

Child abuse and neglect-related murders in South Africa: a comparison of two national surveys in 2009 and 2017

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Summary

Background: Population-based statistics on deaths from child abuse and neglect are only routinely available in countries that have reliable national statistics on child murder. For low-income and middle-income countries, relatively little is known about prevalence trends of child murder. South Africa is an exception, having conducted dedicated national studies on child murders for 2009 and 2017 to provide data on child murders overall and on child abuse and neglect-related murders. We aimed to compare child abuse and neglect-related murders in South Africa across two surveys to determine any change between 2009 and 2017.

Methods: We conducted two retrospective national mortuary-based surveys on murder of children aged 0–17 years for 2009 and 2017 from a proportionate random sample of medico-legal laboratories in South Africa. A sampling frame of medico-legal laboratories for each study year was prepared with stratification by medico-legal laboratory size. A minimum of 2 years after the crime was allowed before data collection to enable progression of the investigation process. Child abuse and neglect-related murders were identified using both medico-legal laboratory post-mortem autopsy reports and police data. To identify a child abuse and neglect-related murder, we primarily used the framework of abuse happening within the context of responsibility of care arrangements but broadened this to include all perpetrators and abuse identified from the data. We stratified age into 0–4, 5–9, 10–14, and 15–17 years and further stratified children younger than 5 years into early neonates

(newborns killed within 6 days of birth), 7 days to 11 months, and 1–4 years. We calculated incidence rate ratios (IRR) with 95% CIs to compare rates between 2009 and 2017.

Findings: An estimated 458 (95% CI 377–539) children in 2009 and 213 (179–247) children in 2017 were murdered in circumstances of child abuse and neglect. The percentage of all child murders that were child abuse and neglect-related declined from 2009 to 2017 (458 [45·0%] of 1018 in 2009 vs 213 [25·0%] of 851 in 2017), with the overall age-standardised rate decreasing from 2·6 to 1·1 per 100 000 children aged 0–17 years (IRR 0·43 [95% CI 0·35–0·54]). Girls represented 276 (60·3%) of 458 murders in 2009, which declined to 96 (45·1%) of 213 murders in 2017, and boys represented 178 (38·9%) of 458 murders in 2009 and 109 (51·4%) of 213 murders in 2017. The decrease was statistically significant for girls in the 0–4 year (IRR 0·33 [0·22–0·49]) and 5–9 year (0·33 [0·15–0·73]) age groups and for boys in the 0–4 year age group (0·49 [0·33–0·71]). Among early neonates (within 6 days of birth), the decrease in child abuse and neglect-related murders was more pronounced among girls than among boys (IRR 0·33 [95% CI 0·19–0·56] vs 0·46 [0·28–0·77]).

Interpretation: Child abuse and neglect-related murders are common in South Africa but our study shows that they can be reduced. The high rate of these murders points to the need to continue research and monitoring to inform priority targeted interventions and to better understand the impact of child support policies.

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Introduction

Child abuse and neglect includes both deliberate acts of violence directed to children and acts of omission. WHO regards child abuse and neglect as encompassing “all forms of physical and/or emotional ill-treatment, sexual abuse, neglect or negligent treatment or commercial or other exploitation, resulting in actual or potential harm to the child's health, survival, development or dignity in the context of a relationship of responsibility, trust or power”.¹ There are immediate and long-term consequences, including mortality.^{2,3} Until two decades ago, child abuse and neglect was an under-recognised phenomena in many societies. Despite increased awareness of this crime against children, under-reporting is still common mainly because violence towards children is often socially accepted, condoned by communities, and continued with impunity.¹ Furthermore, younger children who are the most vulnerable are unable to disclose their experiences, and child protection and legal systems in many regions continue to fail to respond to, and protect, children.⁴

Population prevalence studies reporting on non-fatal physical, sexual, and emotional abuse have been done in the past 15 years. A systematic review of past-year prevalence of violence shows that one in two children aged 2–17 years experience violence globally and that there is an even higher prevalence in Africa, Asia, and North America.^{4,5} Further background on risk factors for non-fatal child abuse and neglect and the development of a package of evidence-based prevention interventions are presented in the appendix (p 2).^{6–9}

Research in context

Evidence before this study

Although research on child abuse overall has increased in the past 20 years, resulting in better measurement of prevalence and description of types of abuse, perpetrators, and age patterns, less attention has been given to children who die as a consequence of violence towards them or as a result of acts of omission (neglect). We searched PubMed and Scopus from Nov 1, 2013, to Oct 31, 2023, for English-language articles, using variations of the following MeSH terms and keywords: (child* OR youth OR adolescen* OR infan*) AND (maltreatment OR trauma OR abuse OR neglect OR adverse AND childhood AND experience* OR ace OR mistreatment OR advers* OR victimi*) AND (mortality OR death OR dying OR longevity AND survival OR “premature mortality” OR “all-cause mortality” OR fatal* OR population rates). We focused on studies done in low-income and middle-income countries. since most of the published literature are from high-income settings, and on age and sex patterns, population rates, and risk factors. We further did a manual review of the reference lists of relevant reports, including UN reports. We found no study reporting on child abuse and neglect-related murders from low-income and middle-income countries, and studies from high-income settings commonly used routine administrative data such as the WHO Global Death Estimates or child protection service records. Data from low-income and middle-income country settings reporting child murder were often incomplete, with victim–perpetrator relationship missing, and usually focused only on children younger than 5 years. We found child abuse and neglect-related murder rates reported only for the USA and UK and two studies of risk factors in the USA.

Added value of this study

To the best of our knowledge, our study is the only dedicated child abuse and neglect-related murder study from a middle-income country. Using a robust method that included both forensic and police data, as well as two surveys with same methodology, we could compare data between two timepoints and analyse sex and age patterns, which are crucial for the development of targeted interventions. The substantial changes in prevalence in less than a decade suggest that the murder of children can be reduced, even in a country where violence is a common feature of daily lives. We found that parents remain the most common perpetrators, pointing to a need for more evidence for parenting support and interventions. These epidemiological data are of value for multiple stakeholders, including policy makers, child-rights advocates, and child protection workers.

Implications of all the available evidence

Child mortality is a key indicator of the development and health of a country, and studies on child fatalities from violence are needed to monitor the Sustainable Development Goal target 16.2 (“protect children from exploitation, trafficking, and violence”). Given the scarcity of reliable data, dedicated studies are needed to better understand the scope of child abuse and neglect-related murders, especially in low-income and middle-income settings. The decline in child abuse and neglect-related murders in South Africa is encouraging, and strengthening structural interventions that focus on improving the lives of women, children, and families are needed to ensure continuation of this trend.

Murder as the most extreme outcome of violence against children has received much less attention. The 2014 UNICEF report *Hidden in plain sight* noted that 100 000 children were killed globally each year and that age, sex, and region were important predictors.⁶ The same report presented a global child murder rate of 4.0 per 100 000 individuals aged 0–19 years, but the association with abuse and neglect was not reported. According to administrative data from child welfare agencies, 1820 children in the USA were murdered in circumstances of child abuse and neglect in 2021, equivalent to a rate of 2.46 per 100 000 children aged 0–17 years.¹⁰ A much lower number was reported in the UK in a 2021 statistical report, which

cited an average of 58 child abuse and neglect-related deaths per year in the previous 5 years (4.5 per million children aged 0–17 years per year in 2015–19).¹¹

Using WHO death reporting data, child abuse and neglect-related murder rates have been reported for the period 1974 to 2014 from high-income settings.^{12,13} The rates cover the age groups of 0–4 years and 0–14 years and are presented per million population, an indication of the low rates in these settings. This analysis shows an overall decline in rates for most of the included countries.^{12,13} The first dedicated South African child murder survey in 2009 reported a child murder rate of 7.9 per 100 000 children younger than 5 years and a fatal child abuse rate of 6.6 per 100 000 children younger than 18 years.¹⁴ Across countries, mortality rates are higher among children younger than 5 years and aged 15–17 years, compared with children of other ages, which was also reported in the South African study.^{6,14} In 2017 a systematic review on global child murder perpetrators presented data from 44 countries and found that 56.5% of the children were killed by a parent, and older male children were more often killed by acquaintances than younger children were.¹⁵ The review included published studies and administrative data from country statistics offices, and noted the sparse data from low-income and middle-income countries and Africa.¹⁵

Risk factor studies for child abuse and neglect-related murders are scarce. We identified two studies from the US. The fatal child neglect study by Welch and colleagues using data from Oklahoma, USA, reported on 372 cases of children aged 0–17 years from 22 years of child death review reports. The cases between 1987 and 2008 involved three main types of fatal neglect—supervisory neglect, deprivation of needs, and medical neglect.¹⁶ The second study also used child protection data and explored both fatal and non-fatal child maltreatment due to physical abuse and neglect among children younger than 6 years.¹⁷ Using a case–control study design, male children, younger caregivers, multiple children under 3 years in the home, and not living with biological parents were reported as key risk factors. The study found mothers' experience of intimate partner violence as a mitigating factor, and authors explained that mothers might have received interventions and support such as removal of the perpetrator or placing the child in protection services.¹⁷

Child abuse and neglect is preventable, and understanding the epidemiology of child murders is a key step in the development of prevention interventions. The South African national study of child murders in 2009 provided the first reliable estimates for the country, and the repeat survey in 2017 provided the opportunity to compare child abuse and neglect-related murders over time.^{14,18} This study aimed to compare and identify changes in child abuse and neglect-related murder rates during the 8 years. We also aimed to describe the age and sex patterns and to compare changes related to the crime, perpetrators, and cause of death to assist in developing prevention interventions.

Methods

Study design and participants

The 2017 survey followed a similar methodology to the previously reported 2009 national retrospective survey of child murders in South Africa.¹⁴ For both surveys we identified all children aged 0–17 years with injury-related deaths that might have been murder in national

samples of medico-legal laboratories between Jan 1 and Dec 31 in 2009 and 2017. The sampling frame was all 137 medico-legal laboratories operating in 2017 and all 122 medico-legal laboratories operating in 2009. In both studies the medico-legal laboratories were stratified into three groups based on the number of autopsies performed per year—small (<500), medium (500–1499), and large (>1499; see sampling frame and fraction in appendix p 3). A sampling fraction of 31.1% was chosen in 2009 to enable calculation of national estimates, and additional funding in 2017 allowed for a larger sampling fraction of 59.1% to calculate both national and provincial estimates.

Ethical approval was granted by the South African Medical Research Council's Ethics Committee (EC 008–5-2018) and approval for access to data was obtained from the National Department of Health, the Provincial Forensic Pathology Services, and the South African Police Service.

Procedures

At the medico-legal laboratories we used the death register to identify non-natural deaths. We included deaths due to drowning, poisoning, falls, fire injuries, and deaths recorded as undetermined. Cases were later excluded if they were not confirmed as a murder during the police data collection stage. We included abandoned babies, referred to as concealed pregnancies, a legal term for a secret birth followed by abandonment, where there was evidence of viability of a baby born at a minimum of 26 weeks gestation and documented in the autopsy report. We confirmed the cause of death from the autopsy reports and excluded unintentional deaths, such as stillbirths and sudden unexpected deaths in infants, as well as abortions. Autopsy reports were available for all cases in both surveys, and we extracted sex, age, cause of death, evidence of sexual assault, and the name of the police station and the Crime Administration System number, the latter being critical for the identification of the police investigation in the second phase of the study. We considered biological sex and gender equivalent unless indicated otherwise from the autopsy report or police dockets (none found).

Data on the crime were extracted from the police dockets during interviews with police, which were largely done over the telephone for the 2017 cases due to COVID-19 restrictions, or via face-to-face interviews where possible. We verified the victim information collected at the medico-legal laboratories (sex, age, race, cause of death, and place of death). Perpetrator information (age, sex, and relationship with the victim) and crime information (evidence of rape, the setting, and legal outcome) were extracted from police dockets. Child abuse and neglect-related murders were identified during the interviews with police, using information on circumstances of the death and the perpetrator. Data collection for both surveys started at least 2 years after the crime; the 2009 survey started in January, 2012, and the 2017 survey started in March, 2020. A minimum of a 2-year interval between the crime and data collection ensured adequate progression for the crime investigation before data collection. We used Kobotoolbox, a web-based data entry tool.

We followed the same conceptual model of defining and identifying child abuse and neglect-related murders in both studies. The South African Children's Act (no 38 of 2005) defines abuse and neglect in the context of responsibility of care arrangements.¹⁹ This includes a parent, foster parent, and carers within institutions. We primarily used this aspect of the

definition which characterises trust and power. Additionally, we recognised that child abuse includes a wide range of experiences, including forced marriages, labour practices, and trafficking perpetrated by those who are not parents and caregivers.

The process of identifying child abuse and neglect-related murders involved review of each case using data from both the postmortem reports and police interviews (docket review with police). Cases were included if police data showed that the injury leading to the death was deliberately inflicted, or due to neglect or negligence, within the context of a relationship of presumed responsibility and care by a parent or other caregiver. We also included all abandoned babies, cases with clear evidence of deliberate injury, and children younger than 15 years with evidence of rape reported in the autopsy report as child abuse and neglect-related murders irrespective of perpetrator identity and whether a police investigation was done. Further information on how child abuse and neglect were identified in cases with missing police data are presented in the appendix (p 4).

COVID-19 conditions were a key factor contributing to data not being collected from the police for the 2017 survey. We started police data collection for the 2017 study at the start of the South African COVID-19 lockdown (March, 2020). The unique circumstances resulted in a much longer period of data collection for 2017.

Statistical analysis

The two studies were considered independent surveys due to the time separation and the independent sampling procedures. All statistical analysis considered the multi-stage design of the study; the mortuaries were treated as clusters, with weighting stratified by mortuary size in 2009 and mortuary size and province in 2017 due to additional funding to report at provincial level (see sample fraction in appendix p 3). To calculate the age-specific rates, we used the number of livebirths estimates for children younger than 1 year and population estimates for children aged 1–17 years, all derived from the Thembisa model version 4.4 for demographic statistics commonly used by the South African Government for administrative purposes at the national and provincial levels.²⁰ All data were weighted for analysis. We summarised the weighted data and present child abuse and neglect-related murder statistics by age and sex for 2009 and 2017. We did not analyse by race as we do not consider such an analysis to add value in the South African context. We analysed children in age groups (0–4, 5–9, 10–14, and 15–17 years). To understand murders of children younger than 5 years, we further stratified these children into the following three groups: early neonates (newborns killed within 6 days of birth), children aged 7 days to 11 months, and children aged 1–4 years. We calculated incidence rate ratios (IRRs) and their respective 95% CIs to compare rates between 2009 and 2017. The standard errors for IRRs took into account the design effects of the survey. The IRR estimates meet the assumptions of temporal stability (a stable, open population used with mid-year estimates taking into account growth in the population) and measurement consistency (identical study protocols used) for both studies.²¹ See assumptions related to IRRs in the appendix (p 5). Pearson Chi-square test was used to compare differences in percentages between 2009 and 2017 for categories of factors such as cause of death, injury setting, crime settings, and victim–perpetrator relationship. Data were analysed using STATA 17.

Role of the funding source

The funders had no role in the study design, data collection, analysis, interpretation of the results, writing of the manuscript, or decision to submit the paper for publication.

Results

In 2017, 893 children younger than 18 years were estimated to have been killed in South Africa, compared with 1018 in 2009. Whether or not the death resulted from child abuse and neglect could not be established in 24 cases (weighted $n=42$ [4.7%] of 893 murders) in 2017, and these were excluded from analysis (appendix p 4). The analysis included 851 murders in 2017 where child abuse and neglect involvement was determined and an estimated 213 (25.1%) of 851 murders were classified as child abuse and neglect-related (figure). This is lower than the percentage in 2009 when 458 (45.0%) of 1018 murders were identified as child abuse and neglect-related.

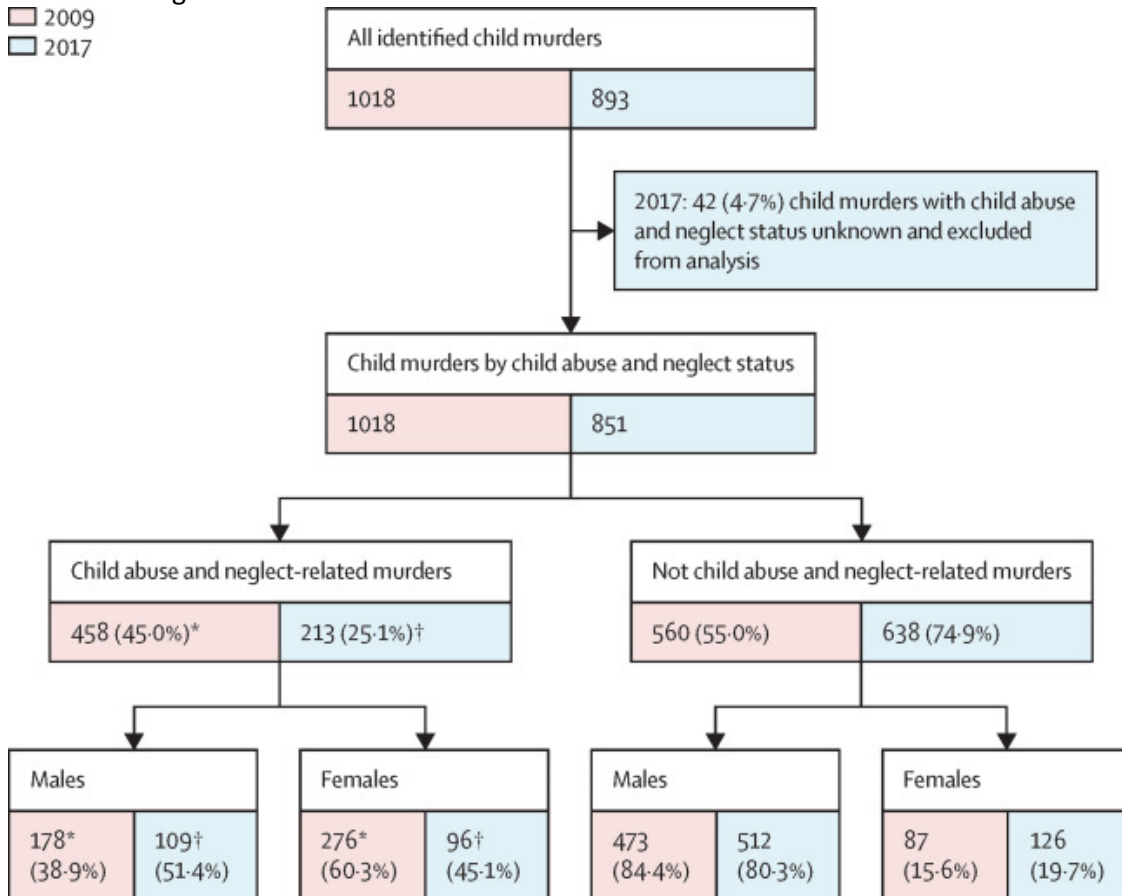


Figure Identification of child abuse and neglect-related murders and weighted estimates

We found an overall decrease in the rate of child abuse and neglect-related murders among all children from 2.6 (95% CI 2.2–3.1) per 100 000 in 2009 to 1.1 (1.0–1.3) per 100 000 in 2017 (IRR 0.43 [95% CI 0.35–0.54]), with the biggest decrease found among children younger than 5 years (table 1). A change in the sex distribution was also observed. In 2009, the percentage of males was 38.9% (95% CI 32.4–45.9; 178 of 458), which increased to 51.4% (45.2–57.4; 109

Table 1. Age-specific child abuse and neglect-related murder rates in 2009 and 2017, by sex and in all children

	Males					Females					All children				
	Count, 2009 (95% CI)	Rate, 2009 (95% CI)	Count, 2017 (95% CI)	Rate, 2017 (95% CI)	IRR (95% CI), 2017 vs 2009	Count, 2009 (95% CI)	Rate, 2009 (95% CI)	Count, 2017 (95% CI)	Rate, 2017 (95% CI)	IRR (95% CI), 2017 vs 2009	Count, 2009 (95% CI)	Rate, 2009 (95% CI)	Count, 2017 (95% CI)	Rate, 2017 (95% CI)	IRR (95% CI), 2017 vs 2009
0–4 years	154 (113–196)	5.7 (4.2–7.3)	79 (59–98)	2.8 (2.1–3.4)	0.49 (0.33–0.71)	180 (126–235)	6.7 (4.7–8.8)	63 (51–75)	2.2 (1.8–2.7)	0.33 (0.22–0.49)	339 (254–423)	6.3 (4.7–7.9)	150 (123–176)	2.6 (2.2–3.1)	0.42 (0.32–0.55)
5–9 years	13 (0–28)	0.6 (0.0–1.2)	19 (11–28)	0.7 (0.4–1.0)	1.20 (0.45–3.19)	40 (19–61)	1.8 (0.9–2.7)	16 (9–24)	0.6 (0.3–0.9)	0.33 (0.15–0.73)	53 (30–76)	1.2 (0.7–1.7)	36 (25–47)	0.7 (0.5–0.9)	0.56 (0.31–1.00)
10–14 years	8 (0–19)	0.3 (0.0–0.8)	9 (4–15)	0.4 (0.2–0.6)	1.07 (0.28–4.01)	28 (9–47)	1.2 (0.4–2)	13 (7–20)	0.5 (0.3–0.8)	0.44 (0.18–1.10)	36 (15–58)	0.8 (0.3–1.3)	23 (14–32)	0.5 (0.3–0.7)	0.61 (0.29–1.26)
15–17 years	3 (0–8)	0.2 (0.0–0.5)	2 (0–5)	0.1 (0.0–0.4)	0.72 (0.06–8.64)	28 (11–44)	1.9 (0.7–3)	3 (3–3)	0.2 (0.2–0.2)	0.12 (0.02–0.61)	30 (13–47)	1.0 (0.4–1.6)	5 (2–8)	0.2 (0.1–0.3)	0.18 (0.05–0.68)
Overall	178 (132–224)	2.0 (1.5–2.6)	109 (72–121)	1.2 (0.8–1.3)	0.57 (0.41–0.79)	276 (222–330)	3.2 (2.6–3.8)	96 (80–112)	1.0 (0.9–1.2)	0.32 (0.23–0.45)	458 (377–539)	2.6 (2.2–3.1)	213 (179–247)	1.1 (1.0–1.3)	0.43 (0.35–0.54)

2009 total population estimates: overall=17 409 486; by age: 0–4 years=5 369 346; 5–9 years=4 471 701; 10–14 years=4 630 071; and 15–17 years=2 938 368. 2009 male population estimates: overall=8 740 979; 0–4 years=2 699 806; 5–9 years=2 250 791; 10–14 years=2 325 233; and 15–17 years=1 465 149. 2009 female population estimates: overall=8 668 507; 0–4 years=2 699 540; 5–9 years=2 220 910; 10–14 years=2 304 838; and 15–17 years=1 473 219. 2017 total population estimates: overall=18 714 751; 0–4 years=5 668 326; 5–9 years=5 469 166; 10–14 years=4 874 324; and 15–17 years=2 702 935. 2017 male population estimates: overall=9 410 418; 0–4 years=2 851 302; 5–9 years=2 751 471; 10–14 years=2 450 689; and 15–17 years=1 356 956. 2017 female population estimates: overall=9 304 333; 0–4 years=2 817 024; 5–9 years=2 717 695; 10–14 years=2 423 635; and 15–17 years=1 345 979. IRR is calculated by taking the fractions of the exposed and the total population. The 95% CIs are then adjusted from normal approximation calculation to account for the design effect of the survey by multiplying the standard errors with the design effect of the study. IRR=incidence rate ratio.

of 213) in 2017, and the percentage of females decreased from 60.3% (53.5–66.6; 276 of 458) in 2009 to 45.1% (39.4–50.9; 96 of 213) in 2017. A decrease in child abuse and neglect-related murder rates from 2009 to 2017 was found for females overall (IRR 0.32 [0.23–0.45]) and in all female age-groups except 10–14 years. Among males, a decrease was only found for boys aged 0–4 years (IRR 0.49 [0.33–0.71]).

We found a decrease in the rates of child abuse and neglect-related murders among neonates within 6 days of their birth for both male children (IRR 0.46 [95% CI 0.28–0.77]) and female children (0.33 [0.19–0.56]; table 2). In 2009, the rate was 15.5 (10.0–20.9) per 100 000 for male newborns and 18.5 (11.4–25.7) per 100 000 for female newborns, which decreased to 7.1 (5.3–9.0) per 100 000 for male newborns and 6.0 (4.4–7.6) per 100 000 for female newborns in 2017. A decrease in child abuse and neglect-related murders was also found among girls within the first year after birth (7 days to 11 months) and for boys aged 1–4 years.

Overall, the home remained the most frequent location of child abuse and neglect-related murders across both years, with 96 (51.3% [95% CI 44.4–58.2]) of 187 children killed in their natal home in 2017 (table 3). We saw an increase of child abuse and neglect-related murders within the home among boys to 61 (65.4% [55.7–74.0]) of 93 boys in 2017 from 68 (38.4% [28.4–49.6]) of 178 boys in 2009. For girls, deaths in public spaces reduced to 22 (25.3% [19.1–32.7]) of 87 in 2017 from 115 (41.9% [29.5–55.4]) of 274 in 2009. An overall increase in the percentage of child abuse and neglect-related murders in small town, semi-rural, or rural settings was found, which was most pronounced for boys, but no difference between the two survey years was seen for girls (table 3).

Overall, we found significant changes between 2009 and 2017 for cause of death among all children. The most common cause of child abuse and neglect-related murders among all children remained infant abandonment which decreased to 58 (27.2% [95% CI 22.6–32.2]) of 213 children in 2017 from 161 (35.4% [29.4–42.0]) of 454 children in 2009. Among girls, the percentage of strangulation or asphyxiation increased and was the most frequent cause of death in 2017, replacing infant abandonment, which had previously been the most common (table 3). For boys, infant abandonment also decreased, and was jointly the most common cause of death in 2017 with blunt force trauma (table 3). Deaths with associated rape also proportionately decreased and occurred predominantly among girls (table 3).

We saw a decrease in mothers and an increase in fathers as perpetrators in 2017 compared with 2009, and the changes were especially pronounced among boys (table 4). Convictions nearly doubled from 112 (24.7% [17.2–34.1]) of 454 cases in 2009 to 67 (45.4% [36.4–54.8]) of 147 cases in 2017 ($p < 0.0001$).

Table 2. Age-specific child abuse and neglect-related murder and all child murders among neonates and children aged 0–4 years in 2009 and 2017

	Males					Females				
	Count, 2009 (95% CI)	Rate, 2009 (95% CI)	Count, 2017 (95% CI)	Rate, 2017 (95% CI)	IRR 2017 vs 2009	Count, 2009 (95% CI)	Rate, 2009 (95% CI)	Count, 2017 (95% CI)	Rate, 2017 (95% CI)	IRR 2017 vs 2009
Child abuse and neglect-related murders	154	.	79	.	.	175	.	63	.	.
Early neonate (0–6 days)	94 (61–127)	15.5 (10.0–20.9)	41 (30–52)	7.1 (5.3–9.0)	0.46 (0.28–0.77)	110 (68–153)	18.5 (11.4–25.7)	34 (24–44)	6.0 (4.3–7.7)	0.33 (0.19–0.56)
7 days to 11 months	27 (13–41)	4.4 (2.1–6.7)	14 (8–20)	2.4 (1.3–3.6)	0.55 (0.22–1.35)	31 (10–51)	5.2 (1.7–8.6)	7 (7–7)	1.2 (1.2–1.2)	0.24 (0.08–0.75)
1–4 years	33 (17–50)	1.6 (0.8–2.4)	24 (14–34)	1.0 (0.6–1.5)	0.68 (0.33–1.40)	34 (15–52)	1.6 (0.7–2.5)	22 (12–33)	1.0 (0.5–1.5)	0.60 (0.29–1.27)
All child murders	193	.	95	.	.	200	.	80	.	.
Early neonate (0–6 days)	94 (61–127)	15.5 (10.0–20.9)	41 (30–52)	7.1 (5.3–9.0)	0.46 (0.28–0.77)	110 (68–153)	18.5 (11.4–25.7)	34 (25–43)	6.0 (4.4–7.6)	0.33 (0.19–0.56)
7 days to 11 months	42 (22–61)	6.9 (3.6–10.0)	21 (13–28)	3.6 (2.3–4.9)	0.53 (0.26–1.10)	36 (11–61)	6.0 (1.8–10.2)	8 (8–8)	1.4 (1.4–1.4)	0.24 (0.08–0.68)
1–4 years	58 (36–80)	2.7 (1.7–3.8)	33 (21–44)	1.4 (0.9–1.9)	0.53 (0.29–0.96)	54 (30–77)	2.6 (1.4–3.7)	38 (26–50)	1.7 (1.1–2.2)	0.65 (0.37–1.16)

Livebirths for 2009 by sex: males=608 248; females=596 164; overall=1 204 412. Population estimates of age group 1–4 years for 2009 by sex: males=2 125 126; females=2 102 141; overall=4 227 267. Livebirths for 2017 by sex: males=572 553; females=563 721; overall=1 136 274. Population estimates of age group 1–4 years for 2017 by sex: males=2 286 786; females=2 260 114; overall=4 456 900. IRR is calculated by taking the fractions of the exposed and the total population. The 95% CIs are then adjusted from normal approximation calculation to account for the design effect of the survey by multiplying the standard errors with the design effect of the study. IRR=incidence rate ratio.

Table 3. Child abuse and neglect-related murders among children aged 0–17 years in 2009 and 2017 by location of death, injury setting, cause of death, and suspected rape

	Males					Females					All children				
	Count (95% CI), 2009	Percentage (95% CI), 2009	Count (95% CI), 2017	Percentage (95% CI), 2017	p value	Count (95% CI), 2009	Percentage (95% CI), 2009	Count (95% CI), 2017	Percentage (95% CI), 2017	p value	Count (95% CI), 2009	Percentage (95% CI), 2009	Count (95% CI), 2017	Percentage (95% CI), 2017	p value
Location of death*	178	.	93	.	<0.0001	274	.	87	.	<0.0001	452	.	187	.	<0.0001
Own home	68 (43–94)	38.4% (28.4–49.6)	61 (44–78)	65.4% (55.7–74.0)	.	121 (80–162)	44.2% (32.0–57.1)	34 (26–42)	38.9% (32.1–46.3)	.	189 (139–240)	41.9% (33.7–50.6)	96 (76–116)	51.3% (44.4–58.2)	.
Another home	25 (4–46)	14.2% (6.2–29.2)	5 (2–8)	5.4% (2.9–9.8)	.	17 (1–33)	6.2% (2.4–15.1)	5 (3–6)	5.2% (3.4–7.7)	.	42 (10–74)	9.3% (4.3–18.9)	10 (6–13)	5.1% (3.5–7.4)	.
Public space	51 (27–76)	28.8% (19.4–40.5)	13 (6–21)	14.4% (8.4–23.7)	.	115 (69–160)	41.9% (29.5–55.4)	22 (15–29)	25.3% (19.1–32.7)	.	166 (113–220)	36.7% (27.5–47.1)	37 (28–47)	20.0% (15.7–25.3)	.
Place unknown	33 (16–51)	18.6% (11.3–29.2)	10 (5–15)	11.1% (6.6–17.9)	.	21 (6–36)	7.8% (3.7–15.5)	20 (13–27)	23.1% (17.5–29.9)	.	54 (31–78)	12.0% (7.9–17.9)	34 (24–44)	18.2% (13.9–23.5)	.
Other [†]	0	0.0%	4 (2–5)	3.7% (2.1–6.5)	.	0	0.0%	7 (5–8)	7.5% (5.3–10.4)	.	0	0.0%	10 (8–12)	5.3% (4.0–7.2)	.
Injury setting*	178	.	94	.	<0.0001	274	.	87	.	0.67	452	.	187	.	0.0010
Major urban centre or suburb	84 (54–114)	47.1% (35.2–59.4)	20 (14–25)	20.9% (15.2–28.0)	.	105 (68–141)	38.2% (27.9–49.7)	31 (20–41)	35.5% (26.5–45.6)	.	189 (134–243)	41.7% (33.1–50.8)	52 (38–67)	28.0% (21.9–35.1)	.
Small town, semi-rural, or rural setting	94 (60–128)	52.9% (40.6–64.8)	74 (56–91)	79.1% (72.0–84.8)	.	170 (125–214)	61.8% (50.4–72.2)	56 (44–68)	64.5% (54.4–73.5)	.	264 (206–322)	58.3% (49.2–66.9)	135 (113–157)	72.0% (64.9–78.1)	.
Cause of death*	178	.	109	.	<0.0001	276	.	96	.	0.011	454	.	213	.	<0.0001
Gunshot wounds	3 (0–8)	1.4% (0.2–10.5)	9 (5–14)	8.3% (5.3–12.8)	.	0	0.0%	2 (2–2)	2.1% (1.8–2.5)	.	3 (0–8)	0.6% (0.1–4.1)	11 (7–16)	5.2% (3.5–7.6)	.
Stab wounds	0	0.0%	7 (0–14)	6.1% (1.9–17.5)	.	25 (11–39)	9.0% (4.9–15.7)	5 (0–11)	5.2% (1.8–14.1)	.	25 (11–39)	5.4% (3.0–9.8)	12 (4–20)	5.5% (2.8–10.5)	.
Blunt force trauma	40 (20–59)	22.3% (14.5–32.8)	27 (18–35)	24.5% (19.4–30.5)	.	61 (34–89)	22.3% (14.2–33.3)	13 (7–19)	13.3% (8.2–20.8)	.	101 (65–137)	22.3% (15.7–30.7)	40 (30–50)	18.6% (15.2–22.5)	.
Strangulation or asphyxiation	42 (19–65)	23.7% (14.8–35.7)	17 (11–24)	16% (10.5–23.5)	.	72 (40–104)	26.0% (17.4–37.0)	34 (25–43)	35.3% (27.6–43.9)	.	114 (72–156)	25.1% (18.3–33.5)	51 (41–62)	24.1% (19.2–29.9)	.
Fire	5 (0–13)	3.0% (0.8–11.3)	7 (3–12)	6.5% (3.5–12.0)	.	4 (0–11)	1.6% (0.4–6.4)	4 (4–4)	4.2% (3.5–4.9)	.	10 (1–18)	2.1% (0.9–5.2)	11 (7–16)	5.2% (3.5–7.8)	.

Drowning	2 (0-6)	1.0% (0.1-7.2)	2 (0-6)	2.1% (0.4-9.8)	.	0	0.0%	0	0.0%	.	2 (0-6)	0.4% (0.1-2.9)	2 (0-6)	1.1% (0.2-5.1)	.
Multiple injuries	4 (0-11)	2.4% (0.6-8.9)	1 (1-1)	0.9% (0.7-1.2)	.	5 (0-12)	1.8% (0.4-7.1)	3 (0-6)	3.1% (1.0-9.4)	.	9 (0-21)	2.0% (0.6-6.7)	4 (1-7)	1.9% (0.8-4.3)	.
Infant abandonment	72 (48-97)	40.7% (30.6-51.6)	27 (13-40)	24.2% (16.6-34.0)	.	88 (54-122)	32.1% (23.3-42.2)	27 (20-35)	28.5% (22.3-35.6)	.	161 (116-205)	35.4% (29.4-42.0)	58 (42-74)	27.2% (22.6-32.2)	.
Other [‡]	8 (0-17)	4.4% (1.4-12.8)	11 (4-19)	10.4% (5.8-18.0)	.	8 (0-16)	2.7% (0.9-7.9)	7 (1-13)	7.3% (3.3-15.3)	.	15 (2-29)	3.4% (1.4-8.2)	20 (11-30)	9.6% (6.7-13.6)	.
Undetermined	2 (0-6)	1.0% (0.1-7.7)	1 (0-2)	0.9% (0.4-2.1)	.	13 (0-27)	4.6% (1.6-12.5)	1 (0-2)	1.0% (0.5-2.4)	.	14 (0-29)	3.2% (1.1-8.6)	4 (1-6)	1.7% (0.8-3.7)	.
Rape suspected*	178	.	109	.	.	276	.	n=96	.	.	454	.	213	.	.
Yes	8 (0-19)	4.5% (1.2-16.3)	4 (1-7)	3.7% (1.6-8.0)	0.74	92 (57-127)	33.3% (22.4-46.4)	24 (16-32)	25.0% (18.5-32.7)	0.10	100 (62-138)	22.0% (14.7-31.7)	28 (19-37)	13.1% (9.6-17.7)	0.0070

Percentages recorded from weighted analysis output and may not be the same as the n/N calculation.

* Varying sample size due to missing data.

† Other includes bar, tavern, hospital, motel, or educational setting.

‡ Other includes poisoning, hanging, assault, not specified, or complications from circumcision.

Table 4. Child abuse and neglect-related murders in 2009 and 2017 by perpetrator age, victim–perpetrator relationship, and perpetrator conviction status

	Males					Females					All children				
	Count (95% CI), 2009	Percentage (95% CI), 2009	Count (95% CI), 2017	Percentage (95% CI), 2017	p value	Count (95% CI), 2009	Percentage (95% CI), 2009	Count (95% CI), 2017	Percentage (95% CI), 2017	p value	Count (95% CI), 2009	Percentage (95% CI), 2009	Count (95% CI), 2017	Percentage (95% CI), 2017	p value
Perpetrator age*	103	.	74	.	.	181	.	60	.	.	284	.	134	.	.
Mean age (95% CI)	.	28.6% (23.1–34.0)	.	30.6% (29.2–32.0)	0.48	.	28.6% (25.6–31.5)	.	30.9% (29.2–32.6)	0.16	.	28.5% (25.9–31.1)	.	30.8% (29.9–31.7)	0.092
Minor (aged <18 years)	5 (0–16)	5.2% (0.7–30.5)	3 (0–7)	4.5% (1.6–12.0)	0.80	11 (0–22)	6.0% (2.1–16.2)	5 (0–9)	7.8% (3.2–17.6)	0.54	16 (1–31)	5.7% (2.2–14.0)	8 (2–14)	6% (3.0–11.4)	0.89
Victim–perpetrator relationship*	178	.	71	.	.	274	.	60	.	.	452	.	131	.	.
Mother	133 (90–176)	74.8% (60.0–85.4)	27 (21–34)	38.3% (29.7–47.6)	<0.0001	158 (108–208)	57.8% (46.3–68.5)	30 (18–42)	50.3% (38.0–62.5)	<0.0001	292 (217–366)	64.5% (55.8–72.3)	57 (44–70)	43.8% (37.1–50.6)	<0.0001
Father	14 (0–28)	7.9% (2.8–20.1)	28 (16–39)	39.0% (28.5–50.7)	<0.0001	17 (5–29)	6.2% (2.8–13.2)	11 (8–14)	18.4% (13.3–25.0)	<0.0001	31 (11–51)	6.9% (3.4–13.2)	39 (27–51)	29.6% (23.5–36.5)	<0.0001
Family member or relative	14 (1–27)	8.0% (3.2–18.7)	8 (2–15)	11.5% (5.7–21.8)	<0.0001	18 (5–31)	6.4% (3.2–12.5)	7 (2–13)	12.4% (6.1–23.9)	<0.0001	32 (14–50)	7.0% (4.0–12.2)	16 (7–24)	11.9% (7.1–19.3)	<0.0001
Stepmother or stepfather	7 (0–18)	3.8% (0.7–17.3)	4 (4–4)	5.6% (4.5–7.0)	<0.0001	14 (1–27)	5.2% (1.9–13.1)	7 (2–12)	12.2% (6.4–21.8)	<0.0001	21 (4–38)	4.6% (2.0–10.6)	11 (6–16)	8.6% (5.8–12.7)	<0.0001
Stranger	0	0.0%	4 (3–5)	5.6% (4.1–7.7)	<0.0001	9 (0–20)	3.3% (1.0–10.5)	4 (3–5)	6.7% (4.8–9.1)	<0.0001	9 (0–20)	2.0% (0.6–6.6)	8 (7–9)	6.1% (4.9–7.7)	<0.0001
Others [†] or acquaintances	10 (0–22)	5.6% (1.7–16.8)	0	0.0%	<0.0001	68 (37–99)	21.1% (13.8–30.8)	0	0.0%	<0.0001	78 (37–99)	15.0% (9.6–22.6)	0	0.0	<0.0001
Perpetrator convicted*	178	.	78	.	.	276	.	69	.	.	454	.	147	.	.
Yes	48 (21–74)	26.9% (16.4–40.8)	33 (19–48)	42.5% (29.8–56.1)	0.015	64 (38–90)	23.3% (15.4–33.7)	33 (23–44)	48.9% (38.8–59.0)	<0.0001	112 (71–153)	24.7% (17.2–34.1)	67 (47–86)	45.4% (36.4–54.8)	<0.0001

Percentages recorded from weighted analysis output and might not be the same as the n/N calculation.

* Varying sample size due to missing data.

† Others were sister's ex-boyfriend, school excursion service provider, villager, foster parents, daughter, police officer, grandmothers' boyfriend, mothers' friend, and friend of father boarding in the same house.

Discussion

Overall, 213 children were killed in South Africa through abuse and neglect in 2017, representing a substantial decrease in the child abuse and neglect-related murder rate compared with 2009. These findings are globally unique, as little is known about child abuse and neglect fatality rates in low-income and middle-income country settings. Available data from high-income settings show a similar decline for children younger than 4 years.^{13,22} We found that the greatest decrease was among the youngest boys and girls aged 0–4 years. Parents were the main perpetrators, which aligns with findings of a systematic review of perpetrators of non-fatal violence against children.²³ Between 2009 and 2017, we saw a new prominence of fathers as perpetrators and a decline in mothers, who were the most common perpetrators in 2009. This was likely related to the decrease in abandoned babies in 2017, for which mothers are always presumed to be the perpetrators. Our study has also shown a decrease in rape in conjunction with child murder, but girls are still the most common victims. We have also seen an increase in child abuse and neglect-related murders in rural areas versus urban areas, especially among boys, and this might be linked to greater hardships and poverty in rural households, which has been associated with an increased risk of child abuse in South Africa.²⁴

We have considered different explanations for the decline among child abuse and neglect-related murders of children younger than 5 years. It is possible that the increase in convictions served as a discouragement, but the overall number of murder cases with a conviction has not shown improvement nationally.²⁵ Effective child protection systems are also not evident in South Africa.^{26,27} There are programmes that support families, but there is little evidence of their scale and impact in the literature. Evidence from parenting programmes show that they might decrease child maltreatment, but again there is scarce evidence of scale-up in South Africa.^{28–30} We therefore consider the possibility that the nationwide decline is due to a combination of structural interventions. Many national interventions to improve the economic position of families, women, and children have been initiated since South Africa's transition to democracy in 1994. Some of these include education (eg, early childhood development programmes and free education for poor households), health (user-fee exempted at government health services for primary health care as well as free health care for pregnant and breastfeeding women and children younger than 6 years), and economic and empowerment opportunities to reduce economic hardships, which include social protection through cash-based interventions. Indeed, South Africa has one of the largest social assistance programmes in Africa, with the Child Support Grant the biggest social grant in the country. The grant was initiated in 1998 for children up to age 7 years and then incrementally increased, so that by 2013 it was available for all eligible children younger than 18 years.³¹ It is known that not all eligible caregivers receive the Child Support Grant, especially in their child's first year of life.³¹ The Child Support Grant expanded from approximately 9 million recipients in 2009 to 12 million by 2017.³²

An emerging body of research has shown that the Child Support Grant has positively affected child health and empowered recipients.³³ An analysis of the National Income Dynamics Survey including five waves of data from 2008 to 2017 has shown how social support grants in general were used to improve livelihoods. The analysis showed an increase in formal and informal employment among recipients of the Child Support Grant.³⁴ Qualitative studies

confirm that recipients have used the Child Support Grant to further generate income.^{34,35} Moreover, research suggests changes in the way in which children are viewed in communities as a result of the Child Support Grant, as it has made children less of an economic burden within families.^{31,36} Indeed, in some communities birth rates are higher among child support grant recipients.^{36,37} In rural communities, mothers and grandmothers who are Child Support Grant recipients have found the grant to be empowering. In qualitative research, women describe having greater dignity, autonomy, and decision-making powers as grant recipients.³⁵ Thus, it seems likely that the Child Support Grant has shifted the narrative around children in poor-resource homes from being seen as a burden to being seen as a resource and an avenue for greater empowerment of the caregiver. This is particularly salient as most fathers reside away from their children and relatively few contribute maintenance.³⁸ Furthermore, a 2024 systematic review (including two studies from South Africa) of the relationship between cash-based interventions and violence provides further evidence of the impact of social protection in the prevention of violence against children.³⁹ The review found evidence that cash-based interventions decrease physical child abuse.³⁹ However, a critique of the Child Support Grant is its low value and that it does not move the poorest children above the poverty line, and calls for its increase have been made.⁴⁰ No other research has explored child abuse and neglect-related deaths, and we recommend further research to better understand the role of the Child Support Grant, and other similar interventions globally, in the decline of child abuse overall and for child abuse and neglect-related murders.

We have identified several limitations in our research. First, there were additional stratification variables used in the 2017 survey that were not used in the 2009 survey. However, we primarily used the same sampling frame and the same sampling strategy in both years, using mortality size to obtain representative national estimates. Second, we might have misclassified cases, although we took steps to avoid this and cautiously considered cases that were likely to be unintentional injury deaths, such as poisoning or burns, where inquests ultimately established whether there was any wrongdoing. We might have missed child murder cases that were not processed by the forensic services, such as babies buried after concealed pregnancies, but it is unlikely that this would have been more common in 2017. We could also have missed cases by perpetrators that were not implicit within our definition, but we were very inclusive and included, for example, cases of children killed by a school excursion service provider. Third, our study focused on injury deaths, which included physical and sexual abuse, but cases of neglect (eg, deprivation and poor health supervision) would probably have been recorded as a natural death if they were not identified by the health system or child protection services as child abuse or neglect. After the 2009 study, a child death review pilot was initiated in a few selected geographical regions to improve identification and investigative processes.⁴¹ By 2017, the child death review project was still only functioning in selected regions and unlikely to have made an impact yet at the national level. Finally, we had no missing data from the police in 2009 but 23.3% of the 2017 cases had missing police data due to COVID-19 conditions and difficulties accessing police data at this time. This resulted in missing data on perpetrator age and relationship with the child, which could have influenced results related to the perpetrator. However, the overall perpetrator profile remained unchanged except for an increase in fathers as perpetrators. Having no missing data from medico-legal laboratories is reassuring. The amount of missing police data also did not differ according to mortality size at which the cases were identified. In an era of advanced technology, we recommend and continue to call for data systems that connect

police and justice systems for effective management of crime. Given the focus on injury-related physical and sexual abuse deaths, and caution in identifying child abuse and neglect-related murders, the rates of child abuse and neglect-related murders we have observed are very likely underestimates.

In conclusion, we have shown a substantial decline in deaths from child abuse and neglect in South Africa over less than a decade and, in so doing, have shown that child abuse and neglect-related deaths can be reduced in a middle-income country. This study cannot determine what contributed to the decline, and a combination of factors is the most likely explanation. However, given the emerging evidence on the expansion and positive impact of the Child Support Grant in the past 10 years on South African households, we considered the Child Support Grant as playing an important role. We recommend the Child Support Grant be strengthened to alleviate the hardships experienced by many South African families. We recognise, however, that child abuse and neglect-related murder rates remain high and, despite the decline, we cannot be complacent. We need to target interventions to children most at risk and assist families in ameliorating their hardships in rural areas. Increased investment in evidence-based prevention and responses is key. Our research has also shown the value of dedicated studies on child abuse and neglect fatalities in low-income and middle-income settings beyond South Africa, and how the use of a consistent methodology can enable comparisons and provide evidence to determine trends.

Contributors

The original study design was conceptualised by LJM as part of her Master's thesis. NA was responsible for funding acquisition of the project. The conceptualisation of this paper and analysis was led by NA and RJ with input from all authors. Project implementation and management was led by NA and supported by BD and AK. Data curation was done by SM, CL, AK, and EC. Formal analysis was done by SM, EC, CL, NA, and RJ with the initial interpretation done by the same team. SM, EC, AK, and NA accessed the raw data and verified the data. The original draft was written by NA and all authors contributed to writing, reviewing, and editing the manuscript. NA, SM, EC, and RJ took final responsibility for the decision to submit the manuscript for publication. All authors were permitted to access the data if they wished, and all authors accept responsibility to submit the manuscript for publication.

Data sharing

Access to a de-identified dataset is available upon reasonable request. Requests should be sent to the corresponding author for consideration. A period of 24 months after publication of the main study results should elapse before requests are made, to allow the authors to publish sub-studies and further analyses.

Declaration of interests

RM has received grants from Back of the Yards Algae Sciences. All other authors declare no competing interests.

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