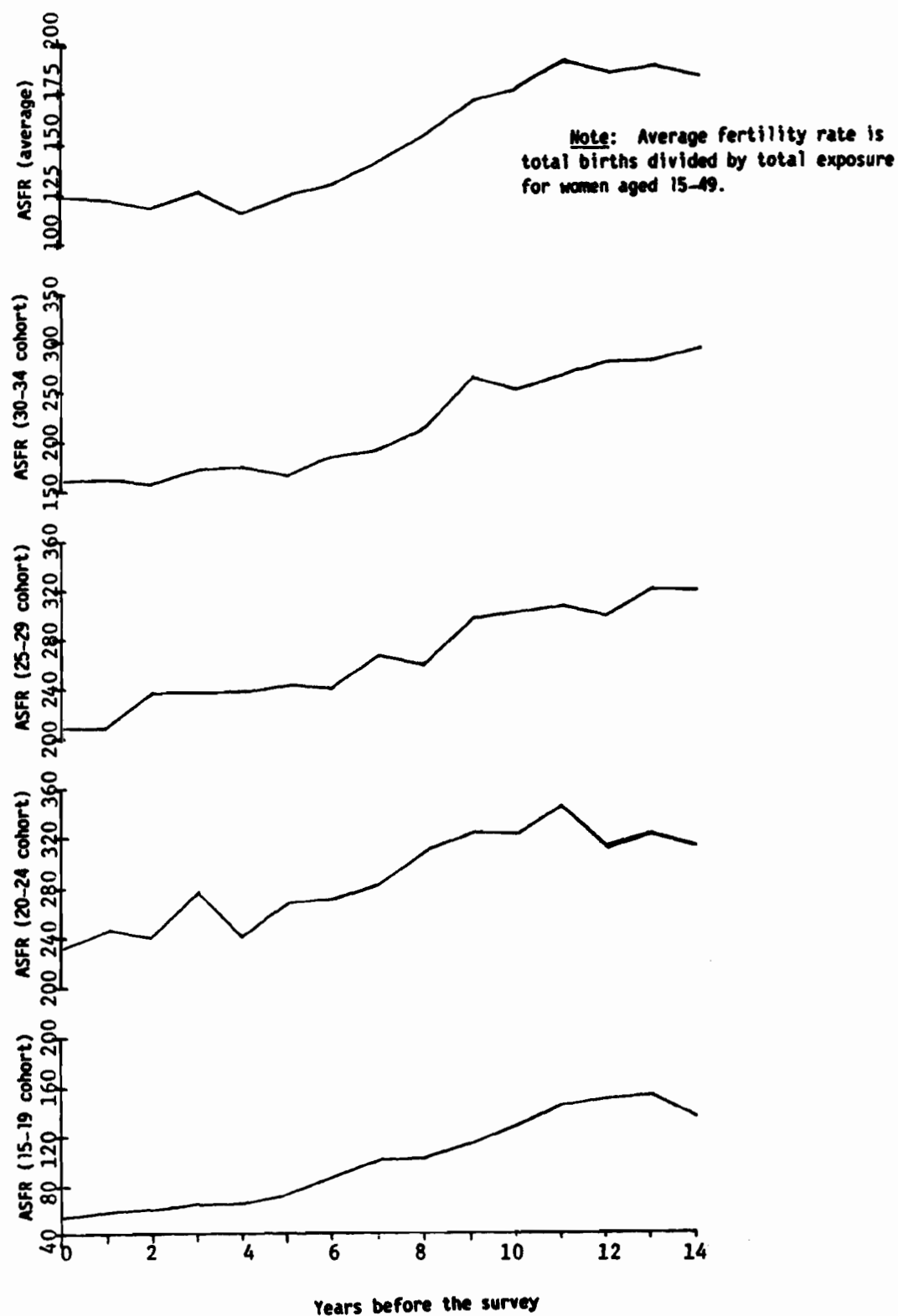


Figure VI. Age-specific fertility rates for selected cohorts and average fertility rate for single years before the survey:
Fiji



GHANA

The Ghana Fertility Survey (GFS) was conducted from February 1979 to March 1980. Ghana had its first population census in 1891 after which decennial censuses were carried out until 1931 and then in 1948. Most of those censuses were of uncertain quality and coverage. Subsequently, two post-independence censuses were carried out in 1960 and in 1970. A post-enumeration survey was carried out after the 1960 census, and a supplementary enquiry after the 1970 census. Data from the two surveys will be used for comparison with the GFS. In addition a national demographic survey was conducted in 1968-1969. Only about 40 per cent of births and 25 per cent of deaths are covered (Central Bureau of Statistics, 1983) by the Ghana registration system, so registration data will not be used for comparison with the GFS.

Age data

Of the 6,125 women interviewed in the individual survey, 52.1 per cent knew the month and year of birth, 27.2 per cent knew only the year and 20.7 per cent responded in terms of their age (Chidambaram and Sathar, 1984). The Myer's index of digital preference for household data among females was 16.7. This is a vast improvement over the 20.1 recorded among females in the 1970 census (Rutstein, 1984).

Figure I, which includes the male and female age distribution from the household survey, shows a deficit of males from about 15-45 years. It is more likely that an under-enumeration of males occurred in those ages rather than a shifting of ages, because there does not appear to be a surplus of males in any of the other age groups. An under-enumeration of males may be due to two factors: under-enumeration; and migration of young adult males (Owusu, 1984). The female age distribution shows heaping in the age group 50-54 years and a slight dip at 15-19 years. Those age groups define the boundaries for selection of women for the individual interview, and it is possible that interviewers shifted women from 15-19 to the age group 10-14 and from 45-49 to the age group 50-54 in order to avoid the individual interview. A comparison of the female household age distribution with the female age distribution from the 1970 census (fig. II) shows that the Ghana Fertility Survey had a smoother age distribution than the census, except at age 50-54. The proportions aged 0-4 and 5-9 were lower in the GFS, and it is possible that some under-enumeration occurred in those age groups.

Marriage history data

Marriage history data was based on a sample of 4,943 ever-married women. Of them, 40.3 per cent knew the month and year of their first union, 35.5 per cent knew the calendar year, while among 24.2 per cent the marriage date was reported in terms of "years ago" or age at marriage (Chidambaram and Sathar, 1984).

The distribution of years since first marriage (fig. III) shows fluctuations from year to year and a considerable amount of heaping in the periods 1, 2, 5, 9 and 28 years before the survey. Proportions married for

five-year periods in the past, constructed from marriage history information (fig. IV), show an apparent under-estimation of proportion married among the 40-44 cohort or, alternatively, an apparent over-estimation of proportion married among the 35-39 cohort. Proportions married in the 20-24-year cohort also appear to be over-estimated. The trend in proportions married appears to be erratic among 15-19-year olds but possibly with a small decline over the past 25 years. Comparison with the 1971 Supplementary Enquiry marital status distribution shows close correspondence for age groups 20-24 and 25-29 but among the 15-19 year olds the proportion ever married in the 1971 survey is lower than that implied by the GFS for the corresponding date. Since data for another point in time are not available, it is difficult to say which of the two is more accurate. There does not appear to be a trend in proportions married - that is, age at marriage does not seem to have changed over the past 15 years except perhaps among very young women where a small increase in age at marriage may have taken place.

Birth history

Of all births reported, 63.5 per cent reported both the month and year of birth, 20.8 per cent only the year, while 15.6 per cent reported the date in terms of years ago or age (Chidambaram and Sathar, 1984). An event chart was used to help respondents remember correctly the date of birth. The mean number of children ever born to women increases monotonically from 0.24 among women 15-19 years to 6.71 children among women aged 45-49 years (table 1). A distribution of mean number of children ever born for 1970 was reconstructed using the birth history of the GFS. When compared with the results from the 1970 census, the mean from the GFS is slightly lower in every age group except among 15-19 year olds, although the GFS 1970 is higher in every age group (except 40-44) when compared with the 1979-1980 distribution.

Cohort period fertility rates for five-year periods preceding the survey date (table 2) show very little change in the rates from the period 30-34 years before the survey up to 5-9 years before the survey. The rates however, are not constant and there is some variability. For all cohorts, fertility rates show a small decline from the period 5-9 years before the survey to 0-4 years before the survey. The fertility profiles for the different cohorts (figure V) show very little evidence of displacement of births from the distant past to the more recent past. Comparisons of age-specific fertility rates from the GFS with the 1971 Supplementary Enquiry are presented in table 3. The rates reconstructed from the GFS birth history for 1970-1972 are higher than those from the 1971 Supplementary Enquiry, especially in the older age groups, from 30-34 to 40-44. Comparisons with recent fertility rates (1977-1979) from the GFS shows very little change from 1970-1972 to 1977-1979 (4.0 per cent decline in the TFR). Fertility levels for older women from 35-39 to 40-44, are lower than in 1970-1972 but higher than in the 1971 survey. An evaluation of the quality of the trend information by socio-economic subgroups showed that while data deficiencies cannot be completely ruled out, the observed trend from the three higher "social status groups" (urban, some schooling, knows exact date of birth) can be accepted as at least partly true. The lower social status subgroups, however, showed stronger evidence of misreporting errors (Owusu, 1984).

Single-year fertility rates for selected age groups were examined for year-to-year variability in rates (fig. VI). All age groups show a dip in the rates in the period 1-2 years before the survey and in the periods 7 and 11 years before the survey. Peaks occur in the period 0, 6, 10 and 12 years before the survey - the peaks at 0, 6 and 10 being particularly pronounced.

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Table 1. Children ever born per woman from the Ghana Fertility Survey (GFS), the 1960 Post-enumeration Survey, the 1970 census and the 1971 Supplementary Enquiry: Ghana

Age group	1960 Post-enumeration survey	1970		1979-1980 GFS
		census	GFS	
15-19	0.46	0.26	0.29	0.24
20-24	1.72	1.54	1.39	1.37
25-29	3.06	3.06	2.94	2.69
30-34	4.24	4.61	4.14	4.04
35-39	5.08	5.61	5.37	5.36
40-44	5.70	6.28	6.02	6.12
45-49	6.14	6.42	..	6.71

Source: Post-enumeration survey 1960: S.V. Gaisie, "Dynamics of population growth in Ghana: fertility and mortality", *Demography* (1972), p. 20; 1970 census: Central Bureau of Statistics, *Ghana fertility survey, 1979-1980: First Report* (Accra, 1983), p. 44.

Table 2. Cohort period rates and cumulative cohort fertility by age at survey: Ghana

Age group of cohort at end of period	Number of women in cohort	Years prior to survey						
		0-4	5-9	10-14	15-19	20-24	25-29	30-34
Cohort-period fertility rates								
10-14	0	0.000	0.001	0.001	0.003	0.004	0.004	0.000
15-19	1 371	0.047	0.060	0.054	0.062	0.074	0.046	0.058
20-24	1 220	0.213	0.214	0.210	0.219	0.201	0.195	
25-29	1 011	0.266	0.271	0.280	0.272	0.272		
30-34	802	0.263	0.282	0.294	0.282			
35-39	703	0.213	0.244	0.251				
40-44	579	0.166	0.189					
45-49	439	0.093						
Cumulative fertility of cohorts at end of period								
10-14		0.000	0.004	0.003	0.017	0.019	0.021	0.002
15-19		0.241	0.301	0.228	0.328	0.393	0.233	0.301
20-24		1.366	1.357	1.377	1.489	1.238	1.278	
25-29		2.686	2.729	2.890	2.596	2.638		
30-34		4.044	4.302	4.064	4.046			
35-39		5.364	5.285	5.298				
40-44		6.116	6.244					
45-49		6.711						

Source: S. Singh, "Birth histories", *WFS Comparative Studies, Cross-national Summaries: Additional Tables* (Voorburg, Netherlands, ISI/WFS, 1984), p. 13.

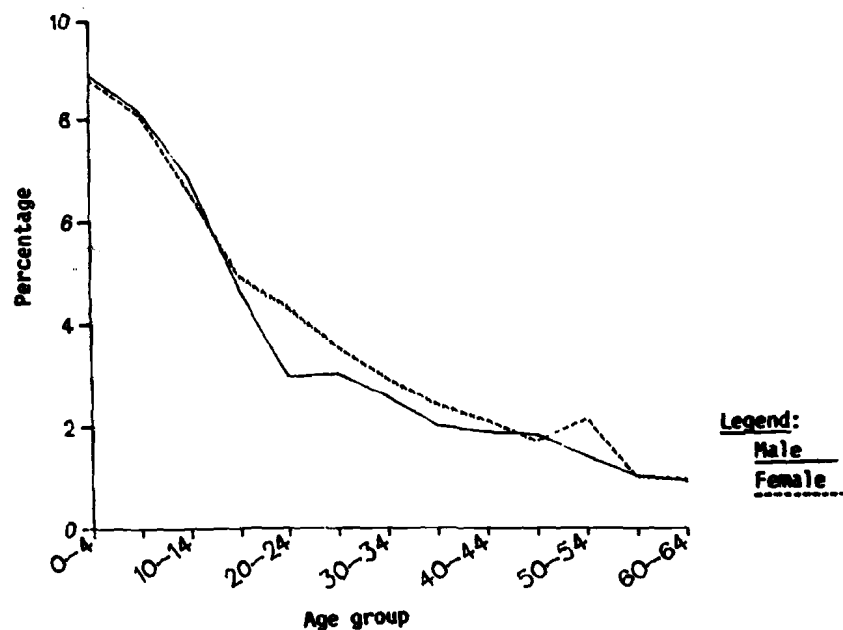
Table 3. Age-specific fertility rates for selected periods from the 1971 Supplementary Enquiry and the Ghana Fertility Survey (GFS): Ghana

Age group	1971 Supplementary Enquiry (1)	GFS 1970-1972 (2)	GFS 1977-1979 (3)	Percentage change GFS (2)-(3)
15-19	0.110	0.137	0.143	4.4
20-24	0.259	0.259	0.261	0.8
25-29	0.266	0.282	0.283	0.4
30-34	0.236	0.266	0.259	- 2.6
35-39	0.176	0.212	0.180	-15.1
40-44	0.097	0.169	0.139	-17.8
45-49	0.041	..	0.047	..
TFR	5.92	6.83 a/	6.56	- 4.0

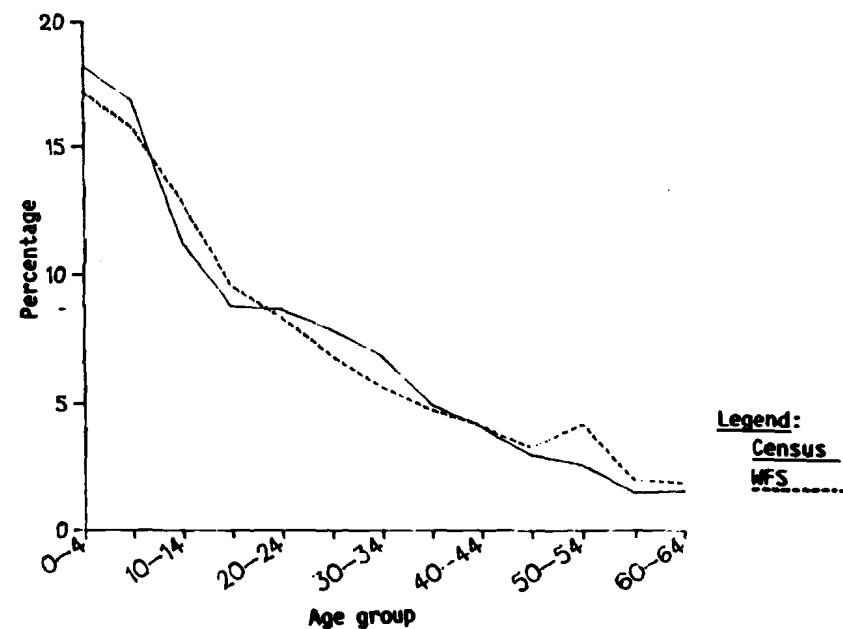
Source: Central Bureau of Statistics, Ghana Fertility Survey, 1979-1980: First Report (Accra, 1983), table 5.4.

a/ The rate for 45-49 was assumed to be the same as that in the 1971 Survey - that is, 0.041.

**Figure I. Distribution of males and females
as a percentage of the total population
by five-year age groups: Ghana**



**Figure II. Distribution of the female
population by five-year age groups:
World Fertility Survey (1979/1980) and
1970 census: Ghana**



Source: J. Owusu, "Evaluation of the Ghana Fertility Survey, 1979-1980", *NFS Scientific Reports*, No. 69, (Voorburg, Netherlands, ISI/WFS), p. 14, table 4.

**Figure III. Distribution of ever-married women aged 15-49
by years since first married: Ghana**

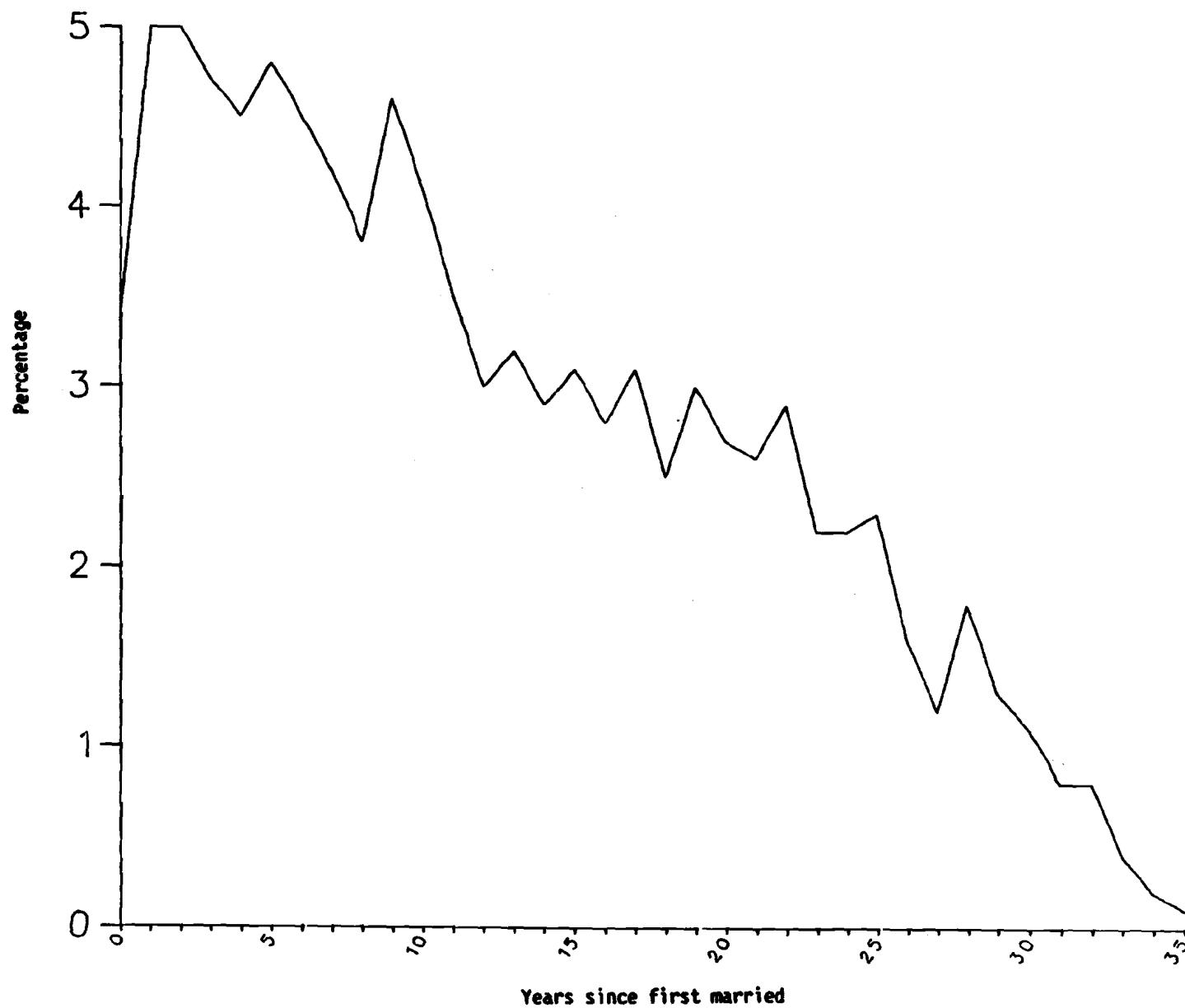
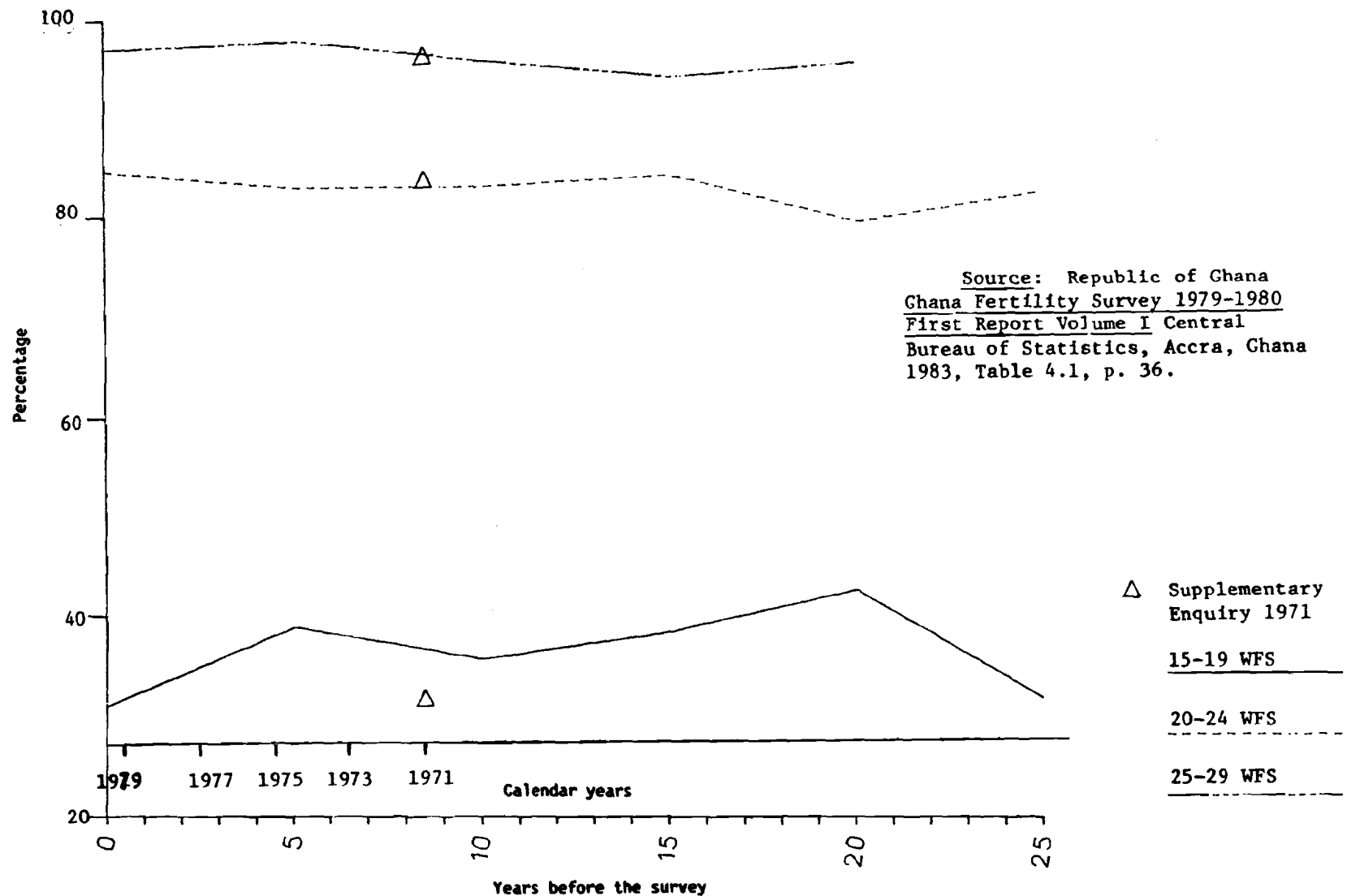


Figure IV. Proportions ever-married at designated periods prior to the survey for selected age groups: World Fertility Survey data and Supplementary Enquiry, 1971: Ghana



Source: Central Bureau of Statistics, Ghana Fertility Survey, 1979-1980: First Report (Accra, 1983), p. 36, table 4.1.

**Figure V. Cohort-period fertility rates for women aged 30-49 at interview:
Ghana**

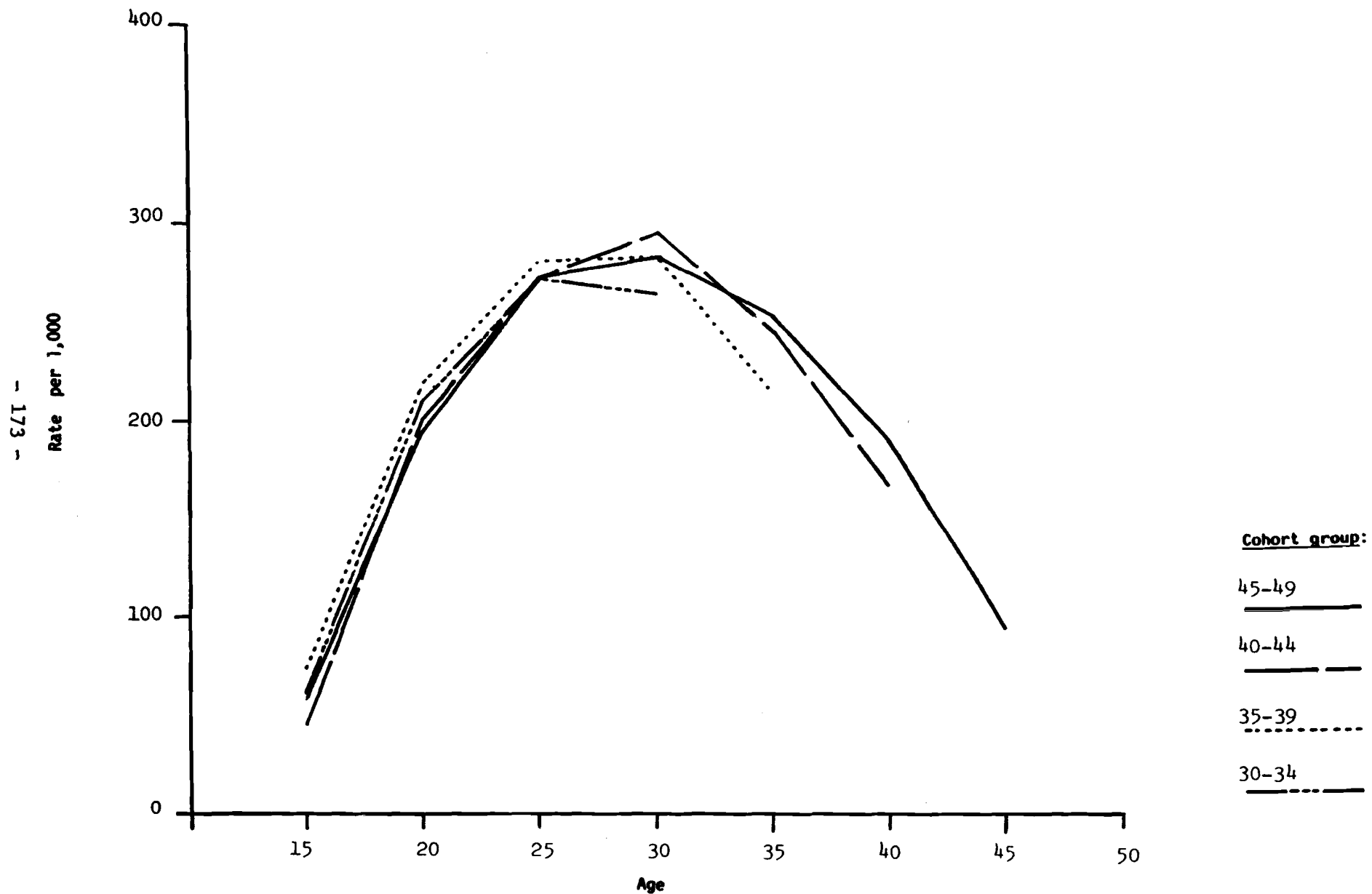
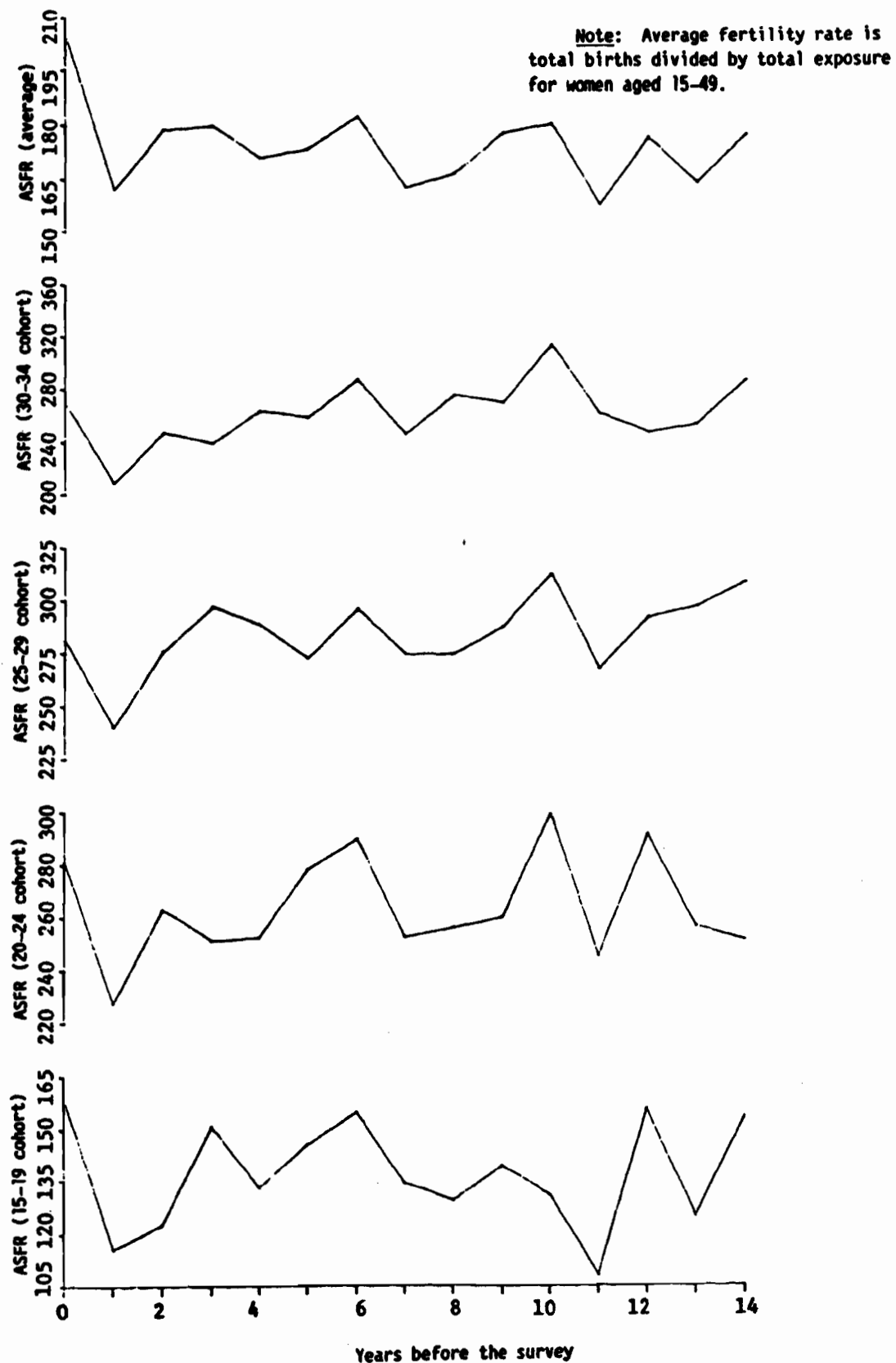


Figure VI. Age-specific fertility rates for selected cohorts and average fertility rate for single years before the survey: Ghana



GUYANA

The Guyana Fertility Survey (GFS) was undertaken from June to August 1975 and was the first national demographic survey in Guyana to collect information on the fertility behaviour of the population. Previous fertility estimates had been based on censuses (most recently, those of 1960 and 1970) and birth registration data, which is rated as being at least 90 per cent complete (United Nations, 1981). The individual questionnaire was administered to all women in the household aged 15-49, regardless of union status, except females aged 15-19 who were currently in full-time primary or secondary school.

Age data

The household schedule fell short of the core schedule recommendation of the World Fertility Survey in London in that, although age was asked, it was coded in broad groups (0-14, 15-49, 50+) rather than by single years (Singh, 1980). Thus, an evaluation of age reporting must be confined to the age information for women interviewed in the individual questionnaire.

Ninety-eight per cent of respondents were able to provide their month and year of birth, so date imputations were minimal (Balkaran, 1982). Digit preference in age reporting among women in Guyana appears minimal, with a Myer's index of 4.8 calculated on the basis of women 20-49, as compared with an index of 3.9 for the 1970 census based on the same age group (Balkaran, 1980).

Figure II compares the distribution of women by age for the 15-49-year-olds in the GFS and the census. (Fig. I could not be drawn.) The distribution from the GFS was estimated by applying the age distribution from the individual data (including the number of women ineligible for the questionnaire due to school attendance) to the proportion of the household population in the eligible age groups. A smaller proportion of the GFS household population was in the 0-14 age group (43.5 per cent) than was found in the 1970 census (46.4 per cent). The percentage 15-19 is slightly higher in the GFS. However, on the whole, the distributions are reasonably close. There is some chance that too many women were reported as over 50 in the survey, since the population over 50 was 12.5 per cent of the total in the GFS and 11.1 per cent in the census.

Marriage history data

Although not specifically a Caribbean country, Guyana shares with the West Indies the threefold marital union pattern - namely, legal unions, common law unions and visiting unions. The marriage history data are based on a sample of 3,616 women ever in a union. The dates of 79 per cent of all first unions were reported with month and year (Chidambaram and Sathar, 1984). The distribution of years since first marriage is highly irregular, as can be seen in figure III. There is heaping in 1970, eight years before the survey (roughly the year of independence, 1966), and 1960. The number of first unions formed in the past five years before the survey is relatively high, though the number formed within the past year is not.

Comparison of the current status distribution from the GFS with the 1970 census shows roughly comparable percentages in the common law and widowed, separated and divorced categories, slightly smaller percentages married at each age in the Guyana Fertility Survey and significantly higher percentages in visiting unions (Balkaran, 1980). The census defined a woman as in a visiting union only if she had borne a child within the past year and was not in any other union, whereas WFS classified women in visiting unions regardless of their fertility history.

Figure IV shows the percentage ever in union at different points prior to the survey date, using GFS data, census data and GFS data adjusted to census definitions of visiting unions. The age of union appears to have risen among younger women, but the trends between 1960 and 1970 from the GFS data appear exaggerated for the 15-19 group. This may be due to the exaggerated proportions ever in union which appear at each age group at different points in the past for the cohort of women aged 30-34, resulting possibly from age misstatement or, more likely, some misplacement of marriage dates in the past. Prior to 1960, some of the increases in the percentage in union may be due to the omissions of earlier unions by older women - in particular, visiting and common law unions. Thus, it seems that the current marital status distribution from GFS is reasonably accurate, but the trends are affected by omissions and date misstatements.

Birth history data

Of all births reported, 91.2 per cent were given with a month and a year (Chidambaram and Sathar, 1984). A comparison of parity from the GFS with the 1970 census shows higher parity in the GFS at the oldest two age groups (see table 1). This could reflect better enumeration. The lower parity at younger ages could reflect fertility declines. A comparison of mean number of children ever born for each age group from the 1970 census and reconstructed parity from the Guyana Fertility Survey shows very close correspondence for each age except the 25-29-year-olds, which is reported in the GFS to have slightly higher parity than in the census in 1970. This is the cohort aged 30-34 at the time of the survey, which also appeared to have exaggerated years since first marriage (see above).

Table 2 presents cohort-period fertility rates for five-year periods in the past. First, it can be seen that omissions are unlikely to be a major problem, since the parity of 45-49-year-olds at age 40-44 is roughly the same as women aged 40-44 at the time of the survey. However, it is likely that there has been some shifting of births towards the present by older cohorts (see fig. V). Both the 40-44 and 45-49 age groups have older fertility schedules than do their next younger counterparts, though they all peak at 25 years. It is also apparent that the 30-34 cohort has fertility that is implausibly high in periods in the past. The combination of the two factors suggests that the fertility estimated for the period 5-14 years before the survey may be too high and therefore, the trend may be exaggerated. The schedule of age-specific fertility declines in figure VI shows some irregularities but no strong evidence of back-dating of births from 0-4 to 5-9 years before the survey.

A comparison of age-specific fertility rates from civil registration data and GFS in table 3 shows significantly higher fertility recorded in the GFS for every age for years in the past. For example, the GFS records a TFR of 6.6 for the period 1960-1964 compared to 6.1 from civil registration data. For the period 1970-1974, the rates are 5.1 and 4.5, respectively. Nonetheless, the decline is essentially identical between the two sources.

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Table 1. Children ever born per woman from 1960 and 1970 censuses and WFS: Guyana

Age group	1960 census	1970		1975 WFS
		WFS	census	
15-19	0.3	0.2	0.2	0.3
20-24	1.8	1.4	1.4	1.3
25-29	3.4	3.7	3.4	2.8
30-34	4.5	4.9	4.9	4.8
35-39	..	5.8	6.0	5.7
40-44	..	6.3	6.2	6.3
45-49	..	..	5.9	6.4

Source: S. Balkaran, "Evaluation of the Guyana Fertility Survey, 1975", Scientific Reports, No. 26 (Voorburg, Netherlands, ISI/WFS, June 1980); For the 1970 census, 45-49 years: Demographic Yearbook, Historical Supplement: Special Issue (United Nations publication, Sales No. E/F.79.XIII.8), table 7.

Table 2. Cohort period rates and cumulative cohort fertility by age at survey: Guyana, 1975

Age group of cohort at end of period	Number of women in cohort	Years prior to survey						
		0-4	5-9	10-14	15-19	20-24	25-29	30-34
Cohort-period fertility rates								
10-14	0	0.000	0.000	0.001	0.001	0.001	0.003	0.001
15-19	1 025	0.039	0.044	0.050	0.090	0.080	0.075	0.055
20-24	978	0.217	0.239	0.306	0.298	0.273	0.255	
25-29	760	0.263	0.345	0.344	0.339	0.310		
30-34	554	0.216	0.260	0.297	0.292			
35-39	504	0.147	0.191	0.228				
40-44	428	0.078	0.115					
45-49	393	0.023						
Cumulative fertility of cohorts at end of period								
10-14		0.000	0.001	0.004	0.004	0.007	0.014	0.007
15-19		0.196	0.224	0.253	0.455	0.413	0.383	0.282
20-24		1.307	1.446	1.986	1.901	1.748	1.560	
25-29		2.763	3.709	3.619	3.444	3.109		
30-34		4.791	4.921	4.930	4.570			
35-39		5.655	5.886	5.712				
40-44		6.273	6.288					
45-49		6.402						

Source: WFS standard recode tapes.

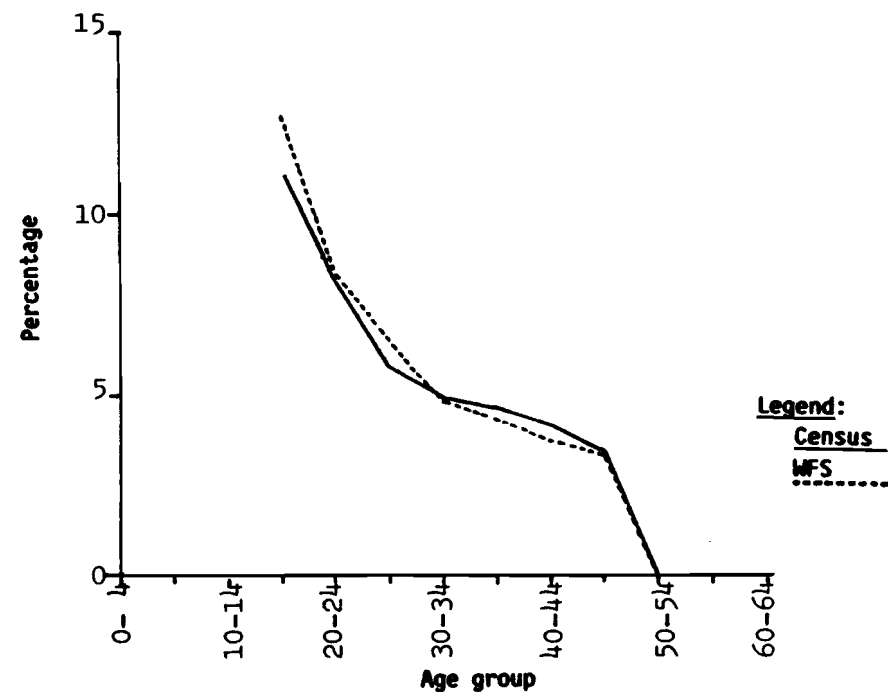
Table 3. Age-specific fertility rates for selected periods from WFS and birth registration data: Guyana

Age group	1960-1964		1965-1969		1970-1974		Percentage change	
	BR (1)	WFS (2)	BR (3)	WFS (4)	BR (5)	WFS (6)	WFS (2) - (6)	Outside (1) - (5)
15-19	0.132	0.167	0.117	0.136	0.107	0.118	-29.3	-18.9
20-24	0.335	0.364	0.279	0.332	0.260	0.291	-20.1	-22.4
25-29	0.296	0.318	0.275	0.308	0.219	0.250	-21.4	-26.0
30-34	0.246	0.271	0.216	0.231	0.170	0.191	-29.5	-30.9
35-39	0.152	..	0.136	0.154	0.108	0.117	..	-29.0
40-44	0.050	..	0.044	..	0.040	0.049	..	-20.0
45-49	0.007	..	0.006	..	0.005	..	..	-28.6
TFR	6.1	6.6 a/	5.4	6.1 a/	4.5	5.1	-22.7	-26.2

Source: birth registration data for 1960-1964 and 1970-1974: S. Balkaran, "Evaluation of the Guyana Fertility Survey, 1975", *Scientific Reports*, No. 26 (Voorburg, Netherlands, ISI/WFS, February 1982), p. 41; 1965-1969: S. Singh, "Demographic variables and fertility in Guyana, 1960-1971", *Population Studies*, vol. 33 (1979), p. 317, table 3.

a/ For the purpose of calculating a total fertility rate, the age-specific fertility rates from the registration data were used when the age-specific fertility rate from WFS was not available.

Figure II. Distribution of the female population by five-year age groups: World Fertility Survey (1975) and 1970 census: Guyana



Source for the census of 1970: Demographic Yearbook, Historical Supplement: Special Issue (United Nations publication, Sales No. E/P.79.XIII.8), table 3.

**Figure III. Distribution of ever-married women aged 15-49
by years since first married: Guyana**

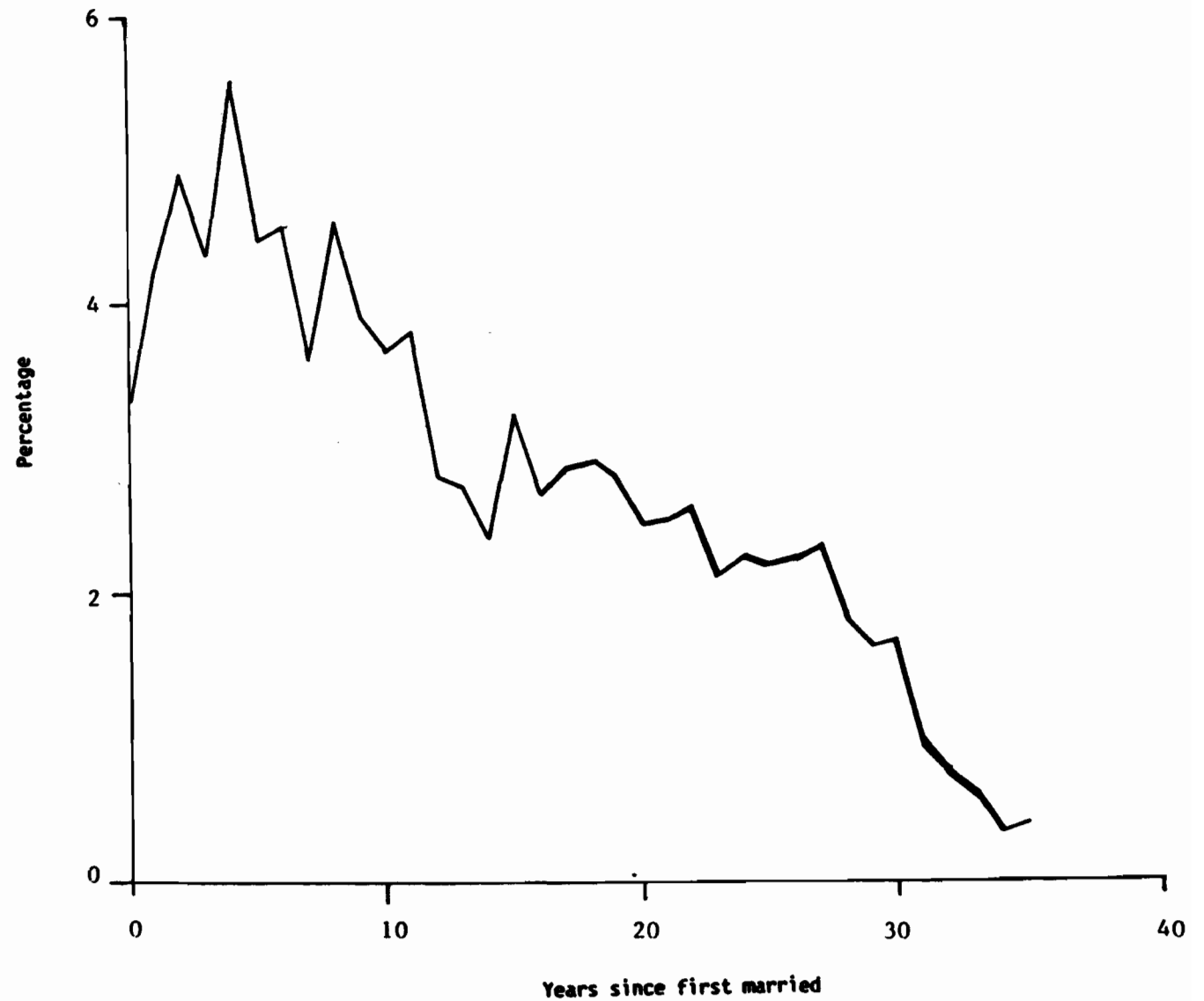
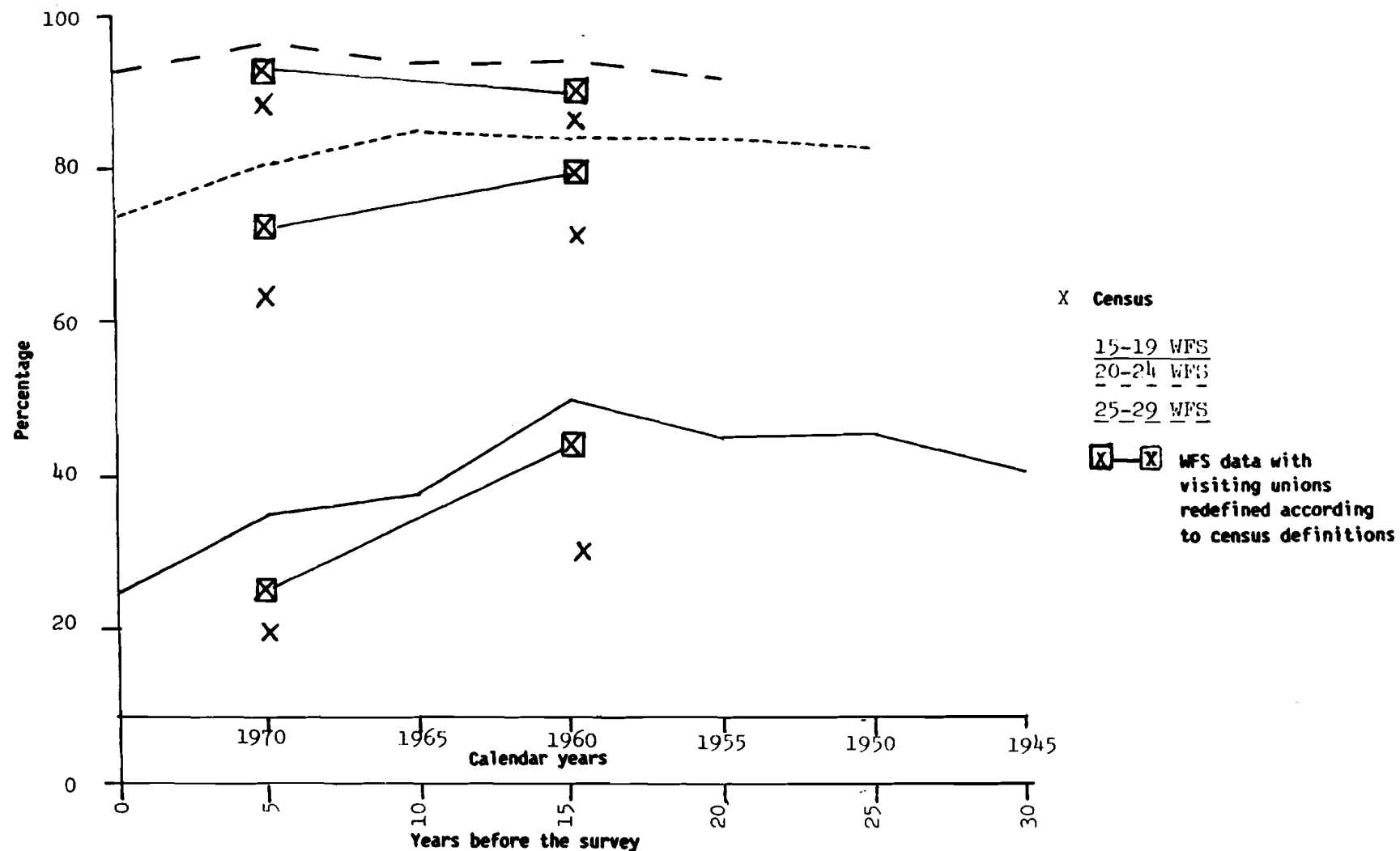
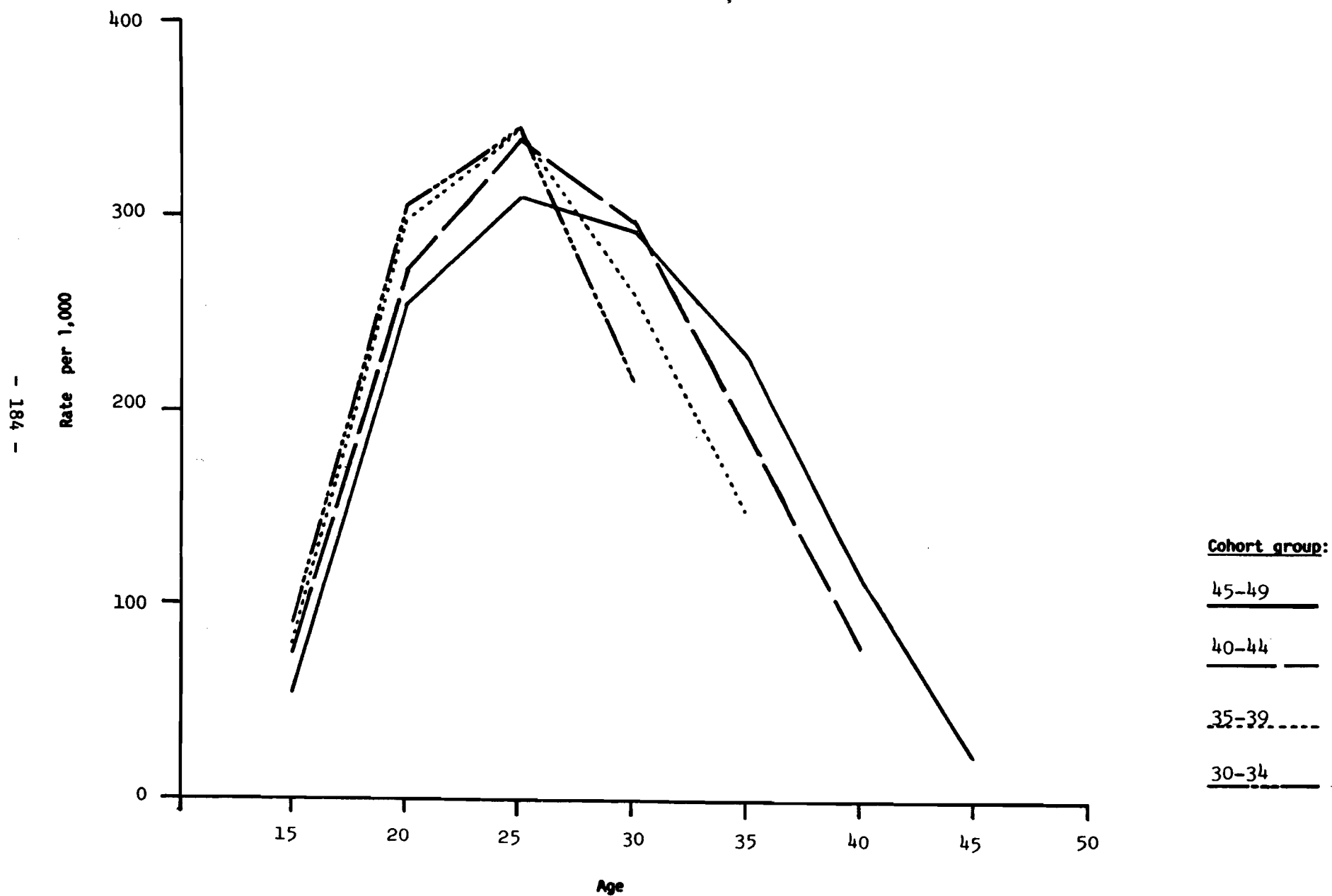


Figure IV. Proportions ever-married at designated periods prior to the survey for selected age groups: World Fertility Survey data and other sources: Guyana

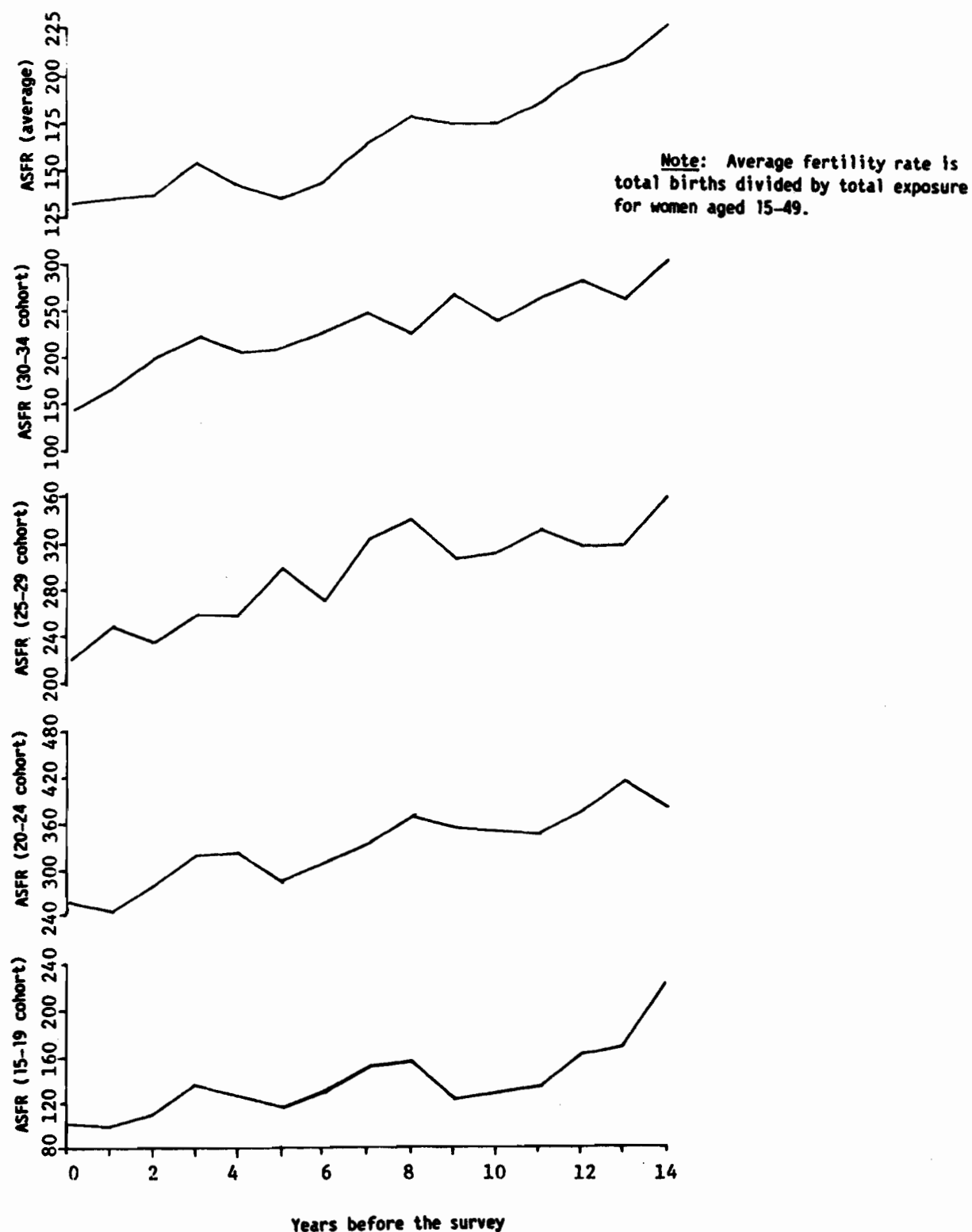


Source for adjusted WFS and census data: S. Balkaran, "Evaluation of the Guyana Fertility Survey, 1975", *WFS Scientific Reports*, No. 26 (Voorburg, Netherlands, ISI/WFS, February 1982), table 6.

**Figure V. Cohort-period fertility rates for women aged 30-49 at interview:
Guyana**



**Figure VI. Age-specific fertility rates for selected cohorts and average fertility rate for single years before the survey:
Guyana**



HAITI

The Haitian Fertility Survey (Enquête haitienne sur la fecondité) was conducted between July and September of 1977. Previous data on fertility for Haiti came from the population census of 1971 and the Multiround Demographic Survey conducted between 1971 and 1975. Civil registration is not complete, and registration data will not be used for comparison with the EHF.

Age data

In the individual questionnaire, 91.7 per cent of respondents reported their date of birth with month and year of birth, and only 8.3 per cent reported only the calendar year (Chidambaram and Sathar, 1984). The single-year household age distribution shows heaping on digits ending with 0, 5, 2 and 7. The Myer's index for digital preference was 9.9 for females (Rutstein, 1984), which is an improvement over that for the 1971 census, which was 13.4 for females (Tardieu, 1984).

A comparison of the male and female age distributions from the household survey (fig.I) shows considerable heaping among females in the age groups 10-14 years and 50-54 years. Those age groups lie just outside the boundaries for eligibility in the individual interview, and it is likely that the interviewers under-/over-stated age in order to avoid the individual interview. Young children, especially those aged 5-9 years, both males and females, appear to be under-enumerated. The 1977 census female age distribution is not without flaw. Nevertheless, a comparison with the EHF female age distribution (fig. II) confirms the observations made in the comparison with the male age distribution from the EHF. In addition, there appears to be a deficit of females between the ages of 35 and 44 years.

Marriage history data

Of the 2,252 ever-married respondents who were asked about their marriage history, 92.7 per cent knew the month and year of their first union while 7.3 per cent knew only the year (Chidambaram and Sathar, 1984). The percentage distribution of years since first union (fig. III) is rather erratic, with a pronounced heaping of marriages 2-8 years before the survey. There appeared to be corresponding large deficits 0 and 1 year before the survey and 10 and 11 years before the survey.

In Haiti, the more stable unions are legal marriage and customary unions (placée), while the more unstable ones include the rinmin/fiancée and the vivavek, which do not involve cohabitation between the partners. The EHF defined as single only those women who have never had sexual relations. The 1971 census, however, did not separate out unstable unions but instead classified women in unstable unions as being single as well. Comparisons between the two sources should therefore take this into account. Figure IV shows a reconstruction of the proportions married for periods in the past. For all three of the youngest age groups, there appears to be a peak 5 years before the survey and a dip at the time of the survey. This is most likely due to some backward shifting of marriage dates away from the survey, as seen in figure III. Further, there appears to be a deficit of marriages in the

10-year period before the survey in all age groups. In general, there is very little evidence of a substantial decline in proportion married, although a small decline is suggested among 15-19-year olds. Comparison with the 1977 census is difficult because of the differences in definition that were mentioned above. A regrouping of the EHF data allows some comparison between the survey and the census for women in stable unions. The percentages are quite similar implying little change in the proportions in a stable union over the six-year period.

Birth history data

An event chart was used in estimating birth dates of all births reported in the birth history. Of the 8,022 reported births, 93.8 per cent were reported with both the month and year of birth (Chidambaram and Sathar, 1984). The parity distribution at the time of the survey (table 1) shows a monotonically increasing distribution up to age 45-49, at which point the mean number of children ever born was 5.9. A comparison of the 1971 census parity distribution with that reconstructed from the EHF birth history for 1971 shows very close correspondence. Among women aged 40-44 years the mean number of children ever born recorded in the EHF is slightly lower than that of the census.

An examination of the cohort-period fertility rates (table 2) shows lower fertility at the young age groups among the oldest cohorts. Some omission of early births probably occurred among that cohort. The age pattern of cohort fertility (fig. V) shows an older age pattern for the 45-49 cohort than those for the younger cohorts, which is an indication of some shifting of dates of births towards the survey date. Single-year fertility rates by age group are shown in figure VI. The average rate (for all age groups) is fairly smooth and constant over the preceding 10-year period, except for pronounced heaping 10 years before the survey date, with corresponding troughs 9 and 11 years before the survey date. The average rates also show a sharp increase in rates in the 0- and 1-year periods before the survey. Some shifting of births probably occurred and is more pronounced for the different age groups. Among the 15-19 and 20-24-year olds, there appears to be a deficit of births two years before the survey, while among 25-29 and 30-34-year olds, the deficit occurs one year before the survey. In addition, the rates for the latter two age groups appear very erratic over the whole 10-year period.

Age-specific rates estimated from the second round of the Multiround Demographic Survey were compared with those obtained from the birth history of the EHF (table 3). The total fertility rate from the EHF in 1972-1974 was slightly higher - 5.5 - than the one obtained from the Demographic Survey - 5.1. Another analysis using preliminary results of rounds 2 and 3 of the Demographic Survey and of the 1971 census suggests somewhat higher total fertility for that period: it is estimated to lie between 5.75 and 5.90 as a minimum and 6.15 and 6.25 as a maximum (Allman and May, 1979). The EHF estimate falls slightly below that minimum value. A comparison of the age pattern of fertility from the two sources shows a slightly older age pattern from the EHF estimate.

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Table 1. Children ever born per woman from
HFS and the 1971 census: Haiti

Age group	1971		1977 HFS
	census	HFS	
15-19	0.1	0.1	0.1
20-24	1.0	1.0	0.8
25-29	2.2	2.2	2.0
30-34	3.5	3.7	3.4
35-39	5.0	5.0	4.5
40-44	5.5	5.3	5.6
45-49	..	..	5.9

Source: HFS (1977) and census (1971):
C. Tardieu "Evaluation des donnees de l'Enquete
haitienne sur la fecondite" Scientific Reports,
No. 50 (Voorburg, Netherlands, WFS/ISI, 1984),
p. 39.

Table 2. Cohort period rates and cumulative cohort fertility
by age at survey: Haiti

Age group of cohort at end of period	Number of women in cohort	Years prior to survey						
		0-4	5-9	10-14	15-19	20-24	25-29	30-34
Cohort-period fertility rates								
10-14	2	0.000	0.001	0.000	0.000	0.001	0.001	0.002
15-19	794	0.021	0.023	0.033	0.034	0.043	0.030	0.018
20-24	720	0.130	0.140	0.142	0.147	0.179	0.116	
25-29	550	0.229	0.241	0.248	0.284	0.241		
30-34	392	0.259	0.255	0.277	0.289			
35-39	355	0.212	0.208	0.254				
40-44	271	0.137	0.185					
45-49	266	0.086						
Cumulative fertility of cohorts at end of period								
10-14		0.000	0.005	0.001	0.002	0.005	0.006	0.008
15-19		0.108	0.116	0.169	0.176	0.220	0.158	0.090
20-24		0.766	0.867	0.888	0.953	1.054	0.670	
25-29		2.010	2.095	2.191	2.472	1.876		
30-34		3.392	3.464	3.855	3.320			
35-39		4.524	4.898	4.589				
40-44		5.584	5.513					
45-49		5.941						

Source: S. Singh, "Birth histories", WFS Comparative Studies,
Cross-national Summaries: Additional Tables (Voorburg, Netherlands,
ISI/WFS, 1984), p. 88.

Table 3. Age-specific fertility rates
for selected periods from
WFS and the Multiround
Demographic Survey: Haiti

Age group	Multiround Demographic Survey, 1973	HFS 1972-1974
15-19	0.063	0.061
20-24	0.205	0.197
25-29	0.248	0.267
30-34	0.215	0.233
35-39	0.170	0.180
40-44	0.080	0.126
45-49	0.045	..
TFR	5.1	5.5

Source: Multiround Demographic
Survey, 1973: J. Allman and J. May,
"Fertility, mortality, migration and
family planning in Haiti", Population
Studies, vol. 33 (1979), p. 505.

Figure I. Distribution of males and females as a percentage of the total population by five-year age groups: Haiti

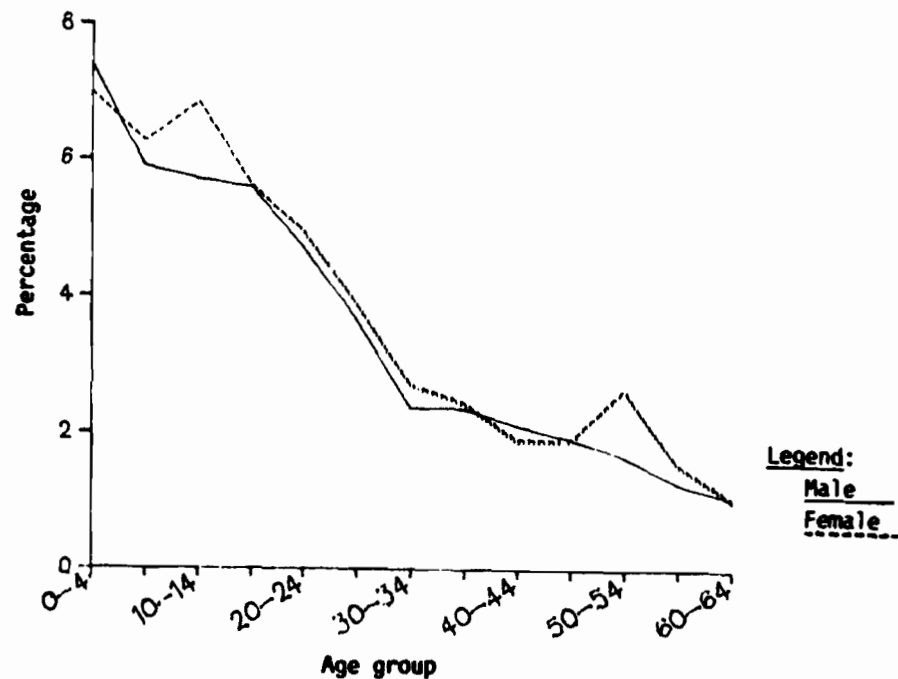
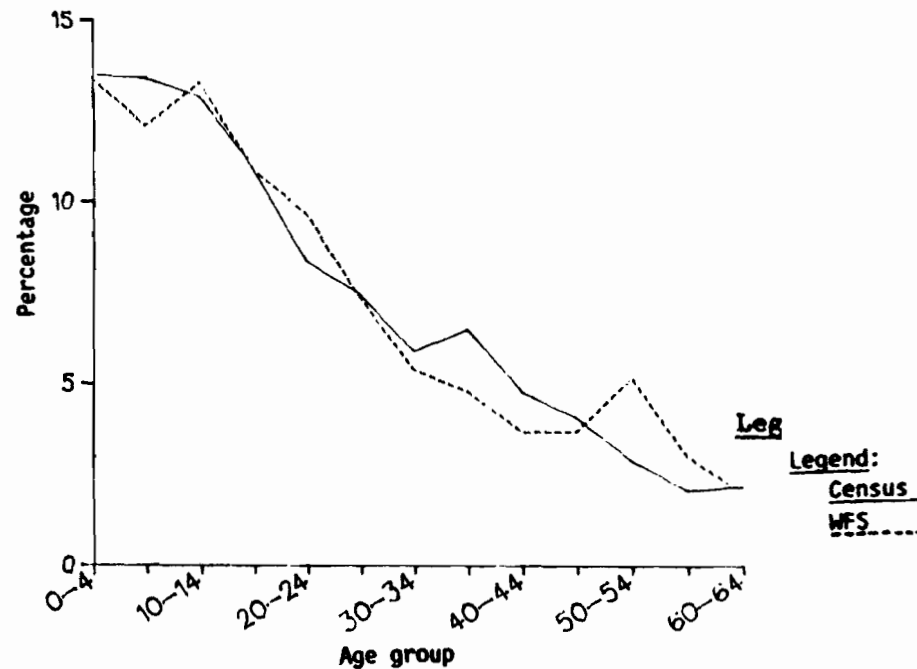


Figure II. Distribution of the female population by five-year age groups: Haitian Fertility Survey (1977) and 1971 census: Haiti



Source: for the 1971 census: Institut haitien de statistique, Enquête Haitienne sur la Fecondité, 1977. Rapport national, vol. I (Port-au-Prince, 1981), p. 14 tableau 3.0.1.1; for the 1977 HFS: Camille Tardieu, "Evaluation des données de l'Enquête haitienne sur la fecondité", WFS Scientific Reports, No. 50, (Voorburg, Netherlands, ISI/WFS), p. 19, table 5.

**Figure III. Distribution of ever-married women aged 15-49
by years since first married: Haiti**

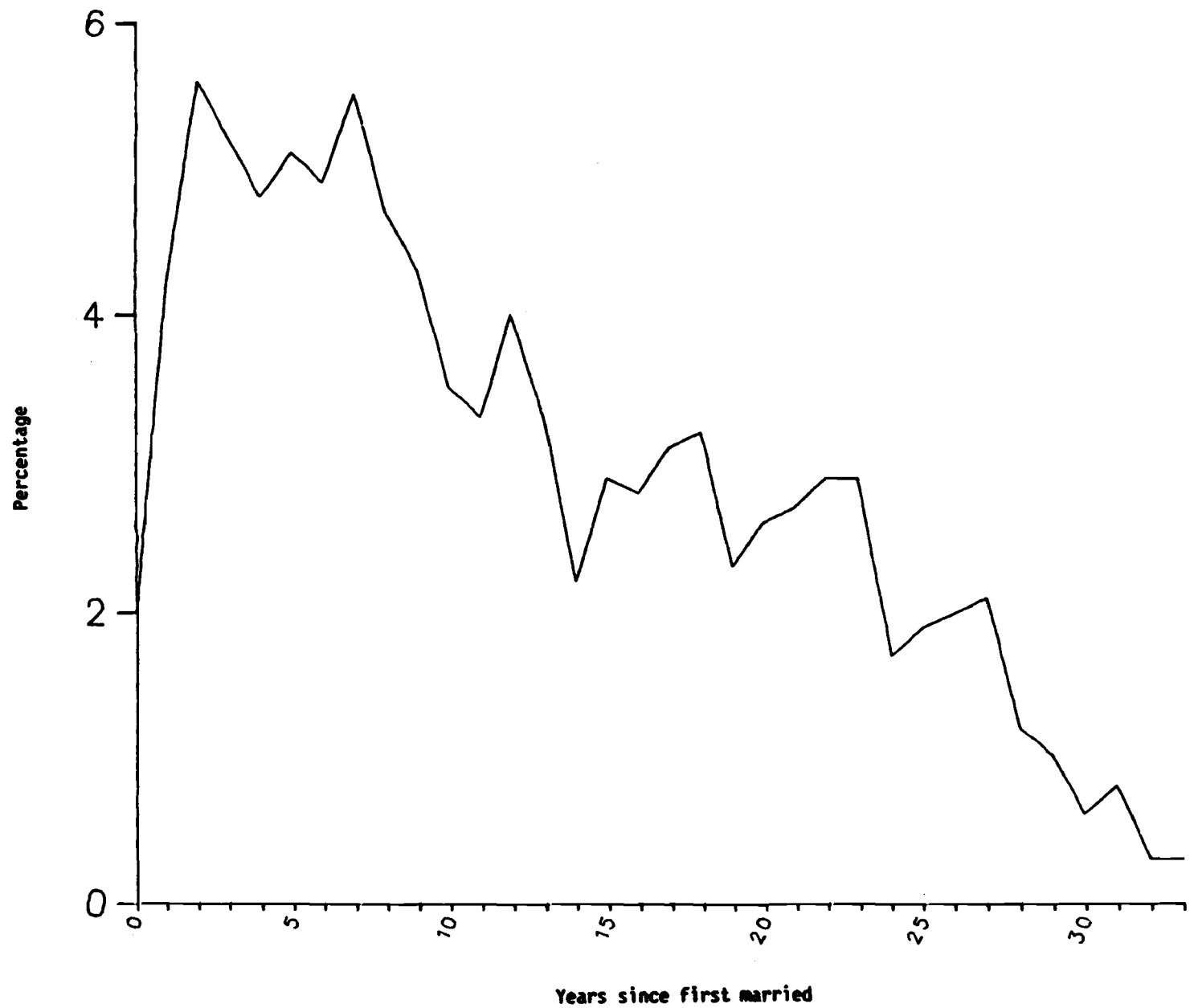
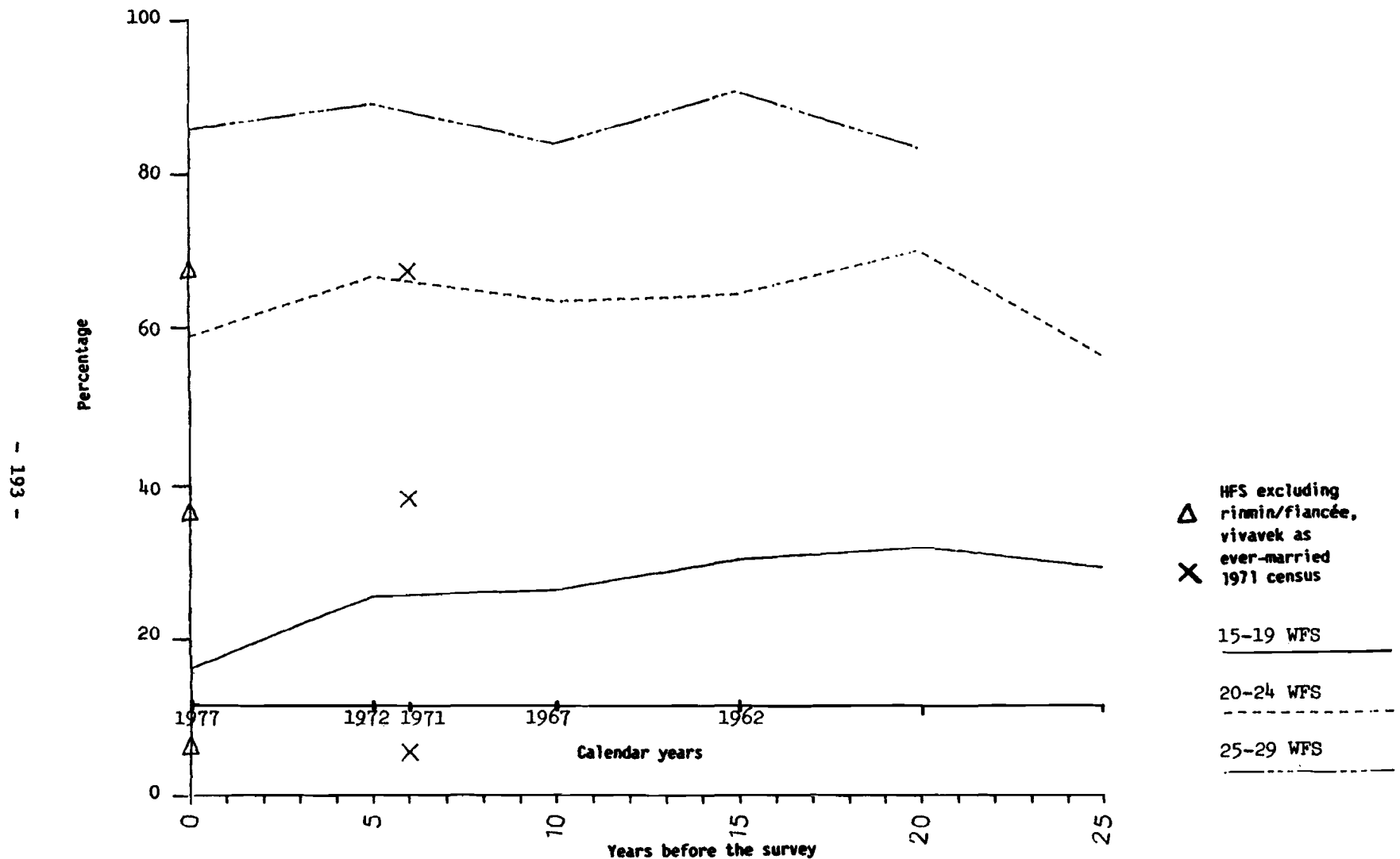
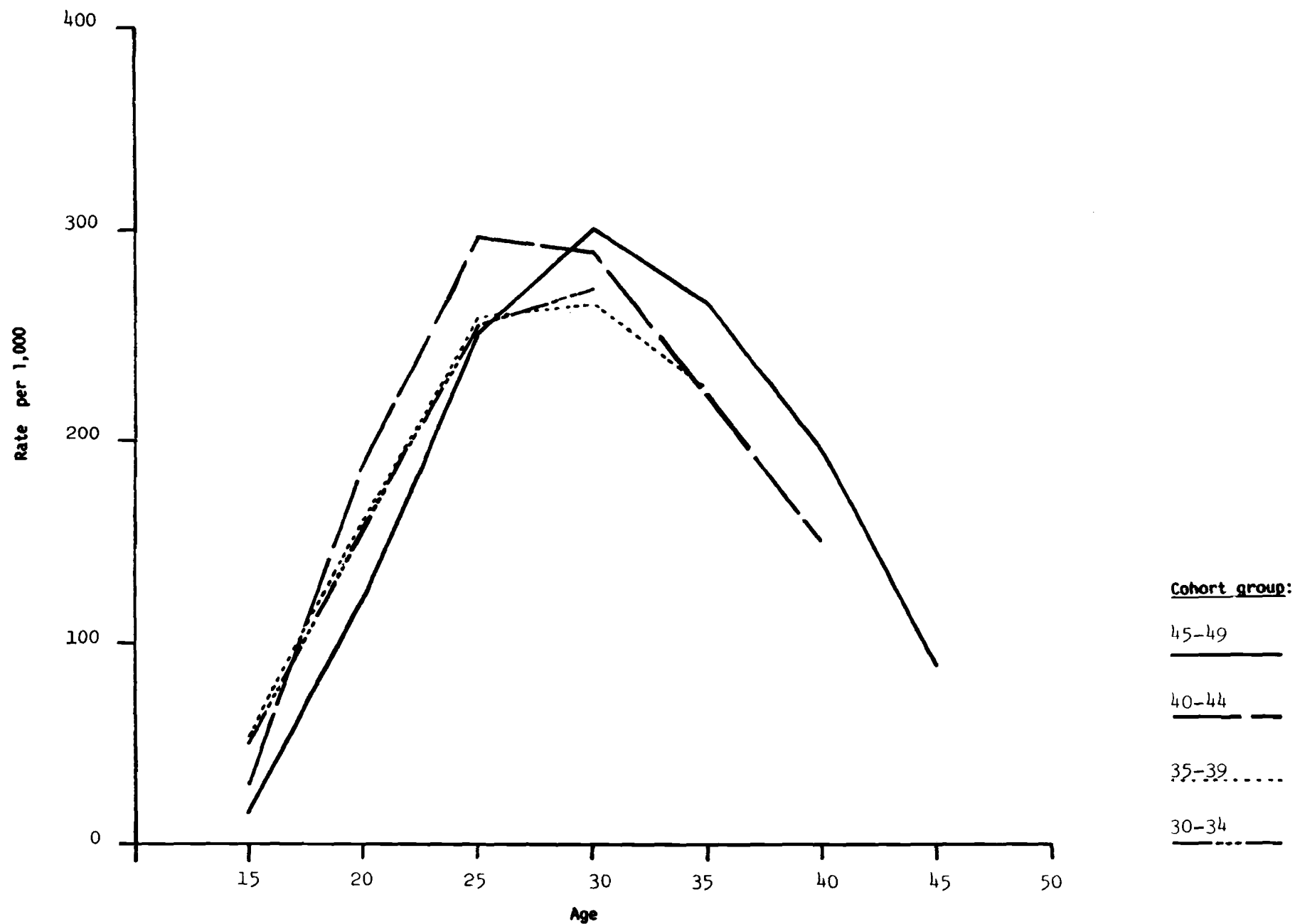


Figure IV. Proportions ever-married at designated periods prior to the survey for selected age groups: World Fertility Survey data and 1971 census data: Haiti

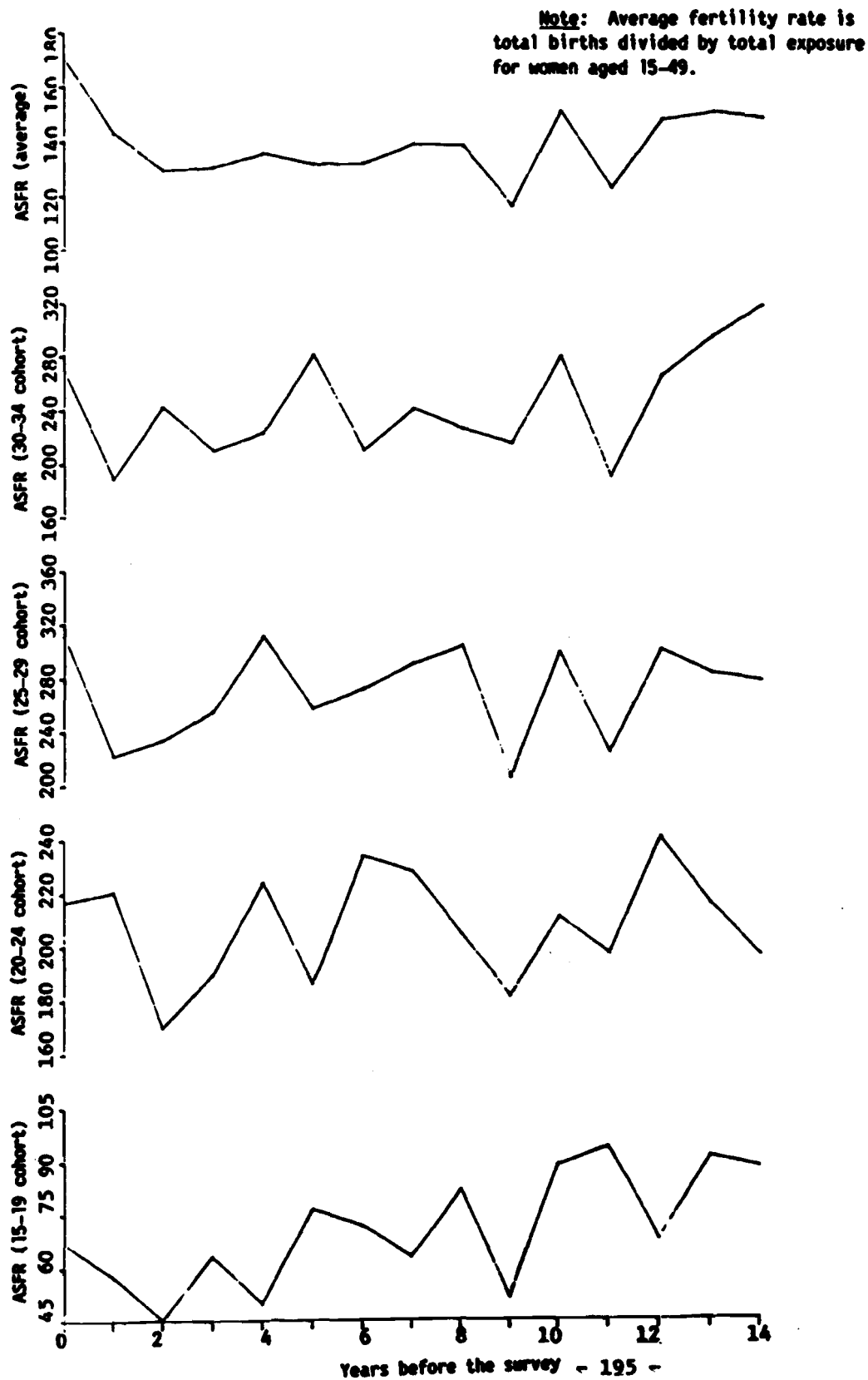


Source: Institut haitien de statistique, Enquête Haitienne sur la Fecondité (1977). Rapport national, vol. I (Port-au-Prince, Janvier 1981), p. 17, tableau 3.0.1.5.

Figure V. Cohort-period fertility rates for women aged 30-49 at interview:
Haiti



**Figure VI. Age-specific fertility rates for selected cohorts and average fertility rate for single years before the survey:
Haiti**



INDONESIA

The Indonesian Fertility Survey was canvassed from April to May 1976. In 1976 an intercensal population survey (SUPAS) was designed to provide measures of population change at the middle of the census decade 1971-1981. The project consisted of three phases: SUPAS I, a large-scale household survey (national in scope) which listed basic demographic characteristics of the population; SUPAS II, a subsample of SUPAS I, which included a comprehensive set of questions on demographic and socio-economic characteristics; and SUPAS III, which was the household sample for the Indonesian Fertility Survey. The Indonesian Fertility Survey (IFS) was confined to the island of Java and Bali, which contain about two thirds of the Indonesian population.

Since independence in 1945, only two nation-wide censuses have been conducted, in 1961 and in 1971. The mid decade population survey in 1976 was undertaken to provide more reliable information about population trends, since the birth registration system has poor geographical coverage and is not complete, where it exists (Suharto and Cho, 1978).

Age data

An Indonesian Reliability Survey (IRS), using a subsample of successfully interviewed respondents, was conducted to measure the reliability of IFS data on birth dates and ages. In the IFS individual questionnaire the respondent was asked her year of birth and, if she did not know, she was asked her age. In both surveys, the interviewer asked the month of birth. Allowing a margin difference of less than one year, consistent answers were obtained for only 43 per cent of respondents reinterviewed in IFS (MacDonald, Yasin and Jones, 1978). Data from the individual questionnaire of IFS show that only 22.3 per cent of the respondents reported both the month and year of birth (Chidambaram and Sathar, 1984).

The single-year age distribution from the household survey shows a considerable amount of heaping on digits ending with 0 and 5. Myer's index for females is 11.6 (Rutstein, 1984). Grouped data for females show heaping at ages 5-9 and/or an under-enumeration of children aged 0-4 as well as heaping at ages 35-39 and at ages 50-54 (fig. I). The heaping at ages 50-54 has occurred in other WFS surveys, resulting from shifting of women aged 45-49 into the 50-54 age group. The male age distribution also shows heaping at ages 5-9 years, 35-39 years and, to a lesser extent, 45-49 years. There is no heaping on 50-54 for males.

A comparison with the age distribution obtained from SUPAS II (1976) in figure II shows that heaping also occurred at ages 35-39 and 15-19 but heaping at ages 50-54 is absent in SUPAS II, as expected. Further, the 0-4 age group is larger than the 5-9 age group, which are both proportionately higher in SUPAS II than in IFS. The results of the Indonesian Reliability Survey show that among women aged 35-39 on reinterview, 13.8 per cent reported ages that were three or more years older and 12.3 per cent reported ages that were three or more years younger. Only 37.0 per cent reported the same age. (MacDonald, Yasin and Jones, 1978). Among women aged 45-49 as many as 22.6 per cent were found to be older by three or more years, and only 35.8 reported the same

age. Thus, there appears to be a considerable amount of shifting from one age to the next on reinterview. The extent to which this shifting is parity-related is not known.

Marriage history data

The marriage history data is based on a sample of 9,155 ever-married women - a large sample by WFS standards. Of the respondents, 45.7 per cent gave the month and year of first marriage, and 41 per cent responded in terms of age at first marriage rather than year (Chidambaram and Sathar, 1984). Allowing for a margin of error of less than one year, the IRS showed consistent answers for age at first marriage in 38 per cent of the cases (MacDonald, Yasin and Jones, 1978). The percentage distribution of years since first marriage (fig. III) shows some heaping at durations ending with 0 and 5 at longer durations. In addition, there appears to be a relatively large number of marriages in the 2-6 years before the survey and a relative deficit at one year.

The current proportions ever-married in five-year age groups from the IFS, when compared with those obtained from SUPAS II (which is a sample of almost all of Indonesia, while the Indonesian Fertility Survey is a sample from Java and Bali only), show close correspondence, with SUPAS II being slightly lower for nearly all age groups (Biro Pusat Statistik, 1978). Reconstructed proportions married for periods in the past show close correspondence with other sources of data for the older age groups (fig. IV). However, for the 15-19 age group, the trends in proportions ever-married from IFS seems exaggerated when compared with past census and survey data.^{1/}

Birth history data

Information on date of birth was obtained in the same manner as date of birth of the respondent and date of marriage. The year and the month of birth were given for 46.5 per cent of all births (Chidambaram and Sathar, 1984). The Indonesian Reliability Survey reported that only 36.7 per cent of first births reported in the reinterview had dates which were within one year of the date or age given in IFS.

The mean number of children ever born per ever-married woman from the IFS is slightly lower for some groups than corresponding data from SUPAS II which refers to all of Indonesia (table 1). The IFS distribution shows women aged 40-44 having a slightly higher average parity than women aged 45-49 years. This is an indication of omission of births among older women. The Reliability Survey found that discrepancies in the number of children born between the original interview and the reinterview mostly involved dead children. Older respondents and those with little or no education were more prone to such errors (MacDonald, Yasin and Jones, 1978).

Table 2 shows the cohort-period rates for individual five-year periods before the survey. Displacement of births to the 5-14 years before the survey, possibly from the present and more probably from the most distant past is indicated. For each group, there is some increase in fertility recorded up until the 5-14 years before the survey and a decline in the most recent

period. Figure V corroborates this by showing that the younger the cohort, the younger the pattern of age-specific fertility.

An examination of figure VI shows trends in age-specific fertility rates for the 15 years before the survey. There is a strong suggestion of preference for certain dates (or ages of children) for periods more than 10 years in the past. The apparent "trough" in rates within the five years preceding the survey is unlikely to be genuine. While it cannot be proved that age/date misreporting involved shifts across five-year boundaries, some transfer from the period 0-4 to 5-9 years before the survey must be suspected.^{2/}

Age-specific fertility rates for calendar years in the past are compared with similar rates from SUPAS I^{3/} (own children method) and the 1971 census (also own children method) in table 3. For the most recent periods, IFS and SUPAS I compare quite closely, with SUPAS I having slightly higher rates in almost all age categories. For the period covering 1967-1970, three sets of figures are compared. All three sources are reasonably close for the youngest three age groups, but the IFS is higher for ages 35-39 and 40-44. In terms of fertility trends, it is likely that the IFS births in the most recent period have been displaced to the next to the most recent period (that is, 0-4 to 5-9 years before the survey), which could be why the IFS rate is less than SUPAS I in 1971-1976 and more than SUPAS I in 1967-1970.^{4/} The comparison of trends in these alternative fertility measures from table 3 and figure V, as well as the under-enumeration of children 0-4, noted above, reinforce the likelihood that some recent births were shifted to the 5-9 years before the survey. In addition, the pattern of rates of more distant periods and for older versus younger cohorts (table 2 and fig. V) suggests shifting towards the interview into the period 5-14 years before, and/or omission of distant births.

Notes

^{1/} Survey data are available for 1967 and 1963, while census data are available for 1971. The proportions married from these sources are reported in McNicoll and Mamas, 1973.

^{2/} An analysis of the recent birth history from the Indonesia fertility/mortality survey in 1973 shows very similar findings with respect to the deficit of births in the first two years prior to the survey. A follow-up re-survey in 1975 showed that a misstatement of year of birth was a major factor in the low number of reported births in 1971 and 1972 (McDonald, Yasin and Jones, 1976).

^{3/} These included an adjustment for under-enumeration of young children (Suharto and Cho, 1978).

^{4/} An evaluation of the Indonesia Fertility Survey also found possible shifting of births to the adjacent years in the three-year period prior to the survey (Supraptilah, 1982).

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Table 1. Children ever born per ever-married woman from WFS, SUPAS II and 1971 census: Indonesia

Age group	1971 a/ census	1976 a/ SUPAS II	1976 WFS
15-19	0.6	0.7	0.6
20-24	1.7	1.6	1.7
25-29	3.1	2.9	2.8
30-34	4.2	4.2	4.0
35-39	4.9	5.1	4.8
40-44	5.0	5.3	5.3
45-49	4.9	5.3	5.2

Source: 1971 census: Demographic Yearbook, Historical Supplement: Special Issue (United Nations publication, Sales No. E/F.79.XIII.8), table 7; 1976 SUPAS II: Biro Pusat Statistik, Fertility of the Indonesian Population-Tabulation, Series No. 1 (Jakarta, 1978), table 2.

a/ Data refer to all of Indonesia.

Table 2. Cohort period rates and cumulative cohort fertility by age at survey: Indonesia, 1976

Age group of cohort at end of period	Number of women in cohort	Years prior to survey						
		0-4	5-9	10-14	15-19	20-24	25-29	30-34
Cohort-period fertility rates								
10-14	47	0.000	0.001	0.004	0.005	0.007	0.007	0.005
15-19	947	0.044	0.063	0.074	0.089	0.085	0.074	0.066
20-24	1 624	0.198	0.212	0.231	0.226	0.223	0.190	
25-29	1 501	0.245	0.261	0.260	0.253	0.228		
30-34	1 414	0.202	0.231	0.238	0.230			
35-39	1 408	0.143	0.181	0.176				
40-44	1 250	0.082	0.109					
45-49	964	0.033						
Cumulative fertility of cohorts at end of period								
10-14		0.001	0.007	0.021	0.026	0.034	0.036	0.024
15-19		0.229	0.334	0.394	0.481	0.460	0.392	0.359
20-24		1.325	1.456	1.638	1.590	1.506	1.307	
25-29		2.678	2.941	2.890	2.773	2.446		
30-34		3.949	4.043	3.961	3.596			
35-39		4.760	4.865	4.477				
40-44		5.272	5.020					
45-49		5.183						

Source: WFS standard recode tapes.

Table 3. Age-specific fertility rates for selected periods from the Census, SUPAS I, and WFS: Indonesia

Age group	1967-1970			1971-1975		Percentage change	
	SUPAS I (1)	Census (2)	WFS (3)	SUPAS I (4)	WFS (5)	WFS (3) - (5)	Outside source (1) - (4)
15-19	0.145	0.162	0.154	0.130	0.127	-17.5	-19.8
20-24	0.256	0.275	0.262	0.254	0.250	- 4.6	- 7.6
25-29	0.255	0.256	0.254	0.240	0.226	-10.2	- 6.3
30-34	0.191	0.192	0.209	0.183	0.170	-18.7	- 4.7
35-39	0.127	0.110	0.145	0.106	0.116	-20.0	- 3.6
40-44	0.054	0.048	0.090	0.051	0.052	-42.2	- 6.3
45-49	0.021	0.014	..	0.016	0.016	..	- 0.1
TFR	5.2	5.3	5.7 a/	4.9	4.8	-15.8	- 5.8

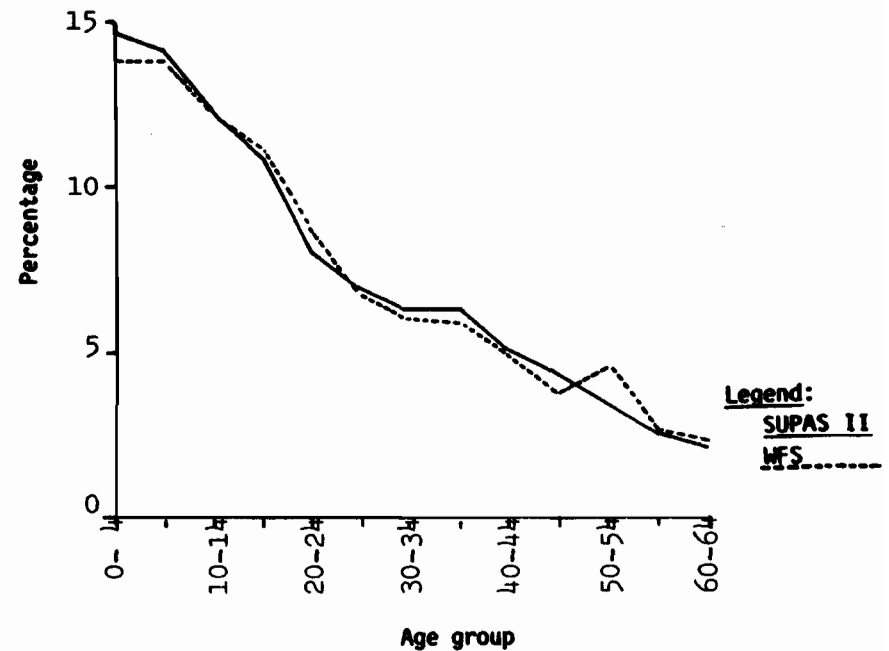
Source: SUPAS I and 1971 census: S. Suharto and L.J. Cho, "Preliminary estimates of Indonesian fertility based on the 1976 intercensal population survey", Papers of the East-West Population Institute No. 52 (Honolulu, East-West Center, 1978), tables 2 and 5. The own-children method was used to obtain these rates.

a/ For the purpose of calculating a total fertility rate, an average of the age-specific fertility rates for 45-49 were taken from the census and SUPAS I.

Figure I. Distribution of males and females as a percentage of the total population by five-year age groups: Indonesia



Figure II. Distribution of the female population by five-year age groups: World Fertility Survey (1976) and SUPAS II (1976): Indonesia



Source: SUPAS II (1976): Biro Pusat Statistik, 1976 Intercensal Population Survey: Tabulation Series, No. 3 (Jakarta, 1978), table 01.

**Figure III. Distribution of ever-married women aged 15-49
by years since first married: Indonesia**

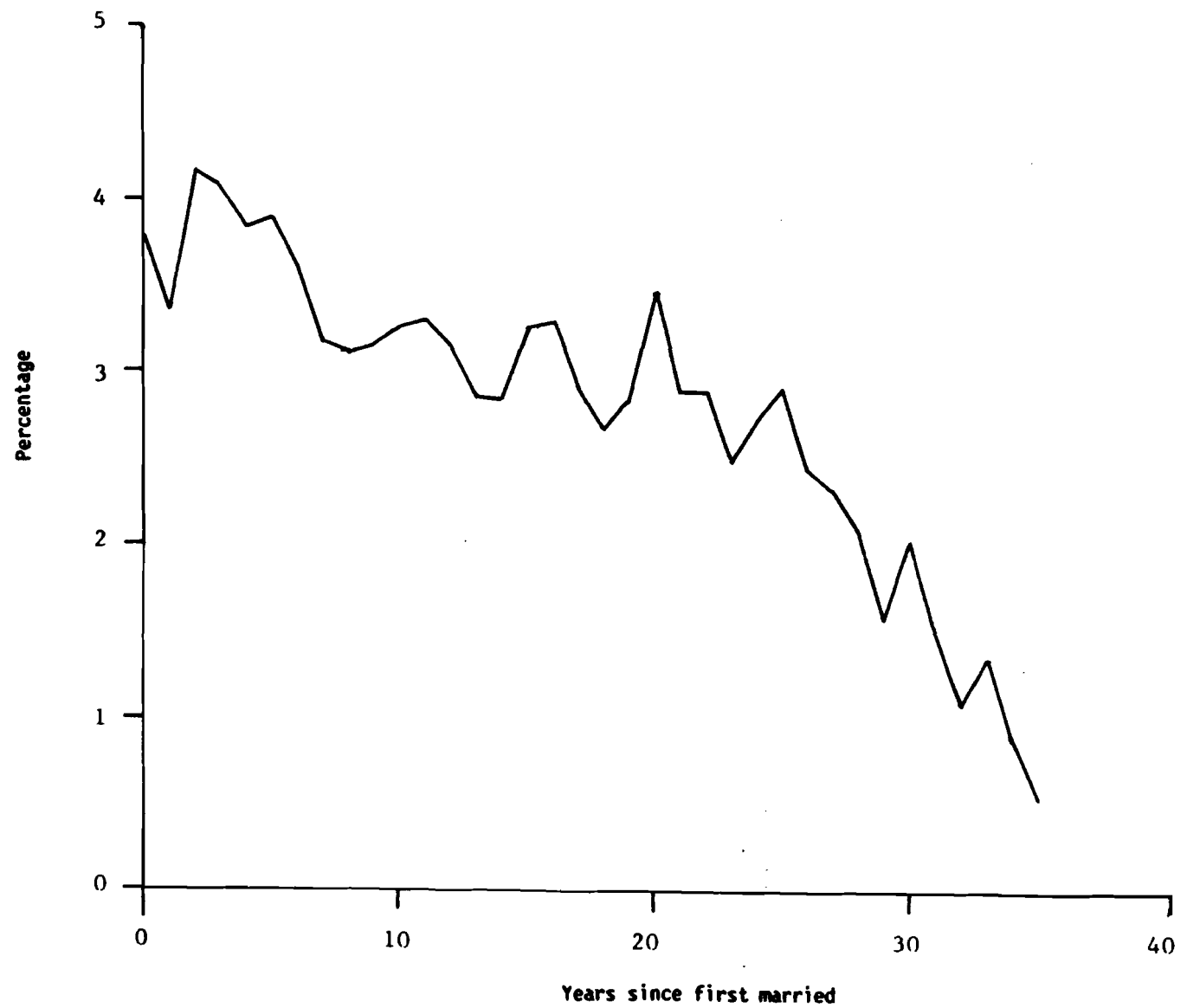
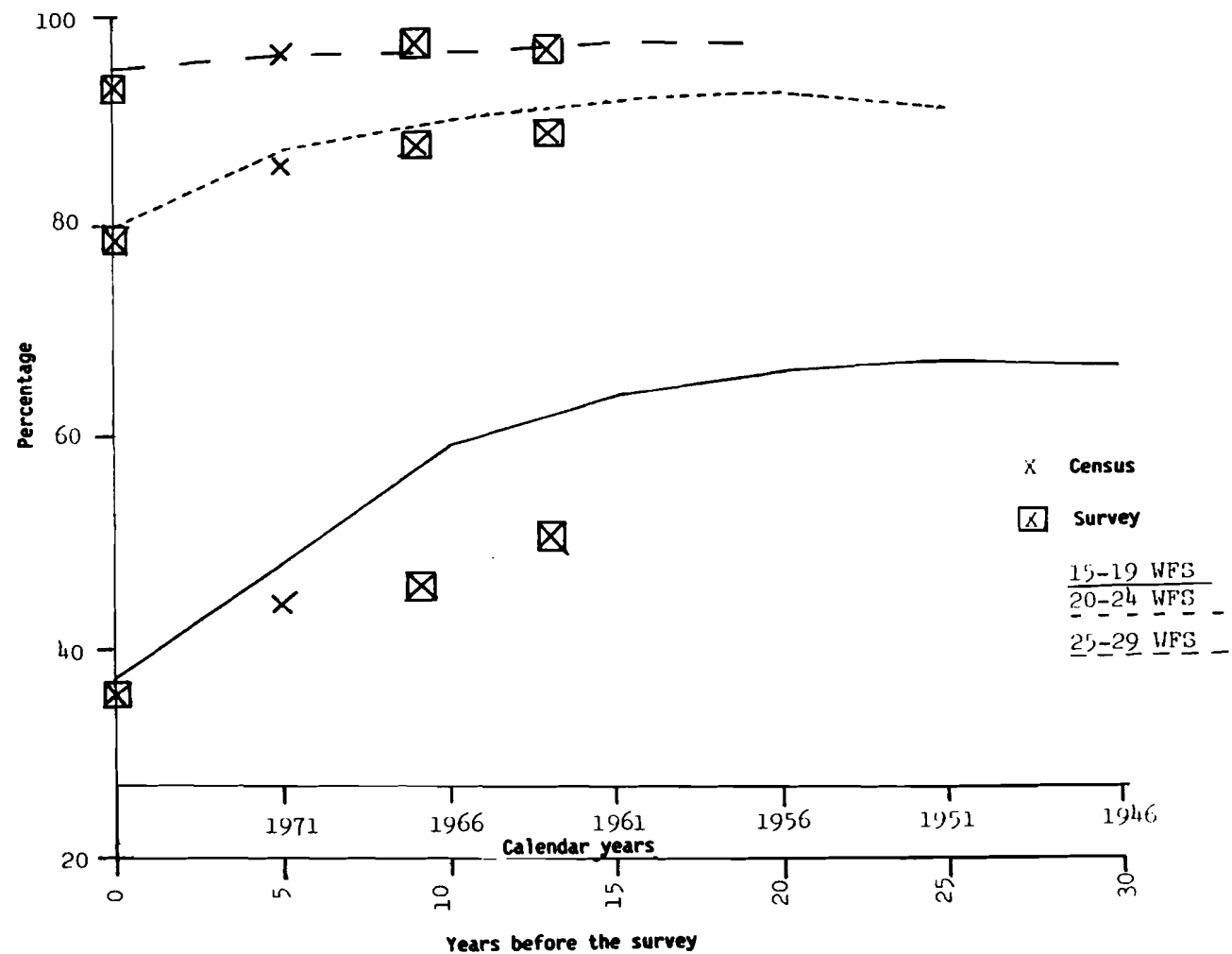


Figure IV. Proportions ever-married at designated periods prior to the survey for selected age groups: World Fertility Survey data and other sources: Indonesia



Source: for the 1976 survey: Biro Pusat Statistik, Fertility of the Indonesian Population: Tabulation Series, No. 1 (Jakarta, 1978), table 02; for the 1971 census and the 1967 and 1963 surveys: G. McNicoll and M. Mamas, "The demographic situation in Indonesia", Papers of the East-West Population Institute, No. 28 (Honolulu, East-West Center, 1973).

Figure V. Cohort-period fertility rates for women aged 30-49 at interview:
Indonesia

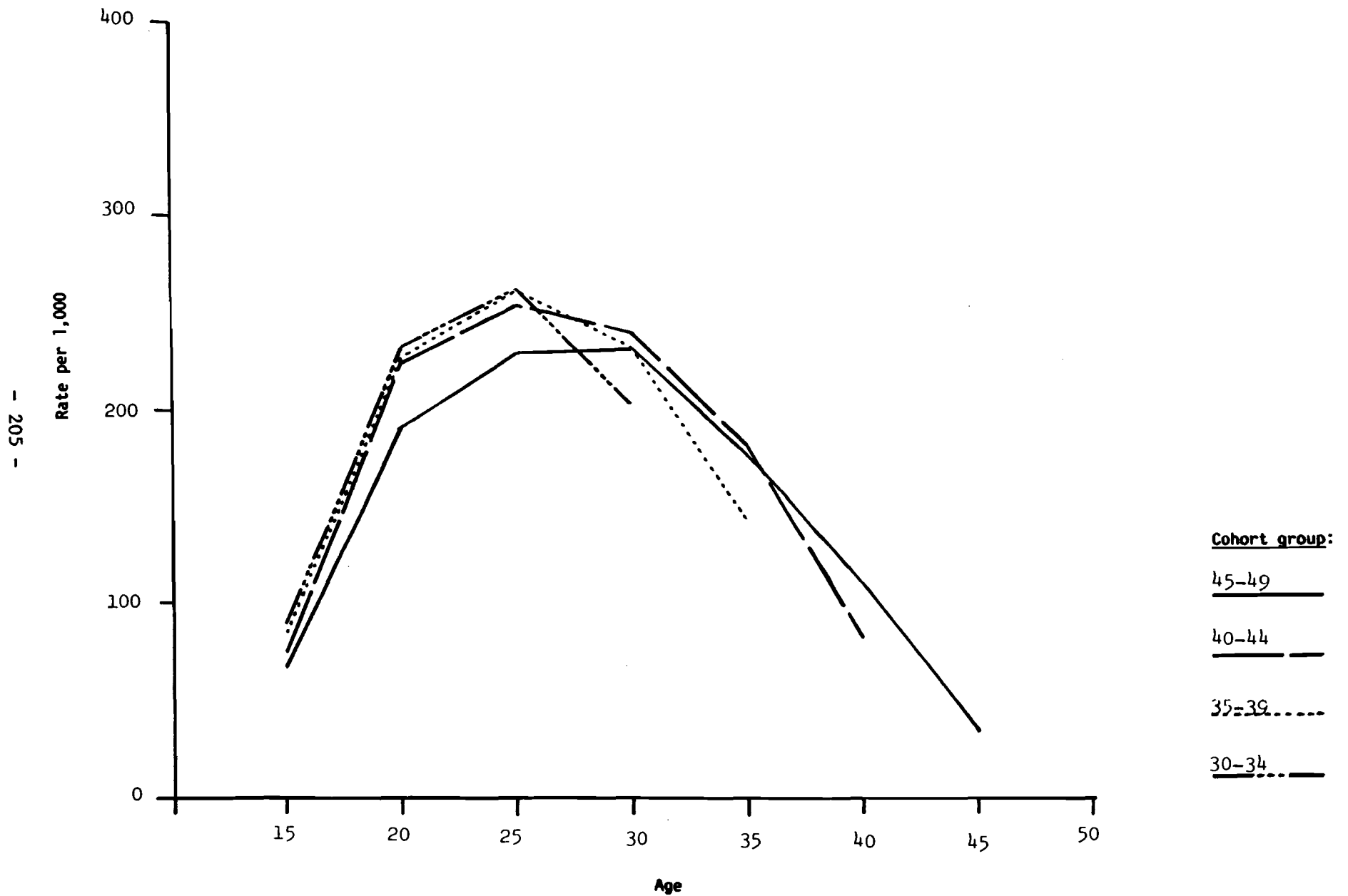
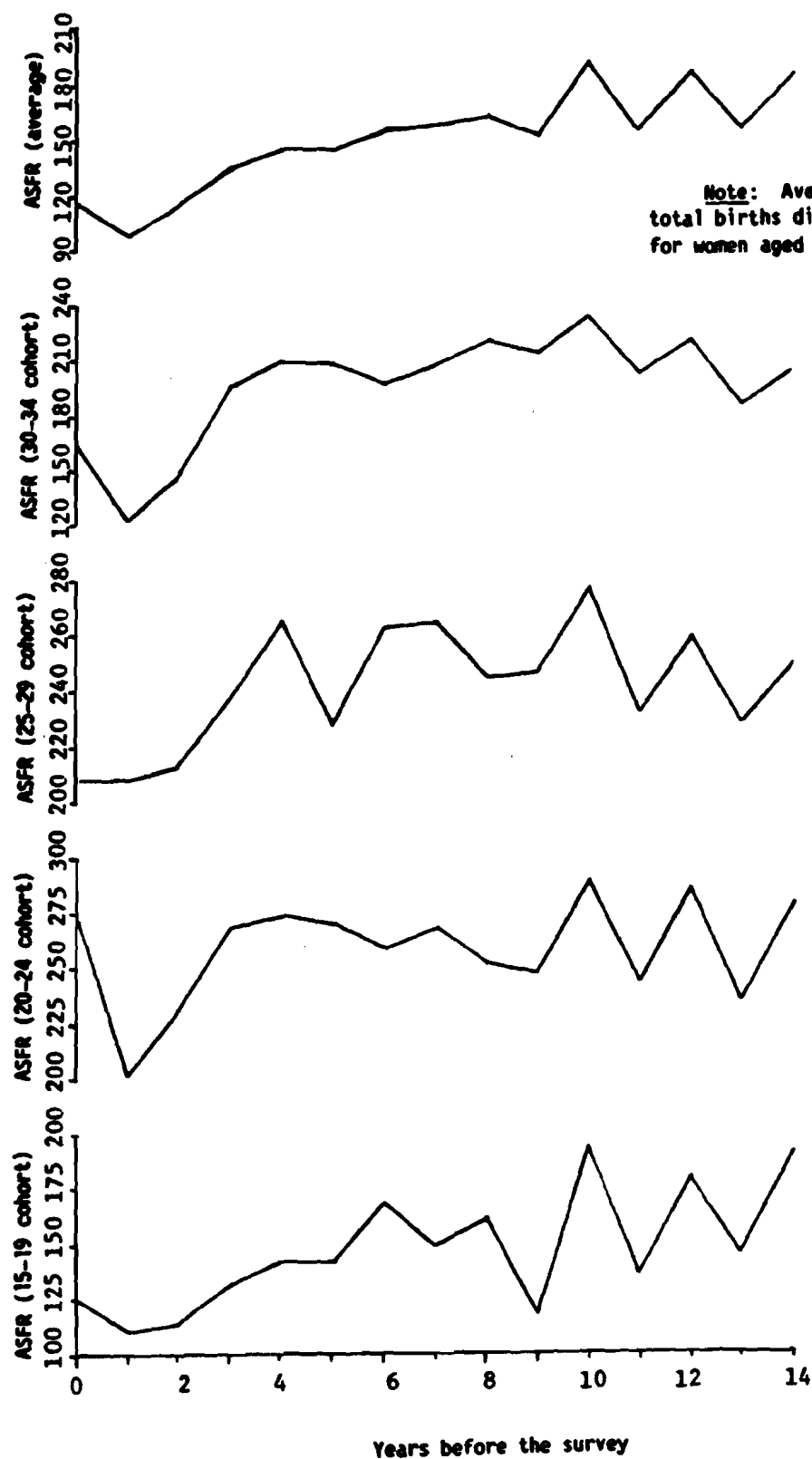


Figure VI. Age-specific fertility rates for selected cohorts and average fertility rate for single years before the survey: Indonesia



JAMAICA

The Jamaica Fertility Survey (JFS) started in November 1975 and was completed by the end of January 1976, except for two primary sampling units where enumeration could not be undertaken because of civil disturbances.

The individual survey included all women of reproductive age (15-49 years old) regardless of marital status, except for women 15-19 who were full-time students in a primary or secondary school at the time of the enumeration (and who were assumed to be single and childless (Singh, 1982)). JFS can be envisaged in the larger context of the Jamaican demographic data-gathering effort. A labour force survey was undertaken in October 1975. Population censuses were conducted in 1943, 1960 and 1970. Jamaica has had a long history of civil registration, and as of 1970, under-registration was estimated at only 0.4 per cent (United States Bureau of the Census, 1977).

Age data

Nearly 95 per cent of women in the sample reported a month and year for their date of birth (Chidambaram and Sathar, 1984). Age reporting in Jamaica appears relatively good, with a Myer's index of 4.7 for the female population calculated from the household data. A comparison of the household survey with the 1970 census showed that for women, Myer's index was 6.7 (Singh, 1982).

Figure I shows the male and female age distribution by five-year age groups. There appears to have been a shift of women out of the reproductive years into the 50-54-year-old age group. The single year age distribution shows a strong heaping on age 50. A comparison with the 1970 census also suggests some under-enumeration of children 0-9 (see fig. II).

Marriage history data

Three types of unions were identified in Jamaica: legal marriage; common law; and visiting unions. Marriage history was based on a small sample of 2,766 women ever in union at the time of the survey. For 66 per cent of all recorded unions, the respondent was able to give a calendar month and year of union. However, only 53 per cent of women ever in union could give a month and year for the start of their first union (Chidambaram and Sathar, 1984). For each age group, the median age at first union was younger for those reporting their age at the time of union than for those who gave the exact date of the event (Singh, 1982).

It is difficult to compare the current marital status distribution with the 1970 census because of differences in the definition of "visiting union" between the JFS and the census. In the census, a woman was classified as being in a visiting union if she was neither married nor in a common law union

but had had a child in the 12 months preceding the census (Singh, 1982). In the JFS, a woman was classified as being in a visiting union if she answered "yes" to the question "Do you have a visiting partner - that is, a more or less steady partner with whom you have sexual relations?" Despite the lack of comparability between the census and the JFS on the definition of visiting unions and single status, the reasonably close match between the JFS and the 1970 census in the proportions of those legally married and those in common law unions suggests that the current marital status distribution from the JFS is reasonably accurate (Singh, 1982).

The quality of the data on the history of unions can be assessed using the information in figures III and IV. Figure III shows the distribution of women by years since first union. There are prominent peaks at 1970 and 1960 as well as 1962, the year of independence. The overall pattern is an irregular one. Figure IV shows a sharp increase in the percentage ever in union, the percentage more than doubling over a period of 30 years among those aged 15-19 years. There is also a rise in percentage ever in union among those aged 20-24 years, particularly during the period 1950-1965. Although proportions married and in common law unions have been found to correspond roughly to comparable proportions from 1970, 1969 and 1943 censuses (Singh and Lightbourne, 1981), it is difficult to assess completeness of reporting of the formation of visiting unions, particularly when they were the first type of union. There is some evidence from changes in mean ages at first union and first births that older women over-stated their age at first union (Singh, 1982) and possibly omitted the reporting of first unions when they were of the "visiting" sort. However, it is clear that when census definitions are used, the trends between 1960 and 1970 are remarkably consistent. Nonetheless, the striking difference in the proportion of women ever in union, using the census versus the JFS definitions, makes clear how slippery any concept of marital status is in the context of Jamaican society. Thus, although there has been some decline in the age at entry into first union, the decline is likely to be somewhat exaggerated in the JFS, particularly in the period prior to 1960.

Birth history

Of all births recorded, 91 per cent were reported with a month and year (Chidambaram and Sathar, 1984). Census data from 1960 and 1970 for children ever born can be compared with figures from the JFS (see table 1). Although civil registration and census data document a fertility decline in Jamaica, the mean parity of women aged over 35 appeared higher in the JFS in 1975 than it had in the 1970 census; this probably indicates better enumeration of births in the survey. In addition, the JFS implies that parity in 1970 (reconstructed from the birth histories) was higher for women aged 30 and over than the census had shown. It should also be noted that, at the time of the survey, the parity of the 45-49 group exceeded the parity of the 40-44, group suggesting that omissions were not a major problem.

An examination of the cohort-period rates from WFS shown in table 2 shows evidence of birth date shifting, with a striking peak occurring 10-14 years before the survey. This is substantiated in figure V, which shows forward shifting of dates by the oldest cohorts. An examination of trends in age-specific fertility rates by single years shows a pattern of rates by

single years which is quite irregular and may be partially explained by the small sample (see fig. VI). There is no clear preference for particular digits or calendar years and no strong evidence to suggest a shifting of births from the 0-4 to the 5-9 period before the survey.

A comparison of age-specific fertility rates with both registration data and census data shows some discrepancies which are of potential concern (see table 3). The total fertility rate calculated from the birth history for 1960-1964 is somewhat higher than TFR calculated from the birth registration data from the same year. This may be partially explained by the birth shifting noted in table 2, but some under-registration of births in the registration data may have also contributed to those differences. It can be seen that by 1970 the total fertility rates from the census and JFS are roughly the same, although the census suggests a younger pattern of births. No comparison can be made for the most recent period because no registration data has been published since 1964 (Singh, 1982).

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Table 1. Children ever born per woman from WFS and 1960 and 1970 census: Jamaica

Age group	1960 census	1970		1975-1976 WFS
		census	WFS	
15-19	0.3	0.4	0.4	0.6
20-24	1.3	1.5	1.7	1.6
25-29	2.4	3.0	3.0	2.8
30-34	3.1	4.1	4.4	4.0
35-39	3.6	4.7	5.0	5.1
40-44	3.8	4.7	5.2	5.4
45-49	4.1	4.5.	..	5.5

Sources: 1960 census: Demographic Yearbook, Historical Supplement: Special Issue (United Nations publication, Sales No. E/F.79.XIII.8), table 7; 1970 census: United States Bureau of the Census, Country Demographic Profiles: Jamaica (ISP-DP-9), (Washington, D.C., Government Printing Office, 1977), table 8.

Table 2. Cohort period rates and cumulative cohort fertility by age at survey: Jamaica, 1975

Age group of cohort at end of period	Number of women in cohort	Years prior to survey						
		0-4	5-9	10-14	15-19	20-24	25-29	30-34
Cohort-period fertility rates								
10-14	0	0.000	0.001	0.000	0.005	0.003	0.002	0.001
15-19	508	0.055	0.082	0.089	0.075	0.071	0.051	0.049
20-24	644	0.232	0.238	0.252	0.239	0.191	0.171	
25-29	506	0.233	0.285	0.301	0.272	0.253		
30-34	389	0.203	0.248	0.289	0.268			
35-39	383	0.152	0.183	0.220				
40-44	338	0.092	0.113					
45-49	328	0.030						
Cumulative fertility of cohorts at end of period								
10-14		0.000	0.007	0.002	0.026	0.013	0.008	0.006
15-19		0.283	0.411	0.470	0.388	0.363	0.260	0.256
20-24		1.573	1.662	1.650	1.556	1.213	1.110	
25-29		2.828	3.077	3.063	2.574	2.375		
30-34		4.093	4.300	4.018	3.716			
35-39		5.063	4.935	4.814				
40-44		5.396	5.378					
45-49		5.530						

Source: WFS standard recode tapes.

Table 3. Age-specific fertility rates for selected periods from 1970 census, birth registration data, and WFS: Jamaica

Age group	1960-1964		1970	1969-1971	Percentage change	
	BR (1)	WFS (2)	Census (3)	WFS (4)	WFS (2) - (4)	Outside source (1) - (3)
15-19	0.151	0.178	0.167	0.179	0.6	10.6
20-24	0.292	0.284	0.302	0.271	- 4.6	3.4
25-29	0.268	0.300	0.268	0.243	-19.0	0.0
30-34	0.221	0.252	0.190	0.217	-13.9	-14.0
35-39	0.145	..	0.127	0.136	..	-12.4
40-44	0.050	..	0.047	0.065	..	- 6.0
45-49	0.008	..	0.008	..	..	0.0
TFR	5.7	6.1 a/	5.5	5.6 a/	- 8.2	- 3.5

Source: 1960, 1962-1964 birth registration data: Demographic Yearbook, Historical Supplement: Special Issue (United Nations publication, Sales No. E/F.79.XIII.8), table 6; 1961 birth registration data and 1970 census: S. Singh, "Evaluation of the Jamaica Fertility Survey", Scientific Reports, No. 34 (ISI/WFS, Voorburg, Netherlands, forthcoming), table 23.

a/ For the purpose of calculating a total fertility rate, the age-specific fertility rates from the outside source were used when the age-specific rate from WFS was not available.

Figure I. Distribution of males and females as a percentage of the total population by five-year age groups: Jamaica

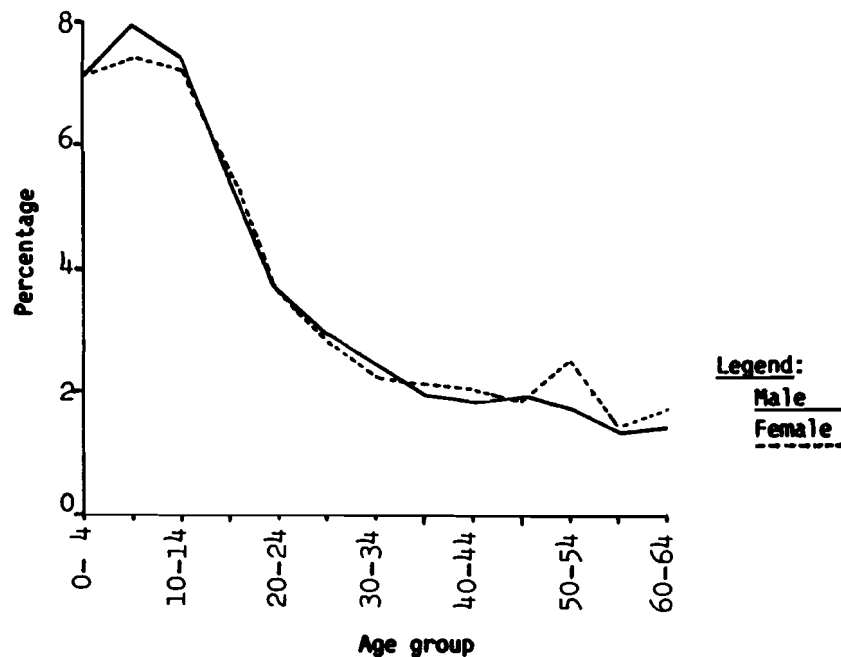
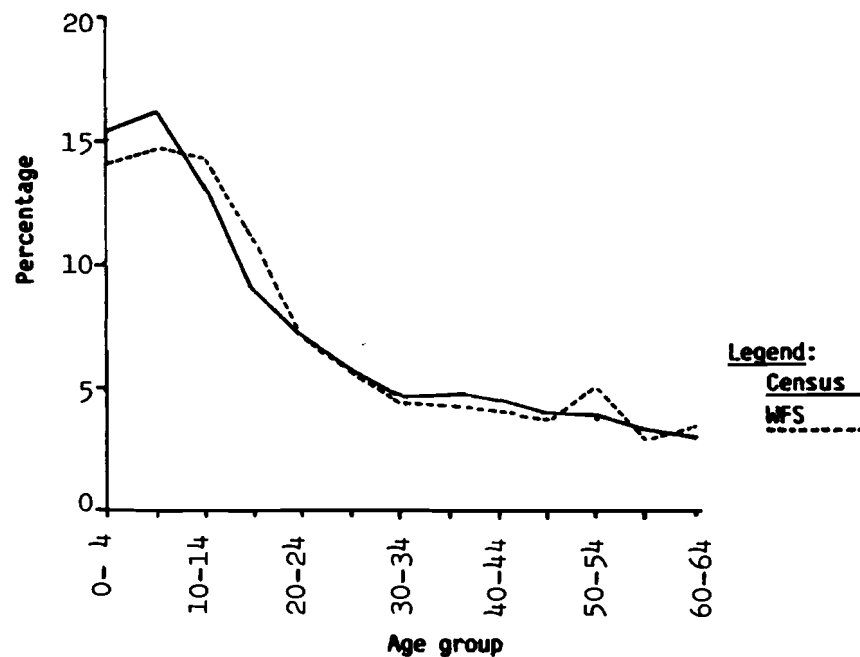


Figure II. Distribution of the female population by five-year age groups: World Fertility Survey (1975/1976) and 1970 census: Jamaica



Source for the 1970 census: *Demographic Yearbook, Historical Supplement: Special Issue* (United Nations publication, Sales No. E/P.79.XIII.8), table 3.

**Figure III. Distribution of ever-married women aged 15-49
by years since first married: Jamaica**

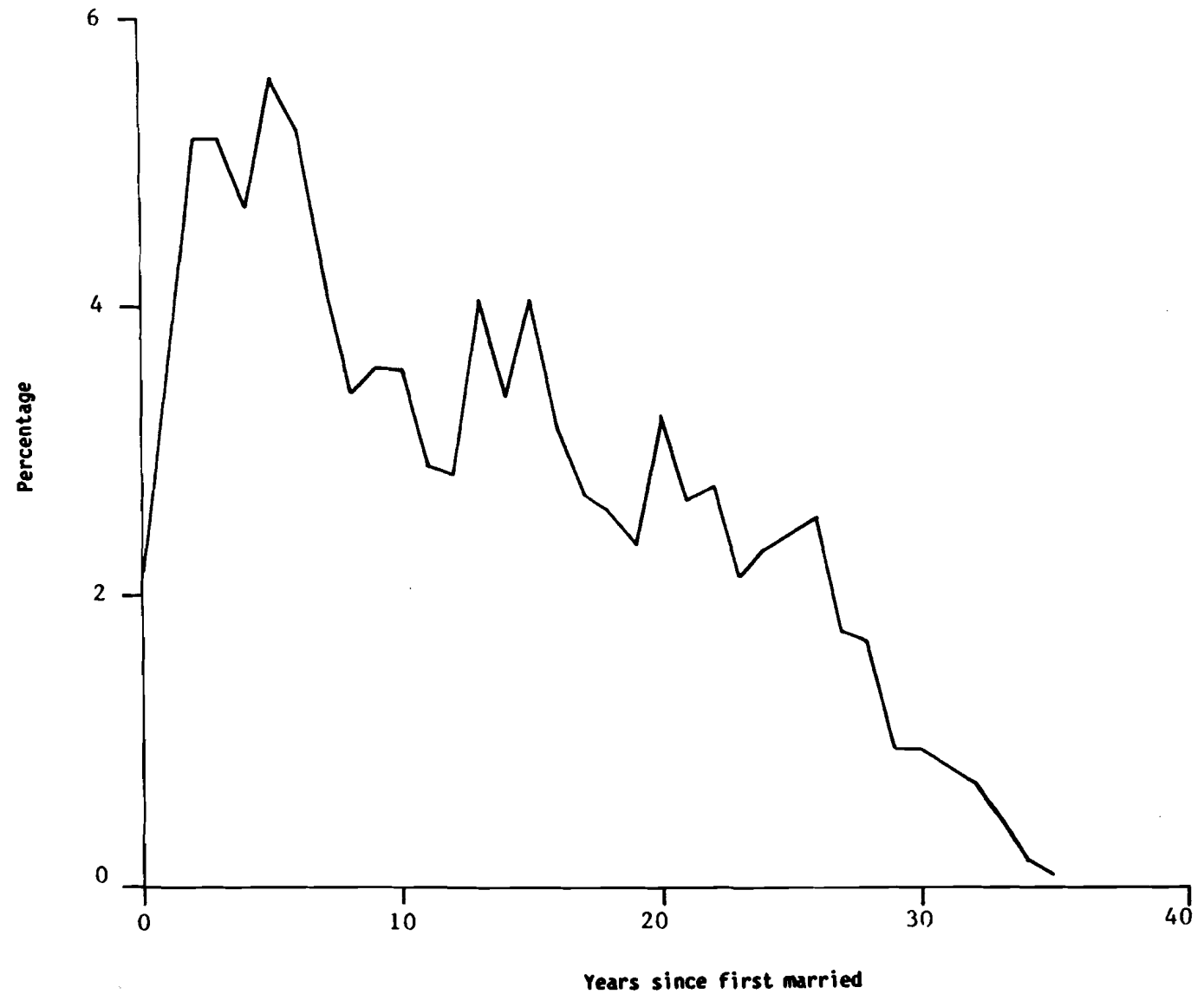
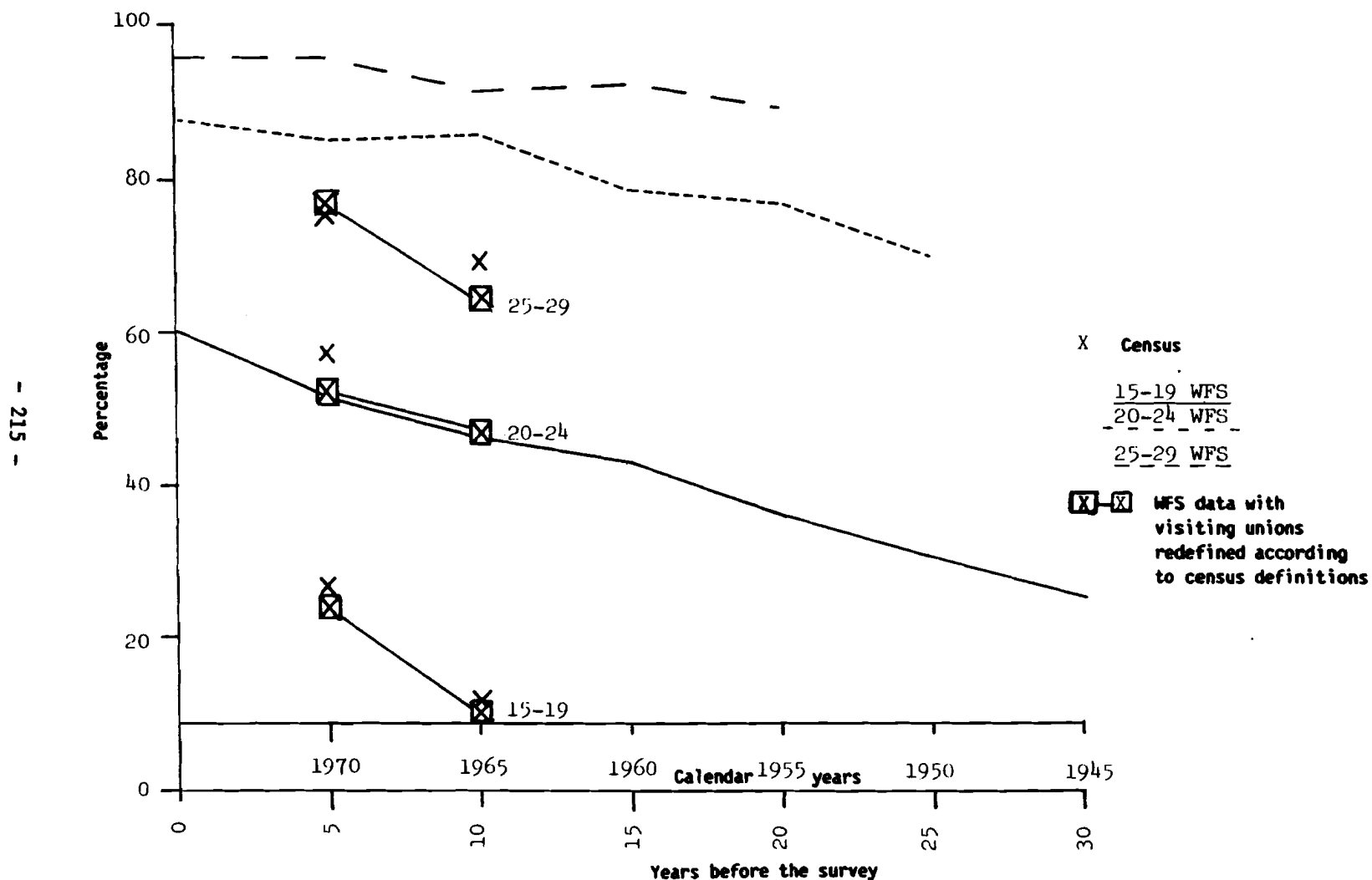
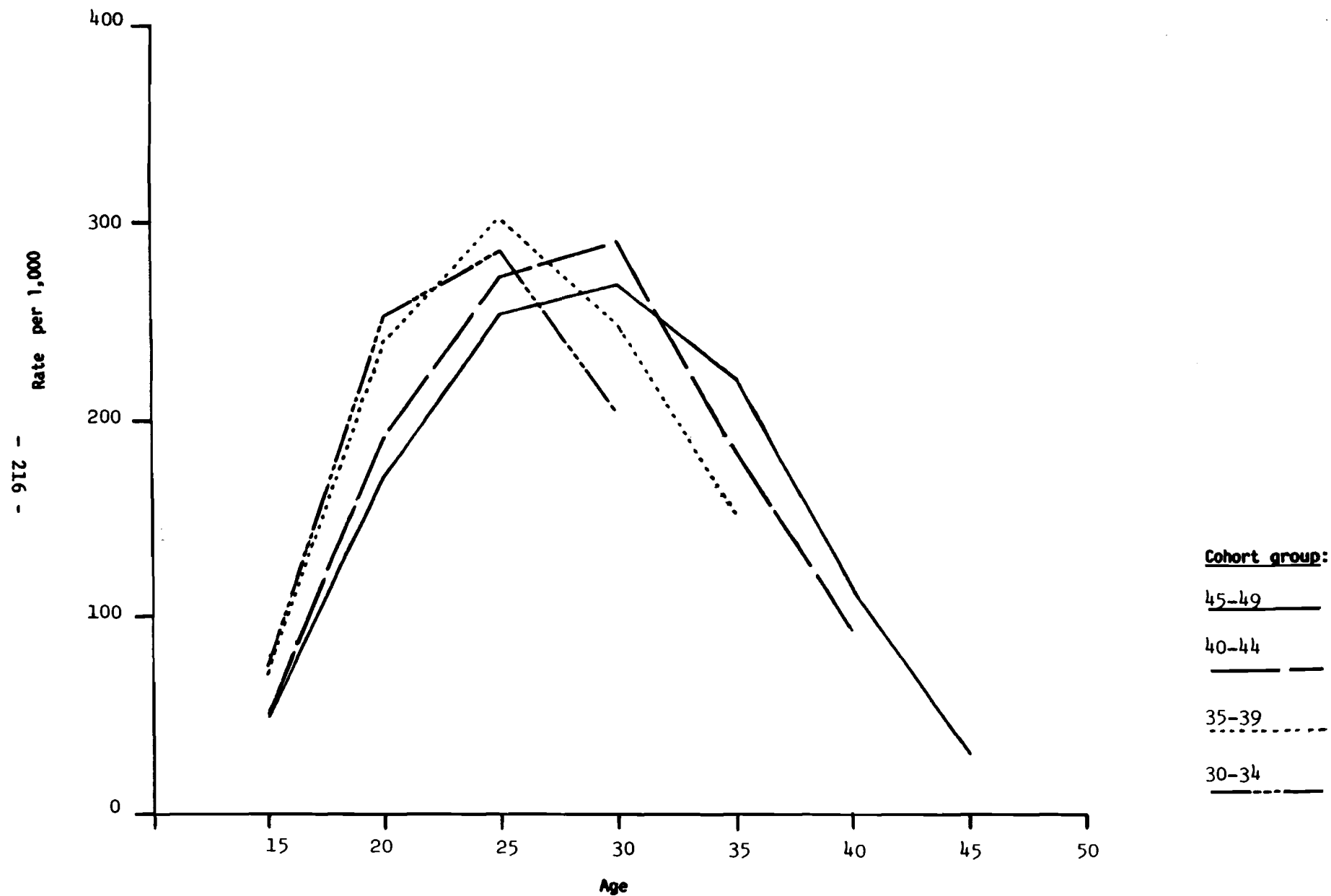


Figure IV. Proportions ever-married at designated periods prior to the survey for selected age groups: World Fertility Survey data and other sources: Jamaica

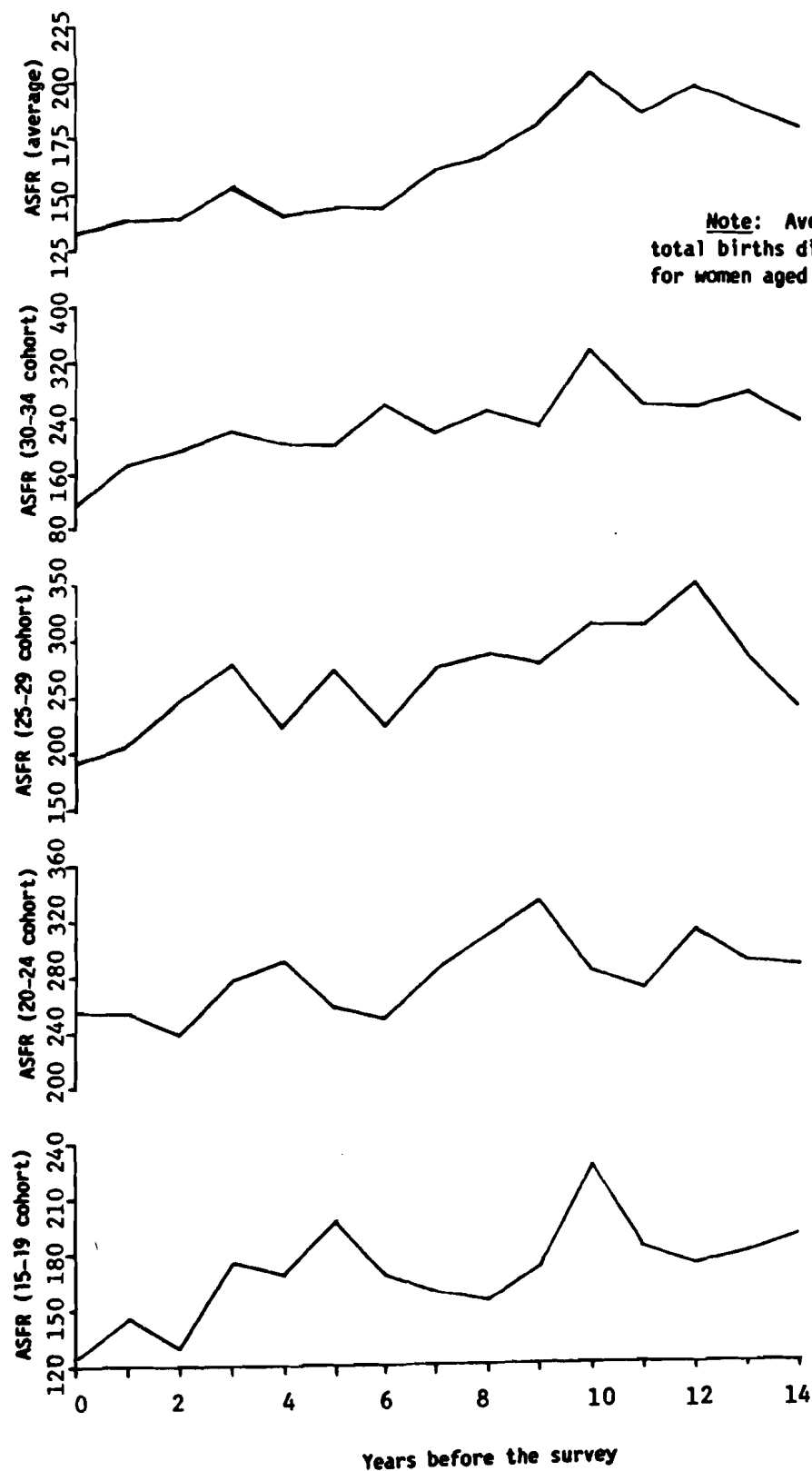


Source for adjusted WFS and census data: S. Singh, "Evaluation of Jamaican Fertility Survey data", *WFS Scientific Reports*, No. 34 (Voorburg, Netherlands, ISI/WFS, forthcoming), table 13.

**Figure V. Cohort-period fertility rates for women aged 30-49 at interview:
Jamaica**



**Figure VI. Age-specific fertility rates for selected cohorts and average fertility rate for single years before the survey:
Jamaica**



JORDAN

The Jordan Fertility Survey (JFS) was conducted in 1976 between June and September. Although comparisons can be made between the JFS and an earlier 1972 survey and between the East Bank population at the 1961 census and that at that time of the survey, the comparisons are complicated by population movements following the 1967 war.^{1/} The 1972 and 1976 surveys both covered the East Bank, but the earlier survey excluded people living in camps for displaced persons, those in communities of under 100 persons (together, 6 per cent of the population) and nomads. (Department of Statistics, 1979) In addition, there has been significant migration between the 1972 and 1976 surveys and also between the 1961 census and 1972. Birth registration is estimated at roughly 80 per cent between 1976 and 1979 (Abu Jaber, 1980).

Age data

The month and year of birth were reported by only 29.7 per cent of women in the individual interview (Chidambaram and Sathar, 1984). Most responses, (54.2 per cent) were in the form of completed years of age, while 16.1 per cent gave the year of birth but not the month. There was very pronounced heaping on ages ending in 0 and 5, with preference also for ages ending in 2 and 8, in both the household and the individual surveys. The Myer's index, calculated from the distribution of women in the household interview was 24.3 (Rutstein, 1984). Migration and age misreporting have probably influenced the household age distribution so that it is difficult to draw conclusions about the extent of misreporting.

The proportion of females in the age groups from 20 to 39 years was higher than that of males to a greater extent than in most of the other countries examined here (fig. I). This could be caused by under-enumeration of males in those age groups and also, in part, by net migration. Comparisons with the age distribution from the 1972 National Fertility Survey (fig. II) show discrepancies at ages 0-14 and 25-29 years. In addition, there appears to be a slight heaping at ages 35-39 in the WFS female age distribution.

Marriage history data

The marriage history is based on a sample of 3,610 ever-married women. The year and month of first marriage was reported by 58.4 per cent of interviewed women (Chidambaram and Sathar, 1984). An additional 12.2 per cent gave only the year, with the remaining 21.2 per cent of responses being in terms of the woman's age at first marriage.

The percentage distribution of ever-married women by years since first marriage (fig. III) is rather irregular, with noticeable heaping on 6 and 15 years duration. In obtaining date of marriage, respondents were asked first the month and year of marriage, and then - if those were and if not known - the age at marriage. If that also was not known, the question "how many years ago?" was asked; this may account for the pattern of heaping.

The marital status of women from the JFS and the reconstructed proportions married from the marriage history were compared with the

distribution in 1972 and in 1961 of the East Bank population. There was good agreement between the proportions implied by the marriage histories and those observed in 1972, but the JFS data implied considerably higher proportions married in age groups 15-19 and 20-24 than were reported in 1961 (fig. IV). It is possible that too young an age at marriage has been reported in the JFS, particularly for the cohort aged 35-39 at the time of the survey. The population movements between 1961 and 1976 may also have produced a 1976 population whose age at marriage does not match that of cohorts in the 1961 census.

Birth history data

Of all births recorded, 66.5 per cent were reported with a month and year (Chidambaram and Sathar, 1984). Parity, as reported in the JFS, increases steadily with age up to 45-49 (table 1). However, the implied parity, five years before the survey, of women aged 45-49 at interview is lower than the parity of women 40-44 at the survey (table 2, lower panel); this suggests that some omission of births probably occurred. The number of children ever born by 1972 was reconstructed from the JFS retrospective birth histories and compared with the 1972 survey data. The average parities computed from JFS data for 1972 are higher at ages over 35 than those assessed in 1972 (in JFS) and are higher at every age than parities recorded in the 1961 census.

Examination of the full set of cohort-period fertility rates (table 2) shows fertility rates declining from the period 10-14 years before the survey up to the most recent period for all age groups, the percentage declines being greatest at ages under 25 and least at 25-34. Fertility rates more than 14 years before the survey are higher and fluctuating. This is some evidence of forward date-shifting for the oldest cohort (see also fig. V).^{2/}

The trend in age-specific fertility rates by single years is erratic and shows some deficit of births in the 1-2 before the survey (fig. VI). There is some evidence of a preference for digits 8 and 12, and there is a deficit of births among those aged 25-29 six years before the survey and among 20-24-year-olds nine years before the survey.

Unfortunately, Jordan does not have a complete birth registration system or estimates of age-specific fertility rates from the 1972 national fertility survey (NFS) to allow comparisons. Table 3 shows age-specific fertility rates based on the 1961 census and an estimate for 1972-1976 based on parity changes between the 1972 survey and the 1976 JFS. The 1961 estimates appear deficient and the 1972-1979 estimates are very close to those from the JFS. The recorded decline from the JFS is somewhat uncertain, given the possibility of some date shifting. In fact, adjustments of the household fertility data using the P/F ratio technique resulted in a TFR of 8.85, which suggests the possibility that the real TFR is higher for the period 0-4 years before the survey than is registered on the birth history of the JFS (Blacker, Hill and Moser, 1981). However, the adjusted TFR of 8.85 is likely to be an upper-bound estimate, given the implicit assumption built into the calculation that age of marriage has not changed.

Notes

1/ For more information on the 1972 survey, see Department of Statistics, National Fertility Survey in Jordan, 1972 (Amman, 1976).

2/ In an evaluation of WFS fertility rates by duration of marriage, use of P/F ratios by marriage duration show that the rates for the period 10-14 years before the survey appear to be exaggerated. See A. Abdel-Aziz, "Evaluation of the Jordan Fertility Survey, 1976", Scientific Reports, No. 42 (Voorburg, Netherlands, WSI/ISI 1983).

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Table 1. Children ever born per woman from WFS and 1961 census and 1972 survey: Jordan

Age group	1961 census	1972		1976 WFS
		Survey	WFS	
15-19	0.2	0.2	0.3	0.2
20-24	1.5	1.7	1.7	1.5
25-29	3.2	4.0	3.9	3.7
30-34	5.2	5.8	5.6	5.6
35-39	6.8	7.2	7.4	7.1
40-44	7.3	7.6	8.4	8.4
45-49	7.6	7.2	..	8.6

Source: A. Abdul-Aziz, "Evaluation of the Jordan Fertility Survey, 1976", WFS Scientific Reports, No. 42 (Voorburg, Netherlands, WFS/ISI, 1983), tables 4.1 and 4.2.

Table 2. Cohort period rates and cumulative cohort fertility by age at survey: Jordan, 1976

Age group of cohort at end of period	Number of women in cohort	Years prior to survey						
		0-4	5-9	10-14	15-19	20-24	25-29	30-34
Cohort-period fertility rates								
10-14	4	0.000	0.000	0.000	0.001	0.003	0.002	0.002
15-19	325	0.035	0.060	0.078	0.075	0.079	0.083	0.083
20-24	596	0.254	0.290	0.304	0.284	0.257	0.287	
25-29	709	0.370	0.392	0.394	0.411	0.365		
30-34	628	0.350	0.362	0.411	0.372			
35-39	543	0.297	0.328	0.336				
40-44	435	0.188	0.209					
45-49	372	0.073						
Cumulative fertility of cohorts at end of period								
10-14		0.000	0.001	0.002	0.006	0.015	0.010	0.009
15-19		0.176	0.301	0.398	0.388	0.403	0.422	0.430
20-24		1.570	1.850	1.909	1.824	1.707	1.864	
25-29		3.698	3.867	3.792	3.763	3.690		
30-34		5.616	5.600	5.818	5.548			
35-39		7.083	7.459	7.229				
40-44		8.398	8.276					
45-49		8.640						

Source: WFS standard recode tapes.

Table 3. Age-specific fertility rates for selected periods from 1961 census, 1972 survey, and WFS data: Jordan

Age group	1961 Census (1)	1960-1962 WFS (2)	1972-1976 NFS/WFS (3)	1971-1976 WFS (4)	Percentage change	
					WFS (2) - (4)	Outside source (1) - (3)
15-19	0.108	0.208	0.135	0.125	-39.9	25.0
20-24	0.328	0.372	0.360	0.347	- 6.7	9.8
25-29	0.382	0.422	0.365	0.372	-11.9	- 4.5
30-34	0.361	0.359	0.307	0.335	- 6.7	-15.0
35-39	0.213	..	0.249	0.245	..	16.9
40-44	0.077	..	0.122	0.104	..	58.4
45-49	0.019	..	0.025	..	..	31.6
TFR	7.4	8.4 a/	7.8	7.8 a/	- 7.1	5.4

Source: 1961 census: Estimated using the average parities from the 1961 census and the registered births by age of mother for 1961-1966, from Kamel Abu Jaber and others, "Levels and trends of fertility and mortality in Jordan", in Kamel Abu Jaber, ed., Levels and Trends of Fertility and Mortality in Selected Arab Countries of West Asia (Amman, University of Jordan, 1980), p. 27, table 21; 1972-1976 NFS/WFS: Estimated from the 1972-1976 parity changes between the 1972 national fertility survey and the 1972 WFS, from Kamel Abu Jaber and others, "Levels and trends of fertility and mortality in Jordan", in Kamel Abu Jaber, ed., Levels and Trends of Fertility and Mortality in Selected Arab Countries of West Asia (Amman, University of Jordan, 1980), p.30, table 26.

a/ For the purpose of calculating a total fertility rate, the age-specific fertility rates from the outside source were used when the age-specific rate from WFS was not available.

Figure I. Distribution of males and females as a percentage of the total population by five-year age groups: Jordan

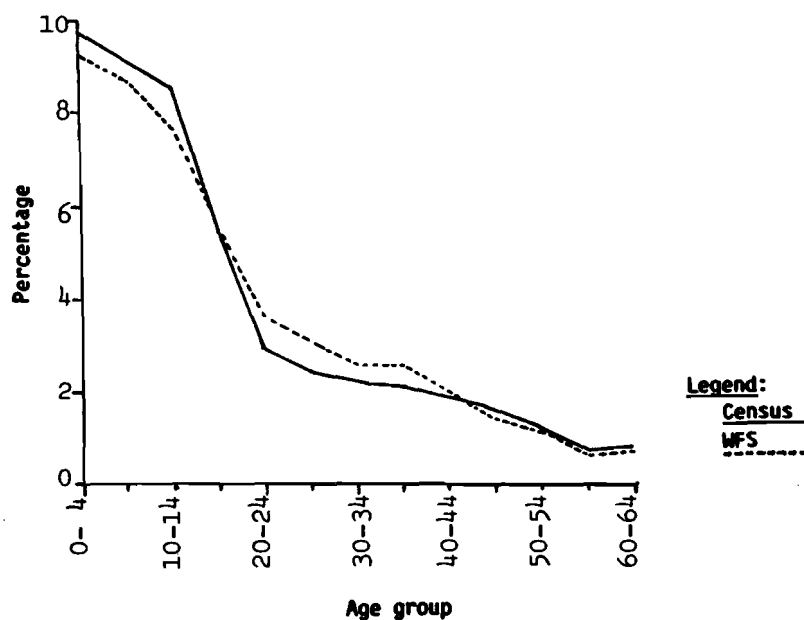
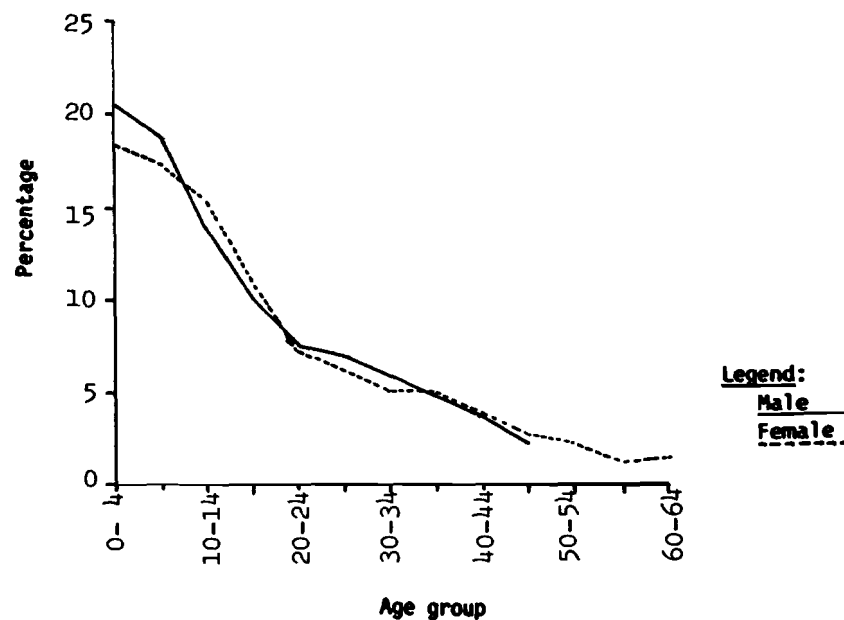


Figure II. Distribution of the female population by five-year age groups: World Fertility Survey (1976) and 1972 census: Jordan



Source for the 1972 census: Department of Statistics, National Fertility Survey in Jordan, 1972 (Amman, 1976), p. 22, table 2.

Note: Five-year age distribution is only available through ages 45-49 from the NPS (1972).

**Figure III. Distribution of ever-married women aged 15-49
by years since first married: Jordan**

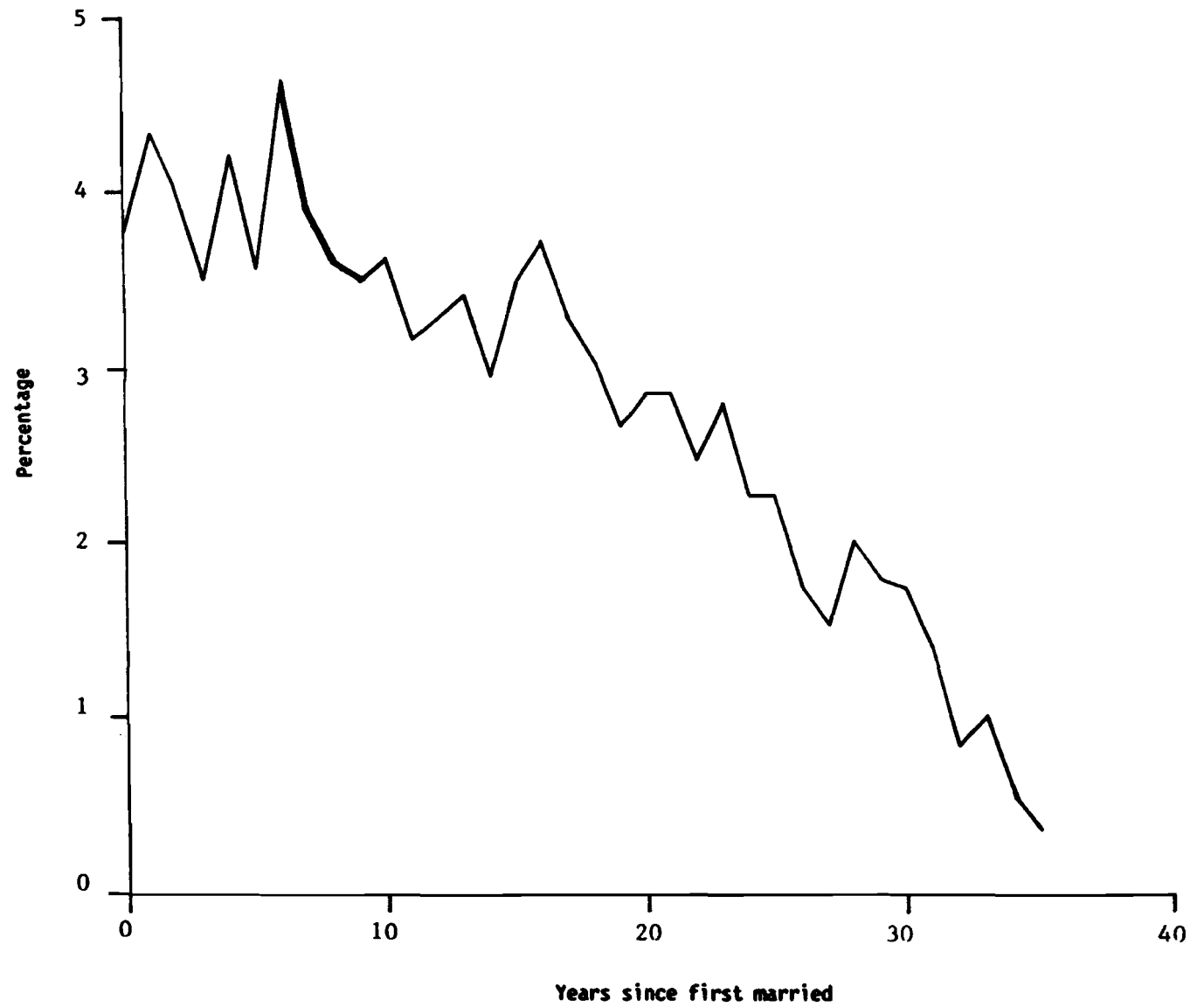
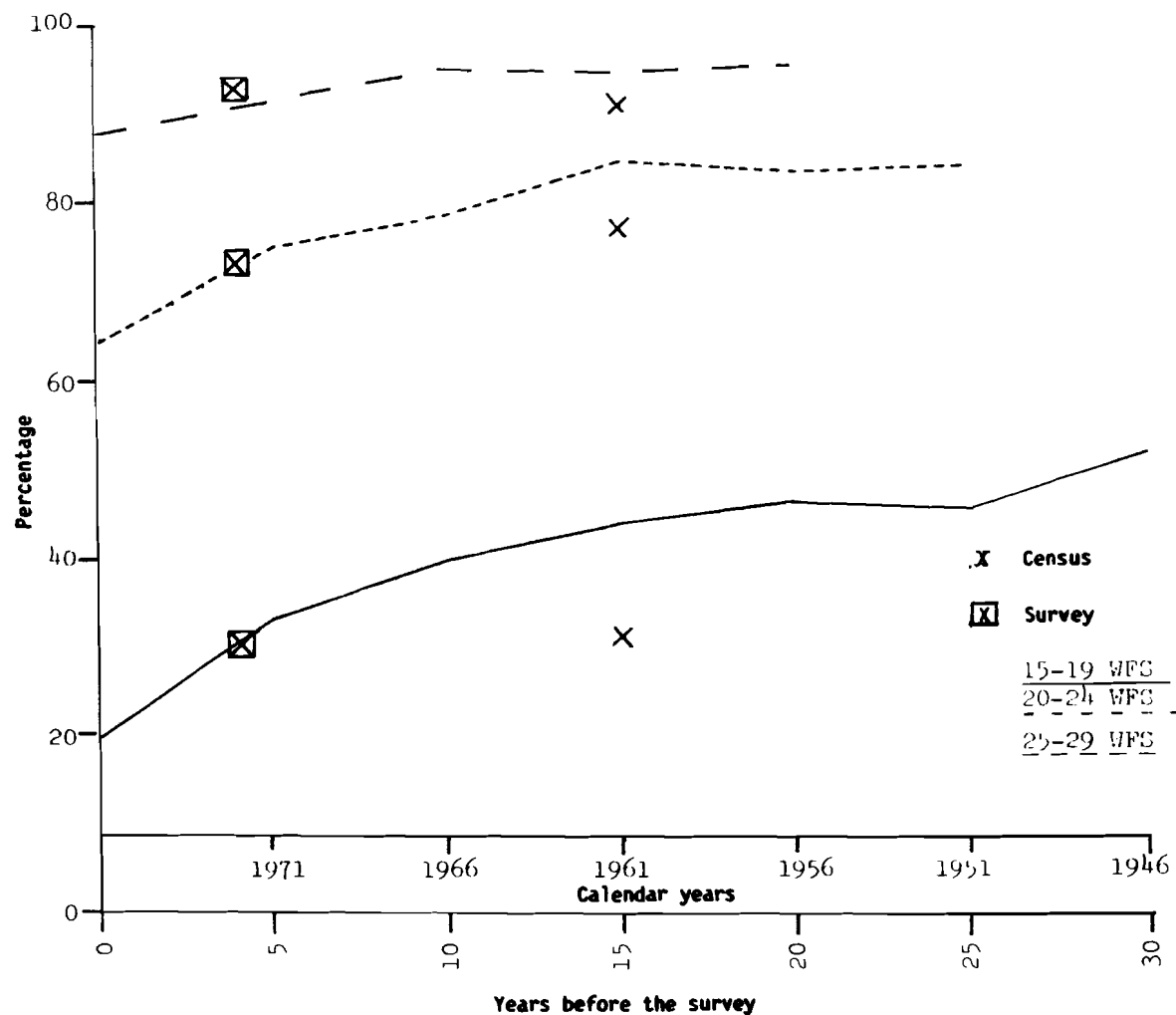
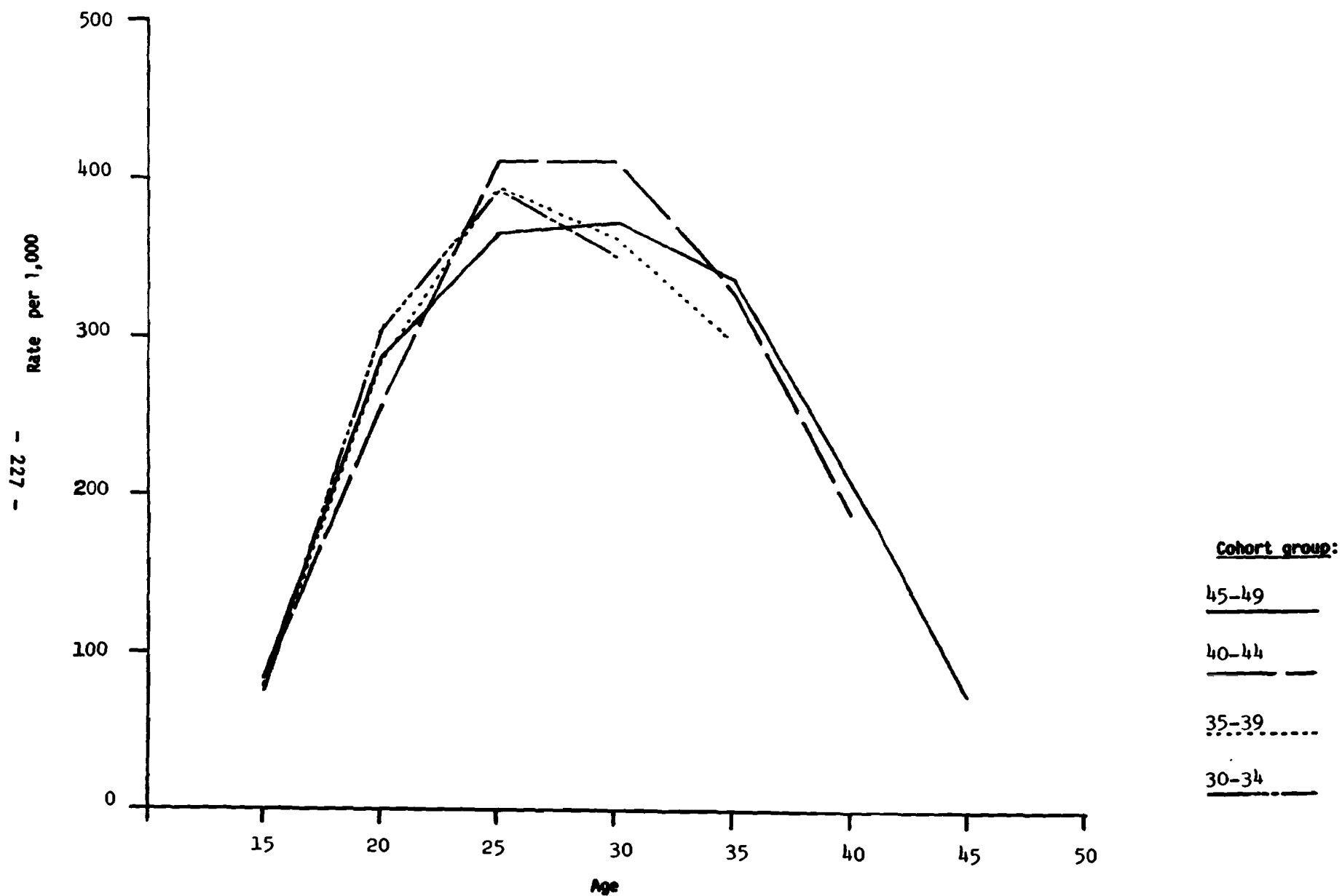


Figure IV. Proportions ever-married at designated periods prior to the survey for selected age groups: World Fertility Survey data and other sources: Jordan

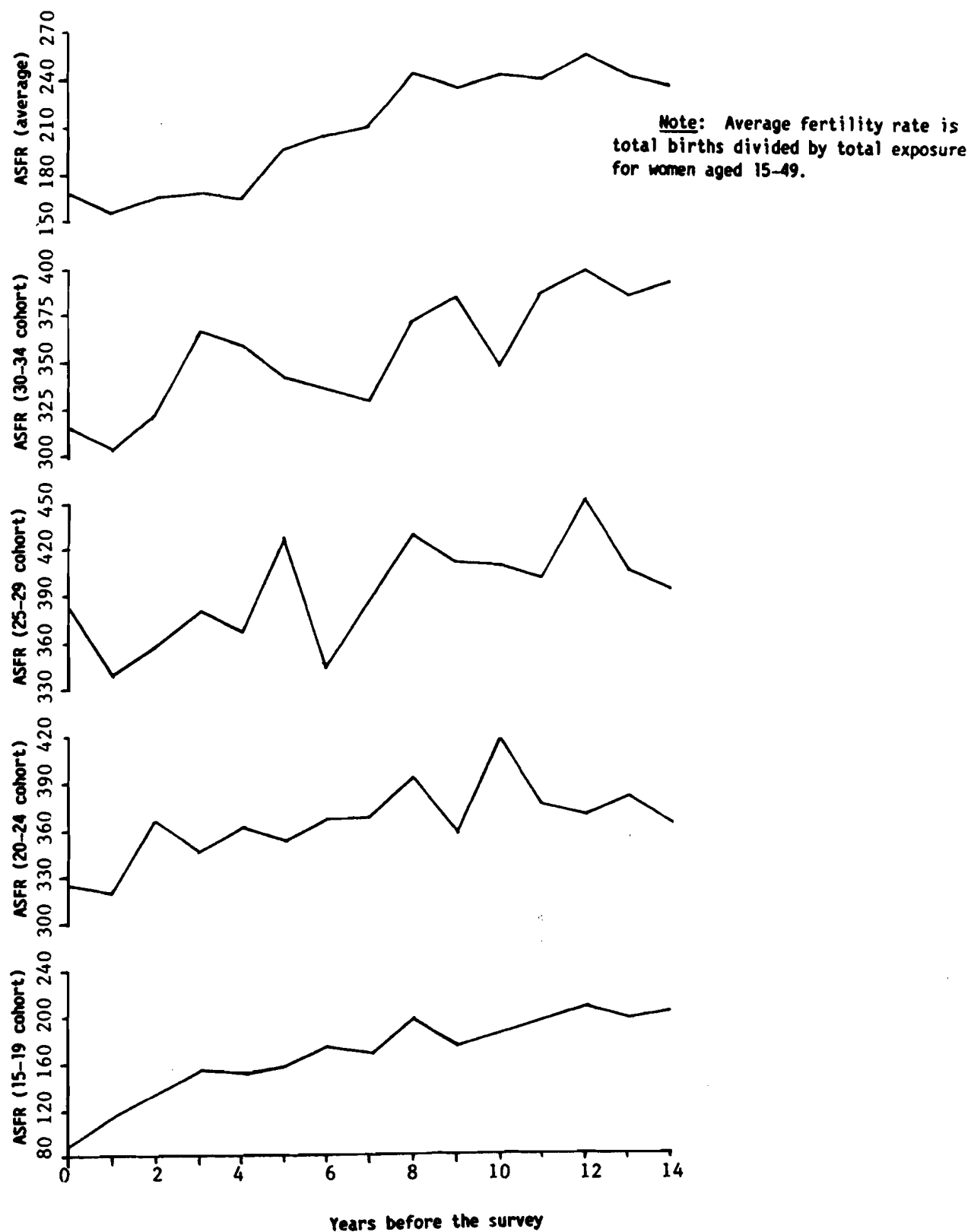


Source: Abdullah Abdel-Aziz, "Evaluation of the Jordan Fertility Survey, 1976", *WFS Scientific Reports*, No. 42 (Voorburg, Netherlands, ISI/WFS, forthcoming),

Figure V. Cohort-period fertility rates for women aged 30-49 at interview:
Jordan



**Figure VI. Age-specific fertility rates for selected cohorts and average fertility rate for single years before the survey:
Jordan**



KENYA

The Kenya Fertility Survey (KFS) was carried out between September 1977 and April 1978. Kenya has had four population censuses - in 1948, 1962, 1969 and 1979 - and two demographic surveys - in 1973, the Demographic Baseline Survey and in 1977/78, the National Demographic Survey (NDS). In fact, the sampling frame for WFS was provided by round 1 of the National Demographic Survey, conducted early in 1977 (Chidambaram, Cleland and Verara, 1980). Kenya is still lacking in reliable systematic information on the vital demographic events of births, deaths and migration so that in the past that type of demographic information had to be estimated from census information (United States Bureau of the Census, 1978).

Age data

Of the total sample, 34 per cent of women were able to state the month and year of their birth (Chidambaram and Sathar, 1984). In the cases where neither the year nor the month was reported (32 per cent), age was estimated by a variety of methods, including historical calendars and information provided by other members of the household (WFS and Government of Kenya, 1980). Myer's index of digital preferences was 7.6 among Kenyan women (Rutstein, 1984). The preference among females seems to be for digits 0, 5 and 8 (possibly because the survey date is 1978). The single-year age distribution for Kenyan females shows heaping at ages 13 and 14 and also ages 51-53. It is likely that interviewers have shifted women out of the eligible range (15-50 years) in order to avoid the individual interview (Chidambaram, Cleland and Verara, 1980). The age distribution in five-year age groups (fig. I) shows an excess of females at ages 25-29 and 35-39. This could be the result of heaping on digits ending with 8 (that is, 28 and 38) in addition to the heaping on digits with 5 (that is, 25 and 35). In contrast to the National Demographic Survey (1977) the WFS female age distribution shows heaping on ages 10-14 and also slight heaping on ages 50-54, as discussed above (see fig. II). However, like the WFS, the NDS survey also shows heaping on 25-29 and 35-39.

Marriage history data

The marriage history data were based on a sample of 6,241 women ever in union at the time of the survey. In WFS, marriage was defined to include both unions which had been sanctioned by religious or civil law and less formal unions which simply entailed living together in a more or less stable sexual partnership. Thus, both formal and consensual unions have been included in the survey. Of the respondents, 69 per cent gave a month and year for the date of first marriage (Chidambaram and Sathar, 1984).

A distribution of years since first married (fig. III) shows heaping at 25 years duration. For the more recent period there seems to be a deficit of marriages of duration of 2 years, which may have been shifted forwards to 0 years or backwards to 4 years. A strong preference for even years is shown in the most recent period.

Comparisons of proportions ever married at various periods in the past, derived from the marriage history, with data on proportions married from other sources (fig. IV) shows close correspondence for all age groups for the year 1977. Proportions married in 1962 from WFS and the census are also quite close, although the intermediate point (1969) does not agree as closely. Both WFS reconstructed data and other sources show a sharp decrease in proportions ever married (especially among 15-19 year olds) from 1962 to 1977.

A close look at figure IV shows an inverted U-shaped pattern in the trends in proportion ever married for each age group. The peak of the curve can be identified with data for the 30-34 cohort. Two possible explanations are suggested. First, there was a trend towards a decreasing age at marriage among women in the cohorts older than 30-34; and secondly, women recorded as 30-34 at the time of the survey exaggerated the years since the first marriage or misstated their ages. Data for the most recent period, however, appear reliable.

Birth history data

The month and year of birth was reported in 75 per cent of all births (Chidambaram and Sathar, 1984). About 10 per cent of births were reported with only the calendar year, while the remaining were reported in terms of "years ago" or age.

The distribution of children ever born from WFS and NDS is very similar for age groups up to 30-34 years (see table 1). Beyond 35 years, WFS shows a higher mean number of children ever born, suggesting perhaps better enumeration in WFS. Nonetheless, a comparison of cumulative fertility for the 45-49 and 40-44 cohorts at age 40-44 shows that omissions probably occurred among older women (see table 2). It is important to note that both surveys show improved enumeration of children ever born compared to the censuses of 1962 and 1969. However, it is possible that part of the difference may be due to increased fertility rather than improved enumeration.

Cohort fertility rates for five-year periods before the survey (table 2) show rates for each age peaking at about 10-14 years prior to the survey date. Figure V shows evidence of forward shifting of birth dates for the three oldest cohorts.^{1/} An examination of age-specific fertility rates by single years before the survey (fig. VI) shows considerable irregularity of rates for women aged 30-34 and 20-24, with heaping on even years.

Age-specific fertility rates from WFS averaged over a three-year period preceding the survey date are compared with an estimate from NDS (table 3). Although the total fertility rate is similar (the WFS estimate being slightly lower), fertility rates in the younger age groups (20-34) were lower for WFS than in NDS, so that the fertility curve from WFS had a less pronounced peak. Comparisons with the 1969 census data show a large discrepancy. The total fertility rate between the two sources is different by almost 1.5 children. It is very likely that the census rates have been under-estimated.^{2/} On the other hand, it is likely that the WFS rate for the date may be too high because of misdating of births, resulting in a heaping of births in the period 10-14 years and, to a lesser extent, 5-9 years prior to the survey.

Notes

1/ An evaluation of the Kenya Fertility Survey reached a similar conclusion about misallocation of dates of live births by older women (Henin, Korten and Warner, 1982).

2/ The age-specific rates from the 1969 census are even lower than those for 1977. See also World Fertility Survey and Government of Kenya, (1980), p. 91.

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Table 1. Children ever born per woman from the World Fertility Survey, National Demographic Survey, and 1962 and 1969 censuses: Kenya

Age group	1962 census	1969 census	1977 NDS	1977-1978 WFS
15-19	0.4	0.4	0.3	0.4
20-24	1.6	1.9	1.8	1.8
25-29	3.0	3.6	3.7	3.8
30-34	4.2	5.1	5.6	5.6
35-39	5.1	6.0	6.7	6.8
40-44	5.6	6.4	7.2	7.6
45-49	5.9	6.7	7.5	7.9

Source: World Fertility Survey and Government of Kenya, Kenya Fertility Survey, 1977-78: First Report, vol. I (Nairobi, Central Bureau of Statistics, Ministry of Economic Planning and Development, 1980), p. 85.

Table 2. Cohort period rates and cumulative cohort fertility by age at survey: Kenya, 1977-78

Age group of cohort at end of period	Number of women in cohort	Years prior to survey						
		0-4	5-9	10-14	15-19	20-24	25-29	30-34
Cohort-period fertility rates								
10-14	0	0.000	0.006	0.010	0.012	0.016	0.021	0.005
15-19	1 907	0.066	0.077	0.092	0.095	0.086	0.073	0.058
20-24	1 435	0.285	0.293	0.314	0.275	0.244	0.226	
25-29	1 479	0.360	0.367	0.369	0.326	0.311		
30-34	1 011	0.324	0.346	0.358	0.314			
35-39	926	0.278	0.306	0.315				
40-44	614	0.207	0.226					
45-49	719	0.120						
Cumulative fertility of cohorts at end of period								
10-14		0.000	0.028	0.050	0.060	0.078	0.104	0.027
15-19		0.359	0.434	0.518	0.555	0.532	0.392	0.316
20-24		1.906	1.984	2.127	1.906	1.612	1.444	
25-29		3.782	3.962	3.748	3.240	2.996		
30-34		5.581	5.478	5.032	4.566			
35-39		6.870	6.563	6.142				
40-44		7.599	7.273					
45-49		7.874						

Source: WFS standard recode tapes.

Table 3. Age-specific fertility rates for selected periods from 1969 census, 1977-1978 NDS, a/ and WFS: Kenya

Age group	1969 census (1)	1968-1970 WFS (2)	1977-1978 NDS (3)	1976-1978 WFS (4)	Percentage change	
					WFS (2) - (4)	Outside source (1) - (3)
15-19	0.132	0.200	0.177	0.192	- 4.0	34.1
20-24	0.331	0.359	0.377	0.354	- 1.4	13.9
25-29	0.337	0.373	0.386	0.377	1.1	14.5
30-34	0.294	0.337	0.323	0.273	-19.0	9.9
35-39	0.223	0.285	0.233	0.205	-28.1	4.5
40-44	0.135	0.185	0.107	0.145	-21.6	-20.7
45-49	0.068	..	0.014	0.049	..	-79.4
TFR	7.6	9.0 b/	8.1	8.0	-11.1	6.6

Source: 1969 census: S. Ominde, "The population of Kenya/Uganda/Tanzania", CIPRED Series, 1975, p. 31; 1977-1978 NDS: World Fertility Survey and Government of Kenya, Kenya Fertility Survey 1977-1978: First Report, vol. I (Nairobi, Central Bureau of Statistics, Ministry of Economic Planning and Development, 1980), table 5.4.

a/ NDS: National Demographic Survey. Adjusted using Gompertz.

b/ For the purpose of calculating a total fertility rate, the age-specific fertility rates from the outside source were used when the age-specific rate from WFS was not available.

Figure I. Distribution of males and females as a percentage of the total population by five-year age groups: Kenya

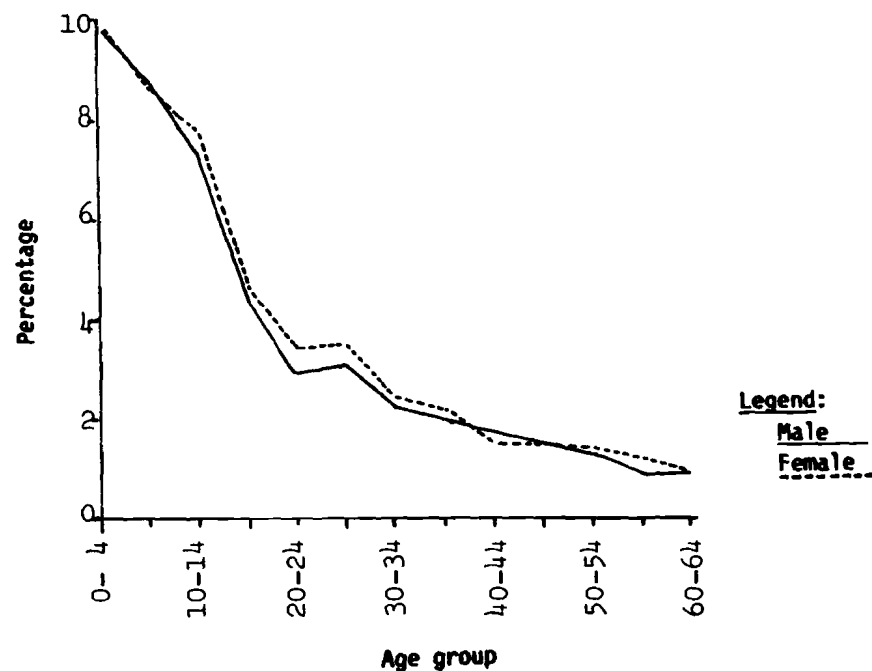
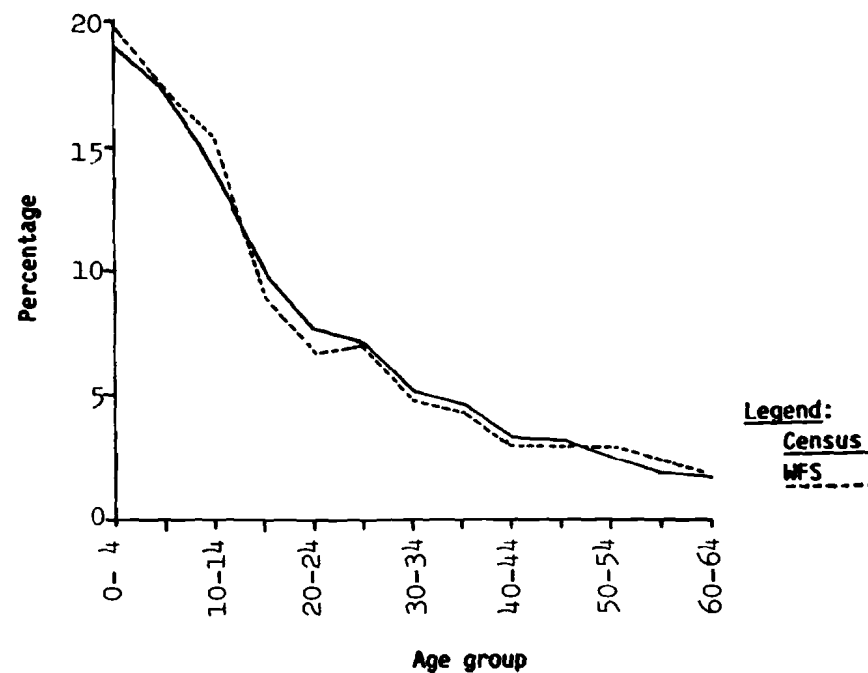


Figure II. Distribution of the female population by five-year age groups: World Fertility Survey (1978) and 1977 census: Kenya



Source: NDS (1977): World Fertility Survey and Government of Kenya, Kenya Fertility Survey 1977-1978: First Report, vol I (Nairobi, Central Bureau of Statistics, Ministry of Economic Planning and Development, 1980), p. 45.

**Figure III. Distribution of ever-married women aged 15-49
by years since first married: Kenya**

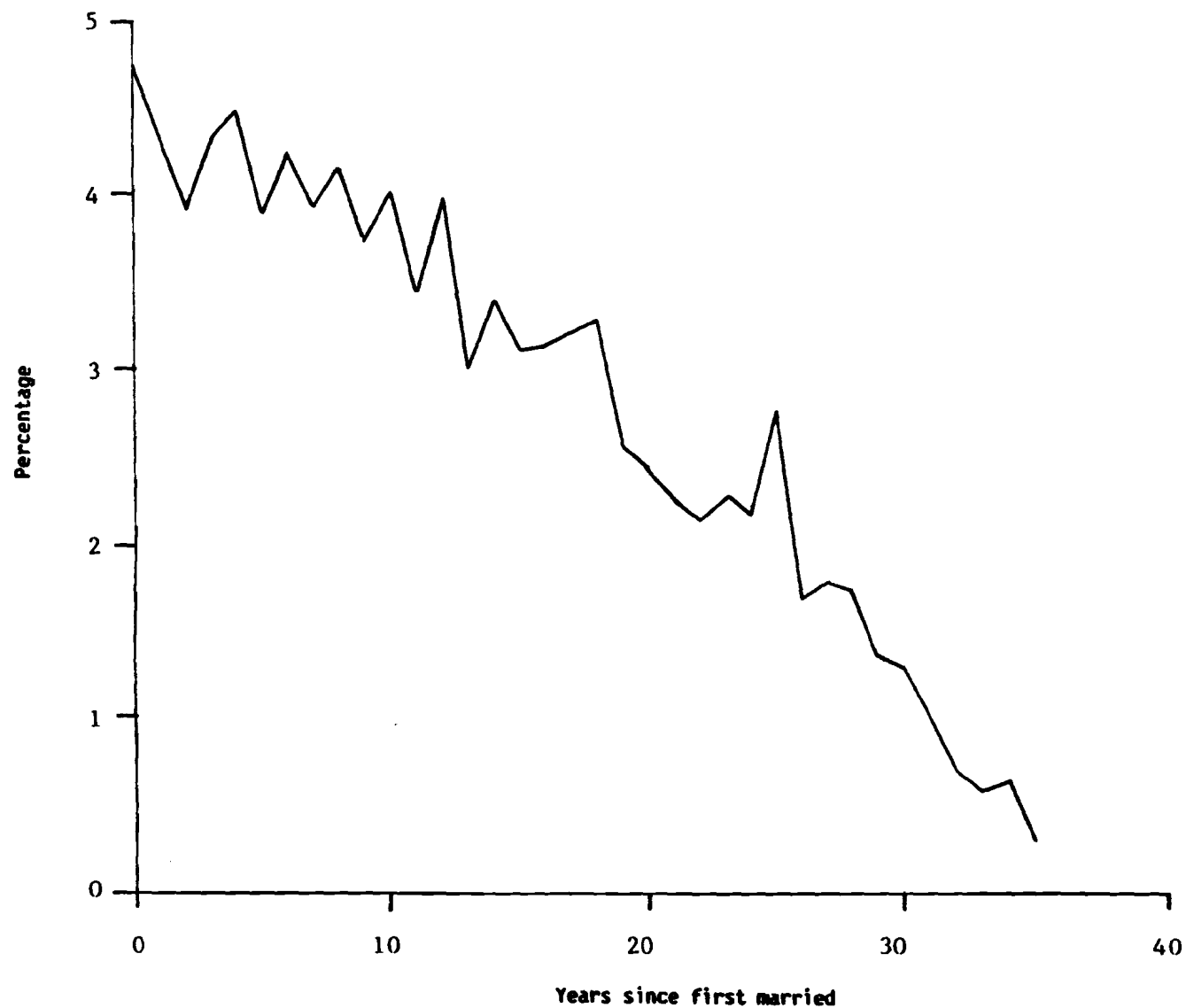
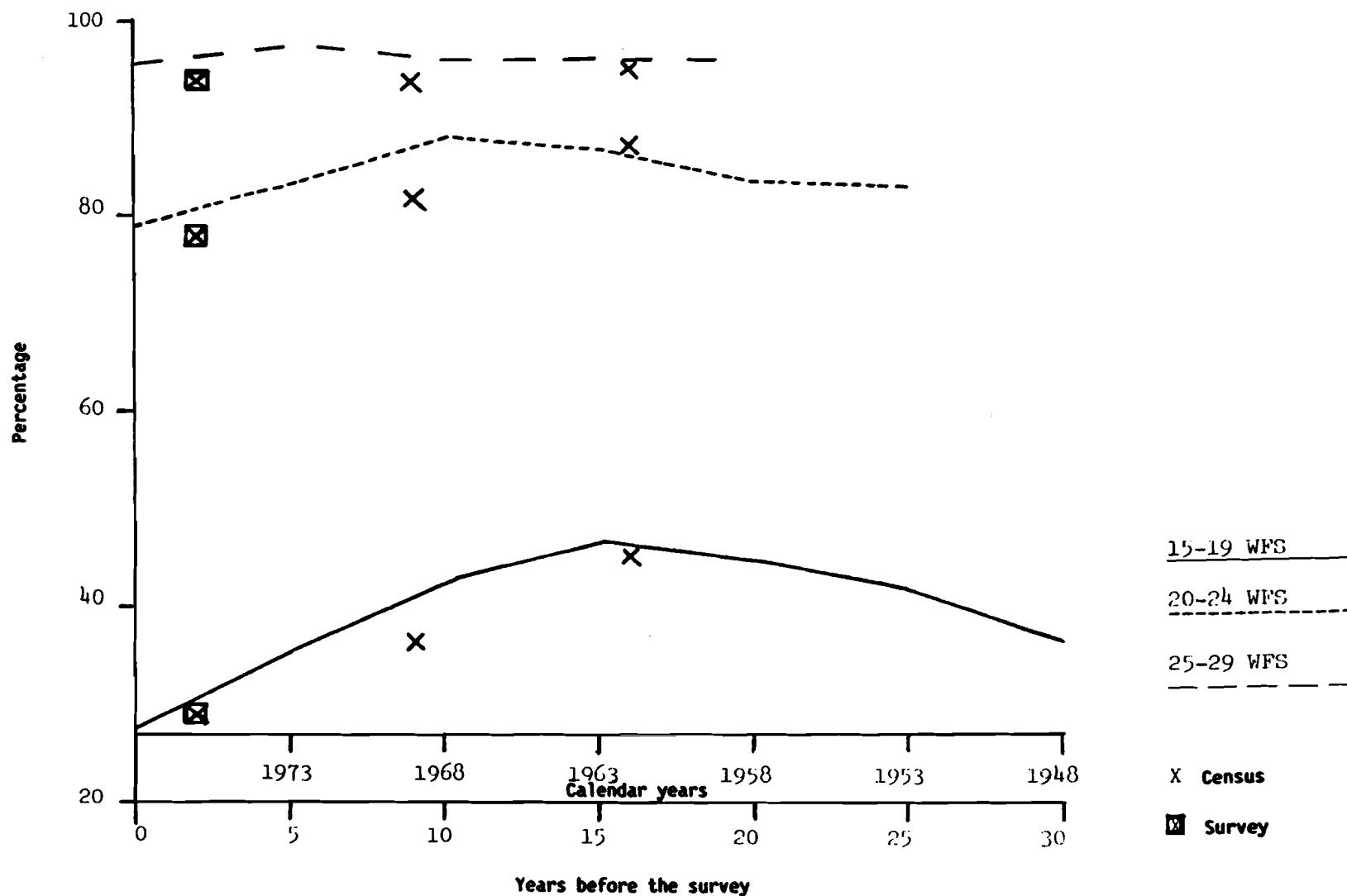
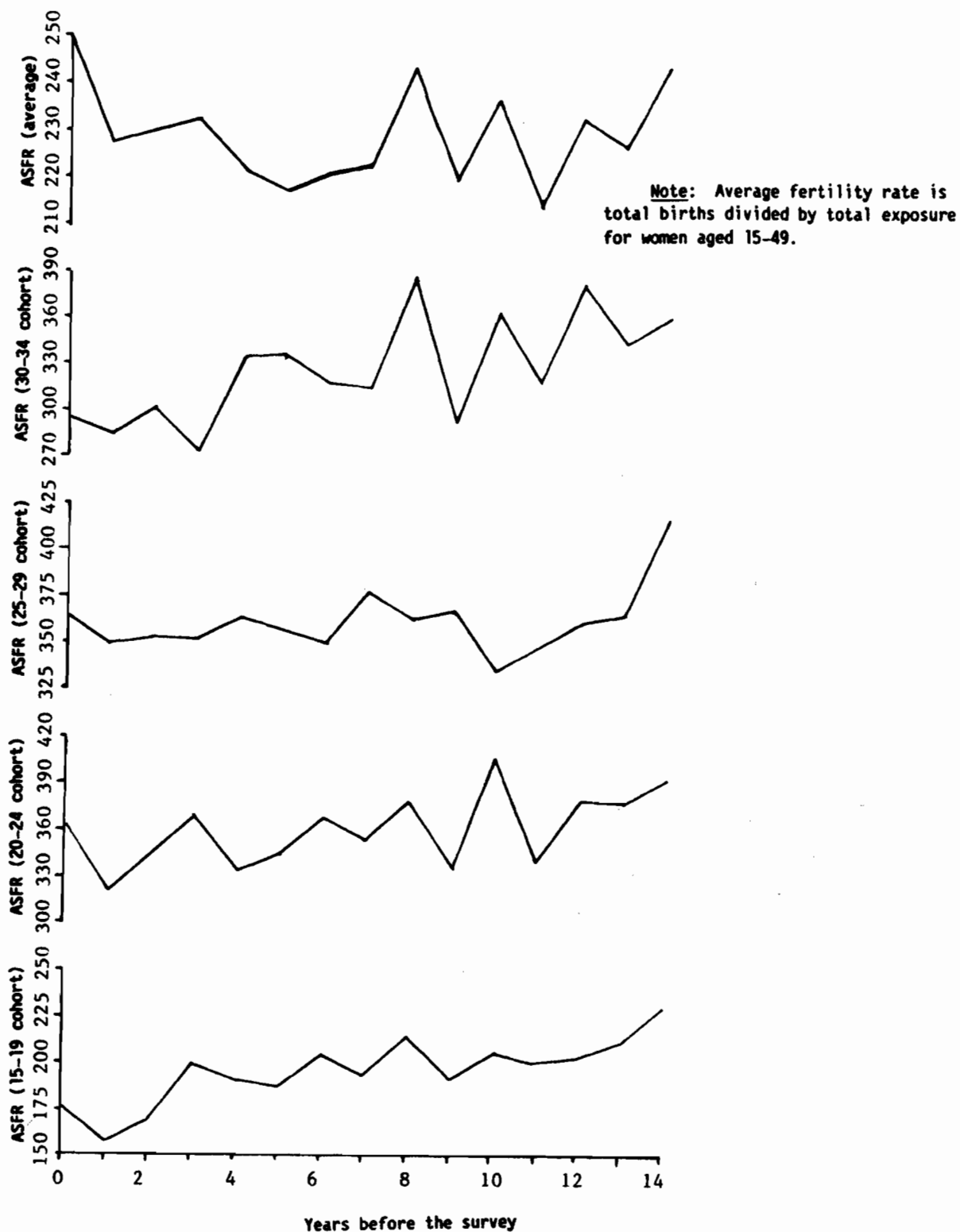


Figure IV. Proportions ever-married at designated periods prior to the survey for selected age groups: World Fertility Survey data and other sources: Kenya



Source: World Fertility Survey and Government of Kenya, Kenya Fertility Survey: Major Highlights (Nairobi, Central Bureau of Statistics, 1979), pp. 20 and 71

**Figure VI. Age-specific fertility rates for selected cohorts and average fertility rate for single years before the survey:
Kenya**



LESOTHO

The Lesotho Fertility Survey (LFS) was carried out between April and December 1977, interviewing all ever-married women who were between 15 and 49 years of age, in selected households. The survey was carried out in three phases: phase 1 was a large-scale household survey; phase 2 was the individual survey of ever-married women, while in phase 3, a subsample of women was re-interviewed in order to ascertain response reliability. The first population count in Lesotho was made in 1875, followed by population censuses in 1891, 1911, 1936 and 1976. In 1976, the population of Lesotho was counted at 1.2 million people (Lesotho Central Bureau of Statistics, 1981). Fertility estimates are available for comparison from the Demographic Component of the Rural Household Consumption and Expenditure Survey, 1967-1969 and the Lesotho Demographic Survey of 1971-1973.

A large proportion of the labour force in Lesotho is employed outside of the country. Data from the 1966 and 1976 censuses show that about 12 per cent of the de jure population was temporarily out of the country and that of the over 70 per cent were males aged 15-49 years (Lesotho Central Bureau of Statistics, 1981). As a result, sharp differences are seen between the de facto and de jure household age distribution, especially for males. In the assessment of the quality of the age distribution, however, the de facto population is analysed since the women selected for the individual interview come from the de facto population.

Age data

A total of 3,603 ever-married women were interviewed in the individual survey, of whom 72.5 per cent were able to provide both the month and year of birth while 27.5 per cent knew only their year of birth (Chidambaram and Sathar, 1984). The Myer's index for digital preference in age reporting among females is 6.2, with a preference for 0 and, to a lesser extent, 4 and 5. The Myer's index for the 1976 census de facto female age reporting was 6.2 for females aged between 10 and 79 years (Timaeus and Balasubramanian, 1984). A comparison of the male and female de facto household (phase I) age distribution (fig. I) shows substantial deficit of males in the labour-force ages caused by the numbers of migrant workers who were outside Lesotho. Among both males and females, there appears to be some heaping in the age groups 10-14 years, 40-44 years and 55-59 years. An examination of the female age distribution from the phase II household questionnaire (fig. II) shows a deficit of females aged 45-49 years, with an excess at ages 50-54 and 55-59. Some shifting of females out of the eligible age range which is not evident in the household age distribution from phase I must have occurred (fig. I). Comparison of the female age distribution from the 1976 census (fig. II) shows close correspondence. In a detailed evaluation of the age distribution, Timaeus and Balasubramanian (1984) concluded that age reporting was fairly good except at the older ages. At the older ages two problems were evident: a shifting out of the eligible age groups of women aged 45-59, and the pronounced heaping on age group 40-44 years.

Marriage history data

Marriage in Lesotho is traditionally a prolonged process involving bride wealth payments (bohali) and return gifts. The process may or may not have a Christian ceremony at the end. In the individual questionnaire, the date of marriage was defined as the date the man and woman began living together, in order to capture the date of consummation of the marriage. Of the 3,603 ever-married women interviewed in the LFS, 88.2 per cent reported the month and year of the date when they first started living with a man, 5.4 per cent reported the year only, while 6.4 per cent gave the date in terms of "years ago" or "age at marriage" (Chidambaram and Sathar, 1984).

The distribution of years since first married (fig. III) shows marked heaping 7 years and 17 years before the survey. Since the LFS was aimed out in 1977, this would represent heaping on the calendar years 1970 and 1960. There also appears to be a deficit of marriages in the period 10-11 years before the survey.

Proportions ever-married do not appear to have changed over time for any of the three age groups, 15-19, 20-24 and 25-29 (fig. IV). A comparison with the marital status distribution from the 1976 and 1966 census shows close correspondence except at one point; the 15-19 year olds in 1966. Data from the 1966 and 1976 censuses show an increase in the proportions married among the 15-19 year olds while data from the reconstructed marriage histories of the Lesotho Fertility Survey show little change over the same period. Unfortunately, data are not available from other censuses or surveys for an earlier point in time; therefore, it is difficult to ascertain the accuracy of the 1966 figure. In a detailed evaluation of the Lesotho Fertility Survey, Timaeus and Balasubramanian (1984) have tended to accept the 1966 proportion reported in the census as being more accurate, based on two assumptions: the possibility that respondents understated their age at marriage in the retrospective marriage history, and that since census data are based on a simple question on current status, they are more likely to be accurate. Based on this reasoning, one would conclude that there has been a decrease in the age at marriage from 1966 to the most recent period, as implied by the census data. However, if indeed women interviewed in the Lesotho Fertility Survey understated their age at marriage, it would be more likely for older women to do it and the result would be apparent increase in age at marriage over time, which is not the case in the LFS. Since there is some uncertainty about both explanations, it is difficult to ascertain whether age at marriage decreased or if it remained constant over time.

Birth history data

Some 89.7 per cent of all reported births had information on both month and year of birth, 4.3 per cent had only the calendar year, while for 6.0 per cent, the response was in terms of "years ago" or "age" (Chidambaram and Sathar, 1984).

The mean number of children ever-born increases monotonically with age up to an average of 5.4 children among women aged 45-49 at the time of the survey (table 1). Comparison with the 1976 census shows that a higher mean number of

children ever born was recorded by the LFS in every age group. Data are also available from the 1968-1969 Demographic Component of Rural Household Consumption and Expenditure Survey and the 1971-1973 Lesotho Demographic Survey. These are compared with LFS estimates reconstructed from birth history information. Among the younger age groups, 15-29 years, the LFS estimates were always higher, but among older women, the LFS mean was lower or similar, although differences are not large.

Cohort period fertility rates presented in table 2 show minor fluctuations in rates from the most distant period up to the most recent period among women aged 15-19 years. Among older women, rates have increased slightly up to the most recent period. In general, however, rates have remained fairly constant across all age groups. This point is further confirmed in figure V which shows cohort-period fertility rates for four 5-year cohorts from 30-34 years to 45-49 years. The fertility profiles for all four cohorts are similar, and the younger cohorts appear to have only slightly higher rates than the older cohorts.

The lower panel of table 2, on cumulative fertility rates for the various cohorts at different periods in the past, shows that, although the parity of women aged 45-49 years at the time of the survey was higher than the parity of those aged 40-44 years, the 45-49 cohort did have lower parity when they were 40-44 years old than women aged 40-44 at the time of the survey. The difference, however, is very small so that, although it suggests possible omission of births among older women, the effect on estimates of completed parity is likely to be negligible.

Single-year age-specific fertility rates (fig. VI) show heaping on 4, 7, 9 and 12 years prior to the survey. Correspondingly, there appears to be a deficit 3, 6 and 10 years before the survey. Heaping on 7 and 12 years before the survey is probably due to dating of births with a preference for 0 and 5 - i.e., 1970 and 1965, since the survey date was 1977. There seems to be no apparent reason for the heaping on 4 and 9 years before the survey. Among 20-24 and 25-29-year-olds and to a lesser extent 15-19-year-olds, an increase in age specific fertility rates is seen over the three years preceding the survey date, the increase being most pronounced among the 20-24-year-olds. Whether the increase is real cannot be determined from these data alone.

In table 3, age-specific fertility rates for selected calendar years are compared with rates from outside sources. The total fertility rate from the LFS averaged from 1975 to 1977 is 5.9, which is similar to that obtained from the 1976 census. The LFS total fertility rate for the period 1971 to 1973 is 5.5, compared with a TFR of 5.6 from the 1971-1973 Demographic Survey. This difference, however, is also small. Both the external sources and the LFS show an increase in fertility from the early to mid 1970s.

The age pattern of fertility obtained from the LFS compares quite closely with that from the 1971-1973 Demographic Survey and the 1976 census except that the LFS fertility schedule, for the more recent period, has an earlier peak (20-24 years as compared with 25-29 years from the 1976 census). Further, fertility among 15-19-year-olds is higher in the LFS than in the outside sources. The differences, however, are not large.

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Table 1. Children ever born per woman from Lesotho
Fertility Survey and other sources: Lesotho

Age group	1967-1969 Survey	1968 LFS	1971-1973 Survey	1972 LFS	1976 census	1977 LFS
15-19	0.12	0.18	0.11	0.24	0.15	0.49
20-24	1.08	1.32	1.01	1.15	1.05	1.43
25-29	2.44	2.60	2.44	2.66	2.13	2.62
30-34	3.63	3.54	3.66	3.75	3.43	3.95
35-39	4.36	4.35	4.64	4.48	4.21	4.73
40-44	4.76	5.22	5.16	5.06	4.65	5.14
45-49	4.78	n.a.	5.05	n.a.	4.72	5.42

Source: 1967-69 Survey, 1971-73 Survey and 1976 census: Ian Timaeus and K. Balasubramanian, "Evaluation of the Lesotho Fertility Survey, 1977", Scientific Reports, No. 58 (Voorburg, Netherlands, ISI/WFS, March 1984), table 14.

Table 2. Cohort period rates and cumulative cohort fertility by age at survey: Lesotho

Age group of cohort at end of period	Number of women in cohort	Years prior to survey						
		0-4	5-9	10-14	15-19	20-24	25-29	30-34
Cohort-period fertility rates								
10-14	0	0.000	0.000	0.003	0.003	0.002	0.001	0.002
15-19	372	0.031	0.035	0.035	0.041	0.031	0.045	0.037
20-24	773	0.201	0.180	0.196	0.185	0.163	0.175	
25-29	676	0.269	0.262	0.261	0.244	0.240		
30-34	514	0.247	0.242	0.228	0.220			
35-39	482	0.197	0.197	0.195				
40-44	494	0.128	0.127					
45-49	293	0.061						
Cumulative fertility of cohorts at end of period								
10-14		0.000	0.001	0.014	0.017	0.012	0.006	0.008
15-19		0.156	0.188	0.190	0.217	0.161	0.233	0.183
20-24		1.192	1.089	1.196	1.086	1.046	1.058	
25-29		2.431	2.507	2.390	2.267	2.257		
30-34		3.744	3.598	3.407	3.357			
35-39		4.584	4.392	4.330				
40-44		5.033	4.967					
45-49		5.273						

Source: WFS standard recode tapes.

Table 3. Age-specific fertility rates for selected periods from 1977 LFS, 1976 Census, and 1971-1973 Demographic Survey: Lesotho

Age group	1971-1973 Demographic Survey	1971-1973 LFS	1976 Census	1975-1977 LFS	Percentage change 1971-1973 - 1975-1977	
					Outside source $((3)-(1))/(1)$	LFS $((4)-(2))/(2)$
	(1)	(2)	(3)	(4)		
15-19	0.061	0.096	0.070	0.101	14.8	5.2
20-24	0.248	0.238	0.258	0.274	4.0	15.1
25-29	0.271	0.247	0.280	0.269	3.3	8.9
30-34	0.247	0.223	0.240	0.246	- 2.8	10.3
35-39	0.173	0.165	0.178	0.175	2.9	6.1
40-44	0.087	0.102	0.104	0.085	19.5	-16.7
45-49	0.037	..	0.042	0.034	..	..
TFR	5.62	5.54 a/	5.86	5.92	4.3	6.9

Sources: 1971-1973 demographic survey: Lesotho Central Bureau of Statistics, Lesotho Fertility Survey 1977, First Report, vol. I (Maseru, 1981), p. 9, table 1.2.; 1976 census: I. Yimaus and K. Balasubramanian, "Evaluation of the Lesotho Fertility Survey", WFS Scientific Reports, No. 58 (Voorburg, Netherlands, ISI/WFS, March 1984), table 13.

a/ The rate for the 45-49 age group was assumed to be the same as that in the 1971-1973 survey.

Figure I. Distribution of males and females as a percentage of the total population by five-year age groups: Lesotho

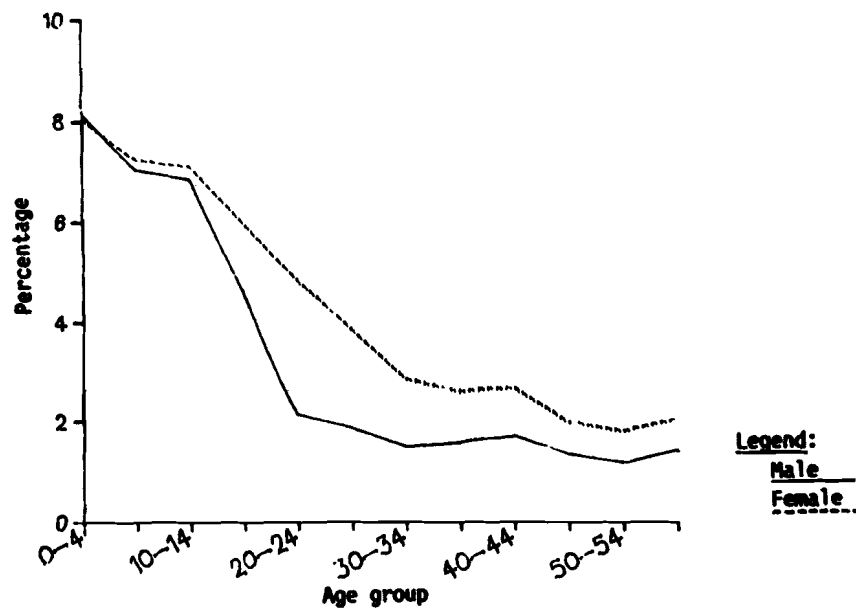
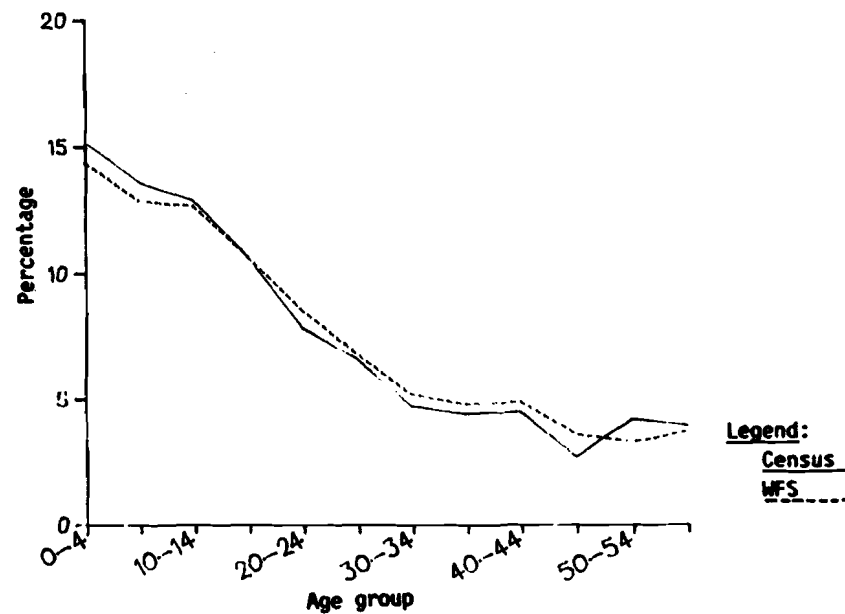


Figure II. Distribution of the female population by five-year age groups: World Fertility Survey (1977) and 1976 census: Lesotho



Source: Central Bureau of Statistics, *Lesotho Fertility Survey, 1977, First Report*, vol. I (Maseru, 1981), p. 39, table 3.2.

**Figure III. Distribution of ever-married women aged 15-49
by years since first married: Lesotho**

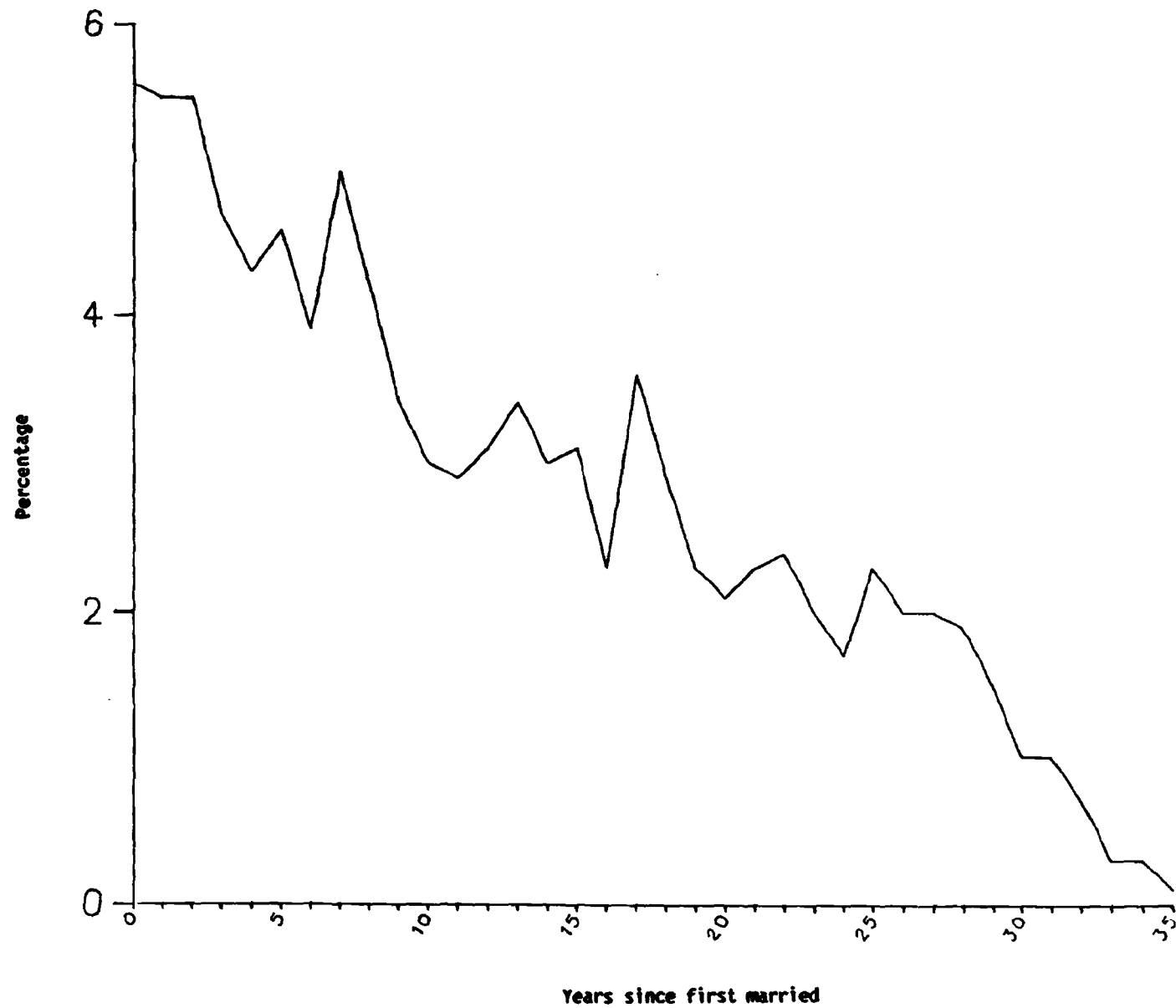


Figure IV. Proportions ever-married at designated periods prior to the survey for selected age groups: Lesotho

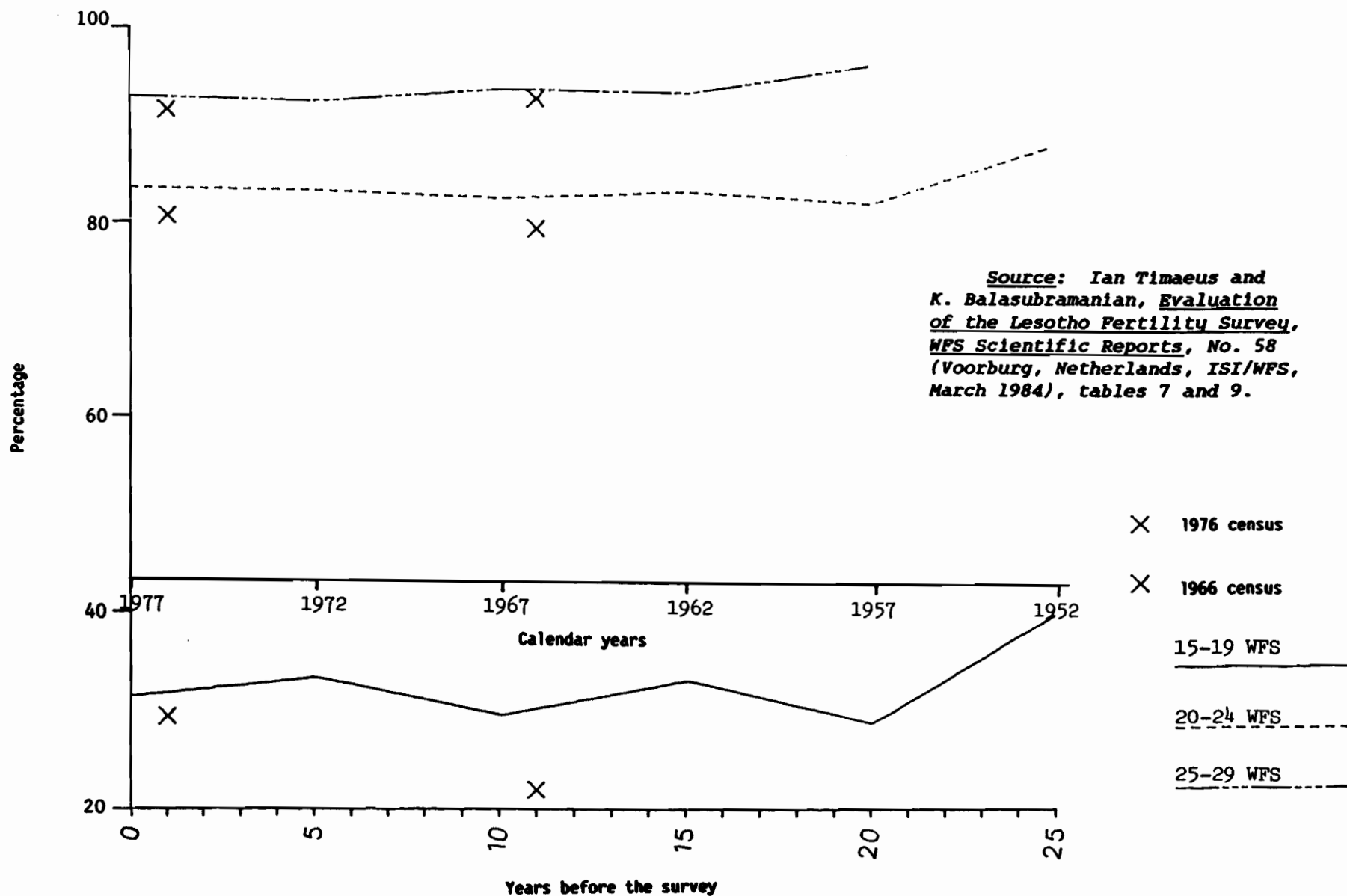
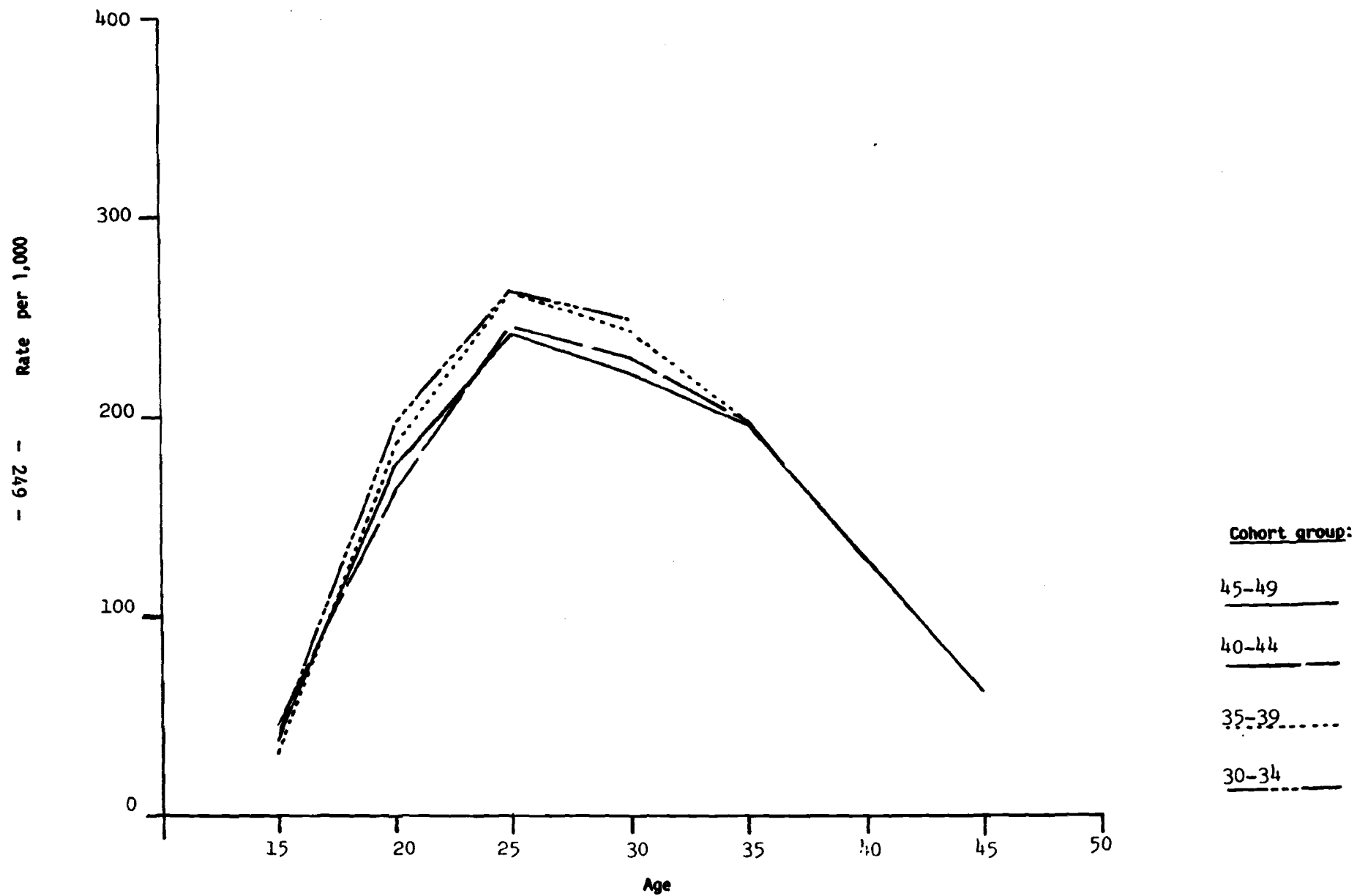
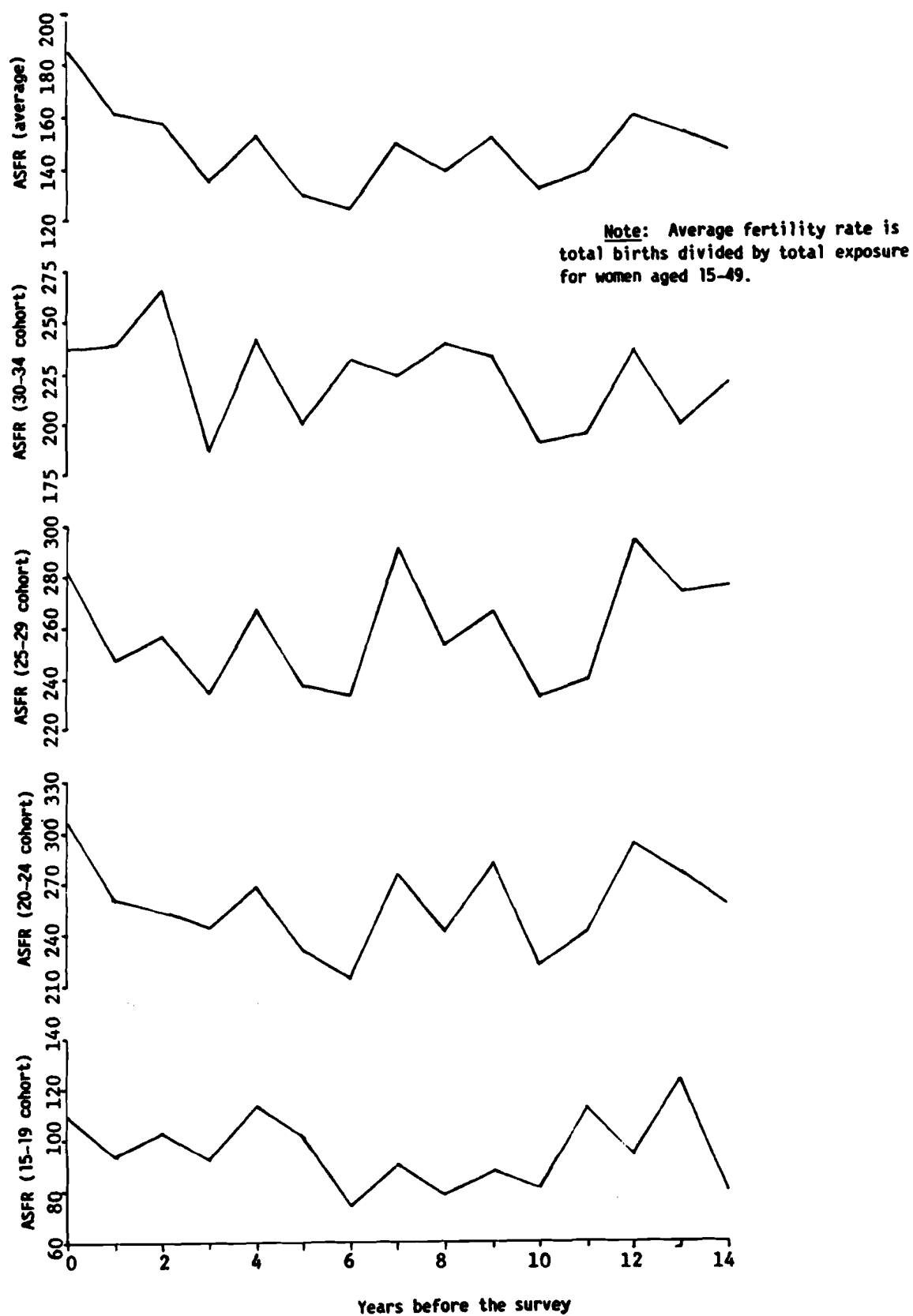


Figure V. Cohort-period fertility rates for women aged 30-49 at interview:
Lesotho



**Figure VI. Age-specific fertility rates for selected cohorts and average fertility rate for single years before the survey:
Lesotho**



MALAYSIA (PENINSULAR)

The World Fertility Survey of Malaysia (Malaysian Fertility and Family Survey: MFFS) was conducted in 1974, with field work extending from August 1974 to December 1974. Prior to 1974, the latest fertility survey with birth history information was the 1966/67 KAP survey. Subsequently, a brief KAP survey was attached to the Post-Enumeration Survey for the 1970 census. Census data are available for 1957, 1970 and for earlier periods from 1931 (World Fertility Survey, 1977).

It should be noted that Malaysia consists of Peninsular Malaysia, which has 84 per cent of the population of Malaysia, and two states, Sabah and Sarawak, that have the remaining 16 per cent. The MFFS covered only Peninsular Malaysia, which is very different from Sabah and Sarawak in terms of availability of demographic data (World Fertility Survey, 1977).

Birth registration in Peninsular Malaysia can be considered to be of high quality. Between 1962 and 1966, birth registration was estimated to be 95 per cent complete. The 1966/67 Socio-Economic Survey estimated that only 1.9 per cent of births were unregistered (Fernandez, Hawley and Pedraza, 1974).

Age data

Data from the MFFS standard recode tape show that 57 per cent of women reported both the year and month of birth, while the remaining 43 per cent reported the year only (Chidambaram and Sathar, 1984). The Myer's index of digital preference is relatively low at 8.5 (Rutstein, 1984), with popular digits being 0, 5 and 6.

The age distribution by five-year groups from the household survey (fig. I) shows some heaping at 5-9 and 35-39 for both sexes and at 45-59 among males. The deficit at 0-4 is more marked for women. Comparison of age data grouped in five years with the 1970 age distribution shows fairly close correspondence except in the youngest age groups (fig. II). The MFFS distribution has smaller proportions in those age groups. A slight "bump" in the age group 35-39 in MFFS in 1974 is matched by a corresponding bump in age group 30-34 in the 1970 census.

Marriage history data

The marriage history is based on a sample of 6,321 ever-married women. Nearly 62 per cent of respondents reported both the month and year of marriage (Chidambaram and Sathar, 1984); the remaining 38 per cent reported the year only. When the respondent was unable to provide the date of marriage, she was asked to estimate the duration of her marriage, which was then subtracted from the date of the survey to obtain the calendar year of marriage (Yatim, 1982). Data on years since first marriage show some fluctuations which could be related to some major events (fig. III), such as the year of independence, 1957.

Comparison of proportions married (constructed from MFFS data) with the 1970 and 1957 census proportions married shows close correspondence (fig. IV);

both sources indicate declines over time in proportions married among 15-19 and 20-24-year-olds, with levels and trends from both sources corresponding remarkably well. Census data for 1947, 1957 and 1970 show the singulate mean age at marriage to have increased from 18.5 in 1947 to 19.4 in 1957 and 22.3 in 1970 (Hirschman, 1980).

Birth history data

Of all births reported, 86.2 per cent were reported with both a month and calendar year (Chidambaram and Sathar, 1984). Parity as of 1970, as reconstructed from MFFS birth histories, shows close correspondence with 1970 census parity data for all age groups below 35-39. Parity for women 40-44 and 45-49 is higher in MFFS data than for the 1970 census, which suggests a more complete enumeration in the MFFS of children born to older women (table 1). Further, the parity of the cohort 45-49 was higher than that of the cohort 40-44 when both were at 40-44; this indicates that errors of omission are probably not substantial (table 2, lower panel).

Age-specific cohort fertility rates for given periods preceding the survey date (table 2) show declining trends in rates for each age group for 15-19 years prior to the survey up to the survey date. Rates for periods further back than 20 years from the survey date show an increasing trend, suggesting some forward displacement of births at least among the oldest women (fig. V). Figure VI shows age-specific fertility rates by single years. There is no evidence that births have been shifted from the recent period to 5-9 years before the survey.

In table 3, age-specific fertility rates from birth registration and the MFFS for 1966-1969 and 1970-1974 are compared. The trends in total fertility rates are identical, and the only difference between the two sources of data is that the MFFS shows a slightly younger fertility schedule.

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Table 1. Children ever born per ever-married woman from 1970 census and WFS: Malaysia

Age group	1970 census	1970 WFS	1974 WFS
15-19	0.7	0.7	0.8
20-24	1.8	1.7	1.7
25-29	3.1	3.2	2.8
30-34	4.5	4.5	4.2
35-39	5.5	5.7	5.5
40-44	5.9	6.1	6.1
45-49	5.7	6.3	6.2

Source: Masitah M. Yatim, "Evaluation of the Malaysian Fertility and Family Survey, 1974", WFS Scientific Reports, No. 27 (Voorburg, Netherlands, ISI/WFS, February 1982), table 12.

Table 2. Cohort period rates and cumulative cohort fertility by age at survey: Malaysia, 1974

Age group of cohort at end of period	Number of women in cohort	Years prior to survey						
		0-4	5-9	10-14	15-19	20-24	25-29	30-34
Cohort-period fertility rates								
10-14	4	0.000	0.000	0.000	0.001	0.001	0.001	0.004
15-19	255	0.019	0.027	0.039	0.055	0.072	0.064	0.066
20-24	909	0.149	0.173	0.222	0.240	0.260	0.225	
25-29	1 192	0.253	0.293	0.315	0.324	0.306		
30-34	1 089	0.223	0.256	0.280	0.289			
35-39	1 115	0.175	0.187	0.210				
40-44	860	0.079	0.107					
45-49	737	0.022						
Cumulative fertility of cohorts at end of period								
10-14		0.000	0.001	0.001	0.008	0.004	0.006	0.022
15-19		0.094	0.135	0.200	0.280	0.367	0.340	0.350
20-24		0.881	1.065	1.390	1.567	1.641	1.477	
25-29		2.331	2.853	3.140	3.263	3.007		
30-34		3.970	4.421	4.663	4.451			
35-39		5.298	5.596	5.503				
40-44		5.991	6.038					
45-49		6.147						

Source: WFS standard recode tapes.

Table 3. Age-specific fertility rates for selected periods from
WFS data and birth registration data: Malaysia

Age group	1966-1969		1970-1974		Percentage change	
	BR (1)	WFS (2)	BR (3)	WFS (4)	WFS (2) - (4)	Outside source (1) - (3)
15-19	0.066	0.085	0.052	0.062	-27.1	-21.2
20-24	0.247	0.252	0.218	0.231	- 8.3	-11.7
25-29	0.271	0.288	0.256	0.254	-11.8	- 5.5
30-34	0.238	0.218	0.217	0.199	- 8.7	- 8.8
35-39	0.142	0.138	0.138	0.133	- 3.6	- 2.8
40-44	0.060	..	0.052	0.040	..	-13.3
45-49	0.017	..	0.012	0.014	..	-29.4
TFR	5.2	5.2 a/	4.7	4.7	- 9.6	- 9.6

Source: Birth registration data: Demographic Yearbook, Historical Supplement:
Special Issue (United Nations publication, Sales No. E/F.79.XIII.8), table 6.

a/ For the purpose of calculating a total fertility rate, the age-specific fertility rates from the birth registration data were used when the age-specific rate from WFS was not available.

Figure I. Distribution of males and females as a percentage of the total population by five-year age groups: Malaysia

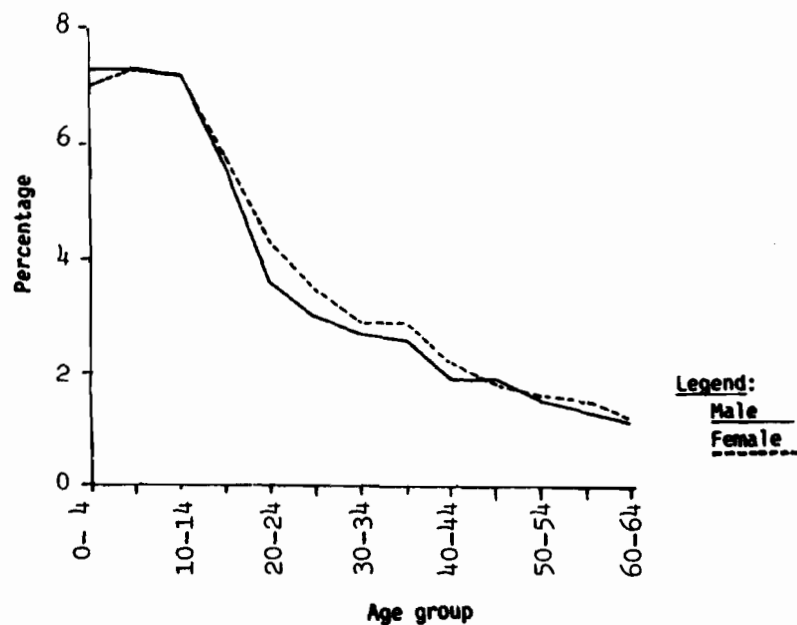
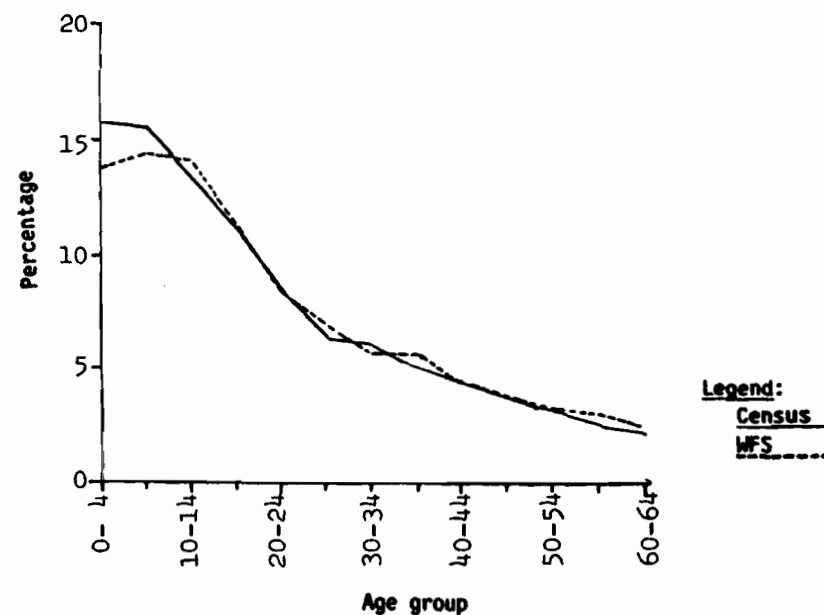


Figure II. Distribution of the female population by five-year age groups: World Fertility Survey (1974) and 1970 census: Malaysia



Source for the 1970 census: M. Yatim, "Evaluation of the Malaysian Fertility and Family Survey, 1974", *WFS Scientific Reports*, No. 27 (Voorburg, Netherlands, ISI/WFS, February 1982), table 1.

**Figure III. Distribution of ever-married women aged 15-49
by years since first married: Malaysia**

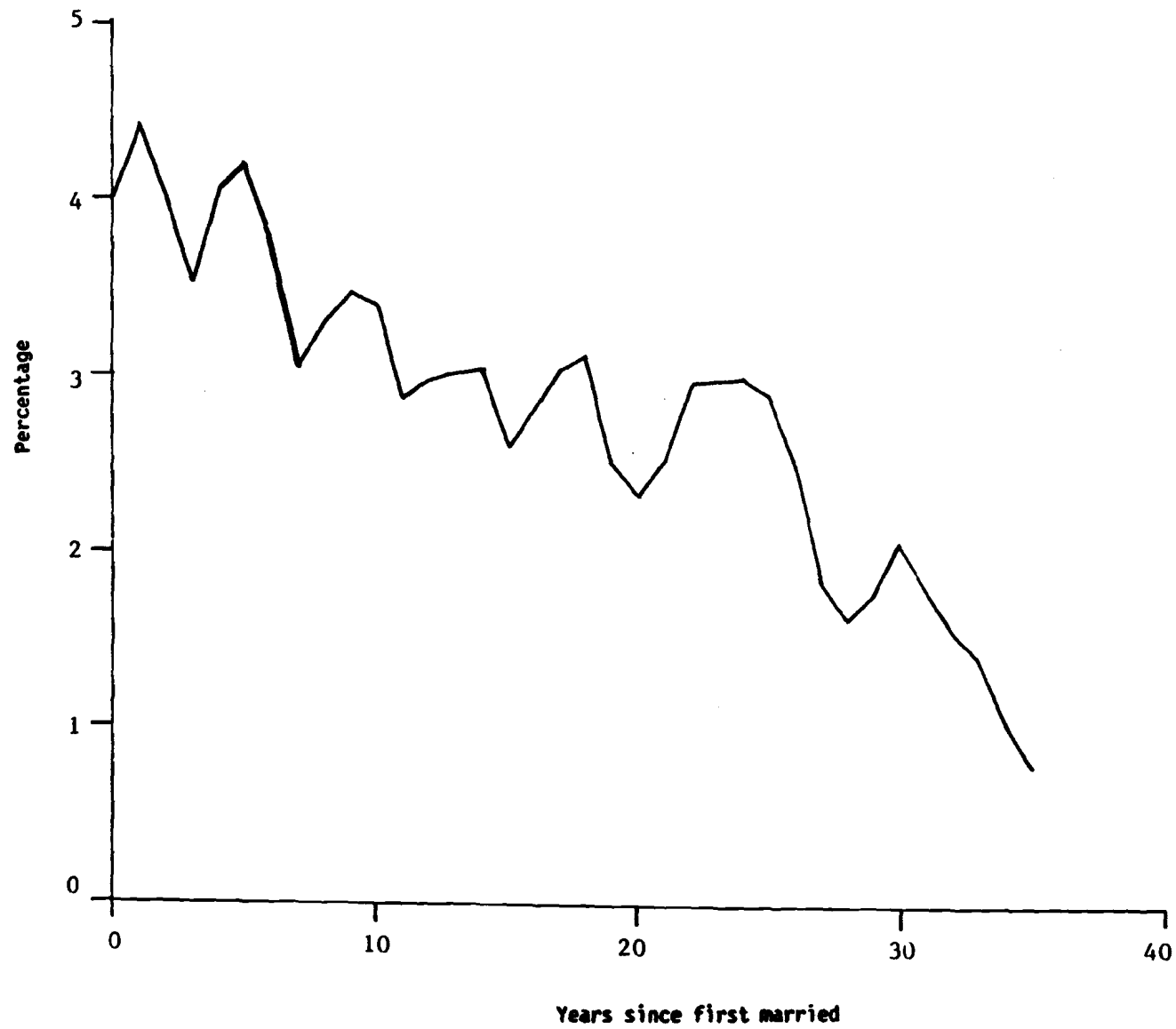
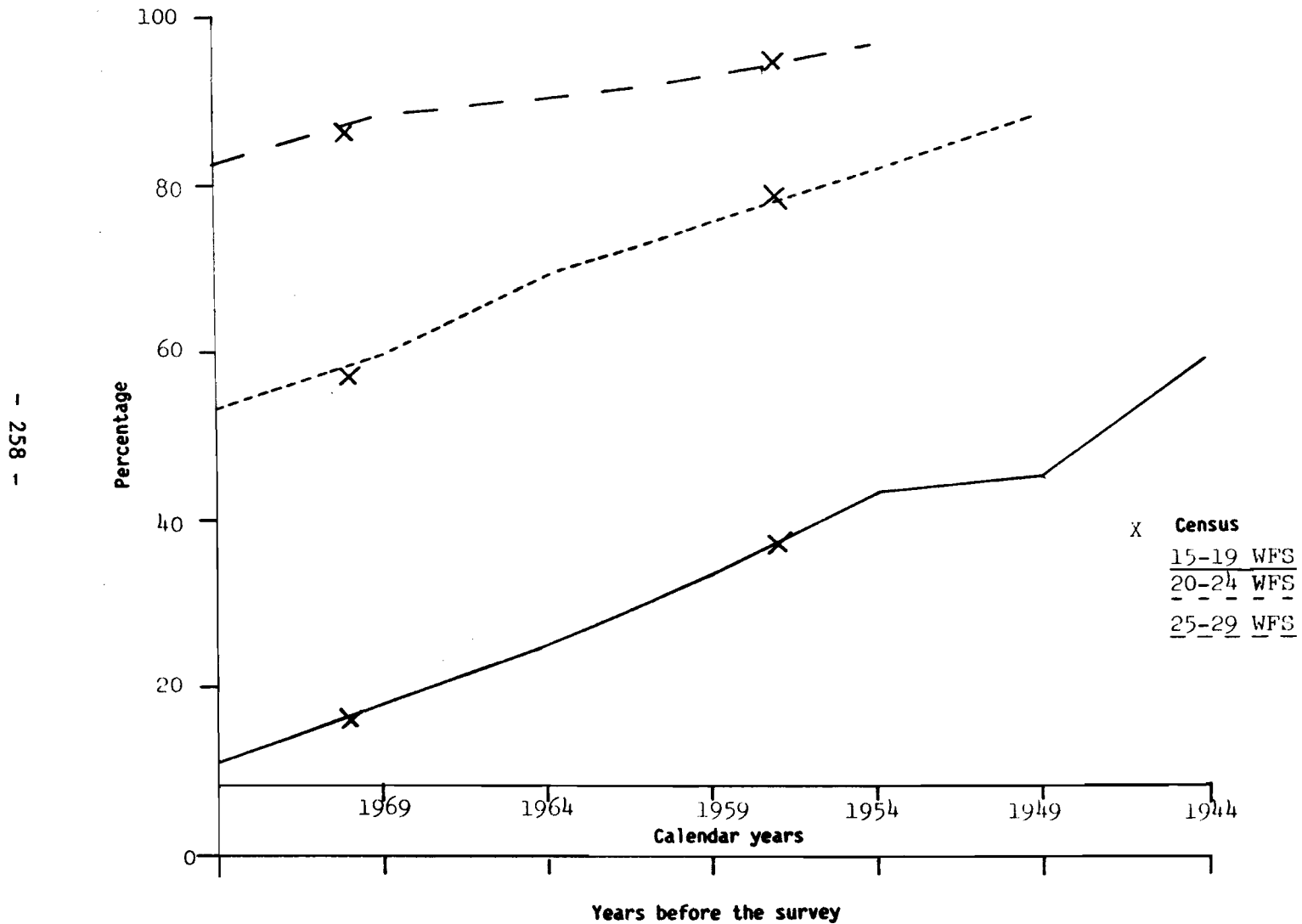


Figure IV. Proportions ever-married at designated periods prior to the survey for selected age groups: World Fertility Survey data and other sources: Malaysia



Source: United States Bureau of the Census, Country Demographic Profile: Malaysia (Washington, D.C., 1979), table 11.

Figure V. Cohort-period fertility rates for women aged 30-49 at interview:
Malaysia

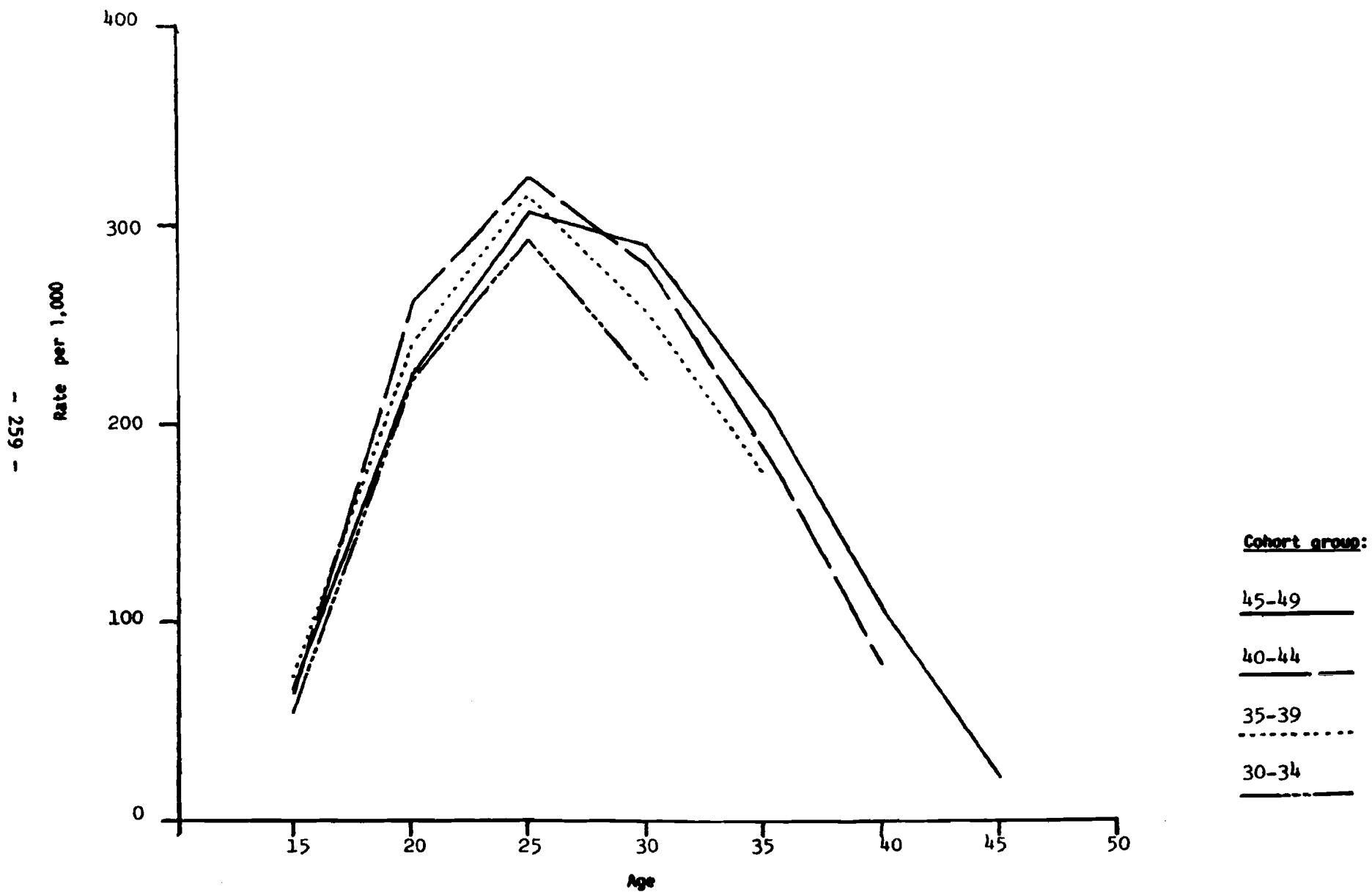
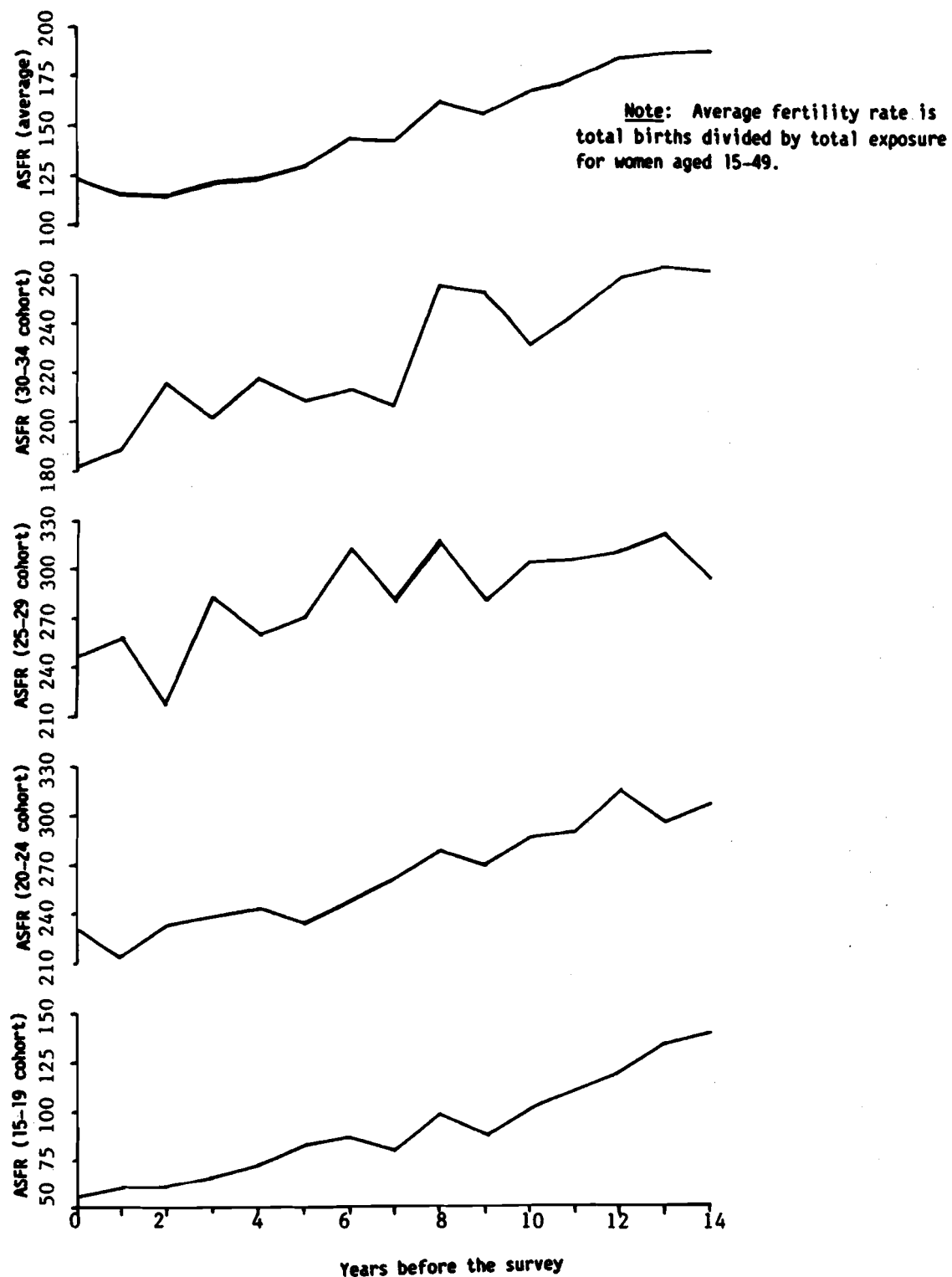


Figure VI. Age-specific fertility rates for selected cohorts and average fertility rate for single years before the survey: Malaysia



MAURITANIA

The Mauritania Fertility Survey (Enquête nationale mauritanienne sur la fécondité - ENMF) was conducted between April and November 1981. The survey covered only the sedentary population which in 1981 comprised 70 per cent of the total population of Mauritania (Scott and Harpham, 1984). The 1976/77 population census was the first exhaustive source of information on demographic factors at the national level. In 1964/65, a demographic survey was carried out only in rural areas, therefore the data will not be used for comparison here.

Age data

Only 3.9 per cent of ever married women interviewed in the individual questionnaire knew both the month and year of birth, while 95.6 per cent knew only the calendar year of birth (Chidambaram and Sathar, 1984). The age-event chart was used in the estimation of birth dates in Mauritania and also special probing was done in order to obtain more accurate information on birth dates. One analysis of age reporting found that special probing does appear to have improved the quality of the data (Rutstein, 1984). Myer's index of digital preference is rather high: among females in the household interview it was 23.9 (Rutstein, 1984), slightly higher than the 1977 census figure - 21.2 (Direction de la statistique, no date).

The male and female household age distribution (fig. I) shows some serious discrepancies up to age 40. At ages below 15 years, males have higher proportions than females, but between ages 15 and 30 females have higher proportions. Comparisons with the 1977 age distribution for women (fig. II) show some discrepancies in the age groups 10-14, 40-44 and 50-54 years.^{1/} The heaping on 50-54 years in the ENMF is most likely due to age shifting out of the eligible age groups by interviewers.

Marriage history data

Only 7.4 per cent of ever-married women knew the month and year of first union, while nearly three quarters could give only the calendar year (Chidambaram and Sathar, 1984). The percentage distribution of ever-married women by years since first married (fig. III) shows a very uneven distribution with an apparent deficit of marriages in the three years before the survey and pronounced heaping at 20 and 30 years before the survey. The deficit of marriages in the three years before the survey is probably due to some backward shifting of marriage dates.

An examination of proportions married, using the marriage history to reconstruct past patterns shows sharp declines, especially in the most recent period (fig. IV). There are no reasons to suspect large increases in age at marriage in Mauritania. Therefore the sharp declines in the recent period are probably partly due to backward shifting of marriage dates. Two cohorts, the 25-29 and the 30-34 cohorts, appear to have over-estimated the proportions married. An evaluation by Abderrahmane (1984) showed marriage date reporting to be particularly problematic among women more than 40 years old. Comparison with the marital status distribution from the 1977 census shows that the

census recorded somewhat lower proportions married than the ENMF, but it is not possible to say which of the distributions is a better estimate.

Birth history data

Of all births, 11.6 per cent were reported with both month and year of birth, while 88.4 per cent were reported with only the calendar year (Chidambaram and Sathar, 1984). An age-event chart was used in estimating birth dates. The parity distribution from the ENMF is shown in table 1. The mean number of children ever born increases monotonically up to age 45-49; in that age group women had 6.3 children per woman. The increasing mean number of children ever born with age indicates that omission of births among older women was either non-existent or occurred to a very small degree. The comparison of the ENMF parity data with an external source is therefore not possible. The 1977 census collected information on children ever born only of nomadic women who comprised about 36 per cent of the population (Ministère du plan et de l'aménagement du territoire, 1984). An examination of cumulative cohort fertility rates shows that there might be some omission of births among the oldest cohort. The 45-49 cohort had fewer births per woman when they were 40-44 years old than the 40-44 cohort at the time of the survey - 5.6 versus 5.9, respectively (table 2, lower panel). In a detailed evaluation of the Mauritania Fertility Survey birth history data, Abderrahmane (1984) found some omission of female infants that died at very young ages, especially among the 45-49 cohort.

An examination of the cohort period fertility rates (table 2) and the age pattern of cohort fertility (fig. V) shows fertility increasing among all age groups up to the period 5-9 years before the survey, followed by declines in the most recent period. Shifting of dates of birth must have occurred from the distant past towards the survey date. This is borne out by the cohort age pattern, which shifts towards a younger age pattern of fertility among the younger cohorts. The decline in fertility among all age groups from the 5-9 year period to the 0-4 year period could also be the result of some backward shifting of birth dates from the most recent period away from the survey date. Indeed, single-year fertility rates (fig. VI) show a dip in fertility rates in the period 1-2 years before the survey date, and heaping on 0-3 years before the survey. Dips in rates also occur 4, 11 and 13 and 14 years before the survey. Single-year rates for individual age groups appear extremely uneven.

Comparison of age specific fertility rates from the ENMF with those obtained from the 1977 census is shown in table 3. Fertility related information was only asked of the nomadic population in the 1977 census. The rates presented for the non-nomadic population have been prorated from the nomadic population and adjusted for discrepancies in age reporting (Direction de la statistique, no date).

Comparison of rates from the two sources shows the total fertility rates to be quite similar - 6.7 and 6.9 from the census and the ENMF, respectively, but the age pattern of fertility from the two sources is quite different. The ENMF has a very young age pattern compared with that of the census. Since the census estimates have undergone considerable adjustment and estimation, it is

difficult to say which of the two age patterns is more accurate. Gross misstatement of age of women could also be responsible for the ENMF age pattern. The ENMF recorded some decline in fertility over the recent period but the cohort-period rates and the single-year age specific fertility rates suggest that the decline is probably spurious and caused by backward shifting of birth dates away from the survey date.

Note

1/ Comparison of the male age distribution from the ENMF with that of the 1977 census shows that the male age distribution from the ENMF had higher proportions below 15 years and lower proportions at higher ages, though differences are not large.

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Table 1. Children ever-born per woman
from ENMF, 1981: Mauritania

Age group	ENMF 1981
15-19	0.9
20-24	2.1
25-29	3.5
30-34	4.8
35-39	5.7
40-44	6.0
45-49	6.3

Table 2. Cohort period rates and cumulative cohort fertility
by age at survey: Mauritania

Age group of cohort at end of period	Number of women in cohort	Years prior to survey						
		0-4	5-9	10-14	15-19	20-24	25-29	30-34
Cohort-period fertility rates								
10-14	50	0.000	0.009	0.014	0.015	0.017	0.018	0.017
15-19	467	0.072	0.097	0.111	0.102	0.119	0.099	0.079
20-24	711	0.217	0.265	0.260	0.219	0.202	0.184	
25-29	657	0.287	0.310	0.281	0.244	0.224		
30-34	540	0.264	0.290	0.263	0.255			
35-39	439	0.209	0.226	0.213				
40-44	317	0.121	0.162					
45-49	239	0.062						
Cumulative fertility of cohorts at end of period								
10-14		0.000	0.047	0.069	0.077	0.086	0.092	0.086
15-19		0.405	0.556	0.630	0.596	0.686	0.581	0.449
20-24		1.643	1.955	1.894	1.780	1.589	1.371	
25-29		3.391	3.445	3.184	2.808	2.489		
30-34		4.764	4.632	4.122	3.767			
35-39		5.678	5.250	4.830				
40-44		5.854	5.638					
45-49		5.949						

Source: S. Singh, "Birth histories", WFS Comparative Studies, Cross-national Summaries: Additional Tables (Voorburg, Netherlands, ISI/WFS, 1984), p. 43.

Table 3. Age-specific fertility rates for selected periods from ENMF 1981 and the 1977 Population Census: Mauritania

Age group	census 1976a/	ENMF 1975-1977	ENMF 1979-1980	Percentage change ENMF
15-19	0.118	0.163	0.153	- 6.1
20-24	0.260	0.299	0.266	-11.0
25-29	0.316	0.311	0.296	- 4.8
30-34	0.294	0.267	0.260	- 2.6
35-39	0.219	0.163	0.188	15.3
40-44	0.098	0.113	0.070	-38.0
45-49	0.032	0.069	0.029	-58.0
TFR	6.7	6.9	6.3	

Source: 1976 census: Direction de la Statistique, Recensement general de la population, 1977, vol. II (Nouakchott).

a/ Non-nomadic population

Figure I. Distribution of males and females as a percentage of the total population by five-year age groups: Mauritania

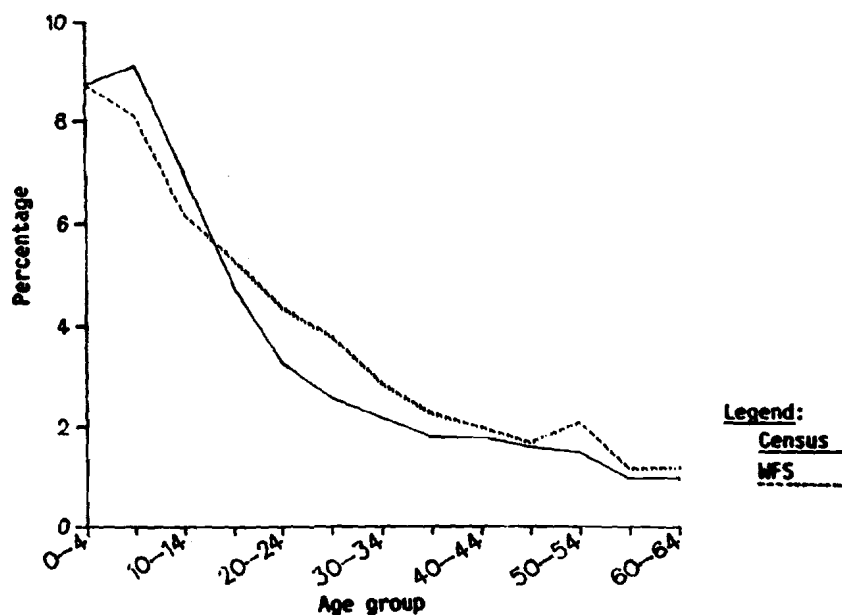
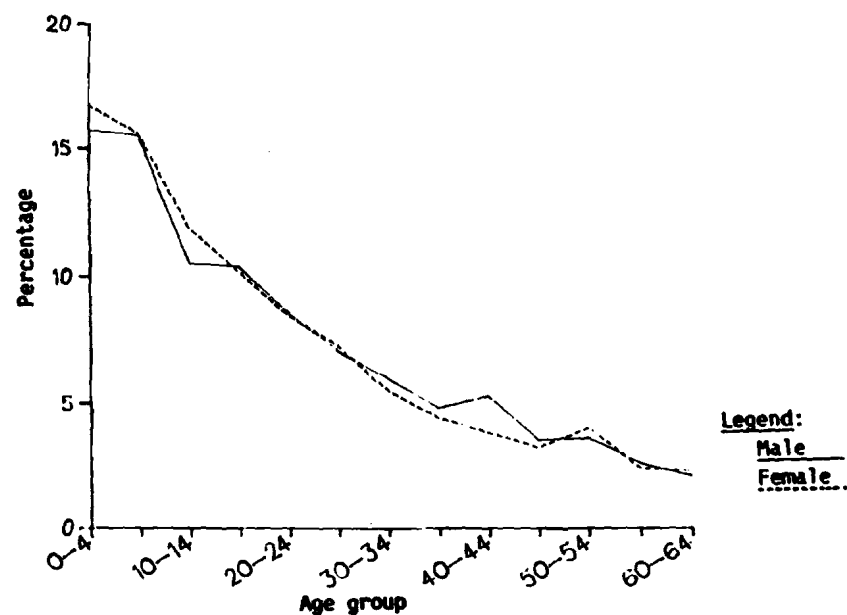


Figure II. Distribution of the female population by five-year age groups: Enquête nationale mauritanienne sur la fécondité (1981) and 1977 census: Mauritania



Source: Ministère du plan et de l'aménagement du territoire, Enquête nationale mauritanienne sur la fécondité, 1981. Rapport principal, vol. I (Nouakchott, Mars 1984), p. 26., tableau 3.6.

**Figure III. Distribution of ever-married women aged 15-49
by years since first married: Mauritania**

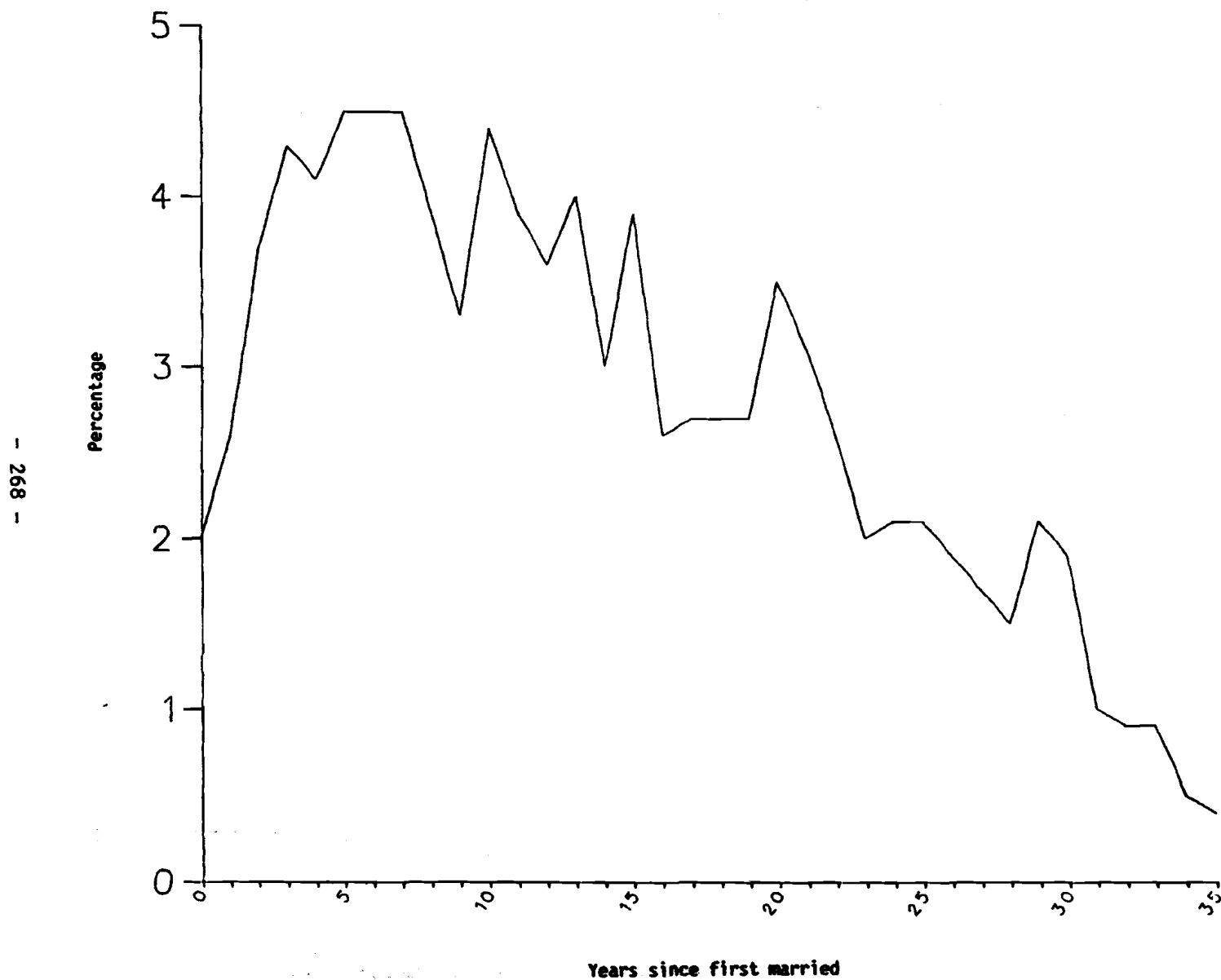
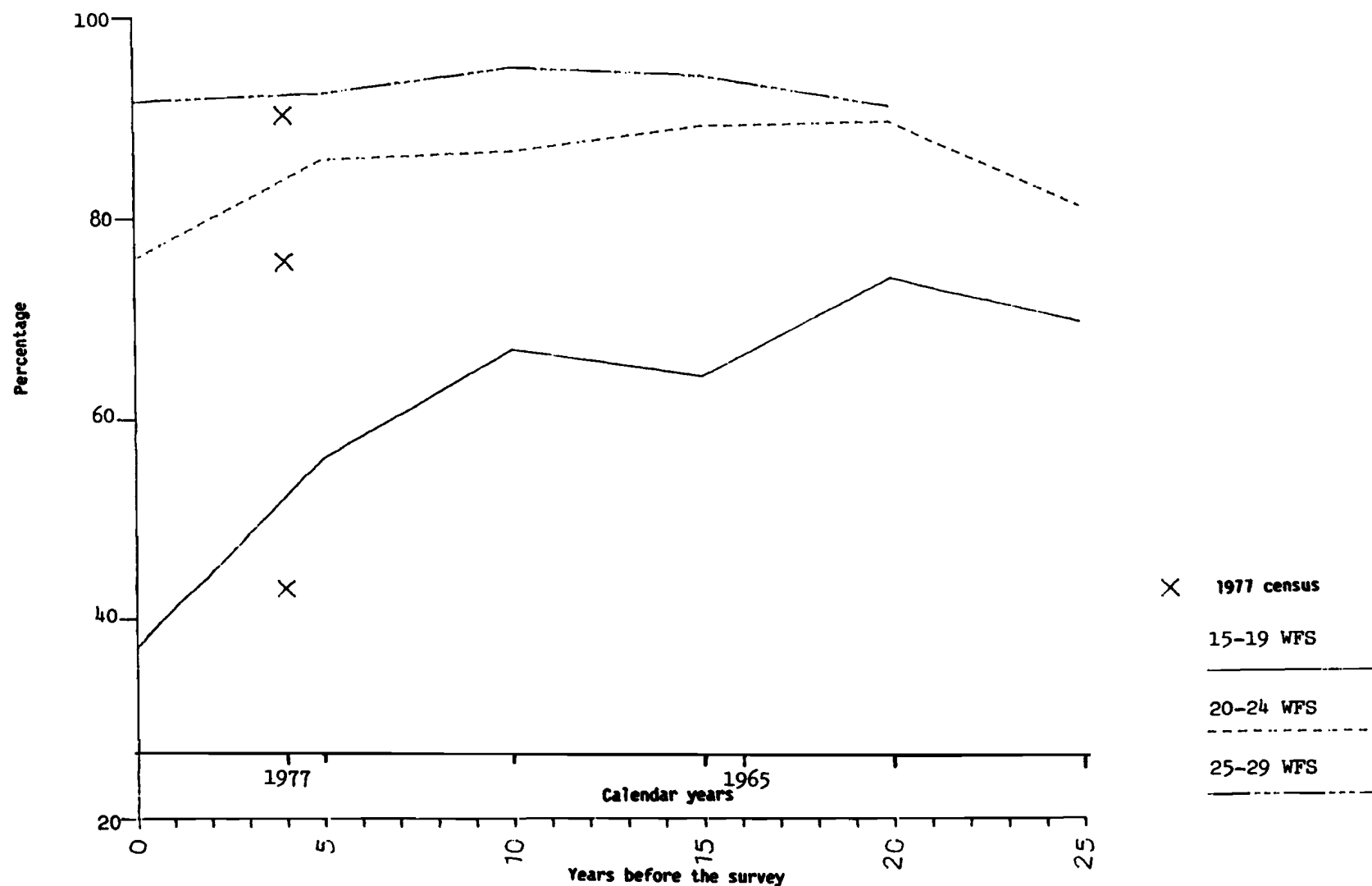


Figure IV. Proportions ever-married at designated periods prior to the survey for selected age groups: World Fertility Survey data and 1977 census data: Mauritania



Source: Direction de la statistique, Recensement general de la population, 1977, vol. II (Nouakchott), table 5.

Note: Census data include nomadic population.

**Figure V. Cohort-period fertility rates for women aged 30-49 at interview:
Mauritania**

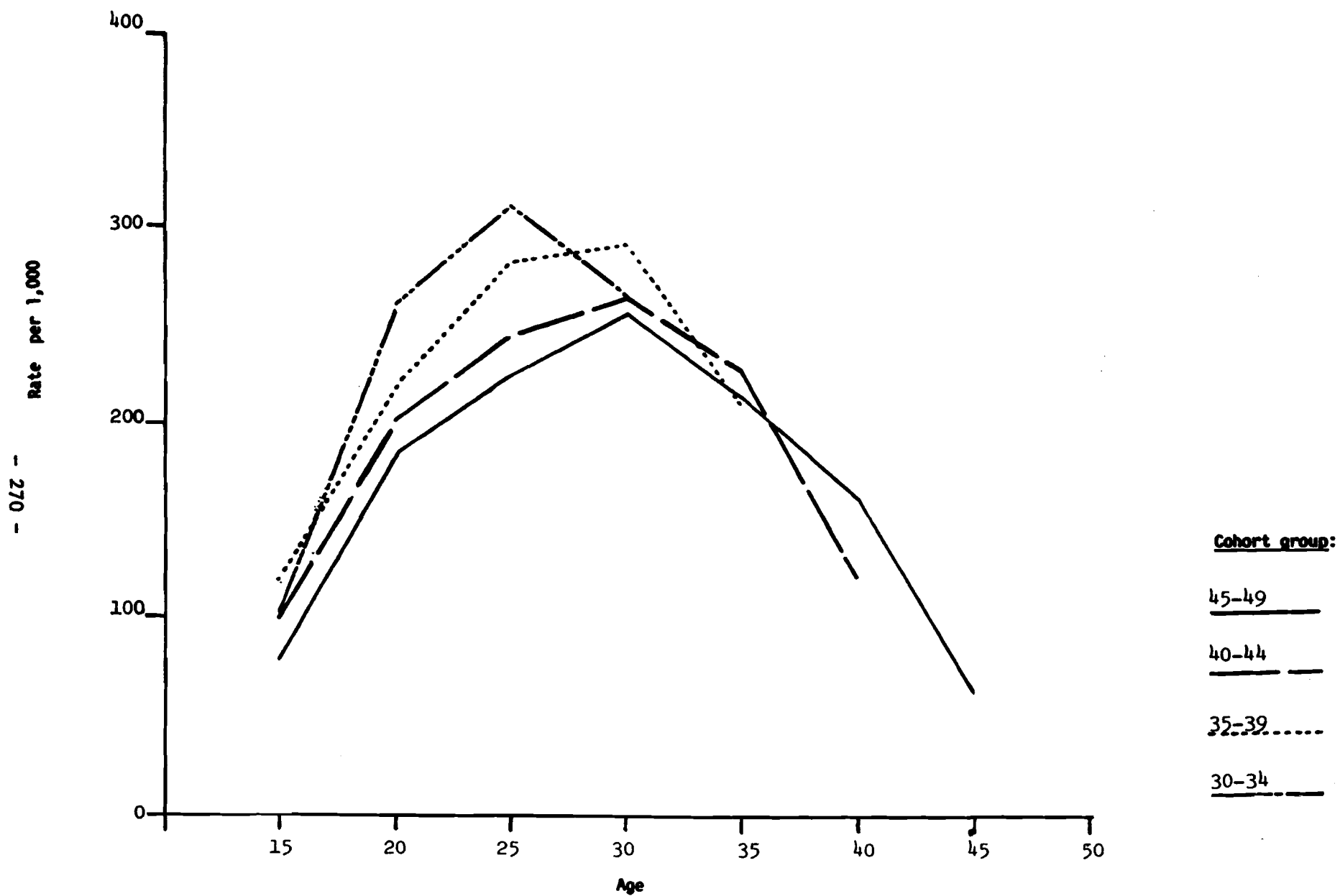
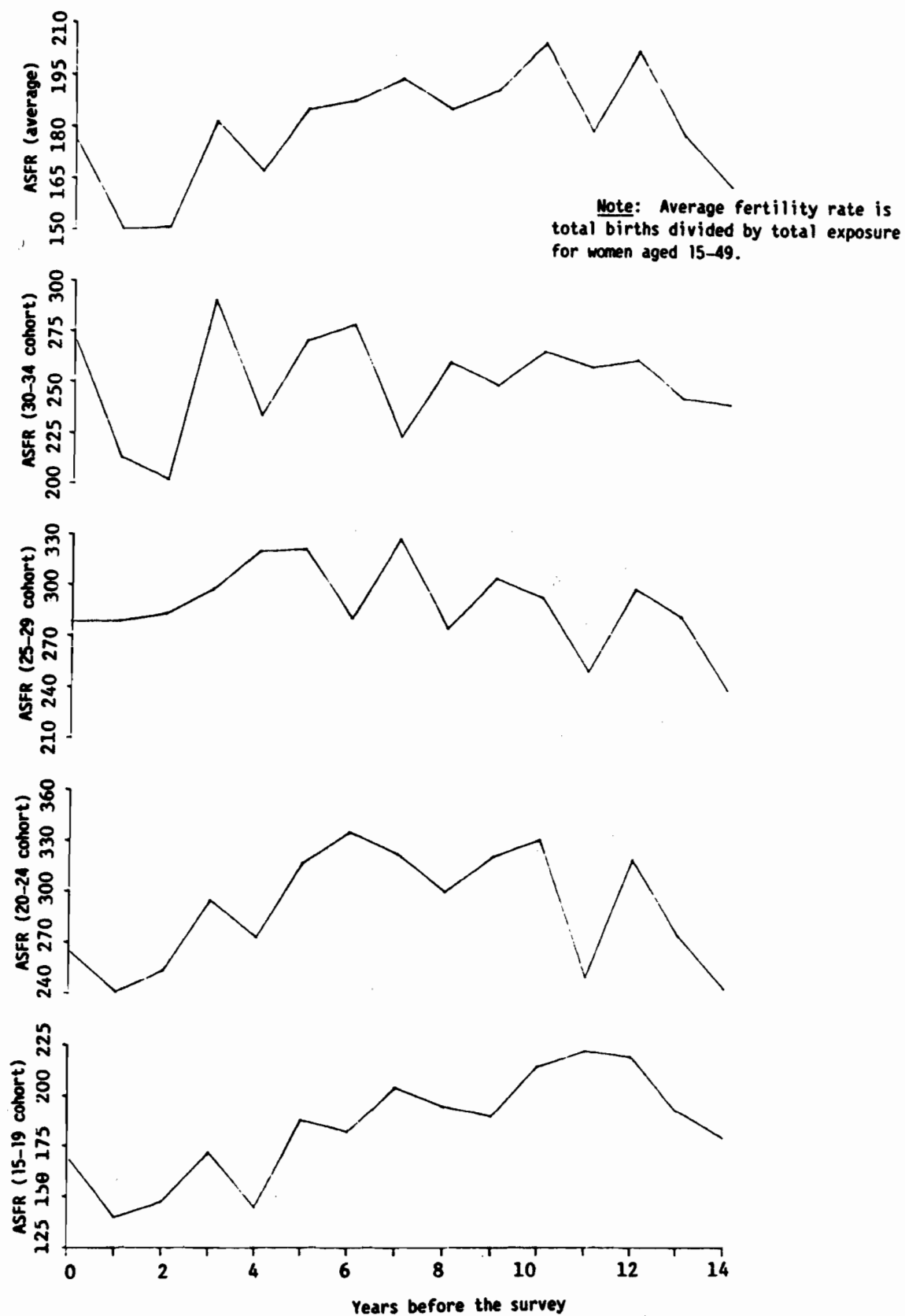


Figure VI. Age-specific fertility rates for selected cohorts and average fertility rate for single years before the survey: Mauritania



MEXICO

The Mexican Fertility Survey, (Encuesta Mexicana de Fecundidad, EMF) which took place from July 1976 to March 1977 was the first national demographic survey made in Mexico. There had been two sub-national surveys: the Demographic Survey of Mexico City in 1964, and the Demographic Survey of Rural Areas in 1970. Since the 1976 EMF survey, two other national surveys, both on the prevalence and use of contraceptives, have taken place.^{1/} In addition to the surveys, census information is available from 1930 onwards, and civil registration, which has been compulsory since 1859, is thought to have been about 95 per cent complete by 1970 (United States Bureau of the Census, 1979). However, it is generally felt that the overall quality of the data is superior in the surveys, especially the 1976 EMF and the 1979 Prevalence Survey (Ordica and Potter, 1981).

Age data

The degree of age heaping found in EMF was slightly less than that found in the censuses, but there still remains a preference for digits 0 to 5, as evidenced by the value of Myer's index of 6.3 (Rutstein, 1984). This is lower than the Myer's index of 9.0 for the 1979 Prevalence Survey (Dirección de Planificación, 1980). The extent of date imputation was relatively small, with 2 per cent of the cases requiring month imputation, 8 per cent requiring year imputation, and 5 per cent requiring both (Secretaría de Programación y Presupuesto, 1979).

The distribution of males and females from the household survey shows a noticeable over-enumeration of females in the 35-39 age group (fig. I). When the female age distribution of EMF is compared with the census (fig. II), the only major differences are found in the 10-14- and 50-54-year old groups, with the EMF showing higher percentages, probably as a result of some shifting of women out of the eligible ages for the individual questionnaire. Both the census and the survey show the same heaping of women in the 35-39-year-old group.

Marriage history data

The marriage history is based on a sample of 6,255 women ever in a union at the time of the survey. Almost all women reported the month and year of their first marriage (Chidambaram and Sathar, 1984). The distribution of years since first marriage shows strong preference for durations which correspond to calendar years 1960, 1950 and 1945 (fig. III). There is also a slight preference for durations 10 and 20 years before the survey.

Restrospective marriage history data from EMF show very little decline over the past 20 years in the proportions ever-married among 15-19-year-olds

but no obvious trend in the older age groups. The cohort 40-44 shows slightly higher proportions ever-married than adjacent cohorts at each point in the past, suggesting some relationship between age reporting and marital status. It is also possible that early consensual unions were omitted, particularly by older women. The census data do not suggest any trend (fig. IV). Percentages of women single are somewhat higher in the 1960 and 1970 censuses than in the EMF. However, companions for the older age groups in 1970, the proportions of women in legal and consensual unions are virtually identical, but low proportions of separated or divorced women in the census data are offset by higher proportions single. In general, it is likely that the census data have under-estimated the proportion ever in a union.

Birth history data

The information on birth dates from EMF is nearly complete, with only 3.5 per cent of the cases requiring month imputation. The percentage requiring year imputation was 1.2 per cent, and those requiring both month and year imputation was 0.5 per cent (Secretaría de Programación y Presupuesto, 1979). Table 1 shows a parity comparison between the EMF, the 1970 census and the 1978 Prevalence Survey. It is clear that enumeration has been more complete in the EMF than the census for the three oldest age groups. The slight differences in parity between 1976 and 1978 may reflect better enumeration in the EMF and/or some recent fertility decline (Ordica and Potter, 1981).

Five-year cohort-period fertility rates indicate a moderate decline in fertility over the past 15 years preceding the survey (table 2). Rates for the period 10-14 years before the survey are generally the highest, and those for the earlier periods are increasingly below the peak rates. The average parity of the cohort 45-49, five years before the survey, is slightly less than the average parity of the cohort 40-44 at the time of the survey. It is more likely that the difference is due to omissions of births and not to an increase in fertility, since a comparison of the other cohorts does not show the same differences (Ordica and Potter, 1981). It is also noticeable that the fertility of the 35-39-year-old cohort is relatively high compared to neighbouring cohorts at each age, which is likely to be related to the misreporting of age of this group. Figure V shows some very slight evidence of forward shifting of birth dates for the oldest cohort.

The trends in age-specific fertility by single years show a decline in fertility for all age groups and in the average rates (fig. VI). The average rates show a declining trend up to about five years before the survey, after which the trend is fairly constant up to the survey date. The rates are, for the most part, fairly smooth, although some year-to-year fluctuations are observed.

Since civil registration has been compulsory since 1859, the survey results can be compared with fertility rates from birth registration. Comparisons were made for periods 1961-1965, 1966-1970 and 1971-1972 in table 3. Comparisons beyond 1972 were not made because registration after that was affected by a national programme that promoted the legalization of consensual unions and the inclusion of their children in the civil register (Ordica and Potter, 1981). There EMF shows higher rates than those from

external sources for all three periods for which comparisons were made. Differences were especially large in the 15-19 and 20-24 age groups. The comparison of total fertility rates, however, does not show much difference, although in all comparisons, the TFR from the EMF is higher. The TFR declined 15 per cent from 1966-1970 to 1974-1976 according to the EMF, while the decline recorded by external sources was 18 per cent. Declines by age group are consistent between the two sources among women 20-24 and 25-29 years old. The largest discrepancies are among women 15-19 and 35-39 years of age.

Note

1/ The first survey was taken in 1978. It involved 4,492 women aged 15-49. For further information, see Westinghouse Health Systems, Contraceptive Prevalence Survey: Mexico, Summary Report (October 1978). The second survey was taken in 1979, with a sample size of 22,536 women aged 15-49. For further information, see Dirección de Planificación, Encuesta Nacional de Prevalencia, Septiembre a Diciembre de 1979 (Mexico City, D.F., 1980).

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Table 1. Children ever born per woman
from WFS and the 1970 census
and Prevalence Survey: Mexico

Age group	1970 census	1976 WFS	1978 Prevalence Survey
15-19	n.a.	0.3	0.2
20-24	1.4	1.2	1.4
25-29	3.1	2.8	2.9
30-34	4.6	4.5	4.4
35-39	5.7	6.0	6.0
40-44	6.3	6.6	6.4
45-49	6.3	6.7	6.6

Source: 1970 census: Secretaría de Programación y Presupuesto, Encuesta Mexicana de Fecundidad Primer Informe Nacional, (Mexico City, Dirección General de Estadística, February 1979), p. 72; 1978 Prevalence Survey: Coordinación del Programa Nacional de Planificación Familiar, Summary Report (October 1978). Contraceptive Prevalence Survey: Mexico, Summary Report, (Baltimore, Westinghouse Health Systems, 1978).

Table 2. Cohort period rates and cumulative cohort fertility
by age at survey: Mexico, 1976

Age group of cohort at end of period	Number of women in cohort	Years prior to survey						
		0-4	5-9	10-14	15-19	20-24	25-29	30-34
Cohort-period fertility rates								
10-14	0	0.000	0.001	0.001	0.001	0.002	0.003	0.002
15-19	485	0.039	0.049	0.059	0.060	0.065	0.063	0.059
20-24	1 707	0.216	0.232	0.251	0.258	0.245	0.219	
25-29	1 415	0.292	0.325	0.337	0.328	0.310		
30-34	1 148	0.273	0.312	0.316	0.299			
35-39	1 053	0.226	0.246	0.261				
40-44	820	0.125	0.154					
45-49	682	0.048						
Cumulative fertility of cohorts at end of period								
10-14		0.000	0.004	0.004	0.004	0.010	0.014	0.010
15-19		0.198	0.250	0.301	0.312	0.339	0.326	0.301
20-24		1.330	1.461	1.568	1.631	1.549	1.394	
25-29		2.923	3.191	3.317	3.189	2.946		
30-34		4.555	4.879	4.771	4.440			
35-39		6.010	6.002	5.743				
40-44		6.629	6.512					
45-49		6.754						

Source: WFS standard recode tapes.

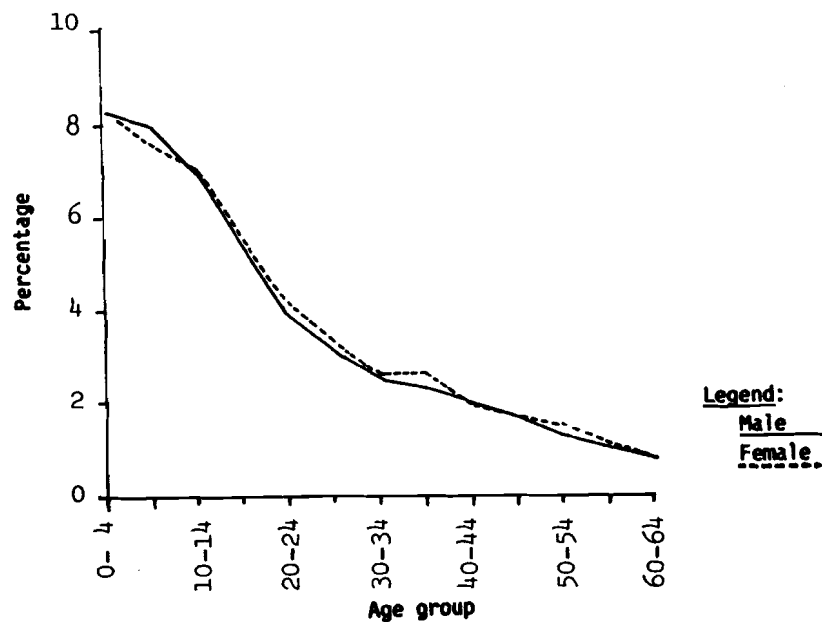
Table 3. Age-specific fertility rates for selected periods from WFS, birth registration data, and the 1978 Prevalence Survey: Mexico

Age group	1966-1970		1971-1972		1978	1974-1976	Percentage change	
	BR (1)	WFS (2)	BR (3)	WFS (4)	CPS (5)	WFS (6)	WFS (2) - (6)	Outside (1) - (5)
15-19	0.092	0.131	0.097	0.119	0.092	0.110	-16.0	0.0
20-24	0.289	0.318	0.287	0.302	0.249	0.282	-11.3	-13.8
25-29	0.317	0.340	0.311	0.319	0.249	0.270	-20.6	-21.5
30-34	0.251	0.279	0.250	0.276	0.231	0.232	-16.8	-8.0
35-39	0.214	0.205	0.210	0.190	0.148	0.173	-15.6	-30.8
40-44	..	..	0.102	0.096	0.068	0.074	..	..
45-49	..	..	..	..	0.010	0.016	..	..
TFR	6.3 a/	6.8 a/	6.3 a/	6.5 a/	5.2	5.8	-14.7	-17.5

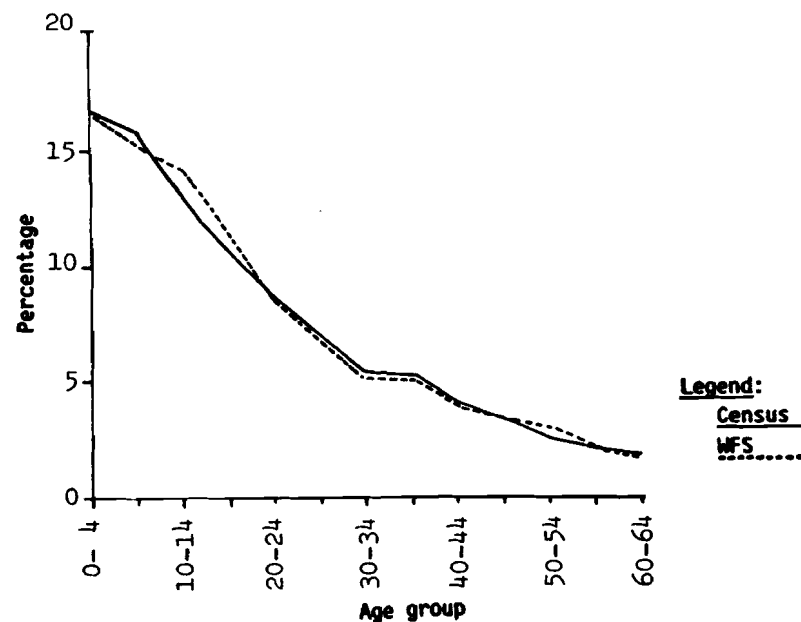
Source: Birth registration data and CPS: M. Ordica and J. Potter, "Evaluation of the Mexican Fertility Survey 1976-1977, WFS Scientific Reports, No. 21 (Voorburg, Netherlands, ISI/WFS, 1981), tables 14 and 16.

a/ TFR calculated up to age group 40-44 only. For the age group 40-44, rates from 1971-1972 were assumed for 1966-1970.

**Figure I. Distribution of males and females
as a percentage of the total population
by five-year age groups: Mexico**



**Figure II. Distribution of the female
population by five-year age groups:
World Fertility Survey (1976) and
1970 census: Mexico**



Source for the 1970 census: Demographic Yearbook, Historical Supplement: Special Issue (United Nations publication, Sales No. E/P.XIII.8), table 8.

**Figure III. Distribution of ever-married women aged 15-49
by years since first married: Mexico**

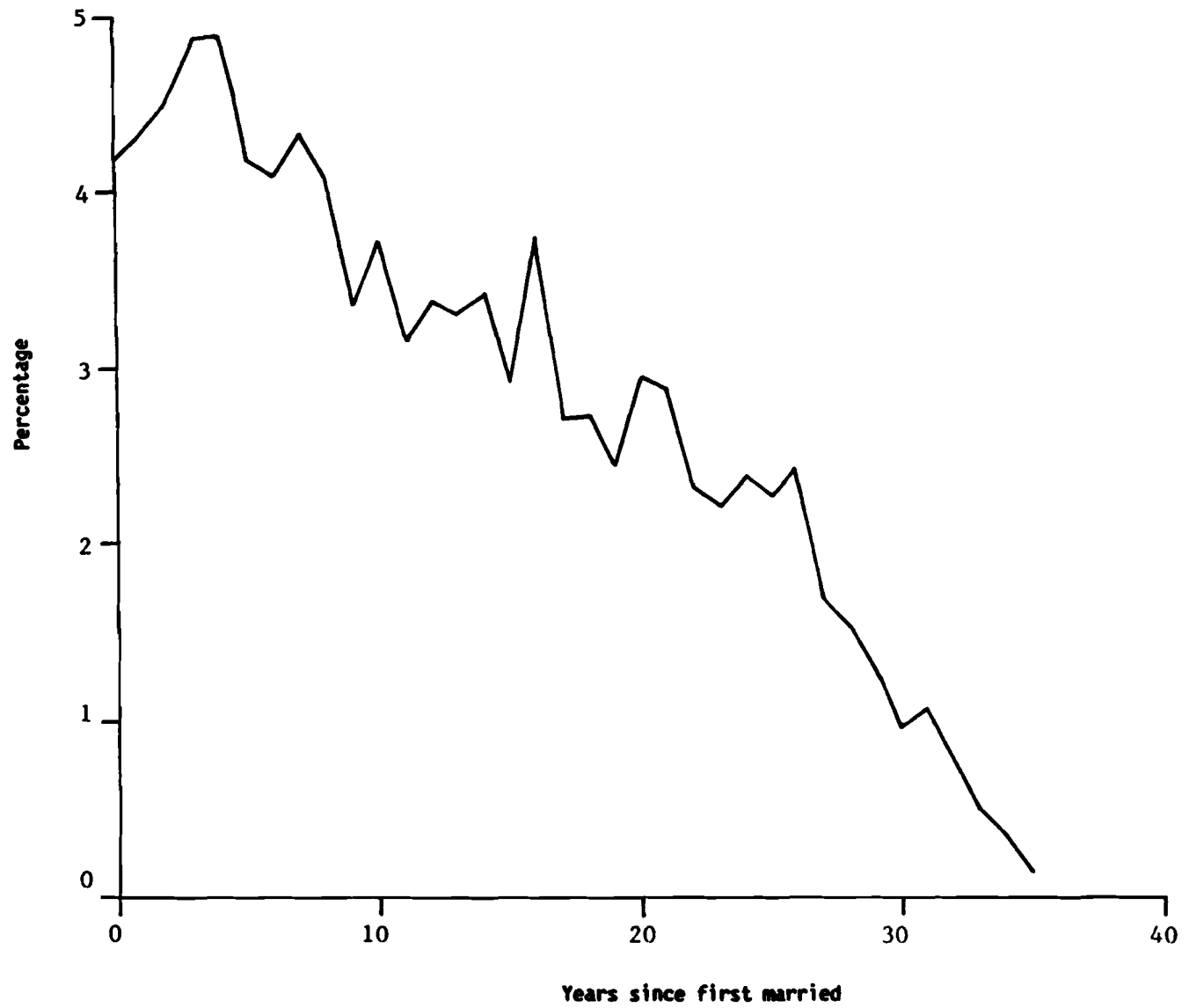
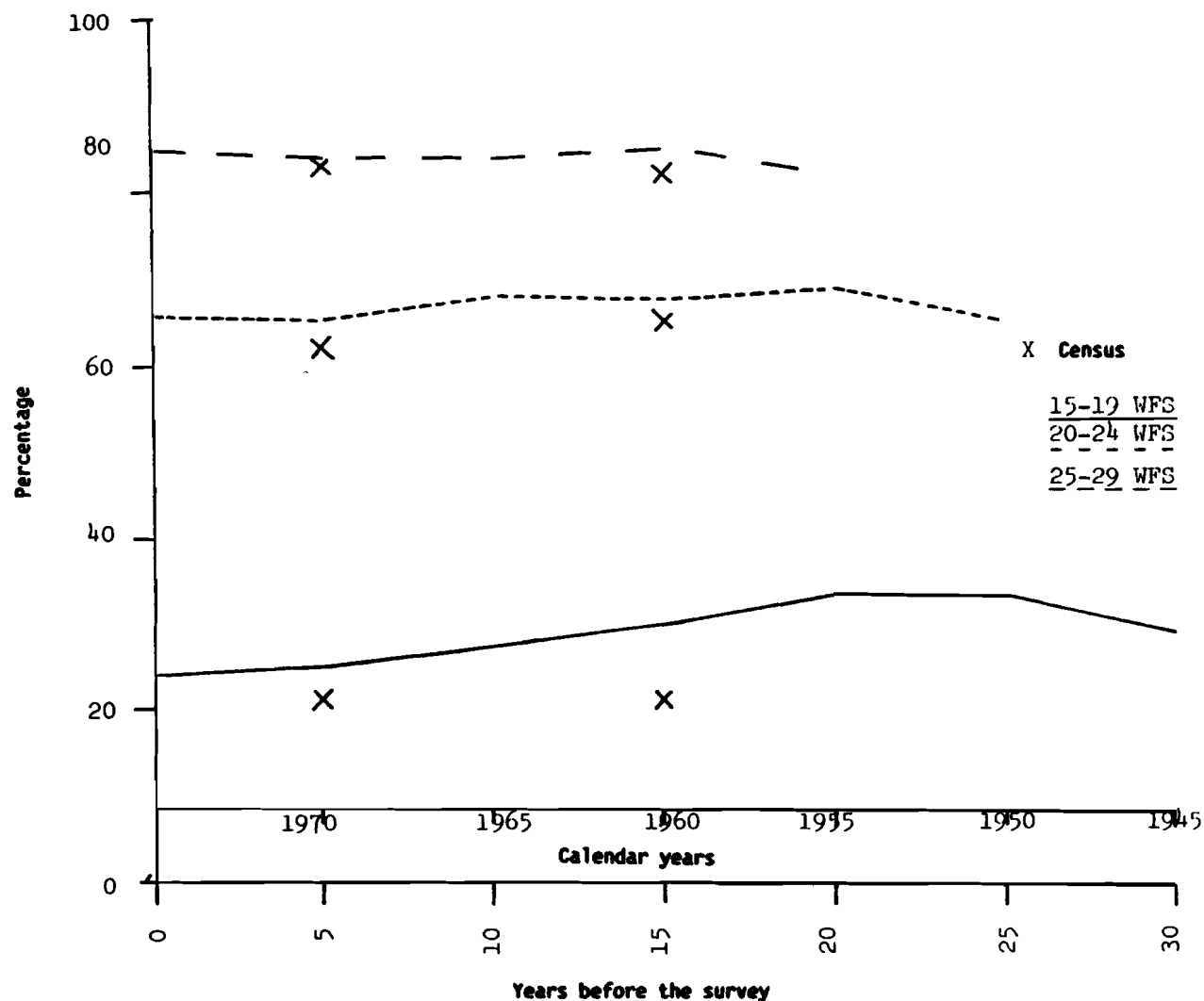


Figure IV. Proportions ever-married at designated periods prior to the survey for selected age groups: World Fertility Survey data and other sources: Mexico



Source for the 1970 census: Demographic Yearbook, Historical Supplement: Special Issue (United Nations publication, Sales No. E/P.XIII.8), table 12.

**Figure V. Cohort-period fertility rates for women aged 30-49 at interview:
Mexico**

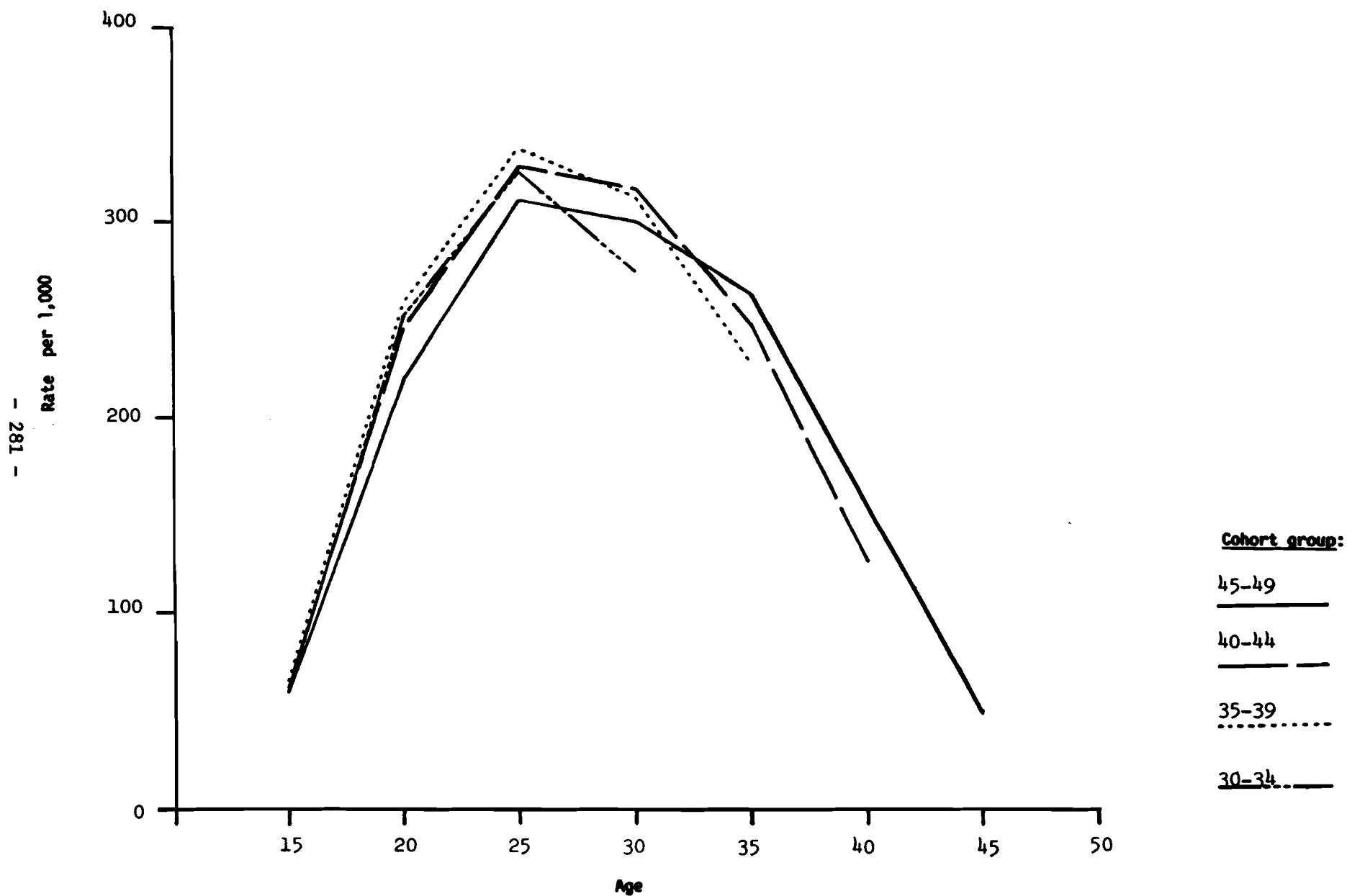
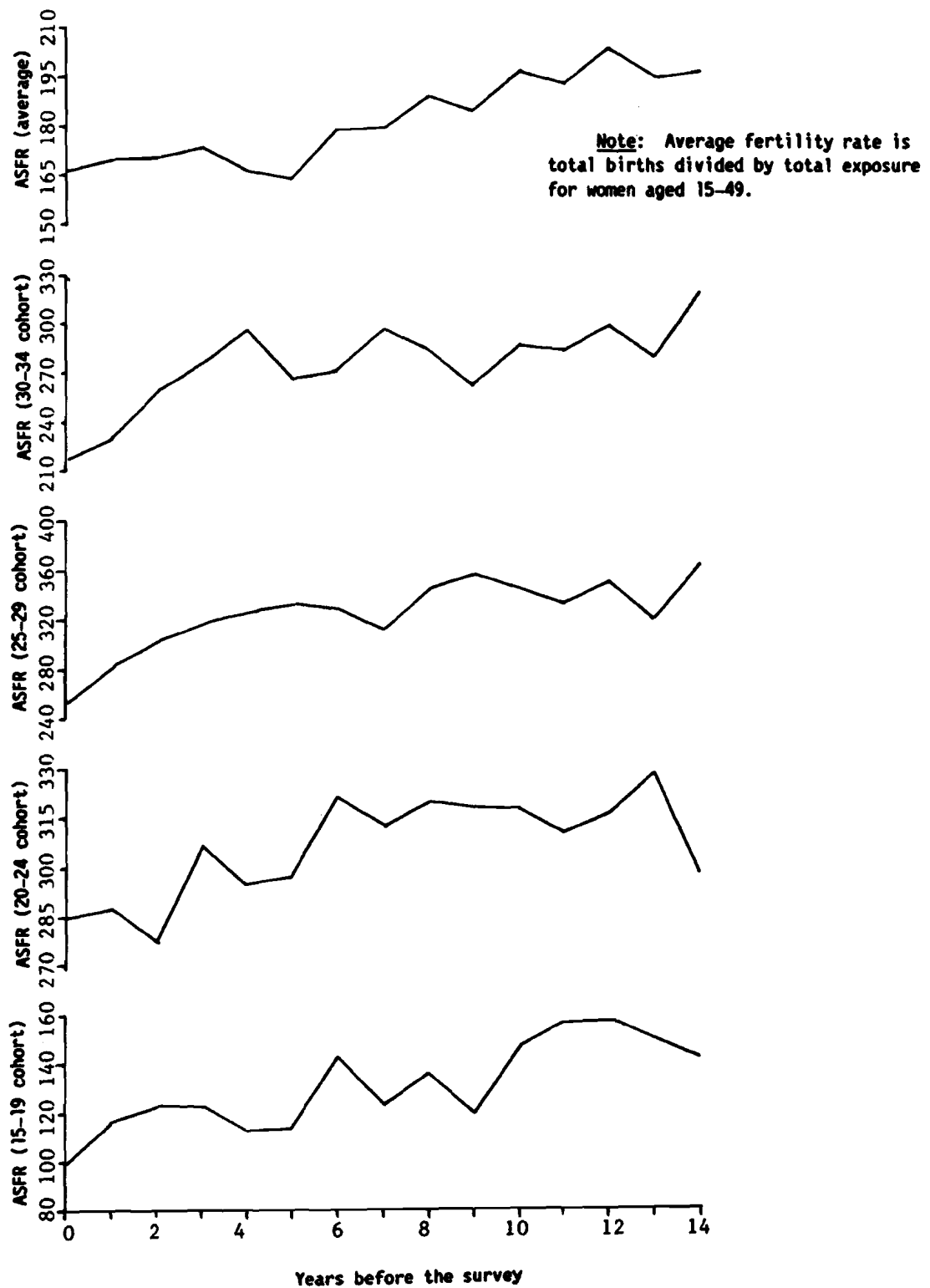


Figure VI. Age-specific fertility rates for selected cohorts and average fertility rate for single years before the survey: Mexico



MOROCCO

The Moroccan Fertility Survey (Enquête nationale sur la fécondité et la planification familiale - ENFPF) was conducted between October 1979 and July 1980. Since registration data in Morocco is incomplete, estimates on fertility are made from censuses and surveys. Population censuses in Morocco were conducted in 1960, 1971 and 1982. During the period 1961-1963 a multiple-objectives survey was conducted from which demographic information is available. Other surveys include a KAP survey in 1966/67 and a 1976 employment survey which was carried out in urban areas. In 1972-1973 a Dual Record Experimental Study was conducted and estimates of fertility from that study are also available for comparison.

Age data

The month and year of birth was reported by 22.2 per cent of respondents in the individual survey. For 33.6 per cent, only the calendar year was reported, while in the case of 44.1 per cent of respondents the date of birth was obtained from the report on age (Chidambaram and Sathar, 1984). Single-year age distribution shows considerable heaping on digits ending in 0 and 5, especially among older women. The Myer's index of digital preference for the female age distribution of the household survey is 17.8 (Rutstein, 1984) which is an improvement over that recorded in the 1971 census (26.8) (Minister de la santé publique, 1984).

A comparison of the male and female household age distribution (fig. I) shows a relatively small cohort of males and females aged 30-34 years. This is probably the impact of the famine and the epidemics of typhus and relapsing fever during 1945-1946, resulting in increased mortality and decreased fertility (United States Bureau of the Census, 1980). Females aged 5-9 appear to be severely under-enumerated relative to males, while among those aged 35-44 years, males appear to be under-enumerated, although this could reflect labour out-migration of males.

The female age distribution is compared with the 1971 census age distribution in figure II. Serious discrepancies between the two distributions can be seen among women aged below 25 years. Among young females (below 10 years) the ENFPF appears to have under-enumerated females, but among women aged between 10 and 25 years the proportions recorded in the census are lower. Comparisons with the 1982 census distribution (not shown) shows closer correspondence with the ENFPF, except at ages 5-9 years.

Marriage history data

The marriage history data was based on a sample of 4,105 ever-married women of whom 35.2 per cent knew the month and year of their first union, and 24.0 per cent of whom knew only the year. For 40.8 per cent of the women, the marriage date was estimated from the age at marriage or duration of marriage (Chidambaram and Sathar, 1984).

The distribution of ever-married women by years since first married (fig. III) shows some pronounced heaping 3, 14, 20 and 26 years before the

survey. By contrast, the period from 15 to 19 years before the survey appeared to have a deficit of marriages, with a pronounced low 17 years prior to the survey. The cohort born between 1942 and 1946 would be between 17 and 21 years at that time, which is about the age at marriage for those women. Since the cohort was relatively small because of the epidemics and famine, it is likely that a dearth of marriages occurred when they reached marriageable ages (United States Bureau of the Census, 1980).

Proportions married by age group were reconstructed for periods in the past using marriage history data (fig. IV). Large declines in the proportions married among women 15-19 and 20-24 are seen over the previous 15 years, the decline being especially steep among 15-19-year-olds. Proportions married appear to be exaggerated among the 35-39 cohort. Comparison with the marital status distribution from the 1960 and 1971 censuses shows census proportions married to be somewhat lower for the 15-19 age group but similar for the other age groups. However, both sources show considerable declines in proportions married.

Birth history data

The month and year of birth was reported for 59.7 per cent of all births. For 14.9 per cent, only the year of birth was reported, while for 25.4 per cent, the date of birth was reported in terms of "years ago" or age (Chidambaram and Sathar, 1984).

The parity distribution at the time of the survey shows mean number of children ever born monotonically increasing with age up to age 40-44 years. Parity at age 45-49 years is slightly lower, suggesting some possible omission of children by older women. Comparison of the parity distribution between the 1972-1973 Dual Record Experimental Study and the reconstructed ENFPF distribution shows higher parity for all age groups in the ENFPF. The differences, however, are not large.

An examination of cohort-period fertility rates for periods in the past (table 2) shows that fertility was high and fluctuating in the past up to the period 5-9 years before the survey. The age groups 15-19, 20-24 and 30-34 show some decline starting at about 15 years before the survey date. The age pattern of cohort fertility (fig. V) does not show any evidence of date misplacement towards the survey date. Cumulative fertility of cohorts (bottom panel of table 2) shows that the oldest cohort (45-49) had lower parity at age 40-44 years than the 40-44 cohort at the time of the survey (6.8 versus 7.1 children). This suggests some omission of births among women aged 45-49 years.

Age-specific fertility rates for single years before the survey show little fluctuations from year to year in the average rates (fig. VI). Peaks occur at periods 0, 10 and 13 years before the survey. The rates for the 20-24 age group show large fluctuations between 5 and 11 years before the survey. This period reflects the rates for the 25-29 cohort when they were 20-24 years old. Among the 30-34 age groups, pronounced heaping occurred in the period 5-10 years before the survey. The rates for the 25-29 and 15-19 age groups, by contrast, appear relatively smooth.

Comparison of age-specific fertility rates and total fertility rates from external sources are presented in table 3. Unfortunately, comparison of recent fertility is not possible. The rates from the 1972-1973 Dual Record Experimental Study have been adjusted^{1/} (United States Bureau of the Census, 1980). Although the total fertility rates from the ENFPF and the Dual-Record Study match closely (7.0 and 6.9, respectively), the age-pattern of fertility from the two sources differs considerably. The Dual-Record Study shows a more peaked, older age pattern, while the ENFPF has a flatter, younger age pattern. The age pattern in the earlier (1961-1963) multiple-objectives survey also does not compare well: the ENFPF shows a much younger age pattern of fertility. From those data alone, it is difficult to say which of the rates are the best estimate of fertility at a given time.

Note

^{1/} The rates from the 1972-1973 Dual Record Experimental Study were adjusted to the level of matched and unmatched births. Separate estimates for urban and rural areas were weighted to national levels using the unadjusted 1971 census.

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Table 1. Children ever born per woman from
ENFPF and the 1972-1973 Dual Record
Experimental Study: Morocco

Age group	Dual Record Experimental Study 1972-1973	ENFPF 1972-1973	1979-1980 ENFPF
15-19	0.1	0.3	0.2
20-24	1.4	1.7	1.2
25-29	3.3	3.6	2.8
30-34	4.9	5.3	4.8
35-39	6.0	6.2	6.3
40-44	6.4	n.a.	7.1
45-49	6.4	n.a.	7.0

Source: Dual Record Experimental Study, 1972-1973: United States Department of Commerce, Bureau of the Census, Country Demographic Profiles: Morocco, (Washington, D.C., Government Printing Office, July 1980), table 9.

Table 2. Cohort period rates and cumulative cohort fertility
by age at survey: Morocco

Age group of cohort at end of period	Number of women in cohort	Years prior to survey						
		0-4	5-9	10-14	15-19	20-24	25-29	30-34
Cohort-period fertility rates								
10-14	54	0.000	0.001	0.003	0.004	0.004	0.006	0.006
15-19	1 412	0.033	0.053	0.062	0.081	0.110	0.090	0.098
20-24	1 142	0.190	0.223	0.263	0.281	0.281	0.273	
25-29	826	0.282	0.328	0.325	0.338	0.332		
30-34	620	0.278	0.297	0.308	0.288			
35-39	636	0.197	0.245	0.228				
40-44	554	0.146	0.147					
45-49	457	0.053						
Cumulative fertility of cohorts at end of period								
10-14		0.000	0.005	0.014	0.021	0.021	0.031	0.032
15-19		0.171	0.277	0.328	0.426	0.583	0.480	0.510
20-24		1.227	1.444	1.742	1.989	1.884	1.875	
25-29		2.856	3.382	3.615	3.572	3.534		
30-34		4.771	5.102	5.110	4.972			
35-39		6.085	6.338	6.114				
40-44		7.069	6.847					
45-49		7.114						

Source: S. Singh, "Birth histories", WFS Comparative Studies, Cross-national Summaries: Additional Tables (Voorburg, Netherlands, ISI/WFS, 1984), p. 48.

Table 3. Age-specific fertility rates for selected periods from Multiple-Objectives Survey, 1961-63, Dual-Record Experiment Study, 1972-73 and ENFPF: Morocco

Age group	Multiple-Objectives Survey 1961-1963	ENFPF 1961-1963	Dual-Record Experimental Study 1972-1973	ENFPF 1971-1973	Percentage change	
					Outside	ENFPF
15-19	0.093	0.206	0.066	0.134	-29.0	-35.0
20-24	0.300	0.334	0.296	0.309	- 1.3	- 7.5
25-29	0.317	0.323	0.365	0.327	15.1	1.2
30-34	0.289	0.261	0.304	0.276	5.2	5.8
35-39	0.184	..	0.220	0.199	19.6	..
40-44	0.106	..	0.093	0.122	-12.3	..
45-49	0.092	..	0.033	..	-64.1	..
TFR	6.9	7.5	6.9	7.0	0.0	- 6.8

Source: INSEA, La Population Du Maroc, CICRED, Series Rabat, table 2.3; United States Bureau of the Census, Country Demographic Profiles: Morocco (Washington, D.C., Government Printing Office, 1980), table 7.

Figure I. Distribution of males and females as a percentage of the total population by five-year age groups: Morocco

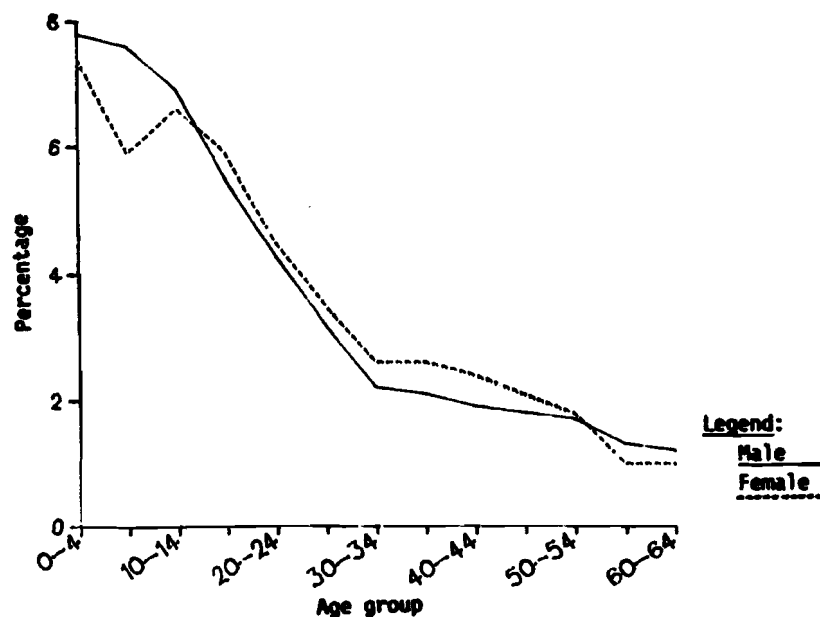
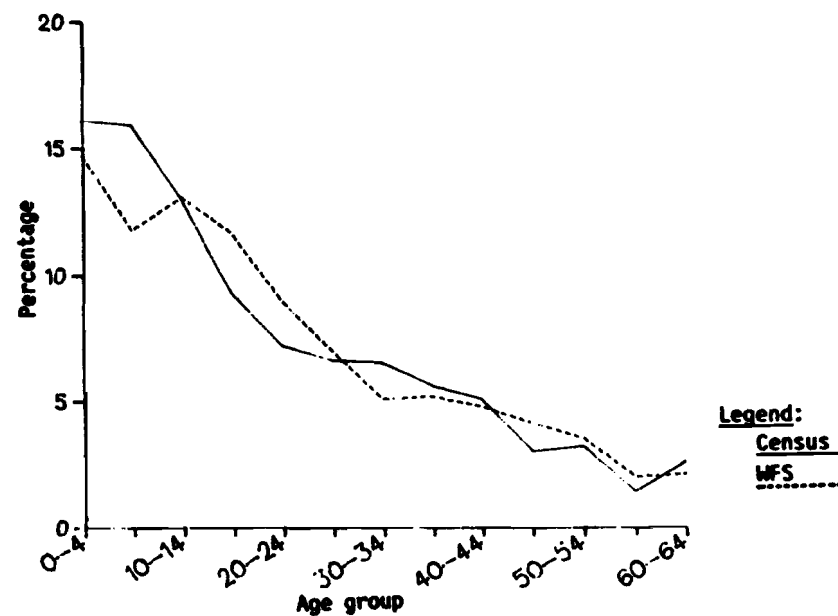


Figure II. Distribution of the female population by five-year age groups: World Fertility Survey (1979-1980) and 1979 census: Morocco



Source: Ministère de la santé publique, Enquête nationale sur la fécondité et la planification familiale au Maroc 1979-1980. Rapport national, vol. II (Rabat, 1984), pp. 5 and 14, tables 1.2 and 1.6.

**Figure III. Distribution of ever-married women aged 15-49
by years since first married: Morocco**

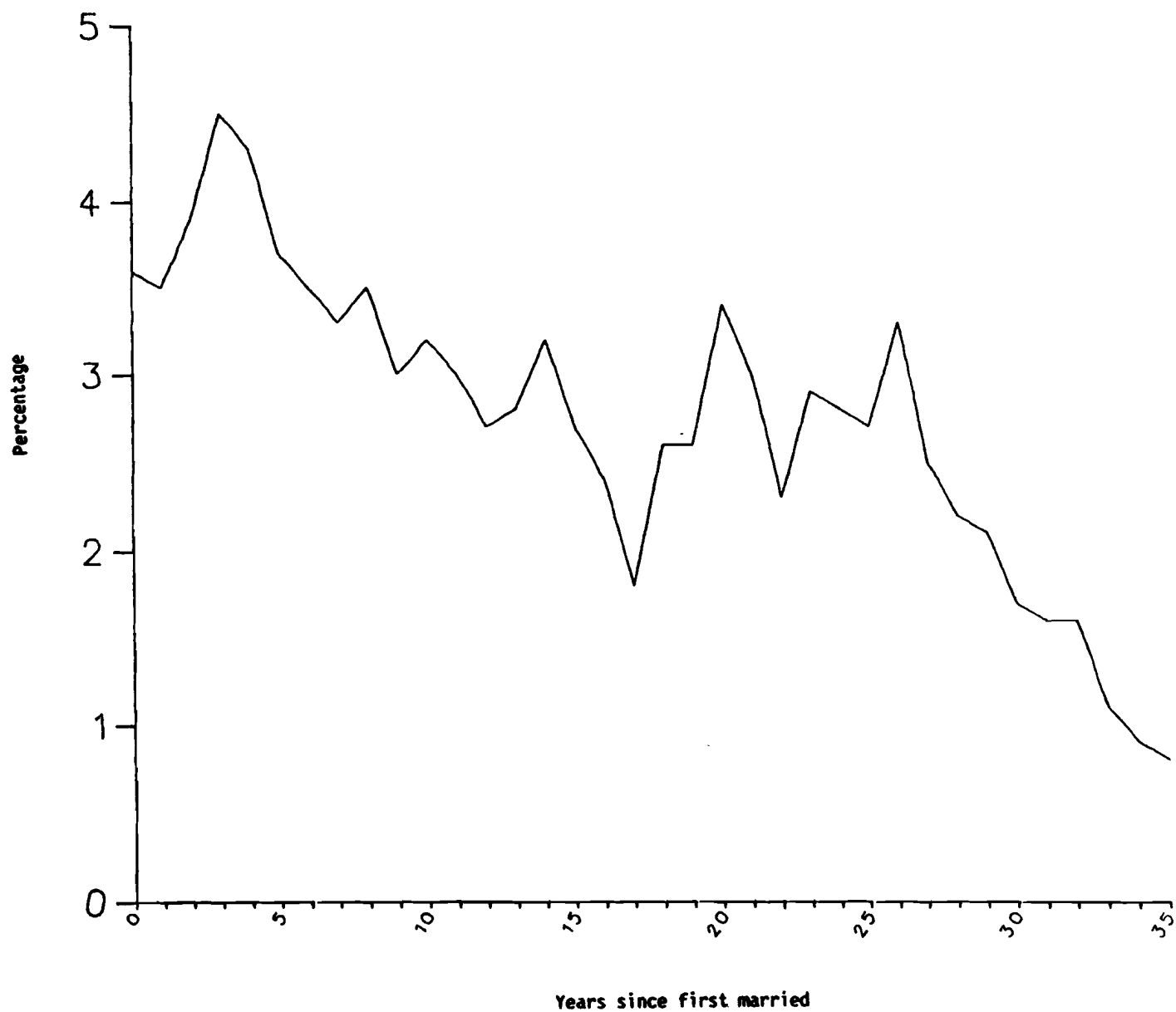
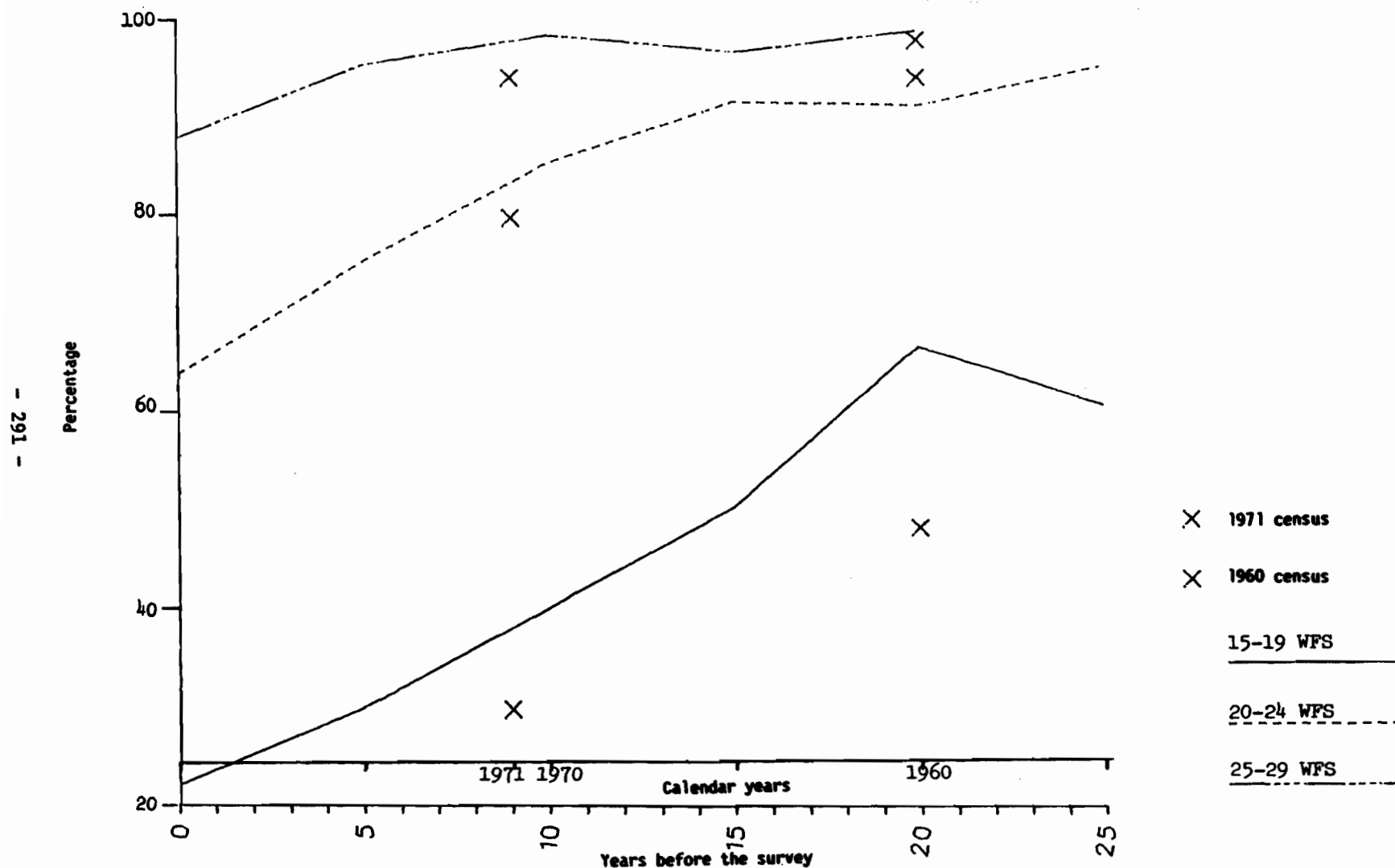


Figure IV. Proportions ever-married at designated periods prior to the survey for selected age groups: World Fertility Survey data and other sources: Morocco



Source: United States Bureau of the Census, Country Demographic Profiles: Morocco (Washington, D.C., Government Printing Office, 1980) (ISP-DP-23), p. 29, table 11.

**Figure V. Cohort-period fertility rates for women aged 30-49 at interview:
Morocco**

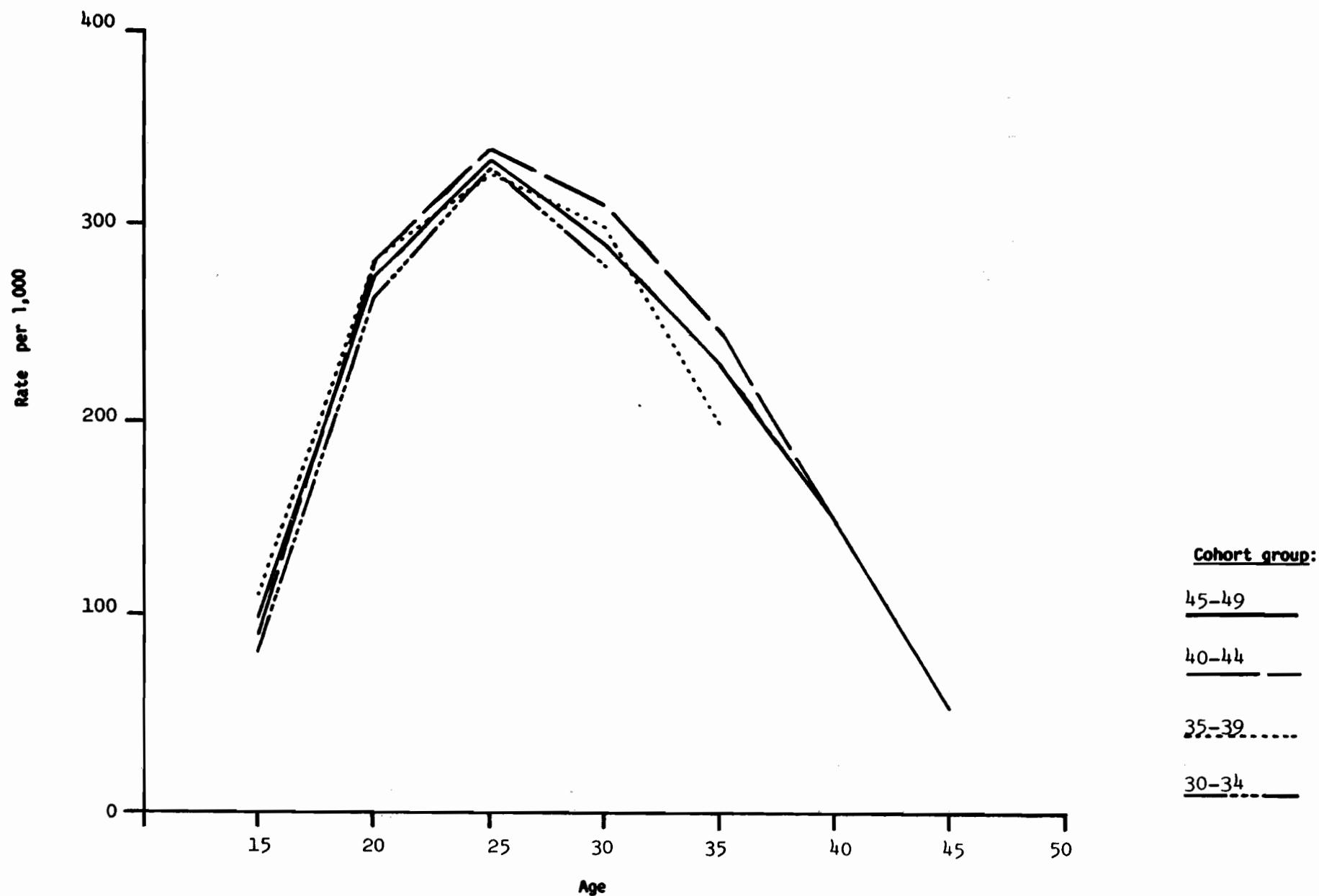
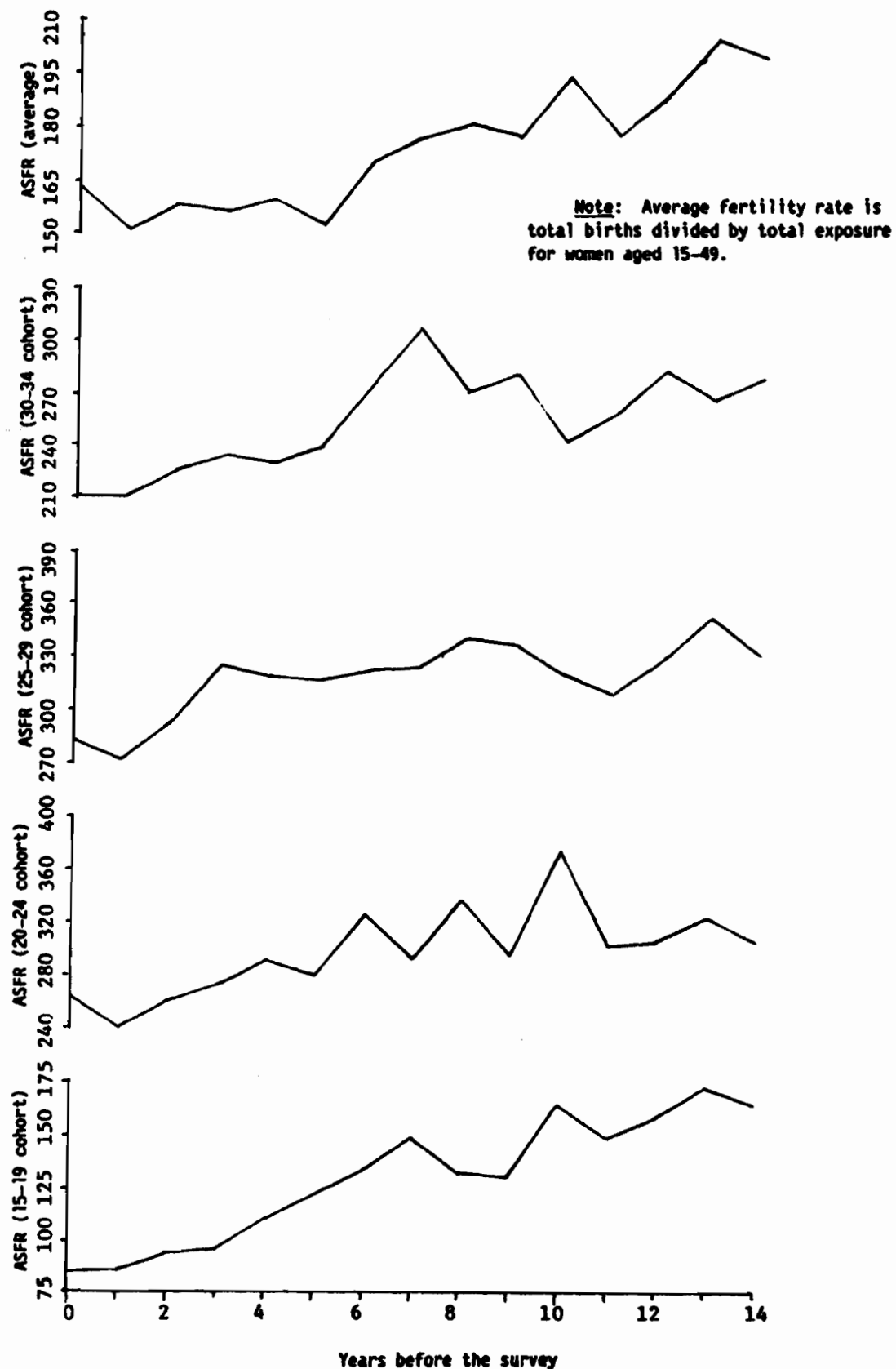


Figure VI. Age-specific fertility rates for selected cohorts and average fertility rate for single years before the survey: Morocco



NEPAL

Censuses have been collected in Nepal at decennial intervals since 1911, but accurate fertility data are scarce. Prior to the Nepal Fertility Survey (NFS), from April to June of 1976, there had been two recent censuses (1961 and 1971) and several demographic surveys (1974-1975 and 1976), all of which contained clear evidence of misreporting (Goldman, Coale and Weinstein, 1979).

Age data

Only 13 per cent of the ever-married women in the individual survey reported their month and year of birth (Chidambaram and Sathar, 1984). An examination of the female age-distribution for single years from the household survey shows strong age heaping on preferred digits - in particular, 0 and 5. The Myer's index based on women is 16.8 (Rutstein, 1984). Digit preference in the NFS data is none the less better than in the 1971 census (Goldman, Coale and Weinstein, 1979).

Five-year group data for women show a considerable amount of heaping at ages 20-24, 25-29, 40-44 and 50-54 (fig. I). Similar heapings are evident in the male age distribution, although there does not appear to be heaping for males at ages 20-24 and 25-29. When compared with the adjusted 1971 census age distribution (fig. II), the NFS age distribution does indeed appear irregular. Ages 15-19, 30-39, and 45-49 appear under-enumerated, while a considerable amount of heaping is apparent at ages 20-25 and 50-54. There appears to be a tendency to overstate the ages of younger women who are married, particularly those with several children (Goldman, Coale and Weinstein, 1979).

Marriage history data

Nepal is unique among WFS countries in that a full marriage history was not elicited from each respondent. Because of cultural and religious proscriptions against remarriage, respondents were only asked "In what month and year did you get married?". This means that in some cases, when women have in fact been married more than once, information was only collected on their most recent marriage. The extent of remarriage, though not known, is thought to be relatively low. (Because of the prevalence of child marriage in Nepal, the date of marriage was adjusted to represent the onset of cohabitation.) If the date of marriage was not known, the respondent was asked how many years ago she got married. Of those responding, 27.3 per cent gave a month and year of their current marriage (Chidambaram and Sathar, 1984).

The percentage distribution of ever-married women by marriage duration (fig. III) is highly irregular and shows heaping on durations ending with 0 and 5, which is probably emphasized by the "years ago" option in the date-of-marriage question. Further, the number of marriages in the 0-2 years preceding the survey is somewhat low, possibly due to the exclusion of women under 15 from the interview in a country where many are married by the age of 12-13.

When comparing the marital status distribution from the NFS data as of the census dates (using marital history data) with the census distribution in

1961 and 1971 (fig. IV), the match is found to be very good for 1971 but the proportions ever-married from NFS appear too low compared to the census in 1961. According to the 1961 and 1971 censuses, there is evidence of a rise in the age at marriage, with the singulate mean age at marriage estimated as 15.2 and 16.7, respectively (Goldman, Coale and Weinstein, 1979). However, the reliability of the censuses has not been ascertained so that the differences between the NFS and the 1961 census could be from reporting errors in the census. The NFS data show a decline in proportions ever-married in the 10-14 and 15-19 groups but the proportions ever-married in age groups 20-29 appear to have risen slightly.

The differences between the census and NFS data for 1961 may be due to under-estimation in the NFS of marital duration for more-than-once-married women and over-estimation of age at marriage for older cohorts of women. However, only 1 per cent of all recorded marriages are reported as commencing after the arrival of a child. Although this represents only a lower bound estimate of the prevalence of remarriage (given the absence of illegitimacy in Nepal), it does suggest that remarriage is not sufficiently prevalent to cause a major problem in the dating of first marriage. It is none the less likely that the marital history may have been distorted by the underestimate of marital duration causing exposure time within marriage to be under-estimated at points further back in the past. However, it should be noted that the proportions ever-married at the time of the survey appear reasonable.

Birth history data

Of all births reported, 100 per cent were recorded with a year and month. This is explained by the way information was recorded on the questionnaire: responses in terms of years ago were immediately translated into a calendar year in the past. It is not certain how this may have affected the data recorded (Chidambaram and Sathar, 1984).

The mean number of children ever born by age group shows that women aged 45-49 had slightly more children than women aged 40-44, suggesting some omission of births among older women (table 1). When NFS parity for 1971 is compared with the 1971 census, the mean number of children ever born is higher in every age group in the NFS, perhaps the result of better enumeration. When examining the cohort-period fertility rates from the individual birth history, a pattern of steadily increasing fertility is apparent with small declines in the most recent period (table 2). The low levels of fertility reported for periods further back in the past are likely to be due to omissions and displacements. This has been shown to be particularly true of women who did not know their ages (Goldman, Coale and Weinstein, 1979). Figure V shows very similar cohort-fertility profiles for the oldest groups so omissions cannot be clearly discerned.

Figure VI, which shows annual trends in age-specific fertility rates, shows a reasonably flat picture with some preference for year 4 and avoidance of 13. There is no clear evidence of backdating of recent births to the period 5-9 years before the survey. An increase in fertility is recorded over the most recent three-year period. This increase is particularly large among women who were 30-34 years old at the time of the survey.

Because of a lack of birth registration data and severe under-enumeration of births in the census, the only basis of comparison for recent fertility from the NFS data is other recent demographic surveys. Age-specific birth rates based on births from 1971 to 1975 show an age pattern and a fertility level which are very similar to those estimated from the Demographic Sample Surveys of 1974-1975 and 1976 (table 3). This leads to the conclusion that, although errors in birth and nuptiality histories make it impossible to discuss trends in Nepal, the current level of fertility estimated from the NFS is no doubt the best estimate currently available. However, even the current age-specific fertility rates are likely to be distorted by systematic age misstatement, which may lead to an under-estimation of fertility at younger ages.

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Table 1. Children ever born per ever-married woman from WFS and 1971 census: Nepal

Age group	1971 census	1971 WFS	1976 WFS
15-19	0.3	0.3	0.3
20-24	1.1	1.5	1.4
25-29	2.2	2.7	2.9
30-34	3.1	4.0	4.1
35-39	3.7	4.9	5.1
40-44	4.0	5.5	5.6
45-49	4.0	..	5.8

Source: Nepal Fertility Survey, 1976: First Report (Kathmandu, Health Ministry, 1977), p. 41.

Table 2. Cohort period rates and cumulative cohort fertility by age at survey: Nepal, 1976

Age group of cohort at end of period	Number of women in cohort	Years prior to survey						
		0-4	5-9	10-14	15-19	20-24	25-29	30-34
Cohort-period fertility rates								
10-14	0	0.000	0.000	0.001	0.000	0.000	0.000	0.001
15-19	749	0.037	0.043	0.048	0.043	0.046	0.031	0.029
20-24	1 217	0.223	0.225	0.210	0.194	0.181	0.174	
25-29	1 136	0.296	0.285	0.283	0.270	0.267		
30-34	863	0.271	0.280	0.267	0.259			
35-39	733	0.213	0.224	0.221				
40-44	725	0.129	0.151					
45-49	518	0.053						
Cumulative fertility of cohorts at end of period								
10-14		0.000	0.001	0.008	0.000	0.001	0.002	0.003
15-19		0.187	0.223	0.240	0.218	0.230	0.157	0.147
20-24		1.339	1.367	1.269	1.203	1.062	1.015	
25-29		2.849	2.696	2.616	2.414	2.350		
30-34		4.053	4.017	3.751	3.644			
35-39		5.081	4.873	4.750				
40-44		5.517	5.504					
45-49		5.770						

Source: WFS standard recode tapes.

Table 3. Age-specific fertility rates for selected periods from WFS and other demographic surveys: Nepal

Age group	Demographic sample surveys		WFS
	1974-1975	1976	1971-1975
15-19	0.114	0.138	0.130
20-24	0.270	0.305	0.278
25-29	0.297	0.284	0.286
30-34	0.260	0.252	0.228
35-39	0.169	0.170	0.159
40-44	0.089	0.095	0.082
45-49	0.050	0.034	0.034
TFR	6.2	6.4	6.0

Source: Demographic sample surveys: N. Goldman, A.J. Coale and M. Weinstein, "The quality of data in the Nepal Fertility Survey", WFS Scientific Reports, No. 6 (Voorburg, Netherlands, ISI/WFS, 1979). Rates are adjusted.

Figure I. Distribution of males and females as a percentage of the total population by five-year age groups: Nepal

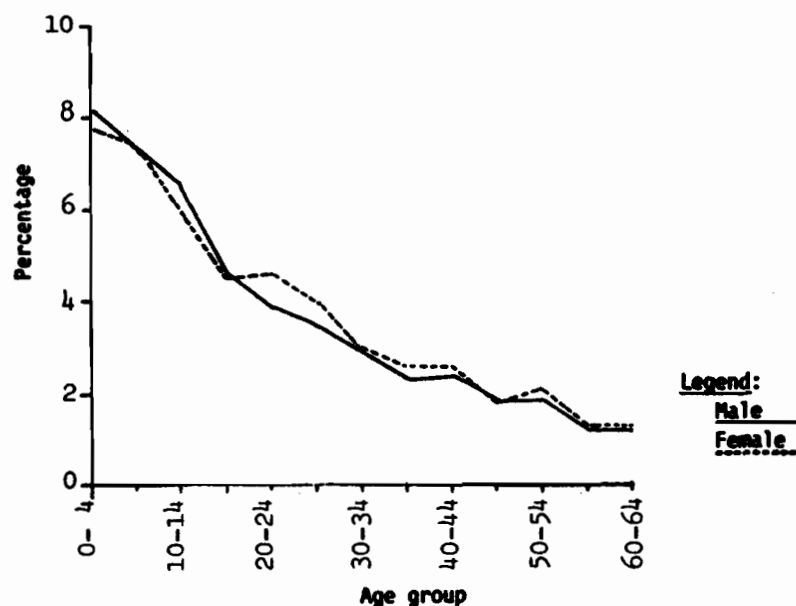
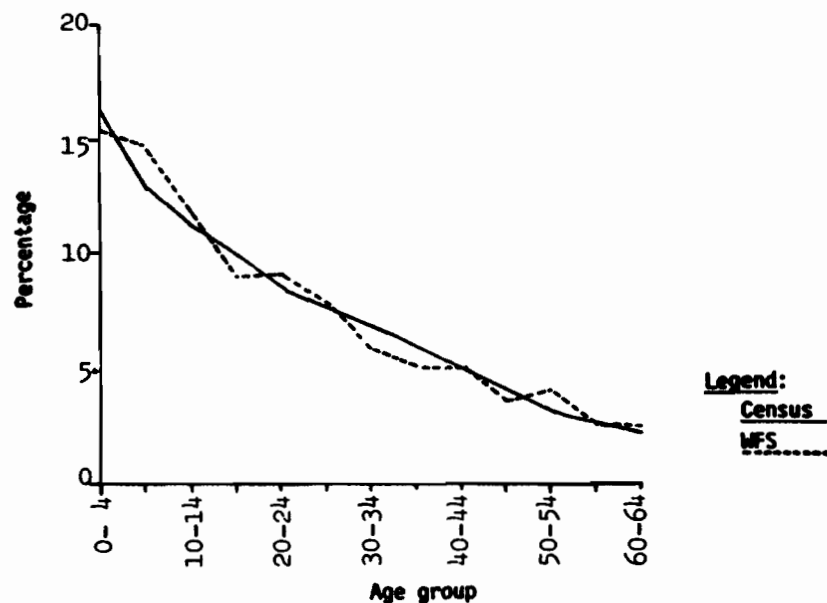


Figure II. Distribution of the female population by five-year age groups: World Fertility Survey (1976) and 1971 census: Nepal



Source for the 1971 census: United States Bureau of the Census, Country Demographic Profiles: Nepal (Washington, D.C., Government Printing Office, 1979), table 2.

**Figure III. Distribution of ever-married women aged 15-49
by years since first married: Nepal**

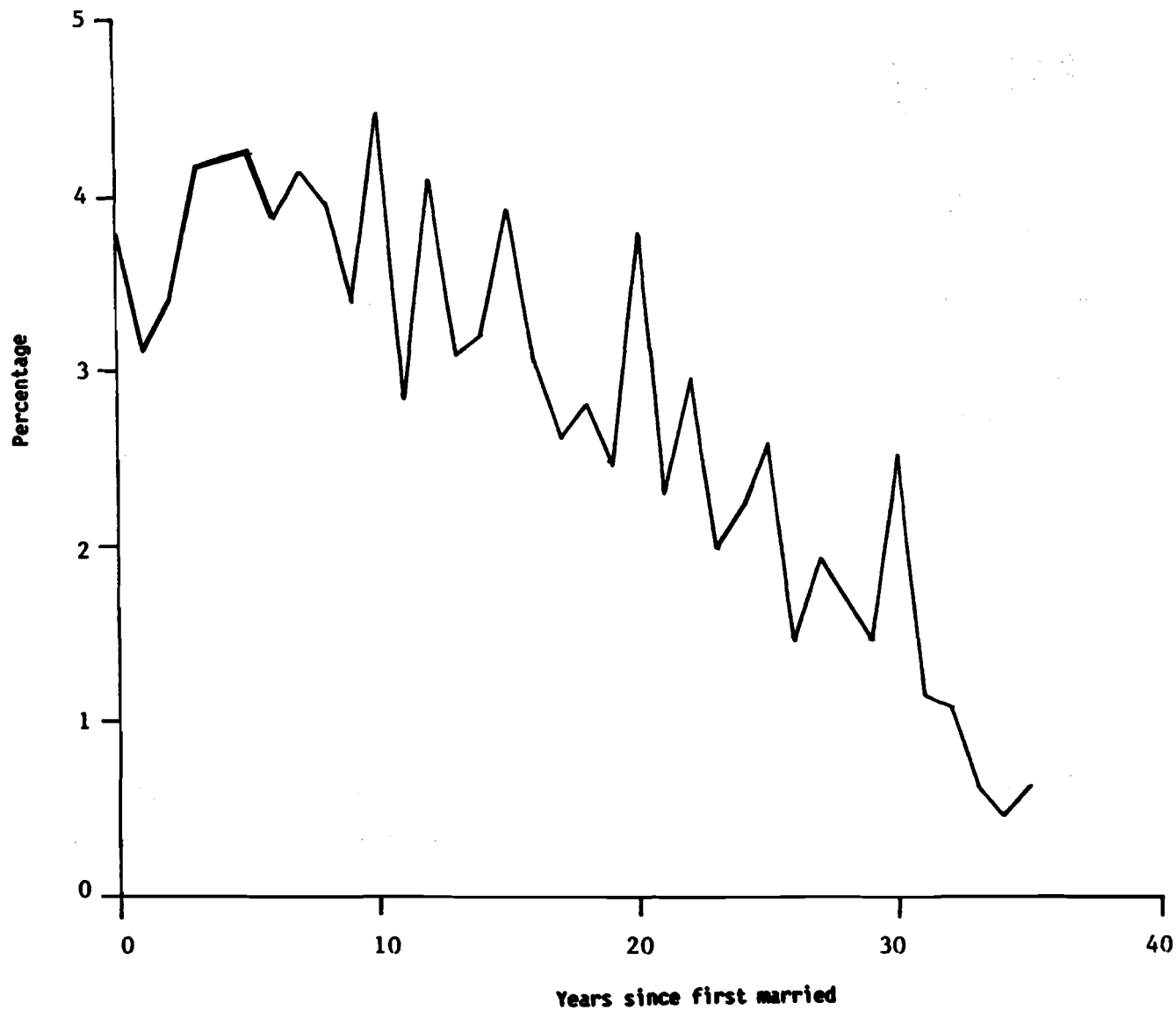
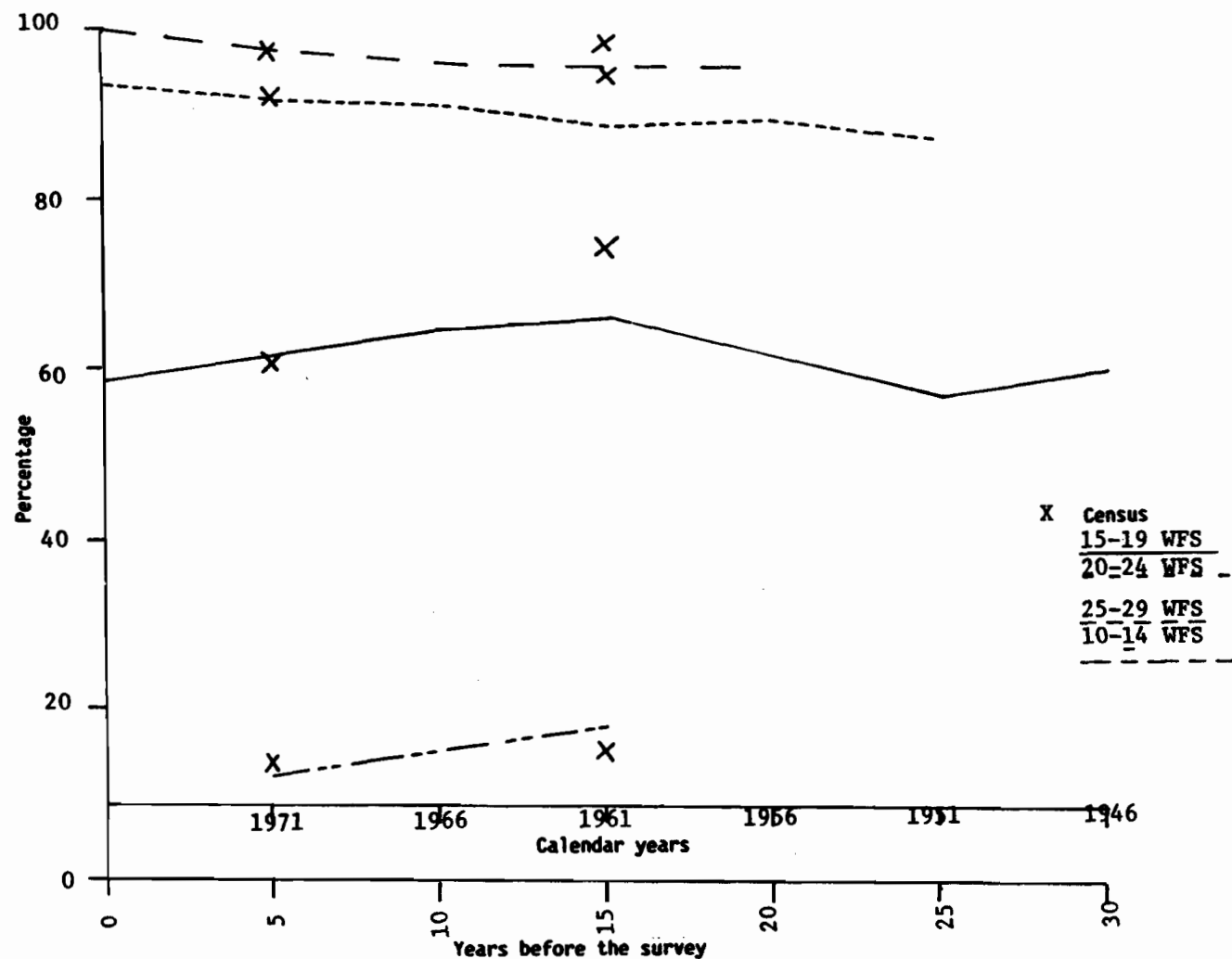


Figure IV. Proportions ever-married at designated periods prior to the survey for selected age groups: World Fertility Survey data and other sources: Nepal



Source: for the 1971 census: A.J. Coale, N. Goldman, and M. Weinstein, "The quality of data in the Nepal Fertility Survey", *WFS Scientific Reports*, No. 6 (Voorburg, Netherlands, ISI/WFS, December 1979); for the 1961 census: *Demographic Yearbook, 1968* (United Nations publication Sales No. E/F.69.XIII.1), p. 244, table 7.

Figure V. Cohort-period fertility rates for women aged 30-49 at interview:
Nepal

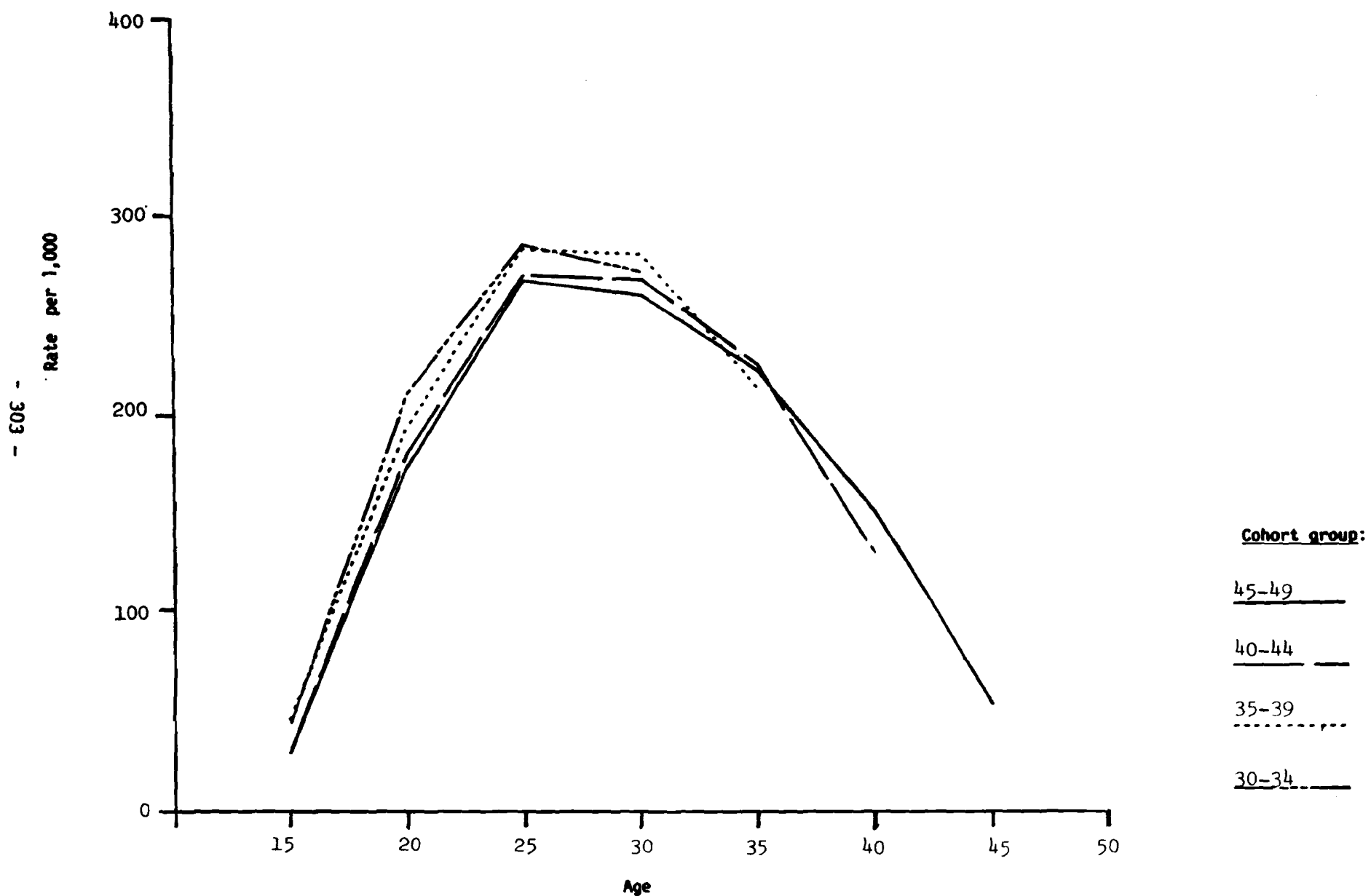
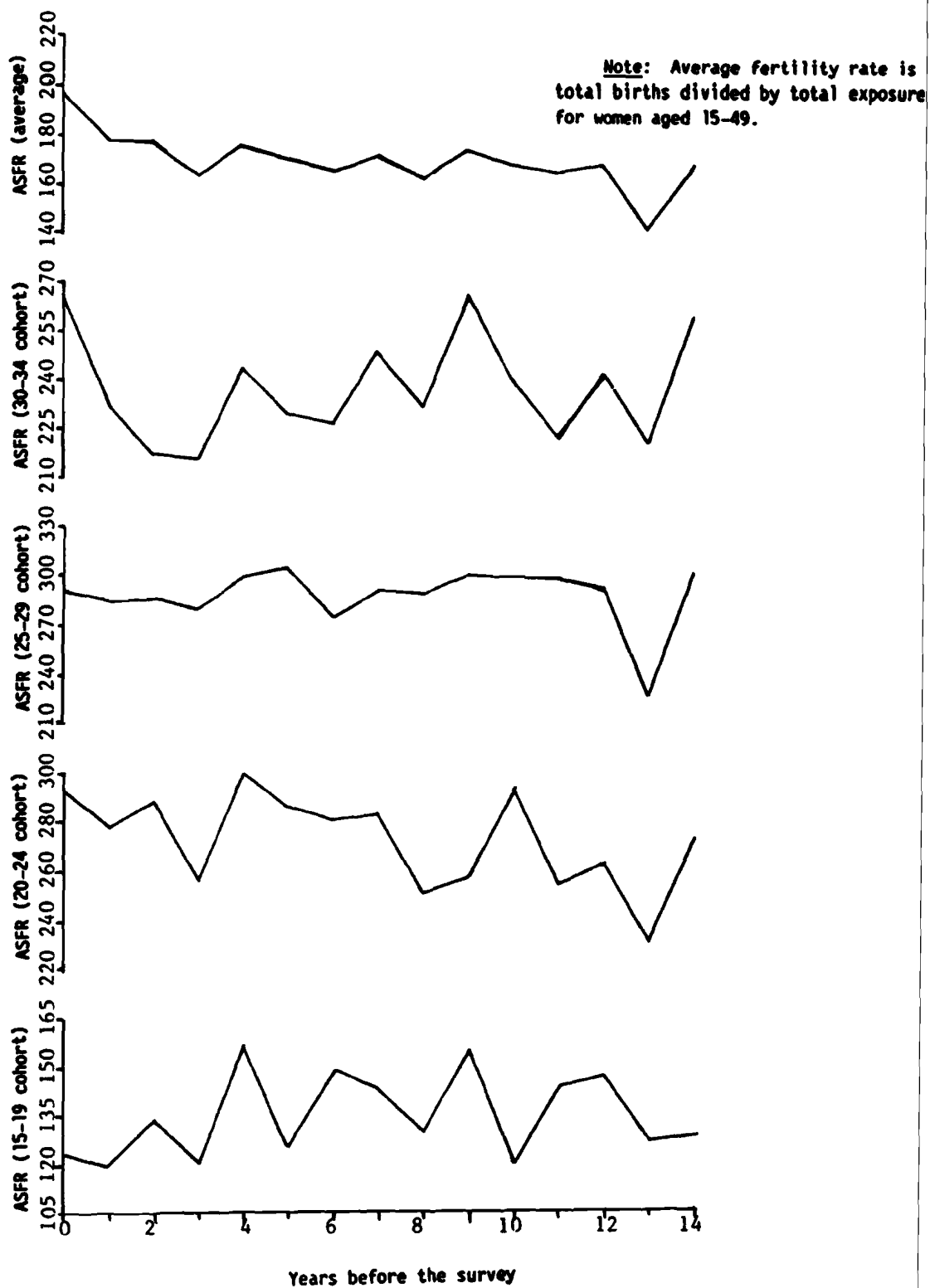


Figure VI. Age-specific fertility rates for selected cohorts and average fertility rate for single years before the survey: Nepal



PAKISTAN

Pakistan has conducted numerous sample surveys because of its commitment to population control and the inadequacy of its basic demographic data. Despite a 100-year tradition of birth registration, the data are viewed as defective. In addition, the 1961 and 1972 population censuses were characterized by extensive age misreporting and under-enumeration. From 1962 to 1965, a record of vital events was collected through the Pakistan Growth Estimation Survey (PGE) and from 1968 to 1971, the efforts were continued with the Population Growth Survey (PGS) (United States Bureau of the Census, 1980). Because previous surveys were criticized for various inadequacies, the Pakistan Fertility Survey (PFS), conducted from May to December 1975, as part of the World Fertility Survey programme, represents a potentially important source of basic data on fertility levels and trends (Pakistan and World Fertility Survey, 1976).

Age data

Only 6.8 per cent of the respondents reported age in terms of the month and year, the rest reported in terms of current age (Chidambaram and Sathar, 1984). The Myer's index of digital preferences based on women from the household survey is 12.1 (Rutstein, 1984). There was a very strong preference for 0 and 5 and a lesser preference for digits ending in 8.

The five-year age distribution (fig. I), shows a deficit of females relative to males in the age groups 35-39 and 50-54 years. Some shifting of ages into the 25-34, the 40-44 and the 55-64 age groups must have taken place. Comparison of the five-year age distribution with the 1972 census (fig. II) shows fairly large under-enumeration or shifting of ages in the PFS data among the 0-4 group. The 1972 census data have been adjusted (United States Bureau of the Census, 1980), and the comparison shows more clearly the shortcomings of the PFS data. As noted in the comparison with the male age distribution, there are deficits in age groups 35-39 and 50-54 and heaping at age groups 25-29, 40-44 and 60-64.

Marriage history data

The marriage history data are based on a sample of 4,952 ever-married women of whom 73.2 per cent gave both a month and a year for first marriage. There is strong evidence to suggest that age misreporting may be related to marital status, particularly among young women of marriageable age (Chidambaram and Sathar, 1984). The distribution of duration of marriage by single years (fig. III) shows strong heaping at certain years in the past - in particular, at 1947, the year in which Pakistan gained independence, and at 1965, the year Pakistan was at war with India - and, in general, a very irregular pattern.

A comparison of the percentage ever-married from the 1972 census with the average percentage ever-married from the PFS shows a very close correspondence for every age group except the 15-19 year olds (fig. IV). For that group, in 1972, the PFS has enumerated a larger percentage ever-married than the census (roughly 45.0 per cent vs. 34.4 per cent). This is difficult to explain,

because the known tendency to under-report the ages of unmarried women was also found to exist in the PFS.

There is evidence of an increase in the age of marriage from the 1951, 1961 and 1972 censuses as well as from the PFS itself (fig. IV). The change is most noticeable in the 15-19-year-old group but is also substantial for the 20-24 year olds. However, the retrospective data from the PFS show a much stronger decline in the proportions ever-married, particularly for the 15-24-year-old group than do the data from the three most recent censuses. Given the extensive age misreporting in previous censuses, it is difficult to evaluate these discrepancies.

Birth history data

Of all births, 79.8 per cent were reported with a month and a year (Chidambaram and Sathar, 1984). Data on children ever-born by age group show that women aged 45-49 years had a mean of 6.8 while those aged 40-44 had a mean of 6.9 children; this suggests some omission of births among older women (table 1). The enumeration in PFS, however, is considerably better than in the most recent previous survey in 1971, as is seen by comparing the 1971 parity from the survey with the 1970 parity estimated from the PFS.

An examination of the cohort-period fertility triangle shows some possible distortions in the relative fertility of different cohorts and the timing of that fertility (table 2). The 30-34-year-age group appears to have relatively high fertility throughout its reproductive career. The relatively high fertility of the 30-34-year-age group plus the omissions of births by the oldest cohorts gives the impression of an increase in fertility in the 10 years prior to the most recent five-year period and a recent decline. In addition, the cohort fertility profiles in figure V show some evidence of the forward displacement of birth dates. The fertility profile of the two oldest cohorts (40-44 and 45-49) are older than that for the 30-34 and 35-39 cohorts.

The trends in age-specific fertility by single years show serious irregularities, including a clear preference for even digits for periods eight or more years before the survey (fig. VI). In addition, there is a dip in the rates at years 1 and 2 before the survey, followed by a partial recovery in the year immediately preceding the survey (that is, year 0). This strongly suggests misplacement of dates of recent births, and, while there is no proof of a net shift out of the 0-4 period and into the 5-9 years before the survey, this is a strong possibility.^{2/}

The total fertility rate estimated from the PFS for the period 1968-1971 is 7.4, dramatically in excess of the 6.0 figure derived from PGS (1968-1971) and also well above the 7.0 figure derived by average estimates from PGE (1963-1965) (table 3). Since the PFS estimate is likely to be an under-estimate of fertility in the early 1970s because of the deficit of births in the recent period, it is unlikely that fertility declined in this period.

Notes

1/ An examination of proportions ever-married by single years shows a discrete jump from 19 to 20, which sharply deviates from the trend.

2/ An application of the P/F ratio technique and the transformed Gompertz Model suggested under-reporting of births in the most recent five-year period for the cohorts aged 30-34 and 35-39 at the survey, accompanied by over-reporting in the previous five-year period (Booth and Alam, 1980).

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Table 1. Children ever born per woman from WFS and 1971 Population Growth Survey: Pakistan

Age group	1971 PGS	1970 WFS	1975 WFS
15-19	0.2	0.7	0.2
20-24	1.3	2.0	1.5
25-29	2.8	3.6	3.1
30-34	4.4	5.0	4.8
35-39	5.5	6.3	5.8
40-44	6.0	6.7	6.9
45-49	6.5	..	6.8

Source: 1971 PGS: V.C. Chidambaram and others, "Some aspects of WFS data quality: a preliminary assessment", WFS Comparative Studies, No. 16. (Voorburg, Netherlands, ISI/WFS, 1980), table II.

Table 2. Cohort period rates and cumulative cohort fertility by age at survey: Pakistan, 1975

Age group of cohort at end of period	Number of women in cohort	Years prior to survey						
		0-4	5-9	10-14	15-19	20-24	25-29	30-34
Cohort-period fertility rates								
10-14	32	0.000	0.001	0.001	0.001	0.001	0.001	0.002
15-19	599	0.046	0.071	0.073	0.073	0.075	0.111	0.077
20-24	848	0.224	0.246	0.255	0.251	0.257	0.264	
25-29	912	0.298	0.333	0.322	0.306	0.303		
30-34	818	0.300	0.303	0.311	0.302			
35-39	623	0.225	0.251	0.240				
40-44	618	0.139	0.146					
45-49	502	0.033						
Cumulative fertility of cohorts at end of period								
10-14		0.001	0.003	0.007	0.007	0.005	0.006	0.011
15-19		0.233	0.365	0.374	0.371	0.381	0.567	0.392
20-24		1.487	1.605	1.644	1.636	1.853	1.710	
25-29		3.094	3.310	3.248	3.383	3.223		
30-34		4.810	4.765	4.940	4.735			
35-39		5.889	6.195	5.937				
40-44		6.889	6.667					
45-49		6.831						

Source: WFS standard recode tapes.

Table 3. Age-specific fertility rates for selected periods from the PGE a/, PGS b/, and WFS data: Pakistan

Age group	1963-1965		1968-1971		Percentage change	
	PGE a/ (1)	WFS (2)	PGS b/ (3)	WFS (4)	WFS (2) - (4)	Outside source (1) - (3)
15-19	0.120	0.198	0.058	0.179	- 9.6	-51.7
20-24	0.264	0.316	0.223	0.314	- 0.6	-15.5
25-29	0.332	0.346	0.261	0.334	- 3.5	-21.4
30-34	0.318	0.288	0.252	0.274	- 4.9	-20.8
35-39	0.218	210	0.200	0.197	- 6.2	- 8.3
40-44	0.096	..	0.124	0.090	..	29.2
45-49	0.054	..	0.085	..	..	57.4
TFR	7.0	7.5 c/	6.0	7.4 c/	- 1.3	-14.3

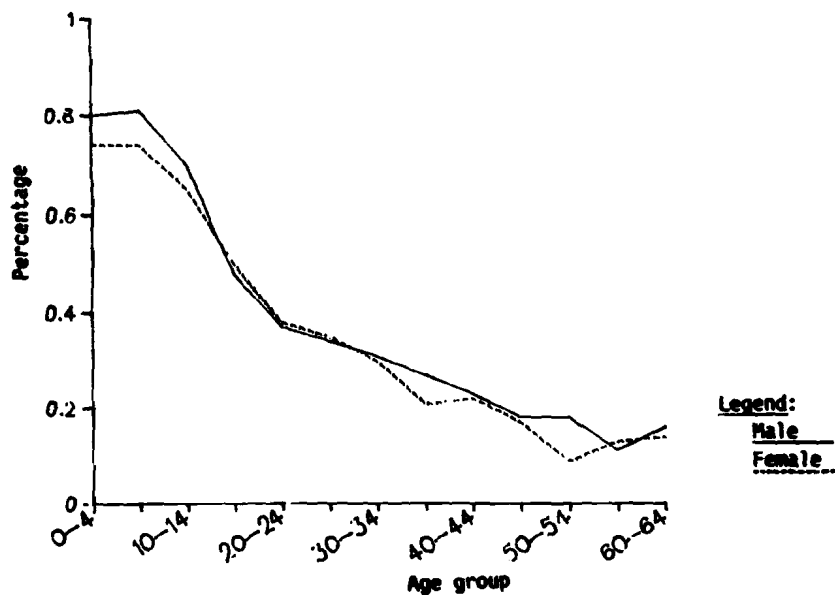
Source: H. Booth and I. Alam, "Fertility in Pakistan: levels, trends and differentials", World Fertility Survey Conference 1980. Record of Proceedings (Voorburg, Netherlands, ISI/WFS, 1981).

a/ PGE: Pakistan Growth Estimation Survey.

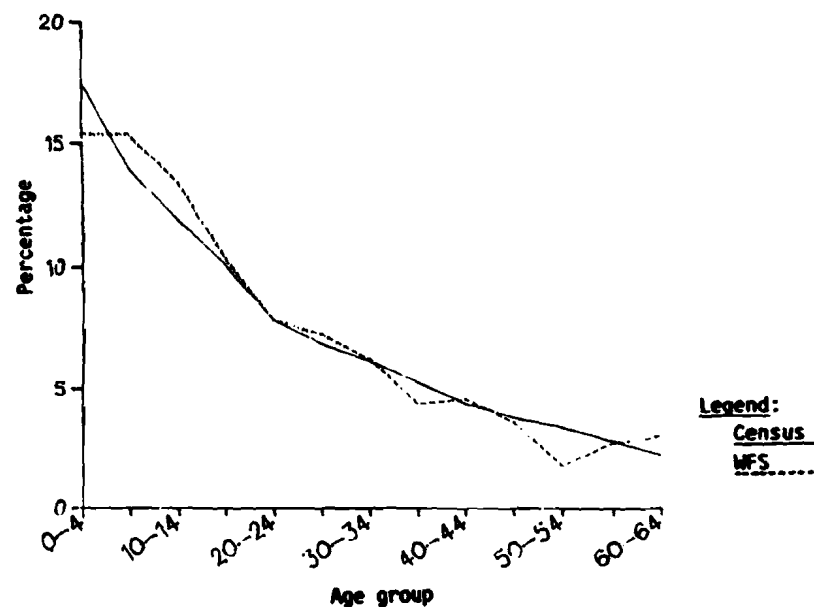
b/ PGS: Population Growth Survey.

c/ For the purpose of calculating a total fertility rate, the age-specific fertility rates from the other surveys were used when the age-specific rate from WFS was not available.

**Figure I. Distribution of males and females
as a percentage of the total population
by five-year age groups: Pakistan**



**Figure II. Distribution of the female
population by five-year age groups:
World Fertility Survey (1974) and
1972 census: Pakistan**



Source for the 1972 census: United States
Bureau of the Census, Country Demographic Profiles:
Pakistan (Washington, D.C., Government Printing Office,
1980), table 2.

**Figure III. Distribution of ever-married women aged 15-49
by years since first married: Pakistan**

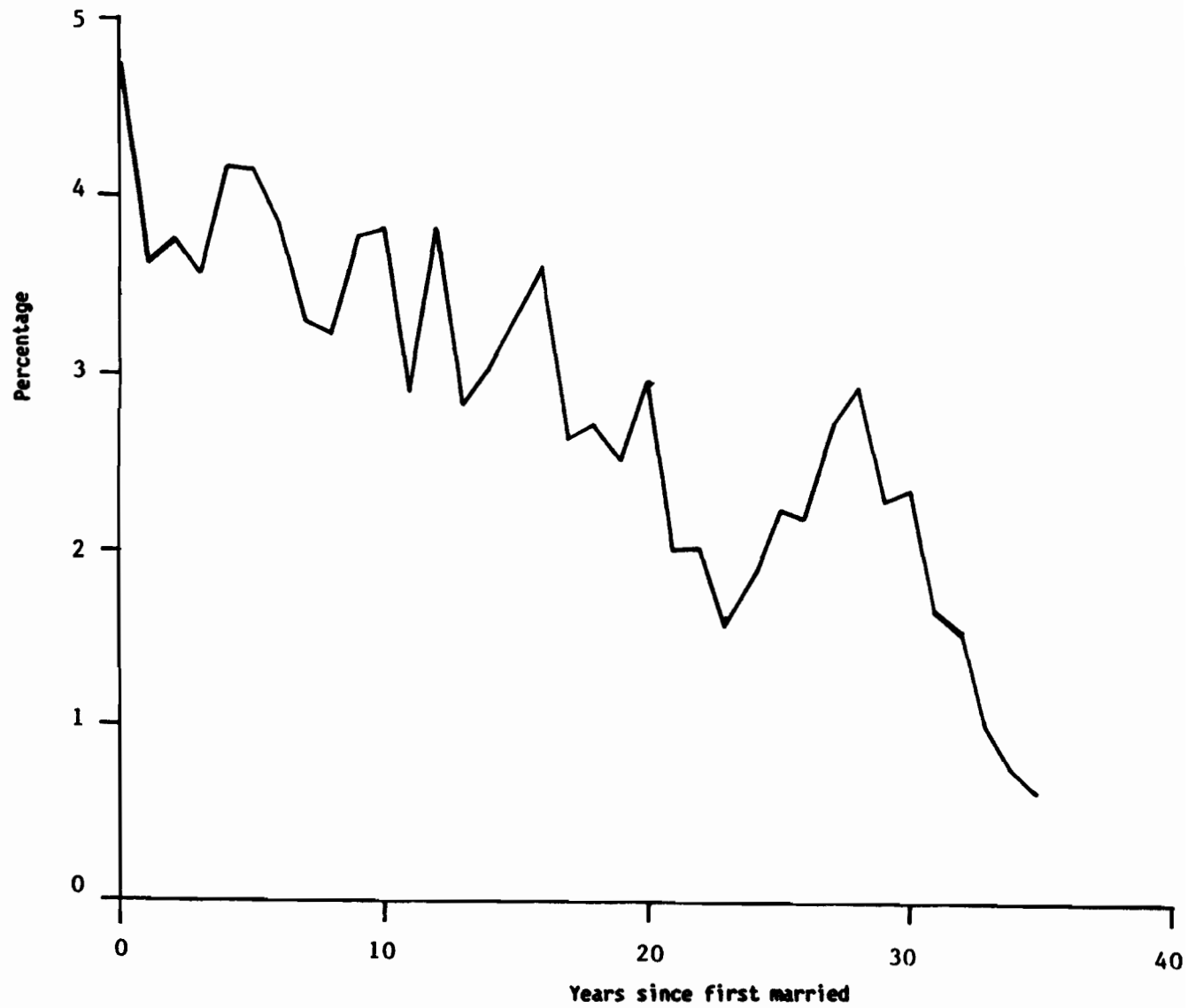
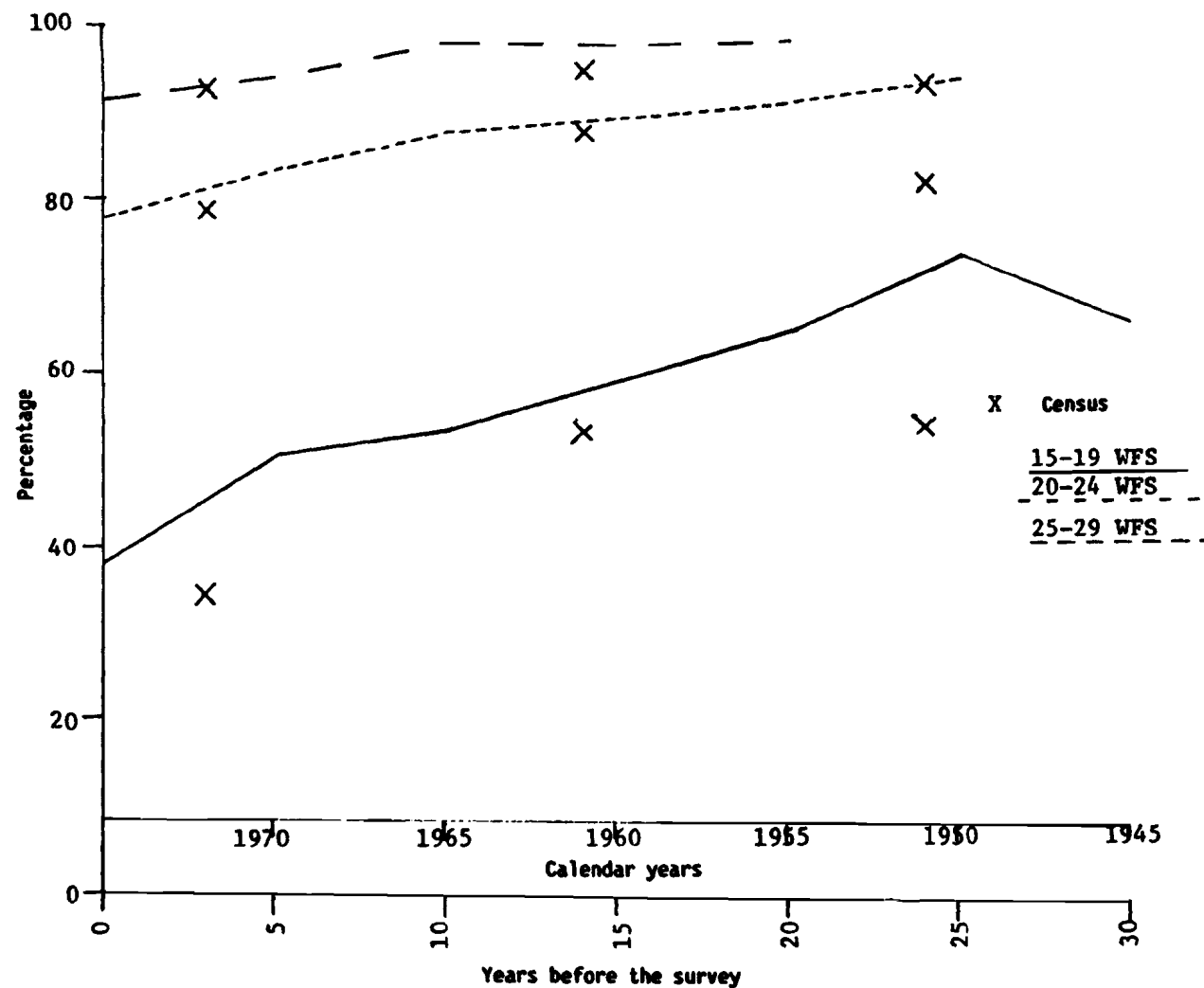
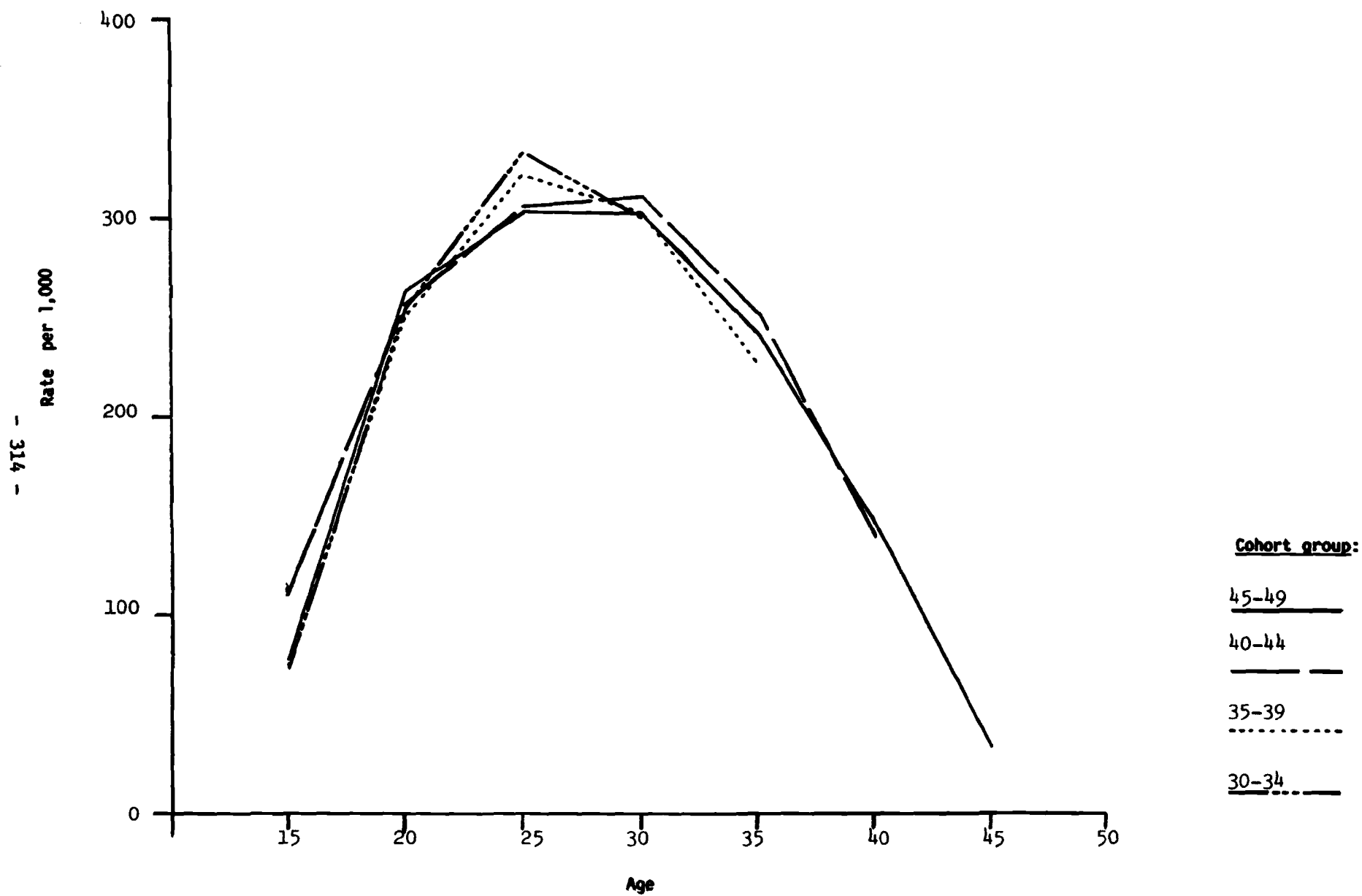


Figure IV. Proportions ever-married at designated periods prior to the survey for selected age groups: World Fertility Survey data and other sources: Pakistan

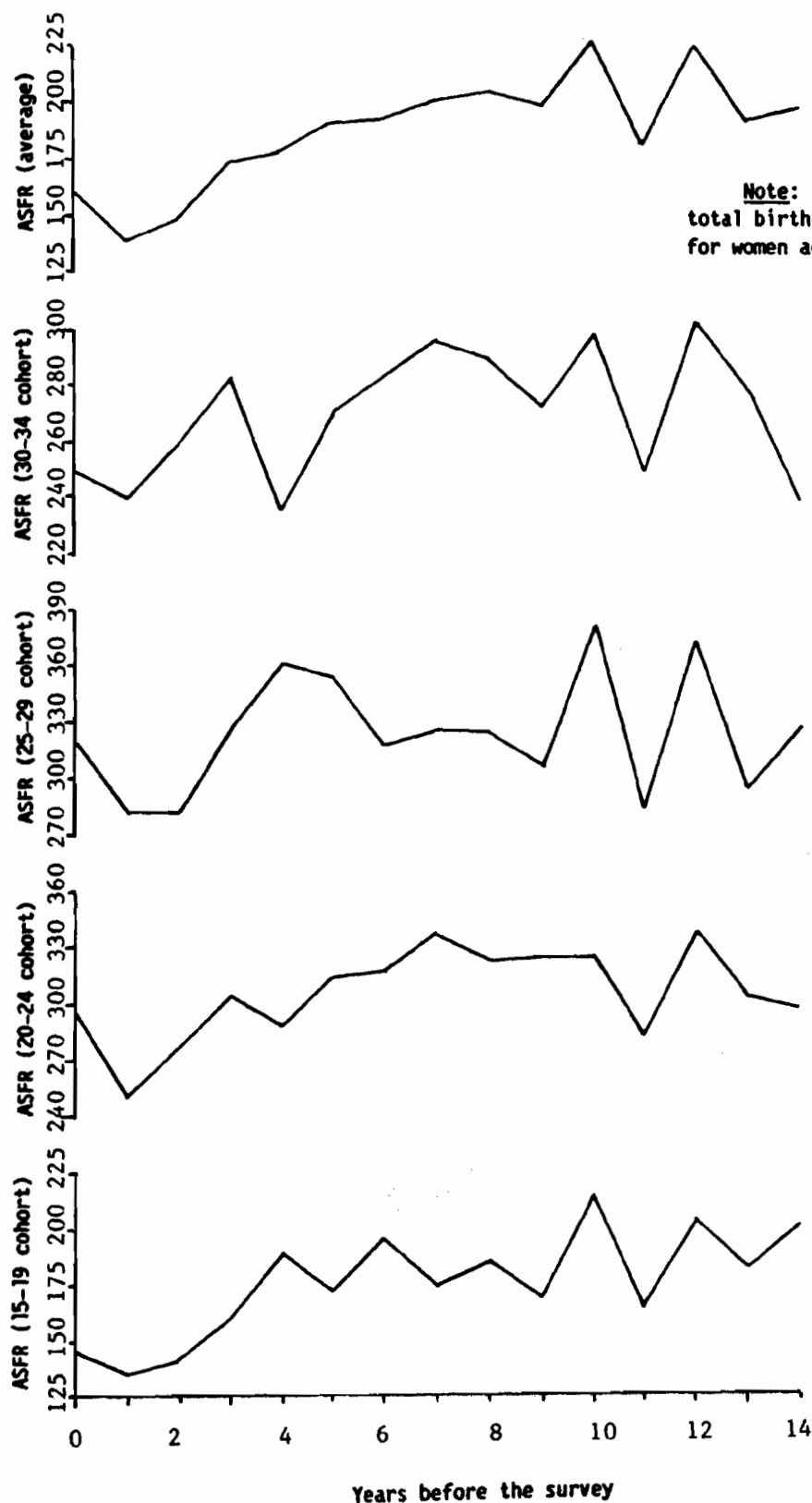


Source: M. Karim, "Nuptiality in Pakistan: trends and determinants", World Fertility Survey Conference, 1980: Record of Proceedings (Voorburg, Netherlands, ISI/WFS, 1981).

**Figure V. Cohort-period fertility rates for women aged 30-49 at interview:
Pakistan**



**Figure VI. Age-specific fertility rates for selected cohorts and average fertility rate for single years before the survey:
Pakistan**



PANAMA

Panama was the second Latin American country to participate in the World Fertility Survey programme. The survey (Encuesta de Fecundidad de Panama: EFP) was conducted between December 1975 and March 1976. At roughly the same time, a multi-round demographic survey was conducted (1975-1977) which collected retrospective fertility history in its third phase (Chackiel, Medika and Hill, 1982). Census data from 1950, 1960 and 1970 are available, and the extent of omissions in birth registration data has been estimated at roughly 2 per cent since the late 1960s (United States Bureau of Census, 1977). All women between the ages of 20 and 49 were eligible for the individual interview.

Age data

Nearly 100 per cent of all respondents gave their month and year of birth (Chidambaram and Sathar, 1984). The Myer's index of digital preference is 3.7 (Rutstein, 1984). There is some preference for 0 and a milder preference for 2, 4, 5 and 8.

Figure I shows the male and female age distribution from the EFP. Many peculiarities are apparent. At both ends of the eligible age groups for the individual interview, there are too few women, with a bulge in the 50-54 age group. A comparison of the female age distribution from the EFP and the 1970 census in figure II highlights the above-mentioned distortions. Women aged 10-19 and 50-59 represent too high a proportion of the sample, suggesting that some of the oldest and youngest women within the eligible group (20-49) were misreported as being either younger (in the case of women 20-24) or older (in the case of women aged 45-49) than their actual age. As a percentage of the total female population, the census found 34.8 per cent of all women to be aged 20-49, whereas the household survey only recorded 32 per cent in that age group.

It is possible that within the eligible group 20-49, women's ages have been accurately reported but younger and older women within the 20-49 age range have been undersampled, resulting in too high a proportion of the 20-49-age group being recorded in the 30-34-age group. Because the 30-34-age group is roughly at the centre of the eligible age group, this is possible.

Marriage history data

The marriage history data were based on a sample of 3,203 women ever in a union, of which 94.5 per cent reported a month and a year for their first union (Chidambaram and Sathar, 1984).

A comparison of the marital status distribution in the household and individual questionnaires gives no evidence of any bias in the selection of women in the individual interview. The slightly higher percentage of women married in the individual survey can be explained by the probe questions in the case of consensual unions.

The quality of the marriage history data can be assessed in figures III and IV. There are several peaks in proportions at 5 and 10 years before the

survey, as shown in figure IIII.^{1/} A comparison of the proportion ever-married from the 1970 census with the proportion ever in union five years before the survey shows slightly greater enumeration of unions in the EFP data in every age group 20-24 and over. This can be explained by more complete reporting of consensual unions in the EFP. In figure IV, the proportions ever in union are compared at different points in the past between the EFP and the census. For this purpose, those categorized as separated in the 1970 census (a new category) were counted as single, to be comparable with 1950 and 1960 definitions. Although there is a slight downward trend in proportions ever in union in the EFP data, this is not apparent in the census data. This could be due to a displacement of union dates to 5 and 10 years ago, as shown in figure III. It is difficult, therefore, to be certain of any trend in marriage patterns.^{2/}

Birth history data

Of all births reported, 97.7 per cent were recorded with a month and a year (Chidambaram and Sathar, 1984). When comparing parity from the EFP with a recent census (table 1), it is clear that parity at the time of the census from the EFP shows a higher count of children at each age over 25, thus indicating more complete enumeration. The steady progression of parity at the oldest ages does not suggest that omissions are a major problem, although the cumulative fertility of cohorts 40-44 and 45-49 at age 40-44 are very close (table 2, lower panel).

An examination of cohort fertility rates by five-year periods before the survey can be scanned for evidence of possible omissions and displacements of events which would affect the interpretation of fertility trends (table 2). There is no strong evidence of omissions since the parity of the 40-44 and 45-49 cohort is the same at age 40-44. In addition, the cohort fertility profiles shown in figure V do not suggest that forward displacement of births is a problem. The single year age-specific fertility is quite irregular (see fig. VI), probably due to the small sample size but also to a deficit of births recorded 1-2 years before the survey. There is no evidence in table 2 that the fertility of the 30-34 cohort is out of line with respect to neighbouring cohorts.

A comparison of age-specific fertility rates from birth registration data and the EFP shows a clear downward trend in fertility from the early 1960s. The level of fertility in the most recent period is remarkably consistent between the birth registration data and the EFP (table 3). The downward trend in fertility as reflected by WFS rates is greater than that reflected by the birth registration rates at all age groups where comparisons can be made. An exaggeration of trends from the EFP data is likely due to misdating of events through backward displacement of births. However, an improvement in birth registration over time could also have caused the trends in birth registration rates to be under-estimated.^{3/}

Notes

^{1/} The general deficit of first unions in the few years before the survey is probably due to the exclusion from the interview of women aged 15-19.

2/ There is a slight possibility of a recent decline in proportions married at ages 15-19, since the proportion single from the household data was 80 per cent, compared with 73 per cent in the 1970 census.

3/ A similar conclusion was arrived at in a detailed study of fertility levels and trends in Panama using data from vital registration censuses and surveys (Chackiel, Medica and Hill, 1982).

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Table 1. Children ever born per woman from 1970 census and WFS: Panama

Age group	1971 census	1970-1971 WFS	1975-1976 WFS
15-19	0.3	0.2	..
20-24	1.4	1.4	1.2
25-29	2.8	2.9	2.6
30-34	4.1	4.3	3.8
35-39	5.0	5.3	4.9
40-44	5.2	5.7	5.6
45-49	5.2	...	5.8

Source: 1970 census: United States Bureau of the Census, Country Demographic Profiles: Panama (ISP-DP-9) (Washington, D.C., Government Printing Office, 1977), table 8.

Table 2. Cohort period rates and cumulative cohort fertility by age at survey: Panama, 1976

Age group of cohort at end of period	Number of women in cohort	Years prior to survey						
		0-4	5-9	10-14	15-19	20-24	25-29	30-34
Cohort-period fertility rates								
10-14	0	0.000	0.000	0.001	0.001	0.001	0.001	0.001
15-19	4	0.044	0.044	0.058	0.056	0.068	0.067	0.069
20-24	868	0.187	0.228	0.238	0.246	0.242	0.218	
25-29	795	0.235	0.280	0.307	0.299	0.300		
30-34	730	0.181	0.238	0.265	0.249			
35-39	535	0.128	0.179	0.185				
40-44	405	0.076	0.109					
45-49	362	0.023						
Cumulative fertility of cohorts at end of period								
10-14		0.000	0.000	0.005	0.006	0.003	0.007	0.005
15-19		0.218	0.222	0.296	0.285	0.348	0.338	0.348
20-24		1.158	1.436	1.475	1.579	1.548	1.439	
25-29		2.614	2.877	3.114	3.044	2.939		
30-34		3.784	4.305	4.370	4.185			
35-39		4.944	5.267	5.110				
40-44		5.644	5.657					
45-49		5.771						

Source: WFS standard recode tapes.

Table 3. Age-specific fertility rates for selected periods from WFS
and birth registration data: Panama

Age group	1961-1965		1966-1970		1971-1975		Percentage change	
	BR (1)	WFS (2)	BR (3)	WFS (4)	BR (5)	WFS (6)	WFS (2) - (6)	Outside (1) - (5)
15-19	0.138	0.144	0.132	0.122	0.123	(0.123)	...	-10.9
20-24	0.286	0.299	0.277	0.280	0.250	0.237	-20.7	-12.6
25-29	0.262	0.296	0.251	0.275	0.219	0.214	-27.7	-16.4
30-34	0.185	0.219	0.184	0.216	0.157	0.154	-29.7	-15.1
35-39	0.118	(0.162)	0.123	0.142	0.108	0.111	-31.5	- 8.5
40-44	0.040	..	0.042	..	0.037	0.040	..	- 7.5
45-49	0.007	..	0.008	..	0.007	..	..	..
TFR	5.2	5.8 a/	5.1	5.4 a/	4.5	4.4 a/	-24.1	-13.5

Source: Birth registration data: J. Chackiel, V. Medica and K. Hill, Fertility and Mortality in Panama, 1950-1975 (Washington, D.C., National Academy Press, 1982).

a/ For the purpose of calculating a total fertility rate, the age-specific fertility rates from the registration data were used when the age-specific fertility rate from WFS was not available.

Figure I. Distribution of males and females as a percentage of the total population by five-year age groups: Panama

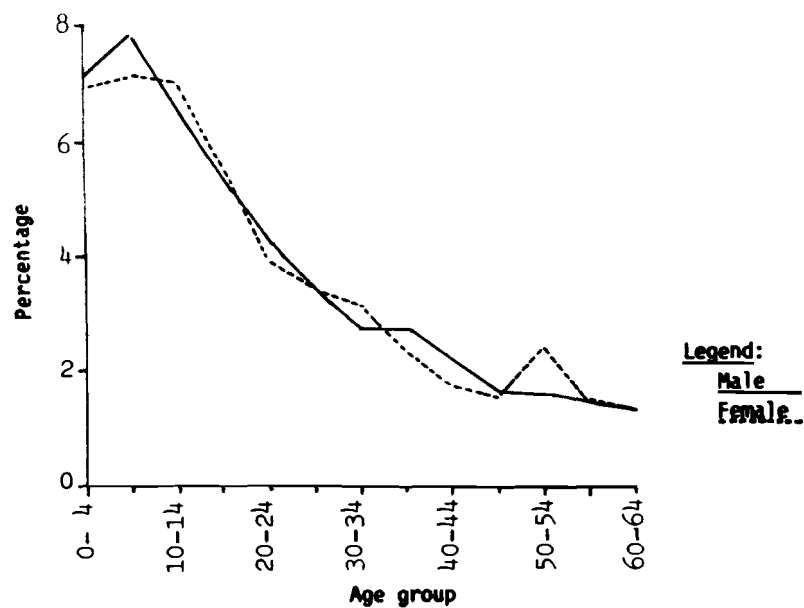
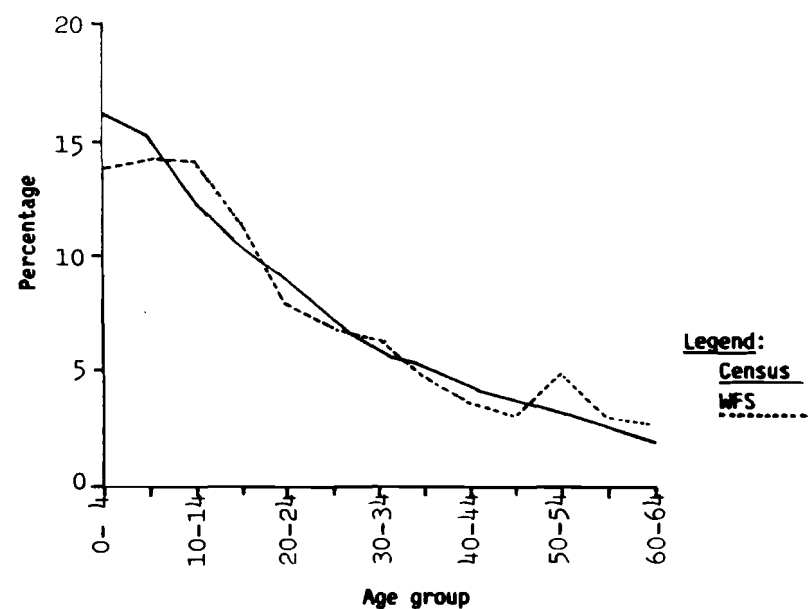


Figure II. Distribution of the female population by five-year age groups: World Fertility Survey (1976) and 1970 census: Panama



Source for the 1970 census: *Demographic Yearbook, Historical Supplement: Special Issue* (United Nations publication, Sales No. E/F.79.XIII.8), table 3.

**Figure III. Distribution of ever-married women aged 15-49
by years since first married: Panama**

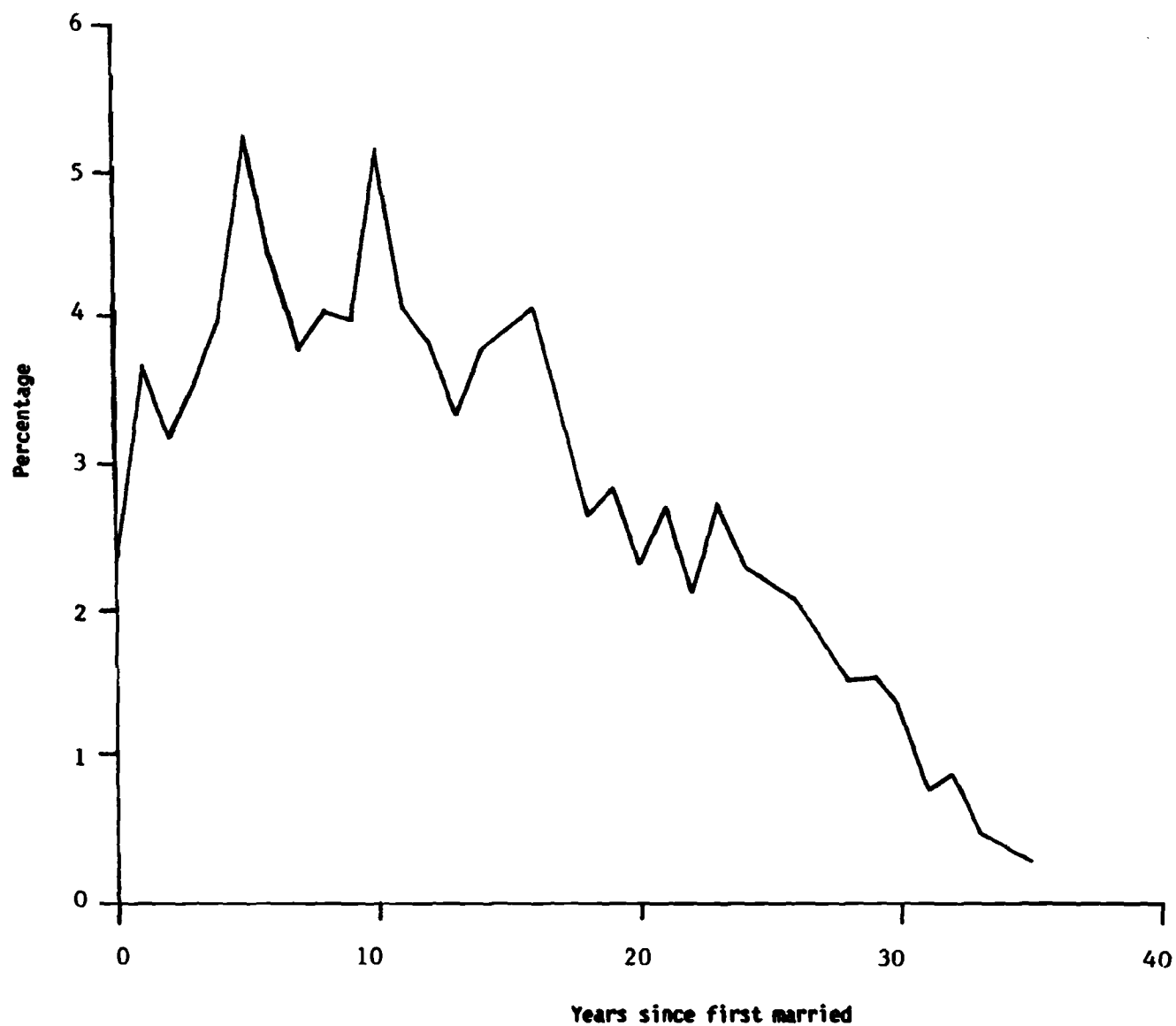
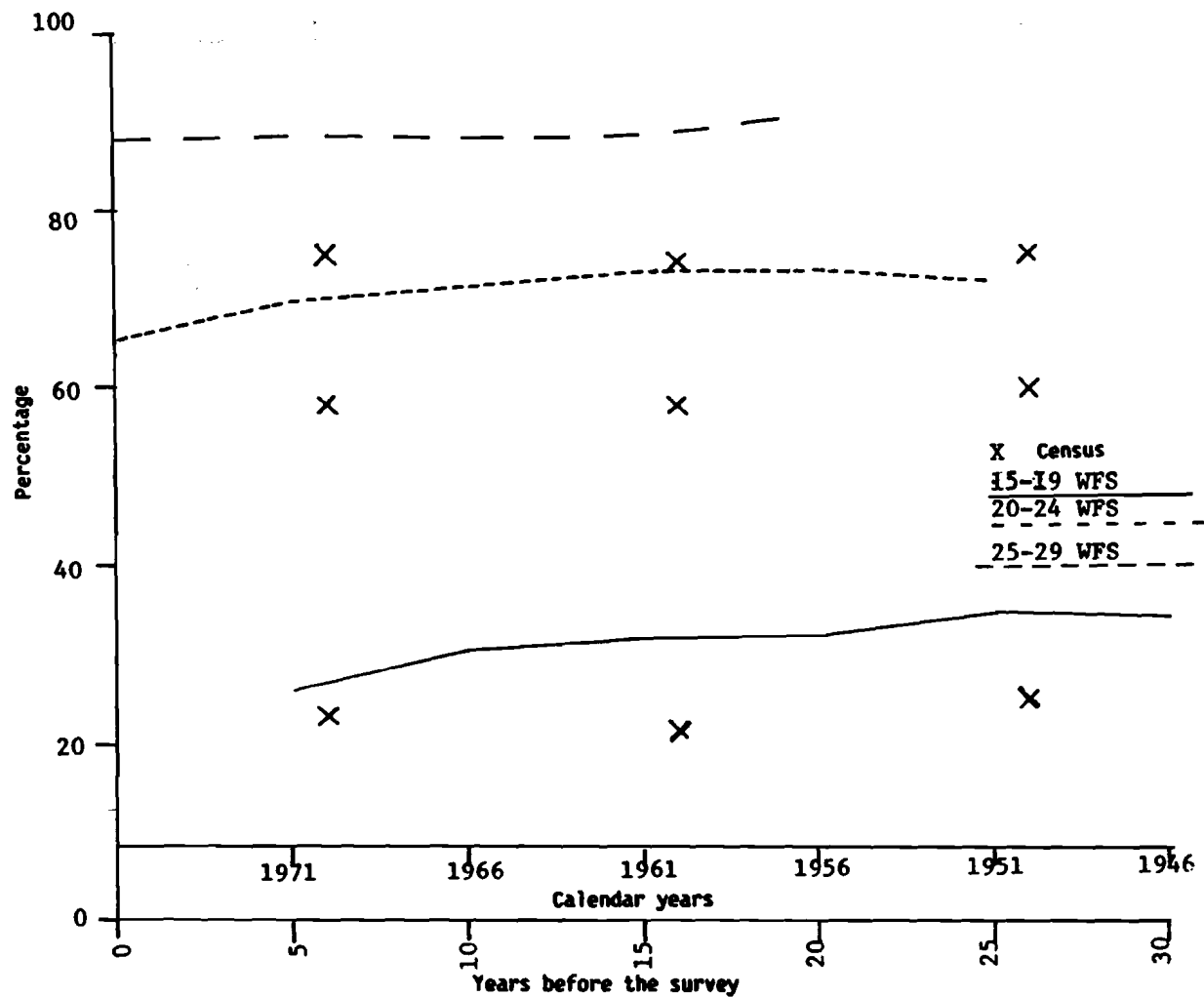


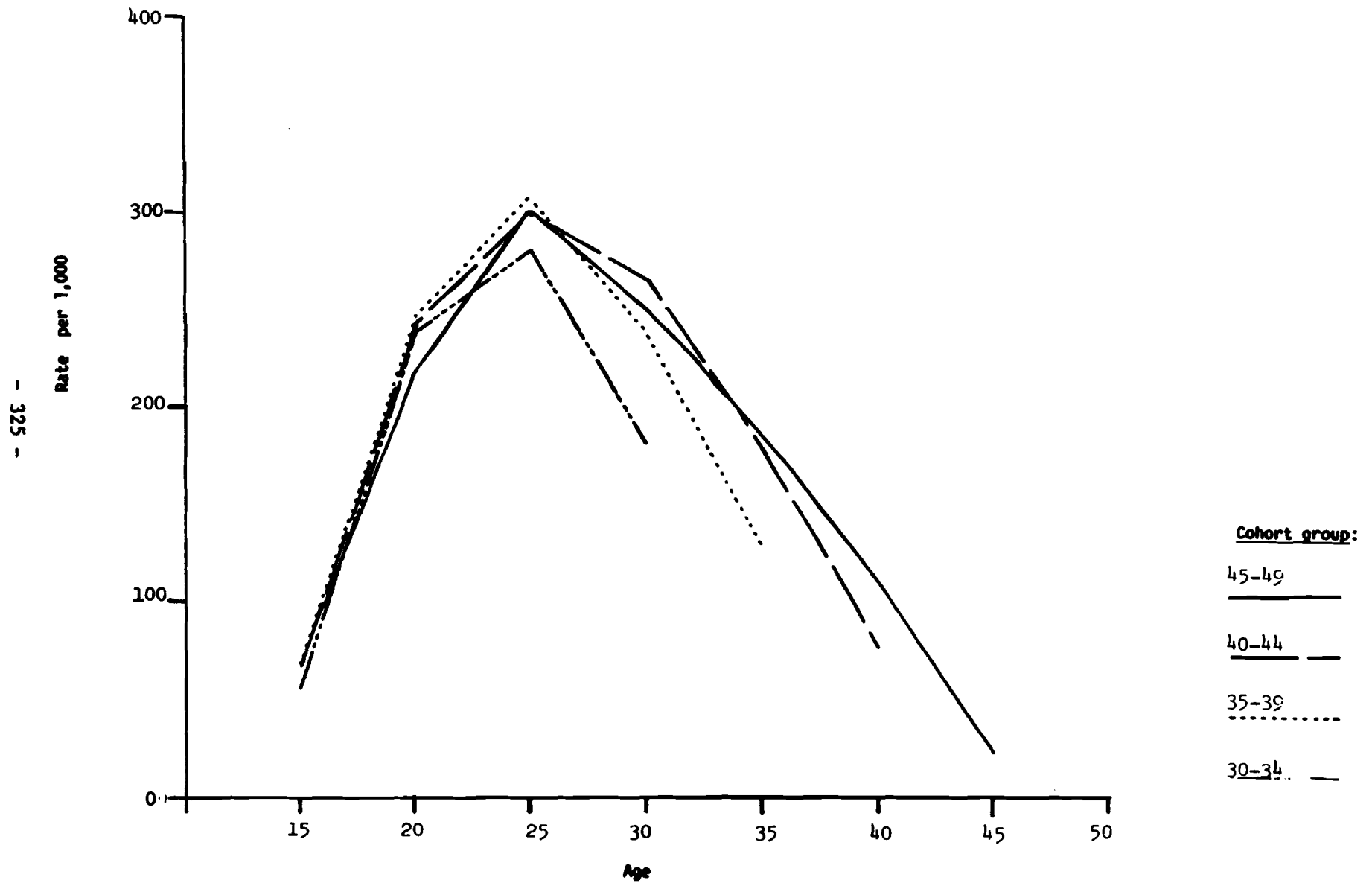
Figure IV. Proportions ever-married at designated periods prior to the survey for selected age groups: World Fertility Survey data and other sources: Panama



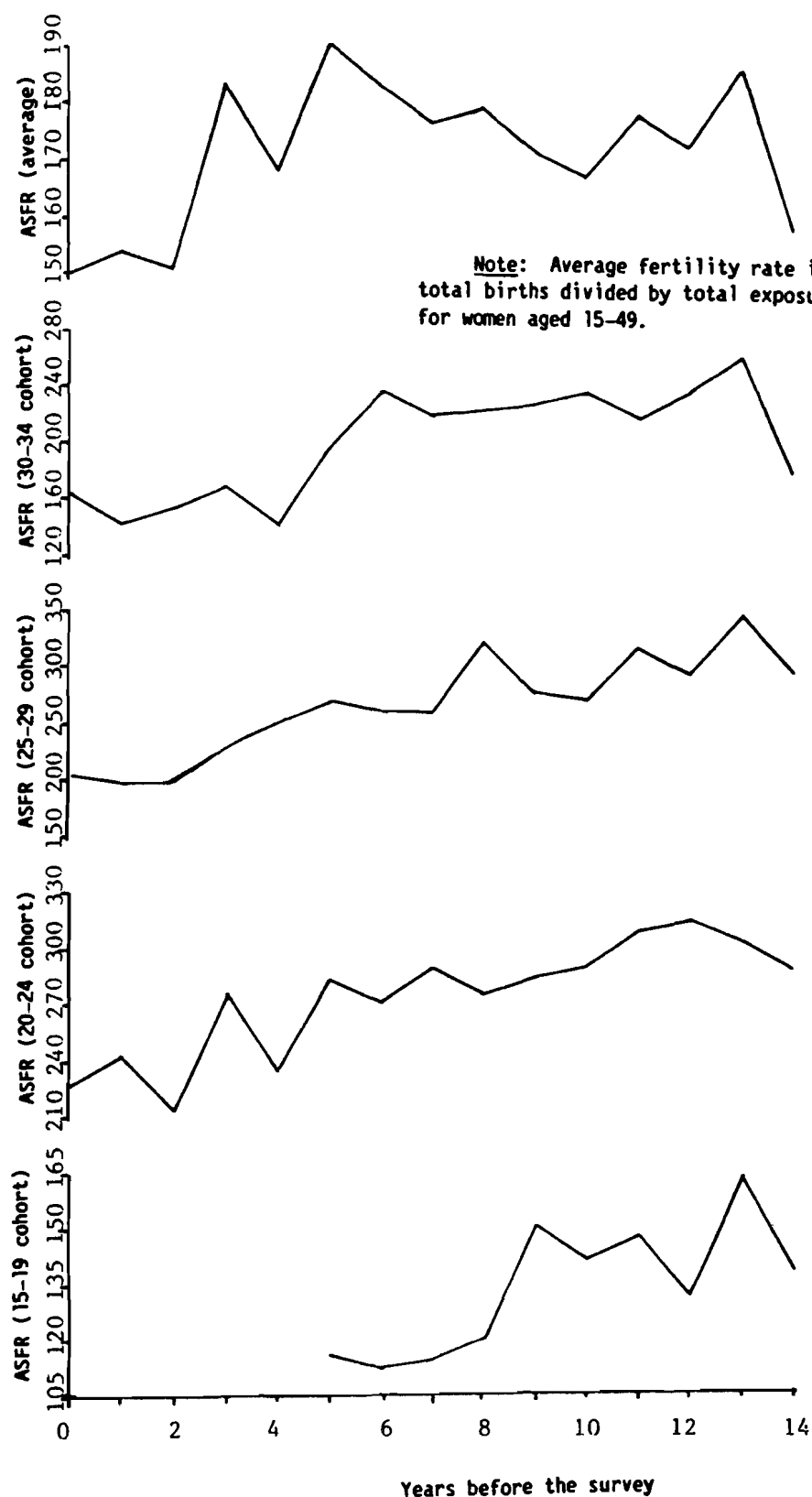
Source: Demographic Yearbook, Historical Supplement: Special Issue (United Nations publication, Sales No. E/P.79.XIII.8), table 3.

Note: 1970 census: "Separated" available as a separate groups only in 1970; therefore counted as single, to be comparable with 1950 and 1960.

**Figure V. Cohort-period fertility rates for women aged 30-49 at interview:
Panama**



**Figure VI. Age-specific fertility rates for selected cohorts and average fertility rate for single years before the survey:
Panama**



PARAGUAY

The National Fertility Survey of Paraguay (Encuesta Nacional de Fecundidad: ENF) was carried out between February and May 1979. Civil registration data in Paraguay suffer from serious under-registration of births, and therefore, registration data cannot be used in the estimation of fertility. Since 1914, four censuses have been carried out, the most recent ones in 1962 and 1972. A demographic survey (Encuesta Demografica Nacional del Paraguay: EDENPAR) was carried out in 1977, and earlier in the same year, a contraceptive prevalence survey (EPAP) was carried out.

Age data

All women reported both the month and year of their birth in the individual interview (Chidambaram and Sathar, 1984). The single year household age distribution is not available for the calculation of Myer's index of digital preference. However, an examination of the single-year-age distribution of women aged 20-49 years from the individual survey shows a preference for digits ending in 0, 2, 5 and 8 (Schoemaker, 1984). A comparison of the male and female five-year-age distribution (fig. I) shows an excess of females aged 35-39 years and 50-54 years. Among young children, there appears to be a deficit of both males and females at ages 0-9 years. A comparison of the female age distribution of the ENF with the 1972 census age distribution (fig. II) shows an excess of females in the ENF in age groups 35-39 and 50-54 years and also among young children. Females aged 0-10 years appear to be under-estimated.

Marriage history data

Ninety-eight per cent of ever-married women in the ENF reported both the calendar year and month of their first union (Chidambaram and Sathar, 1984). The distribution of ever-married women by years since first union (fig. III) shows the distribution of the dates of first unions over the previous 35 years. The distribution appears fairly smooth except for pronounced peaks at periods 4, 6, 8 and 18 and 23-24 years before the survey date.

The marital status distribution for selected periods in the past was reconstructed using the ENF marriage history data (fig. IV). The data show a slight declining trend in the proportions married among 15-19- and 20-24-year-olds, indicating an increase in age at marriage over the period. There appears to be a slight deficit of married women 10 years before the survey date. Comparisons with marital status distributions from the 1962, 1972 and 1982 censuses are also shown in figure IV. Both the 1962 and 1972 censuses show somewhat lower proportions married when compared with the ENF distribution for a corresponding period. The proportion ever-married among 15-19 year olds in the 1982 census corresponded quite closely with the ENF, but this is not the case for the proportions ever-married among 20-24- and 25-29-year olds. The three census distributions indicate a trend towards a decline of age at marriage, which is not very likely. It is more likely that the more recent census covered more of the ever-married women than the previous ones. A comparison of the detailed marital status distribution of the ENF and the 1972 census shows that the 1972 census has lower proportions

married than the ENF among legally married and divorced women than among consensually married women. It is likely that women in consensual unions were reported as single in the 1972 census.

Birth history data

All of the live births recorded in the birth history were recorded with a month and year of birth (Chidambaram and Sathar, 1984). The parity distribution from the ENF is presented in table 1 with those from the 1972 census, 1977 EDENPAR and the 1982 census. The mean number of children ever born increases monotonically with age up to 6.3 births per woman among women aged 45-49 years at the time of the ENF. Comparison with earlier data, the 1972 census and the 1977 EDENPAR, show slight declines in the mean number of children ever born in all age groups, except the oldest where the mean fluctuates between 6.2 in 1972 (6.5 in 1977) and 6.3 in 1979. The 1982 census parity distribution, however, does not compare as well. Among younger women, the mean number of children ever born was slightly higher in the census of 1982, but among older women (women over 30 years), the ENF recorded higher parity. Age misreporting linked with parity might be responsible for the observed differences, although the differences are not large.

An examination of the cohort-period fertility rates shows lower fertility rates at young ages (15-19 and 20-24) among the 45-49 cohort, which is clearly seen in an examination of the age pattern of cohort fertility (fig. V). It is possible that date reporting of births that occurred sometime in the past among the 45-49 cohort is misreported. The average fertility rate for single years from the survey date was examined for yearly fluctuations (fig. VI). The average rate appears smooth except for heaping at 4, 8 and 12 years before the survey. Correspondingly, there is a deficit of births 2-3 years and 11 years before the survey. In the most recent period an increase in fertility in the 0- and 1-year period before the survey is observed. This is probably caused by some shifting of birth dates towards the survey date from 2 and 3 years before the survey. The single year rates for the age groups 15-19 and 20-24 years are very similar in terms of the year-to-year fluctuations in the most recent period. The 25-29 rates show pronounced heaping 4, 8 and 14 years before the survey date.

Age-specific fertility rates from the EDENPAR for 1976/77 are compared with those from the ENF in table 3. The total fertility rate from the ENF is slightly higher than that from the EDENPAR for 1976/77 - 4.9 compared with 4.7, respectively. The age pattern of fertility from the ENF is younger than that from the EDENPAR. For example, at age 20-24 years, the EDENPAR rate is 0.196, compared with 0.223 from the ENF. Unfortunately, age-specific rates from other sources are not available for earlier dates, however, total fertility rates are available from the 1972 census and estimations from the EDENPAR based on birth history information (Schoemaker, 1984).

<u>Years</u>	<u>ENF</u>	<u>Census, 1972</u>	<u>EDENPAR, 1977</u>
1963-1965	7.3	6.6	6.8
1966-1968	6.5	6.4	6.4
1969-1971	6.2	5.7	6.4
1972-1974	5.4	..	5.7
1975-1977	4.9	..	5.0

The three sources match the best for the period 1966-1968. The ENF recorded higher rates compared with the census and EDENPAR for the earlier periods; as a result, the fertility decline recorded by the ENF over the period from 1963-1965 to 1975-1977 is 33 per cent, compared with 26 per cent recorded by the EDENPAR.

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Table 1. Children ever born per woman from
ENF 1979, census 1972, EDENPAR 1977,
and census 1982: Paraguay

Age group	census 1972	EDENPAR 1977	ENF 1979	census 1982
15-19	0.15	0.16	0.14	0.18
20-24	1.08	0.94	0.96	1.08
25-29	2.56	2.21	2.19	2.24
30-34	4.04	3.68	3.51	3.42
35-39	5.31	4.97	4.59	4.52
40-44	6.07	6.03	5.80	5.39
45-49	6.22	6.50	6.26	5.94

Source: Direccion General de Estadística y Censos, Encuesta Nacional de Fecundidad (Asuncion, 1981), pagina 59, cuadro 5.6; census 1982: United Nations Statistical Office Census Questionnaire (unpublished).

Table 2. Cohort period rates and cumulative cohort fertility by age at survey: Paraguay

Age group of cohort at end of period	Number of women in cohort	Years prior to survey						
		0-4	5-9	10-14	15-19	20-24	25-29	30-34
Cohort-period fertility rates								
10-14	0	0.000	0.000	0.000	0.000	0.000	0.002	0.001
15-19	1 145	0.029	0.031	0.036	0.044	0.045	0.048	0.039
20-24	968	0.161	0.172	0.183	0.189	0.226	0.199	
25-29	689	0.230	0.254	0.256	0.294	0.295		
30-34	533	0.222	0.245	0.270	0.278			
35-39	512	0.180	0.205	0.246				
40-44	393	0.116	0.160					
45-49	382	0.037						
Cumulative fertility of cohorts at end of period								
10-14		0.000	0.001	0.002	0.000	0.002	0.012	0.003
15-19		0.144	0.158	0.180	0.220	0.236	0.242	0.194
20-24		0.965	1.042	1.135	1.182	1.374	1.188	
25-29		2.194	2.403	2.463	2.842	2.662		
30-34		3.512	3.689	4.193	4.052			
35-39		4.588	5.219	5.280				
40-44		5.799	6.081					
45-49		6.264						

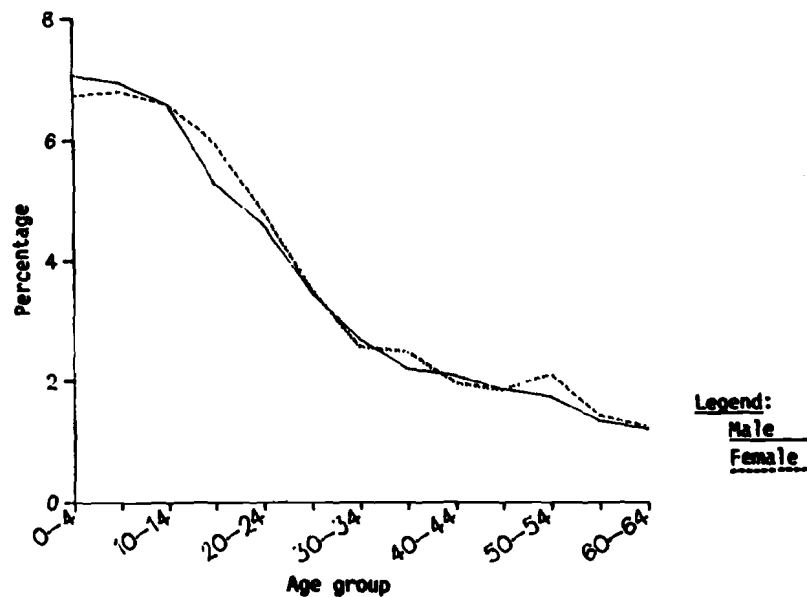
Source: S. Singh, "Birth histories", WFS Comparative Studies, Cross-national Summaries: Additional Tables (Voorburg, Netherlands, ISI/WFS, 1984), p. 78.

Table 3. Age-specific fertility rates
for selected periods from
ENF and EDENPAR: Paraguay

Age group	EDENPAR 1976-1977	ENF 1975-1978
15-19	0.068	0.082
20-24	0.196	0.223
25-29	0.221	0.235
30-34	0.196	0.203
35-39	0.150	0.143
40-44	0.083	0.071
45-49	0.020	0.021
TFR	4.7	4.9

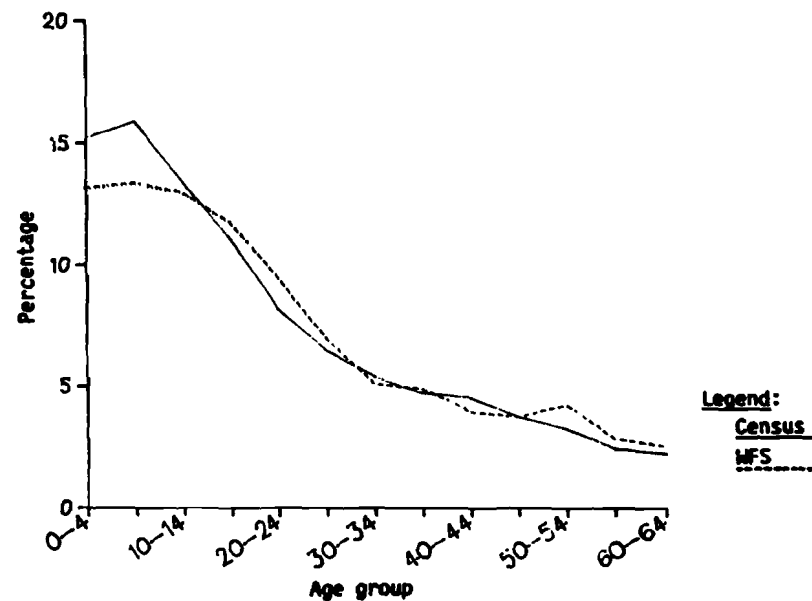
Source: Dirección General de
Estadística y Censos, Encuesta
Nacional de Fecundidad (Asunción,
1981), p. 52.

Figure I. Distribution of males and females as a percentage of the total population by five-year age groups: Paraguay



Source: Dirección General de Estadística y Censos, Encuesta Nacional de Fecundidad (Asunción, 1981), p. 152, table 001.

Figure II. Distribution of the female population by five-year age groups: World Fertility Survey (1979) and 1972 census: Paraguay



Source: for the 1972 census: Demographic Yearbook, Historical Supplement: Special Issue (United Nations publication, Sales No. E/P.79.XIII.8), pp. 244-245, table 3.; for the 1979 WFS: Dirección General de Estadística y Censos, Encuesta Nacional de Fecundidad (Asunción, 1981), p. 152, table 001.

**Figure III. Distribution of ever-married women aged 15-49
by years since first married: Paraguay**

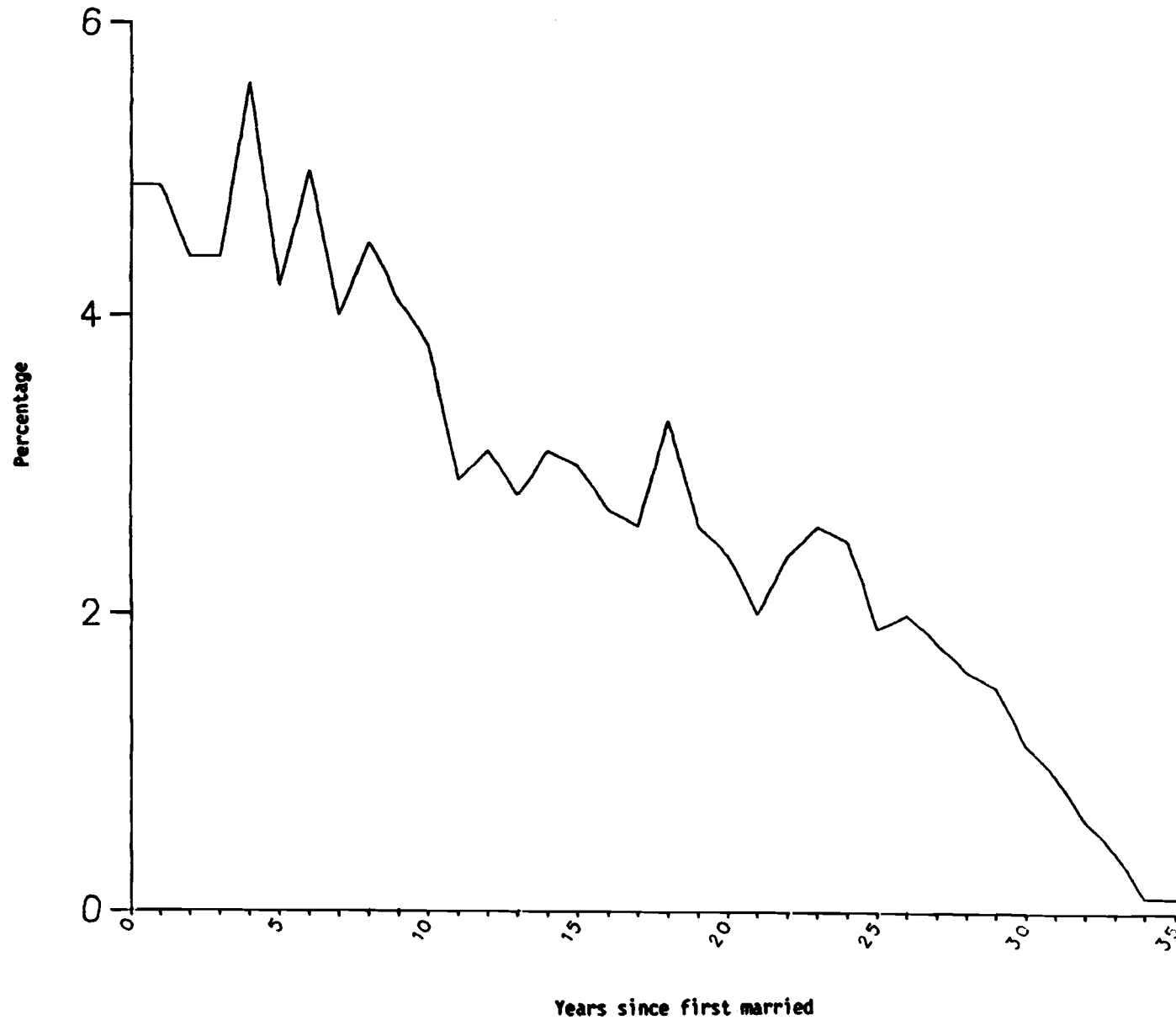
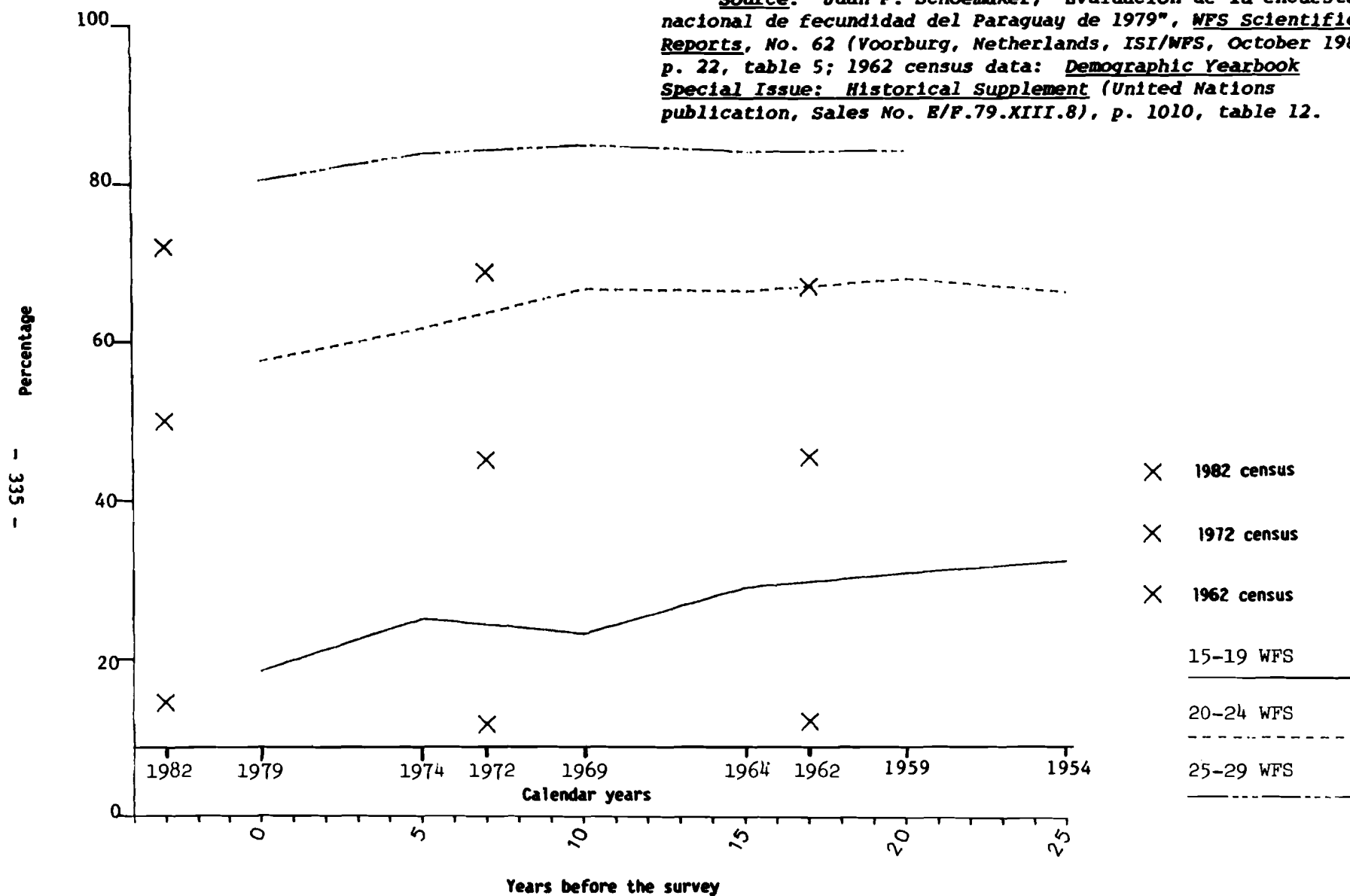


Figure IV. Proportions ever-married at designated periods prior to the survey for selected age groups: World Fertility Survey data and 1962, 1972, and 1982 census data: Paraguay

Source: Juan P. Schoemaker, "Evaluación de la encuesta nacional de fecundidad del Paraguay de 1979", *WFS Scientific Reports*, No. 62 (Voorburg, Netherlands, ISI/WFS, October 1984), p. 22, table 5; 1962 census data: *Demographic Yearbook Special Issue: Historical Supplement* (United Nations publication, Sales No. E/P.79.XIII.8), p. 1010, table 12.



**Figure V. Cohort-period fertility rates for women aged 30-49 at interview:
Paraguay**

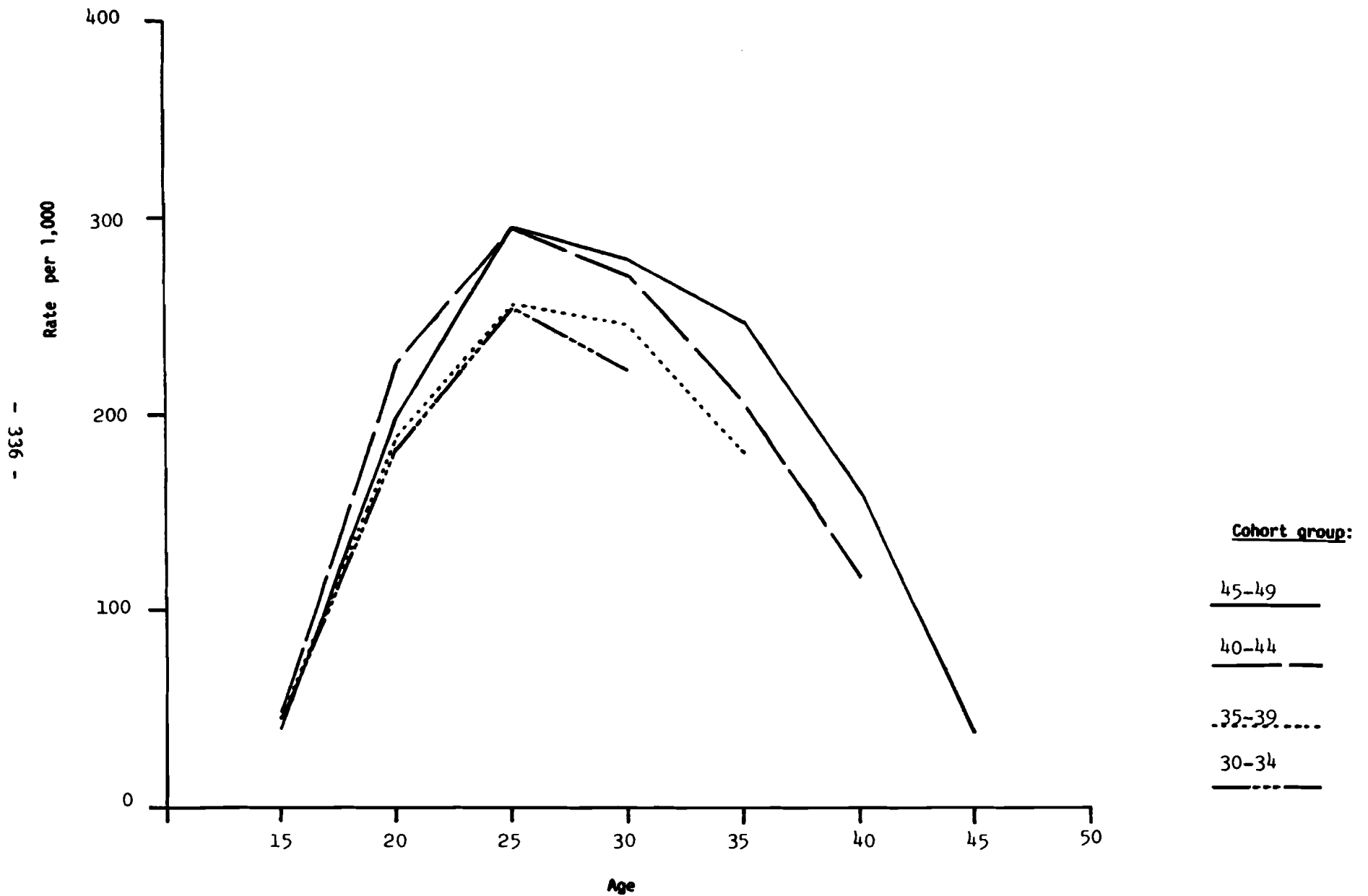
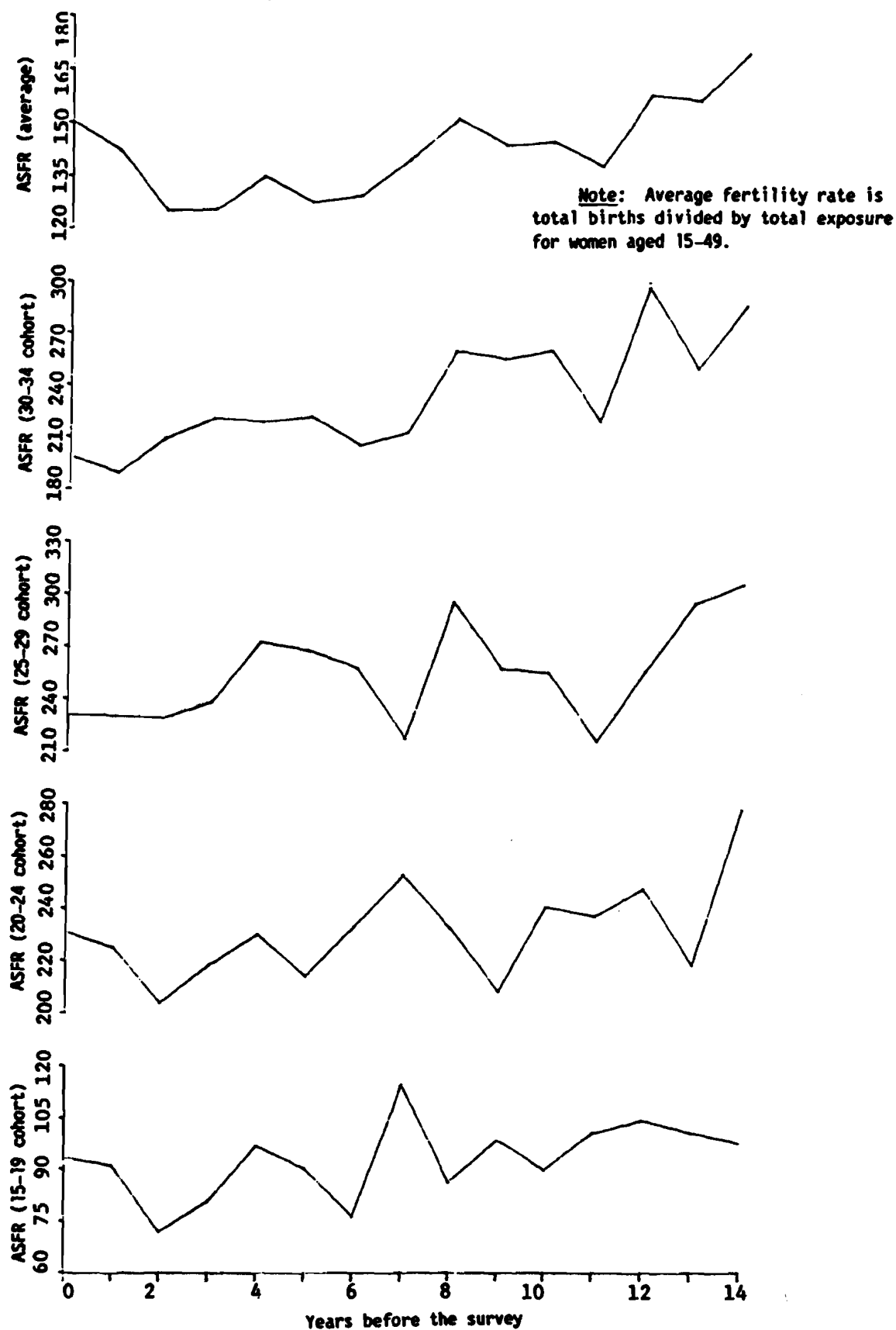


Figure VI. Age-specific fertility rates for selected cohorts and average fertility rate for single years before the survey: Paraguay



PERU

Census and civil registration information in Peru is not complete, and what is available is subject to various errors.^{1/} The last three censuses were taken in 1961, 1972 and 1981.^{2/} There have been several intercensal surveys; notable among them for their fertility information are two which took place in the late 1960s, covering information on fertility and the practice of contraception: PEAL and PECFAL (Dirección General de Encuestas, Censos y Demografía, 1970 and 1971). More recently, between October 1974 and November 1976, the National Demographic Survey (EDEN), with longitudinal and retrospective components, was carried out. The Peruvian National Fertility Survey (ENFP) took place from July 1977 to May 1978 as part of World Fertility Survey programme (Oficina Nacional de Estadística, 1979). Shortly, thereafter, a Response Errors Study (RES) was carried out in order to assess the reliability of the ENFP.

Age data

Age reporting was fairly complete, with 94.7 per cent of respondents giving their month and year of birth (Chidambaram and Sathar, 1984). There is preference for digits ending in 0 and 5, as well as 8 and 2. Myer's index of digital preference is 7.7 (Rutstein, 1984). In the post enumeration survey, 66 per cent of respondents gave their age within one year of the age reported in the individual question (Chidambaram, Cleland and Verma, 1980).

The age distribution based on the household survey shows a slight excess of men in the 45-49 age group, and an excess of women in the 35-39 age group, likely to be due to a shifting of women from the 40-44 and 30-34 age groups (fig. I). Comparison of age reporting in the household and individual questionnaire shows a very high consistency, but this is probably because information on age was recorded in the household and individual questionnaires at the same time (Céspedes, 1982). Comparison of the female age distribution with the 1972 census does not show major dissimilarities (fig. II). The age distributions of both sources show an over-estimate of women in the 35-39 age group. However, the proportion aged 0-4 in ENFP is lower than the census and the proportion aged 10-24 is slightly higher.

Marriage history data

The marriage history data were based on a sample of 5,640 ever-married women. In 81.4 per cent of the cases, the month and year of first marriage was reported (Chidambaram and Sathar, 1984). For the remaining 18.6 per cent, only the year was reported. The Response Errors Study shows that in only 46 per cent of the cases reinterviewed was the marriage date reported within one year of the date reported in the individual questionnaire (Chidambaram, Cleland and Verma, 1984).

The distribution of women by years since first married (fig. III) shows preference for duration intervals ending in 0 and 5. In addition, there was some preference for duration intervals ending in 7, since the year of the survey was 1977 (Céspedes, 1982). Thus, there appears to be on balance a deficit of unions in the 0-4 years before the survey. Examination of the

percentage ever-married by age groups for years prior to the survey suggests that, for the 15-19 and 20-24 age groups, the proportions married have been falling from 29 years prior to the survey (fig. IV). Other age groups also show declines in more recent years. At points farthest away from the survey, there is an increasing trend in proportions ever-married. Increasing proportions ever-married in the past may be due to date misreporting but it is also possible that some early unions, especially consensual ones, were not reported at all. Proportions ever in a union in the 1972 census show close correspondence with the ENFP reconstructed proportions ever-married. The 1961 census data, however, show systematically lower proportions, but it is possible that in the 1961 census, women in consensual unions may have reported themselves as single. Indeed, the data from the census would suggest that there has been no increase in age at marriage between 1961 and 1972 but it is not known whether definitions of marital status changed in any important way between the two censuses.

Birth history data

Of all births reported, 93.1 per cent were recorded with a month and year. Results from RES show that 71 per cent of first birth dates were consistent within one year (O'Muircheartaich and Marckwardt, 1980). The information collected by the ENFP is considered to be of higher quality than the census data. Indeed, in the 1972 census, 27 per cent of the women 15-49 did not respond to the question of children ever born. Census figures were later adjusted for this under-count. Comparison of children ever born between the ENFP and adjusted census data, as well as EDEN, shows that for ages over 40, the ENFP reports higher parity. This underscores the better coverage of the ENFP (see table 1).

Cohort-period fertility rates for five-year periods prior to the ENFP (table 2) show a peak in the rates of 20-24 years prior to the survey date. The rates then decline gradually at first and then more rapidly up until the most recent period. Figure V shows no evidence of forward displacement of births among older cohorts. Figure VI shows no evidence of displacement of births back from the most recent period in the average rates.

Comparison of age-specific fertility rates at the time of the survey with rates from the EDEN Survey of 1974-1976 shows that except for the 35-39 age group, the rates from the ENFP are higher for all age groups (see table 3). It is possible that better enumeration in the ENFP might be responsible for the difference. The total fertility rate from the ENFP is 5.5 per woman while that from the EDEN is 5.3 per woman. Comparison of WFS with the PEAL and PECAL surveys shows similar patterns of fertility for the period 1967-1969. That the rates are quite similar shows the adequacy of the ENFP data, since the comparisons involve rates occurring 10 years prior to the survey (1968).

Notes

- 1/ "La población del Peru" (Paris, CICRED, 1974), p.332.
- 2/ The results of the 1981 census were not available as of this writing.

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Table 1. Children ever born per woman from WFS,
1961 and 1972 censuses and EDEN ^{a/}: Peru

Age group	1961 census	1972 census	1975-1976	
			WFS	EDEN
15-19	0.2	0.2	0.2	0.1
20-24	1.2	1.4	1.1	1.0
25-29	2.7	2.9	2.5	2.6
30-34	4.0	4.2	4.0	4.0
35-39	5.1	5.5	5.4	5.2
40-44	5.7	6.2	6.3	6.0
45-49	6.0	6.4	6.6	6.2

Source: Y. Cespedes, "Evaluation of the Peru National Fertility Survey, 1977-1978", WFS Scientific Reports, No. 33 (Voorburg, Netherlands, ISI/WFS 1982), p. 43, table 8.

^{a/} EDEN: National Demographic Survey

Table 2. Cohort period rates and cumulative cohort fertility
by age at survey: Peru, 1977

Age group of cohort at end of period	Number of women in cohort	Years prior to survey						
		0-4	5-9	10-14	15-19	20-24	25-29	30-34
Cohort-period fertility rates								
10-14	0	0.000	0.000	0.001	0.001	0.001	0.002	0.001
15-19	311	0.029	0.035	0.043	0.048	0.058	0.047	0.049
20-24	893	0.168	0.199	0.207	0.214	0.231	0.190	
25-29	1 056	0.253	0.296	0.299	0.313	0.317		
30-34	928	0.249	0.291	0.297	0.305			
35-39	922	0.211	0.230	0.252				
40-44	804	0.133	0.153					
45-49	720	0.049						
Cumulative fertility of cohorts at end of period								
10-14		0.000	0.001	0.003	0.004	0.005	0.008	0.005
15-19		0.145	0.179	0.220	0.247	0.296	0.239	0.248
20-24		1.017	1.217	1.279	1.368	1.396	1.197	
25-29		2.482	2.761	2.865	2.963	2.784		
30-34		4.007	4.319	4.446	4.311			
35-39		5.374	5.598	5.573				
40-44		6.261	6.336					
45-49		6.582						

Source: WFS standard recode tapes.

Table 3. Age-specific fertility rates for selected periods from WFS, PEAL/PECFAL a/, and EDEN b/: Peru

Age group	1969 PEAL/PECFAL (1)	1967-1969 WFS (2)	1975 EDEN (3)	1974-1976 WFS (4)	Percentage change	
					WFS (2) - (4)	Outside source (1) - (3)
15-19	0.105	0.110	0.082	0.086	-21.8	-21.9
20-24	0.279	0.284	0.225	0.232	-18.3	-19.4
25-29	0.324	0.307	0.263	0.266	-13.4	-18.8
30-34	0.276	0.271	0.231	0.237	-12.6	-16.3
35-39	0.206	0.195	0.183	0.169	-13.3	-11.2
40-44	0.119	..	0.067	0.091	..	-43.7
45-49	0.055	..	0.005	0.028	..	-90.9
TFR	6.6	6.7 c/	5.3	5.5	-17.9	-19.7

Source: Y. Cespedes, "Evaluation of the Peru National Fertility Survey, 1977-1978", WFS Scientific Reports, No. 33 (Voorburg, Netherlands, ISI/WFS 1982), pp. 51 and 53, tables 11 and 12.

a/ PEAL : Encuesta de Aborto Inducido, Conomiento y Use de Anticonceptivos.

PECFAL: Encuesta Nacional de Fecundida Urbana y Rural.

b/ EDEN : National Demographic Survey.

c/ For the purpose of calculating a total fertility rate, the age-specific fertility rates from the PEAL/PECFAL data were used when the age-specific rate from WFS was not available.

Figure I. Distribution of males and females as a percentage of the total population by five-year age groups: Peru

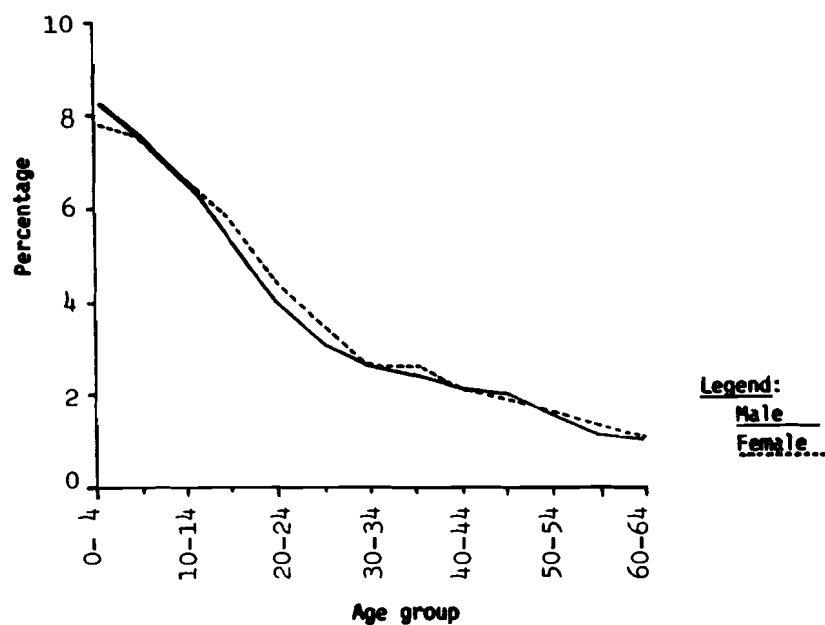
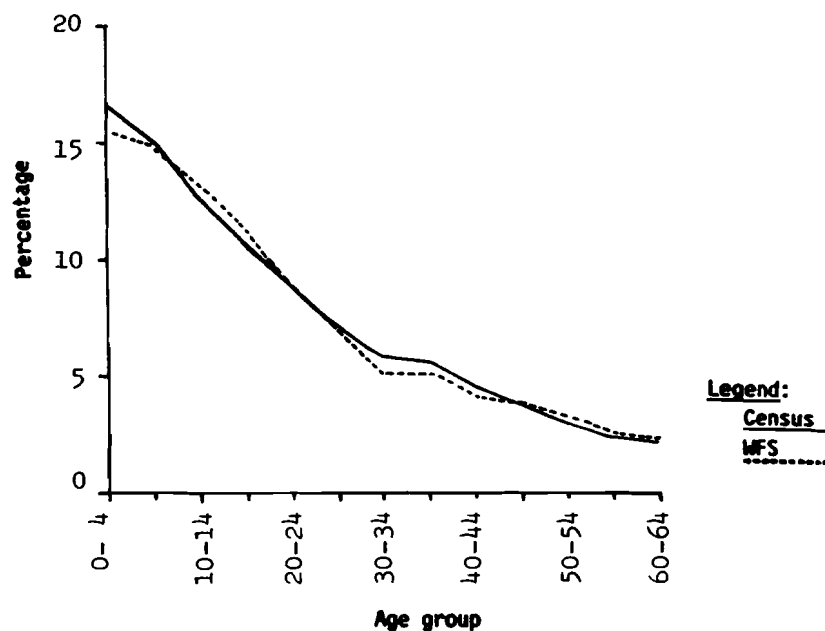


Figure II. Distribution of the female population by five-year age groups: World Fertility Survey (1974) and 1976 census: Peru



Source for the 1976 census: Demographic Yearbook, Historical Supplement: Special Issue (United Nations publication, Sales No. E/P.79.XIII.8), table 8.

**Figure III. Distribution of ever-married women aged 15-49
by years since first married: Peru**

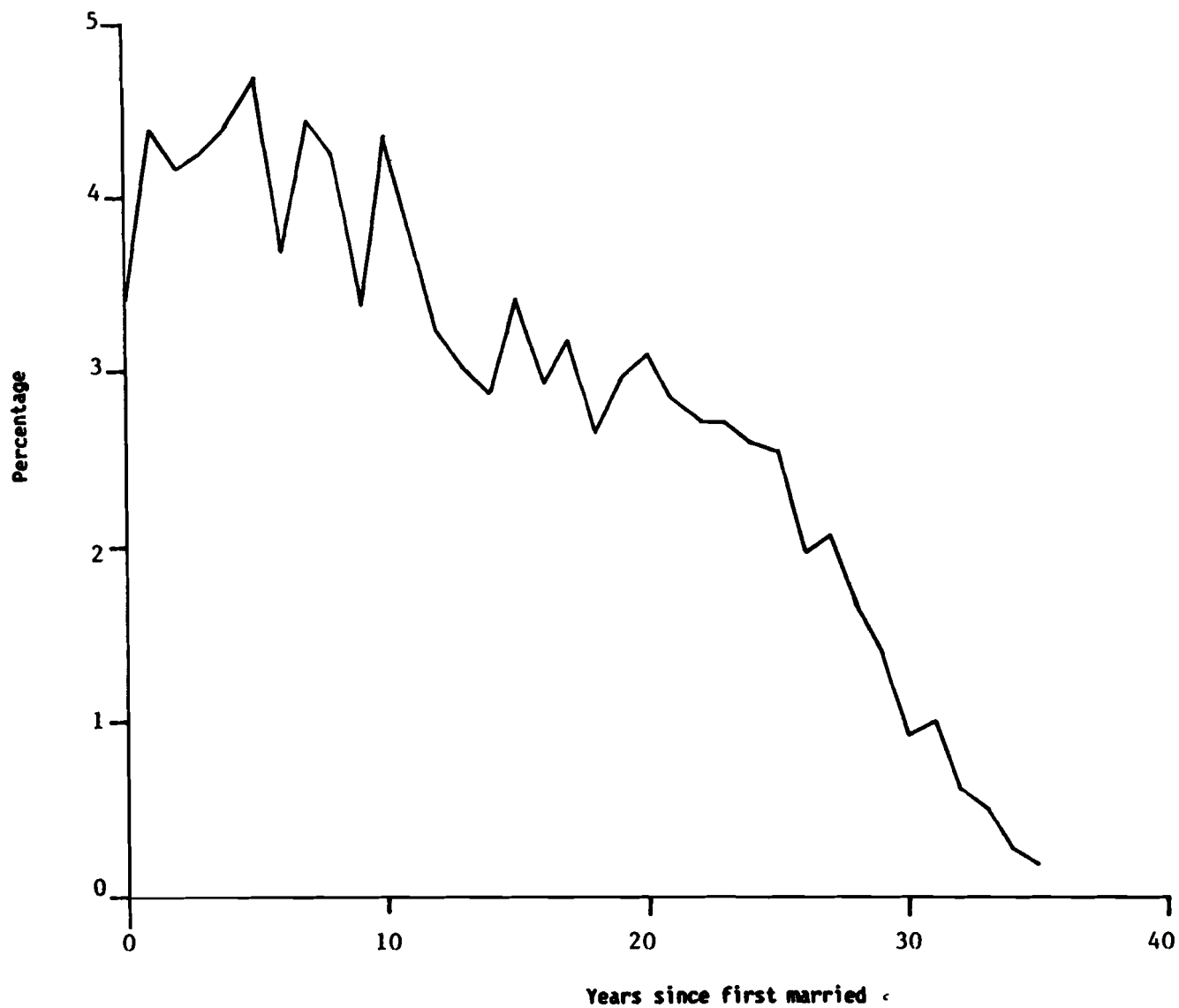
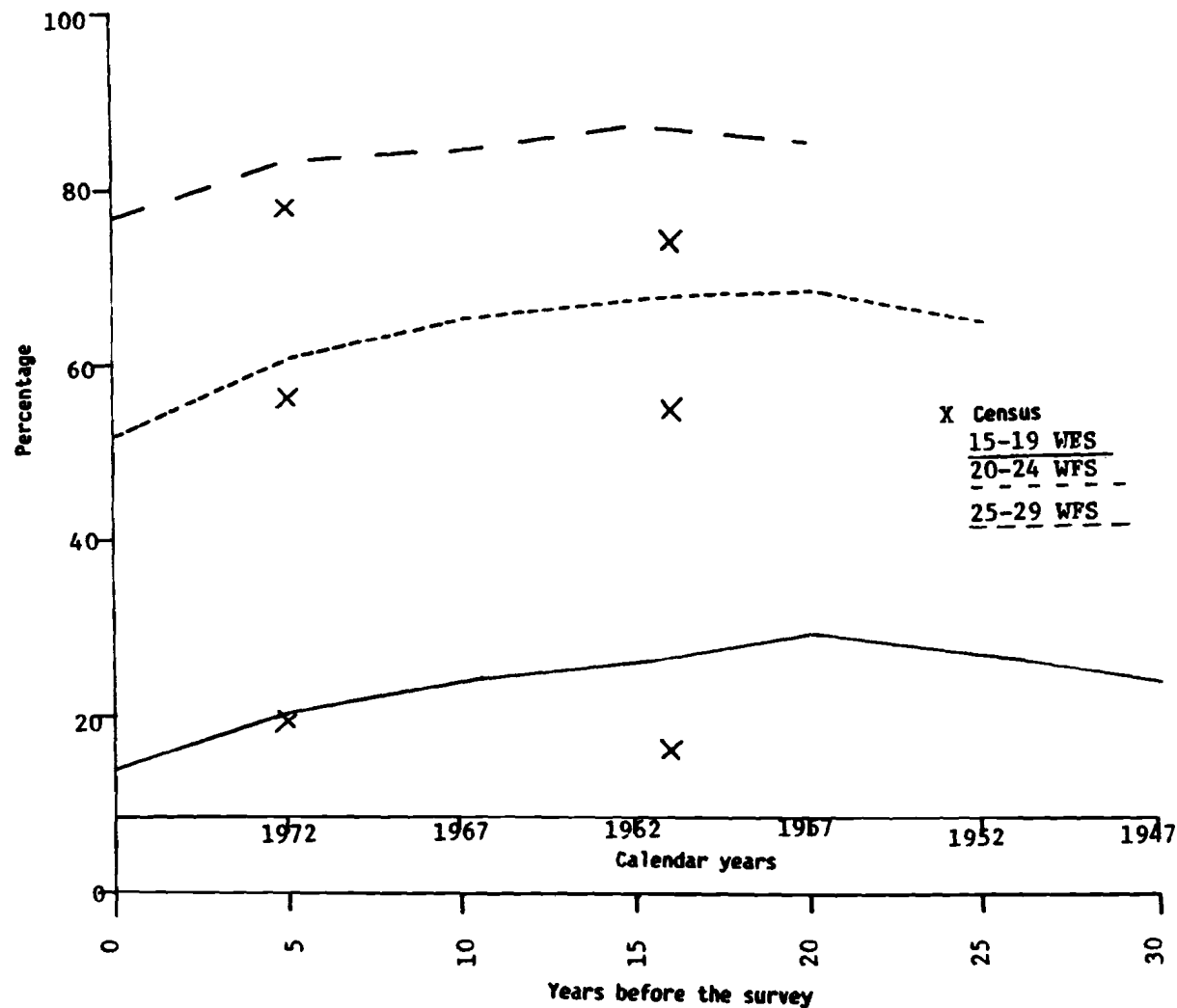


Figure IV. Proportions ever-married at designated periods prior to the survey
for selected age groups: World Fertility Survey data and other
sources: Peru



Source: Demographic Yearbook, Historical Supplement: Special Issue
(United Nations publication, Sales No. E/F.79.XIII.8), table 12.

**Figure V. Cohort-period fertility rates for women aged 30-49 at interview:
Peru**

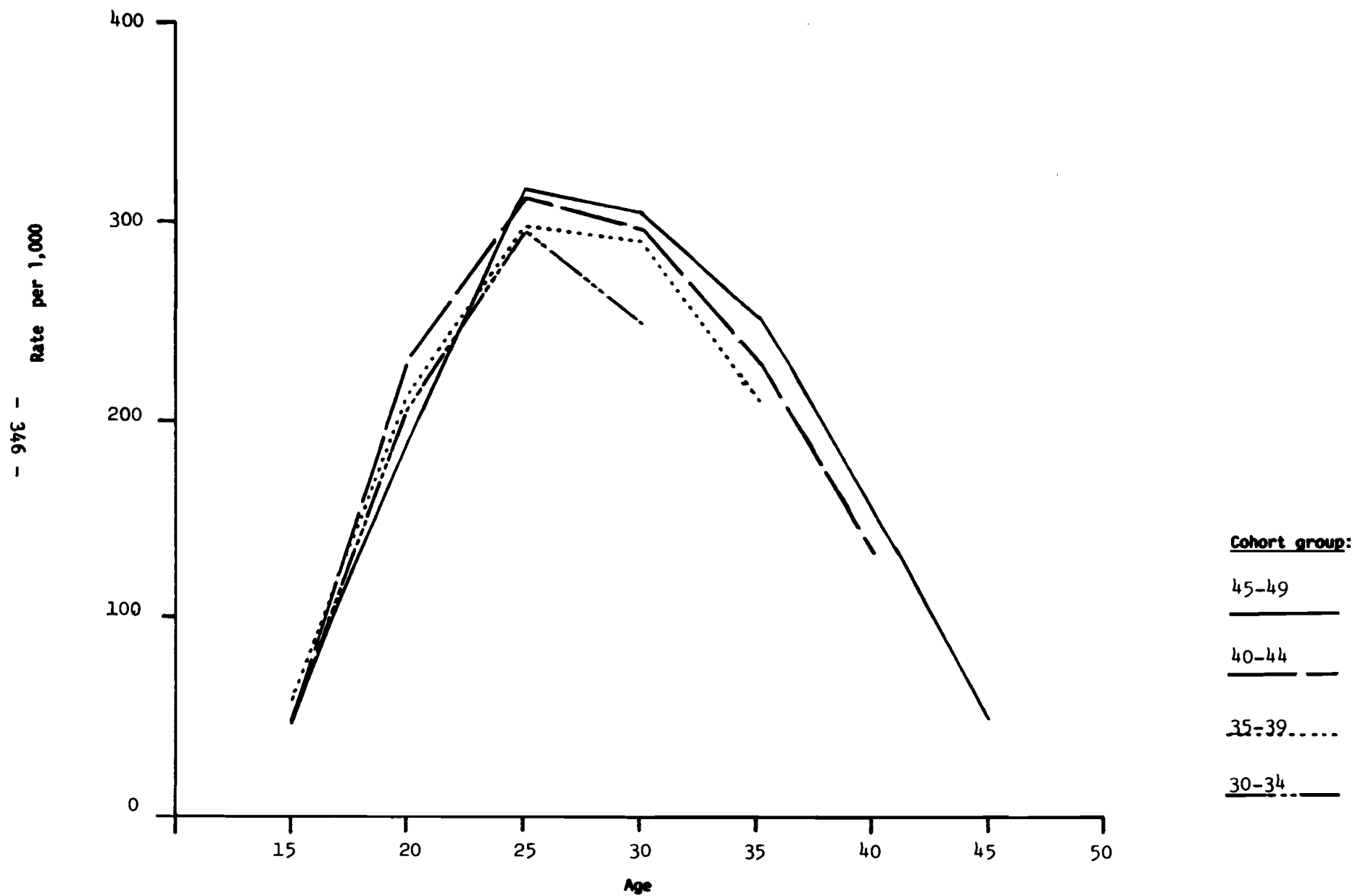
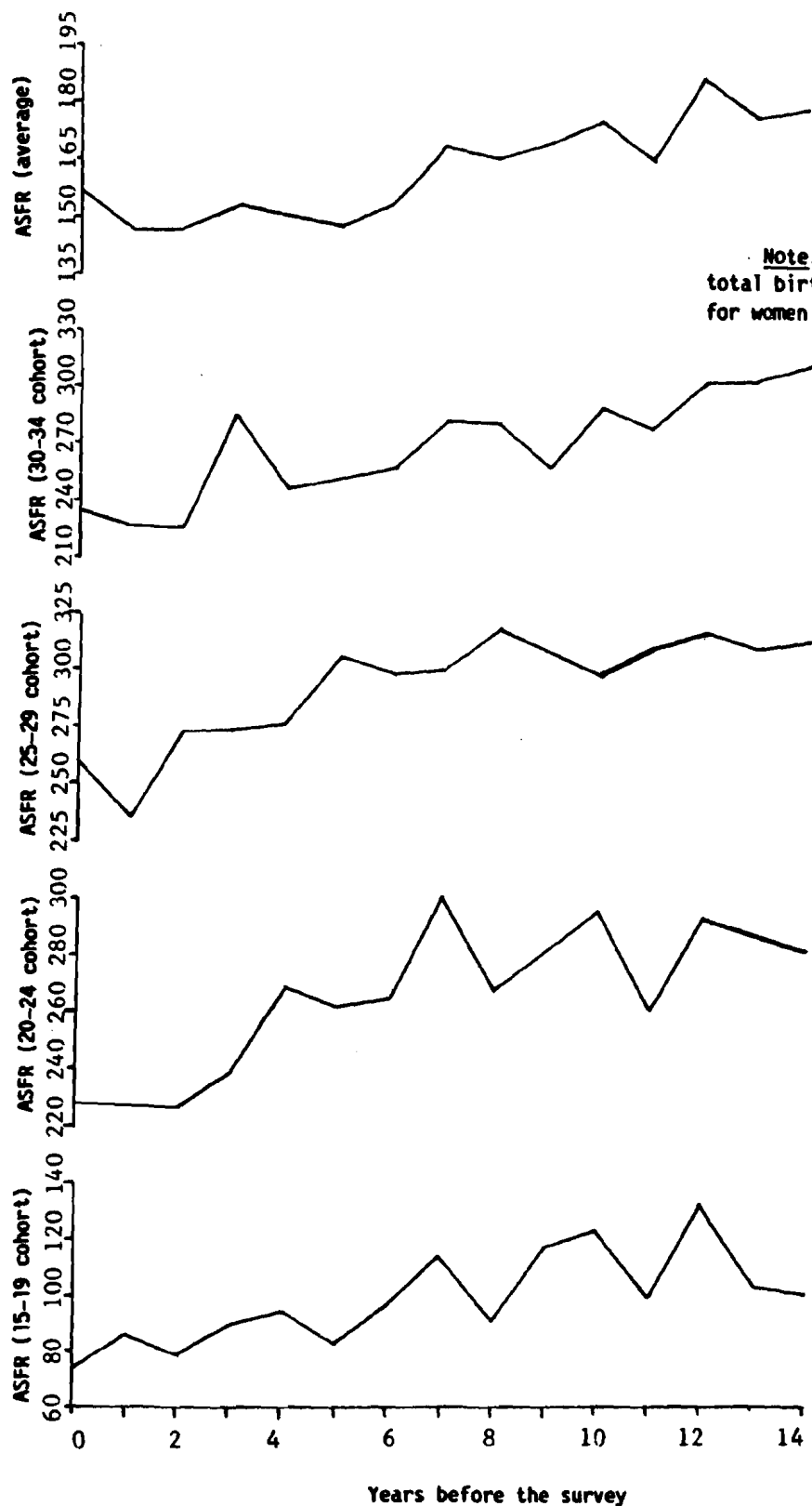


Figure VI. Age-specific fertility rates for selected cohorts and average fertility rate for single years before the survey:
Peru



PHILIPPINES

The Republic of the Philippines Fertility Survey (RPFS) was carried out between 27 February 1978 and 18 June 1978. Only ever-married women were selected for the individual interview. Data from the survey provide an important source of information on fertility levels and trends because the birth registration system of the Philippines is very poor. In 1956, only 76 per cent of local registrars filed reports with the Registrar General and only 88 per cent did so in 1960 (Madigan, 1965). A rough estimate of the extent of under-registration of births ranges from 35-55 per cent (for an unspecified date in the past (Economic and Social Commission for Asia and the Pacific, 1978). National demographic surveys conducted in 1968 and 1973 provided data for analysis of fertility levels and trends in the past. In addition, census data are available for 1960, 1970 and 1975.

Age data

Age reporting in the Philippines appears good. The Myer's index of digital preference in the Philippines is 2.4 (Rutstein, 1984). The preference among females seemed to be for digits 5 and 0. Both the month and year of birth were reported by 97.3 per cent of the respondents, while 2.5 per cent reported only the year (Chidambaram and Sathar, 1984).

The data considered above suggest an age distribution of high accuracy, but figure I shows a few irregularities. The 0-4 age group appears under-enumerated, either because of selective omissions or because over-statement of age shifted some 0-4-year olds to 5-9 age group. In addition, there appears to be slight heaping in age group 35-39, with more noticeable heaping at 50-54 years. It is likely that the heaping at ages 50-54 is caused by an over-statement of ages of women in their forties by interviewers who might have wanted to avoid the long individual interview. Comparison of the female age distribution with that of the 1975 census shows a close correspondence, except for age groups 0-4 and 50-54 years (fig. II).

Marriage history data

The marriage history data are based on the largest sample considered here: 9,268 ever-married women. The month and year of first marriage were reported in 95.8 per cent of the cases while the year only was reported in 3.4 per cent of the cases (Chidambaram and Sathar, 1984). In the RPFS, an effort was made to record not only the date of first marriage but the age at marriage, the type of marriage (formal or informal), whether the couple lived together before, after or at the time of the formal marriage, and the number of marriages (World Fertility Survey, 1979). Thus, both formal and consensual unions have been included in the survey.

A distribution of years since first married show considerable heaping around durations 7 and 18 years, which would approximately be the calendar years 1970 and 1960. More serious, however, seems to be the low percentage of women who have been married for less than four years, although it is unlikely that there was an actual decline in the number of marriages in the four years preceding the survey.

Comparisons of proportions married at various periods in the past, as implied by RPFS history data, with data from other sources shows close correspondence with the 1975 census for all age groups (fig. IV). For periods further from the survey date, the differences are larger, especially for age group 20-24 years. The decline in proportions married seems to be exaggerated by the RPFS data, particularly in the past five years. It is likely that some marriage dates have been displaced back from the survey date.

Birth history data

Of all births reported, 96.2 per cent were reported with a month and year. Table 1 shows a comparison between parity estimated from census and NDS survey data and parity estimated from the RPFS retrospective data. The parity estimated from the RPFS for 1975 is higher for women over 20 than the parity estimated from the 1975 census. Parity at the time of the RPFS shows a steady progression with age suggesting that omissions of early births by older women may not be a major problem. However, it can be seen from table 2 (lower panel) that at age 40, the cohort 45-49 has slightly lower cumulative fertility than the cohort 40-44, suggesting some omissions.

Cohort fertility rates for five-year periods before the survey (table 2) show that the 45-49 cohort seems to have either displaced births or omitted births for periods more than 15 years before the survey date (fig. V). For periods more than 15 years before the survey, the 45-49 cohort has lower fertility than the 40-44 cohort at each age group from 15 to 35. An examination of the annual age-specific fertility rates (fig. VI) shows some year-to-year fluctuation but no evidence of displacement of births from 0-4 to 5-9 years before the survey, although there is a slight up-turn in average rates in the most recent period.

Since the birth registration system in the Philippines does not have complete coverage, it is not possible to compare age-specific rates from the survey with that from vital statistics. However, comparisons with the 1973 National Demographic Survey for 1963-1967 and 1967-1972 show that the RPFS estimates of fertility are significantly higher than the NDS estimates at each age group in 1967-1972 and somewhat higher as well for 1963-1967. Thus, the RPFS estimates show relatively little decline in total fertility over this period, while the NDS estimates show a 6 per cent decline. The major difference between the two sources is the rapid decline in fertility estimated by the National Demographic Surveys (NDS) for women aged 15-24. As there is no strong evidence of backdating of recent births in the RPFS or omissions, the RPFS may provide a more accurate estimate of fertility change than NDS.

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Table 1. Children ever born per woman from censuses,
NDS a/ and WFS: Philippines

Age group	1968 NDS a/	1970 census	1973 NDS a/	1975		1978 WFS
				WFS	census	
15-19	0.1	0.1	0.1	0.1	0.1	0.1
20-24	0.9	1.0	0.8	0.9	0.8	0.8
25-29	2.5	2.6	2.4	2.3	2.2	2.1
30-34	4.0	3.7	3.9	4.0	3.8	3.7
35-39	5.3	4.3	5.3	5.5	5.1	5.2
40-44	..	..	6.2	6.4	5.9	6.4
45-49	..	..	..	..	..	6.6

Source: F. Reyes, "Evaluation of the Republic of the Philippines Fertility Survey, 1978", WFS Scientific Reports, No. 19, (Voorburg, Netherlands, ISI/WFS, 1981), table 12.

a/ NDS: National Demographic Survey

Table 2. Cohort period rates and cumulative cohort fertility
by age at survey: Philippines, 1978

Age group of cohort at end of period	Number of women in cohort	Years prior to survey						
		0-4	5-9	10-14	15-19	20-24	25-29	30-34
Cohort-period fertility rates								
10-14	0	0.000	0.000	0.000	0.000	0.001	0.001	0.000
15-19	276	0.013	0.023	0.021	0.028	0.033	0.037	0.027
20-24	1 212	0.137	0.158	0.170	0.191	0.196	0.169	
25-29	1 765	0.240	0.293	0.301	0.321	0.296		
30-34	1 701	0.244	0.298	0.330	0.328			
35-39	1 673	0.211	0.260	0.275				
40-44	1 410	0.139	0.174					
45-49	1 191	0.046						
Cumulative fertility of cohorts at end of period								
10-14		0.000	0.001	0.000	0.000	0.004	0.004	0.001
15-19		0.066	0.113	0.103	0.145	0.170	0.184	0.143
20-24		0.798	0.894	0.997	1.126	1.166	0.987	
25-29		2.092	2.463	2.632	2.770	2.464		
30-34		3.683	4.122	4.418	4.107			
35-39		5.175	5.716	5.482				
40-44		6.410	6.354					
45-49		6.583						

Source: WFS standard recode tapes.

Table 3. Age-specific fertility rates for selected periods from 1973 NDS a/ and WFS data: Philippines

Age group	1963-1967		1967-1972		Percentage change	
	NDS (1)	WFS (2)	NDS (3)	WFS (4)	WFS (2) - (4)	Outside source (1) - (3)
15-19	0.074	0.074	0.056	0.072	- 2.7	-24.3
20-24	0.254	0.260	0.227	0.253	- 2.7	-10.6
25-29	0.313	0.329	0.302	0.312	- 5.2	- 3.5
30-34	0.281	0.307	0.272	0.294	- 4.2	- 3.2
35-39	0.216	0.253	0.199	0.225	-11.1	- 7.9
40-44	0.101	..	0.100	0.147	..	- 0.1
45-49	0.020	..	0.022	..	..	10.0
TFR	6.3	6.7 b/	5.9	6.6 b/	- 1.5	- 6.3

Source: NDS: From 1973 National Demographic Survey cited in World Fertility Survey, Republic of the Philippines Fertility Survey - 1978: First Report (Manila, National Census and Statistics Office, University of the Philippines Population Institute, Commission on Population, 1979), p. 102

a/ NDS: National Demographic Survey.

b/ For the purpose of calculating a total fertility rate, the age-specific fertility rates from the NDS data were used when the age-specific rate from WFS was not available.

Figure I. Distribution of males and females as a percentage of the total population by five-year age groups: Philippines

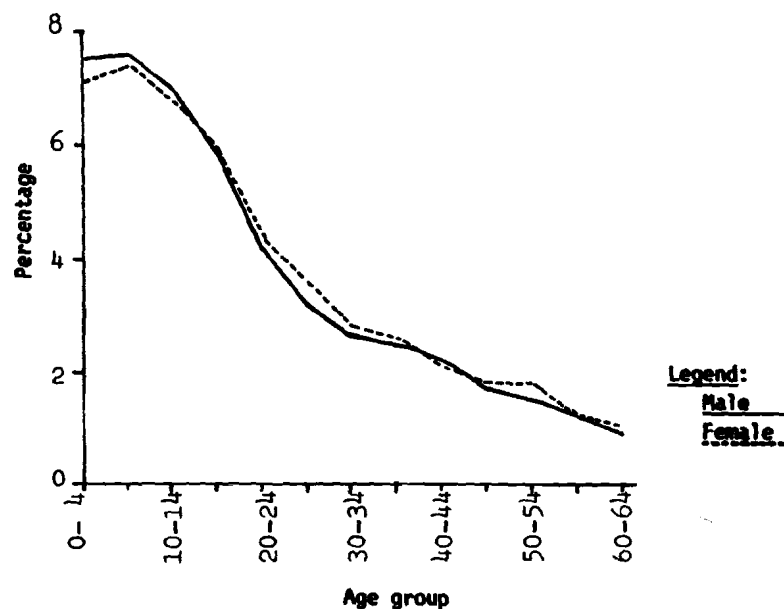
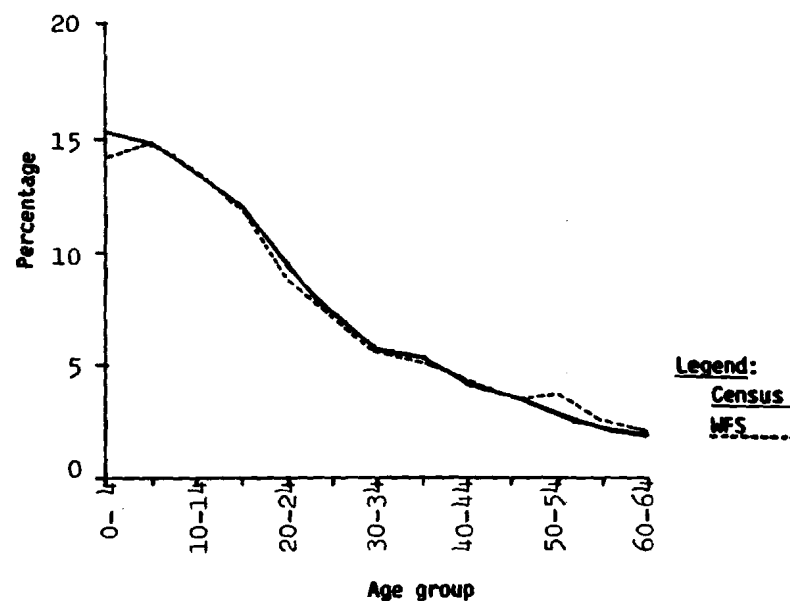


Figure II. Distribution of the female population by five-year age groups: World Fertility Survey (1978) and 1975 census: Philippines



Source for the 1975 census: World Fertility Survey, Republic of the Philippines Fertility Survey, 1978: First Report (Manila, National Census and Statistics Office, University of the Philippines Population Institute, and Commission on Population, 1979), p. 37.

**Figure III. Distribution of ever-married women aged 15-49
by years since first married: Philippines**

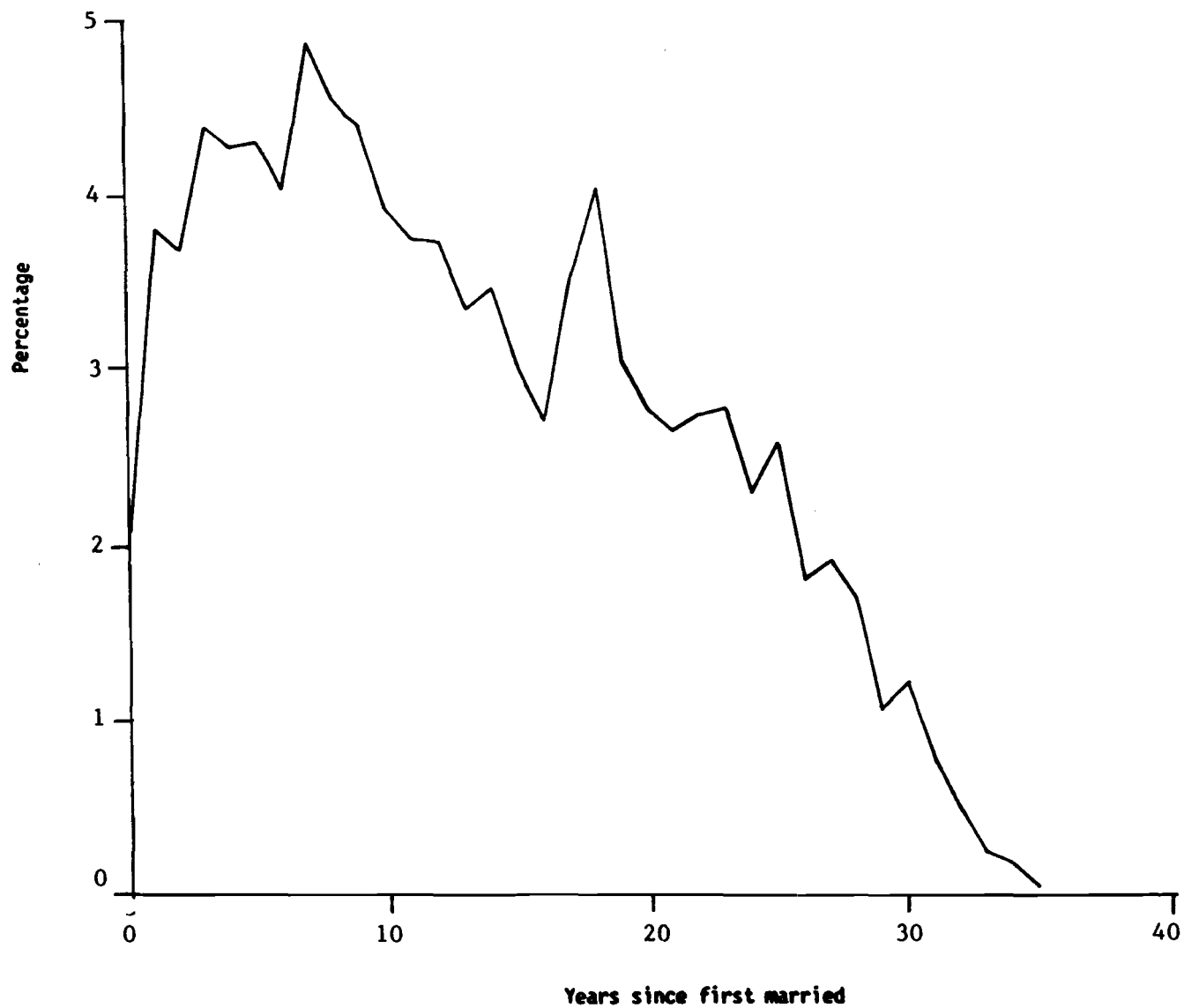
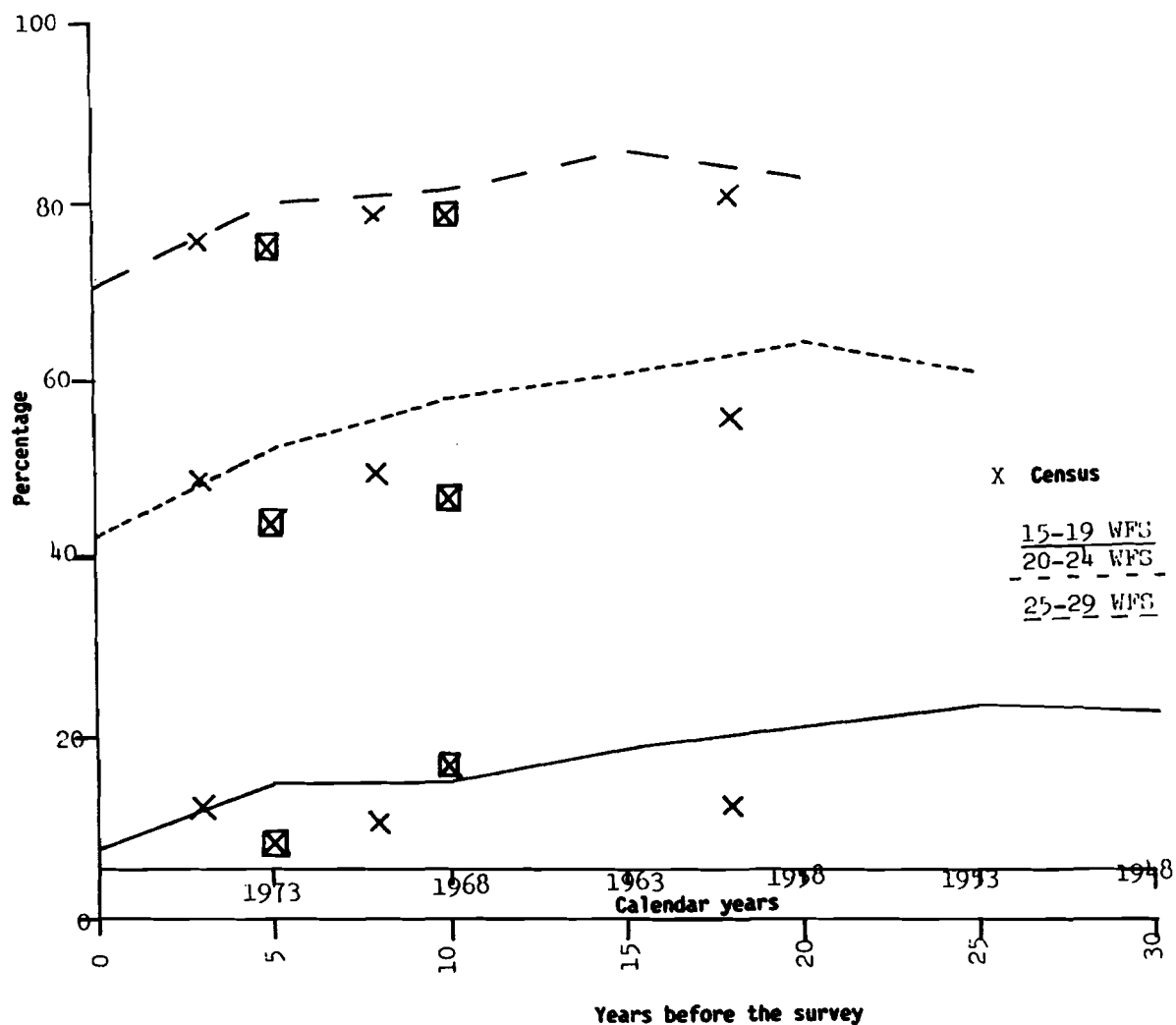


Figure IV. Proportions ever-married at designated periods prior to the survey for selected age groups: World Fertility Survey data and other sources: Philippines



Source: F. Reyes, "Evaluation of the Republic of the Philippines Fertility Survey, 1978", *WFS Scientific Reports*, No. 19 (Voorburg, Netherlands, ISI/WFS, March 1981), table 6.

**Figure V. Cohort-period fertility rates for women aged 30-49 at interview:
Philippines**

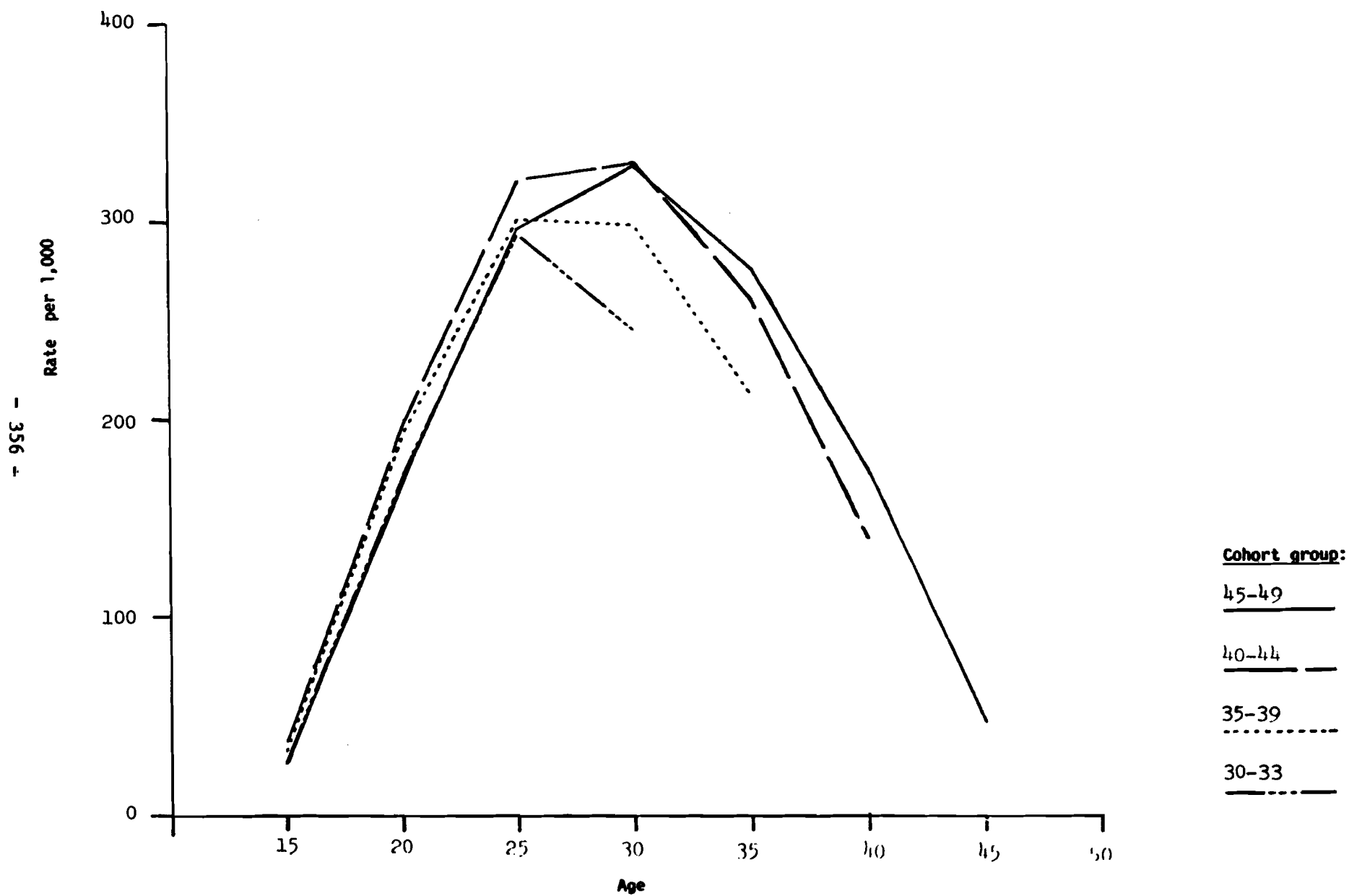
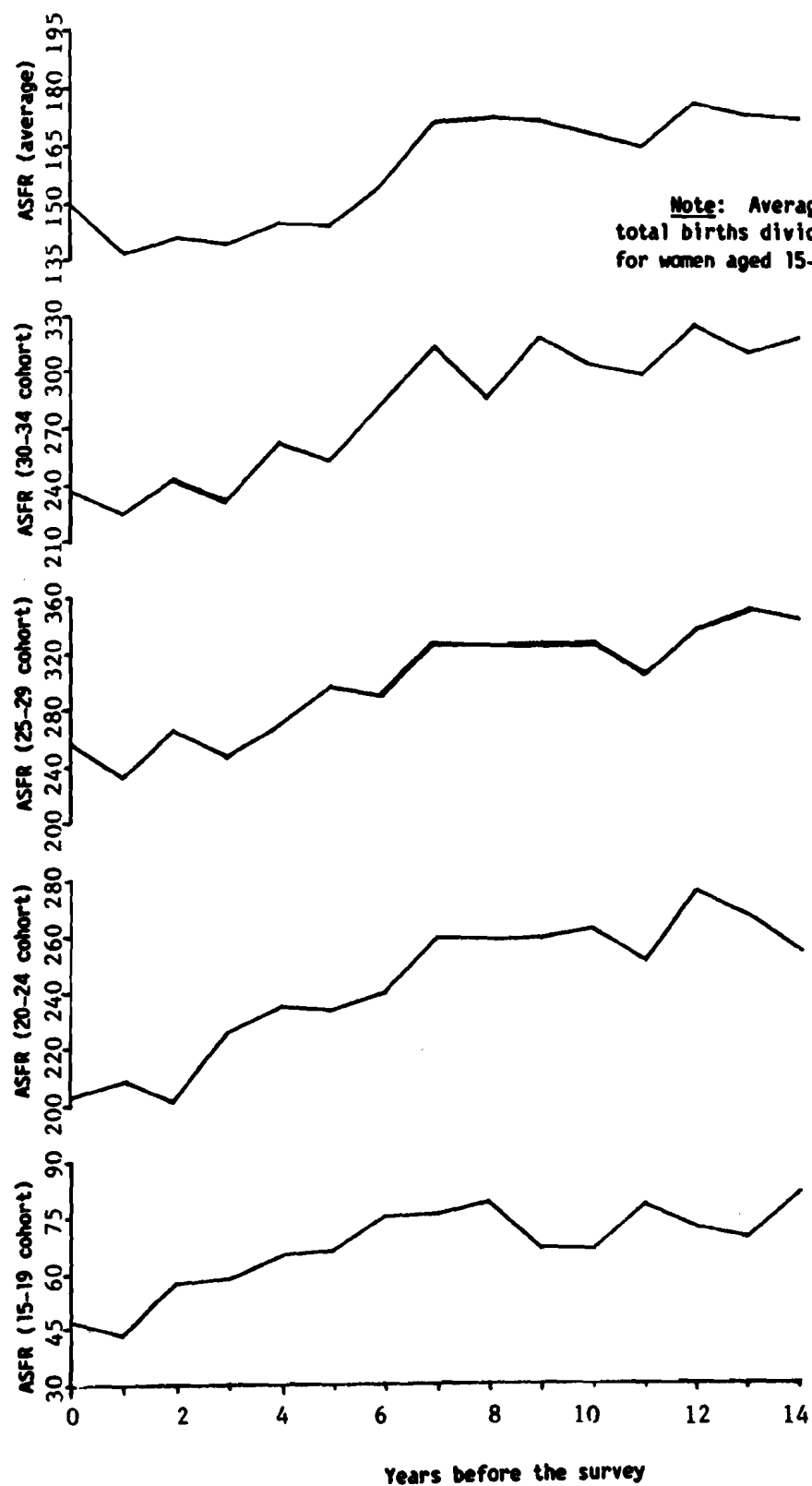


Figure VI. Age-specific fertility rates for selected cohorts and average fertility rate for single years before the survey: Philippines



REPUBLIC OF KOREA

The Korean National Fertility Survey (KNFS) was conducted in the latter part of 1974 as part of the World Fertility Survey programme. The Republic of Korea has a long history of data collection with recent censuses, including those taken in 1955, 1966, 1970 and 1975. Recent national surveys include the 1966 Special Demographic Survey, the 1971 Fertility/Abortion Survey and 1973 National Fertility Survey (United States of America, 1978). A change in the question on age in the 1960 census made the age distribution recorded in that census imprecise and unrelated to previous and subsequent data sources. Under-enumeration in birth registration data is estimated at roughly 17-20 per cent (Coale, Cho and Goldman, 1980).

Age data

All of the respondents reported their month and year of birth (Chidambaram and Sathar, 1984). The Republic of Korea data show Myer's index of 1.9 among women in the household survey (Rutstein, 1984).

The age distribution of the population by sex shows a massive undercount of 20-24-year-old men because of the exclusion of the military and a slight excess of women aged 25-29 and 35-39. When the distribution of females is compared with the adjusted 1975 census, there is a remarkable agreement, although there seems to be a slight undercount among women 15-24 (fig. II). Given the high quality of birth date reporting in the Republic of Korea, it seems likely that differences in census and survey age distributions are more likely to result from sampling error than from age misstatement.

Marriage history data

The marriage history data are based on a sample of 5,430 ever-married women, all of whom reported the month and year of their first marriage (Chidambaram and Sathar, 1984).

Figures III and IV show two different aspects of the marriage history from the KNFS. The first figure shows the percentage distribution of ever-married women by years since first married. The most striking feature of this distribution is the sharp peak which is evident at duration 30 years. Though this is puzzling, a possible explanation is that the date coincides approximately with the end of the Japanese occupation. Figure IV shows another aspect of the marriage history, the proportions ever-married by years prior to the survey, for three age groups. The figure shows that the proportions have declined very sharply for the 15-19 and 20-24 age groups. The proportion ever-married at 25-29 also dropped in the past 10 years. Compared with a series of census observations, the trends are remarkably consistent in the two sources of data.

Birth history data

One hundred per cent of all births reported were recorded with a month and year (Chidambaram and Sathar, 1984). A comparison with the 1975 census of mean number of children ever born to ever-married women shows that the

complete birth history in the KNFS has permitted a significantly improved enumeration of children ever born for women over the age of 30 and, in particular, for the cohort aged 45-49 where the parity from the census was recorded as 4.9 but was found to be 5.8 in the KNFS data (table 1).

An examination of the cohort period fertility rates shows consistently rising parity with age (table 2). Therefore, there is no strong evidence to suggest that birth omissions have been a problem. Although displacement of births is possible, there is no evidence that this has occurred except possibly for the 45-49 cohort 15-24 years before the survey (fig. V). It is possible that their fertility at ages 25-34 is too low relative to their fertility at 20-24 and 35-39, but it is not clear whether the displacement has been forward or backward in time.

An examination of figure VI, showing trends in age-specific fertility rates by single years, shows no signs of displacement of births from the recent period, but does show a deficit for the 25-29 year cohort 6-10 years before the survey.

An examination of table 3 shows a steady decline in age-specific fertility since 1960. The rates calculated from the KNFS match closely with the census through 1972-1974, with the KNFS recording slightly higher fertility, but exactly comparable percentage declines.

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Table 1. Children ever born per ever-married woman
from WFS and 1970 and 1975 censuses:
Republic of Korea

Age group	1970 census	1974 WFS	1975 census
15-19	0.5	0.5	0.5
20-24	1.0	1.0	1.0
25-29	2.1	2.0	2.0
30-34	3.5	3.4	3.2
35-39	4.5	4.4	4.1
40-44	5.3	5.1	4.7
45-49	5.6	5.8	4.9

Sources: 1970 census: Demographic Yearbook, Historical Supplement: Special Issue (United Nations publication, Sales No. E/F.79.XIII.8), table 7;
1975 census: United States Bureau of the Census, Country Demographic Profiles, Republic of Korea, (IDP-DP-17) (Washington, D.C., Government Printing Office, 1978), table 8.

Table 2. Cohort period rates and cumulative cohort fertility
by age at survey: Republic of Korea, 1974

Age group of cohort at end of period	Number of women in cohort	Years prior to survey						
		0-4	5-9	10-14	15-19	20-24	25-29	30-34
Cohort-period fertility rates								
10-14	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000
15-19	55	0.002	0.002	0.003	0.007	0.008	0.027	0.028
20-24	548	0.079	0.086	0.108	0.146	0.155	0.228	
25-29	1 173	0.274	0.291	0.310	0.311	0.264		
30-34	1 080	0.258	0.269	0.297	0.285			
35-39	1 019	0.138	0.167	0.226				
40-44	871	0.068	0.097					
45-49	673	0.022						
Cumulative fertility of cohorts at end of period								
10-14		0.000	0.000	0.000	0.000	0.000	0.000	0.000
15-19		0.012	0.012	0.014	0.033	0.041	0.136	0.142
20-24		0.405	0.445	0.571	0.770	0.909	1.283	
25-29		1.816	2.026	2.318	2.466	2.601		
30-34		3.317	3.662	3.951	4.028			
35-39		4.351	4.786	5.157				
40-44		5.128	5.640					
45-49		5.749						

Source: WFS standard recode tapes.

Table 3. Age-specific fertility rates for selected periods from census estimates and WFS data: Republic of Korea

Age group	1960 census a/	1959-1961 WFS	1966 census a/	1965-1967 WFS	1970 census a/	1969-1971 WFS	1972-1974		Percentage change	
							census a/	WFS	WFS	Outside
15-19	0.035	0.024	0.019	0.017	0.013	0.015	..	0.011	-37.5	-62.9
20-24	0.249	0.259	0.193	0.191	0.174	0.196	..	0.177	-24.3	-30.1
25-29	0.323	0.338	0.290	0.307	0.298	0.337	..	0.305	- 0.3	- 7.7
30-34	0.273	0.282	0.207	0.218	0.207	0.209	..	0.184	-25.9	-24.2
35-39	0.204	..	0.131	0.130	0.111	0.110	..	0.084	..	-45.6
40-44	0.096	..	0.061	..	0.043	0.050	..	0.030	..	-55.2
45-49	0.016	..	0.017	..	0.008	..	..	0.005	..	-50.0
TFR	6.0	6.1 b/	4.6	4.7 b/	4.3	4.6 b/	3.9	4.0		

Source: census data: A.J. Coale, L.J. Cho and N. Goldman, Estimation of Recent Trends in Fertility and Mortality in the Republic of Korea (Washington, D.C., National Academy of Sciences, 1980), p. 2 and 3.

a/ Rates for the census years of 1960, 1966, and 1970 were obtained by the "own-children" method applied to the 1970 Census data. Estimates of the total fertility rate for 1972-1974 were obtained from unpublished "own-children" estimates from the 1975 census.

b/ For the purpose of calculating a total fertility rate, the age-specific fertility rates estimated from the census were used when the age-specific rate from WFS was not available.

Table 3. Age-specific fertility rates for selected periods from census estimates and WFS data: Republic of Korea

Age group	1960 census a/	1959-1961 WFS	1966 census a/	1965-1967 WFS	1970 census a/	1969-1971 WFS	1972-1974		Percentage change	
							census a/	WFS	WFS	Outside
15-19	0.035	0.024	0.019	0.017	0.013	0.015	..	0.011	-37.5	-62.9
20-24	0.249	0.259	0.193	0.191	0.174	0.196	..	0.177	-24.3	-30.1
25-29	0.323	0.338	0.290	0.307	0.298	0.337	..	0.305	- 0.3	- 7.7
30-34	0.273	0.282	0.207	0.218	0.207	0.209	..	0.184	-25.9	-24.2
35-39	0.204	..	0.131	0.130	0.111	0.110	..	0.084	..	-45.6
40-44	0.096	..	0.061	..	0.043	0.050	..	0.030	..	-55.2
45-49	0.016	..	0.017	..	0.008	..	..	0.005	..	-50.0
TFR	6.0	6.1 b/	4.6	4.7 b/	4.3	4.6 b/	3.9	4.0		

Source: census data: A.J. Coale, L.J. Cho and N. Goldman, Estimation of Recent Trends in Fertility and Mortality in the Republic of Korea (Washington, D.C., National Academy of Sciences, 1980), p. 2 and 3.

a/ Rates for the census years of 1960, 1966, and 1970 were obtained by the "own-children" method applied to the 1970 Census data. Estimates of the total fertility rate for 1972-1974 were obtained from unpublished "own-children" estimates from the 1975 census.

b/ For the purpose of calculating a total fertility rate, the age-specific fertility rates estimated from the census were used when the age-specific rate from WFS was not available.

Figure I. Distribution of males and females
as a percentage of the total population
by five-year age groups: Republic of Korea

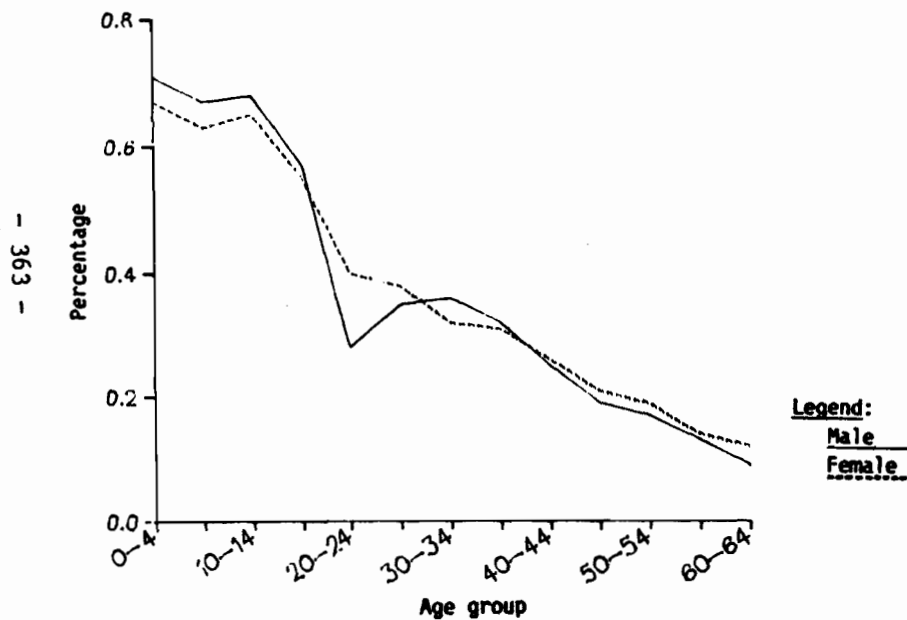
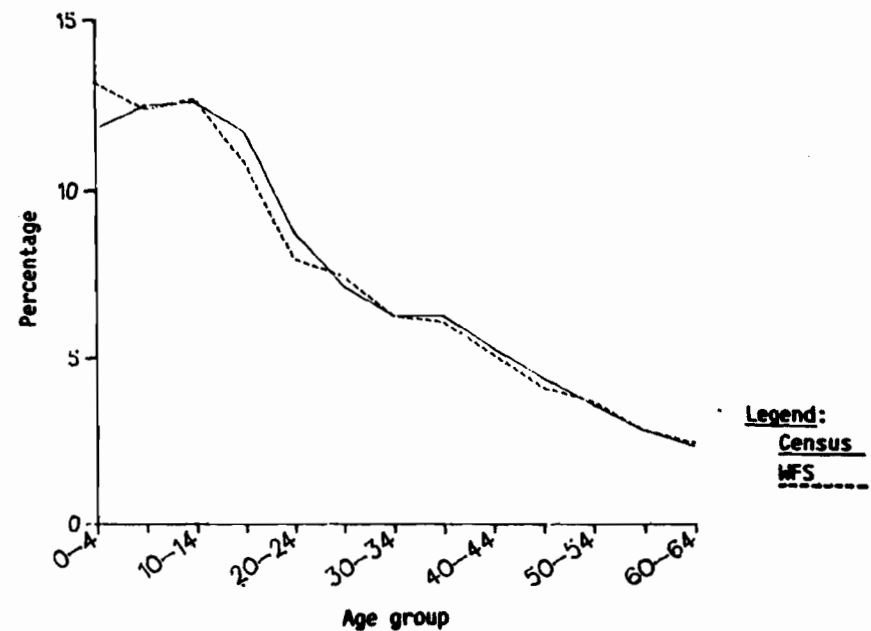


Figure II. Distribution of the female
population by five-year age groups:
World Fertility Survey (1974) and
1975 census: Republic of Korea



Source for the 1975 census: Demographic Yearbook, Historical Supplement: Special Issue (United Nations publication, Sales No. E/P.79.XIII.8), table 3.

**Figure III. Distribution of ever-married women aged 15-49
by years since first married: Republic of Korea**

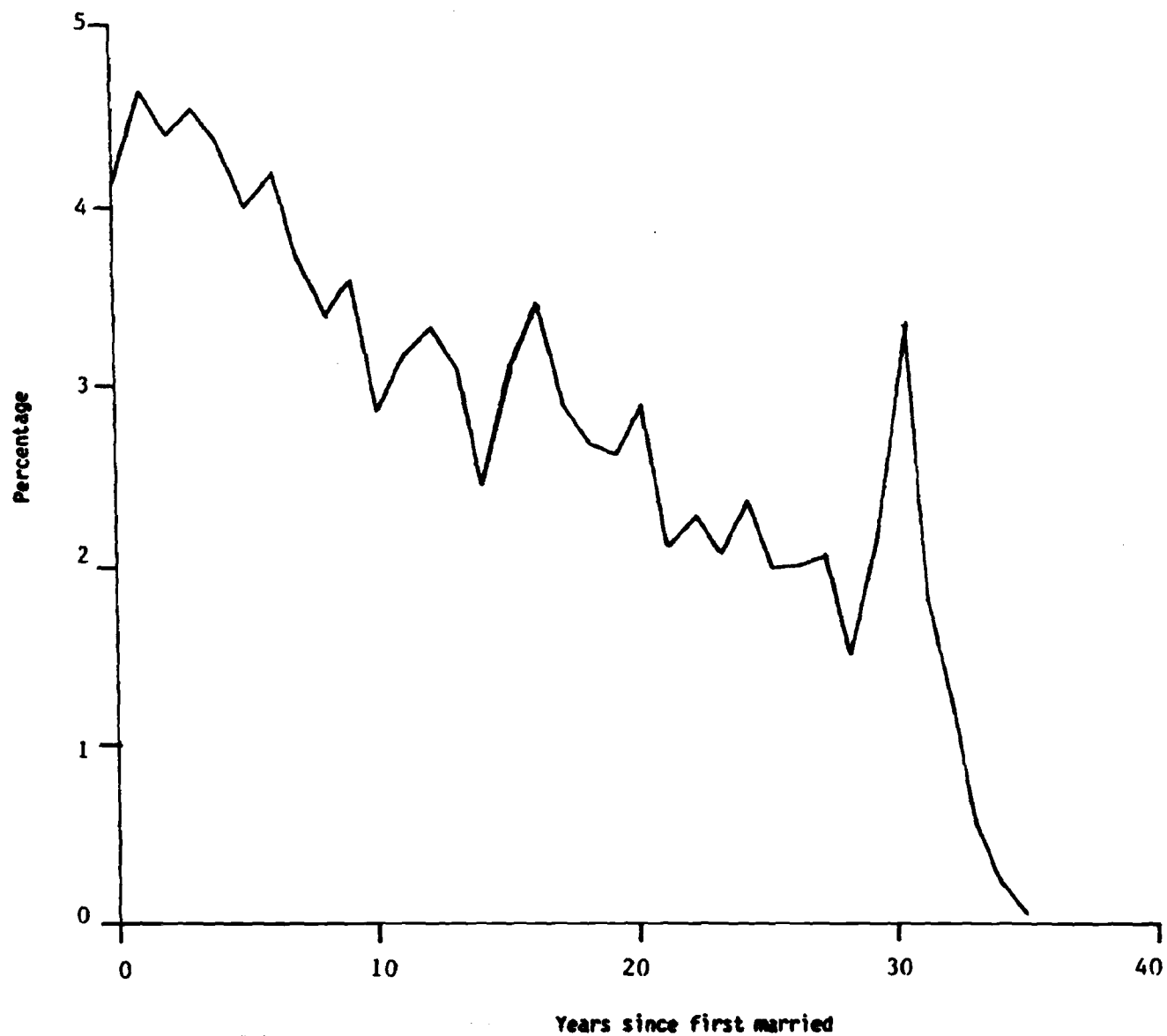
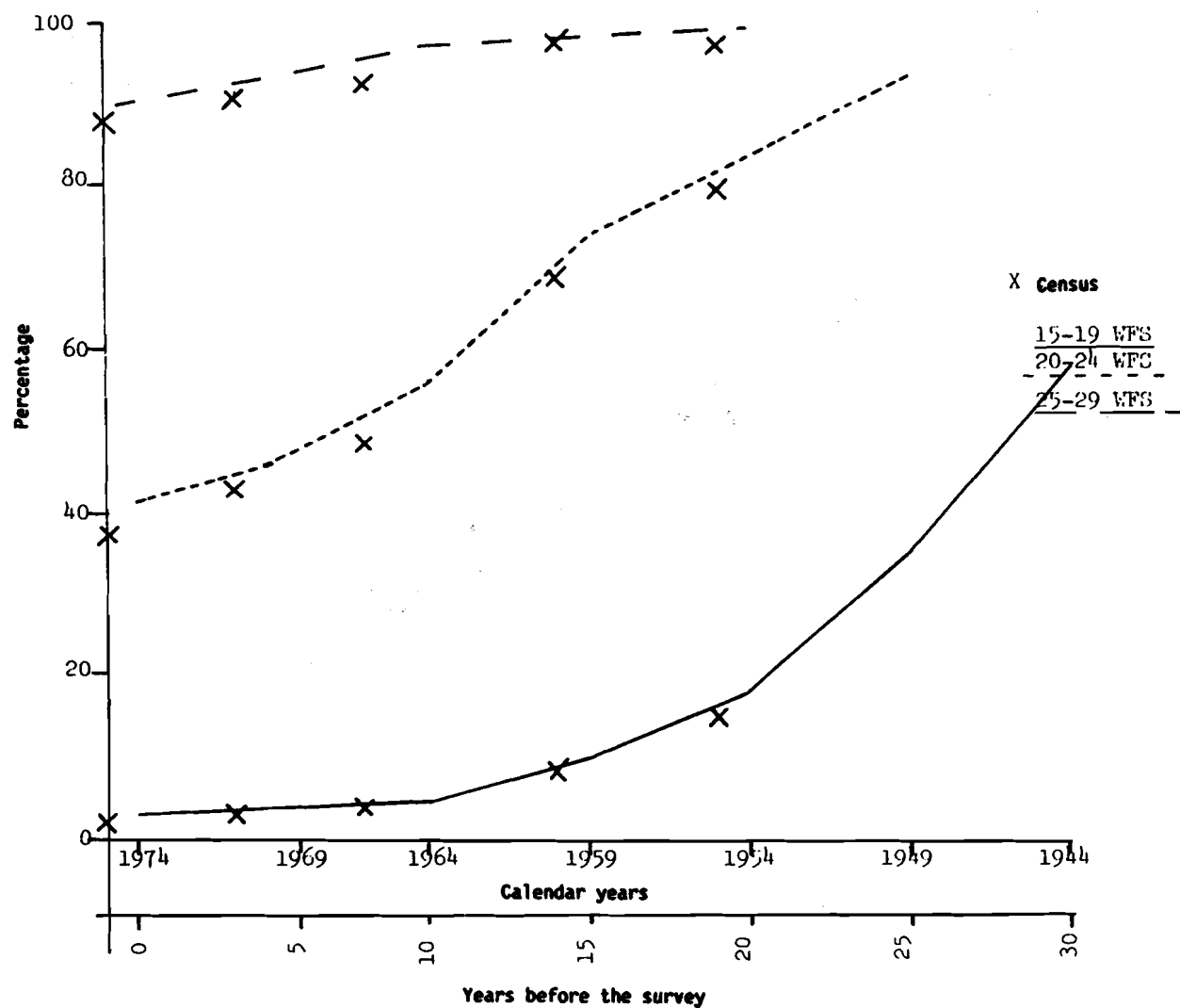
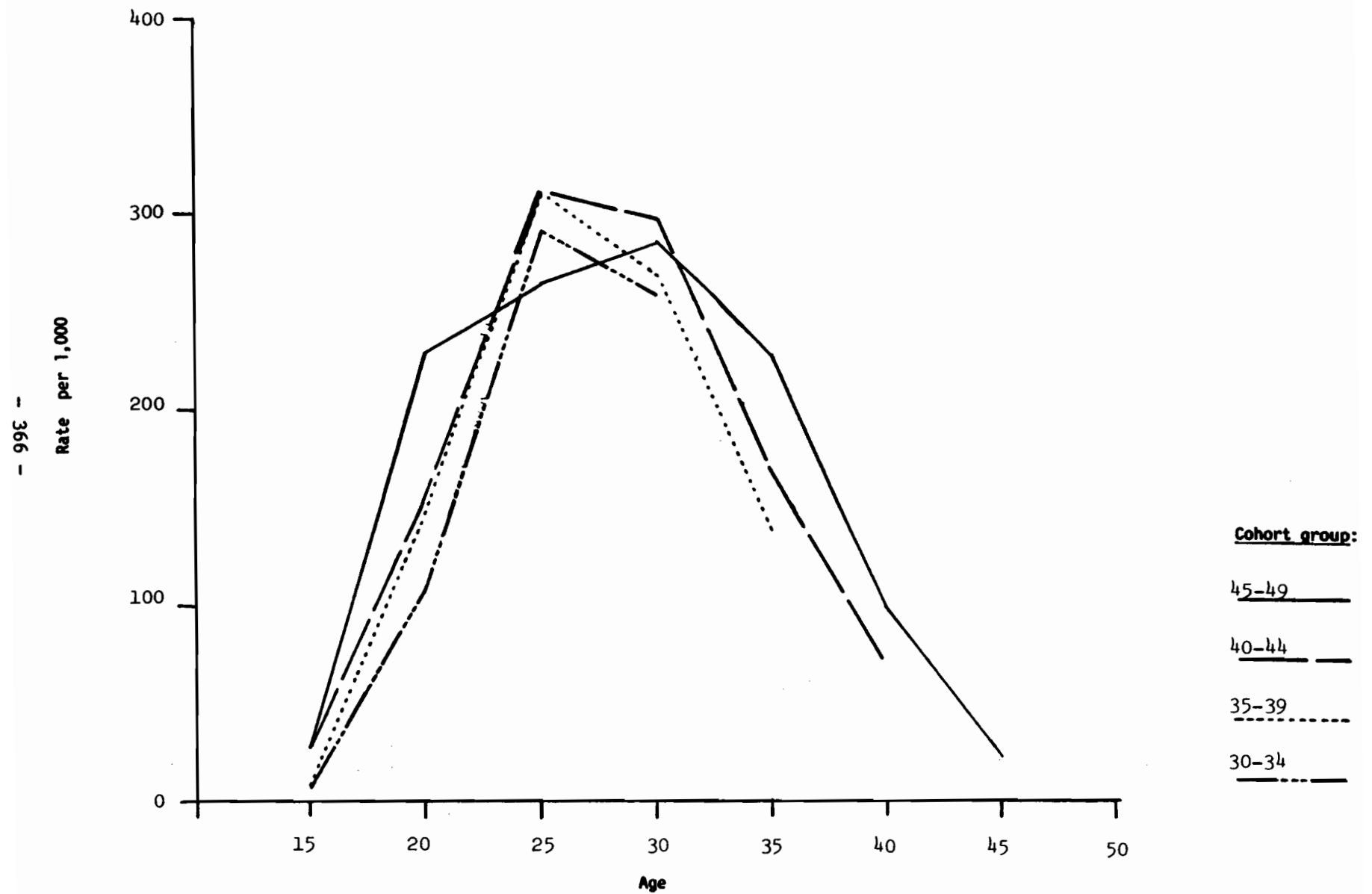


Figure IV. Proportions ever-married at designated periods prior to the survey
for selected age groups: World Fertility Survey data and other
sources: Republic of Korea

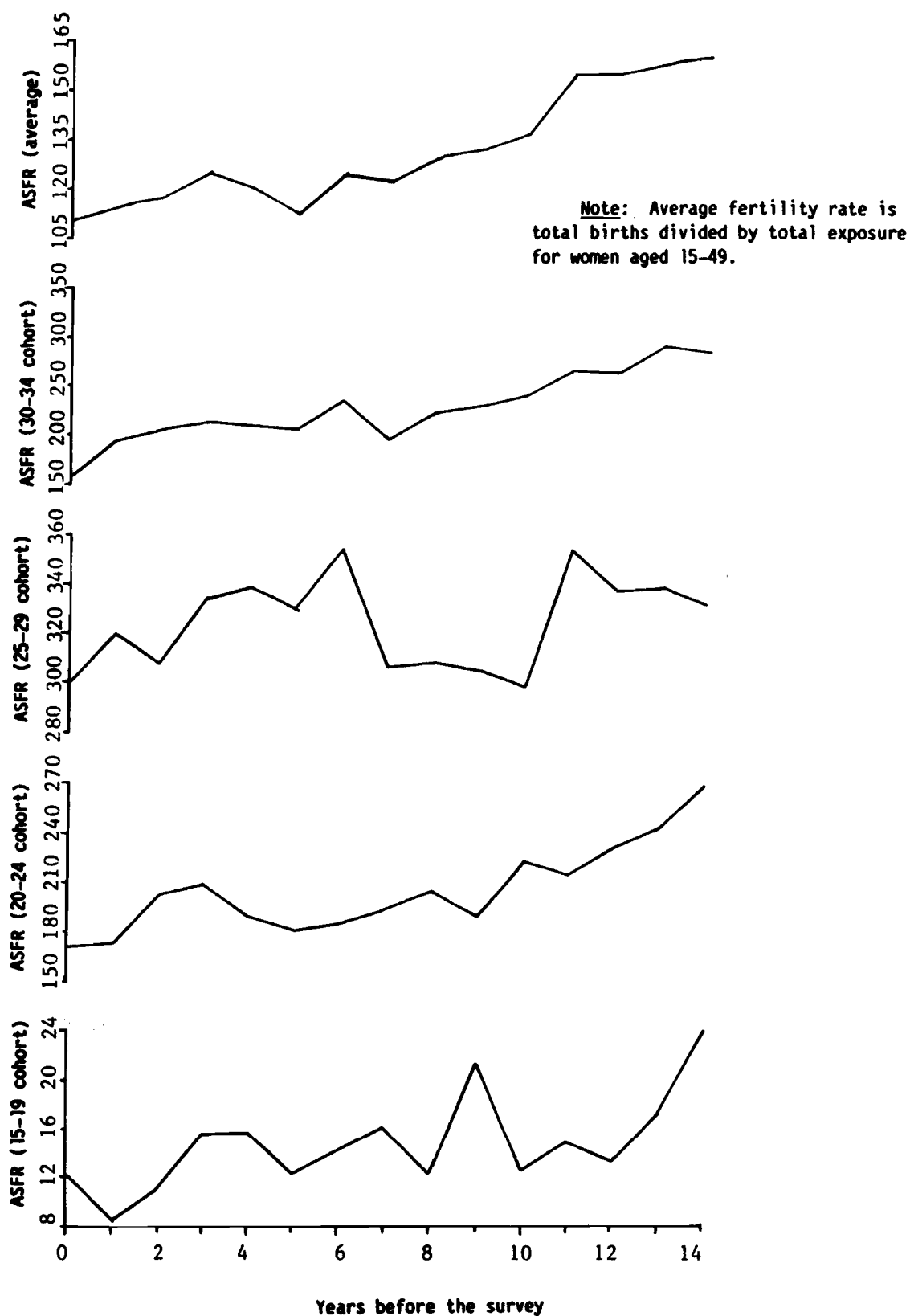


Source: Demographic Yearbook, Historical Supplement: Special Issue (United Nations publication, Sales No. E/F.79.XIII.8), table 12.

**Figure V. Cohort-period fertility rates for women aged 30-49 at interview:
Republic of Korea**



**Figure VI. Age-specific fertility rates for selected cohorts and average fertility rate for single years before the survey:
Republic of Korea**



SENEGAL

The Senegal Fertility Survey (Enquête sénégalaise sur la fécondité - ESF) was carried out between April and October 1978 as a first stage of a three-stage demographic survey. The second stage was on the labour force, and the third stage, migration. Demographic surveys that were conducted in 1960/61 and in 1970/71 provide data for comparison (Gueye, 1984). A census conducted in 1976 enumerated the population of Senegal at 5.1 million.

Age data

Three methods were used in collecting data on age in the Senegal Fertility Survey. The first was a knowledge of the actual date of birth (supplemented with a certificate), the second was probing with the use of a historical calendar, and the third was the use of a graphical method called AGEVEN (Ministère de l'économie et des finances, 1981). The graphical method, when implemented, was used for women aged 13 years and over in the household schedule and all women in the individual schedule.

In the individual survey, of the 3,985 respondents, only 38.2 per cent were able to provide both month and year of birth, 61.8 per cent were able to give only the year of birth (Chidambaram and Sathar, 1984). Myer's index of digital preference was 3.7 for females from the household survey (Rutstein, 1984). This is a vast improvement over the 1960/61 and 1970/71 surveys and the 1976 census, where the indexes for females was 13.7, 9.8 and 30.4 respectively (Gueye, 1984). Digits ending in 0 and 8 were popular.

A comparison of the male and female age distribution from the household survey (fig. I) shows a deficit of men in the age groups 15-19 to 40-44. However, at ages 45-49, there appears to be an excess of males, and in 50-54, an excess of females. The latter could be the result of interviewers shifting women out of the oldest eligible age group 45-49 into the 50-54 age group in order to avoid the individual interview. An examination of the single-year age distribution shows deficits at ages 15, 16 and 49 (Ministère de l'économie et des finances, 1981).

A comparison of the household female age distribution with the female age distribution from the 1976 census (fig. II) shows close correspondence. Proportions aged 0-4 and 50-54 were higher in the WFS.

Marriage history data

Of the 3,472 respondents who were ever-married, 69.4 per cent knew the month and year of marriage while 30.6 per cent knew only the year of marriage (Chidambaram and Sathar, 1984). More than 80 per cent of the Senegal population are Muslims and most of child-bearing is within marriage.^{1/} The percentage distribution of years since first marriage (fig. III) shows excessive heaping at 3, 7, 10, 12, 18, 24 and 26 years before the survey. There are a relatively large number of unions contracted in the 0-4 year period before the survey.

An examination of proportions married, reconstructed from the marriage history, for years before the survey suggests some serious problems in the reporting of marriage dates in the Senegal Fertility Survey, (fig. IV). The trend in proportions married among 15-19-year olds shows a peak 15 years before the survey, followed by a decline up to five years before the survey where upon there is an increase up to the survey date. Among the 20-24-year olds, the peak occurs at the period 10 years before the survey date while among the 25-29-year olds the corresponding peak occurs five years before the survey. This strongly suggests an over-estimation of the proportions married among the 30-34 year cohort. Comparisons with the marital status distribution from the National Demographic Surveys of 1960/61 and 1970/71 and the 1976 census (also shown in fig. IV) shows large discrepancies, especially among 15-19-year-olds. The WFS proportions are higher at every point compared. All sources, however, show some indication of declines in proportions married.

Birth history data

Interviewers obtained both the month and year of birth for 99 per cent of all births with the help of an age event chart (Chidambaram and Sathar, 1984). Table 1 shows children ever born by age for all women. The mean number of children ever born increases from 0.44 children per woman among 15-19-year olds to 7.16 children per women among those aged 45-49 years. Unfortunately, similar data are not available from an external source for comparison.

Cohort-period fertility rates (top panel of table 2) show that the 30-34 cohort has high fertility at all ages relative to fertility of other cohorts. This is evident from looking at the cohort fertility profiles graphed in figure V. Some displacement of early births towards the survey date probably occurred among the older cohorts. Among the 35-39, 40-44 and 45-49 cohorts, fertility rates in the young ages increase from the earlier to the more recent period (table 2), and there is a displacement in the age profile of fertility of those cohorts towards a younger age profile (fig. V).

Fertility rates obtained from the National Demographic survey of 1970/71 are compared with those from WFS reconstructed to the period 1969-1972 in table 3. Fertility at all ages appears to be higher in the WFS, especially in the age groups older than 20-24 years. The total fertility rate from the National Demographic Survey is 6.44, compared with 7.48 from the WFS. Although the total fertility rate does not appear to have declined considerably between the periods from 1969-1972 to 1976-1978 (about 5 per cent), big declines in rates were recorded in the older age groups over that period. In the age groups 35-39 and 40-44, fertility declined 14.0 per cent and 38.9 per cent, respectively, while the younger age groups recorded an increase in fertility, especially among women aged 25-29, where the increase was about 12 per cent.

Figure VI shows age-specific fertility rates by single years before the survey. The average fertility rate (total births divided by total exposure for women aged 15-49) shows excessive heaping on 0, 2 and 12 years before the survey. Fertility rates for specific age groups also show fluctuations around what appears to be a constant trend over the period. All age groups show

heaping in the period 0 years before the survey and year-to-year variability in the rates. That for the 25-29 age group is especially great.

Note

1/ Only about 3 per cent of females had negative first birth intervals.

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Table 1. Children ever born per woman
from the 1978 Senegal Fertility
Survey: Senegal

Age group	Children ever born
15-19	0.44
20-24	1.69
25-29	3.39
30-34	5.28
35-39	5.94
40-44	6.80
45-49	7.16

Table 2. Cohort period rates and cumulative cohort fertility
by age at survey: Senegal

Age group of cohort at end of period	Number of women in cohort	Years prior to survey						
		0-4	5-9	10-14	15-19	20-24	25-29	30-34
Cohort-period fertility rates								
10-14	20	0.010	0.001	0.002	0.002	0.001	0.002	0.002
15-19	889	0.087	0.083	0.095	0.119	0.113	0.090	0.059
20-24	760	0.258	0.263	0.293	0.271	0.269	0.256	
25-29	670	0.318	0.323	0.302	0.296	0.290		
30-34	499	0.311	0.288	0.292	0.302			
35-39	496	0.218	0.250	0.270				
40-44	393	0.153	0.188					
45-49	258	0.078						
Cumulative fertility of cohorts at end of period								
10-14		0.050	0.006	0.008	0.010	0.006	0.008	0.008
15-19		0.442	0.422	0.485	0.603	0.575	0.455	0.298
20-24		1.714	1.801	2.066	1.931	1.802	1.578	
25-29		3.393	3.681	3.442	3.280	3.027		
30-34		5.236	4.883	4.738	4.539			
35-39		5.972	5.990	5.888				
40-44		6.756	6.829					
45-49		7.217						

Source: S. Singh, "Birth histories", WFS Comparative Studies, Cross-national Summaries: Additional Tables (Voorburg, Netherlands, ISI/WFS, 1984), p. 33.

Table 3. Age-specific fertility rates for selected periods from WFS and National Demographic Survey, 1970-1971: Senegal

Age group	National Demographic Survey, 1970-1971 (1)	WFS 1969-1972 (2)	WFS 1976-1978 (3)	Percentage change in WFS (2)-(3)
15-19	0.165	0.183	0.194	6.01
20-24	0.290	0.307	0.298	- 2.93
25-29	0.272	0.299	0.334	11.71
30-34	0.228	0.271	0.280	3.32
35-39	0.161	0.228	0.196	-14.04
40-44	0.109	0.144	0.088	-38.89
45-49	0.063	(0.063)	0.031	..
TFR	6.44	7.48	7.10	- 5.08

Source: National Demographic Survey 1970-71: Ministère de l'économie et des finances, Enquête Senegalaise sur la fécondité, 1978, Rapport national d'analyse, vol. I (Dakar, 1981), p.112.

Figure I. Distribution of males and females
as a percentage of the total population
by five-year age groups: Senegal

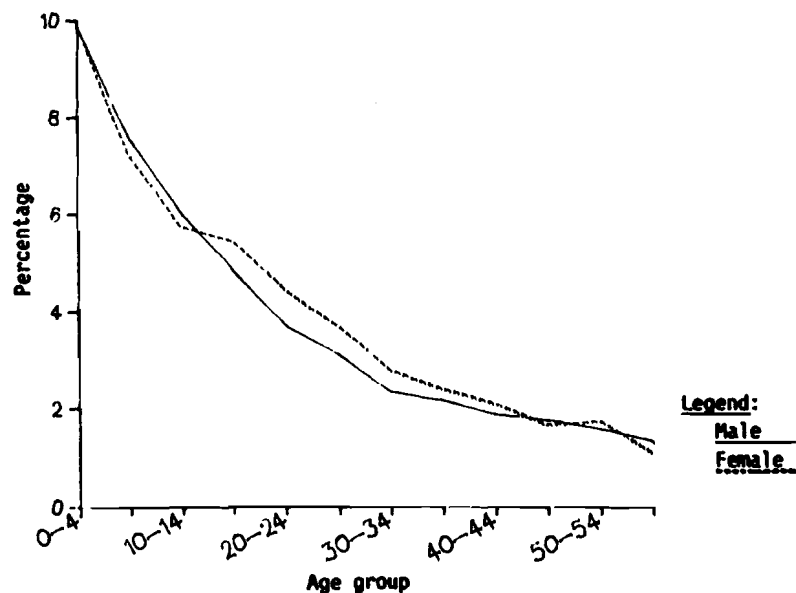
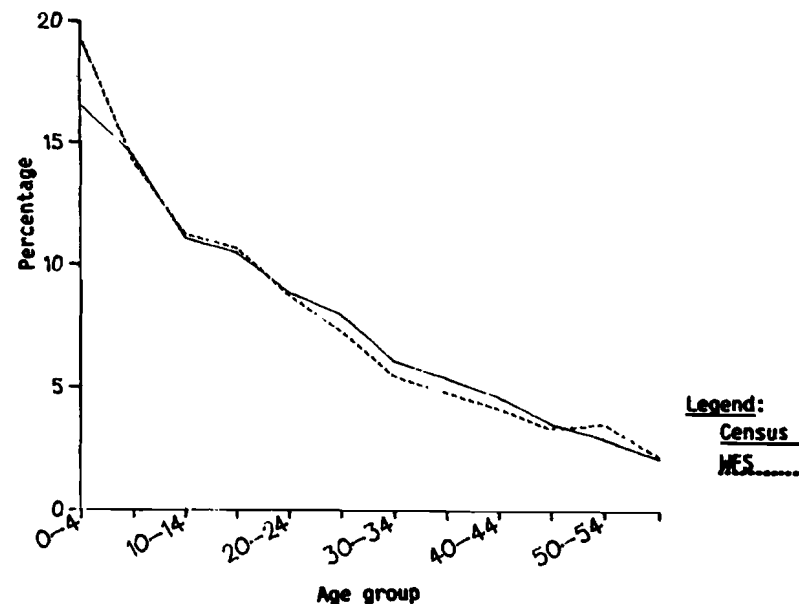


Figure II. Distribution of the female
population by five-year age groups:
World Fertility Survey (1978) and
1976 census: Senegal



Sources: for the 1978 World Fertility Survey: Ministère de l'économie et des finances, Enquête Sénégalaise sur la fécondité. Rapport national d'analyse, vol. I (Dakar, 1981), p. 51, tableau 4.1; for the 1976 census: N. Ndiaye, "Estimation des indices de mortalité et de fécondité de la population du Sénégal" (Dakar, août 1979).

**Figure III. Distribution of ever-married women aged 15-49
by years since first married: Senegal**

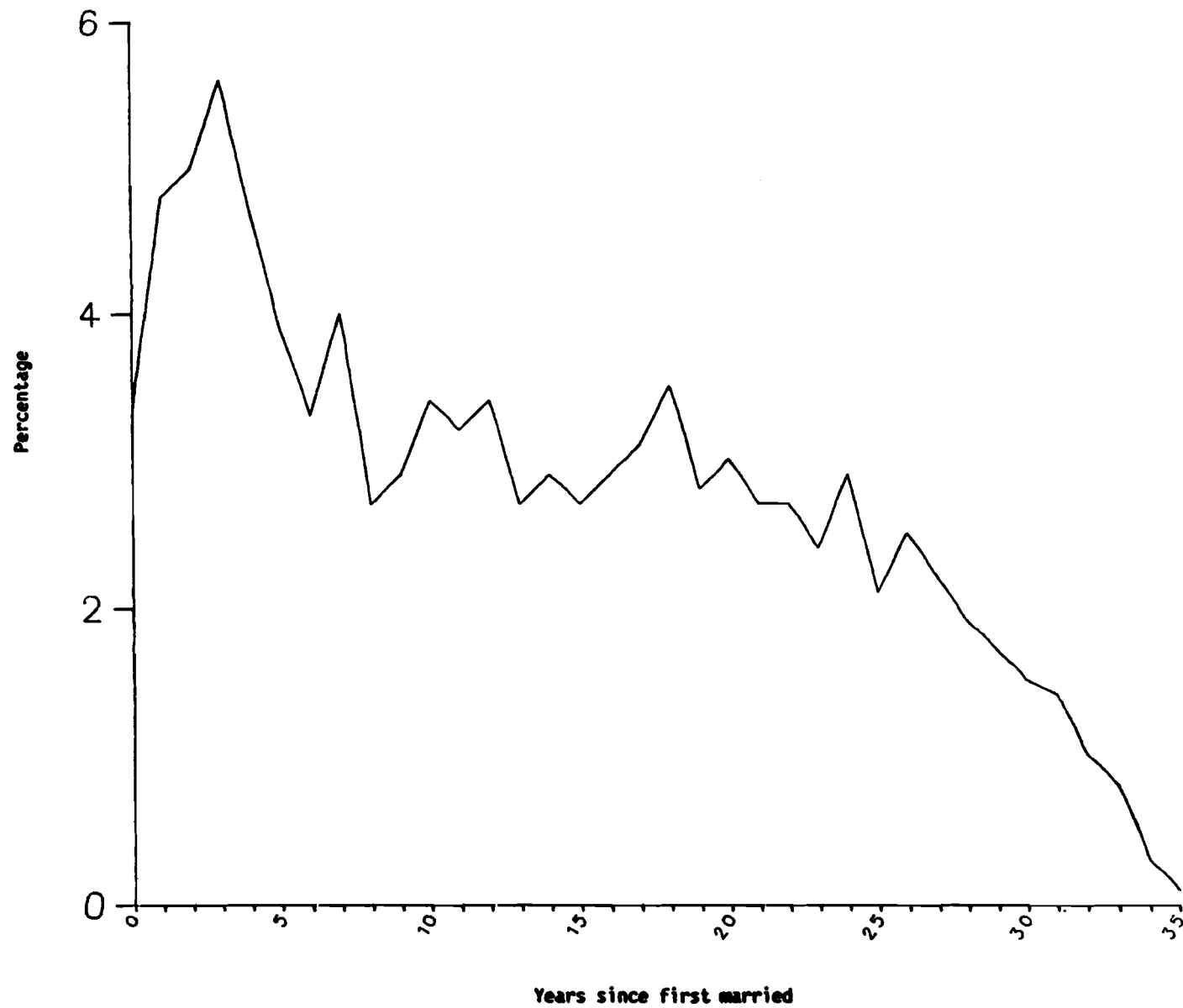
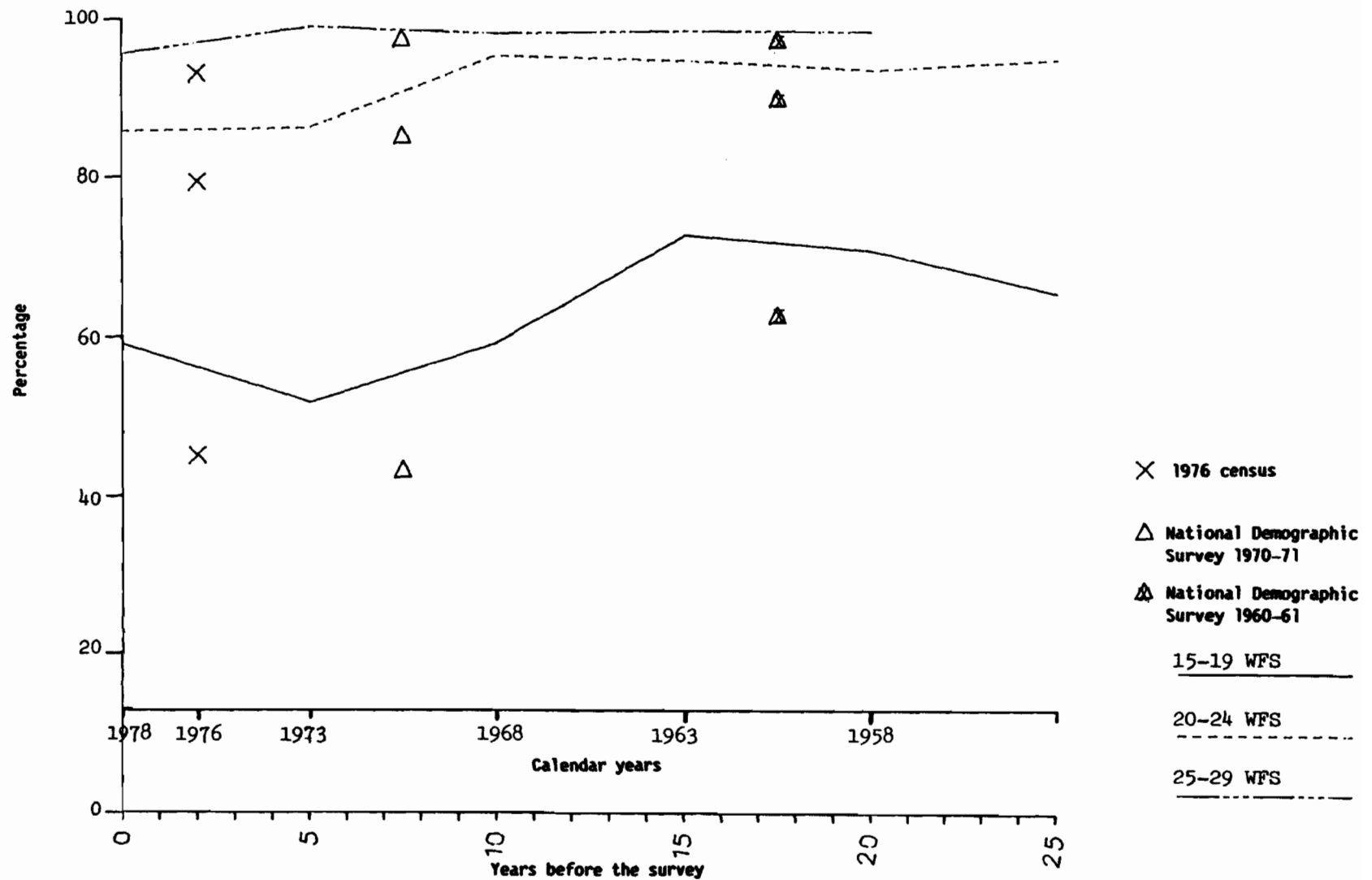
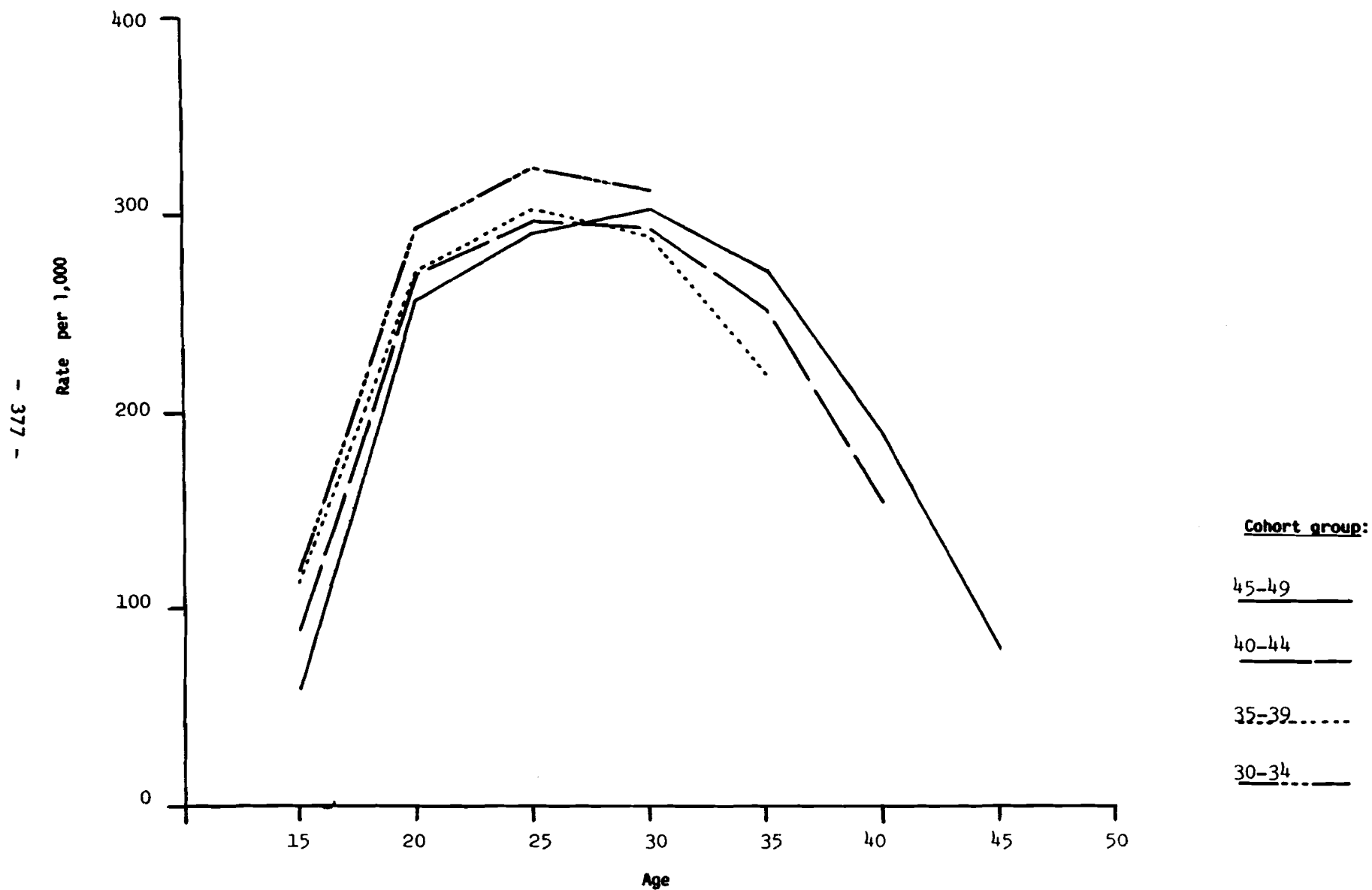


Figure IV. Proportions ever-married at designated periods prior to the survey for selected age groups: World Fertility Survey data, National Demographic surveys of 1960-61 and 1970-71, and 1976 census data: Senegal

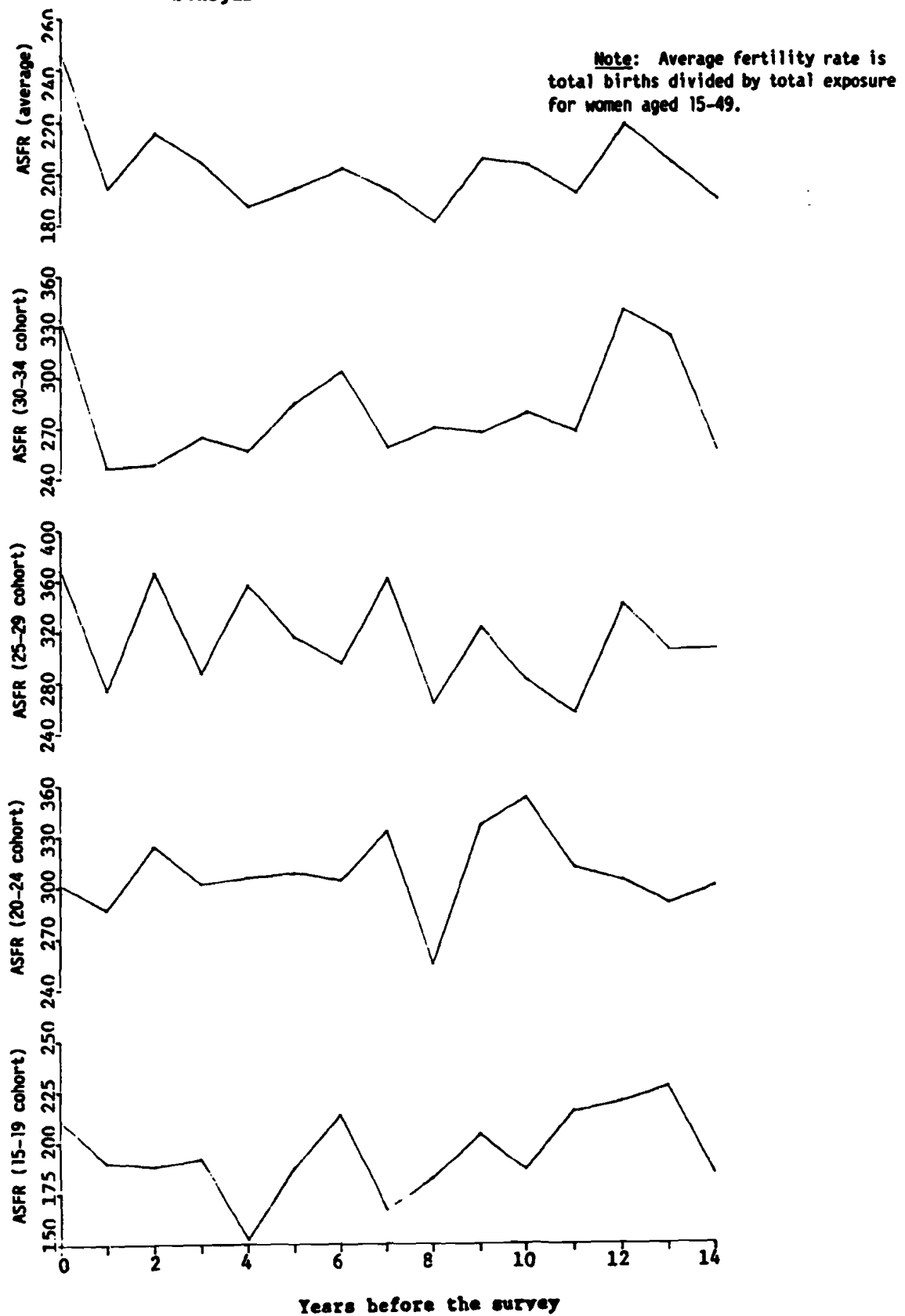


Source: Lamine Gueye, "Enquete sénégalaise sur la fécondité: rapport d'évaluation" *NFS Scientific Reports*, No. 49 (Voorburg, Netherlands, ISI/WFS, December 1974), tables 11 and 13.

**Figure V. Cohort-period fertility rates for women aged 30-49 at interview:
Senegal**



**Figure VI. Age-specific fertility rates for selected cohorts and average fertility rate for single years before the survey:
Senegal**



SRI LANKA

The Sri Lanka Fertility Survey (SLFS) was carried out from August 1975 to November 1975. Registration data in Sri Lanka are considered to be of high quality, especially in recent times. In 1953, birth registration was estimated to be 88.1 per cent complete; in 1967, the coverage increased to 98.7 per cent (Sri Lanka, 1978). Age-specific fertility rates from registration data are available for as far back as 1953. The most recent census data are from 1971 and 1963.

Age data

In the individual interview, 67 per cent of ever-married women reported both the month and year of birth (Chidambaram and Sathar, 1984). The Myer's index for women was 8.8. Preference seems to be for digits ending in 0, 5 and 8. Grouped data (fig. I) shows deficits in age groups 30-34, 40-44 and 50-54, but this could be because of a strong preference for ages 35, 45, and 55. Sex ratios for age groups 10-14 and 15-19 show a strong possibility of an over-estimate of women aged 10-14. The age distribution from household data corresponds closely with the 1971 census data (fig. II), except for ages below 10 years. Declining birth rates could account for much of the difference in the youngest age group although under-enumeration of young children or displacement from 0-4 to 5-9 is more likely to account for some of the difference.

Marriage history data

The marriage history data are based on a sample of 6,810 ever-married women. In 70 per cent of cases respondents reported a month and year of first marriage (Chidambaram and Sathar, 1984). In the reporting of nuptiality data, women are required to give the date of first marriage in all cases; no option was provided for answering in terms of "years ago". Age at first marriage was then calculated from that response.

Nearly 4 per cent of women had ages at marriage below 12 years, most of them being older women (Department of Statistics, 1978). Since age at marriage is computed from date of first marriage, the distribution of years since first marriage can be used to assess the quality of data. Heaping on durations ending with 0 and 5 is evident (fig. III), a tendency which is reinforced by the fact that the survey was conducted in a year ending in 5. The most recent date for which a marital status distribution is available is the 1971 census. In figure IV, proportions ever-married, reconstructed from the SLFS marriage history, are compared with similar proportions reconstructed from the 1971 census.^{1/} Both these sources of data show a slightly sharper trend than the series constructed from actual censuses in the past, although differences are not large for the 20-24 and 25-29 age groups. All sources show that the proportions ever-married have been declining rapidly, particularly at ages 20-29. Indeed, various studies have attributed the decline in crude birth rate in Sri Lanka, from 1952 to 1969, mainly to changes in age and marriage structure (Fernando, 1974). The average age at marriage in 1946 was already high relative to other Asian countries at 20.7, years and it increased to 23.5 in 1971.

Birth history data

Of all births recorded, 73.4 per cent were reported with a month and year (Chidambaram and Sathar, 1984). The mean number of children ever born to women in 1971 (reconstructed from SLFS data), when compared with the 1971 census data, shows a remarkably similar pattern. Declines in fertility may explain lower parities among women 25-39 in 1975, compared to census (table 1).

Cohort fertility rates for five-year periods preceding the survey (table 2) show declining rates for all age groups above 20 years from the earliest to the most recent periods. For the 15-19 age group, the rate 25-29 years ago is slightly lower than those of the adjacent periods. However, fertility rates from the period 20-24 years preceding the survey up to the most recent period do not seem to have any serious displacement that would affect the interpretation of fertility trends. Figure V confirms this conclusion. Figure VI shows some deficit in recent births among 25-29- and 30-34-year-old women, with some likelihood that some births were shifted to the 5-9 year period. There are some definite irregularities in the trends but no clear preference for digits.

A reliable birth registration system allows comparisons of age-specific fertility rates for calendar years preceding the survey (table 3). Rates averaged from 1972 to 1974 correspond closely, as do rates in earlier periods. The SLFS shows, however, a sharper trend over the 15-year period because of higher fertility for 15-19-year-olds in the past and lower fertility among 20-24-year-olds in the recent period.

An examination of the Sri Lankan fertility data by Alam and Cleland (1981) concluded that some displacement backwards in time of dates of first marriages and early births probably occurred, but the survey data for the most recent 15-year period were affected only to a negligible extent.

Notes

1/ Ever-married women in the 1971 census were asked a question on their age at marriage so that it was possible to obtain a similar reconstruction of the proportion ever-married at specific dates in the past (Trussell, 1980).

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Table 1. Children ever born per ever-married woman from WFS, SLFS, and 1971 census: Sri Lanka

Age group	1971 census	1971 SLFS	1975 WFS
15-19	0.6	0.6	0.7
20-24	1.5	1.5	1.5
25-29	2.7	2.9	2.5
30-34	4.0	4.3	3.8
35-39	5.1	5.2	4.9
40-44	5.2	5.3	5.5
45-49	..	..	6.0

Source: 1971 census and 1971 SLFS: I. Alam J.G. Cleland, "Illustrative analysis: recent fertility trends in Sri Lanka", *WFS Scientific Reports*, No. 25 (Voorburg, Netherlands, ISI/WFS, 1981), p. 20.

Table 2. Cohort period rates and cumulative cohort fertility by age at survey: Sri Lanka, 1975

Age group of cohort at end of period	Number of women in cohort	Years prior to survey						
		0-4	5-9	10-14	15-19	20-24	25-29	30-34
Cohort-period fertility rates								
10-14	2	0.000	0.000	0.001	0.002	0.003	0.006	0.003
15-19	174	0.009	0.023	0.035	0.048	0.061	0.057	0.061
20-24	912	0.098	0.123	0.174	0.183	0.204	0.213	
25-29	1 295	0.186	0.234	0.271	0.271	0.280		
30-34	1 221	0.197	0.245	0.259	0.274			
35-39	1 203	0.155	0.181	0.213				
40-44	968	0.076	0.101					
45-49	1 034	0.027						
Cumulative fertility of cohorts at end of period								
10-14		0.001	0.002	0.003	0.010	0.014	0.028	0.016
15-19		0.046	0.117	0.185	0.251	0.334	0.303	0.323
20-24		0.605	0.800	1.121	1.250	1.322	1.389	
25-29		1.728	2.292	2.607	2.675	2.787		
30-34		3.279	3.832	3.971	4.156			
35-39		4.608	4.877	5.219				
40-44		5.259	5.722					
45-49		5.855						

Source: WFS standard recode tapes.

Table 3. Age-specific fertility rates for selected periods from WFS and birth registration data: Sri Lanka

Age group	1965 BR (1)	1964-1966 WFS (2)	1971 BR (3)	1970-1972 WFS (4)	1972-1974		Percentage change	
					BR (5)	WFS (6)	WFS (2) - (6)	Outside (1) - (5)
15-19	0.049	0.077	0.040	0.048	0.037	0.035	-54.5	-24.5
20-24	0.220	0.218	0.184	0.165	0.173	0.147	-32.6	-21.4
25-29	0.269	0.268	0.232	0.235	0.202	0.198	-26.1	-24.9
30-34	0.220	0.226	0.199	0.208	0.173	0.175	-22.6	-21.4
35-39	0.153	0.152	0.131	0.119	0.122	0.120	-21.1	-20.3
40-44	0.042	..	0.040	0.050	0.033	0.040	..	-21.4
45-49	0.006	..	0.006	..	0.006	0.013	..	0.0
TFR	4.8	4.9 a/	4.2	4.2 a/	3.7	3.6	-26.5	-22.9

Source: Birth registration data: I. Alam and J.G. Cleland, "Illustrative analysis: recent fertility trends in Sri Lanka", WFS Scientific Reports, No. 25 (Voorburg, Netherlands, ISI/WFS, 1981) table 7.

a/ For the purpose of calculating a total fertility rate, the age-specific fertility rates from the birth registration were used when the age-specific rate from WFS was not available.

Figure I. Distribution of males and females
as a percentage of the total population
by five-year age groups: Sri Lanka

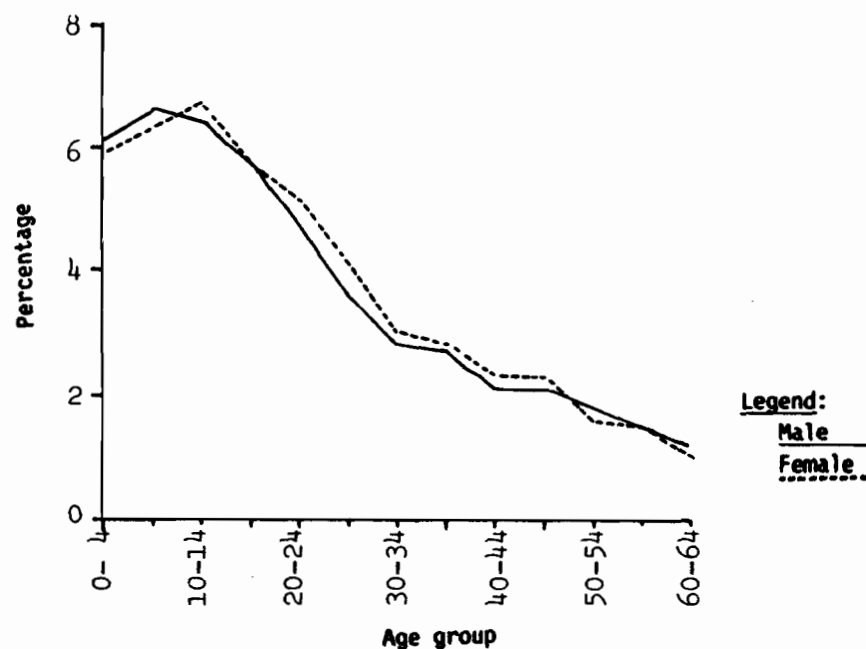
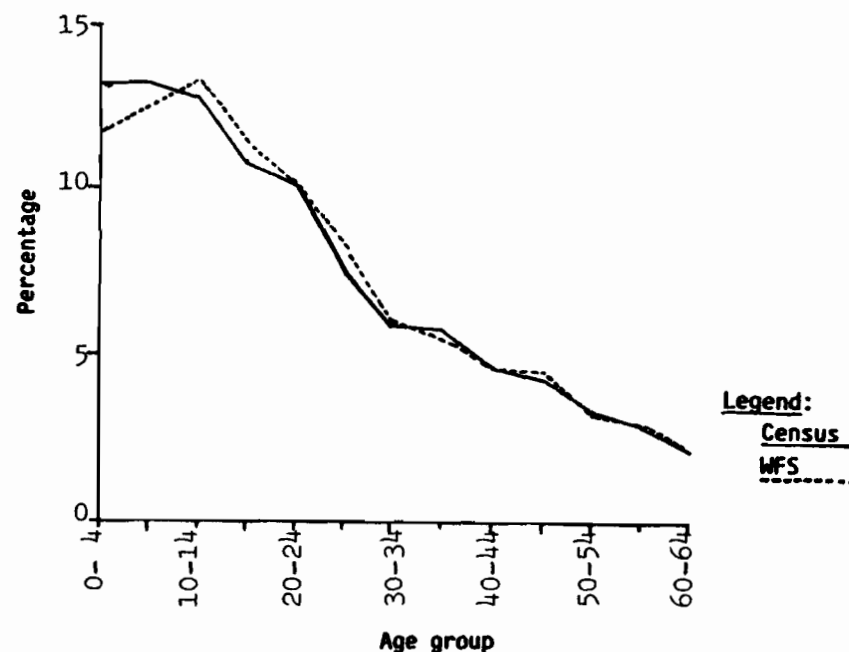


Figure II. Distribution of the female
population by five-year age groups:
World Fertility Survey (1975) and
1971 census: Sri Lanka



Sources for the 1971 census: Department of Statistics, World Fertility Survey, Sri Lanka, 1975. First Report (Colombo, Ministry of Plan Implementation, March 1978), table 2.8.

**Figure III. Distribution of ever-married women aged 15-49
by years since first married: Sri Lanka**

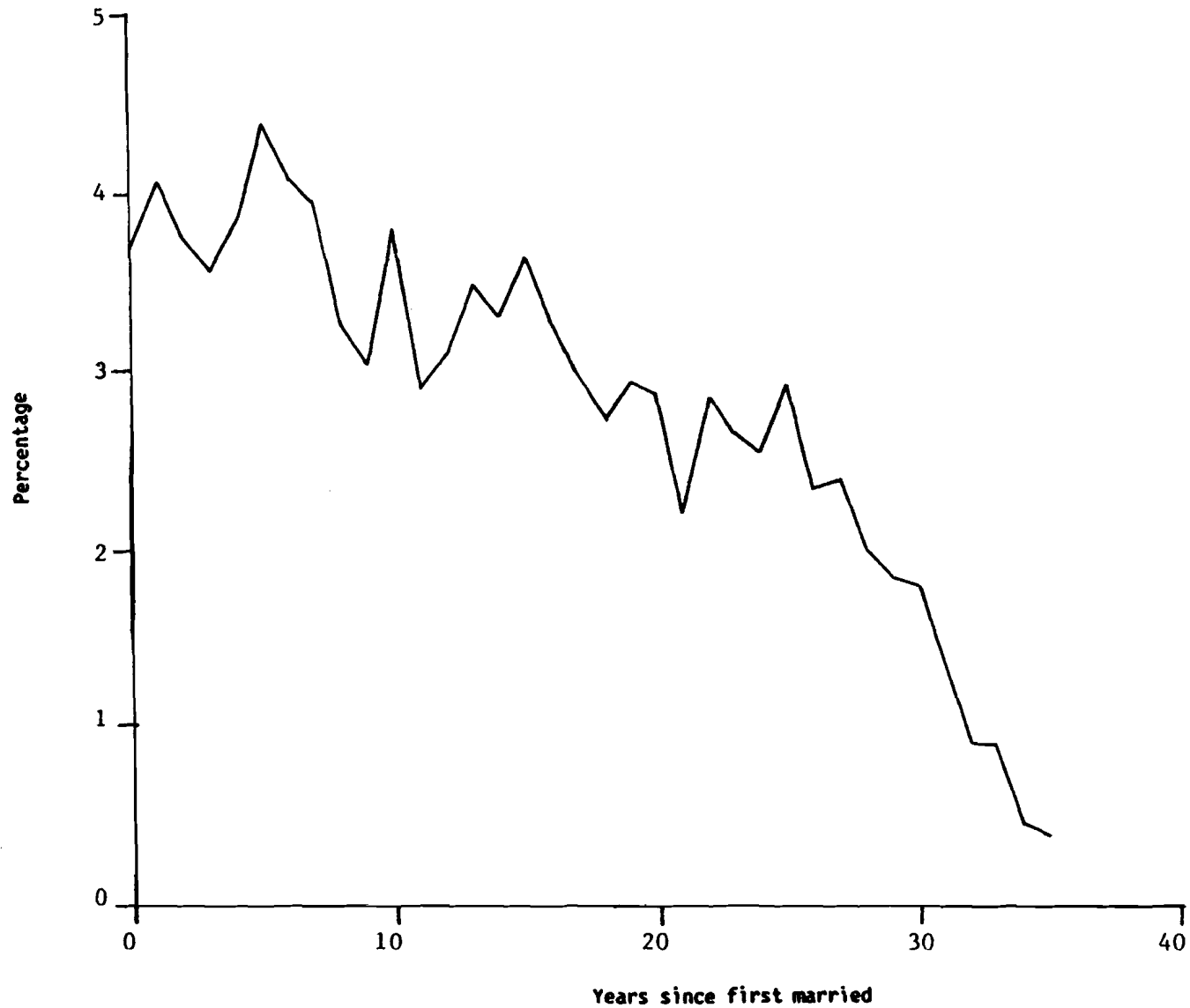
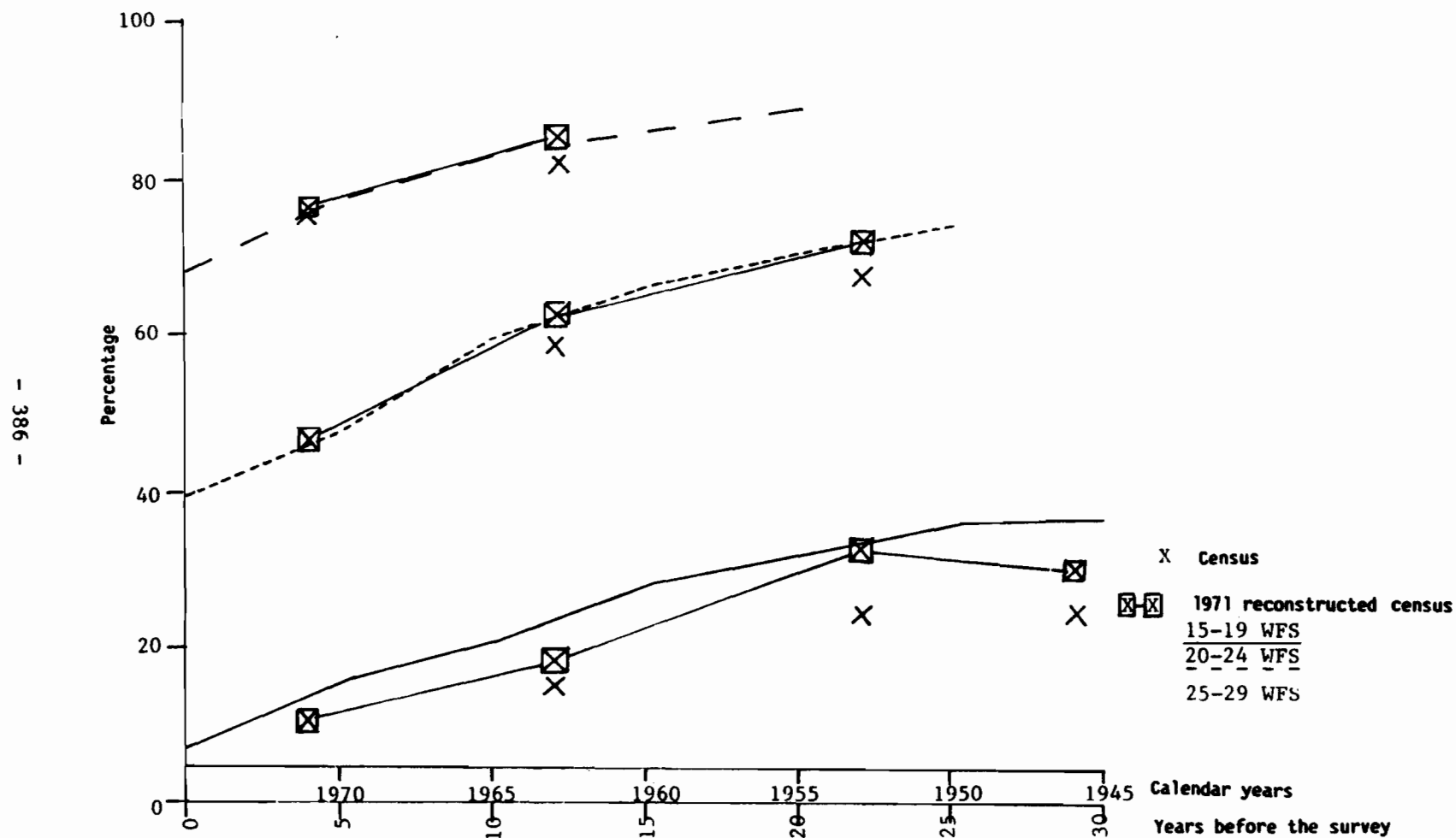
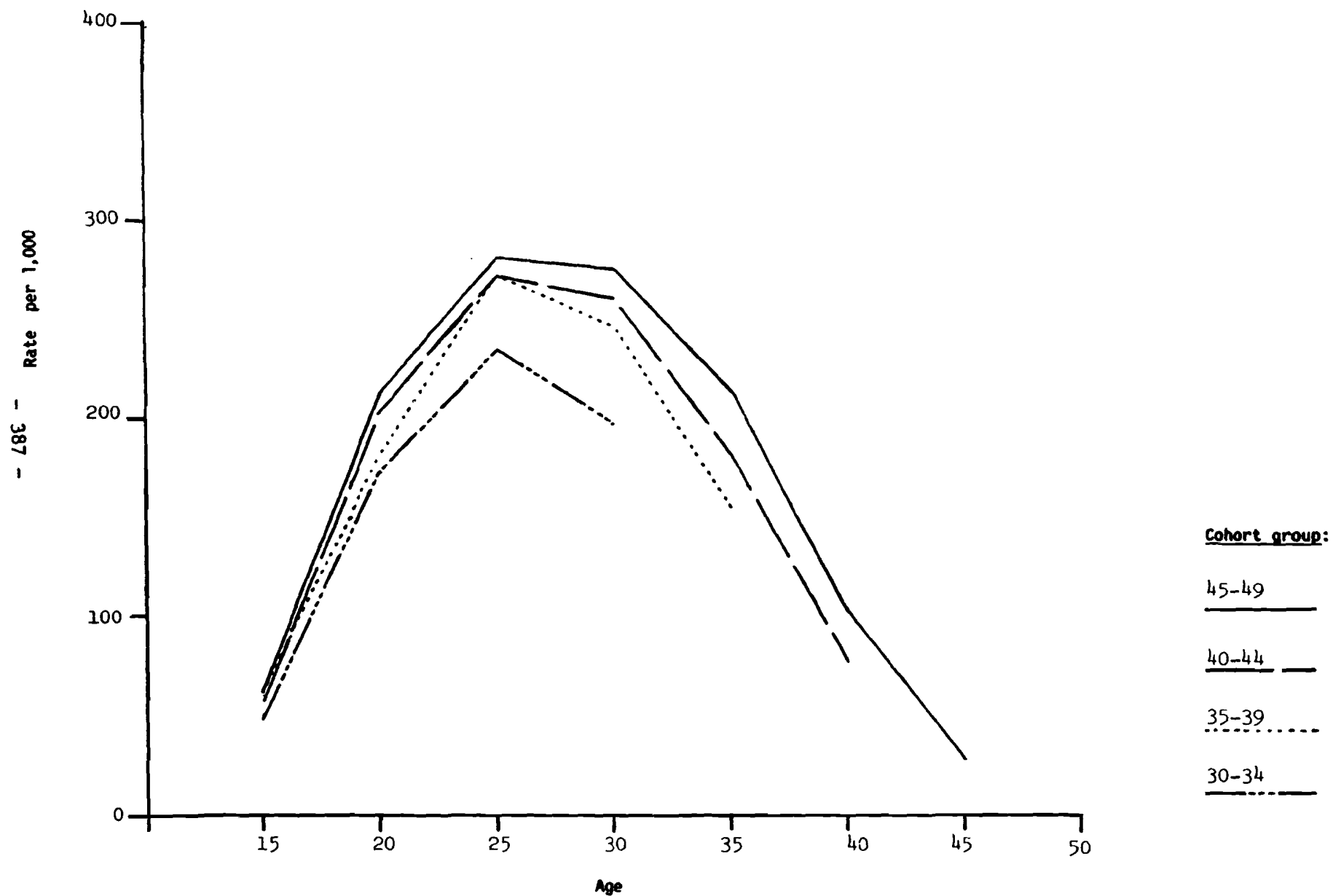


Figure IV. Proportions ever-married at designated periods prior to the survey for selected age groups: World Fertility Survey data and other sources: Sri Lanka

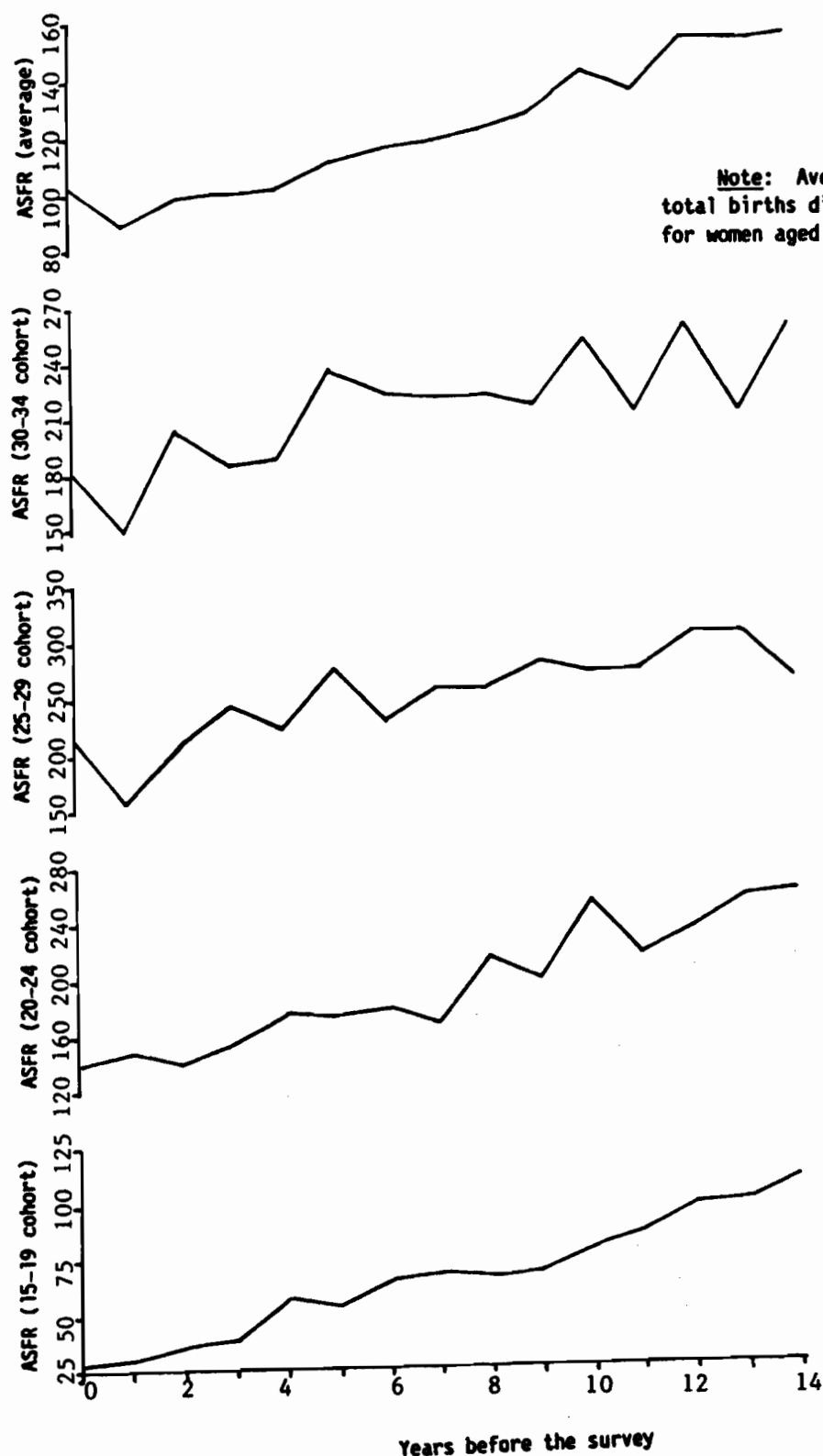


Source: 1971 reconstructed census data: J. Trussel, "Illustrative analysis: age at first marriage in Sri Lanka and Thailand", WFS Scientific Reports, No. 13 (Voorburg, Netherlands, ISI/WFS, 1980).

**Figure V. Cohort-period fertility rates for women aged 30-49 at interview:
Sri Lanka**



**Figure VI. Age-specific fertility rates for selected cohorts and average fertility rate for single years before the survey:
Sri Lanka**



SUDAN

The Sudan Fertility Survey, which was conducted between December 1978 and April 1979, was confined to the northern Sudan only. A post-enumeration survey was carried out in June 1979 on a 10 per cent sample of the individual survey in the Sudan Fertility Survey.^{1/} The first complete national census was conducted in 1973. Data from the census provided estimates of birth rates for the period, since vital registration is seen to be inadequate.

Age data

Of the total sample of ever married women, 21.5 per cent were able to state the month and year of birth while the remaining 78.5 per cent provided information on the year only (Chidambaram and Sathar, 1984). Interviewers were specially trained to probe in detail where necessary and to consult any documentary evidence available when obtaining birth dates. Even so, the Myer's index of digital preference is very high - 28.5 (Rutstein, 1984). The preference among females seems to be for digits 0, 5 and, to a lesser extent, 1 and 6. A comparison of the male and female household age distribution in five-year age groups (fig. I) shows a deficit in the age group 0-4 and heaping on ages 25-29 and 35-39 years for both sexes. Among males, heaping in the group 25-29 is not as evident. Indeed, heaping on age groups 25-29 and 35-39 seems to be a trait of Sudanese age reporting, since a comparison of the female household age distribution with the 1973 census age distribution of females in the northern Sudan shows similar heaping patterns on age groups 25-29 and 35-39. Among young children (aged 0-4), the SFS showed a larger deficit than the 1973 census. In a detailed evaluation of SFS fertility data, Rizgalla (1985) pointed out that serious errors in age and date reporting, which include heaping and transference of dates, significantly affects both period trends and level of fertility and mortality.

Marriage history data

Marriage in Sudan is almost universal. In the northern Sudan, the Islamic sharia marriage, which is legalized by the quaseima (marriage contract), prevails with polygamy allowable and divorce fairly easy to obtain (Ministry of National Planning, 1981). In obtaining information on date of marriage, the interest was in the date of consummation of marriage and not in the date of registration of the marriage contract. Of the 3,114 ever married women below 51 years of age, 41.1 per cent reported both the month and year of first marriage, 34.2 per cent reported the year only and 24.7 per cent responded in terms of "years ago" or "age at marriage" (Chidambaram and Sathar, 1984).

The distribution of years since first married (fig. III) shows a possible deficit of marriages in the most recent five-year period and strong evidence of heaping on 10 and 20 years before the survey date. It is likely that marriages in the seven-year period preceding the survey have been partly under-enumerated and partly back-dated to around the period 10 years before the survey date.

A reconstruction of the proportions ever married at designated periods prior to the survey, using the marriage history (fig. IV) shows a marked decline in the proportions ever married, especially among the 15-19- and the 20-24-year olds, from the period 5-9 years before the survey to the more recent period. The trend in decreasing proportions ever married among 15-19-year olds goes back even further to the period 15 years before the survey. It is possible that there has been an increase in age at marriage, but it is more likely that most of the increase in age at marriage shown by the data is the result of some backward shifting of marriage dates which was seen in figure III. If the more recent marriages are under-reported or back-dated, then the proportion married in the most recent period will also be low across all age groups, as is seen in figure IV. A comparison with proportions married from the 1973 census shows similar proportions married in all age groups. The reconstructed proportions ever married in figure IV show a slight peak for each age group 15-19, 20-24 and 25-29 for the 30-34 cohort, suggesting an over-estimation of proportions married among women in that cohort.

While the data on the proportions ever married for specific periods in the past indicate a decline over the past 10-15 years, with an acceleration in the decline in the recent past, most of the decline could be a result of misstatements as to marriage dates, though a real decline in proportions ever married cannot be completely ruled out.

Birth history data

Of all births reported, 63.0 per cent were reported with information on both month and year of birth, 33.2 per cent had information only on the year, while for 3.8 per cent, the response was in terms of "years ago" (Chidambaram and Sathar, 1984).

The mean number of children ever born to ever married women at the time of the survey increases monotonically with age, with women 45-49 years at the time of the survey having a mean of 6.1 children ever born (table 1). A comparison of the distribution of children ever born from the 1973 census with that of the WFS, reconstructed to reflect the situation in 1973, shows that while the 1973 census shows a mean of 5.1 children to women aged 40-44 years, the SFS had a mean of 5.4 children. The SFS recorded higher means for all age groups. The SFS distribution for 1973 shows monotonically increasing mean number of children with age up to the age group 35-39 years, after which the mean declines from 5.6 to 5.4 children per ever married woman.

Cohort fertility rates for five-year periods before the survey (table 2) show that for each age group in the periods before the survey, fertility rates increase as one moves towards the survey date and then decrease up to the most recent five-year period. In the absence of an increase in fertility in the past, the trend is often interpreted as an indication of misdating of events.

The lower panel of table 2, which shows cumulative fertility rates for the various cohorts at different periods in the past, shows that although the parity of women aged 45-49 years at the time of the survey was greater than the parity of those aged 40-44 years (6.3 children compared with 6.1 children)

the 45-49 cohort did have fewer children when they were 40-44 years old than women aged 40-44 at the time of the survey (5.9 children compared with 6.1 children of the 40-44 cohort). This suggests possible omission of births among older women.

An examination of the fertility profile for cohorts aged 30-49 years (fig. V) shows that the oldest cohort has a flat, broad fertility profile which gets more peaked and narrow for the younger cohorts. This kind of shift in the fertility profile from the older to the younger cohort is some evidence of forward displacement of birth dates.

An examination of single year fertility rates for age groups 15-34 (fig. VI) shows a trough in the period 1-2 years before the survey, with peaks at adjacent years for all age groups. Further, fertility rates appear to peak in the period 6 years before the survey date. This pattern seems to suggest under-enumeration of births in the period 1-2 years before the survey and/or shifting of births to the period 6-8 years before the survey.

Age-specific rates averaged over a three-year period around 1973 from the SFS are compared with rates from the 1973 census in table 3. The total fertility rate for the age groups 15-44 from the census was 5.3, compared with 6.8 from the WFS. However, after adjusting the census data using P/F ratios for age groups 20-24, 25-29 and 30-34, the total fertility rate (age groups 15-49) was 6.8 (Ministry of National Planning, 1981). This compares better with SFS data, though the rate from SFS is still higher. The estimate from SFS, however, might be on the high side (see fig. VI), since fertility rates for all ages peaked in the period six years before the survey, which puts it around 1973. The age pattern of fertility from the two sources, however, are very similar. Unfortunately, no recent estimate of fertility was available from other sources, so that a trend comparison was not possible.

Note

1/ Unfortunately, results from the post-enumeration survey are not available at this time.

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Table 1. Children ever born to ever married woman
from WFS and the 1973 census: Sudan

Age group	1973		WFS
	census	1973	1979
15-19	0.4	1.2	0.7
20-24	1.8	2.4	2.2
25-29	3.4	4.0	3.4
30-34	4.6	5.0	5.0
35-39	5.3	5.6	5.9
40-44	5.1	5.4	6.0
45-49	5.0	...	6.1

Source: 1973 census: Ministry of National
Planning, The Sudan Fertility Survey, 1979, Principal
Report, vol. I (Khartoum, Department of Statistics,
1981), p. 53.

Table 2. Cohort period rates and cumulative cohort fertility
by age at survey: Sudan

Age group of cohort at end of period	Number of women in cohort	Years prior to survey						
		0-4	5-9	10-14	15-19	20-24	25-29	30-34
Cohort-period fertility rates								
10-14	13	0.000	0.001	0.005	0.005	0.005	0.007	0.000
15-19	220	0.031	0.077	0.081	0.090	0.081	0.069	0.043
20-24	515	0.197	0.238	0.245	0.221	0.195	0.173	
25-29	715	0.284	0.339	0.305	0.282	0.226		
30-34	501	0.276	0.320	0.302	0.268			
35-39	589	0.225	0.224	0.254				
40-44	303	0.117	0.181					
45-49	226	0.089						
Cumulative fertility of cohorts at end of period								
10-14		0.000	0.004	0.025	0.025	0.024	0.033	0.002
15-19		0.160	0.412	0.430	0.473	0.439	0.347	0.215
20-24		1.398	1.622	1.696	1.545	1.323	1.078	
25-29		3.040	3.393	3.070	2.733	2.210		
30-34		4.772	4.671	4.244	3.547			
35-39		5.795	5.364	4.815				
40-44		5.947	5.721					
45-49		6.164						

Source: S. Singh, "Birth histories", WFS Comparative Studies,
Cross-national Summaries: Additional Tables (Voorburg, Netherlands,
ISI/WFS, 1984).

Table 3. Age-specific fertility rates for selected periods from the 1973 census and WFS: Sudan

Age group	1973 census (1)	1972-1974 WFS (2)	1974-1978 WFS (3)	Percentage change WFS (3)-(2)
15-19	0.109	0.164	0.118	-28.0
20-24	0.259	0.303	0.265	-12.5
25-29	0.273	0.316	0.268	-15.2
30-34	0.213	0.280	0.252	-10.0
35-39	0.150	0.177	0.151	-14.7
40-44	0.055	0.116	0.107	..
45-49	0.028	..	0.070	..
TFR	5.4	..	6.2	..
TFR(15-44)	5.3	6.8	5.8	-14.7

Source: 1973 census: Ministry of National Planning, The Sudan Fertility Survey, 1979, Principal Report, vol. I (Khartoum, Department of Statistics, 1981), p. 61. After adjustment (based on P/F ratios for age groups 20-24, 25-29 and 30-34), the TFR is 6.8.

Figure I. Distribution of males and females as a percentage of the total population by five-year age groups: Sudan

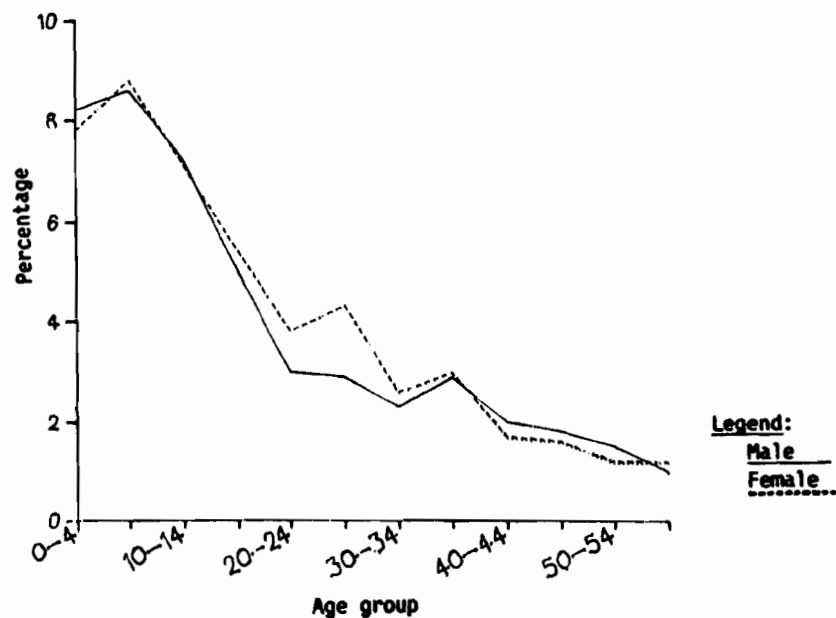
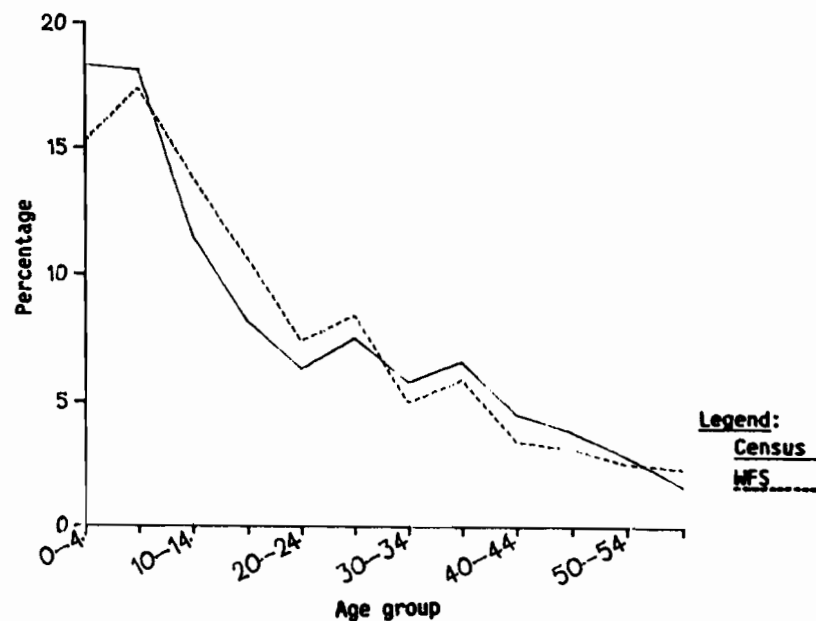


Figure II. Distribution of the female population by five-year age groups: World Fertility Survey (1979) and 1973 census: Sudan



Source: Ministry of National Planning, *The Sudan Fertility Survey, 1979. Principal Report* (Khartoum, Department of Statistics, 1981): vol. I, p. 28, for the 1973 census data, and vol II, p. 717, for the 1979 WFS data.

**Figure III. Distribution of ever-married women aged 15-49
by years since first married: Sudan**

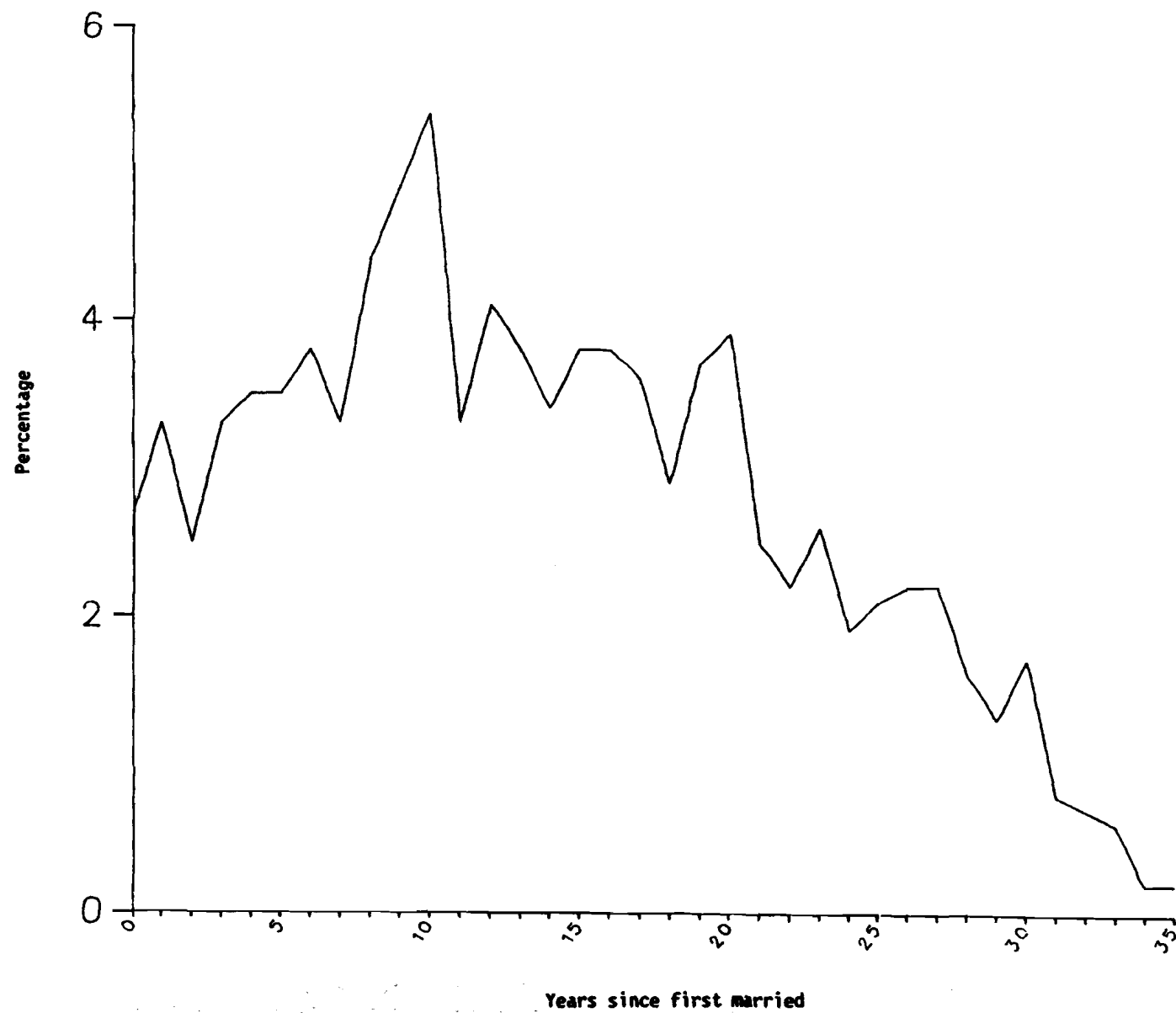
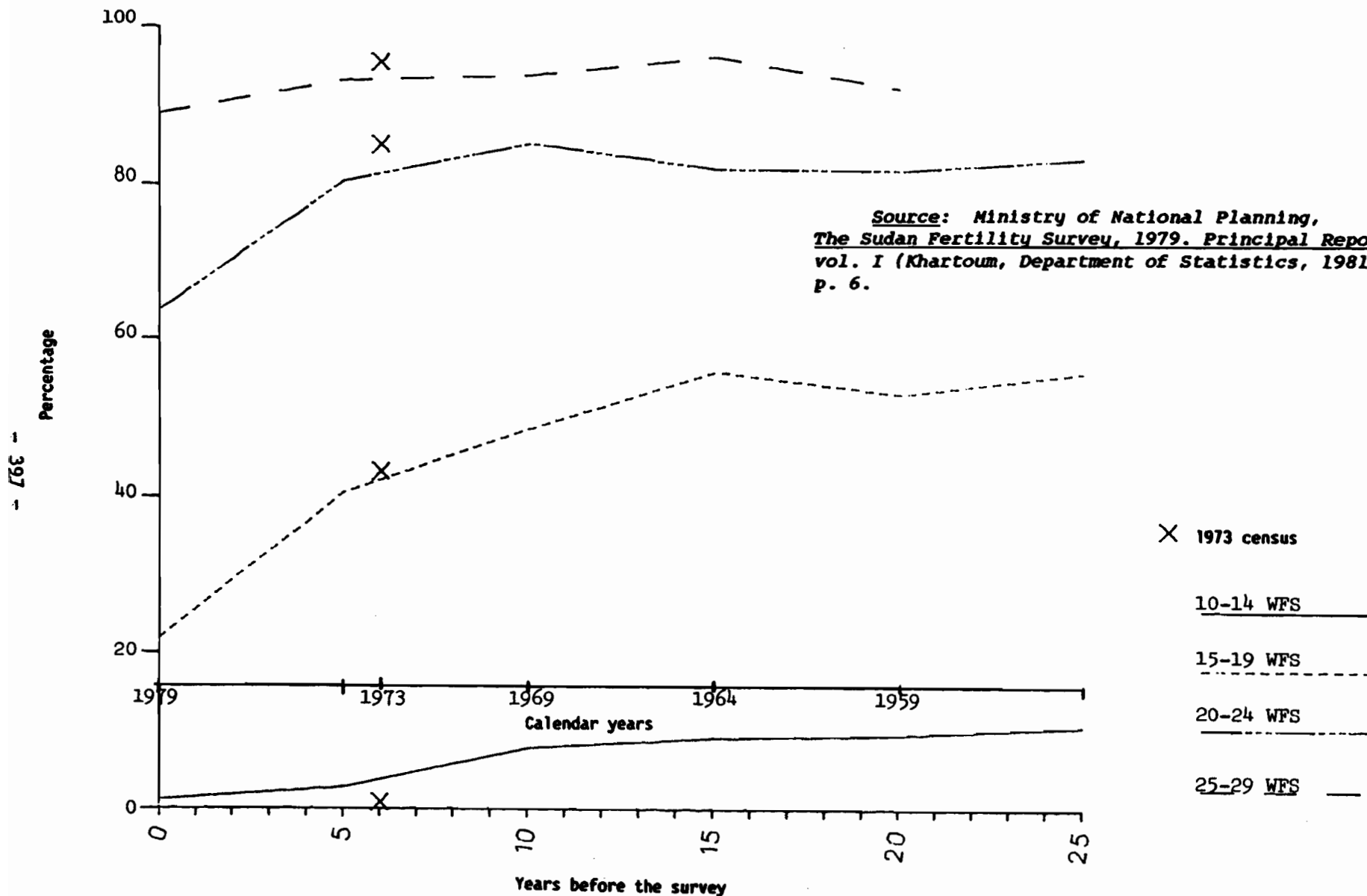


Figure IV. Proportions ever-married at designated periods prior to the survey for selected age groups: World Fertility Survey data and 1973 census data: Sudan

Source: Ministry of National Planning,
The Sudan Fertility Survey, 1979. Principal Report,
vol. I (Khartoum, Department of Statistics, 1981),
p. 6.



**Figure V. Cohort-period fertility rates for women aged 30-49 at interview:
Sudan**

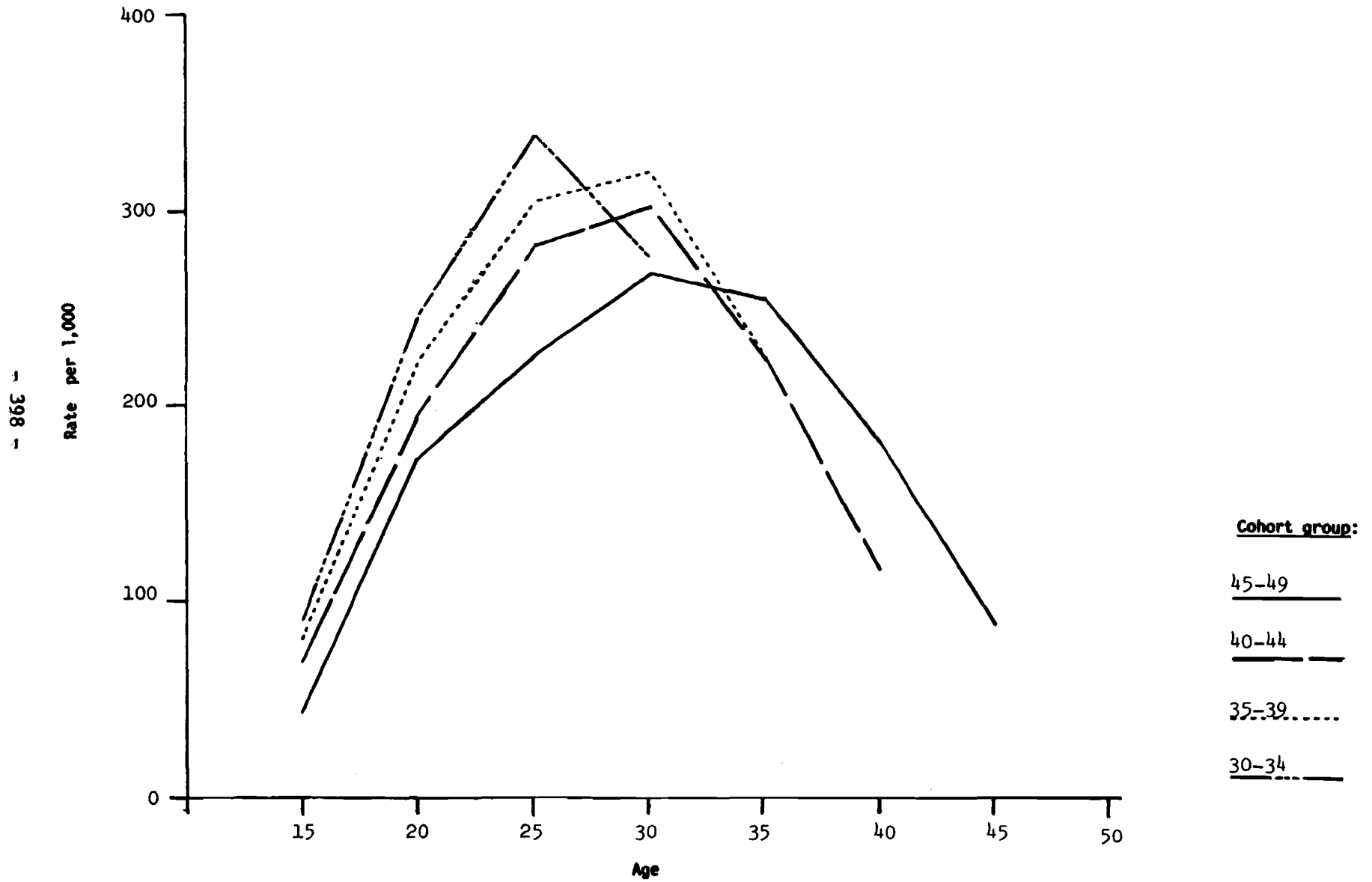
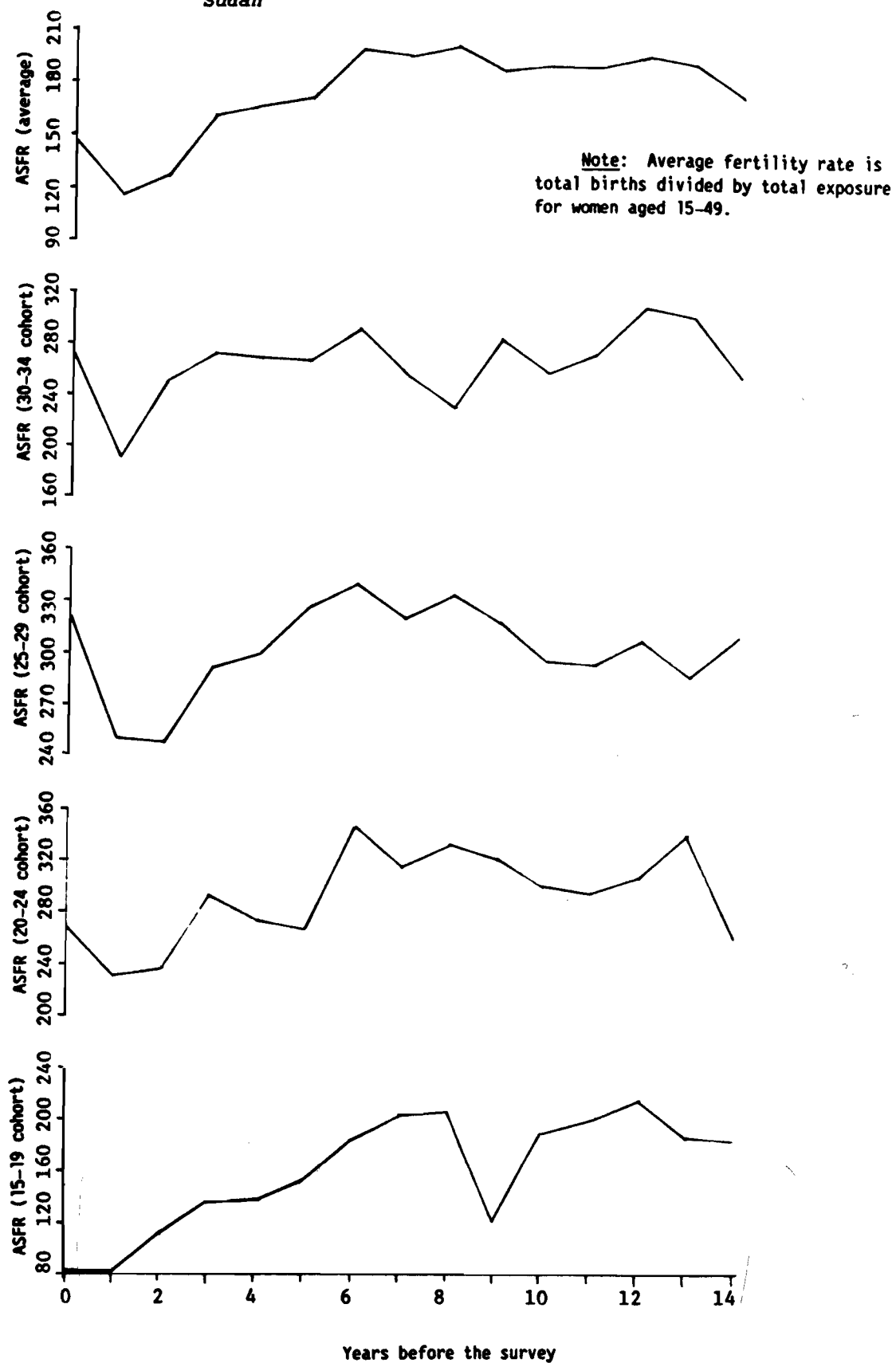


Figure VI. Age-specific fertility rates for selected cohorts and average fertility rate for single years before the survey:
Sudan



SYRIAN ARAB REPUBLIC

The Syria Fertility Survey (SFS) was conducted between June and August of 1978. Comparisons are possible between the SFS and population census data from the 1970 and 1976¹/ population censuses. Censuses were also conducted in 1947 and 1960. In addition, follow-up demographic surveys were conducted between 1976 and 1979 providing information on fertility. Birth registration exists in the Syrian Arab Republic and is only about 70 per cent complete in rural areas, although it is fairly complete in urban areas (Central Bureau of Statistics, 1982).

Age data

The month and year of birth was reported by 57.3 per cent of respondents in the individual interview, while 42.7 per cent reported only the calendar year (Chidambaram and Sathar, 1984). Myer's index among females in the household age distribution was 9.2. There was strong preference for digits ending in 0 and 5, and to a lesser extent 2 and 8 (Central Bureau of Statistics, 1982).

A comparison of the male and female household age distribution (fig. I) shows a slight excess of males over females in the ages below 15 years and a slight excess of females from 15-39 years. Both sexes show heaping at 10-14 years. An examination of sex ratios shows ratios to be in favour of males from 0 to 19 years of age and, then again, at ages above 45 years. This pattern of high sex ratios at the two extremes of the age structure is common in other countries of the Middle East, (e.g., Jordan) and is caused mainly by a large migrant worker population (Economic Commission for Western Asia, 1980). Sex ratios within the child-bearing ages show an excess of females, particularly in age groups 20-24 and 35-39 years. Comparisons with the 1976 census age distribution (fig. II) correspond closely, except at ages 10-14 years where the proportion from the SFS appear to be higher.

Marriage history data

Marriage in the Syrian Arab Republic takes the form of a formal or legal marriage and a social marriage. The period between the two ceremonies varies and can be quite extensive. It is the social marriage (zifag) that marks the consummation of marriage and, in the SFS, the date of the social marriage marks the start of the union (Central Bureau of Statistics, 1982).

Of the 4,487 ever-married women in the sample, 79.0 per cent knew the month and year of their first union, 14.9 per cent knew only the calendar year, while, for 6.1 per cent, only the month of first marriage was reported (Chidambaram and Sathar, 1984). The distribution of years since first married among ever-married women (fig. III) shows a sharp drop in the percentage of marriages from five to seven years duration, and another drop in those of 10-12 years duration. A similar drop is also evident in those of 20-25 years duration. It is likely that date reporting errors are responsible for these sharp drops in the percentage.

The marital status of women from the SFS and reconstructed proportions married were compared with that from the 1970 census and the 1976 sample census in figure IV. A declining trend in the proportions married is evident among the age groups 15-19, 20-24 and 25-29 from about 15 years prior to the survey. The proportion married among the 30-34 cohort appears to be exaggerated, resulting in an over-estimation of the decline in proportions married. However, comparison with the census proportions shows the proportions ever-married from the two sources to be very similar, especially so in the case of the 1976 sample census.

Birth history data

More than four fifths (83.2 per cent) of all births were reported with the month and year of birth. Another 13.6 per cent had information only on the year of birth while, for 3.3 per cent, the date of birth was reported in terms of "years ago" or age (Chidambaram and Sathar, 1984). The parity distribution from the SFS (table 1) shows that children ever born per ever-married woman increases monotonically up to 7.6 children among women aged 45-49 at the time of the survey. Comparison of the parity distribution from the SFS with that of the 1976 census is close, but when the birth history is used to construct a parity distribution for 1970 to be compared with the 1970 census distribution, the comparison is not as good. Parities from the SFS are lower in every age group. Still, differences are not large.

Cohort-period rates from the birth history information (table 2) show declines in fertility among all age groups from the period 10-14 years before the survey up to the most recent period. Prior to that, rates are high and fluctuating. Comparison of cumulated fertility of the oldest cohort with cumulated period fertility rates for the 0-4 and 5-9 years before the survey (table 2, lower panel) does not show any evidence of omission of births among the oldest cohort. Cohort-fertility profiles (fig. V) reveal some evidence of forward displacement of births among the older cohorts.

Data from the 1970 and 1976 censuses and the 1977/78 round of the follow-up demographic surveys allow comparisons of age-specific rates with those constructed from SFS birth histories (table 3). Fertility appears to have declined over the seven-year period among all age groups in both the SFS and the external sources. Declines appear to be greater among older women. The total fertility rate from the 1970 census is about 0.5 child higher than the SFR for a corresponding period from the SFS. Most of the difference is among the 25-29-year olds. Differences between the various sources are much smaller for the more recent period: TFRs are 7.2, 7.4 and 7.5 for the 1976 census, 1975-1977 SFS and 1977/78 follow-up demographic survey, respectively. The age pattern of fertility from the various sources compares well, especially in the more recent period.

Age-specific fertility rates for single-year periods before the survey date show considerable fluctuation in the yearly rates for each age group. However, the fluctuations appear to cancel each other out, since the average rate curve across all age groups appears fairly smooth (top curve in fig. VI). The average rate, however, shows a dip in the period 3-6 years before the survey, with adjacent rates in the most recent period and the

preceding period being higher. This is a reflection of dips in the trend in rates at 5-6 years among 15-19-year olds, at 4 years among 20-24-year olds, 3 years among 25-29-year olds and 1 year among 30-34-year olds. Corresponding peaks at adjacent periods occur, with the resulting trend being a small decline in rates over the period.

Note

1/ The 1976 census was a sample census.

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Table 1. Children ever born per woman from
SFS and the 1970 and 1976 censuses:
Syrian Arab Republic

Age group	1970		1976 census	1978 SFS
	census	SFS		
15-19	0.2	0.1	0.2	0.2
20-24	1.5	1.2	1.2	1.3
25-29	3.4	3.1	3.0	3.1
30-34	5.1	4.7	4.7	4.8
35-39	6.6	6.4	6.3	6.2
40-44	7.4	7.0	7.1	7.3
45-49	7.8	..	7.6	7.6

Source: M.N. Hallak and A.G. Hill, "Levels and trends of fertility and mortality in the Syrian Arab Republic", in Levels and Trends of Fertility and Mortality in Selected Arab Countries of West Asia (Amman, University of Jordan, 1980), p. 54.

Table 2. Cohort period rates and cumulative cohort fertility
by age at survey: Syrian Arab Republic

Age group of cohort at end of period	Number of women in cohort	Years prior to survey						
		0-4	5-9	10-14	15-19	20-24	25-29	30-34
Cohort-period fertility rates								
10-14	6	0.000	0.000	0.001	0.002	0.001	0.001	0.001
15-19	436	0.040	0.043	0.052	0.053	0.046	0.048	0.054
20-24	824	0.216	0.228	0.253	0.223	0.213	0.212	
25-29	810	0.329	0.341	0.359	0.337	0.320		
30-34	700	0.317	0.329	0.361	0.346			
35-39	639	0.293	0.299	0.323				
40-44	552	0.196	0.206					
45-49	520	0.076						
Cumulative fertility of cohorts at end of period								
10-14		0.000	0.002	0.004	0.009	0.003	0.003	0.005
15-19		0.203	0.221	0.270	0.266	0.235	0.246	0.278
20-24		1.300	1.409	1.532	1.352	1.309	1.335	
25-29		3.053	3.238	3.149	2.996	2.937		
30-34		4.821	4.795	4.799	4.668			
35-39		6.259	6.294	6.281				
40-44		7.275	7.312					
45-49		7.690						

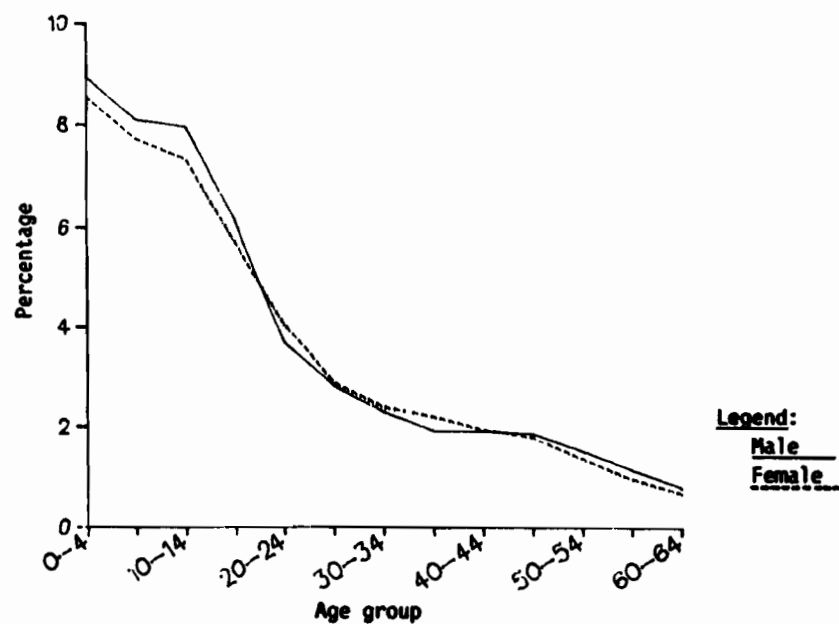
Source: S. Singh, "Birth histories", WFS Comparative Studies, Cross-national Summaries: Additional Tables (Voorburg, Netherlands, ISI/WFS, 1984), p. 63.

Table 3. Age-specific fertility rates for selected periods from the 1970 and 1976 censuses, 1977/78 follow-up demographic surveys and SFS data: Syrian Arab Republic

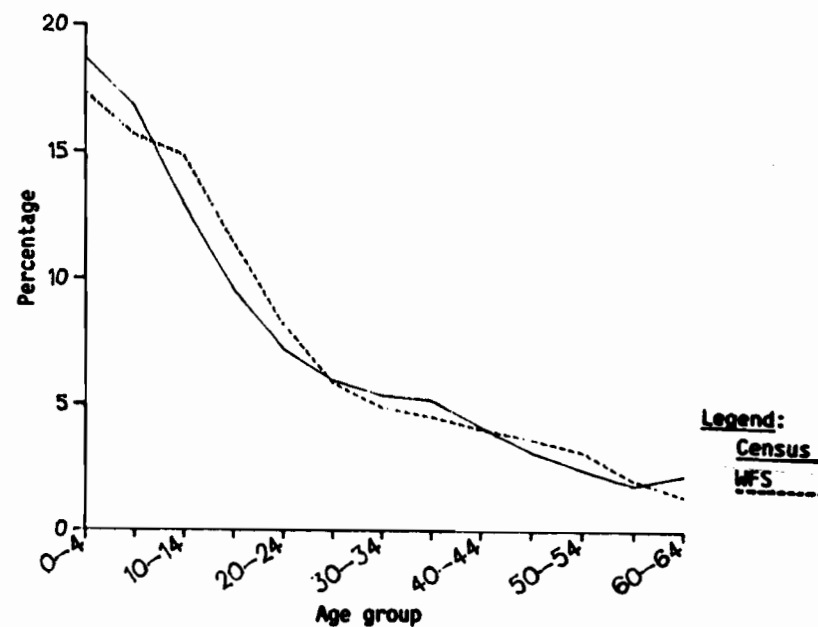
Age group	1970 census (1)	1969-1971 SFS (2)	1976 census (3)	1975-1977 SFS (4)	1977/78 survey (5)	Percentage change	
						Outside (1) - (5)	SFS (2) - (4)
15-19	0.153	0.122	0.113	0.122	0.125	-18.3	0.0
20-24	0.318	0.318	0.280	0.299	0.315	- 0.9	- 6.0
25-29	0.380	0.347	0.345	0.334	0.368	- 3.2	- 3.8
30-34	0.339	0.316	0.308	0.308	0.313	- 7.7	- 2.5
35-39	0.260	0.257	0.237	0.238	0.230	-11.5	- 7.4
40-44	0.135	0.149	0.124	0.129	0.105	-22.2	-13.2
45-49	0.045	..	0.040	0.043	0.036	-20.0	..
TFR	8.2	7.8	7.2	7.4	7.5	- 8.5	- 5.1

Source: M.N. Hallak and A.G. Hill, "Levels and trends of fertility and mortality in the Syrian Arab Republic", in Levels and Trends of Fertility and Mortality in Selected Arab Countries of West Asia (Amman, University of Jordan, 1980).

**Figure I. Distribution of males and females
as a percentage of the total population
by five-year age groups: Syrian Arab Republic**

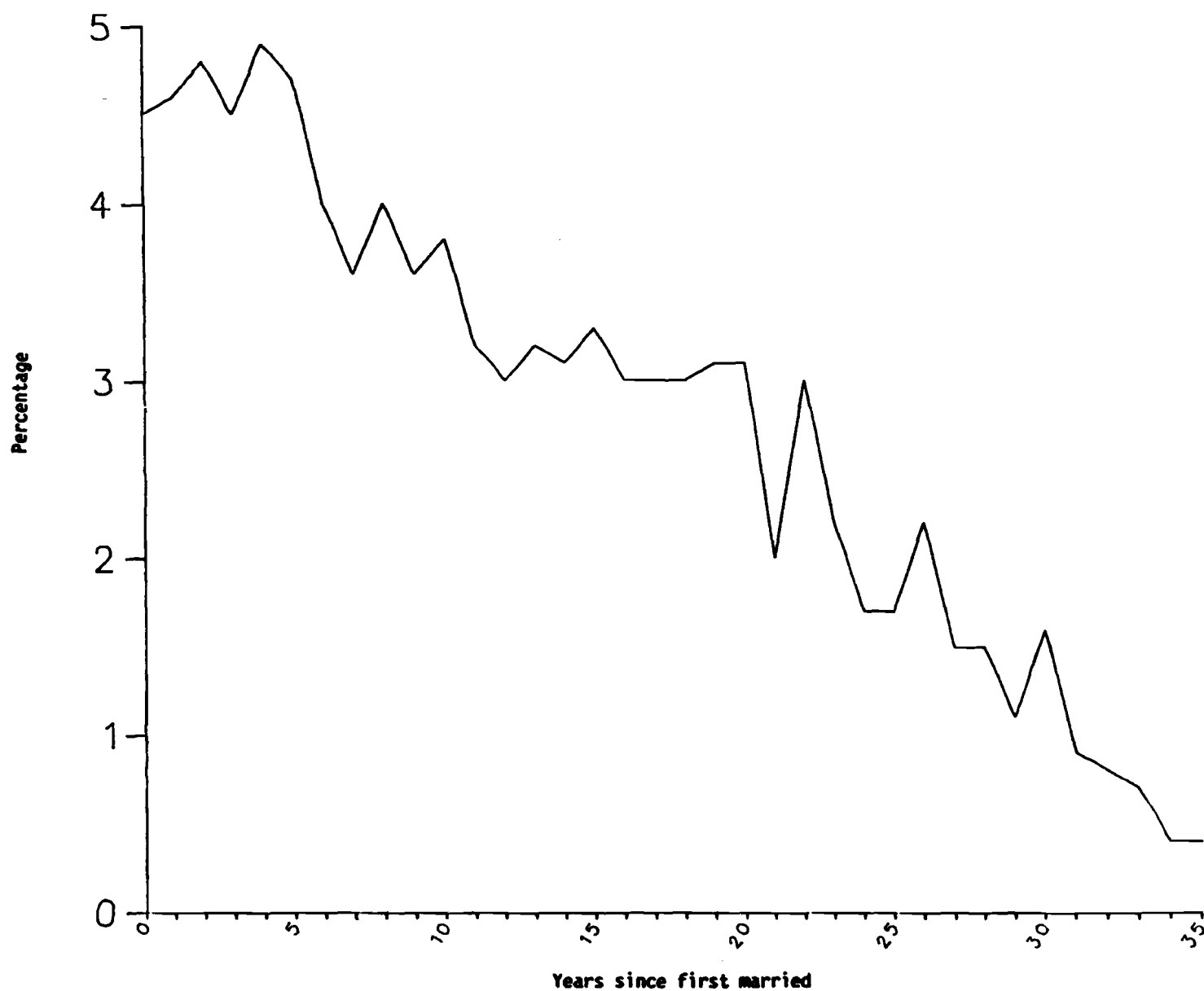


**Figure II. Distribution of the female
population by five-year age groups:
World Fertility Survey (1978) and
1970 census: Syrian Arab Republic**

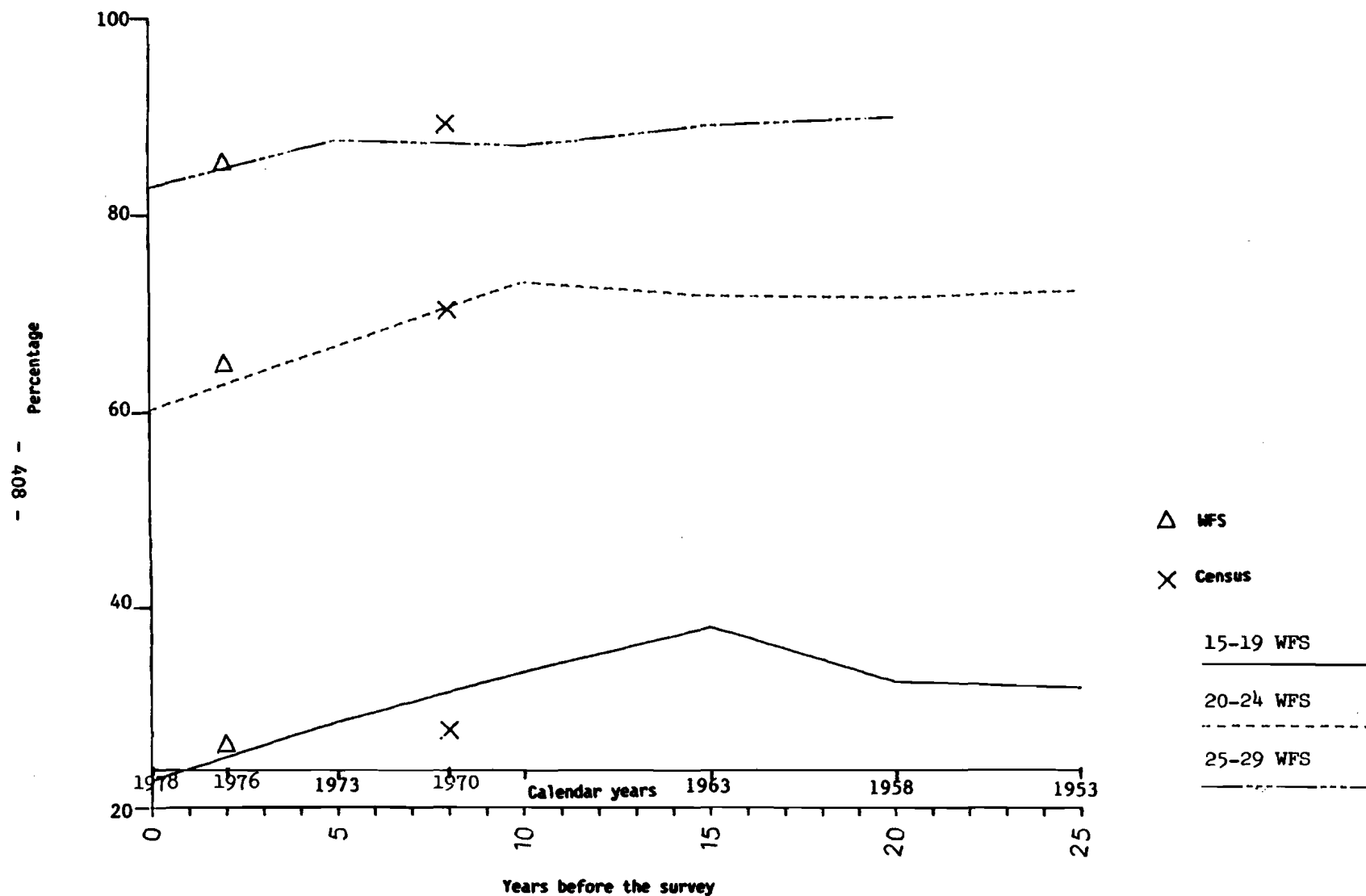


Source: Central Bureau of Statistics,
Syria Fertility Survey, 1978. Principal Report,
vol. I (Damascus, 1982), p. 23, table 3.1.

**Figure III. Distribution of ever-married women aged 15-49
by years since first married: Syrian Arab Republic**

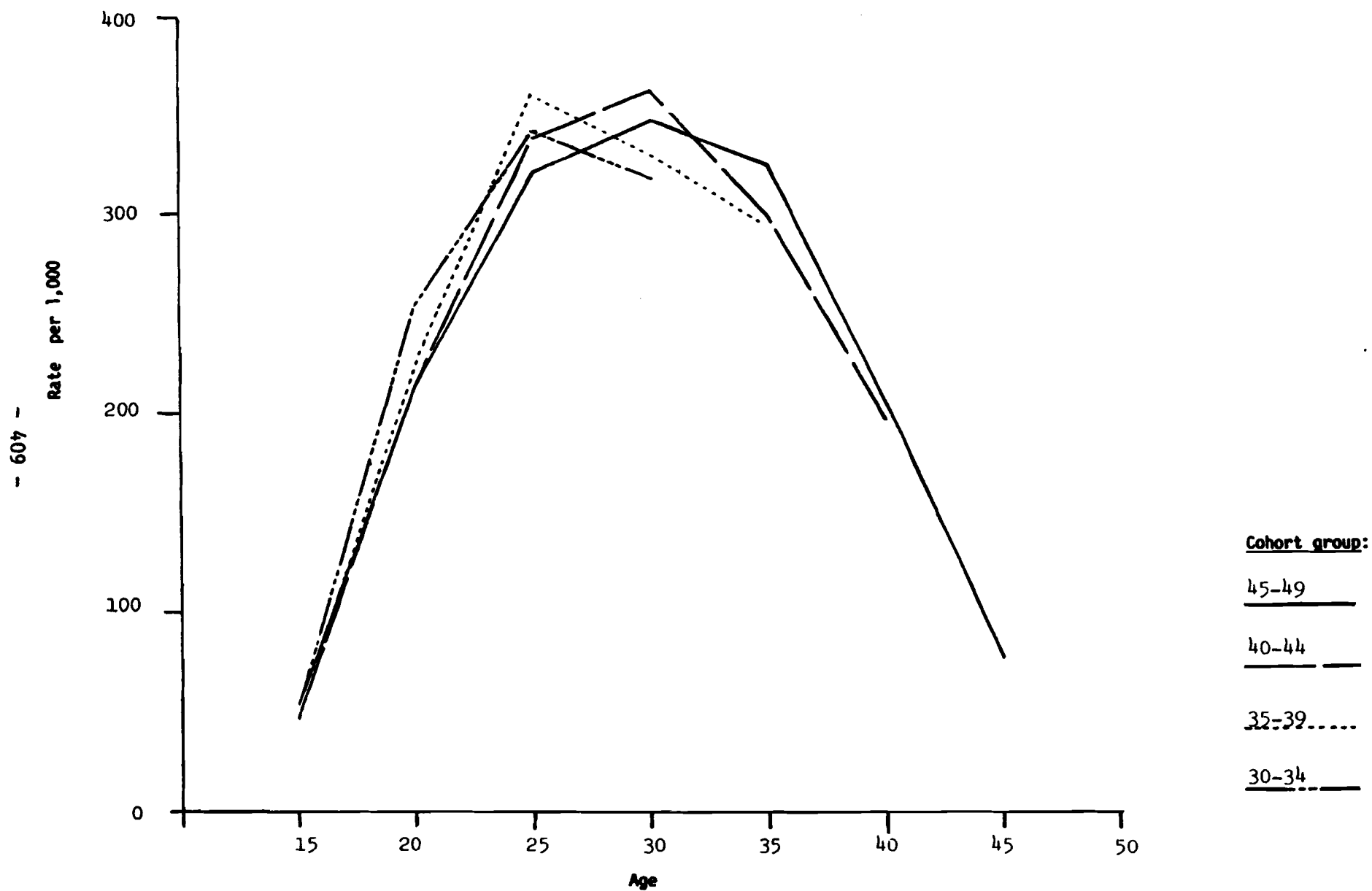


**Figure IV. Proportions ever-married at designated periods prior to the survey
for selected age groups: Syrian Arab Republic**

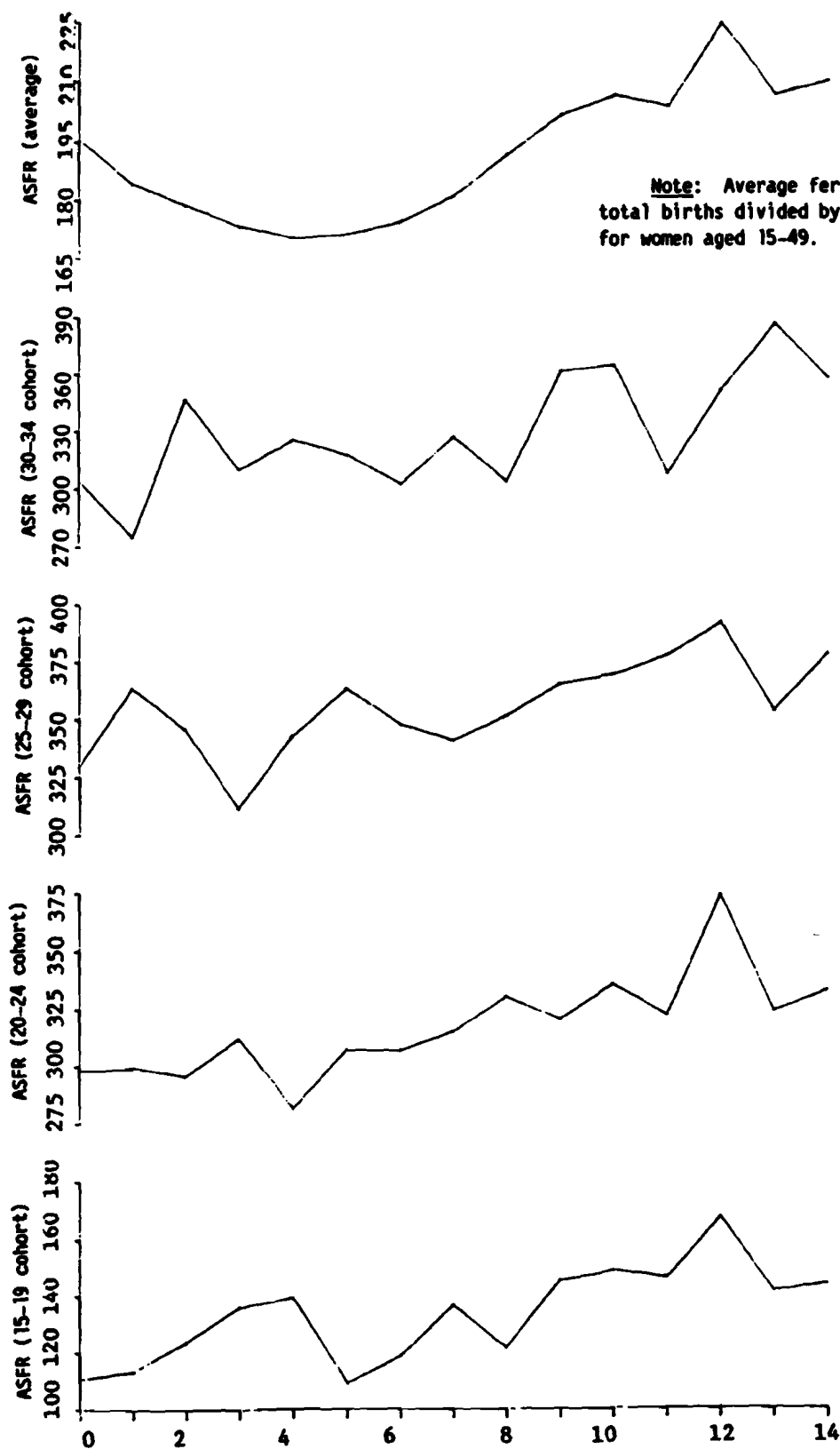


Source: Ibrahim Ali, "Evaluation of the Syria Fertility Survey", (unpublished), table 6.

**Figure V. Cohort-period fertility rates for women aged 30-49 at interview:
Syrian Arab Republic**



**Figure VI. Age-specific fertility rates for selected cohorts and average fertility rate for single years before the survey:
Syrian Arab Republic**



Note: Average fertility rate is total births divided by total exposure for women aged 15-49.

THAILAND

Thailand has had a long history of data collection, and the Survey of Fertility in Thailand (SOFT) is only the most recent in a series of surveys. Birth registration has been estimated to be roughly 70-80 per cent complete in the period since 1960 (National Research Council, 1980) and recent censuses include ones taken in 1960 and 1970. Two dual-record type surveys (Surveys of Population Change - SPC) were conducted in the periods 1964-1967 and 1974-1976. Two rounds of a panel-type survey (Longitudinal Study of Economic, Social and Demographic Change - LS) were conducted in 1969-1970 and 1972-1973. The WFS data were collected between April and June 1975. Since the WFS, a contraceptive prevalence survey was conducted in 1978.

Age data

Eighty-five per cent of respondents reported the month and year of birth (Chidambaram and Sathar, 1984). The Myer's index of digital preference was calculated as 2.7 for women, showing only slight preference for 0, 2, 4 and 8 (Rutstein, 1984). Figure I compares the male and female age distribution from WFS. There appears to be an under-enumeration of children aged 0-4. The sex ratio at 25-29 is strikingly low, which may be due to an under-enumeration of men. In figure II, the female age distribution is compared to the 1970 census. Despite a recent rapid fertility decline in Thailand, a decline in the proportion of the population 0-4 from 16.6 per cent in 1970 to 13.1 per cent in 1975 is not possible, thus suggesting under-enumeration of children aged 0-4 and/or misreporting of age. The proportion aged 15-19 is high relative to the census. However, there is no evidence of any major age misstatement among older women, in contrast to many of the other WFS surveys. In general, in the eligible ages, the WFS age distribution looks smoother than that of the census.

Marriage history data

The marriage history data were based on a sample of 3,820 ever-married women. Seventy-five per cent of respondents gave the month and year of first marriage and the other 25 per cent gave the year only (Chidambaram and Sathar, 1984). The percentage distribution of years since first marriage shown in figure III suggests no particular digit or year preference for the dating of first marriage nor is there marked heaping of marriages in the recent past, although, there seem to be considerable year-to-year fluctuations.

A comparison (fig. IV) of the percentage ever-married from WFS with other data sources, including the 1960 and 1970 census data and the 1975 round of SPC, reveals a puzzling discrepancy in trends and current proportions ever-married. The WFS data show a clear downwards trend over time in the proportions ever-married in each age group, with particularly strong declines

in the 20-24 cohort. The census data, on the other hand, suggest no change between 1960 and 1970, and the 1975 SPC data as well as the 1978 Contraceptive Prevalence Survey (CPS) (Kamnuansilpa, 1981) confirm this absence of trend through 1978. These divergent findings are particularly puzzling given that the WFS sample was selected from the 40,000 households included in the SPC survey. Although the trends in marriage proportions evident in the WFS data are perfectly plausible in and of themselves, the contradictory evidence from several outside sources raises real questions about the validity of the WFS marriage data. In fact, in the WFS data themselves, the mean age of marriage (for women marrying before age 25) is essentially identical for all five-year cohorts from 25-49 (National Statistical Office, 1977).

On the basis of these comparisons, the Panel on Thailand (National Research Council, 1980) for the NAS Committee on Population and Demography chose to accept the 1970 census figure as the best estimate of current marital distribution. Thus, the proportions currently married from the WFS data are likely to be under-estimated. This will cause an over-estimate of age-specific fertility rates, since they are based on births to the ever-married sample, inflated by the reciprocal of the proportion ever-married.

Birth history data

Of all births reported, 84.2 per cent were recorded with a month and a year (Chidambaram and Sathar, 1984). If parity for women ever-married five years before the survey is calculated from WFS data, the WFS shows slightly lower parity than does the census (United States Bureau of the Census, 1978) for women 15-34 and slightly higher parity for women over 35, but the differences are small (table 1).

An examination of the cohort-period fertility rates in table 2 does not suggest any major problem with omissions or displacements. (This is confirmed in fig. V.) The 45-49 cohort may have omitted some births 25 or more years ago but given that current parity of the 45-49 group (6.5) substantially exceeds the parity of the 40-44 group (5.8), these omissions are likely to be small. For women over 25, there is a pattern of continuous fertility decline. For the 20-24 age group, the decline is not noticeable until the most recent period. There is some possibility that the fertility of the 30-34 cohort is too high, particularly in the 5-9 years before the survey. Figure VI shows fluctuating trends in age-specific fertility in the past 15 years with avoidance of year one, and preference for even numbers, 6 to 10 years before the survey.

Table 3 shows age-specific fertility rates from alternative sources, which show a sharp fertility decline confirmed by both census and WFS sources, with the fertility decline based on WFS showing a sharper downward trend for ages 15-24 over the 10-year period.

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Table 1. Children ever born per ever married woman
from WFS and 1970 census: Thailand

Age group	1970 census	1970 WFS	1975 WFS
15-19	0.7	0.6	0.7
20-24	1.8	1.6	1.5
25-29	3.0	3.0	2.6
30-34	4.3	4.1	3.9
35-39	5.5	5.5	4.9
40-44	6.4	6.6	6.1
45-49	6.5	..	6.8

Source: 1970 census: United States Bureau of the Census, Country Demographic Profiles, Thailand, (Washington, D.C., Government Printing Office, 1978), p. 10.

Table 2. Cohort period rates and cumulative cohort fertility
by age at survey: Thailand, 1975

Age group of cohort at end of period	Number of women in cohort	Years prior to survey						
		0-4	5-9	10-14	15-19	20-24	25-29	30-34
Cohort-period fertility rates								
10-14	3	0.002	0.000	0.000	0.000	0.001	0.001	0.000
15-19	214	0.021	0.027	0.026	0.030	0.025	0.028	0.022
20-24	609	0.147	0.176	0.189	0.179	0.190	0.167	
25-29	746	0.221	0.282	0.293	0.316	0.326		
30-34	607	0.200	0.263	0.297	0.327			
35-39	601	0.163	0.222	0.265				
40-44	580	0.115	0.157					
45-49	460	0.040						
Cumulative fertility of cohorts at end of period								
10-14		0.012	0.000	0.001	0.001	0.005	0.004	0.002
15-19		0.106	0.136	0.133	0.155	0.127	0.141	0.112
20-24		0.872	1.015	1.100	1.022	1.093	0.948	
25-29		2.118	2.511	2.489	2.671	2.578		
30-34		3.510	3.805	4.157	4.212			
35-39		4.619	5.267	5.535				
40-44		5.841	6.319					
45-49		6.520						

Source: WFS standard recode tapes.

Table 3. Age-specific fertility rates for selected periods from WFS, census data (own-children method), and SPC a/: Thailand

Age group	1960-1964		1965-1969		1970-1974		Percentage change	
	census (1)	WFS (2)	census (3)	WFS (4)	SPC (5)	WFS (6)	WFS (2) - (6)	Outside (1) - (5)
15-19	0.086	0.084	0.089	0.081	0.081	0.069	-17.9	- 5.8
20-24	0.274	0.266	0.267	0.255	0.239	0.217	-18.4	-12.8
25-29	0.313	0.311	0.299	0.295	0.247	0.221	-28.9	-21.1
30-34	0.281	0.296	0.260	0.243	0.182	0.183	-38.2	-35.2
35-39	0.215	..	0.206	0.201	0.143	0.158	..	-33.5
40-44	0.106	..	0.100	..	0.071	0.072	..	-33.0
45-49	0.020	..	0.019	..	0.018	0.030	..	-10.0
TFR	6.5	6.6 b/	6.2	6.0 b/	4.9	4.8	-27.3	-24.6

Source: census and SPC: National Research Council, Committee on Population and Demography, Panel on Thailand, Fertility and Mortality Changes in Thailand, 1950-1975 (Washington, D.C., National Academy of Sciences, 1980). Estimates are from "own-children" analysis of 1970 census data, table 5. Results from SPC revised and adjusted, table 19.

a/ SPC: Survey of Population Change.

b/ For the purpose of calculating a total fertility rate, the age-specific fertility rates from the census were used when the age-specific rate from WFS was not available.

Figure I. Distribution of males and females as a percentage of the total population by five-year age groups: Thailand

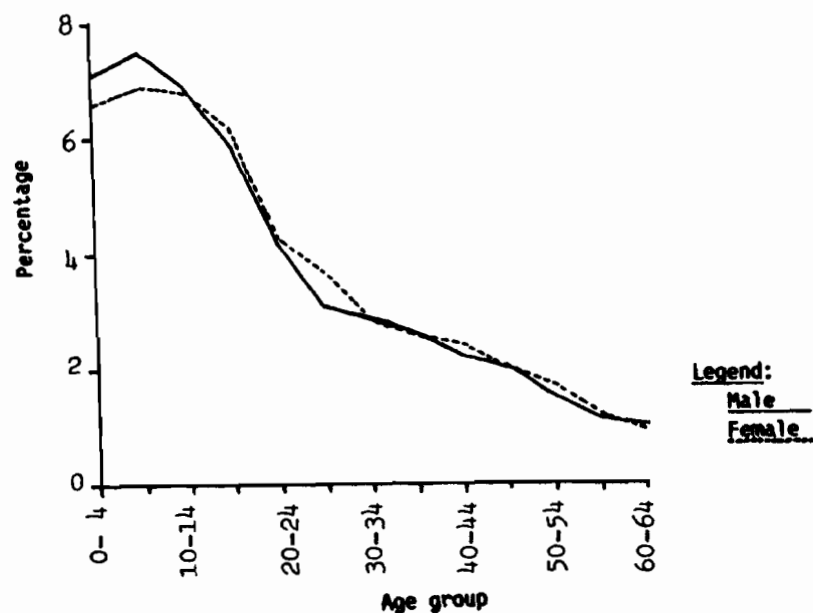
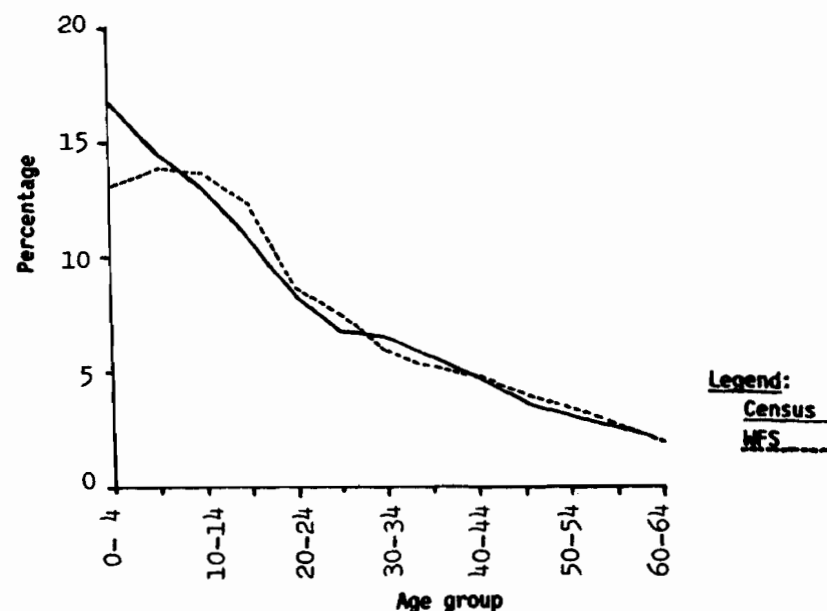


Figure II. Distribution of the female population by five-year age groups: World Fertility Survey (1975) and 1970 census: Thailand



Source for the 1970 census: United States Bureau of the Census, Country Demographic Profiles: Thailand (Washington, D.C., Government Printing Office, April 1978).

**Figure III. Distribution of ever-married women aged 15-49
by years since first married: Thailand**

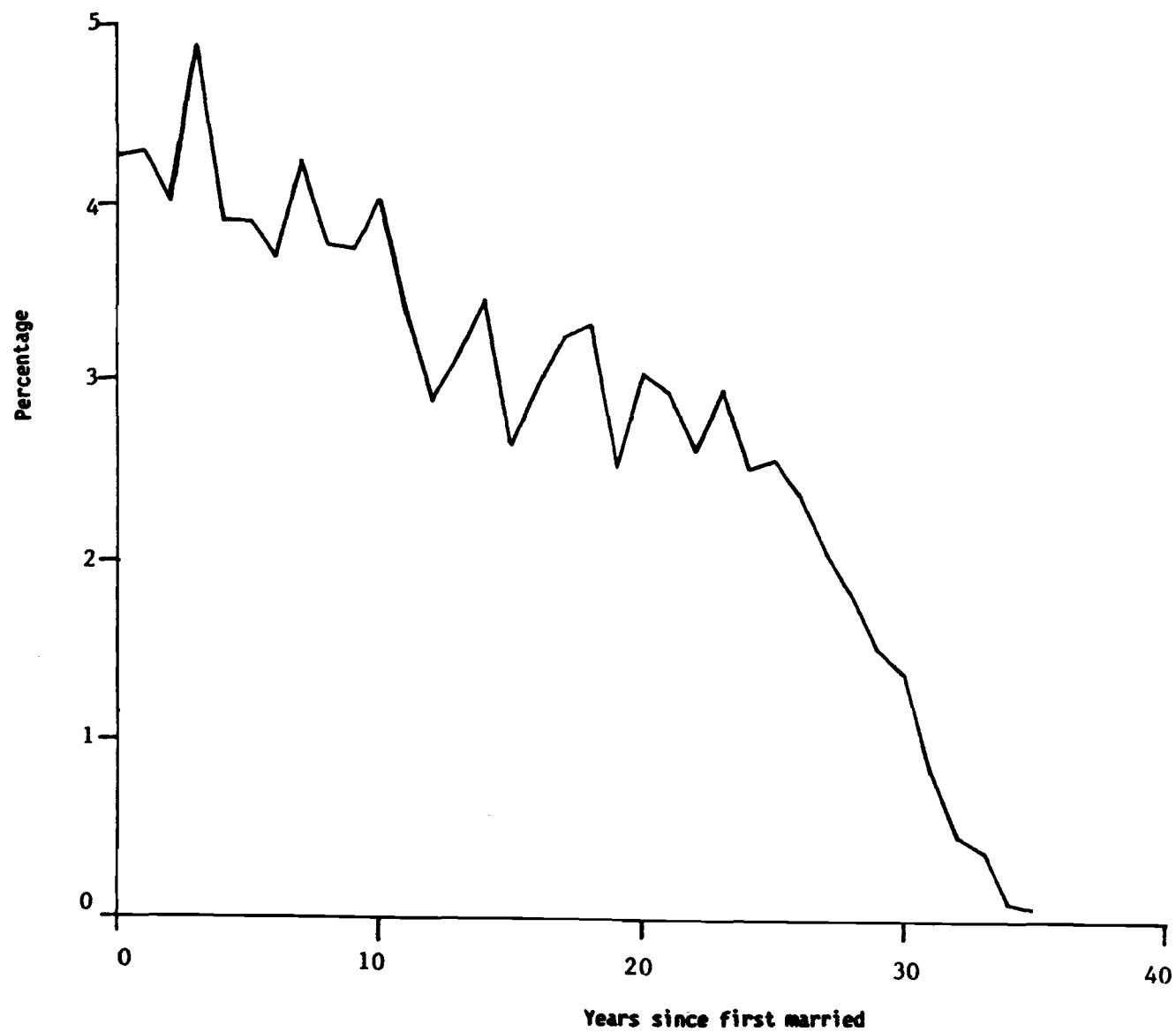
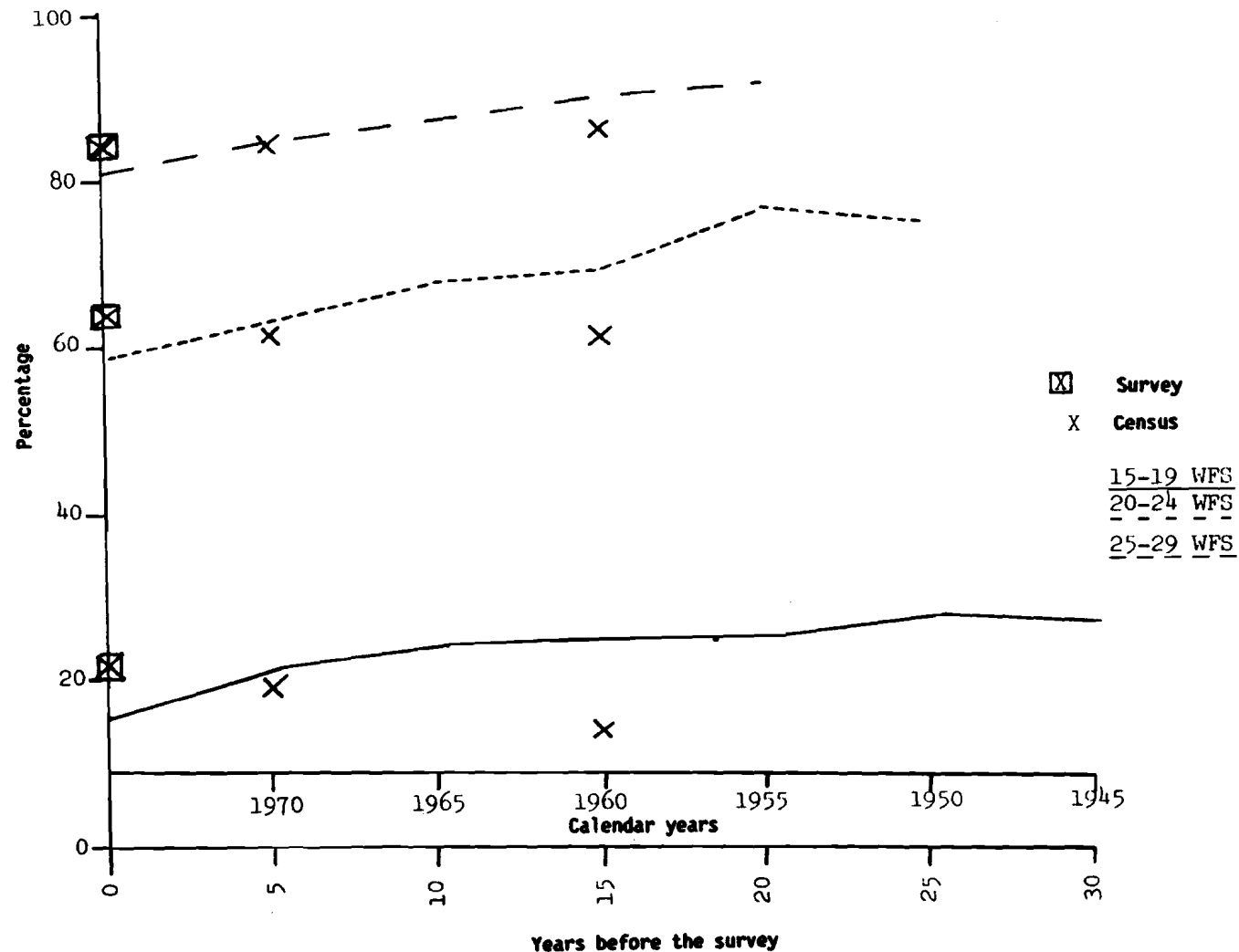


Figure IV. Proportions ever-married at designated periods prior to the survey for selected age groups: World Fertility Survey data and other sources: Thailand



Source: A. Chamratrithirong, "Nuptiality in Thailand: a cross-sectional analysis of the 1970 census", East-West Population Institute Working Paper No. 69 (Honolulu, November 1980).

Figure V. Cohort-period fertility rates for women aged 30-49 at interview:
Thailand

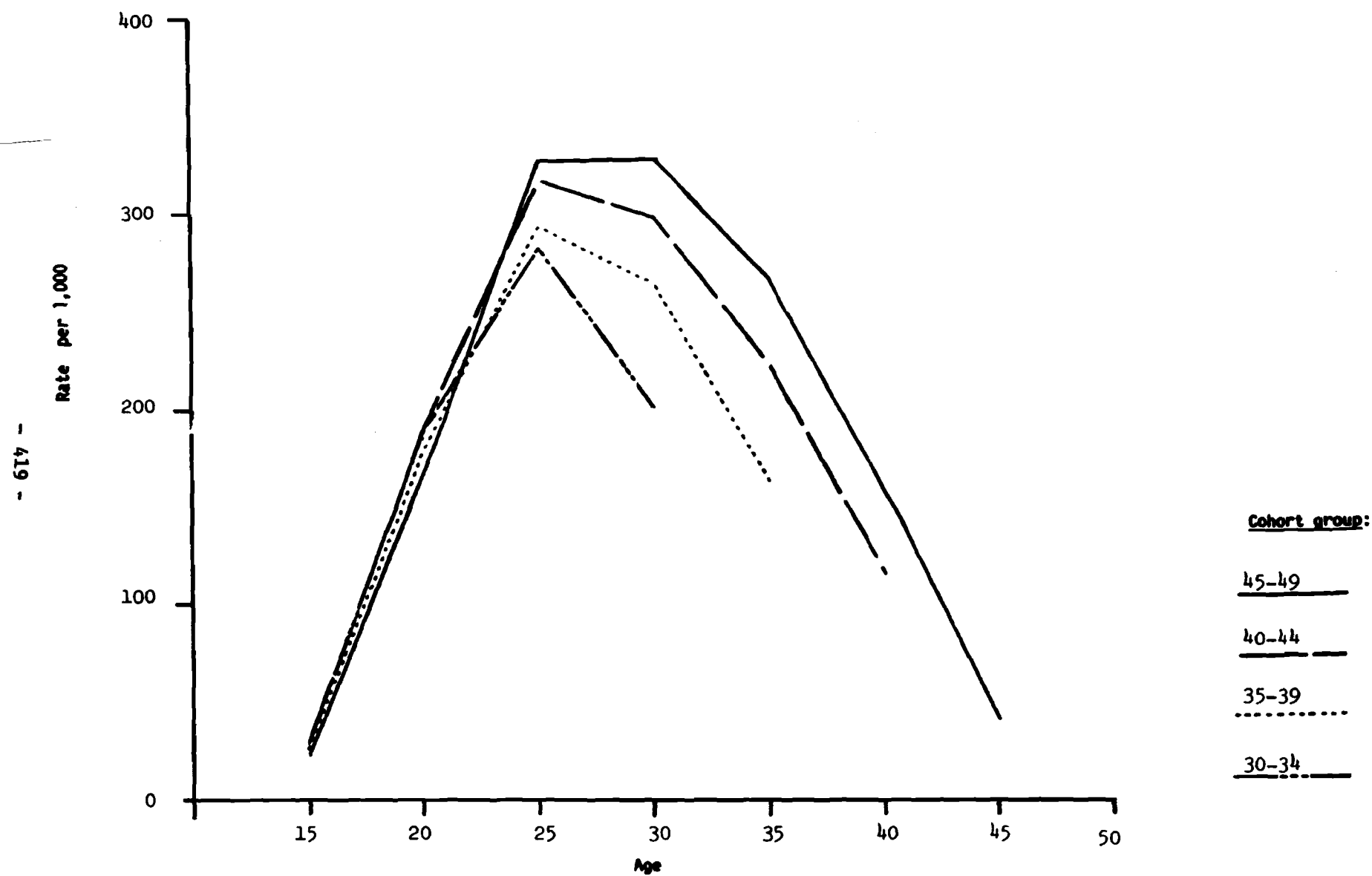
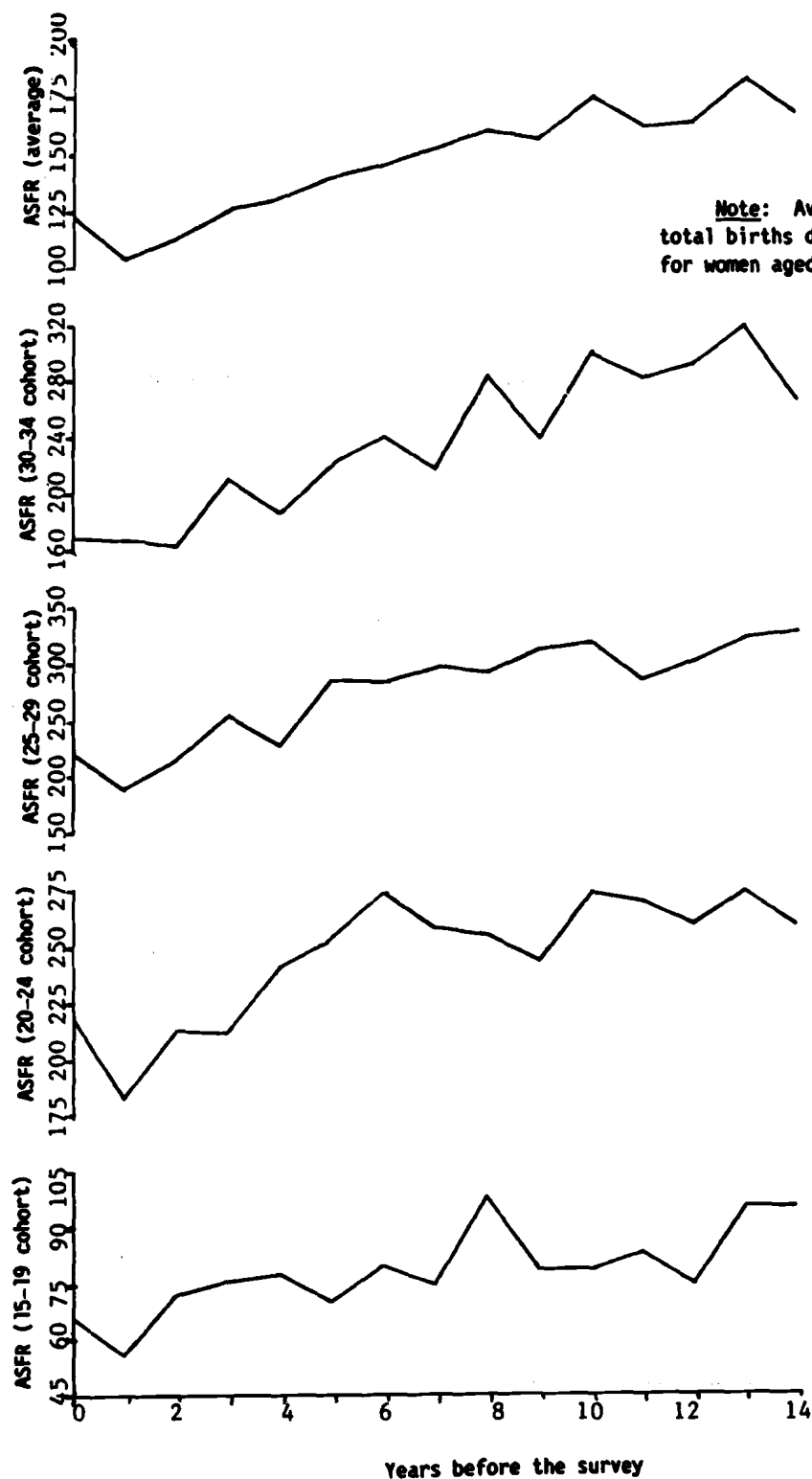


Figure VI. Age-specific fertility rates for selected cohorts and average fertility rate for single years before the survey: Thailand



TRINIDAD AND TOBAGO

The Trinidad and Tobago Fertility Survey (TTFS) was carried out between April and June of 1977. Since the vital registration system in Trinidad and Tobago is fairly complete, the TTFS data serve as a supplement and check to the information already available from vital statistics. The first census of Trinidad and Tobago was conducted in 1844; the second, in 1851. From 1851 to 1981, censuses were conducted at 10-year intervals, with a break in the series because of the Second World War. A census was conducted in 1946, followed by ones in 1960, 1970 and 1980 (Central Statistical Office, 1981). In addition to information from the registration and census, fertility information is available from the 1970 Family Planning Survey conducted by the Institute of Social and Economic Research (ISER) (Hunte, 1983).

Age data

The month and year of birth was reported by 98.3 per cent of the respondents in the individual questionnaire, while only 1.7 per cent responded in terms of age (Chidambaram and Sathar, 1984). Myer's index of digital preference for females in the household survey was 5.1 which is a slight improvement over 8.4 among females in the 1970 census (Rutstein, 1984).

Examination of the male and female age distribution from the household survey shows lower proportion in the age groups 0-4 and 5-9 than in the age groups 10-14 and 15-19 for both sexes (fig. I). This is possibly the result of fertility declines in the past. There appears to be an excess of males among those aged 25-29 years. The excess of females aged 50-54 years is probably the result of shifting of women beyond the age range of eligibility for the individual interview.

Comparison of the TTFS age distribution with the 1970 age distribution (fig. II) shows some discrepancy in the young age groups and in the age groups from 40 to 54 years. At ages below 14, the proportion in the TTFS is lower than that of the census, and the difference probably reflects fertility decline, since the census and TTFS are seven years apart. The TTFS proportion among women 40-44 and 45-49 years is less than that of the census but is greater than the census proportion among women 50-54 years. This further confirms the shifting of women in their forties to the age groups 50-54 years.

Marriage history data

Marriage history data are based on a sample of 3,471 ever-married women. In Trinidad and Tobago, in addition to marriage and common-law unions, a third category, visiting unions, is included in the definition of unions. A visiting union is one in which a woman has a partner but does not share a household with him. Visiting unions are quite common and were included in the definition of union in the 1970 census except that the census only included those visiting unions that resulted in a birth in the past 12 months.

All of the 3,471 women ever in a union reported the date of their first union by giving both the month and year (Chidambaram and Sathar, 1984). The percentage distribution of ever-married women by single-year duration of

marriage (fig. III) shows a deficit of marriages in the period 0 and 1 year before the survey while peaks occur in the periods 5, 7, 18 and 23 years before the survey. Overall, the distribution appears fairly smooth, increasing from the past to the most recent period.

Age at marriage has been increasing in Trinidad and Tobago, as indicated in the reconstruction of proportions married from the TTFS marriage history (fig. IV). Declines in the proportion married are apparent among 15-19- and 20-24-year olds from the period 20 years before the survey to the most recent period. The proportion married among those two age groups appears to be slightly over-estimated in the period five years before the survey and under-estimated in the adjacent periods, 0 and 10 years before the survey. It is likely that the dates of the more recent marriages were shifted from the period 0-4 years before the survey to the period 5-9 years before the survey, thus exaggerating the increase in age at marriage in the recent period. The deficit of marriages in the more recent period is also apparent in figure III.

Comparison of the TTFS marital status distribution with that from the 1970 census and the ISER Family Planning Survey is also presented in figure IV. There appears to be close correspondence with the ISER data among the 25-29- and 20-24-years-olds. Among the 15-19-year-olds the difference can probably be accounted for by the over-representation of the proportion married five years before the survey in the TTFS. As for the comparison with the 1970 census, the census definition of women in visiting unions included only those women who had had a baby in the previous 24 months. However, when TTFS data was reconstructed for 1970, reflecting the census definition, the comparison was good.

Birth history data

Of all reported births, 94.5 per cent were reported with a month and a year of birth, while for 5.5 per cent, only the year of birth was available (Chidambaram and Sathar, 1984). The parity distribution of all women by age shows monotonically increasing parity with age, with the oldest women, 45-49 years, having an average of 5.8 children. The TTFS distribution reconstructed to 1970 is higher in every age group when compared with the 1970 census parity distribution. Differences, however, are not big.

Cohort-period rates from 30-34 years in the past up to the survey date in intervals of five years, which are presented in table 2, show declines in fertility among all age groups from 15-19 years in the past up to the most recent period. Figure V shows the cohort fertility profiles for four cohorts. There does not appear to be any signs of forward displacement of births by the older women.

Trends in fertility implied by the birth history are compared with those obtained from birth registration in table 3. Fertility rates from the two sources match well in the most recent period (1972-1976), both in terms of level and age-pattern of fertility. In the more distant period, however, the total fertility rates, from the two sources differ by 0.8 children, the rate from TTFS being higher. Differences in total fertility rates between the two sources diminish as one gets closer to the survey date. There are two

possible explanations for the differences, one being that too high estimates of the number of women were used for the denominator in the calculation of rates from vital registration and also possible under-registration of births.^{1/} Another possible explanation is that of a possible backward shifting of births in the TTFS from the most recent period 0-4 years to the period 5-9 years before the survey. This second possibility is explored by examining fertility rates from the TTFS for single years preceding the survey date (fig. VI). Backward shifting of births from the most recent period does not appear to be a problem. Although rates for age groups fluctuate somewhat, the average rates show a smooth declining trend up to the most recent period.

Note

^{1/} It is suspected that mid year population estimates of the country were over-estimated by about 5-10 per cent (Hunte, 1983).

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Table 1. Children ever born per woman
from TTFS and the 1970 census:
Trinidad and Tobago

Age group	1970		1977 TTFS
	census	TTFS	
15-19	0.12	0.15	0.11
20-24	1.07	1.11	0.85
25-29	2.65	2.66	1.96
30-34	4.06	4.14	3.18
35-39	4.93	5.21	4.30
40-44	5.24	5.60	5.20
45-49	..	..	..

Source: D. Hunte "Evaluation of the
Trinidad and Tobago Fertility Survey, 1977",
WFS Scientific Reports, No. 44 (Voorburg,
Netherlands, ISI/WFS, 1983), tables 15 and 16.

Table 2. Cohort period rates and cumulative cohort fertility
by age at survey: Trinidad and Tobago

Age group of cohort at end of period	Number of women in cohort	Years prior to survey						
		0-4	5-9	10-14	15-19	20-24	25-29	30-34
Cohort-period fertility rates								
10-14	0	0.000	0.000	0.000	0.002	0.003	0.001	0.003
15-19	1 330	0.023	0.033	0.041	0.064	0.065	0.060	0.061
20-24	1 017	0.140	0.161	0.217	0.247	0.245	0.244	
25-29	720	0.192	0.213	0.284	0.322	0.304		
30-34	637	0.143	0.178	0.233	0.275			
35-39	506	0.090	0.126	0.183				
40-44	406	0.053	0.076					
45-49	366	0.022						
Cumulative fertility of cohorts at end of period								
10-14		0.000	0.000	0.001	0.010	0.014	0.003	0.017
15-19		0.117	0.164	0.216	0.336	0.329	0.319	0.311
20-24		0.865	1.023	1.421	1.562	1.545	1.530	
25-29		1.982	2.487	2.981	3.157	3.053		
30-34		3.201	3.869	4.319	4.426			
35-39		4.319	4.948	5.339				
40-44		5.212	5.721					
45-49		5.831						

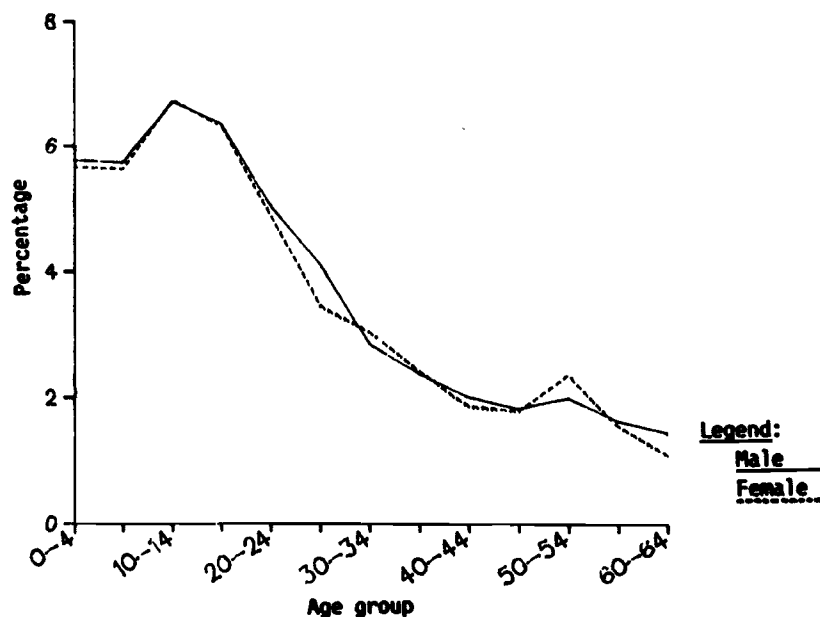
Source: S. Singh, "Birth histories", WFS Comparative Studies,
Cross-national Summaries: Additional Tables (Voorburg, Netherlands,
ISI/WFS, 1984), p. 93.

Table 3. Age-specific fertility rates for selected periods for TTFS
and birth registration data: Trinidad and Tobago

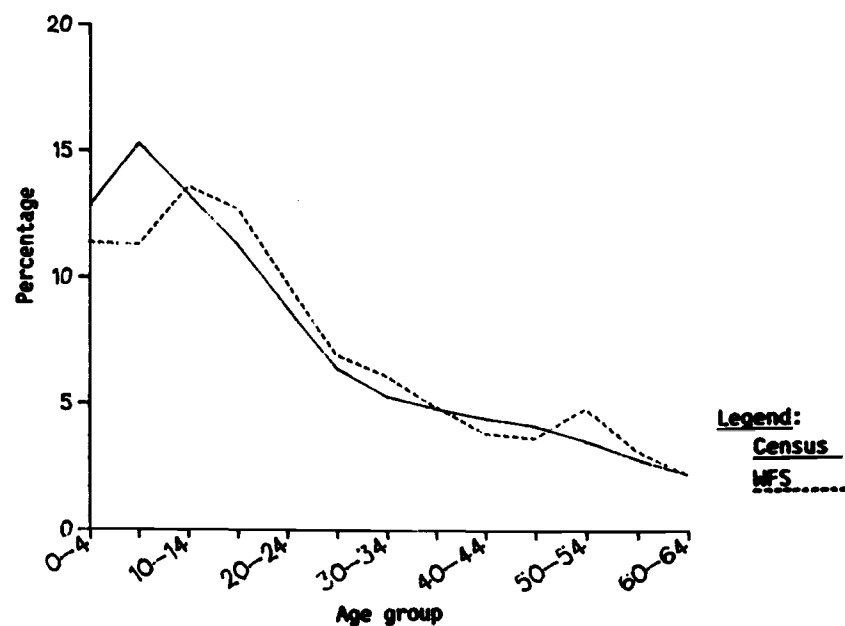
Age group	1962-1966		1967-1971		1972-1976		Percentage change	
	BR	TTFS	BR	TTFS	BR	TTFS	Outside	TTFS
15-19	0.113	0.118	0.088	0.087	0.084	0.079	-25.7	-33.0
20-24	0.260	0.292	0.215	0.215	0.197	0.193	-24.2	-33.9
25-29	0.242	0.281	0.175	0.200	0.175	0.174	-27.7	-38.1
30-34	0.174	0.216	0.125	0.162	0.117	0.118	-32.8	-45.4
35-39	0.117	0.150	0.083	0.104	0.068	0.083	-41.9	-44.7
40-44	0.035	..	0.027	0.049	0.024	0.030	-31.4	..
45-49	0.005	..	0.004	..	0.003	0.010	-40.0	..
TFR	4.7	5.5	3.6	4.1	3.3	3.4	-29.8	-38.2

Source: birth registration data, 1962-1966: Demographic Yearbook, Historical Supplement: Special Issue, (United Nations publication, Sales No. E/F.79.XIII.8), p. 468; birth registration data, 1967-1975: Central Statistical Office, Trinidad and Tobago Fertility Survey, 1977, Country Report, vol. I (Port of Spain, 1981), p. 58; birth registration data, 1976: Population and Vital Statistics Report, 1984 Supplement, (United Nations publication, Sales No. E/F.84.XIII.2), p. 158.

**Figure I. Distribution of males and females
as a percentage of the total population
by five-year age groups: Trinidad and Tobago**



**Figure II. Distribution of the female
population by five-year age groups:
World Fertility Survey (1977) and
1970 census: Trinidad and Tobago**



Sources: Central Statistical Office, Trinidad and Tobago Fertility Survey, 1977. Country Report (Port of Spain, 1981) - for the 1970 census: vol. I, table I.C, p. 7; for WFS data: vol. II, p. 528, table I.1.

**Figure III. Distribution of ever-married women aged 15-49
by years since first married: Trinidad and Tobago**

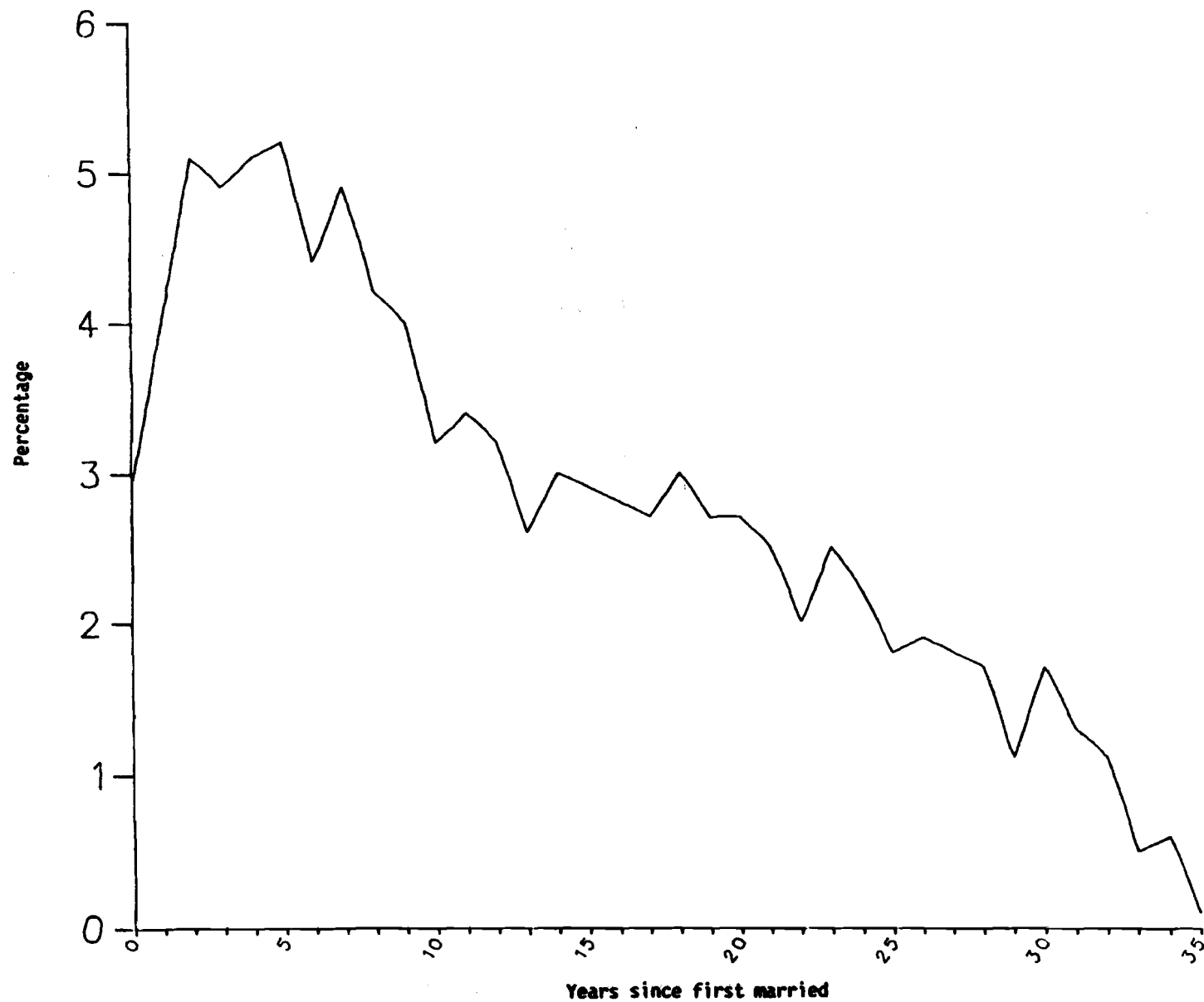
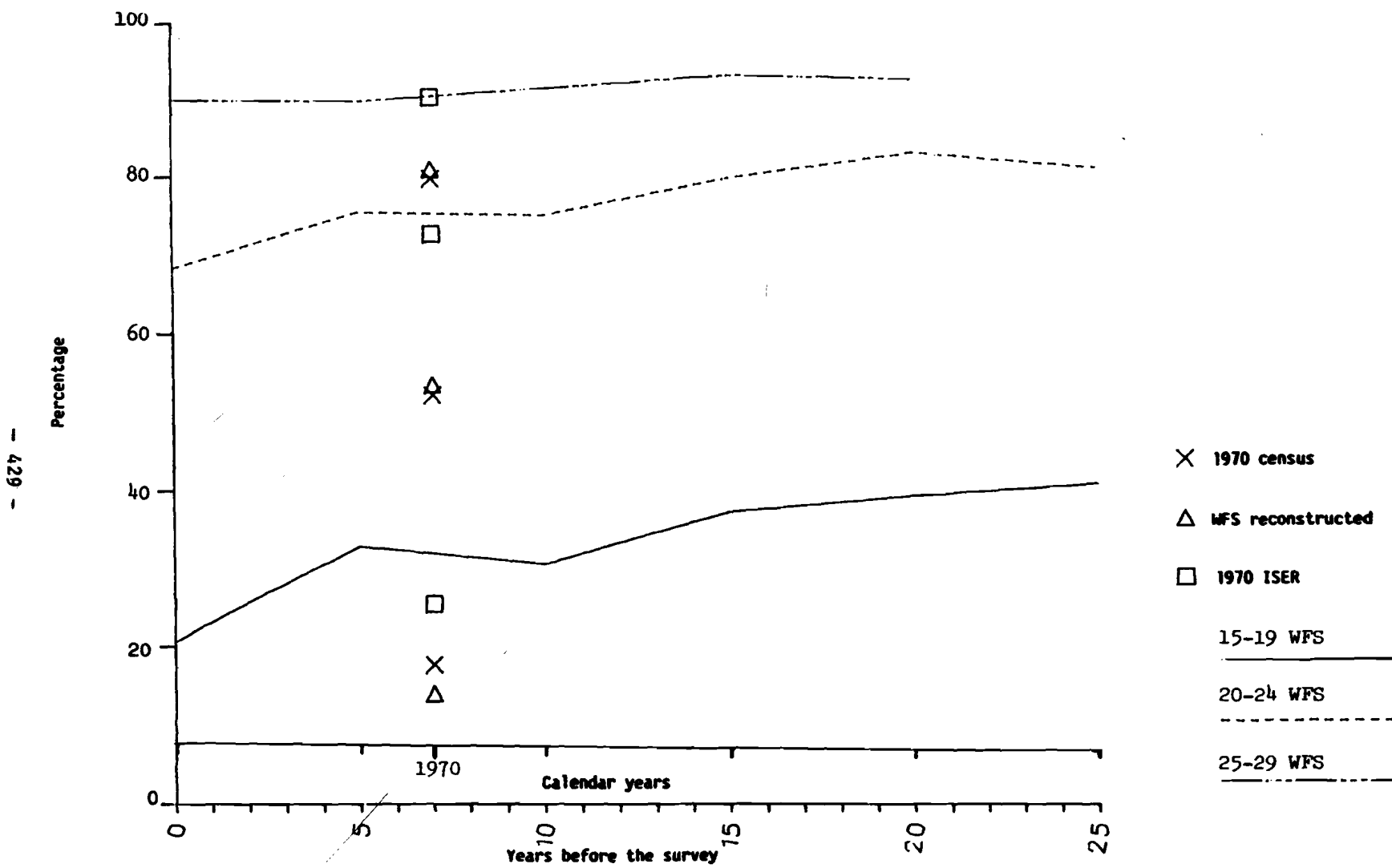


Figure IV. Proportions ever-married at designated periods prior to the survey for selected age groups: Trinidad and Tobago



Source: D. Hunte, "Evaluation of the Trinidad and Tobago Fertility Survey, 1977", *WFS Scientific Reports*, No. 44 (Voorburg, Netherlands, ISI/WFS, September 1983), tables 8 and 9.

**Figure V. Cohort-period fertility rates for women aged 30-49 at interview:
Trinidad and Tobago**

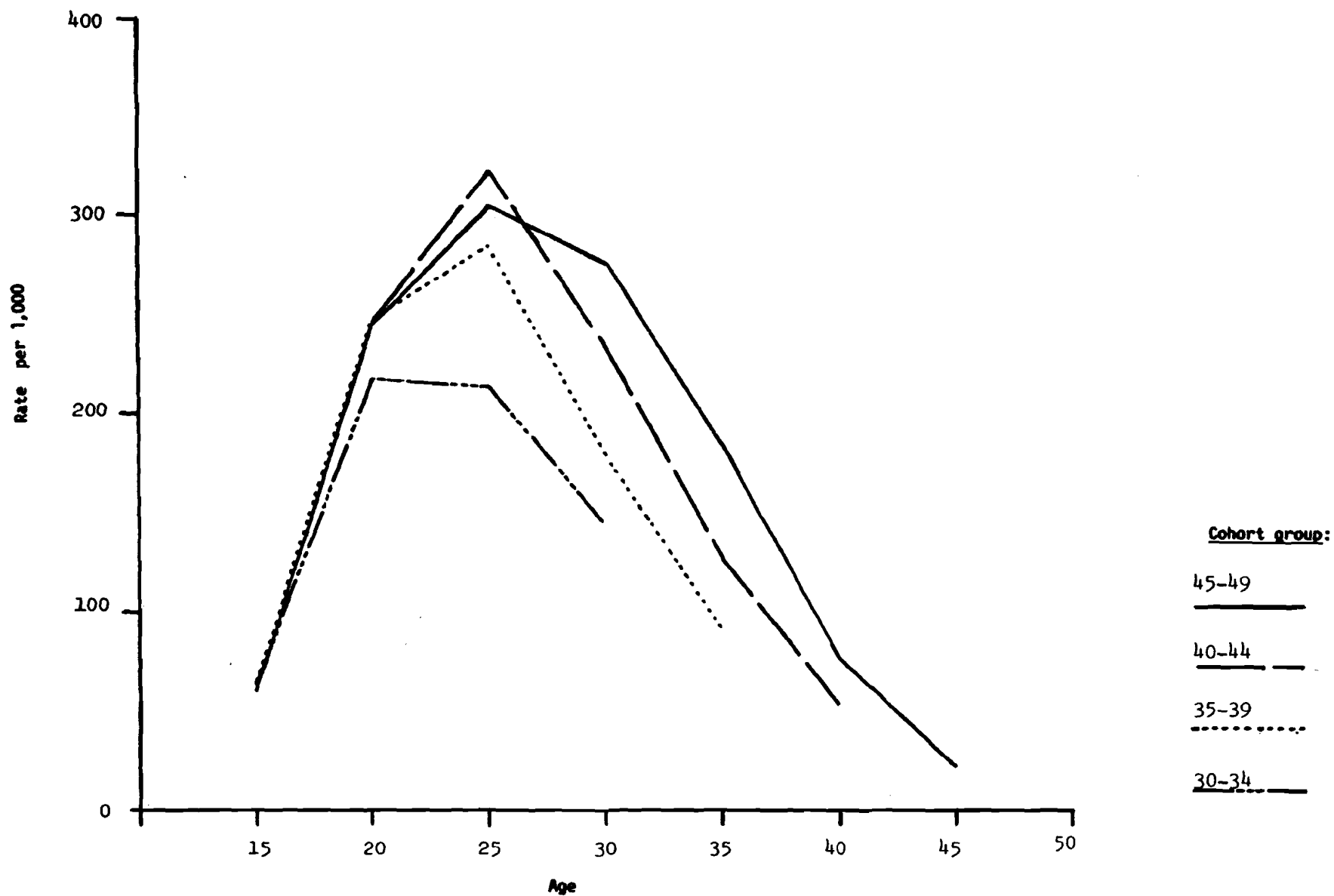
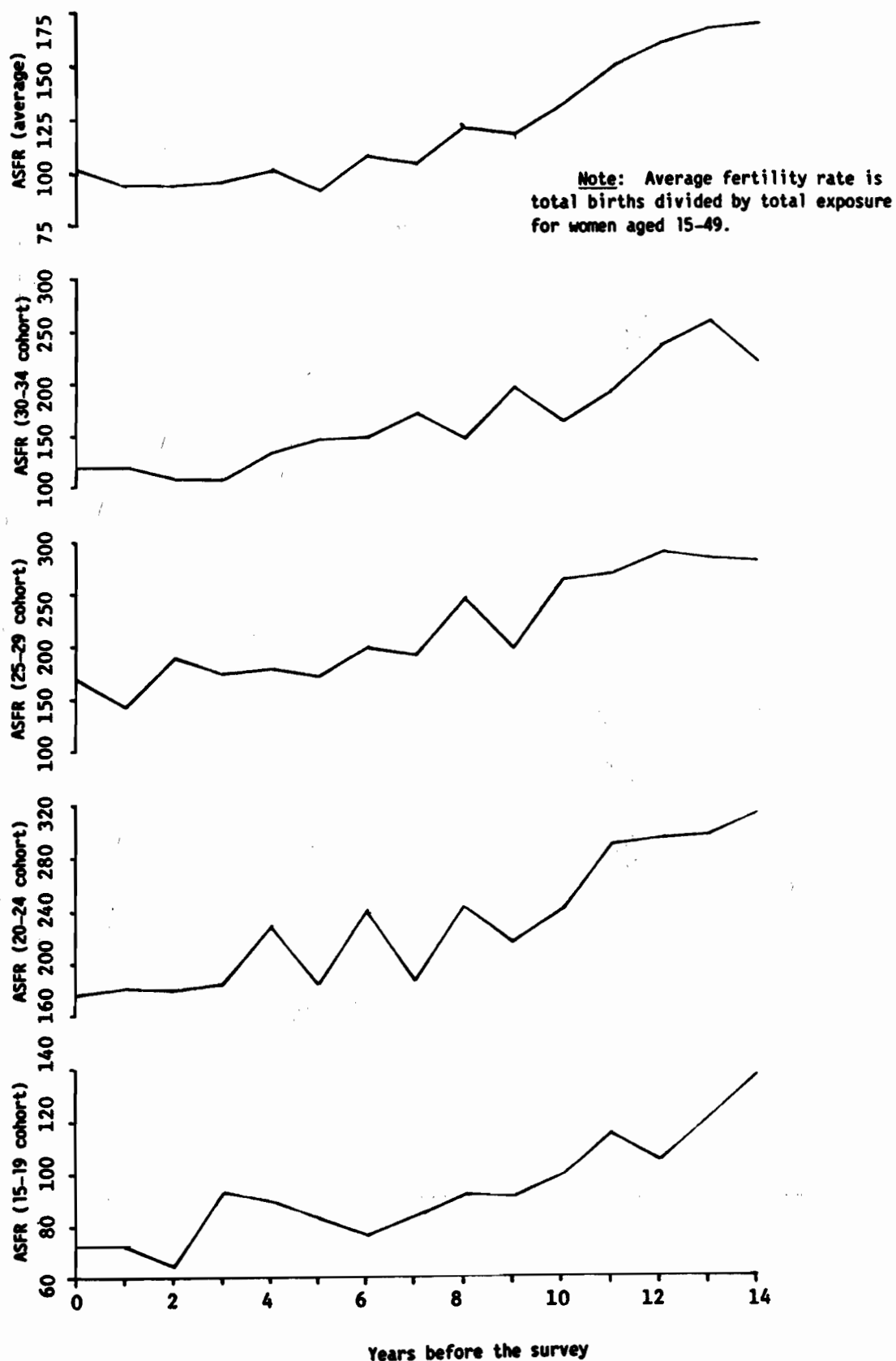


Figure VI. Age-specific fertility rates for selected cohorts and average fertility rate for single years before the survey: Trinidad and Tobago



TUNISIA

The Tunisian Fertility Survey (Enquête tunisienne sur la fécondité, 1978 - ETF) was conducted between May and October 1978. Civil registration began in Tunisia in 1886 but was not really obligatory until 1957 when the system was reorganized. The National Institute of Statistics estimated under-registration of births to be 5 per cent, and coverage has approached 100 per cent in recent years (Office national du planning familial et de la population, 1982). Censuses were conducted in 1966 and 1975, the results of which are available for comparison with the ETF. A three-stage national demographic survey (Enquête nationale démographique) was conducted in 1968/69, and in 1980 a population and employment survey (Enquête population et emploi) was carried out.

Age data

Of all the women interviewed in the individual survey, 88.2 per cent reported their date of birth with both a month and a year, while 11.8 per cent knew only their year of birth (Chidambaram and Sathar, 1984). Compared with other countries in Africa that conducted World Fertility Surveys, Tunisia has the highest percentage of women reporting the complete date of birth. The Myer's index of digital preference among females as reported in the household survey was 6.8, which is an improvement over the index for the female distribution from the 1975 census (Rutstein, 1984).

A comparison of the male and female household age distribution (fig. I) shows a possible slight under-enumeration of females aged 0-4 years and a shifting of ages among women aged 45-49 years to the age group 50-54 years. The latter was probably to avoid the individual interview, since the eligible age range was 15-49 years. It is possible that this occurred at the lower boundary, too, because the distribution shows a peak at the 10-14 age group. However, since the peak occurs among both males and females, it is likely that only some shifting out of the eligible age range occurred. In figure II, the female age distribution from the 1975 census is compared with that from the ETF. The 0-4 age group appears to be under-enumerated in the ETF, while the 10-19 and 50-54 age groups are over-estimated in relation to the census distribution. As noted above, those age groups mark the lower and upper boundaries of the eligible age range, and some shifting of age probably occurred out of the eligible age groups. The 1975 census age distribution shows a trough at age group 30-34, which was presumed due to losses caused by epidemics of typhus and typhoid and the war from 1940-1946 when that cohort was born (Office national du planning familial et de la population, 1982). The trough is reflected in the 35-39 age group in the 1980 survey age distribution.

Marriage history data

The marriage history data was based on 4,123 ever-married women, of whom 53.3 per cent knew the month and year of first marriage, 42.7 per cent knew only the year while 4.0 per cent responded in terms of "years ago" or age at marriage (Chidambaram and Sathar, 1984). The distribution of ever-married women by years since first married (fig. III) shows a rather irregular

distribution. A pronounced trough is evident in the period 11 years before the survey and in general the proportion of marriages appears to be low in the period 9-13 years before the survey. This would be the period from about 1965 to 1969. In 1964 the minimum age at marriage was raised from 15 to 17 for females and from 18 to 20 for males, and there was a surge of marriages just before that period in 1963/64 (Office national du planning familial et de la population, 1982). Therefore, the observed trough in the 1965-1969 period is probably due to some postponement of marriages. Pronounced peaks in the distribution occur in the most recent period and in the periods 16 and 22 years before the survey.

The proportions married for selected periods in the past was reconstructed using the marriage history data from the ETF (fig. IV). Sharp declines in the proportion married are seen in all three age groups, starting about 15 years prior to the survey. Comparison with external sources of data on the marital status distribution confirms the decline.

Birth history data

Both the month and year of birth was reported for 70.4 per cent of all births. Only the calendar year of birth was reported for 17.8 per cent, while in the case of 11.8 per cent, the birth date was given in terms of "years ago" or age (Chidambaram and Sathar, 1984).

A comparison of the parity distribution from the 1975 census with that of the ETF in 1978 (table 1) shows both distributions monotonically increasing with age, with the ETF distribution slightly lower than the census distribution at all age groups. This possibly reflects declines in fertility from 1975 to 1978. Differences are not large.

Cohort-period fertility rates for five-year periods before the survey (table 2, lower panel) do not show any significant evidence of omission of births among older women. However, some evidence of date misplacement is seen in the cohort-period rates and from the cohort age patterns of fertility (fig. V) since there is a shift in the age pattern of fertility from an older peak (among the oldest cohort) to a younger peak (among the younger cohorts). Age-specific fertility rates by single years before the survey are shown in figure VI. The average rate shows a dip in the period a year before the survey date and a trough over the period about 4-8 years before the survey. The rates, however, do not have the extensive year-to-year fluctuations that are observed in data from surveys in other countries. From a small peak in the period 12-13 years before the survey, the average rates declined up to the period five years before the survey, after which the rates increased again. Age-specific rates by age group show considerable fluctuations between 2 and 7 years before the survey among 25-29-year olds and between 8 and 13 years among 20-24-year olds.

The registration of births in Tunisia is fairly complete, and age-specific fertility rates from the registration system were compared with those from the ETF birth history (table 3). The ETF recorded slightly higher rates in all age groups above 25 years. Among 15-19- and 20-24-year olds, rates from the registration were slightly higher, although the overall age

pattern of fertility from the two sources was similar. The decline in fertility from 1966 to the 1974-1978 period is slightly higher when taking registration data into consideration than that recorded by the ETF birth history. Declines by age group show that the ETF recorded larger declines among younger women while the rates from registered data declined more among the older women relative to the ETF. However, the differences are not large for most age groups, except among the 15-19-year olds.

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eligibility analysis", prepared for the WFS Symposium held in 1984,
Methodological session 5, background paper 1.

Table 1. Mean number of children ever-born
per woman from the 1975 census
and the ETF, 1978: Tunisia

Age group	1975 census	1978 ETF
15-19	0.07	0.03
20-24	0.80	0.66
25-29	2.62	2.31
30-34	4.46	4.26
35-39	5.86	5.70
40-44	6.76	6.49
45-49	7.09	6.96

Source: 1975 census: Special tabulations.

Table 2. Cohort period rates and cumulative cohort fertility
by age at survey: Tunisia

Age group of cohort	Number of women	Years prior to survey						
		0-4	5-9	10-14	15-19	20-24	25-29	30-34
at end of period	in cohort							
Cohort-period fertility rates								
10-14	0	0.000	0.000	0.000	0.001	0.001	0.003	0.002
15-19	130	0.007	0.010	0.024	0.039	0.053	0.050	0.046
20-24	643	0.120	0.156	0.216	0.220	0.209	0.175	
25-29	772	0.280	0.310	0.335	0.321	0.328		
30-34	683	0.285	0.299	0.317	0.343			
35-39	685	0.229	0.239	0.276				
40-44	696	0.158	0.158					
45-49	514	0.065						
Cumulative fertility of cohorts at end of period								
10-14		0.000	0.000	0.000	0.004	0.004	0.014	0.008
15-19		0.033	0.050	0.124	0.201	0.279	0.260	0.231
20-24		0.649	0.907	1.279	1.381	1.304	1.103	
25-29		2.305	2.829	3.058	2.911	2.741		
30-34		4.252	4.553	4.497	4.458			
35-39		5.697	5.693	5.836				
40-44		6.484	6.628					
45-49		6.954						

Source: S. Singh, "Birth histories", WFS Comparative Studies, Cross-national Summaries: Additional Tables (Voorburg, Netherlands, ISI/WFS, 1984), p. 58.

Table 3. Age-specific fertility rates for selected periods from WFS and birth registration data: Tunisia

Age group	1966	1965-1967	1970-1971		1974-1978		Percentage change	
	BR	ETF	BR	ETF	BR	ETF	Outside	ETF
15-19	0.077	0.099	0.050	0.047	0.039	0.035	-49.4	-64.6
20-24	0.293	0.314	0.244	0.256	0.232	0.224	-20.8	-28.7
25-29	0.343	0.344	0.274	0.302	0.299	0.309	-12.8	-10.2
30-34	0.311	0.311	0.284	0.272	0.253	0.262	-18.6	-15.8
35-39	0.239	0.236	0.210	0.214	0.183	0.201	-23.4	-14.8
40-44	0.120	..	0.108	..	0.093	0.116	-22.5	..
45-49	0.035	..	0.029	..	0.026	0.039	-25.7	..
TFR	7.1	7.3	6.0	6.1	5.6	5.9	-21.1	-19.2

Source: birth registration data, Socio-economic Development and Fertility Decline, (United Nations publication, forthcoming).

Figure I. Distribution of males and females as a percentage of the total population by five-year age groups: Tunisia

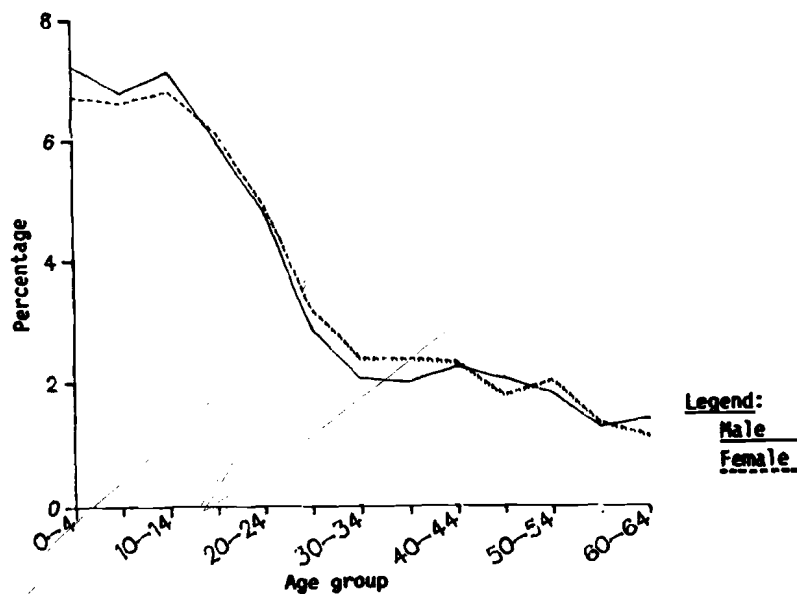
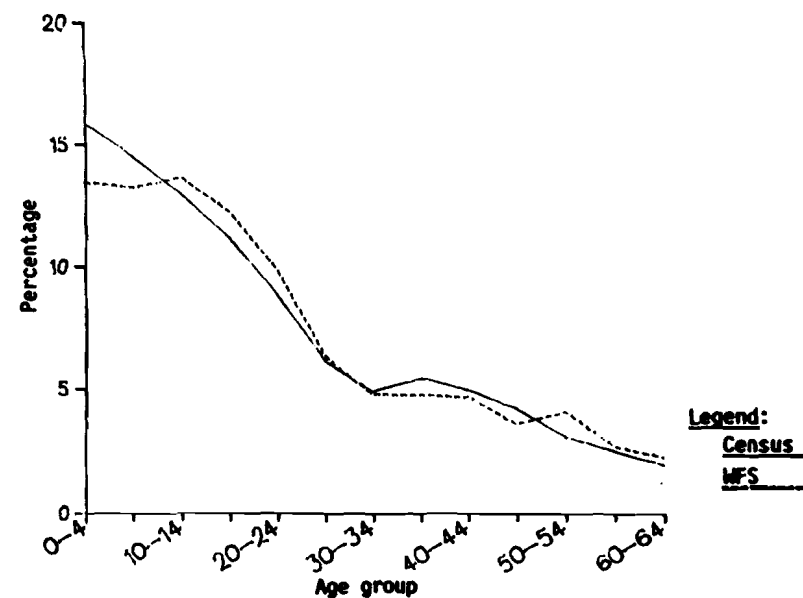


Figure II. Distribution of the female population by five-year age groups: World Fertility Survey (1978) and 1975 census: Tunisia



Sources: Office nationale du planning familial et de la population, Enquête Tunisienne sur la Fécondité, 1978. Rapport Principal, vol. I (Tunis, 1982), p. 41, tableau 3.7.

**Figure III. Distribution of ever-married women aged 15-49
by years since first married: Tunisia**

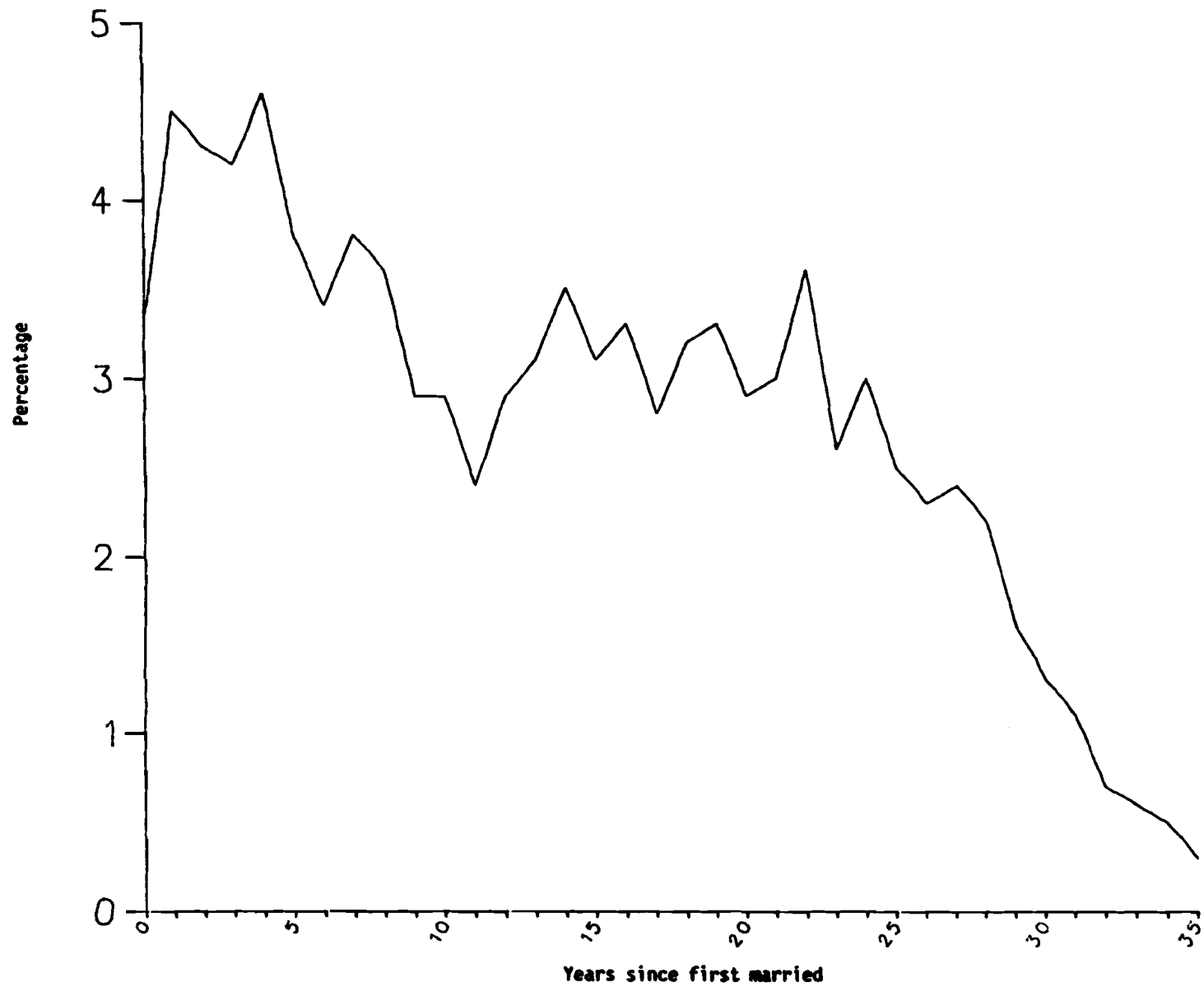
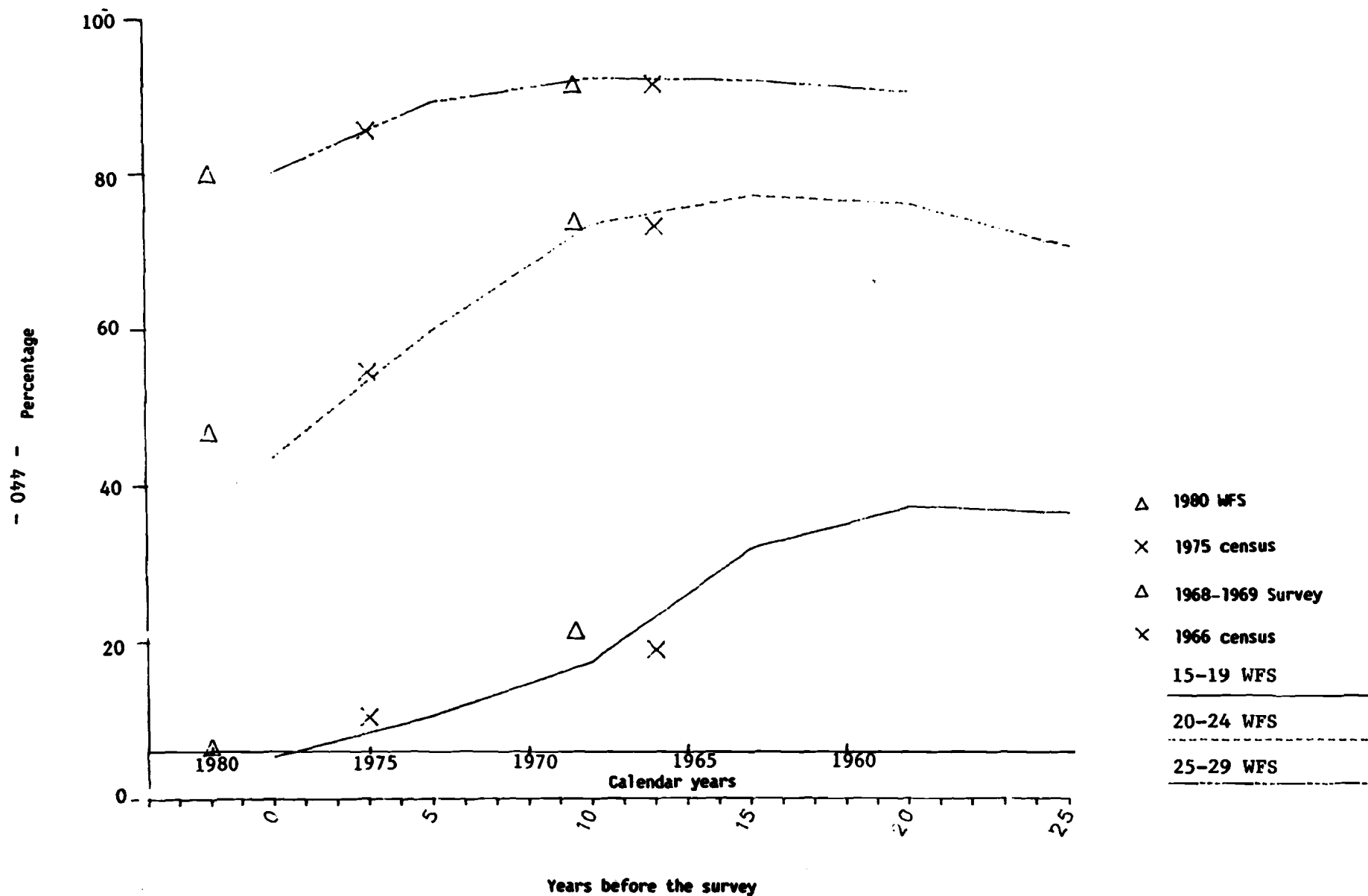


Figure IV. Proportions ever-married at designated periods prior to the survey for selected age groups: World Fertility Survey (1980 data); censuses (1975 and 1966); 1968/69 survey: Tunisia



**Figure V. Cohort-period fertility rates for women aged 30-49 at interview:
Tunisia**

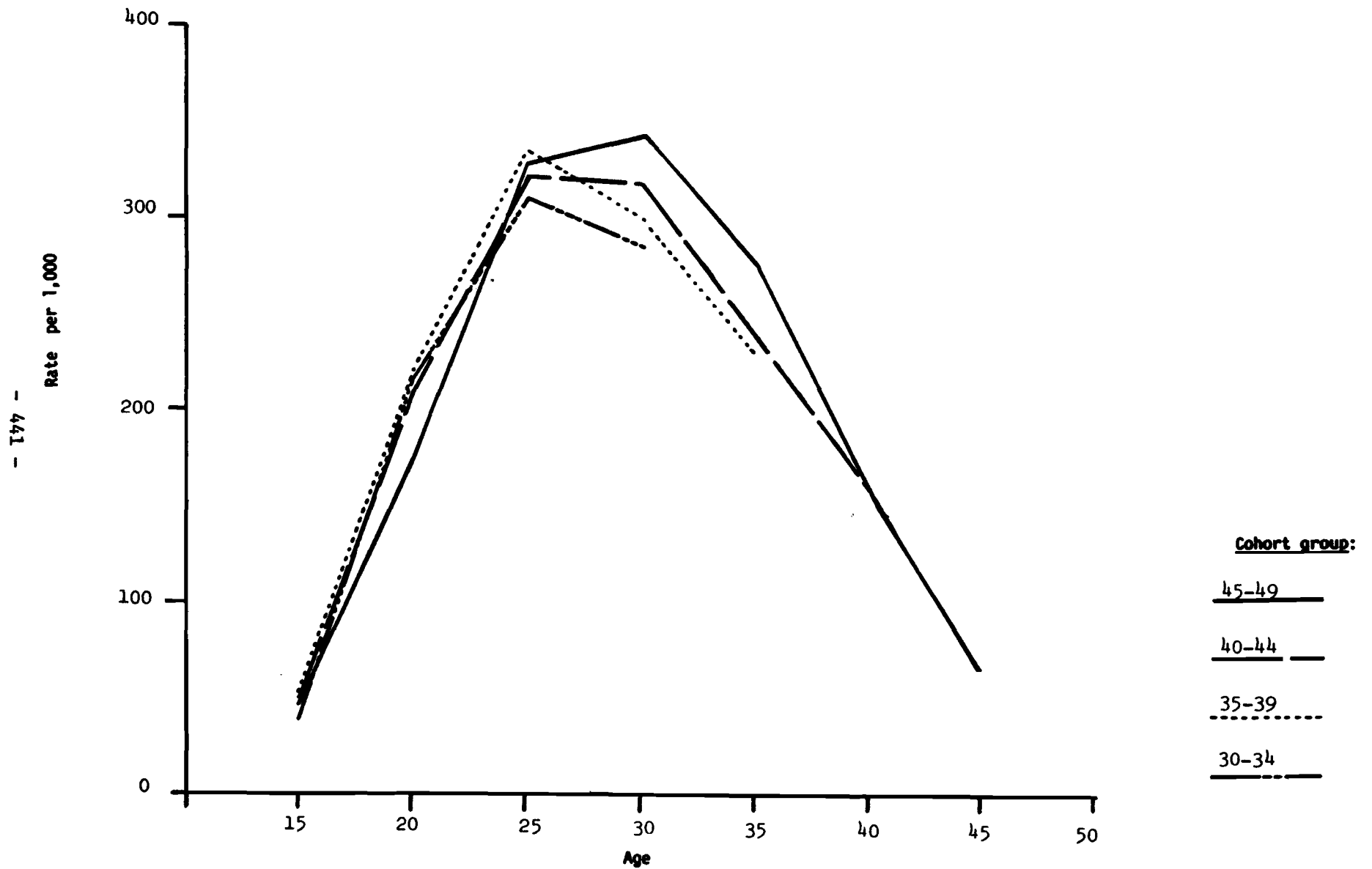
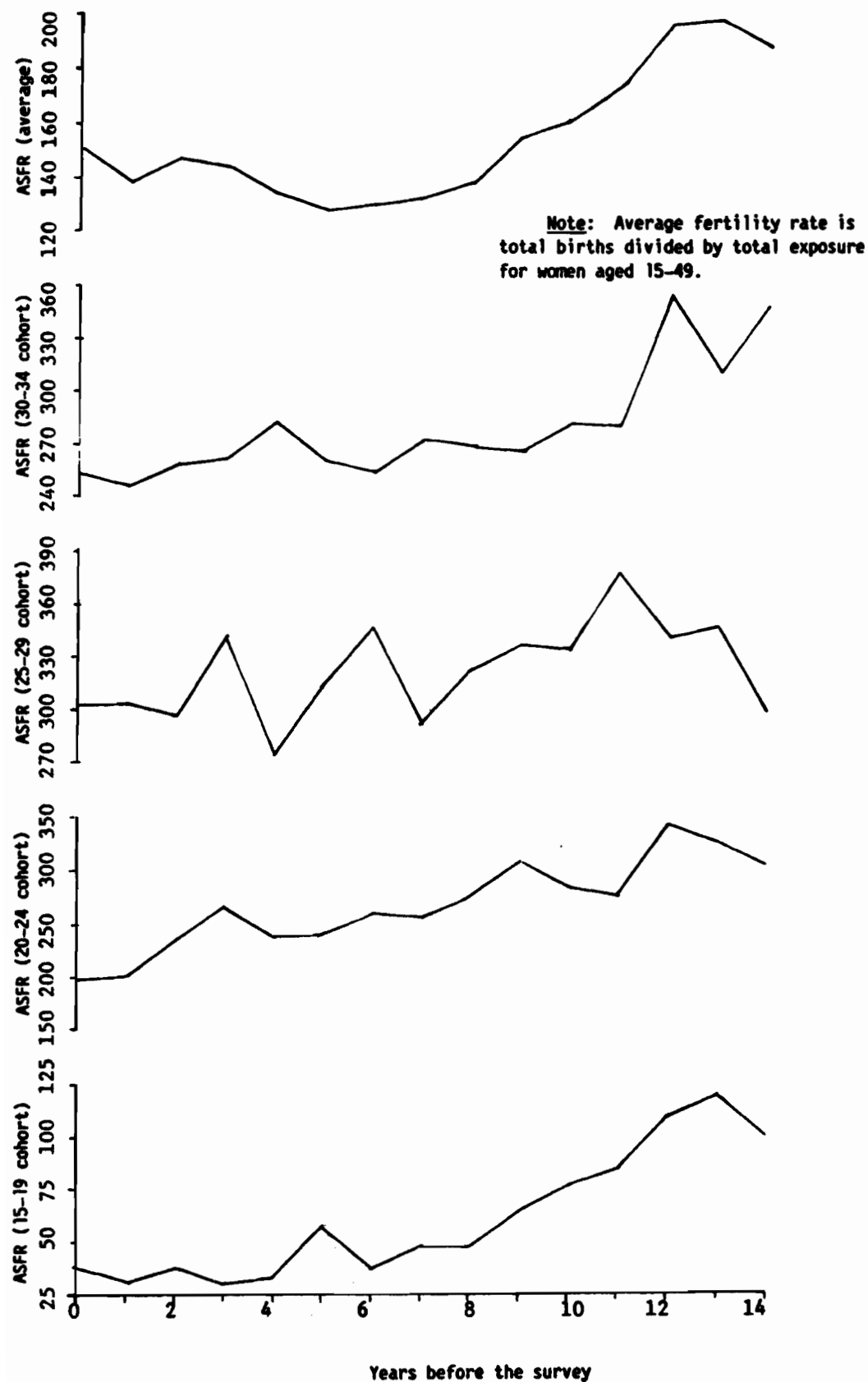


Figure VI. Age-specific fertility rates for selected cohorts and average fertility rate for single years before the survey: Tunisia



VENEZUELA

The Venezuelan Fertility Survey (VFS) was conducted in 1977 from March to August (Oficina Central de Estadística e Informática, 1982). In 1971 a population census was conducted, and information from the census pertaining to age and marital status is available for comparison with the VFS. In the second half of 1974, a household survey was conducted. In recent years, the registration of births has been assessed to be complete (CELADE, 1983), although the data are classified by date of registration rather than date of occurrence. Birth registration data will be used to compare rates from the VFS with an external source.

Age data

The extent of imputation for unknown month and/or calendar year of birth of the respondent is not known. However, information is available on the Myer's index of digital heaping for the female household age distribution. The index for the VFS is 9.4 (Rutstein, 1984) which is not as good as that calculated for the 1971 census distribution, which was 5.3 (Vielma, 1982). An examination by Vielma of the single-year distribution from the household survey, as compared with that from the individual survey showed less heaping in the individual survey possibly because in the individual survey, information was provided by the respondent herself.

A comparison of the male and female household age distribution in five-year age groups (fig. I) shows lower proportions in the 0-9 age group among both males and females compared with the 10-14 age group. Whether this is a result of declining fertility, shifting of birth dates of young children or just under-enumeration of young children is not certain. Within the child-bearing ages, there appears to be heaping on age groups 35-39 and 45-49, with corresponding deficits at 30-34 and 40-44 years among females. Single-year age data show that the heaping in the 35-39 age group probably resulted from a transfer from other adjacent five-year age groups (Vielma, 1982). The upper age limit for the VFS was 40-44 years, and the observed deficit in the 40-44 and heaping in the 45-49 age group probably resulted from interviewers shifting women out of the eligible age range to avoid the individual interview. Some shifting to the younger age group, 35-39, years could also have occurred. Comparison of the VFS female household age distribution with the 1971 census female distribution (fig. II) shows that some under-enumeration and some shifting of birth dates occurred at young ages. As in the comparison with the male age distribution, the VFS female distribution shows heaping at 35-39 and 45-49 years, with corresponding deficits at adjacent age groups.

Marriage history data

Unfortunately, the proportion of ever-married women who reported both the month and year of their first union is not known. A distribution of years since first union among ever-married women, shown in figure III, reveals pronounced heaping at 2, 4, 7 and 18 years before the survey. While the heaping on 7 years reflects marriages in 1970, there are no obvious reasons for heaping on the other digits.

A reconstruction of the marital status distribution for five-year periods in the past is shown in figure IV. The proportions ever-married from the VFS shows a declining trend from the period about 20-25 years before the survey. This declining trend is slightly distorted by an over-estimation of the proportion married by the 35-39 cohort. In other words, the 35-39 cohort reported a lower mean age at marriage. A comparison of the marital status distribution from the individual survey and that obtained from the household schedule shows a higher proportion of ever-married women in the individual survey especially among women aged 40-44 years. It is likely that some women who were reported as single in the household schedule were later found to have been in a previous marriage or a consensual union (Vielma, 1982).

Comparison with the 1971 marital status distribution necessitated a regrouping of single women together with separated women for the VFS. This is because the census does not distinguish between women who were separated from marriage or from consensual unions and were, therefore, included as single (Vielma, 1982). The VFS recorded higher proportions ever-married than the census, for all age groups. An examination of the detailed marital status distribution from both sources shows that the VFS in 1971 had a higher proportion of women in legal unions and consensual unions than that recorded in the census. Two things would have happened. One, in the VFS, a consensual union which subsequently became a legal union with the same partner is likely to be recorded in the VFS as a legal union through a confusion between number of partners and number of unions. This would explain the higher proportion in legal unions. Secondly, the survey was presumably better able to include consensual unions, hence, the higher proportion in the VFS women in consensual unions. Higher proportions in legal unions and in consensual unions would translate into higher proportions ever-married in the VFS as compared with the census.

Birth history data

As in the case of birth dates of women and date of first union, no information is available on the extent of imputation for the month and year of birth of children. The distribution of children ever born from the individual and household surveys was compared (Vielma, 1982). The mean number of children ever born was slightly higher in the individual survey for ages 25-34 years and somewhat higher among women 40-44 years. However, in both the individual and household questionnaire, the mean number of children increases monotonically up to age 40-44 years. A comparison with the 1981 census distribution^{1/} of mean number of children ever born shows differences of more than 0.5 children among women more than 30 years old, and in all age groups the mean recorded in the VFS was higher. While some of the difference could be due to declines in fertility, most of it could be due to better coverage of live births by the VFS.

An examination of cohort-period fertility rates for five-year periods prior to the survey shows very little evidence of omission of births or displacement of births among the oldest cohort for births that occurred in the distant past (table 2). In general, the age pattern of cohort fertility (figure V) shows substantial declines in fertility in the older ages but no evidence of displacement of the oldest cohort fertility profile.

A detailed inspection of annual fluctuations in age-specific fertility for the younger age groups from the VFS (figure VI) shows fluctuations among all age groups, with no preference for any particular year, although, all three of the youngest age groups had an increase in rates in the year preceding the survey, with a "trough" in the period 1-2 years before the survey. Sharp peaks occurred at 8, 7 and 6 years before the survey among 15-19-, 20-24- and 25-29-year-old women, respectively. The peaks were followed by corresponding "lows" in the rates. The overall average rate is fairly flat from 6-9 years before the survey and starts to decline up to 3 years before the survey, after which time there is an upswing in the rates. A sharp dip is evident five years before the survey.

Age-specific fertility rates from the birth history are compared with those obtained from an external source - the birth registration (table 3). In the more recent period, the VFS rates are all lower than those obtained through registration data, but in the earlier period the VFS rates were higher than those from registration data, although differences are not large. Two factors should be borne in mind. One, birth registration data are classified by date of registration rather than date of occurrence, and data for 1974 show that as much as 32 per cent of the total number of births registered were births that occurred in previous years (Vielma, 1982). In a situation of declining fertility (as is the case in Venezuela), fertility rates from registration data would tend to be over-estimates. The second factor is the recent fertility rate from the VFS. As seen above in the examination of single-year fertility rates, there appeared to be some shifting of births out of the most recent period, which would result in low rates for that period. Both factors may be affecting the rates in the most recent period, and since the registration data in the earlier period were not considered complete, it is difficult to make a comparison. The rates from the two sources, however, are not very different. The age patterns of fertility from the two sources compare quite well except at age 25-29, where the VFS rate is lower.

Note

1/ The 1977 census did not include questions on fertility.

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Table 1. Children ever born per woman
from VFS 1977 and census 1981:
Venezuela

Age group	VFS 1977	census 1981
15-19	0.2	0.3
20-24	1.1	1.2
25-29	2.5	2.3
30-34	3.9	3.3
35-39	5.0	4.3
40-44	6.1	5.2
45-49	..	5.8

Source: 1981 census: United Nations, Statistical Office Census Questionnaire (unpublished).

Table 2. Cohort period rates and cumulative cohort fertility
by age at survey: Venezuela

Age group of cohort at end of period	Number of women in cohort	Years prior to survey						
		0-4	5-9	10-14	15-19	20-24	25-29	30-34
Cohort-period fertility rates								
10-14	0	0.000	0.000	0.002	0.001	0.004	0.004	0.001
15-19	1 312	0.036	0.050	0.050	0.065	0.079	0.058	0.000
20-24	979	0.174	0.205	0.228	0.262	0.261	0.000	
25-29	724	0.232	0.282	0.293	0.308	0.000		
30-34	536	0.201	0.231	0.293	0.000			
35-39	452	0.141	0.205	0.000				
40-44	358	0.093	0.000					
45-49	0	0.000						
Cumulative fertility of cohorts at end of period								
10-14		0.000	0.002	0.009	0.006	0.019	0.018	0.006
15-19		0.182	0.260	0.256	0.341	0.412	0.293	0.000
20-24		1.132	1.280	1.481	1.719	1.601	0.000	
25-29		2.489	2.890	3.184	3.140	0.000		
30-34		3.897	4.336	4.606	0.000			
35-39		5.040	5.631	0.000				
40-44		6.095	0.000					
45-49		0.000						

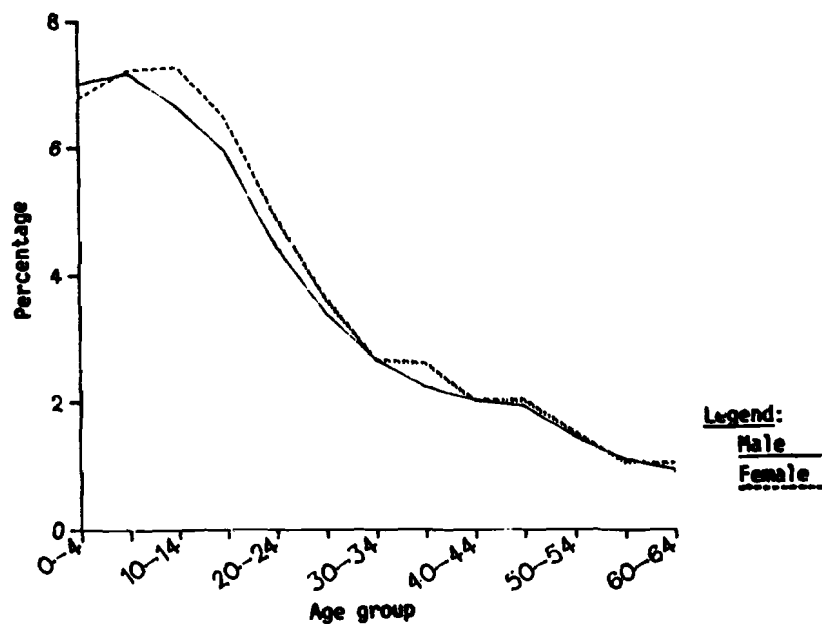
Source: S. Singh, "Birth histories", WFS Comparative Studies, Cross-national Summaries: Additional Tables (Voorburg, Netherlands, ISI/WFS, 1984), p. 83.

Table 3. Age-specific fertility rates for selected periods from VFS and birth registration data: Venezuela

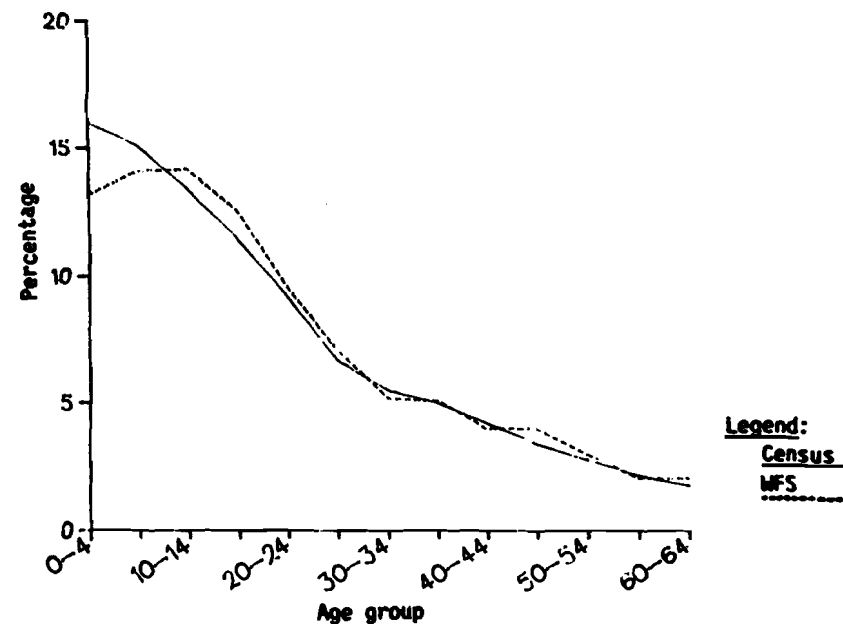
Age group	1967-1971		1972-1976		Percentage change	
	BR (1)	VFS (2)	BR (3)	VFS (4)	BR (4) - (2)	VFS (3) - (1)
15-19	0.118	0.123	0.107	0.096	- 9.3	-22.0
20-24	0.283	0.282	0.246	0.237	-13.1	-16.0
25-29	0.279	0.266	0.237	0.220	-15.0	-17.3
30-34	0.221	0.226	0.193	0.180	-12.7	-20.4
35-39	0.166	0.188	0.141	0.125	-15.1	-33.5
40-44	0.063	..	0.057	0.067	- 9.5	..
45-49	0.014	..	0.012	..	-14.3	..
TFR	5.7	5.8	5.0	4.7	-12.2	-19.0

Source: birth registration: G. Vielma, "Evaluation of the Venezuela Fertility Survey, 1977". WFS Scientific Reports, No. 35 (Voorburg, Netherlands, ISI/WFS, 1982), table 13.

**Figure I. Distribution of males and females
as a percentage of the total population
by five-year age groups: Venezuela**



**Figure II. Distribution of the female
population by five-year age groups:
World Fertility Survey (1977) and
1971 census: Venezuela**



Source: G. Vielma, "Evaluation of the Venezuelan Fertility Survey, 1977", *WFS Scientific Reports, No. 35* (Voorburg, Netherlands, ISI/WFS, 1982), p.13, table 1.

**Figure III. Distribution of ever-married women aged 15-49
by years since first married: Venezuela**

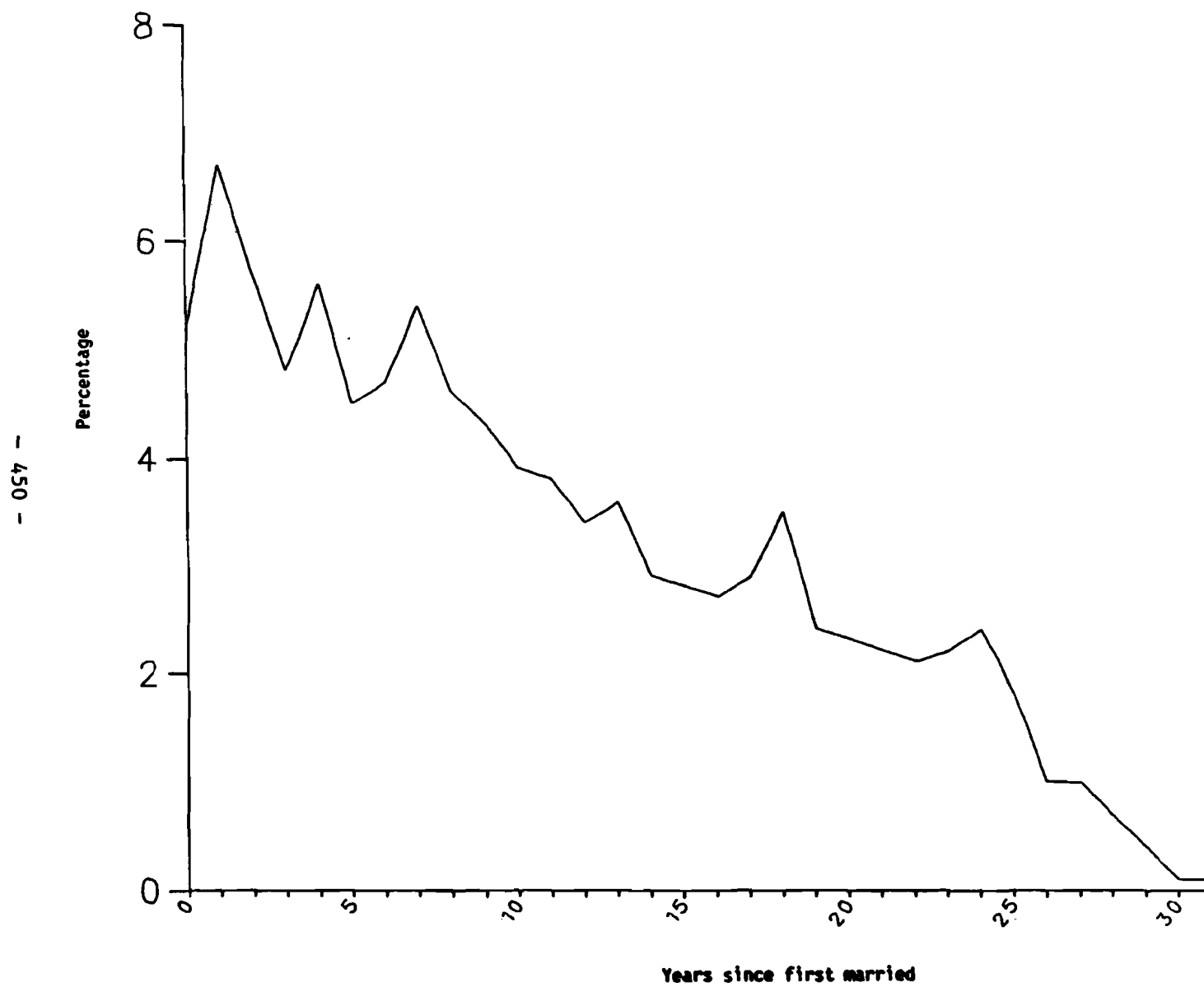
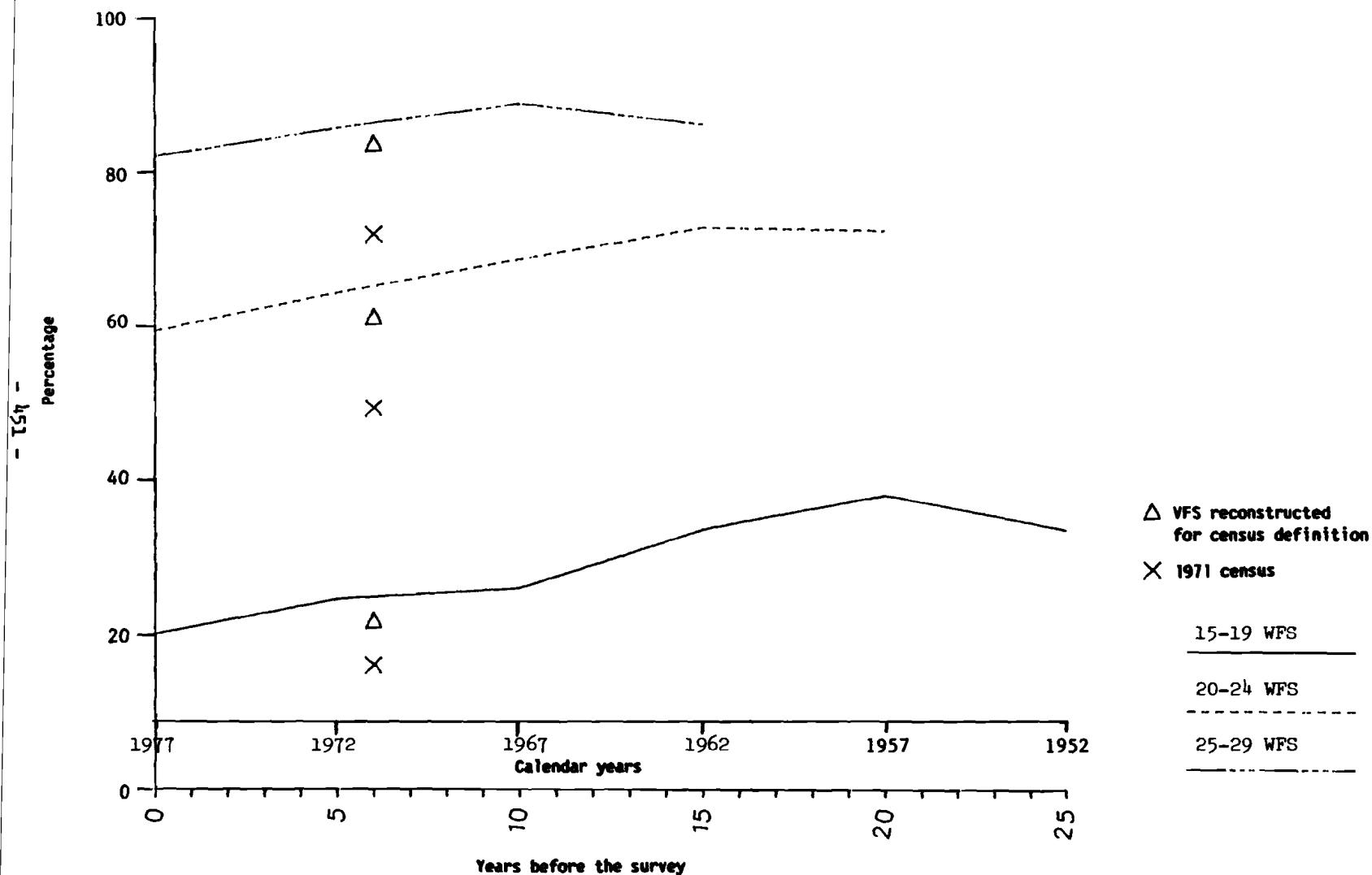


Figure IV. Proportions ever-married at designated periods prior to the survey for selected age groups: World Fertility Survey data and 1971 census: Venezuela



Source: Gilberto Vielma, "Evaluation of the Venezuelan Fertility Survey, 1977", *WFS Scientific Reports*, No. 35 (Voorburg, Netherlands, ISI/WFS, September 1982), p. 20, table 5.

**Figure V. Cohort-period fertility rates for women aged 30-49 at interview:
Venezuela**

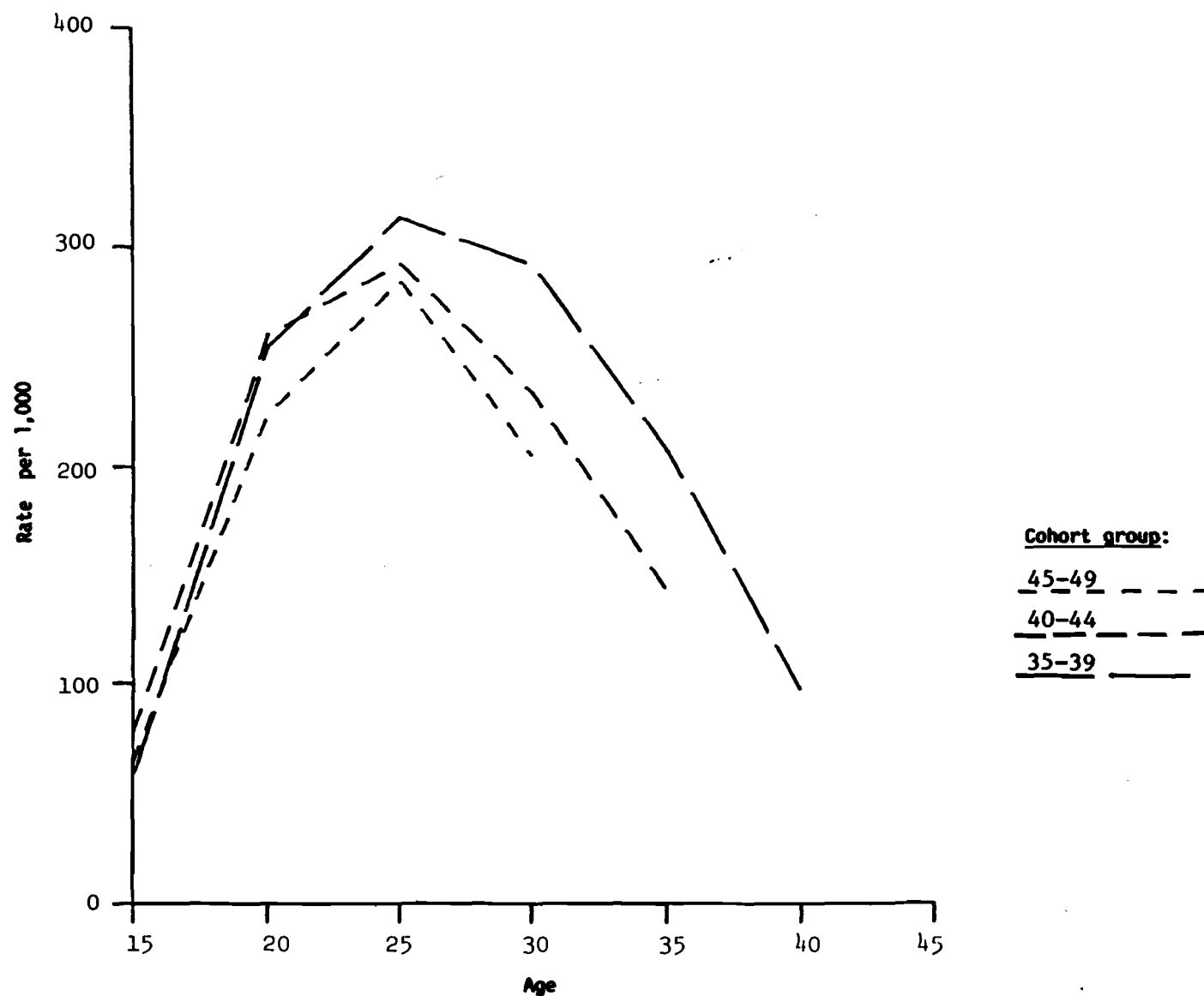
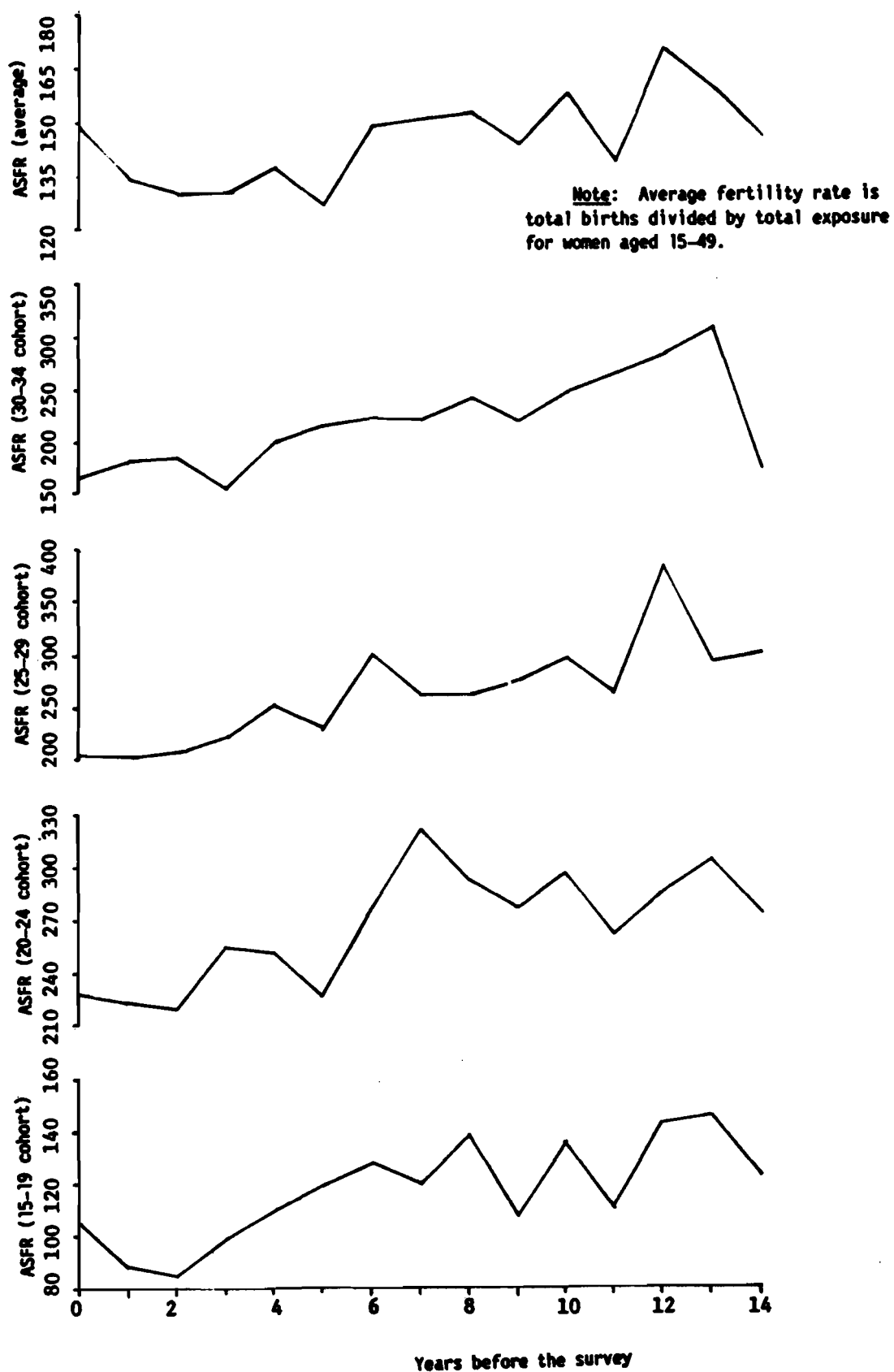


Figure VI. Age-specific fertility rates for selected cohorts and average fertility rate for single years before the survey: Venezuela



YEMEN ARAB REPUBLIC

Yemen conducted its fertility survey (YARFS) in 1979; field work extended from June to November. The first population census of Yemen, conducted in 1975, placed the population at about 6.5 million of whom 88 per cent lived in rural areas (Department of Statistics, 1983). Unfortunately, the census did not collect information on children ever born or births in the preceding year, so the YARFS will provide the first nation-wide estimates of fertility in Yemen. Surveys were conducted in Sanaa and the rural areas of Yemen in 1972 and 1977, respectively: they provided fertility estimates for those areas, but no national estimates were available (Allman and Hill, 1978; and Hill, 1979). Subsequent to the YARFS, a demographic survey was carried out in 1981. Fertility estimates from that survey will be compared with those from the YARFS. There is no civil registration system in Yemen.

Age distribution

Of the 2,605 ever-married women interviewed in the individual survey, only 0.3 per cent reported their date of birth with both month and year of birth. The remaining 99.7 per cent of women knew only the calendar year of birth (Chidambaram and Sathar, 1984). The Myer's index of digital preference is 41.7 (Rutstein, 1984). The single year of age distribution shows tremendous heaping on digits ending with 5 and 0 across all ages (Department of Statistics, 1983). The extremely high Myer's index and the single-year distribution indicate serious problems with age reporting in the YARFS.

Comparison of the male and female distribution from the household survey (fig. I) shows an excess of males at ages below 15 and above 55 years. This type of sex ratio pattern has been observed among other Western Asian countries - for example, Jordan and the Syrian Arab Republic, which have heavy labour migration (Department of Statistics, 1983). In the child-bearing age groups of 15-49, females are in excess, except in the age group 45-49 years where males are in excess. This suggests possible shifting of ages into the 50-54 age group to avoid the individual interview. Both the male and female distributions show heaping at ages 25-29 years. The 1975 census female age distribution also shows heaping at ages 25-29 years (fig. II). The proportion aged 0-4 in the census is lower than that of the survey and is probably due to under-enumeration and shifting to 5-9 years in the census age reporting.

Marriage history data

Of the 2,605 ever-married women, only 7.6 per cent reported both the month and the year of their first union. More than two thirds (69.3 per cent) reported only the calendar year, while 23.2 per cent reported in terms of "years ago" or age at marriage (Chidambaram and Sathar, 1984). Marriage takes place with two ceremonies, the formal "writing of the book" and the social (*zifaf*) ceremony. The period between the two can be quite extensive. Since it is the social ceremony that marks the consummation of marriage, that date was used as the starting date of the union.

The distribution of ever-married women aged 15-49 years by years since married (fig. III) shows considerable year-to-year fluctuations. There

appears to be a deficit of marriages in the 0- and 1-year period before the survey and considerable heaping in the period 2-5 years before the survey. A reconstruction of the proportions married at five-year periods before the survey (fig. IV) shows irregular trends in the proportions married among 15-19- and 20-24-year olds. It is likely that there was no change in age at marriage at all, although there appears to be an increasing trend in proportions married among 20-24-year olds. Comparison with the 1981 Pilot Demographic Survey (PDS) marital status distribution shows that proportions married at the time of the YARFS might be overstated among 15-19-year olds if it is assumed that the 1981 survey data are more accurate. However, it is not possible to make such an assertion.

Birth history data

Of all births, 11.0 per cent were reported with month and year of birth, 84.2 per cent had information on only the year while 4.8 per cent were reported in terms of "years ago" or age (Chidambaram and Sathar, 1984). The number of children ever born per woman (table 1) increases monotonically from 0.4 children per woman among those aged 15-19 to 7.0 children per woman among those aged 45-49 years. Comparison with the parity distribution from the 1981 Pilot Demographic Survey shows close correspondence, although the completed family size from the YARFS is slightly higher than that from the PDS.

Examination of the full set of cohort-period fertility rates (table 2) shows an increasing trend in fertility up to the most recent period in all age groups up to 35-39. As seen earlier, age reporting among women had considerable errors in the form of misstatement of dates. Errors of this nature combined with misplacement of dates of births towards the survey date make the observed rates suspect. Further, an examination of the cohort age pattern of fertility shows irregularities in the age profile, particularly among the older cohorts.

Comparison of age-specific rates for 1976-1978 from the YARFS with those estimated using the Gompertz technique for the 1981 PDS data (table 3) shows the total fertility rate from YARFS to be slightly higher. Although the difference in total fertility rate is only 0.2 of a child, the age pattern of fertility from the two sources is quite different. The YARFS age pattern of fertility appears to be very irregular. The rate among women aged 35-39 years is low compared with the 30-34 age group and is nearly as high as that of the adjacent 40-44 group.

Trends in age-specific fertility rates by single years is extremely erratic. The rate at the time of the survey (0 years) is extremely high compared with the period 1-2 years before the survey. There appears to be a small peak three years before the survey and another seven years before the survey. Clearly, there is considerable date shifting reflected in these rates. The irregularities appear for rates in all age groups.

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Table 1. Children ever born per woman
from YARFS 1979 and the 1981
Pilot Demographic Survey:Yemen

Age group	YARFS 1979	PDS 1981
15-19	0.4	0.4
20-24	1.7	1.7
25-29	3.3	3.3
30-34	5.0	4.7
35-39	6.0	6.1
40-44	6.5	6.5
45-49	7.0	6.7

Source: Department of Statistics,
Population Projections by Sex and Age
1975-2010 (Sana'a, 1984).

Table 2. Cohort period rates and cumulative cohort
fertility by age at survey: Yemen

Age group of cohort at end of period	Number of women in cohort	Years prior to survey						
		0-4	5-9	10-14	15-19	20-24	25-29	30-34
Cohort-period fertility rates								
10-14	46	0.000	0.004	0.005	0.009	0.003	0.002	0.003
15-19	1 396	0.076	0.068	0.074	0.096	0.059	0.055	0.037
20-24	511	0.259	0.223	0.218	0.214	0.169	0.159	
25-29	526	0.342	0.323	0.277	0.280	0.244		
30-34	388	0.351	0.356	0.298	0.296			
35-39	306	0.295	0.286	0.266				
40-44	203	0.199	0.262					
45-49	175	0.170						
Cumulative fertility of cohorts at end of period								
10-14		0.000	0.019	0.027	0.045	0.015	0.012	0.014
15-19		0.401	0.368	0.417	0.493	0.307	0.290	0.201
20-24		1.663	1.533	1.582	1.379	1.133	0.997	
25-29		3.245	3.195	2.766	2.531	2.218		
30-34		4.952	4.547	4.023	3.695			
35-39		6.022	5.451	5.023				
40-44		6.447	6.335					
45-49		7.187						

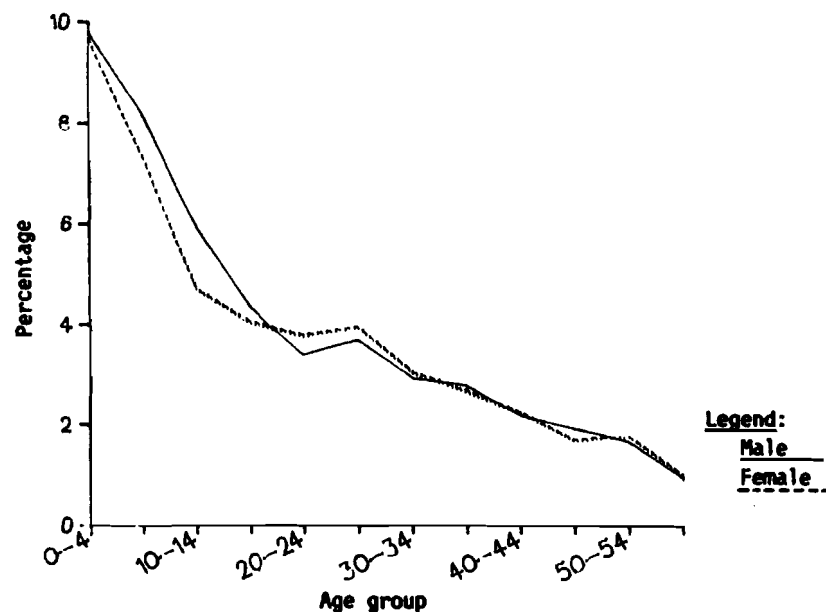
Source: S. Singh, "Birth histories", WFS Comparative Studies (Cross-national Summaries): Additional Tables (Voorburg, Netherlands, ISI/WFS, 1984), p. 68.

Table 3. Age-specific fertility rates
for selected periods from
YARFS and the 1981 Pilot
Demographic Survey: Yemen

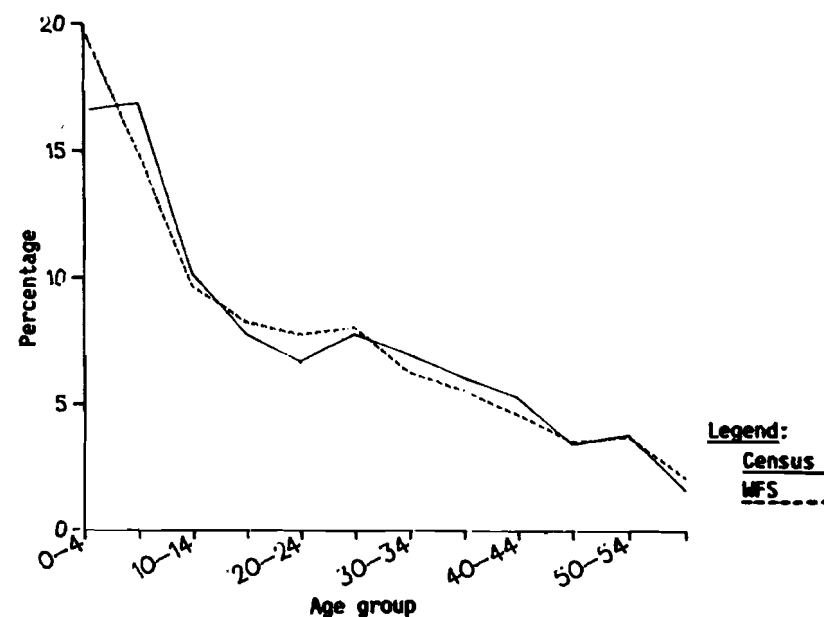
Age group	YARFS 1976-78	PDS 1981
15-19	0.170	0.181
20-24	0.244	0.296
25-29	0.341	0.319
30-34	0.303	0.305
35-39	0.199	0.271
40-44	0.197	0.168
45-49	0.076	0.035
TFR	8.1	7.9

Source: Department of Statistics,
Preliminary Results for the Demographic
Sample Survey for 1981 (Sana'a, 1983).

**Figure I. Distribution of males and females
as a percentage of the total population
by five-year age groups: Yemen**



**Figure II. Distribution of the female
population by five-year age groups:
World Fertility Survey (1979) and
1975 census: Yemen**



Source: Department of Statistics, Central Planning Organization,
Yemen Arab Republic Fertility Survey, 1979, vol. I. Survey Design, Second
Findings (Sana'a, 1983), pp. 25-26, tables 3.1 and 3.3.

**Figure III. Distribution of ever-married women aged 15-49
by years since first married: Yemen**

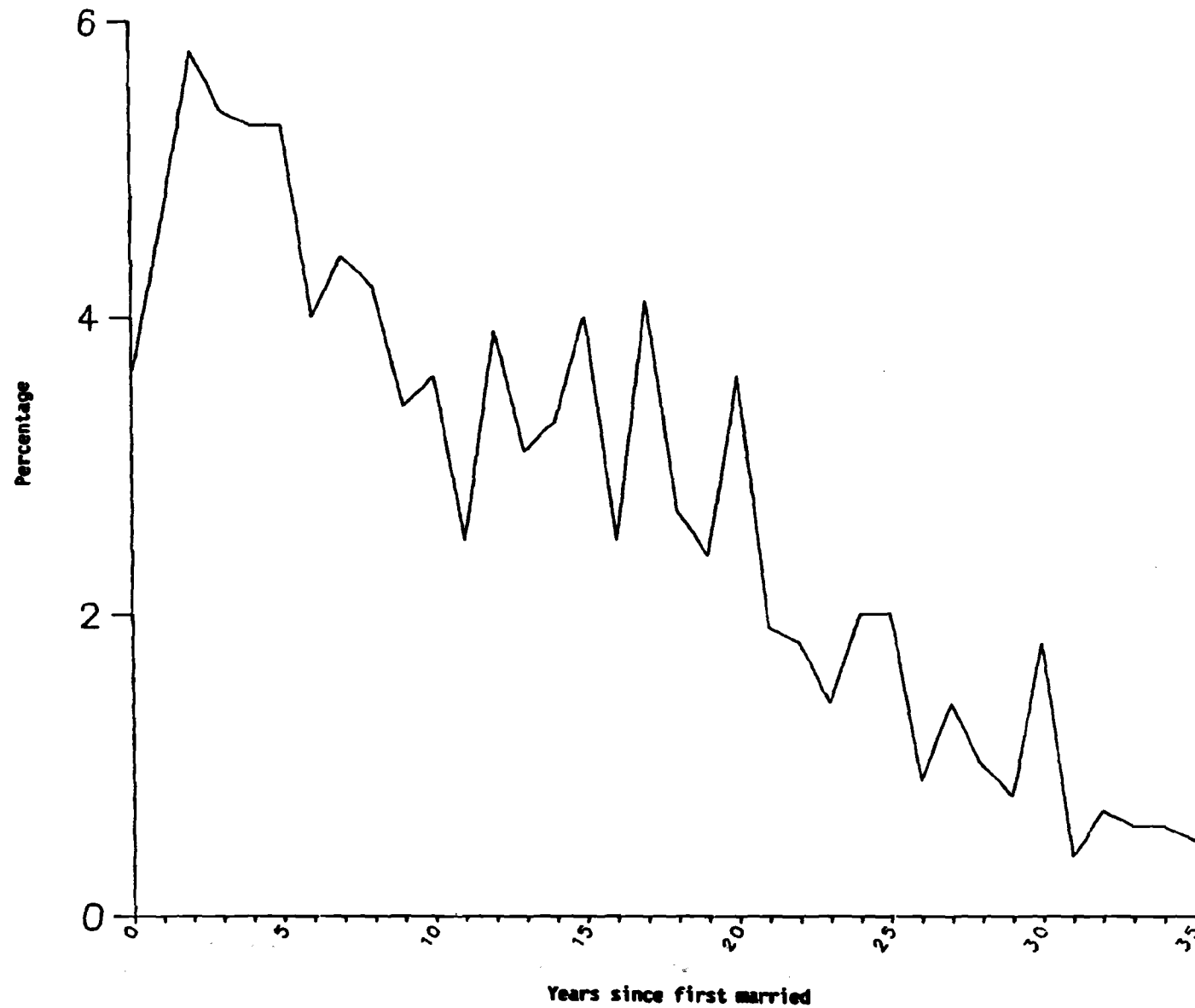
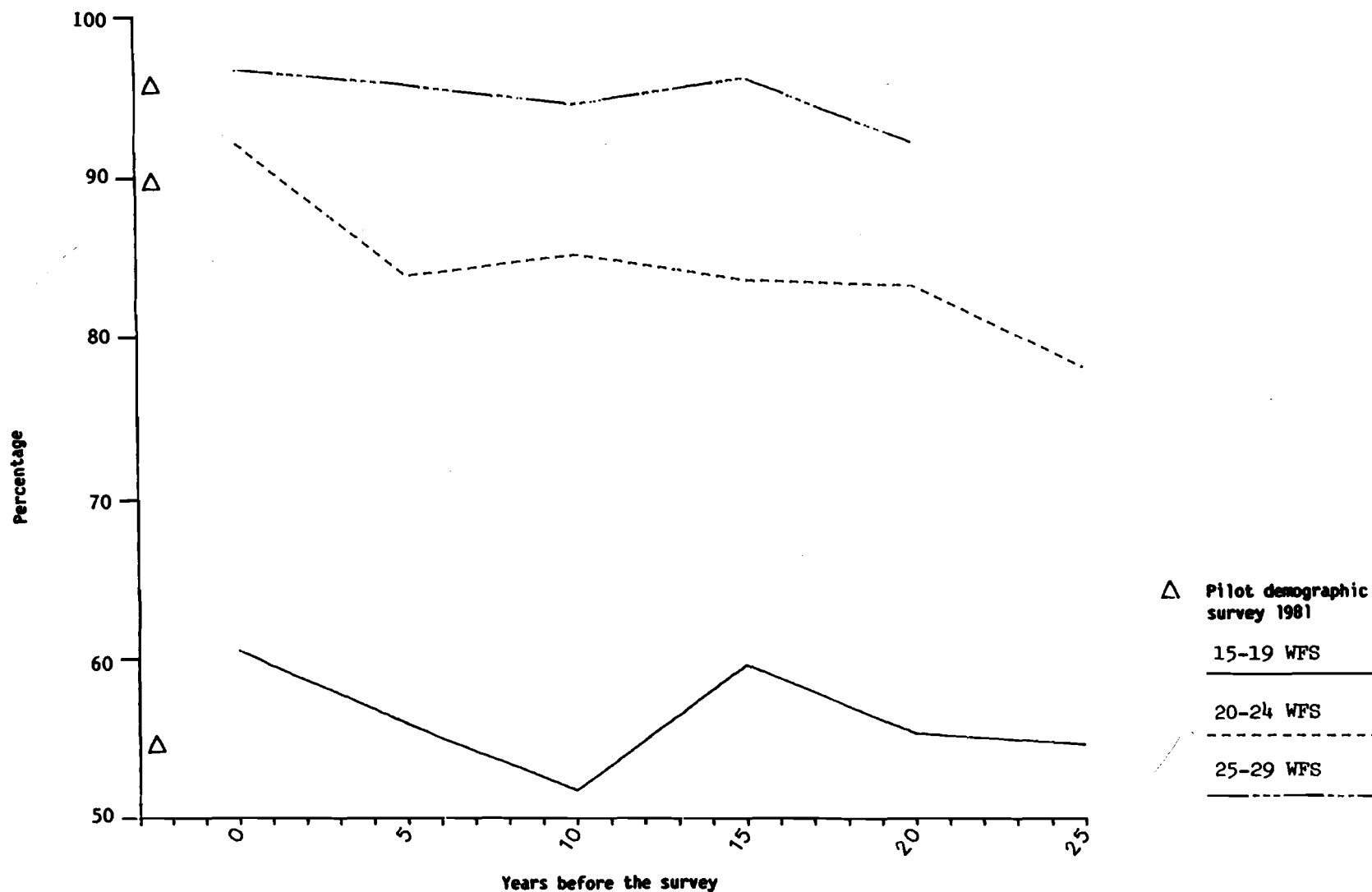
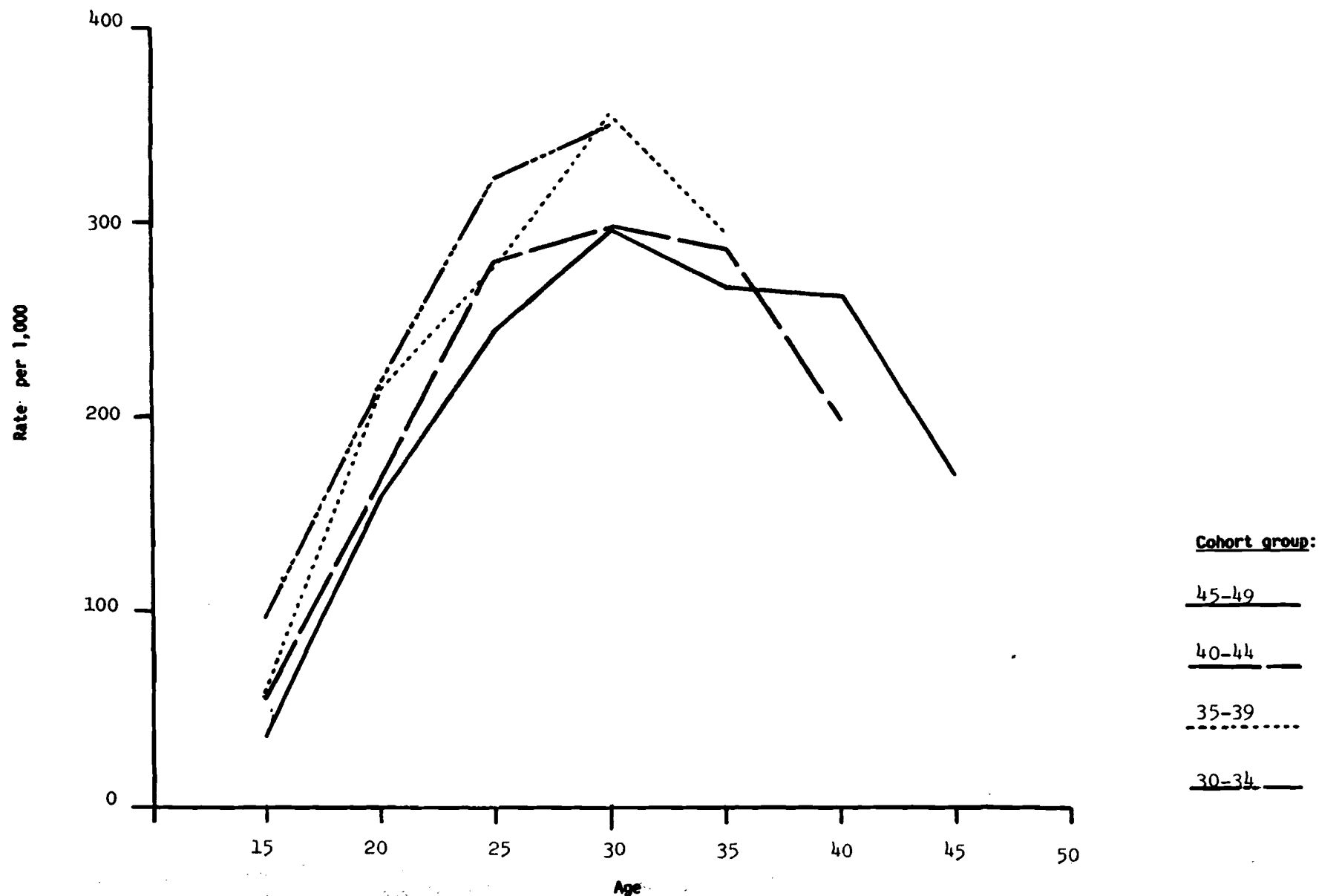


Figure IV. Proportions ever-married at designated periods prior to the survey
for selected age groups: YARFS and 1981 Pilot Demographic Survey:
Yemen



Source: 1981 Pilot Demographic Survey: Department of Statistics,
Preliminary Results for the Demographic Sample Survey for 1981 (Sana'a, 1983).

Figure V. Cohort-period fertility rates for women aged 30-49 at interview:
Yemen



**Figure VI. Age-specific fertility rates for selected cohorts and average fertility rate for single years before the survey:
Yemen**

