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Urban population, urban areas and the problem of dominance

in West-German statistics Olaf Boustedt

#### Summary

1. In German statistics the concept of urban population has not yet been officially defined. In practice, however, the population of the urban counties is often identified with the urban population; from demographic and sociological points of view this must be considered as insufficient and misleading. An analysis of the other attempts at the definition of the urban population by the number of inhabitants, density of population, residential pattern, economic structure, or dominance of the localities in question with regard to their hinterland shows that all these criteria allow of an improved coverage of the urban character of the population. But in particular cases here, too, considerable misunderstandings may occur, especially with minor localities. The best solution will probably be a significant combination of these characteristics.

2. To promote the studies for determining dominance it is suggested to adopt the characteristic of the "central stratum", i.e. of those employed in business, communications, in public services, or briefly, in "non-productive" or "secondary" jobs, and to supplement it by taking into account the distribution of this stratum over the different branches of the economy.

3. For the delimitation of urban agglomeration areas no generally accepted method has as yet been developed in Germany, though the literature on this subject is pretty extensive and comprises many excellent monographies. The extension of regional statistics by which, in addition to the returns for administrative units, the data will be furnished also for other, organic, units (physical geographic areas, economic areas, etc.), is required more and more urgently. A trial investigation for the State of Bavaria was therefore undertaken for 18 towns with at least 30,000 inhabitants each, and at least 50,000 inhabitants within the whole of each agglomeration area. This study which according to empirically developed benchmarks uses the characteristics of density of population, residential pattern, economic structure, and extent of commutation of gainful workers for determining the urban regions, is at present under discussion with the aim to establish general rules for delimiting the agglomeration areas in Germany.

✗ General distribution of this document is limited to the introductory summary. Participants who have been invited to take part in the meeting referred to above will receive also the full text of the paper. Other participants in the Conference will receive the full text upon request.

Pour la traduction française voir au verso. 54-12180

DOCUMENTS MASTER INDEX UNIT MASTER JUL 1 6 1954

#### Populations urbaines, régions urbaines et problème du caractère dominant d'une région d'après les statistiques de l'Allemagne occidentale

#### Olaf Boustedt

<u>Résumé</u>. 1. Dans les statistiques allemandes, la notion de population urbaine n'a pas encore été officiellement définie. En pratique, toutefois, la population des comtés urbains est souvent assimilée à la population urbaine, ce qui, du point de vue démographique comme du point de vue sociologique, est insuffisant et peut prêter à confusion. L'examen des autres tentatives faites pour définir la population urbaine en fonction du nombre d'habitants, de la densité de la population, de la structure résidentielle et économique, ou enfin de la prédominance des localités en question par rapport aux districts avoisinants, montre que ces critères permettent de mieux identifier le caractère urbain d'une population. Mais ici aussi, dans certains cas particuliers, d'importantes erreurs peuvent se produire, notamment en ce qui concerne les localités de faible importance. La meilleure solution réside sans doute dans l'emploi combiné de ces différentes caractéristiques.

2. L'auteur propose, ain de faciliter les études sur le caractère dominant d'une région, d'adopter comme critère la "couche centrale", constituée par la population employée dans le commerce, les communications, les services publics ou, d'une façon générale, dans les emplois "non productifs" ou "secondaires", et de prendre en considération, à titre de complément, la répartition de cette catégorie de personnes dans les différentes branches de l'activité économique.

On n'a pas encore mis au point, en Allemagne, de méthode généralement acceptée ゔ. qui permette de définir les agglomérations urbaines; toutefois la documentation sur ce sujet est considérable et comprend de nombreuses monographies excellentes. Il' devient de plus en plus nécessaire de donner une portée plus générale aux statistiques régionales lesquelles, complétant les résultats obtenus dans les unités administratives, fourniront les données relatives à d'autres unités organiques (régions géographiques, économiques, etc.). Aussi a-t-on entrepris, à titre d'essai, dans l'Etat de Bavière, une enquête portant sur 18 villes d'au moins 30.000 habitants appartenant chacune à une circonscription comprenant au moins 50.000 habitants. En vue d'établir des règles générales permettant de définir les régions urbaines de l'Allemagne, on analyse actuellement les résultats de cette enquête; dans celle-ci les régions urbaines ont été définies en fonction de la densité de la population, de la structure résidentielle, de la structure économique et du degré d'organisation des travailleurs rémunérés, caractéristiques choisies d'après des repères empiriques.

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Seule, la présente analyse d'introduction fait l'objet d'une distribution générale. Les participants qui ont été invités à assister à la séance mentionnée ci-dessus recevront en outre le texte intégral du document. Les autres participants au Congrès recevront le texte intégral sur leur demande.

#### E/CCNF.13/52 Meeting No. 9

# JUN 9 1954

ORIGINAL: ENGLISH

Urban Population, Urban Areas, and the Problem of Dominance

in West-German Statistics

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#### I. The definition of the urban population

According to the present state of scientific discussion the following main groups of characteristics may be distinguished for classifying settlements and their population into urban and rural ones:

## 1. The administrative status

(a) The smallest administrative unit in the Federal Republic of Germany is the community (Gemeinde). According to the number of its population, its economic structure and residential pattern it may be declared a borough (Marktgemeinde) or a town (Stadt). In conformity with the federative structure of the Federal Republic it lies with the individual federal states (Bundesländer) to issue regulations to that effect. Therefore there are no uniform rules, applying to the whole of the federal area, fixing the charac teristics of a town in an administrative sense.

The first administrative unit, comparable throughout the federal states, containing the term 'Stadt' (town) is the 'Stadtkreis' (urban county) as opposed to the 'Landkreis' (rural county). The urban counties have increased rights and duties of communal self-government- They should have a certain minimum size (in Bavaria at least 25 000 inhabitants), and be the economic and cultural centre of their hinterland.

(b) From a regional point of view German official statistics uniformly break down their returns by communities, urban and rural counties. Since the designations 'boroughs' (Marktgemeinden) and 'towns' (Städte) are not comparable all over the federal area, and mostly are not taken into account in processing either, the "urban" population on account of the legal status of the community can only be determined for the urban counties (Stadtkreise). For this reason in practical usage the term 'population of the urban counties' (Bevölkerung der Stadtkreise) has largely become equivalent in meaning with 'urban population' (Stadtbevölkerung), all the more so because this procedure is of importance for practical administration.

(c) Such a way of using administrative terms is extremely problematical for demographic research because thus considerations and decisions of administrative policy take priority over the economic and sociological facts. In official statistics it should therefore be avoided as quite insufficient to take the legal status of a community as a criterion for characterizing its population as "urban" or "rural", in spite of its practical advantages.

# (2) Population figure and residential pattern

In accordance with the recommendations of the International Statistical Institute many returns of the great censuses are tabulated by size classes of communities. Usually the communities with more than 5 000 inhabitants are regarded as towns, but this is not true for official statistics which breaks down the communities by size without denominating the size classes. The classification by size of population has doubtless very great advantages because it sets distinct limits above and below, and is internationally comparable at

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any time. If the delimitation of the size classes and the rules for covering the population (resident population - local population present) agree with one another, then only a well-founded convention is necessary to arrive at absolutely comparable figures.

Since the population figure in many cases depends on the area covered by administrative units (e.g., large communities/Großgemeinden), indeed, communities may reach pretty high population figures by comprising many minor localities without getting the character of a town in the demographic/sociological sense of the word. The studies in this direction are therefore often supplemented by computing the density of the population (inhabitants per  $km^2$ ), the housing figure (Behausungsziffer" - number of dwelling units per residential building) or even the residential pattern (ratio of the non-farm residential buildings to the total number of residential buildings - e.g., at the time of the latest housing census in 1950). All these data, however, ignore the type, the professional or social structure of the population of the community in question, and may lead to considerable mistakes in individual cases.

#### 3) Economic and social structure of the population

To meet the last-named requirement, various proposals have been made to determine the urbanization by the degree of "industrialization" (Vergewerblichung), i.e. the prevalence of non-agricultural, or urban, professions and gainful occupations in the community concerned (thus, e.g., by Fürst and Horstmann). The studies in normal times showed a pretty close positive correlation between the degree of "industrialization" and the number of inhabitants; in minor communities, however, rather considerable deviations were found. Nevertheless, this method showed so many advantages that it was constantly developped, and has now been made the basis of various experiments regarding

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the typification of communities.

#### 4) Determination of the town by its central functions

Whereas all the methods mentioned up to now treated the communities isolated in themselwes, by their locally limited characteristics, especially the geographers wanted to regard the towns as centres of spatial interaction and of their areas of influence. Essential for a town must be its supply function with regard to its surroundings, its hinterland. C h r i s t a l l e r was the first to develop the system of the "central places" and their ascertainment by the "telephone method". Since then these thoughts, too, have been expanded and have contributed a great deal to furnish us with new knowledge of the locational pattern in the distribution and connection of human settlements. But as such urban functions can also be taken over by subcentres not necessarily having an urban character, they can hardly be used - without additional attributes - for defining the concept of 'town'.

#### 5) Conclusion

(a) In order to show how much the results may differ according to the method adopted in delimiting town and country by their individual characteristics, the most important data to the point were compiled for Bavaria in table 1. A closer analysis of these figures cannot be made here from want of space but special attention may be drawn to columns 13 and 14 from which can be seen the different range of the groups of characteristics applied.

(b) The critical appreciation of all factors hitherto examined shows that none of them by itself allows of an entirely satisfactory delimitation of the urban population. They will rather have to be used always in a significant combination with one another.

(c) The surest criteria for the delimitation of town and countryside prove

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doubtless the characteristics concerning the economic structure, the residential pattern, and the number of inhabitants.

(d) The analysis of dominance (centrality) is very interesting for judging the importance of a community within the regional layout of the settlements and their areas of influence. It should also be taken into account in a grouping by characteristics sub (c) - cf. groups V, VI table 1. But in this case dominance will possibly be used more to demonstrate the different importance of the towns than to define the concept of "town" on the lower level.
(e) The legal status of a place of residence is important for administrative purposes but unsuitable for demographic research.

## II. The analysis of the dominance of communities

All German attempts at the solution of this problem start on the supposition that the dominance of a community expresses itself in the scope of its functions with regard to its hinterland. Apart from the telephone method developped by Christaller, who had found a comprehensive expression for these functions in the number of telephone connexions, a more or less wide range of occupations with marked service functions is used as a criterion. Thus Neef uses the ratio of persons engaged in retail trade to the resident population, L i n d e the number of persons served in excess of the population figure of the town (ratio of persons employed in retail trade and handicraft to the resident population) for the analysis of dominance. Starting from former studies by Schlier and Bobek who developped the concept of the "central stratum", the author undertook corresponding computations for Bavaria. Because the central stratum (i.e. those employed in business, communications, in public service, or briefly, in "non-productive" or "secondary" jobs) showed rather an arbitrary dispersion, the distribution of this stratum over the different "non-productive" branches was taken into

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account. For a preliminary investigation had shown that there is a typical concentration for every secondary job from absolute concentration, as with department stores in large towns, to absolute dispersion, e.g., with elementary schools or hairdressers' shops in almost any rural community, however small. This concentration is accompanied by an accumulation of other non-productive jobs so that they can be used as the simplest statistical expression for the degree of differentiation. Based on these results the following scale was established for analysing the dominance of a place:

Table	no.	1
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Number of branches of secondary jobs	Central stratum in per thousand of the resident population	degree of dominance			
35 - 84	75 - 134 .	I. degree			
85 <b>-</b> 164	135 - 179	II. degree			
165 - 250	180 - 210	III. degree			
250	210	highest dominance			

These characteristics and benchmarks, the computation of which is treated in the Zeitschrift des Bayerischen Statistischen Landesamts, 84th year, 1952, no. 1/2, render possible a better coverage of the towns and boroughs by their economic weight, and their influence on the supply of their hinterland, than would be feasible merely by the population figure or the occupational structure (e.g., purely industrial large towns!) of the population.

# III. The delimitation of the urban agglomeration areas

Not less important than the objective definition of the concept of 'urban population' is the geographic delimitation of the 'urban area' (Stadtgebiet). Interest primarily concentrates on the administrative delimitation, for every administration has a restricted area of competence, and therefore wants the necessary statistical data for this particular administrative area. But even here it becomes evident that it is impossible to cover living reality

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by standards of administrative law. The settlement of the urban population does not keep to administrative boundaries, but crystallizes in a narrower or wider circuit around the centre of the urban areas. Whereas in defining the concept of urban population the problem was to find a lower limit for it, the task in demarcating the 'urban area' geographically is to find characteristics for fixing the outer limits of the area in question.

Attempts to cover the urban agglomeration areas statistically were made in Germany at the beginning of this century above all by Brückner, Hasse, and especially by Schott. They all endeavoured to find comparable delimitations for different towns, and therefore defined the agglomeration area as a schematic geographic unit delimited by concentric circles around the centre of the town (with a radius of at first 10, later 15, and even 20 km). Such a schematic analysis, advantageous as is was for comparative studies, was not adapted to showing actual geographic interaction; for

- (1) there were of necessity also included areas to be called anything but urban in character, and
- (2) it did not take into account the actual interaction; which probably was its decisive defect.

Its place was therefore taken by monographic studies for individual towns which naturally could draw upon all factors imaginable for determining the agglomeration area. Excellent as have been many of these studies, one great deficiency remained: on this basis official statistics was clearly unable, considering its extensive inquiries, especially the population censuses, to make available the data for urban agglomerations in its regional tabulations, in addition to their purely administrative breakdown. The development of the concepts of metropolitan area in the USA, of conurbation in

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the United Kingdom, etc., has also in Germany revived the discussion about the concept of agglomeration. To begin with, there have been undertaken various monographic studies for this purpose, e.g., for Kiel, Darmstadt and Cologne. A major investigation comprising a whole state was implemented by the author for Bavaria. All these studies are at present being discussed in the "Stadtgeographischer Arbeitskreis" (Working Team for Municipal Geography) of the "Bundesanstalt für Landeskunde" at Remagen. There at first an agreement was reached regarding the terminology, which is to be seen from the following schematic presentation of the "Stadtregion" (urban region), as the whole of the agglomeration area is called.



There is unanimity also concerning certain basic characteristics. In any case there are to be taken into account:

a) The ratio of the agricultural labour force - as characteristic of the population structure.

b) The density of the population, if possible, also the type of buildings .

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as characteristic of the residential pattern.

c) The persons commuting from the individual parts of the agglomeration area into the central city - as characteristic of interaction.

On the basis of these characteristics the author investigated the urban regions for a total of 18 Bavarian towns. As agglomeration area was to be covered that space "which by the economic structure of its population forms a more or less homogeneous, predominantly non-agricultural geographic unit, and the population of which to a prevelent or at least considerable extent finds its economic existence directly in the places of employment of the central town itself". The area was deliberately demarcated in a way as to make visible the <u>utmost</u> limits. It was, however, avoided to take into account the commercial, cultural and administrative aspects of the dominance of the central city because they have nothing to do with the agglomeration as such. Besides, it is very difficult to cover them by statistical methods.

In this study the following criteria were used for determining urban regions:

Table no. 3	
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Residential pattern			Economic strucutre	Employment-residence ratio				
Names of the Zones	Inhabi-	Prevalent types of	Ratio of gainful workers in agri-	Ratio of commuters into the central area to				
	tants per km <sup>2</sup>	residen- tial buil- dings	culture to total of gainfully em- ployed	non agricul- tural workers	total of commuters			
Central Area (A)	> 500	ME, EM	< 20					
Urbanized Zone (B)	•	EB	<b>&lt;</b> 35	> 30	<b>}</b> .			
Border Zone(C)					>60			
1 inner (C 1)	•	) B	< 50	> 20				
2 outer (C 2)	•	5	50-65	> 20	)			

+) The types of residential buildings were determined by the following characteristics:

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ME = ratio of multi-family and single-family houses
 EM = ratio of single-family and multi-family houses
 EB = single-family houses and farm houses
 B = farm houses

more than 67 per cent of all residential buildings

The requirements for being selected as urban region were that the central town itself had to to have at least 30 000 inhabitants, the agglomeration area at least 50 000. The details of the investigation and its results have been published in the "Allgemeines Statistisches Archiv", vol. 37 (1953) pp.13-26. The results of this study showed a very satisfactory picture for Bavaria though in individual cases certain changes are still desirable for one community or another on account of special local conditions beyond statistical coverage. It is true that conditions are favourable in Bayaria inasmuch as the major urban centres are pretty far between, there are no overlappings and the separation of town and countryside is pretty marked. In areas of urban concentrations, particularly in the Ruhr, the analysis is more difficult, so that both the benchmarks chosen must still be perfected, and additional characteristics found to arrive at distinct delimitations in these very complex geographic structures. It is to be hoped, after all, that by carrying on these studies the concept of the agglomeration area before long can also be introduced into German official statistics, not only for the large censuses but also for various periodical statistics. The necessity for that also results from the organization of a German baby census which naturally enough in the selection of its regional sampling units cannot view the large towns isolated from their surroundings but must take them into account along with their agglomeration areas.

#### Table Nr. 1

# Cumulative Survey of the urban population volume in Bavaria

#### by various characteristics

(as per September 1950)

- inhabitants in thousands, excluding columns 13 and 14 -

		· · · · · · · · · · · · · · · · · · ·	thereof											
Cumul a trime	Number	Inhabi-	20 000		10 000 -		1 5 000 -		3 000 -		2 000 -		larg-	small-
Cumulative groups	communi-	tants	and	over	19	999	و	999	4 9	99	2 99	9	est	est
	ties	total	c."	i. <sup>2)</sup>	C.	i.	́с.	i.	с.	i.	c.	1.	commun	ity
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Communities total 3)	7 087	9 126	27	2 518	35	464	1'11 	785	168	633	277	670	831 937	49
I. Legal ,Status														
urban counties	. 47	2 783	25	2 469	21	305	1	9	-	-	· -	-	831 937	8 802
" + district towns	242	3 729	26	2 493	34	453	62	459	50	189	34	84	23 552	788
" " + boroughs	652	4 572	27	2 518	35	464	81	581	96	365	110	270	25 142	299
" " " + rural communities	* .		= c	ommu	n i t	ies	,	tot	a 1		2		9 632	49
II <u>Density of population</u> (inhabitants per gm <sup>2</sup> )				.	]									-
more than 1 000	78	2 798	23	2 398	15	205	21	157	4	16	6	15	831 937	492
H H 500	232	3 581	26	2 493	30	406	61	446	25	100	29	70	24 193	352
n n 250	587	4 455	26	2 493	34	453	89	644	85	331	106	258	11 733	154
n n 160	1 100	5 262	26	2 493	35	464	101	717	135	512	174	426	11 167	129
n n 90	3 158	7 046	27	2 518	1	_	106	748	161	608	249	605	25 142	77
n n 40	6 349	8 854			_	_	110	779	168	633	272	659	5 157	83
40	0 )40	0 0,4		. –										-
III. Types of communities by prevalent character of residential buildin	gs									•.			•	
multi- and single-family				Ì										400
houses	160	3 170	24	2 444	21	300	31	236	15	88	22	. 54	851 957	122
family houses	.544	4 555	27	2 518	35	464	94	671	98	411	112	275	25 491	185
" " + single-family houses	580	4 629	-	-	-	-	99	711	102	425	113	278	9 632	83
" " " + <u>single</u> - family and farm-houses	2 100	6 466	-	-	-	-	111	785	162	642	251	609	9 453	49
IV. <u>Economic structure</u> (ratio of gainful worke in agriculture to total of gainful workers)	 rs 									705	100	267	831 037	355
up to 19 per cent	520	4 553	27	2 518	35	464	101	723	101	295	100	201	6 077	151
" " 34 " "	1 159	5 559	-	-	-		111	785	153	583	204	499	7 (57)	54
" " 49 <sup>h</sup> "	2 166	6 517 .	-	-	-	-	-	-	163	617	251	023	7 077	. •4
V. <u>Degree of dominance</u> (number of persons serve in excess of the town- population)	a 	•												
more than 25 000 persons	5	1 575	5	1 575	-	-	-	-	-	-	-	-	00 000	10 447
" <u>" 10 000 - "</u>	24	2 365	21	2 316	3	49		-	-	-			50 011	2 014
" <del>"</del> 5 000 "	56	2 780	25	2 4 5 6	16	217	13	101		4	6	14	37 920	2 035
" " 2 500 "	123	3 282	26	2 494	27	361	48	249	54	207	54	172	23 552	2 022
# # 1 000 · #	241	3 808	27	2 518	32 .	424	(4	-520	24	207	125	328	10 879	2 019
" " 1 permon	367	4 217	-	-	33	435	85	609	8/	221	1 22	,20	10 017	,
VI. <u>Central functions</u> 4) central stratum and its composition see p.5			Į į	· •									931 037	78 443
highest degree of dominance	5	1 575	5	1 575	-		-	-	-	-	-	-	76 190	13 851
" + III• " " "	· 24	2 299	21	2 257	3	43	-	-	+2			_	99 890	3 289
" " <b>+II.</b> " " " "	122	3 268	25	2 469	25	331	59	412	112	124	1 143	349	25 491	?
нин <b>+1.</b> и и и	544	4 521	27	2 518	34	350	95	005		464	'''		- <i>, ,</i> ,	

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1) c. = communities
 2) i. = inhabitants
 3) Excluding the county of Lindau
 4) Only communities with more than 1 000 inhabitants .