United Nations A/HRC/50/68

General Assembly

Distr.: General
14 December 2023

Original: English

Human Rights Council
Fiftieth session
13 June–8 July 2022
Agenda item 4
Human rights situations that require the Council's attention

Civilian deaths in the Syrian Arab Republic

Report of the Office of the United Nations High Commissioner for Human Rights*

Summary

In its resolutions 46/22 and 49/27, the Human Rights Council requested the Office of the United Nations High Commissioner for Human Rights to resume its work to establish, document and publish the extent of civilian casualties in the Syrian Arab Republic, in cooperation with civil society, in order to fully assess the number of people killed as a result of 10 years of conflict. Building on previous efforts on casualty recording and reporting on Sustainable Development Goal indicator 16.1.2 on conflict-related deaths, the Office of the United Nations High Commissioner for Human Rights provides statistical analysis covering the period from March 2011 to March 2021.

* The present report was submitted after the deadline in order to include the most recent information.

I. Background

1. In its update to the Human Rights Council at the forty-eighth session, pursuant to Council resolution 46/22, the Office of the United Nations High Commissioner for Human Rights (OHCHR) reported on casualties in the conflict in the Syrian Arab Republic based on a list of 350,209 identified individuals killed in the conflict between March 2011 to March 2021. More work was required to further analyse the data, including to understand how many of those deaths were civilians. On 1 April 2022, the Council adopted resolution 49/27, expressing its concern at the number of people killed and emphasizing the importance of such comprehensive, verifiable and transparent records of the casualties of the conflict. The Council also requested OHCHR to continue to document and publish civilian deaths and to submit a report at its fiftieth session.

2. In the present report, OHCHR provides and analyses the results of its work to produce a rigorous assessment of casualties during 10 years of conflict in the Syrian Arab Republic, including through a statistical analysis of available data on conflict-related deaths. The data directly gathered by the United Nations, government entities and civil society organizations do not, and cannot be considered to, account for each and every casualty occurring in the conflict in the Syrian Arab Republic, owing to the major operational and practical challenges in collecting the necessary information in the circumstances of the conflict. In response to the request by the Human Rights Council, OHCHR has sought to address this gap through the use of established statistical techniques to provide a reliable estimate of the total civilian deaths that may have occurred during 10 years of conflict – both documented and undocumented. The report, accordingly, includes both an enumeration of documented conflict-related deaths, with yearly disaggregations by sex, age, the governorate where the death occurred, the cause of death by weapon type, the actors alleged to have caused the deaths and the civilian status of casualties, and statistical estimates to account for missing data on civilian deaths – undocumented and unidentified.

3. This statistical work builds on previous efforts in assessing direct conflict-related deaths, that is, deaths that resulted directly from war operations and where the acts, decisions and/or purposes that caused those deaths were in furtherance of or under the guise of armed conflict. They may have been caused by the use of weapons or other means and methods. For the purposes of the present report, the term "casualties" is used to indicate deaths.[1] In 2013 and 2014, OHCHR commissioned three statistical analyses of documented killings in the Syrian Arab Republic.[2] In 2019, OHCHR reinforced its global engagement on casualty recording and monitoring and investigating incidents involving civilian casualties, and resumed work on a statistical analysis to include the conflict in the Syrian Arab Republic in its global reporting on the Sustainable Development Goal indicator on conflict-related deaths (indicator 16.1.2).[3]

4. This is the first time that OHCHR is able to report on civilian deaths resulting directly from the 10 years of conflict in the Syrian Arab Republic, including the total number of documented civilian deaths and the estimates of undocumented deaths. The massive figures in the present report do not, however, include indirect deaths, namely, those resulting mainly from the loss of access to essential goods and services that was caused or aggravated by the conflict.

5. Monitoring and documenting conflict-related deaths is essential to help to protect civilians and other potential victims, ensure better respect for international humanitarian and human rights law norms during and after the conflict, and understand the patterns and consequences of armed conflicts for prevention purposes. Documenting individual cases is key to effectively realizing a range of fundamental human rights – knowing the truth, seeking accountability and pursuing effective remedies. It can facilitate survivors' access to education,

[1] It should be noted that some casualty recording systems also include injured persons.

[2] See https://hrdag.org/wp-content/uploads/2013/02/Benetech-final-SY-report.pdf, https://www.ohchr.org/Documents/Countries/SY/HRDAG-Updated-SY-report.pdf and https://www.ohchr.org/Documents/Countries/SY/HRDAGUpdatedReportAug2014.pdf.

[3] For more information on the indicator, see https://www.ohchr.org/EN/Issues/Indicators/Pages/SDGindicators.aspx.

health care and property. It also supports and complements efforts to account for missing people. In the context of the Syrian Arab Republic, OHCHR has been engaged in various activities to address the issue of missing persons, from monitoring related violations and normative developments affecting the rights of victims, survivors and their families to cooperation with relevant actors and promoting the use of international human rights mechanisms.

II. Documenting deaths through casualty recording and statistical analysis

6. The United Nations started casualty recording as part of its ongoing monitoring and investigation work to identify patterns of harm to civilians in conflict situations. The systematic collection and verification of information on incidents of casualties enables the United Nations and other casualty recorders, as well as users of their data and analysis, to follow up on individual cases in support of victims and justice, while also giving a clearer sense of the severity and scale of the conflict and its developments. Casualty recording does not, as such, make findings about the lawfulness of the related deaths under international humanitarian or human rights law, but instead provides a factual description of the events that have taken place and personally identifiable data about the victim. This enables the United Nations to take steps to mitigate harm to civilians, including by engaging with the parties to the conflict themselves.

7. The operating environment in which casualty recording is undertaken is often challenging, with limitations in terms of access to the site of incidents and/or the area where casualties are being reported. In many contexts, and where civil society actors undertake casualty recording, efforts at real-time documentation and dissemination of information on victims, the circumstances of their death and those responsible can put the recorders themselves at risk. They also face multiple challenges in their documentation efforts, including the collapse of their usual networks of information as people are on the move, displaced or in areas where there is a general information shutdown; the limited, or lack of, access to mobile data, the Internet and electricity to collect and transmit information; limitations on their movements; and surveillance. Despite this, in many contexts, individuals and organizations seek to document at least some of the casualties taking place, frequently focusing on the deaths of civilians.

8. The OHCHR office for the Syrian Arab Republic has been conducting independent monitoring of the human rights situation throughout the country. It undertakes inquiries into the impact of armed conflict and violence on civilians and alleged human rights violations and abuses and violations of international humanitarian law, irrespective of when, where or by whom such violations or abuses were or are being committed. As OHCHR does not have access to the territory of the Syrian Arab Republic and hence cannot directly gain access to the locations where incidents have taken place, it relies on remote monitoring through a range of techniques to gain information through reliable networks and sources.

9. While every effort is made to ensure that the information on civilian casualties recorded by the OHCHR office for the Syrian Arab Republic is as comprehensive as possible, the data are not exhaustive of all incidents occurring in the Syrian Arab Republic.[4] To address these limitations to the extent possible, for the statistical analysis described below integrated and more comprehensive information collected from multiple sources, including the Government of the Syrian Arab Republic, Syrian human rights groups and the OHCHR office for the Syrian Arab Republic, was used.

[4] The OHCHR office for the Syrian Arab Republic reports on incidents that exemplify human rights issues of concern. These incidents reflecting civilian casualties are not to be considered as comprehensive, due to the changing patterns of the conflict and the limited access to credible and/or reliable sources in many conflict-affected areas. Verifying all incidents occurring across the Syrian Arab Republic remains challenging and, thus, civilian casualties reported by OHCHR are only indicative and are verified in accordance with OHCHR methodology.

10. OHCHR is the international "custodian agency" for Sustainable Development Goal indicator 16.1.2 on the number of conflict-related deaths per 100,000 population by sex, age and cause of death[5] and, as such, is responsible for methodological development, capacity-building, compilation and reporting in terms of this indicator globally. The indicator is part of the Sustainable Development Goal indicators framework adopted by the General Assembly in July 2017.[6] OHCHR has developed a conceptual, methodological and data collection framework for this indicator based on international legal standards, existing statistical classifications and the groundwork of established practices in casualty recording, as well as extensive consultations with relevant stakeholders. The methodology has been approved by the Inter-Agency and Expert Group on Sustainable Development Goal Indicators, composed of representatives of national statistical offices and regional and international agencies as observers. Under this indicator, OHCHR has been reporting data on 12 of the world's deadliest armed conflicts, including in the Syrian Arab Republic, since 2020.

11. The conflict-related deaths referred to in the present report are not simply a set of abstract numbers. Casualty data represent individual human beings with families who belong to communities. The very purpose of the data collection effort is to strengthen the protection of these individuals and communities and respect for victims' rights, including their right to seek justice, truth and reparation.

III. Methodology

A. Data sources used

12. On 24 March 2021, the Human Rights Council adopted resolution 46/22, in which it requested OHCHR to resume its work to establish the extent of civilian casualties in the Syrian Arab Republic, in cooperation with civil society, in order to fully assess the number of people killed as a result of 10 years of conflict, and to report on progress through an oral update to the Council at its forty-eighth session, in September 2021. Pursuant to this request, in July 2021, OHCHR issued a call for submissions of available data on civilian casualties during the 10 years of conflict in the Syrian Arab Republic.[7] OHCHR also addressed the Permanent Mission of the Syrian Arab Republic to the United Nations Office at Geneva through a note verbale, requesting any information on conflict-related deaths from March 2011 to March 2021.

13. To produce the present report, OHCHR benefited from the collaboration of a number of organizations that have been engaged in gathering information and documenting casualties over many years in the Syrian conflict in challenging circumstances. Some of these had already contributed data for the reporting of OHCHR on the Sustainable Development Goal indicator on conflict-related deaths and previous reports of OHCHR on the Syrian Arab Republic. The sources used for the present report and the corresponding periods for which they shared data with OHCHR are as follows:

(a) Damascus Centre for Human Rights Studies[8] (March 2011–December 2018);

(b) Syrian Centre for Statistics and Research[9] (March 2011–March 2021);

[5] See the technical guidance note on the indicator, available at https://www.ohchr.org/sites/default/files/Documents/Issues/HRIndicators/SDG_Indicator_16_1_2_Guidance_Note.pdf.

[6] See General Assembly resolution 71/313; E/CN.3/2020/2, annex II; and E/CN.3/2021/2, annex. The indicator contributes to the measurement of target 16.1, which is to significantly reduce all forms of violence and related death rates everywhere.

[7] See https://www.ohchr.org/EN/Countries/MENARegion/Pages/SyriaCallSubmission10yearsofconflict.aspx.

[8] See https://euromedrights.org/members/damascus-center-for-human-rights-studies-dchrs/.

[9] See https://csr-sy.org/.

(c) Syrian Network for Human Rights[10] (March 2011–March 2021);

(d) Syrian Observatory for Human Rights[11] (March 2011–March 2021);

(e) Violations Documentation Centre[12] (March 2011–February 2020);

(f) Government of the Syrian Arab Republic (March 2011–November 2012);

(g) Syria Shuhada[13] (March 2011–May 2014);

(h) OHCHR office for the Syrian Arab Republic (January 2019–March 2021).

14. OHCHR has engaged bilaterally with the Damascus Centre for Human Rights Studies, the Syrian Centre for Statistics and Research, the Syrian Network for Human Rights, the Syrian Observatory for Human Rights and the Violations Documentation Centre to understand their methodology, including the categories used to disaggregate the data. OHCHR has been working with these organizations over time and, although their capacities have varied over the course of the 10-year period, they have maintained consistency in the quality and content of their respective records. OHCHR further contacted the Human Rights Data Analysis Group, the same organization that it had commissioned to undertake statistical analyses in 2013 and 2014 of conflict-related deaths in the Syrian Arab Republic, to work with OHCHR statistical and data experts in analysing the hundreds of thousands of records to be reviewed and compared to avoid duplication, while applying appropriate statistical techniques to account for the missing data in existing records and undocumented civilian deaths.[14]

B. Process and techniques used

15. For the analysis undertaken, established statistical and computer science techniques composed of four main steps were used: (a) accessing and preparing records (data processing); (b) identifying records that refer to the same person who died (semi-supervised record linkage or data integration); (c) estimating missing fields from observed records of deaths (imputation); and (d) estimating undocumented deaths (multiple systems estimation). These four steps were carried out by the technical team at the Human Rights Data Analysis Group, in close consultation with subject-matter experts at OHCHR.[15]

16. The first two steps of data processing and record linkage resulted in an enumeration of individuals with their full name and date and location of death. For many records, additional information was also available, including in relation to the identity of the persons who had died, the circumstances and cause of death, the actors alleged to have caused the death and the status of the individual as a civilian or not. This integrated dataset was the basis for the findings regarding documented conflict-related deaths in section IV below.

17. Documented deaths reflect what has been recorded by the relevant data sources. However, when hostilities are of a higher intensity, documenting deaths becomes particularly challenging, and documentation that occurs at the time of events may not be fully representative of the actual scale of casualties taking place. Therefore, established statistical estimation techniques steps three on imputation and four on multiple systems estimation,

[10] See http://sn4hr.org/.

[11] See https://www.syriahr.com/ (in Arabic).

[12] See https://www.vdc-sy.info/index.php/en/about. The Violations Documentation Centre is a project of the Syrian Centre for Media and Freedom of Expression. The records were obtained from the website with permission.

[13] Some of the records were downloaded by the Human Rights Data Analysis Group with permission and some were shared by Syria Shuhada. The records were used in the reports of OHCHR in 2013 on killings in the Syrian Arab Republic.

[14] The Human Rights Data Analysis Group is a non-profit, non-partisan organization that applies scientific methods to the analysis of human rights violations around the world. They have provided their expertise to truth and reconciliation commissions, United Nations missions, human rights bodies, and international and domestic criminal tribunals. For more information, see https://hrdag.org/.

[15] See annex II for technical notes on the methodology.

have been applied to account for undocumented deaths to assist in drawing conclusions about patterns of casualties. Due to limited time and resources, the estimations focused on civilian deaths only.

IV. Documented conflict-related death: 2011–2021

A. Overall documented deaths

18. Based on the information collected by the eight sources listed in the previous section, OHCHR finds a total of 350,209 unique, documented and identifiable casualties for the period from 1 March 2011 through 31 March 2021. A casualty is considered identifiable if the full name, date of death and the governorate in which the person died were recorded. Records missing any of that information are excluded from the present analysis.[16]

19. There were 27,126 deaths of children, which means that, on average, 1 in every 13 deaths was a child. When comparing deaths of men and boys and women and girls, 1 in every 13 deaths was a woman or girl (26,727). The highest number of documented deaths was recorded in the Governorate of Aleppo, where 51,731 individuals died. Other locations with heavy death tolls recorded were rural Damascus (47,483 deaths), Homs (40,986 deaths), Idlib (33,271 deaths), Hama (31,993 deaths) and Tartus (31,369 deaths).

20. Data sources also provided information describing the circumstances of deaths and, in some cases, more detailed information on the causes of death, by type of weapon or means and methods used (see table A.5 in annex I).[17] The information provided does not, however, give a comprehensive picture of the weapons and methods used in the conflict. For example, the cause of death was unspecified or unknown for 45,746 deaths (13.1 per cent). However, 122,931 deaths (35.1 per cent) were attributed to the use of multiple weapons in incidents of, inter alia, clashes, ambushes, attacks and massacres. Other causes of death were, in decreasing order: heavy weapons and explosive munitions, with 81,640 deaths (23.3 per cent); small arms and light weapons, with 76,417 deaths (21.8 per cent); use of objects and other means (including sexual violence, death in custody, torture, strangulation, mutilations, beheadings and hanging), with 12,259 deaths (3.5 per cent); and planted explosives and unexploded ordnance, with 9,184 deaths (2.6 per cent). A total of 1,235 deaths (0.4 per cent) were caused by chemical, biological, radiological or nuclear weapons, with the majority of deaths (893) recorded in 2013. Lastly, 643 deaths (0.2 per cent) were caused by denial of access to, or destruction of, objects indispensable for survival directly resulting from war operations.

21. The Independent International Commission of Inquiry on the Syrian Arab Republic recorded numerous instances of indiscriminate use of air strikes, bombings and planted explosives by numerous actors, including in civilian-populated areas where the Commission

[16] The number of documented deaths by sex, age group, governorate, actors alleged to have caused the death, civilian status of casualties and cause of death by weapon type by year are presented in tables A.1–A.7 in annex I.

[17] For the disaggregation of the “cause of death”, including types of weapons, the categories are based on those used for Sustainable Development Goal indicator 16.1.2. Those categories build on the eleventh revision of the International Statistical Classification of Diseases and Related Health Problems of the World Health Organization, the International Classification of Crime for Statistical Purposes, the International Committee of the Red Cross overview of weapons regulated by international humanitarian law, United Nations practice and OHCHR casualty recording. For more information, see https://www.ohchr.org/sites/default/files/Documents/Issues/HRIndicators/SDG_Indicator_16_1_2_Guidance_Note.pdf. The original records shared with OHCHR include 38,943 unique descriptions of causes of death. The 200 most frequent causes of death, which accounted for the majority of the records, were coded by hand. The remaining causes of death were categorized using keyword searches. Using this approach, the majority of the unique cause of death values to cause of death categories were mapped out. A total of 3,286 values (about 8 per cent) could not be matched as there was insufficient information on the circumstances of the deaths. These were assigned to the “unknown” category.

did not find military objectives nearby, including markets, hospitals, schools and public spaces where civilians gathered in large numbers, which killed and injured civilians throughout the 10 years of conflict. The Commission also recorded thousands of cases of civilians who were tortured, raped and subjected to other forms of sexual violence, arbitrarily detained and forcibly disappeared or killed in detention.[18] In 2013, the Commission documented a major attack with sarin-filled rockets in eastern Ghutah that killed, maimed, injured and terrorized Syrian civilians. The Commission also documented 38 separate instances of the use of chemical weapons, noting that each amounted to a war crime; 32 met its standard of proof for attribution to the Syrian Arab Republic government forces and one to Da'esh. In the remaining five instances, the Commission could not attribute responsibility.[19]

22. Data sources that contributed to this analysis also provided certain information on the actors or groups alleged to have caused deaths (see table A.6 in annex I). According to available data, 39.3 per cent of deaths (137,529) were allegedly caused by actions by the Government and its allies; 35.7 per cent (125,098) by non-State armed groups, which include anti-government groups (5.3 per cent, 18,519); Islamic factions (24.9 per cent, 87,039); and Islamic State (5.1 per cent, 17,868). Allegedly, 0.8 per cent of deaths (2,859) were caused by the coalition forces and in 24.2 per cent (84,595) of the documented conflict-related deaths, the actors were recorded as unknown. It should be noted that in order to provide a more complete picture of the attribution of casualties to the various actors, more work would be required, including applying the estimation techniques detailed below.

B. Documented civilian deaths

23. For purposes of the present report, civilian status is used as a factual category referring to persons who, based on available data and the methodology applied, were not members of the State armed forces nor direct participants in hostilities at the time of their death. For purposes of the statistical analysis, recorded deaths were classified as civilian deaths if at least one source identified them as civilian and no source identified them otherwise. Recorded deaths were classified as non-civilian if at least one source identified them as non-civilian and no source identified them otherwise. Some records with missing information or with information contradicting that in other records may pertain to civilians. As a result, records identifying casualties as civilians provide a minimum verifiable number and are certainly an undercount of the actual number of civilians who died. Of the 350,209 deaths recorded, 143,350, or 40.9 per cent, were identified as civilians. For a significant number of recorded deaths, 44,768, or 12.8 per cent, sources have provided contradictory information about their status, while for 23,116, or 6.6 per cent, the status is unknown. Finally, 138,975 deaths, or 39.7 per cent, have been categorized as non-civilian. Similar to the analysis of attribution set out above, a statistical estimation would enable a fuller understanding of the overall number of casualties, documented and undocumented, for both civilians and non-civilians.

V. Estimates of civilian deaths: 2011–2021

24. Two statistical estimation techniques, imputation and multiple systems estimation, were applied to estimate the total number of civilian deaths, which includes both documented and undocumented civilian deaths, with a measure of uncertainty in the estimates. The imputation served to fill in missing and contradictory information in the documented records of deaths. The information on fully documented civilian deaths and the imputed values were used to estimate undocumented deaths through multiple systems estimation. As a result, it is estimated that an additional 163,537[20] civilian deaths occurred that have not been documented. People whose deaths have not been documented and who cannot be named

[18] A/HRC/46/55.

[19] A/HRC/46/54, paras. 9, 24 and 32; A/HRC/46/55; A/HRC/43/57, paras. 22 and 24; see also https://www.ohchr.org/sites/default/files/Documents/HRBodies/HRCouncil/CoISyria/COISyria_Chemical_Weapons.jpg.

[20] For the undocumented civilian deaths, the credibility interval is between 138,093 and 194,621.

nevertheless deserve to be counted. Accordingly, the total number of civilian casualties is estimated to be 306,887,[21] with a credible interval of approximately 95 per cent. The 95 per cent credible interval implies that, given the observed data and assuming that the model is correct, there is a 95 per cent chance that the true number of civilian deaths is between 281,443 and 337,971. This figure means that the average daily death toll over the 10-year period is an estimated 83 civilians, of whom 15 were females (women and girls) and 18 were children. The extent of civilian casualties in the 10 years of the conflict represents a staggering 1.5 per cent of the total population of the Syrian Arab Republic at the beginning of the conflict, raising serious concerns as to the failure of the parties to the conflict to respect the norms of international humanitarian law on the protection of civilians.

25. In general, the number of documented civilian deaths decreased after 2012. However, according to the estimated figures, while deaths were extremely high in 2012, they peaked in 2013, with a possible further spike in 2014–2015, before decreasing quite significantly in 2016. Between 2016 and 2018, it is possible that the civilian deaths increased again slightly. From 2018 onwards, both the documented and estimated figures show a continuous reduction in the number of civilian deaths. A comparison of documented civilian casualties and estimated civilian casualties for the period 2011–2021 across the Syrian Arab Republic is presented in figure I, annex I of the present report. The lighter grey shading around the line describing the estimated casualties indicates the 95 per cent credible interval for the estimates.

26. Explanation for the pattern of civilian deaths described above may be found in changes in the areas of influence by the different actors in the conflict. For example, the Commission reported that between 2012 and 2016, various armed groups, and later United Nations-designated terrorist groups,[22] gained control over increasing numbers of cities and towns with significant populations. The Government imposed sieges and bombarded areas of suspected opposition activity, including densely populated civilian areas.[23] Several incidents of hostilities documented by the Commission provide context to the estimated increase in civilian deaths in 2015, including the capture of Idlib by a coalition of non-State armed groups in March, the commencement of the Russian military intervention, particularly with increased air strikes in support of the Government in September, and the capture of a large amount of territory controlled by Da'esh by Kurdish-led armed groups supported by the international coalition in the north-east of the country.[24] There were significant marked changes in the conflict during the period 2016–2018, supporting the finding of a possible spike in hostilities, including the Government's recapture of eastern Aleppo after intense government shelling and air strikes in late 2016, the use of sarin in Khan Sheykhun (Idlib) in April 2017, which prompted the first direct air strikes on facilities of the Syrian Arab Republic by the coalition led by the United States of America, and the capture of the city of Raqqah, the de facto capital of Da'esh, by the Syrian Democratic Forces and its allies.[25] The Commission recorded eruptions in fighting in late 2019 and the first quarter of 2020 and warned that "without concerted, immediate action to further a permanent ceasefire and a good faith Syrian-led peace process, the conflict may yet descend to new levels of inhumanity".[26]

[21] This estimate is based both on records of deaths consistently identified as civilian across one or more data sources as well as imputed values for deaths with unknown or contradictory information on the civilian status. It excludes information from: Tartus, in 2017, 2019 and 2020, and Damascus in 2021. These strata could not be estimated because there was not sufficient data to construct estimates using multiple systems estimation. In total, these strata represent less than 0.01 per cent of the total number of civilian deaths documented from 1 March 2011 to 31 March 2021. As this is a very small proportion of the total number of documented civilian deaths, the exclusion of these strata from the estimations does not impact the substantive conclusions about civilian deaths in the Syrian Arab Republic during the 2011–2022 period. In addition, there were no documented civilian deaths in Latakia in 2021 or in Tartus in 2018 and 2021, so the results do not reflect the civilian deaths that may have occurred in those governorates in those years but was not documented by any of the data sources.

[22] Hay'at Tahrir al-Sham and Da'esh.

[23] A/HRC/46/54, para. 6.

[24] Ibid., paras. 11–12.

[25] Ibid., paras. 14–17.

[26] Ibid., paras. 19 and 21.

27. In terms of the disaggregation of civilian deaths by governorate (see figure II, annex I), the highest number of civilian deaths, documented and undocumented, was recorded in rural Damascus (61,800), Aleppo (51,563), Dayr al-Zawr (38,041), Idlib (36,536) and Homs (29,983).[27] In the comparison of documented civilian deaths in the governorates of Dar'a and Dayr al-Zawr, the level of civilian deaths are similar, although there are significantly more estimated undocumented civilian deaths in Dayr al-Zawr. From 2014 until 2017, Da'esh besieged the densely populated Government-held neighbourhoods of Dayr al-Zawr and launched widespread and systematic attacks against the civilian population.[28] It is likely that due to the intensity of the crimes and acts of terror committed by Da'esh that documentation efforts were severely restricted in practice and that the data collected became less representative of the scale of the hostilities that occurred. With regard to the disaggregation by age and sex, the estimated numbers confirmed what is typically known about conflicts: more adults than children die and more men than women.

28. For the present report, it was not possible to undertake a statistical estimate of the causes of death and the actors alleged to have caused deaths based on the techniques described in section III.B, which would have required additional time and resources. Furthermore, no analysis of indirect conflict-related deaths[29] has been included, which would be crucial to fully account for the impact of the conflict.

VI. Conclusions and recommendations

29. **Over the past 10 years, the civilian population has borne the brunt of the conflict, which has resulted in an estimated 306,887 civilian deaths. This is more than double the number of civilian deaths organizations have been able to document over the 10-year period, illustrating the magnitude of the impact of the conflict, as well as how statistical estimation techniques can reinforce the information derived from the documented casualties. It should be clear that this figure represents only a portion of all deaths, as estimations of non-civilian casualties and of deaths resulting from the indirect effect of conflict, mainly through denial or reduced access to essential goods and services, would be required to complete a full picture of the loss of life. The number of civilian deaths, both documented and estimated, raises serious concerns as to the failure of the parties to the conflict to respect the norms of international humanitarian law on the protection of civilians.**

30. **The work done by casualty recorders in documenting individually verifiable information on each casualty is critical. The process is focused on the victims, placing individuals, their families and communities at the centre by ensuring that those killed are not forgotten and that information is available for accountability-related processes, including access to a range of human rights. At the same time, taken collectively, data on casualties, the circumstances and the causes of death help identify patterns of harm and shed light on behaviours that have the most adverse effect on civilians and, in some instances, on the identity of those responsible. Documenting conflict-related deaths in the midst of conflict is extremely difficult and potentially dangerous. The consistent and systematic work of the individuals and groups that have documented casualties on the ground for the 10-year period of the conflict in the Syrian Arab Republic reviewed in the present report should be acknowledged and supported.**

31. **Documenting deaths directly complements efforts to account for missing persons, in particular those who have gone missing in the context of military operations. Given the vast number of missing persons in the Syrian Arab Republic, OHCHR supports calls for the creation of an independent mechanism with a strong international**

[27] With the following 95 per cent credible intervals: 53,192, 73,592 (rural Damascus); 46,315, 58,616 (Aleppo); 29,221, 50,771 (Dayr al-Zawr); 32,471, 41,869 (Idlib); and 26,920, 34,169 (Homs).

[28] A/HRC/46/54, paras. 45 and 53.

[29] Indirect deaths are deaths resulting from a loss of access to essential goods and services (including economic slowdown, shortages of medicines or reduced farming capacity leading to a lack of access to adequate food, water, sanitation, health care and safe conditions of work) caused or aggravated by the armed conflict.

mandate to clarify the fate and whereabouts of missing people, to identify human remains and to provide support to relatives.

32. **In order to protect Syrian civilians – men, women and children – the hostilities must end. In the meantime, compliance with international humanitarian law and human rights law is the only way to prevent and alleviate their suffering.**

33. **The parties to the conflict should strictly abide by their international humanitarian law and human rights obligations and ensure the protection of civilians in their military operations, including by avoiding the use of explosive weapons in populated areas;**

34. **The Government of the Syrian Arab Republic should:**

(a) **Grant OHCHR immediate, full and unfettered access throughout the Syrian Arab Republic to facilitate human rights monitoring, as well as casualty recording;**

(b) **Provide access to effective remedies and reparations for all victims and survivors, including ensuring effective accountability and transitional justice mechanisms, with meaningful participation of victims and survivors to bring about a sustainable, inclusive and peaceful conclusion to the conflict.**

35. **Unless and until the conflict ends, there is a continued risk of civilian deaths. It is therefore critical that States, the United Nations and civil society use all available means to end the conflict and support a transition to peace. Vulnerable groups will feel the impact of the conflict even after it ends. It is important that special measures, such as those usually afforded to war veterans and their families, be extended to support the livelihoods and other opportunities of those who have lost family members, including care and support for those suffering long-term conflict-related injuries.**

36. **The estimation of undocumented deaths using available statistical tools complements and reinforces information derived from the documentation of individual deaths and adds to the existing understanding of patterns of hostilities. Further analysis could be conducted on specific incidents; circumstances of death, such as during sieges or in custody; and particular periods, such as during negotiated ceasefires. The same estimation techniques could also be applied to other data available for the Syrian Arab Republic, namely on non-civilian deaths, enabling better comparisons of civilian and non-civilian deaths. Such rigorous statistical analysis can support court cases and other accountability or transitional justice mechanisms and may be used, inter alia, for historical purposes. For such further estimations to be done and for estimated civilian casualties to be calculated in other contexts, OHCHR would require additional resources to bolster its capacity to apply the statistical techniques used herein, as well as to develop methodologies to estimate indirect deaths in the context of the conflict in the Syrian Arab Republic and in other armed conflicts.**

Annex I

Tables and figures on civilian deaths in the Syrian Arab Republic: 2011–2021

Table A.1
Documented deaths: 2011–2021

2011	*2012*	*2013*	*2014*	*2015*	*2016*	*2017*	*2018*	*2019*	*2020*	*2021*	*Total*
10 105	60 873	58 532	46 593	49 959	45 117	34 331	23 372	12 324	7 729	1 274	350 209

Table A.2
Documented deaths by governorate: 2011–2021

	2011	*2012*	*2013*	*2014*	*2015*	*2016*	*2017*	*2018*	*2019*	*2020*	*2021*	*Total*
Hasaka	92	689	699	701	1 251	760	395	614	1 129	329	162	6 821
Aleppo	235	7 234	8 348	7 949	7 406	10 600	2 944	4 308	1 295	1 197	215	51 731
Raqqah	44	587	922	624	468	1 015	2 514	859	713	284	69	8 099
Suwayda’	106	878	1 034	1 109	1 611	1 268	689	279	42	64	21	7 101
Damascus	317	3 357	3 730	2 108	1 779	1 027	1 213	882	221	278	3	14 915
Dar’a	1 190	3 908	4 367	3 764	3 204	1 812	1 665	1 279	305	404	156	22 054
Dayr al-Zawr	405	3 785	2 415	2 778	2 157	2 468	3 286	2 900	1 543	735	290	22 762
Hama	1 424	5 809	4 455	3 946	4 064	3 398	4 099	1 729	2 082	845	142	31 993
Homs	3 062	9 374	7 474	4 946	5 544	4 801	3 734	1 243	272	501	35	40 986
Idlib	1 173	6 332	4 092	3 204	3 704	3 647	2 974	2 288	3 892	1 831	134	33 271
Latakia	775	4 440	4 023	3 477	5 347	4 672	3 368	808	625	876	9	28 420
Qunaytirah	48	420	686	722	547	375	290	56	18	25	17	3 204
Rural Damascus	714	10 058	11 407	6 833	7 000	4 361	2 804	4 070	141	74	21	47 483
Tartus	520	4 002	4 880	4 432	5 877	4 913	4 356	2 057	46	286	0	31 369

Table A.3
Documented deaths by sex: 2011–2021

	2011	*2012*	*2013*	*2014*	*2015*	*2016*	*2017*	*2018*	*2019*	*2020*	*2021*	*Total*
Female	325	4 135	5 193	3 517	3 547	3 770	2 613	2 033	1 052	423	119	26 727
Male	9 778	56 082	51 557	41 354	45 651	41 300	31 698	11 139	4 877	2 787	1 154	297 377
Unknown	2	656	1 782	1 722	761	47	20	10 200	6 395	4 519	1	26 105

Table A.4
Documented deaths by age group: 2011–2021

	2011	*2012*	*2013*	*2014*	*2015*	*2016*	*2017*	*2018*	*2019*	*2020*	*2021*	*Total*
Adult	8 713	53 202	48 809	39 351	43 627	38 225	29 004	6 759	3 212	1 586	1 065	273 553
Child	591	4 692	5 109	3 502	3 379	3 741	2 337	2 058	1 144	418	155	27 126
Unknown	801	2 979	4 614	3 740	2 953	3 151	2 990	14 555	7 968	5 725	54	49 530

Table A.5
Documented deaths by cause of death: 2011–2021

	2011	*2012*	*2013*	*2014*	*2015*	*2016*	*2017*	*2018*	*2019*	*2020*	*2021*	*Total*
Heavy weapons and explosives	175	15 612	15 582	11 547	11 023	12 144	7 464	4 968	2 095	823	207	81 640
Planted explosives and unexploded ordnance	109	892	966	1 094	1 146	1 450	1 723	777	593	245	189	9 184
Unspecified or unknown	2 662	8 644	5 960	5 980	5 158	3 905	3 501	4 890	3 095	1 656	295	45 746
Small arms and light weapons	6 660	21 326	19 424	12 205	6 838	4 801	2 616	1 182	535	385	445	76 417
Use of objects and other means[a]	454	1 509	2 685	2 972	2 111	686	306	866	341	293	36	12 259
Chemical biological radiological and nuclear	0	11	893	48	100	31	107	36	9	0	0	1 235
Denial of access to/destruction of objects indispensable to survival resulting directly from war operations	16	66	100	62	101	144	107	31	15	0	1	643
Incendiary	3	20	22	1	16	12	6	5	22	10	15	132
Accidents	0	1	6	2	1	6	2	3	1	0	0	22
Multiple weapons used	26	12 792	12 894	12 682	23 465	21 938	18 499	10 614	5 618	4 317	86	122 931

[a] For example, sexual violence, death in custody, torture, strangulation, mutilations, beheadings and/or hanging.

Table A.6
Documented deaths by actors/groups alleged of causing the death: 2011–2021

	2011	*2012*	*2013*	*2014*	*2015*	*2016*	*2017*	*2018*	*2019*	*2020*	*2021*	*Total*
Government and allies	3 958	25 132	25 747	15 910	20 881	19 654	11 330	8 882	3 936	1 780	319	137 529
Coalition forces[a]	0	1	9	126	292	583	1 488	273	59	5	23	2 859
Non-State armed groups												
Anti-government groups	1 211	6 537	3 812	3 156	1 786	1 031	494	381	71	37	3	18 519
Islamic factions[b]	1 425	12 088	10 057	10 002	19 527	17 326	15 235	836	315	158	70	87 039
Islamic State	4	315	1 762	3 511	3 680	3 593	3 230	1 168	188	277	140	17 868
Kurdish-led armed groups	0	0	1	2	77	157	186	199	244	71	42	979
Turkish-affiliated armed groups	0	0	0	2	22	70	97	341	70	79	12	693
Others[c]	0	0	0	0	0	1	0	0	3	85	39	128
Unknown	3 507	16 800	17 144	13 884	3 694	2 702	2 271	11 292	7 438	5 237	626	84 595

[a] Coalition forces, including more than 60 countries led by the United States of America, combating Da'esh.

[b] Jabhat al-Nusra, Hay'at Tahrir al-Sham, non-specific mentions of Islamic factions and reports in which both Islamic factions and Da'esh were reported.

[c] Israeli security forces and Jordanian border guard.

Table A.7
Documented deaths by civilian status: 2011–2021

	2011	*2012*	*2013*	*2014*	*2015*	*2016*	*2017*	*2018*	*2019*	*2020*	*2021*	*Total*
Unknown	1 024	3 120	3 691	2 289	2 884	2 869	2 374	3 044	1 306	514	1	23 116
Contradictory	1 697	12 220	13 923	10 531	3 094	1 419	516	889	260	199	20	44 768
Civilian	5 694	31 075	25 920	19 123	17 351	16 239	10 940	9 055	4 644	2 526	783	143 350
Non-civilian	1 690	14 458	14 998	14 650	26 630	24 590	20 501	10 384	6 114	4 490	470	138 975

Figure I
Comparison of documented and estimated civilian deaths: 2011–2021

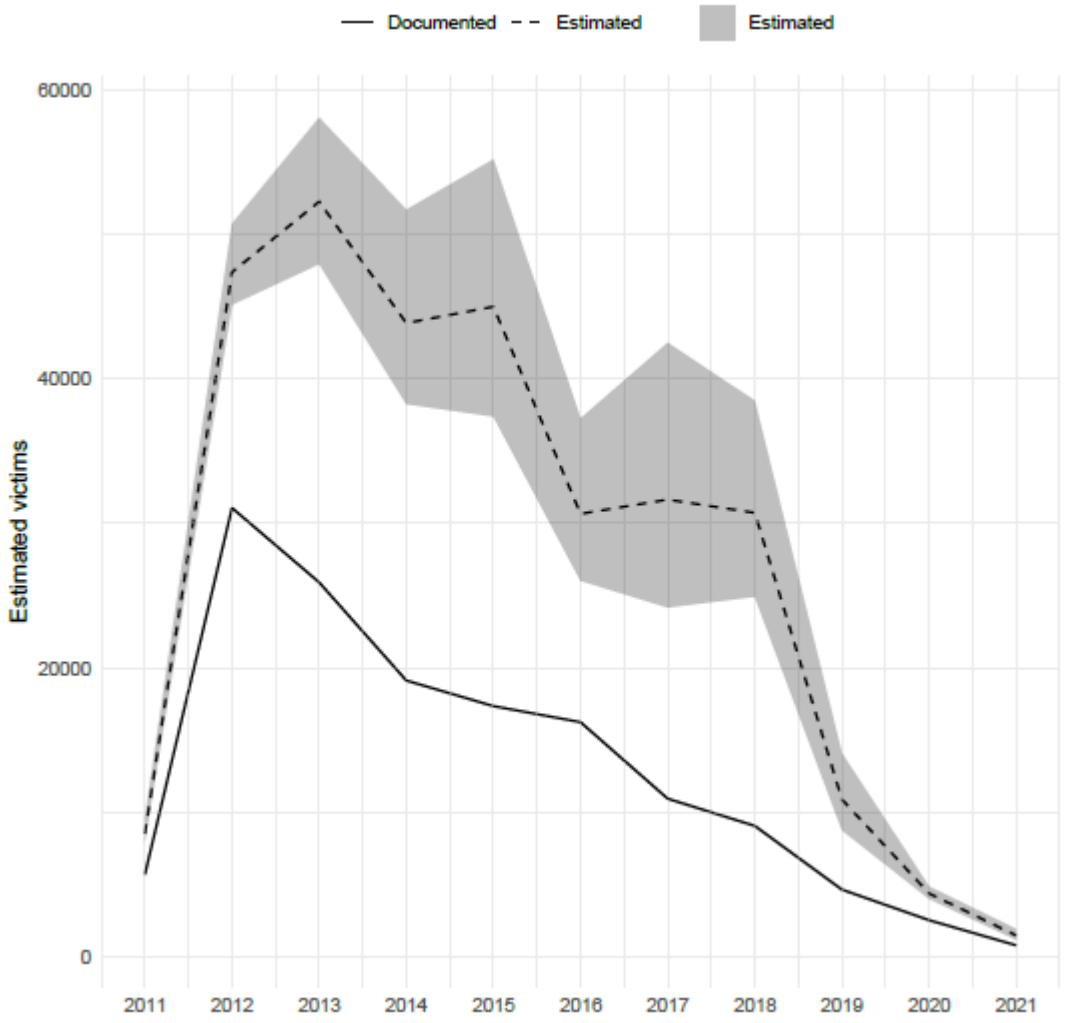


Figure II

Comparison of documented and estimated civilian deaths by governorate: 2011–2021

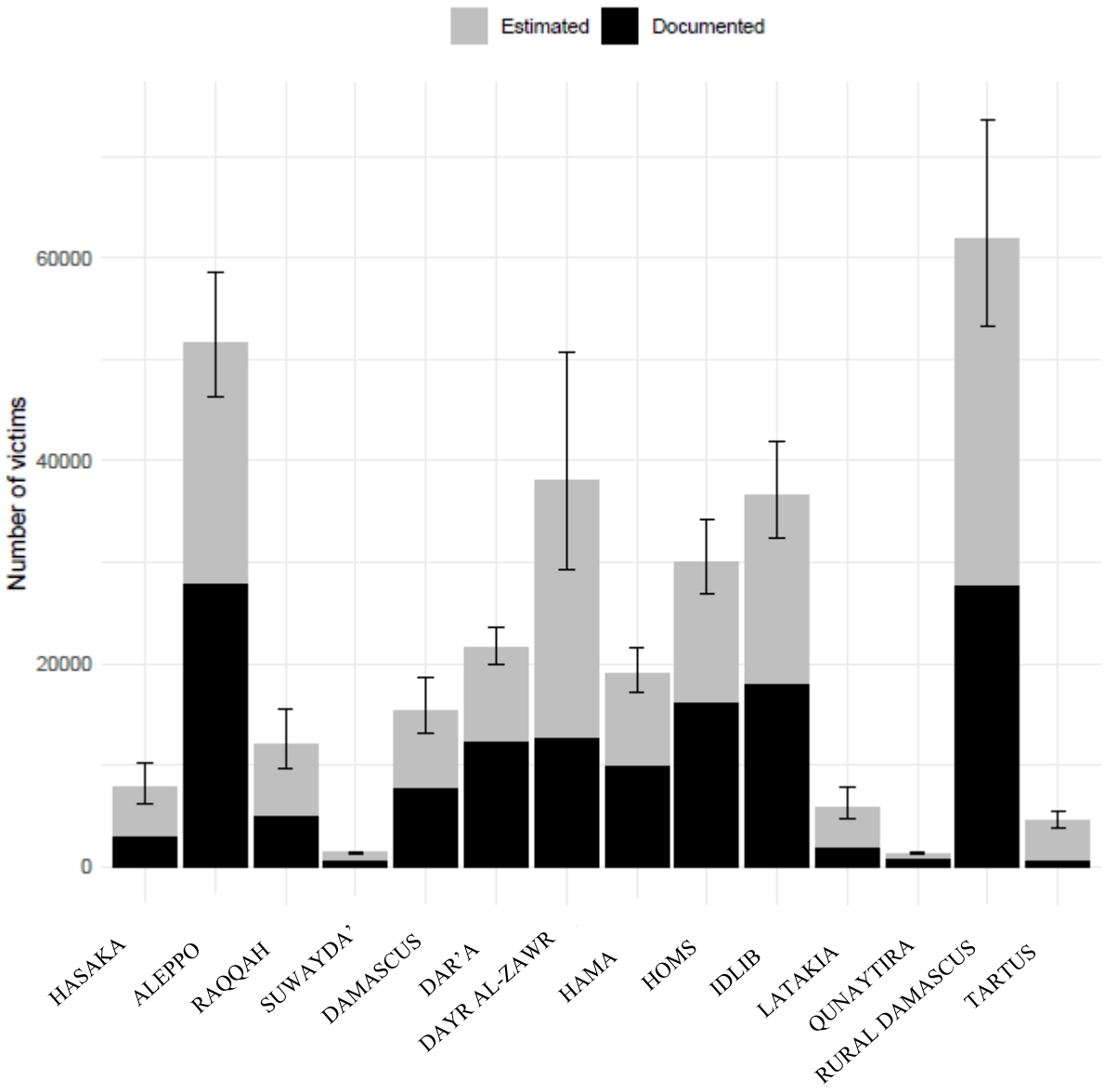


Figure III

Comparison of documented and estimated civilian deaths by age group: 2011–2021

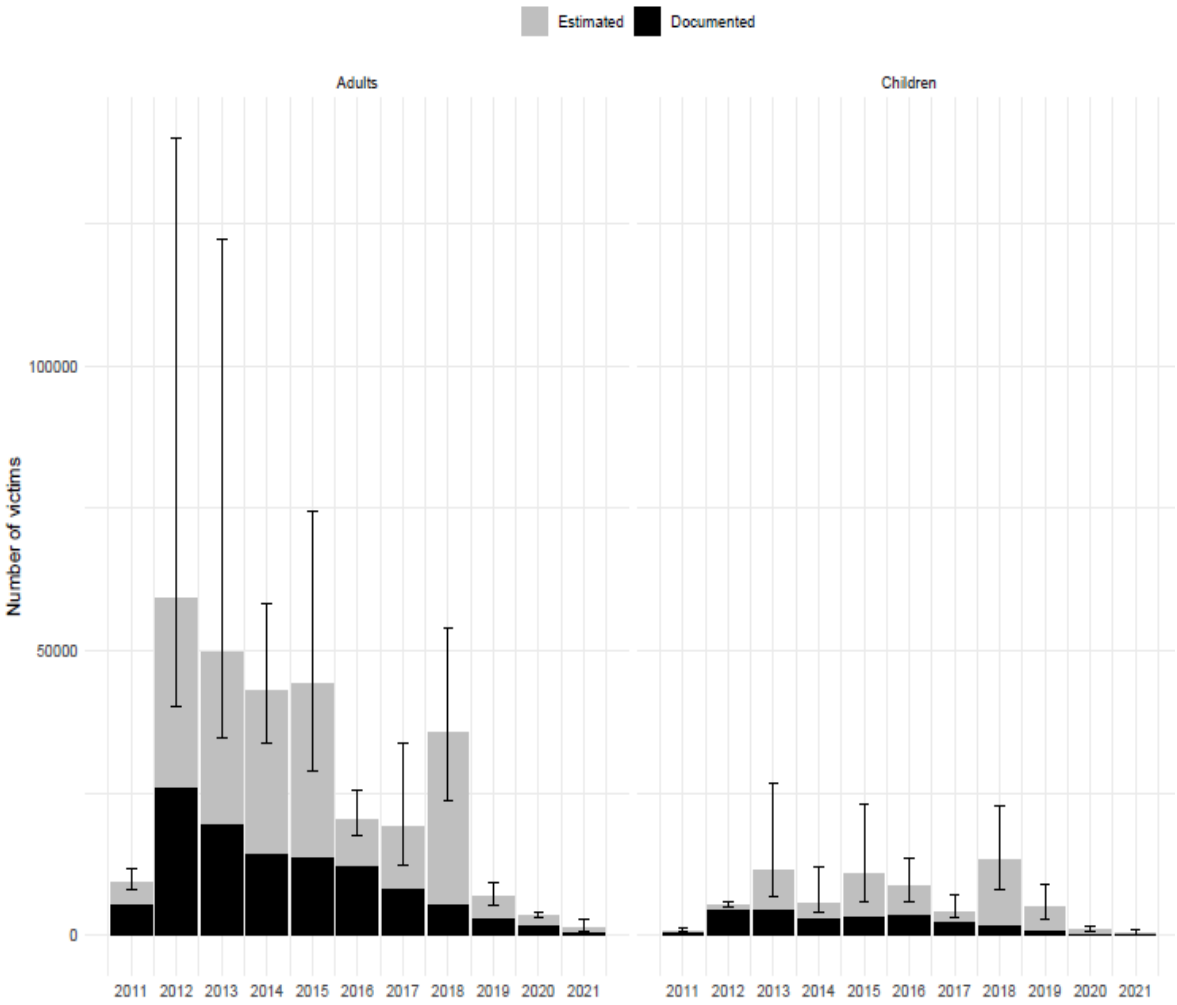
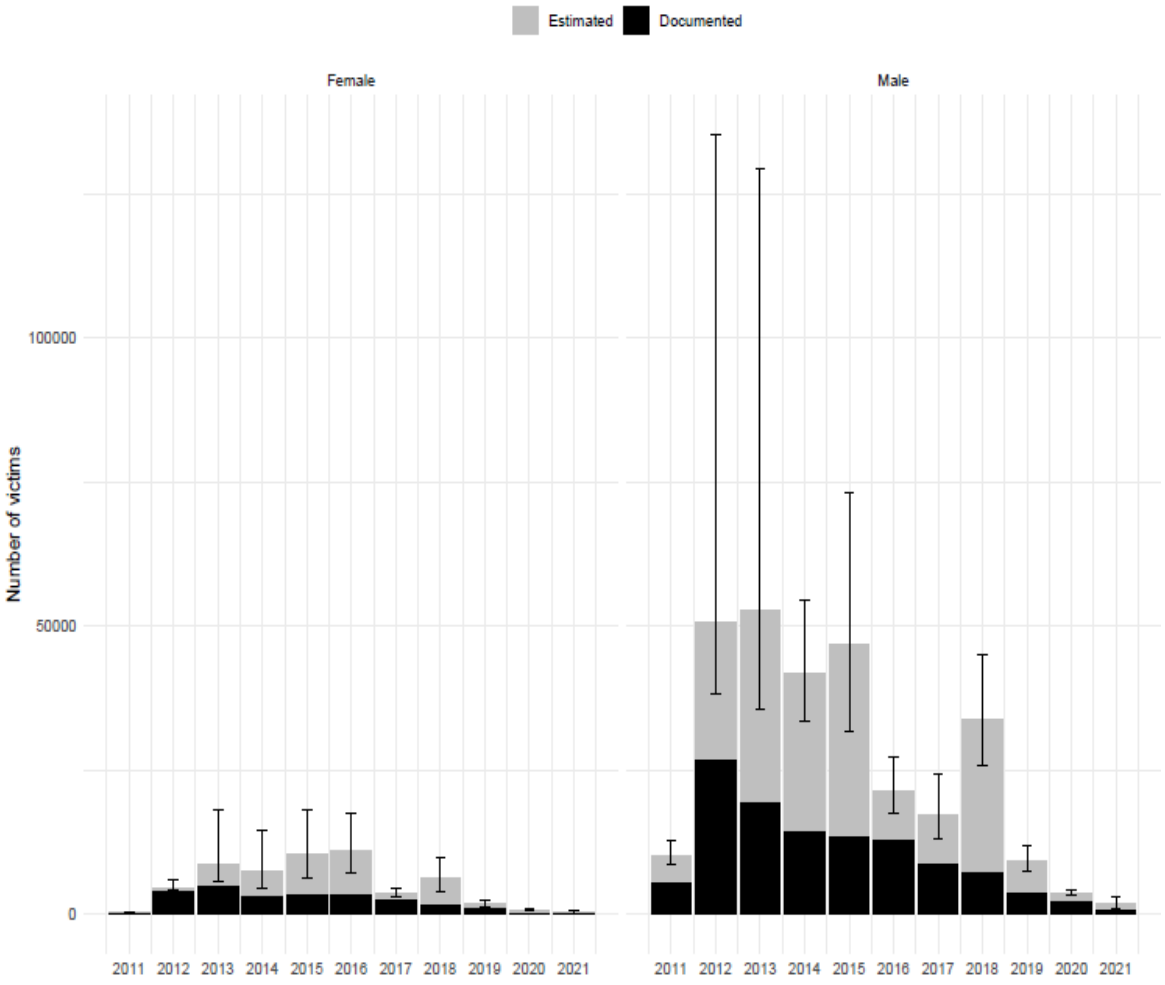


Figure IV

Comparison of documented and estimated civilian deaths by sex: 2011–2021



Annex II

Technical notes on methodology

1. On receiving information from the different sources, the first step was to standardize all of the shared records to manage the different formats and organization obtained ("data processing"). Data processing facilitated the systematic combination and review of all of the records coherently. Records shared were predominantly in Arabic, but some contained a mix of Arabic and English. Content was then transliterated for review in English using coding and transliteration software. Analytical decisions were reviewed by expert Arabic speakers to ensure consistency in outcomes, whether in original Arabic or English transliteration. This ensured that data processing facilitated tracing back any modifications made from the original data content to the final analysis-ready dataset, making it transparent, auditable and replicable.[1]

2. Once all of the records had been processed and standardized, they were combined across all sources into one set ("pooled records"). Records without the full name of the deceased and the date and location of the death were excluded from the analysis of documented deaths. The next step was to de-duplicate entries to ensure that a given individual was only included once. This was done using an established statistical and computer science method called "semi-supervised record linkage" (or "data integration"). Using an iterative combination of human review and computer modelling, records that appeared to be the same or similar across several sources were combined. This approach also made it possible to identify and link records that were likely to refer to the same person, even if the content of the records was not completely identical, for example, if a date of death varied by a few days or if a victim's name was reported slightly differently across sources.[2]

3. The estimation of conflict-related deaths in the Syrian Arab Republic was based, in part, on the work done to understand documented deaths. The first two steps were: (a) accessing and preparing records for analysis through standardization (data processing); and (b) identifying records that referred to the same victim (record linkage). However, while records without the full name, date and location of death were excluded from the analysis of documented deaths, the estimation technique kept all records and replaced missing information based on available information ("imputation") and estimated undocumented deaths ("multiple systems estimation").

4. Two kinds of missing data were considered and accounted for in the analysis. The first piece of missing data was specific information that was missing about documented, identifiable victims, even after integrating all available information about them. For example, the names of the dead and the dates and location of their death may have been available, but not whether they were adults or children, civilians or not. This kind of missing information is common to most statistical studies, particularly in a statistical analysis of conflict-related deaths and can be filled in through imputation.[3] There are several ways of doing statistical imputation. In the present analysis, a model imputed the missing values by comparing records with missing information and similar records with that information. For example, if a particular record did not include information about an individual's age, the age might be

[1] See Megan Price, Anita Gohdes and Patrick Ball, "Technical memo for Amnesty International report on deaths in detention" (Human Rights Data Analysis Group, 2016) for detailed inter-rater reliability results, comparing Arabic and English reviewers.

[2] For more information on the technical details, see Peter Christen, *Data Matching: Concepts and Techniques for Record Linkage, Entity Resolution, and Duplicate Detection* (Heidelberg, Germany, Springer-Verlag Berlin, 2012) as a canonical reference for this method. See also Megan Price, Anita Gohdes and Patrick Ball, "Updated statistical analysis of documentation of killings in the Syrian Arab Republic" (Human Rights Data Analysis Group, 2014), available at https://www.ohchr.org/sites/default/files/Documents/Countries/SY/HRDAGUpdatedReportAug2014.pdf.

[3] For a more detailed explanation of these two types of missing data and how they are accounted for in these analyses, see Maria Gargiulo, "Estimating undocumented human rights violations in conflict settings", video, Women in Data Science Worldwide Conference, 7 March 2022, available at https://www.youtube.com/watch?v=uXe2oQR4aAo.

imputed as an adult or as a child. This imputation process was repeated several times for each record, producing slightly different versions of the same record. This difference in the imputed values represented the uncertainty inherent in the imputation model: since data about this field was not recorded for a given individual, it was not certain what the correct answer was. This uncertainty in the imputation was propagated into the final uncertainty intervals. In this analysis, the imputation model had high statistical confidence, meaning more consistency was observed in the imputed value after multiple repetitions.[4]

5. To augment the information that could be used in the analysis, natural language processing techniques were applied to unstructured text, such as notes, to extract additional information, for instance about the circumstances of the death, the victim or the group alleged to have caused the death. Such information was also used to impute missing information (serving as "support vectors"). This additional information helped to improve the accuracy of the imputation model that was used to fill in missing values for civilian status, sex and age group.

6. The final step used all the above information to estimate the total number of civilians who died. The estimation process applied the multiple systems estimation approach, a broad class of statistical tools explicitly designed to estimate the size of a hard-to-reach population based on multiple overlapping and not necessarily representative samples. Originally proposed in 1783 to study the size of the population of France, this class of tools has been developed and expanded across a wide variety of fields, including ecology, demography, public health and human rights research. This family of methods, applied to conflict-related deaths in the Syrian Arab Republic, allowed for the calculation of an estimate of the total number of civilians who died and for the construction of an uncertainty interval around the estimate.[5] The intuition behind multiple systems estimation is based on the overlap of patterns in documentation across the data sources used. It estimated the "unobserved" pattern, that is, how many victims were not reported by any of these data sources. The more often the same civilian deaths were reported across several sources, the closer the number of civilian deaths were to the observed total. In contrast, fewer repeats implied a more significant number of unobserved civilian casualties.[6]

[4] The imputation model uses a method called multivariate imputation by chained equations (see Stef van Buuren and Karin Groothuis-Oudshoorn, "MICE: multivariate imputation by chained equations in R", *Journal of Statistical Software*, vol. 45, No. 3 (December 2011)) with the predictive mean matching algorithm using the multivariate imputation by chained equations package in the statistical programming language "R". See Stef van Buuren, "Predictive mean matching", in *Flexible Imputation of Missing Data*, 2nd ed. (Boca Raton, Florida, CRC Press, 2018), pp. 77–84, for a useful overview of the predictive mean matching algorithm.

[5] For detailed examples of the use of this method for human rights cases, and particularly the verification of the approach, see Paul B. Spiegel and Peter Salama, "War and mortality in Kosovo, 1998-1999: an epidemiological testimony", *The Lancet*, vol. 355, No. 9222 (June 2000); Vincent Iacopino, *War Crimes in Kosovo: a Population-Based Assessment of Human Rights Violations Against Kosovar Albanians* (Boston, United States of America, Physicians for Human Rights, 1999); Jule Krüger and Patrick Ball, "Evaluation of the Database of the Kosovo Memory Book" (Human Rights Data Analysis Group, December 2014); Historical Clarification Commission, *Guatemala: Memory of Silence* (Guatemala City, Historical Clarification Commission, 1999); Patrick Ball and Megan Price, "The statistics of genocide", *CHANCE*, vol. 31, No. 1 (2018); Jan Zwierzchowski and Ewa Tabeau, "The 1992-1995 war in Bosnia and Herzegovina: census-based multiple system estimation of casualties' undercount", conference paper for the International Research Workshop on the Global Economic Costs of Conflict, Berlin,1–2 February 2010; Kristian Lum and others, "Measuring elusive populations with Bayesian model averaging for multiple systems estimation: a case study on lethal violations in Casanare, 1998-2007", *Statistics, Politics, and Policy*, vol. 1, No. 1 (2010); Valentina Rozo Ángel and Patrick Ball, "Killings of social movement leaders in Colombia: an estimation of the total population of victims – update 2018" (Human Rights Data Analysis Group, 10 December 2019); Patrick Ball and Frances Harrison, "How many people disappeared on 17–19 May 2009 in Sri Lanka?" (Human Rights Data Analysis Group, 12 December 2018); Patrick Ball and others, "Drug-related killings in the Philippines" (Human Rights Data Analysis Group, 26 July 2019).

[6] This can be compared to finding out which of the two dark rooms is larger by using rubber balls with special properties. The balls do not make noise when they hit the walls, floor or ceiling of the room, but when two or more balls collide, they make a clicking noise. In the first room, several clicks could

7. The results presented in the present report were based on a specific multiple systems estimation modelling approach called Bayesian non-parametric latent-class capture-recapture.[7] This approach was well-suited to handle the number of data sources used in this analysis and the varying time periods covered by each source. The approach was applied to the numerous datasets that were developed for the probabilistic imputation and combined the results using standard statistical rules. The final uncertainty intervals include both the uncertainty from imputation and the multiple systems estimation approach.[8]

be heard after throwing the balls. Only one could be heard in the second room after throwing the balls with the same force. Which room is larger? The second room must be larger; the balls had more space to spread out, so they collided less frequently than in the first room. Translating this analogy back to the language of multiple systems estimation, the rubber balls represent the data sources, and the dark rooms represent the unknown size of the civilian conflict-related deaths to be estimated. In this language, a "collision" occurs when two or more of the sources documented the same civilian killed. This analogy is used in many reports of the Human Rights Data Analysis Group using multiple systems estimation.

[7] Daniel Manrique-Vallier, "Bayesian population size estimation using Dirichlet process mixtures", *Biometrics*, vol. 72, No. 4 (March 2016), pp. 1246–1254.

[8] For more information about combining estimation results constructed using data imputed using multiple imputation, see Andrew Gelman and others, *Bayesian Data Analysis*, 3rd ed. (Boca Raton, Florida, CRC Press, 2015), e-book, available at http://public.ebookcentral.proquest.com/choice/publicfullrecord.aspx?p=1438153.