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RESEARCH ARTICLE

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Two decades of tracking femicide in South Africa: An analysis of four national surveys from 1999 to 2020/2021

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ABSTRACT

The absence of reliable administrative data from many countries means that there is little global surveillance of femicide. We conducted femicide surveillance with four dedicated national retrospective mortuary-based surveys to understand its magnitude among women 14 years and older in South Africa from 1999 to 2020/21, including the first year of COVID-19. The surveys included data from police on the investigation to ascertain who perpetrated the femicide (i.e. an intimate partner or someone else). We found overall femicides declined between 1999 and 2009, but the rate of decline slowed in subsequent years. Intimate partner femicide increased during the first year of COVID-19, unlike non-intimate partner femicide. Firearm-related femicides also increased in parallel with the increased availability of firearms in the country during the same period. The data show that South Africa remains one of the countries with the highest recorded rate of intimate partner femicide globally (5.5/100,000 female population), almost five times the global average. We have shown that femicide is preventable, but the conditions of the COVID-19 response likely increased the risk for women in abusive relations. We have also shown the value of dedicated surveys in the absence of reliable information systems.

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Murder; homicide; femicide; gender-related killings; intimate-partner femicide

Introduction

Gender-based violence is a major public health and human rights problem globally, presenting obstacles to achieving sustainable development goals (SDGs) (Garcí et al., 2016). Femicide is the most extreme form and outcome of gender-based violence, but it has only recently been placed in the spotlight through the research briefs from the United Nations Office on Drugs and Crime (UNODC) providing annual global estimates (United Nations Office on Drugs and Crime, 2021, 2024). The most recent research brief reported an increase in femicides globally compared to the previous year, with an estimated 60% of all women murdered globally in 2023 being killed by an intimate partner or a family member (55% in 2022). This figure amounts to a global rate of 1.3/100,000 female population for 2023. The same report showed the African region accounted for the greatest number of victims, with a rate of 2.9/100,000 followed by the Americas

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(1.6/100,000) and Oceania region (1.5/100,000) with rates from Asia (0.8/100,000) and Europe (0.6/100,000) being lower than the global rate (United Nations Office on Drugs and Crime, 2024).

Comparisons among counties, regions and across years are dependent on reliable data. The UNODC relies on country administrative data, which are often not gender sensitive, to identify motives and relationships between victims and perpetrators. It is therefore very likely that many cases remain invisible, particularly in low- and middle-income countries (LMICs) (Dawson et al., 2024; Zecha et al., 2023). The UNODC and UN Women developed a statistical framework on gender-related killings and encouraged countries to implement it to monitor femicide in their settings (United Nations Office on Drugs and Crime and UN Women, 2021). The 2023 report showed how its application in France between 2019 and 2022 assisted in identifying 84% of the female murders as gender-related (United Nations Office on Drugs and Crime, 2024).

In South Africa routine administrative data to identify and measure different types of femicide are not available, and a series of dedicated, independent, cross-sectional, representative national surveys, first conducted in 1999 and repeated in 2009 and 2017, have focused on two main types of femicide, women/girls killed by intimate partners (intimate partner femicide (IPF)) and women/girls killed by perpetrators who are not intimate partners (non-intimate partner femicide (NIPF)) (Abrahams et al., 2024). These national femicide surveys have long been the only national and provincial data on gender-based violence in the country. The three surveys over the 18 years showed an overall reduction in all three forms of femicide measured, with the greatest reduction observed between 1999 and 2009. The IPF rate in 1999 was 9.5/100,000 and decreased to 6.6/100,000, 10 years later in 2009 and was 4.9/100,000 in 2017. Despite this reduction, the 2017 IPF rate remains among the highest globally, nearly four times the 2017 global rate for intimate partner and family-related homicide (4.9/100,000 vs 1.3/100,000 female population) (United Nations Office on Drugs and Crime, 2019). A study of global trends between 2003 and 2014 using UNODC data (including killings by both intimate partners and family members) showed the highest mean rate was reported in Latin American countries, with El Salvador reporting a mean rate of 12.5/100,000 followed by Honduras (11.6/100,000), Jamaica (10.1/100,000) and Belize (9.7/100,000) (Whittington et al., 2023).

During the COVID-19 period, restrictions on social movements (stay-at-home curfews), economic activities (resulting in loss of income for many), and health impacts were experienced across the globe. Many warned that these increased household stressors could increase the risk for intimate partner violence and intimate partner femicide (Hall & Tucker, 2020; Roesch et al., 2020). A number of femicide studies showed a mixed picture of no change or a decline. The UNODC reported a lower global rate at the 1.2/100,000 female population level, but this was not consistent across regions, with increases reported in sub-regions (Northern America and Southern and Western Europe) where trend data were available (United Nations Office on Drugs and Crime, 2021). No change in femicide was reported in a study of six Spanish-speaking countries (Aebi et al., 2021). In addition to movement restrictions, the South African Government included a ban on the sale of alcohol at the start of the lockdown period. This public health approach was applied to decrease hospital admissions, as alcohol is a known risk factor for injuries and interpersonal violence (Shield et al., 2020). The opportunity arose to repeat the national femicide study during the first year of the COVID-19 pandemic, and the aim of this paper was to describe and compare the prevalence trends of overall femicide, intimate partner femicide and non-intimate partner femicide across all four surveys, with a focus on femicide during the first year of the COVID-19 pandemic.

Methods

Study context

In South Africa, the legal term for 'unlawful and intentional killing' is murder, and we use this term in this paper. Using similar methods, we conducted four national retrospective studies of the murder in female victims aged 14 years and older. We included victims from the age of 14 years, as South African women commonly start intimate partner relations at this age. Our primary objective since our first survey in 1999 has been to understand the prevalence and contextual dynamics of intimate partner femicide, defined as a

woman killed by a current or ex-intimate partner. The absence of reliable femicide data in the country meant that the primary objective of the surveys has remained unchanged. Women killed by all other perpetrators were coded as non-intimate partner femicides. The definitions used in all four surveys are shown in Box 1. Our primary data source was mortuary records since data on murder cases are available from state-based mortuaries because the Inquests Act of 1959 requires a post-mortem examination of all unnatural deaths (Republic of South Africa, 1959). Our second data source was data collected from police investigation dockets (see details below).

Box 1. Femicidedefinitions used in the four national South African Femicide Surveys.

Femicide	Murder of a woman
Intimate partner femicide (IPF)	Murder of a woman by an intimate partner (i.e. a current or ex-husband/boyfriend, same-sex partner or a rejected would-be lover)
Non-intimate partner femicide (NIPF)	Murder of a woman by someone other than an intimate partner (i.e. stranger, family member, acquaintance etc.)

Study design and sample

The study design is based on a study of rape femicides initially developed by one of the authors (Martin, 1999). We used a multi-stage stratified cluster sample, with mortuaries as the primary sampling unit. A sampling frame listing all state-based mortuaries operating in the country in the study year was developed. We stratified the mortuaries by size based on the number of autopsies performed per annum (see Table 1). Our interest in including provincial estimates after the 2009 study meant larger sampling fractions in 2017 and 2020/21. More details on the sampling process are presented elsewhere (Naeemah Abrahams et al., 2024). The first three surveys covered calendar years, i.e. 1 January to 31 December. The fourth survey covered the first year of the South African COVID-19 period, which covered 12 months from 1 April 2020 to 31 March 2021.

Data collection at mortuaries (phase 1)

We started data collection at the sample mortuaries. Access was granted by national and provincial health authorities. Data were extracted from two mortuary data sources (mortuary registers and autopsy reports) for each study period. Trained fieldworkers started with the mortuary register to identify females aged 14 years and older, with death due to murder. Identification numbers and biological sex data are mostly

Table 1. Sampling frame and sampling fraction used across the four surveys.

	1999		2009		2017		2020/1	
Mortuary strata	Number of mortuaries	Sample (sampling fraction)	Number of mortuaries	Sample (sampling fraction)	Number of mortuaries	Sample (sampling fraction)	Number of mortuaries	Sample (sampling fraction)
Small: <500 autopsies performed per year	176	12 (6.8)	81	20 (24.7)	96	55 (57.3)	95	51 (53.7)
Medium: 500–1499 autopsies performed per year	34	5 (14.7)	33	13 (39.4)	31	19 (61.3)	24	17 (70.8)
Large: >1499 autopsies performed per year	15	8 (53.3)	8	5 (55.5)	10	7 (70.0)	9	7 (77.8)
Total	225	25 (11.1)	122	38 (31.1)	137	81 (59.1)	128	75 (58.6)

recorded in the mortuary register and assisted with identifying females 14 years and older. We were inclusive at this initial process and included cases that had ambiguous injury descriptions listed in the register, i.e. a woman with blunt injuries. The second data source was the mortuary file, which included the autopsy report for each case identified in the register. We started with confirmation of sex as reported by the forensic pathologist in the report and age. We extracted data on the cause of death (stab, gunshot, blunt force, etc.), South African Police Service (SAPS) Crime Administration System (CAS) number, name of police station and whether samples for forensic evidence were collected. We also identified evidence of sexual assault reported in the autopsy report. These included genital injuries; collection of specimens such as vaginal swabs, pubic hair, and nail clippings, etc, or reports that a rape evidence kit was used; statements that sexual assault was suspected; or reports that the body was found with dislodged or removed clothes/underwear. We excluded patients if the cause of death remained undetermined and if both age and sex could not be determined. See additional notes in the supplemental file (page 1) on data management and validation of missing age, sex and cause of death data for the four surveys as well as the distribution of all female murders and cases with police data across samples (Table S1 supplemental file).

Data collection with police (phase 2)

Approval and access were granted by National and Provincial police management. We requested informed written consent from the police officers who extracted the data from the police dockets. Given the absence of linked data between the forensic and police systems, we used the CAS number collected at the mortuary to link the case to a police investigation. Further identifiers included the name of the police station in 1999 and 2009, and from 2017 onwards, we added the South African identification number of the victim. Data collection with police generally started approximately two years after the deaths to allow for the legal cases to have reached finalisation, but investigations and legal processes were often still in progress. Data collection with the police took longer (between 10 and 12 months) than data collection at the mortuaries. The 2017 police data collection started on the eve of the COVID-19 pandemic and extended over a longer period (19 months: March 2020 to September 2021) due to COVID-19 restrictions. The experiences of police data collection during COVID-19 are presented elsewhere (Manganyi et al., 2024).

Data collection from the police was either conducted in-person or telephonically. The police docket was the primary source. Either the primary investigating officer or a senior detective extracted the data from the docket including: whether murder was suspected, victim information (age, education, employment), perpetrator information (age, sex, education, employment, known use of alcohol, firearm ownership and prior convictions) and the victim–perpetrator relationship, the latter important to identify the type of femicide, i.e. intimate partner femicide (IPF) (perpetrator is an intimate partner) or a non-intimate partner femicide (NIPF) (perpetrator is a non-partner). Data on the investigation and legal outcome were requested, including cases when the legal outcomes were not finalised. We established whether a perpetrator was suspected and perceived to be primarily responsible for the crime. This is the convention in homicide research used widely, including in the supplementary homicide data by the Bureau of Justice in the US (Bureau of Justice Statistics, 2019). For perpetrators who were intimate partners, we asked about their prior history of intimate partner violence against the victim. In South Africa race continues to be a risk factor for murder victims. In this study, we use racial categories as defined and developed under apartheid. These categories and their meanings are relevant only to the South African context, such as the social construct of the 'Coloured' racial group, which refers to people of a mixed, but culturally specific, group.

Data management and statistical analysis

In 1999 and 2009, we used a paper-based questionnaire to collect data, and in 2017 and 2020/21, we used REDCap, a web-based data entry tool (Harris et al., 2009). All the mortuaries sampled in the four surveys contributed data. Data management and cleaning were performed in MS Excel and Stata 17. The analysis in this paper followed the same comparison used in the analysis for the 1999, 2009 and 2017 surveys (Abrahams et al., 2024). The analysis included imputing missing data on victim–perpetrator relationships

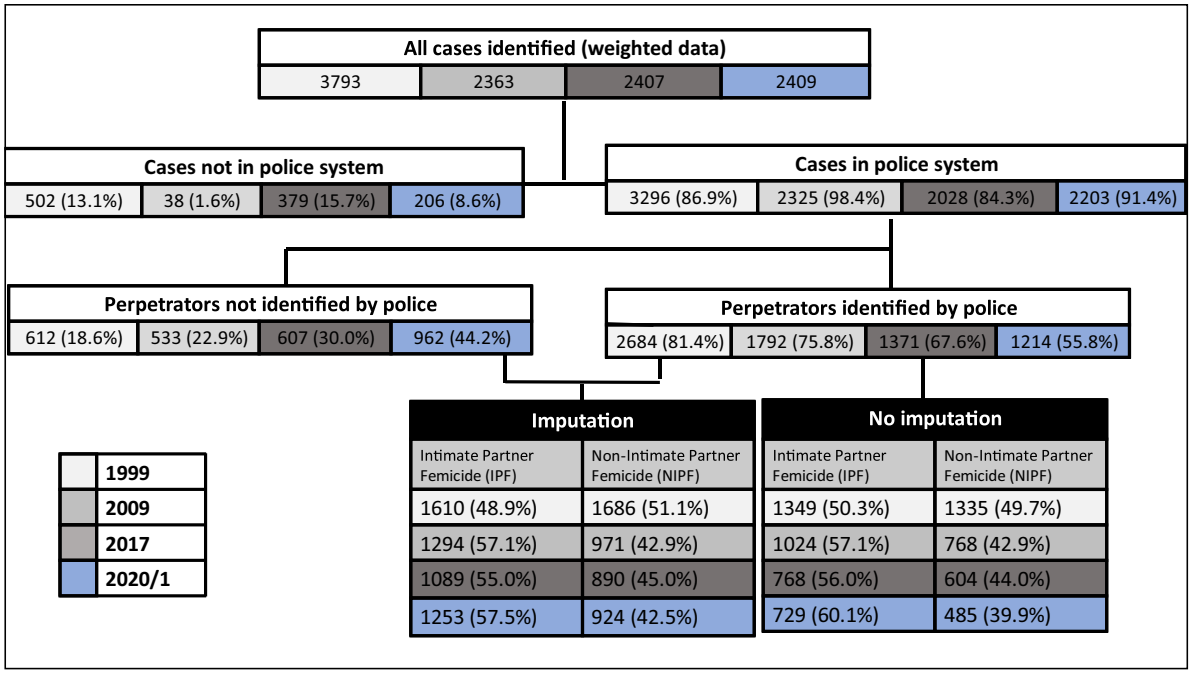


Figure 1. Flow chart of all estimated femicide cases of women 14 years and older across the four studies: weighted and imputed data.

in order to classify the unknown cases as IPF or NIPF, necessitated by the increase in the proportion of perpetrator data missing from the police interviews (see Figure 1). When perpetrators are not identified by the police, the victim–perpetrator relationship cannot be established. The imputation process is described below.

Analysis weighting was based on the first two surveys designed to report on the national level only, and the strata were based on the mortuary size. Larger samples from 2017 allowed for provincial estimates with survey stratification by mortuary size and province for the 2017 and 2020/21 surveys. For the 2017 & 2020/21 studies, the survey weights included the probability of selecting the mortuaries within the mortuary size and province strata. The probability of selection was based on the number of mortuaries randomly selected within each mortuary size stratum (and province stratum for 2017 & 2020/21 studies). The weighting formula (Wi) is summarised below:

Wi = realisation weight (RWi) × 1/sampling fraction (SF) × 1/primary sampling unit selection probability (PSUP)

where:

RWi = expected sample/realised sample for mortuary(i)

SFi1/2 = if mortuaries had half their post-mortem folders surveyed

SFi1 = if mortuaries had all their post-mortem folders surveyed

PSUP = number of mortuaries randomly selected for the stratum

total number of mortuaries in stratum

All four surveys were set up as independent surveys by the senior biostatistician on the team (CL). We therefore analysed the studies as independent surveys because of the independent sampling procedures for each study and time separation. We accounted for the multi-stage design with weighting stratified by mortuary size (and by province in 2017 and 2020/21) and the mortuaries as clusters in the estimation of standard errors. We used Taylor linearisation to obtain robust standard errors for parameter estimates.

Age-standardised rates (ASRs) were calculated using female population estimates derived from the Thembisa model version 4.4 and the World Health Organization (WHO) world standard population distribution normalised weightings. The Thembisa model for demographic statistics is a mathematical model widely used for government and administrative purposes at both the national and provincial levels (Johnson et al., 2017; Machemedze et al., 2020). The incorporation of the normalised weights allows for a

comparison of our study estimates with other countries (Ahmad et al., 2001). The ASR calculations also accounted for missing ages (see detail in Table 2 footnotes). We used the Mid-year population estimates from Statistics South Africa to calculate rates by race (Statistics South Africa, 2022).

Age standardised rates were calculated to accounted for undetermined age by multiplying the age standardised rate not accounting for undetermined age with a factor calculated by taking total number of female homicide cases divided by the total number of female homicide cases minus the total number of female homicide cases with undetermined age.

Incidence rate ratio (IRR) is calculated by taking the fractions of the exposed and their total population. The 95% confidence intervals are then adjusted from the normal approximation calculation to account for the design effect of the survey

We present overall femicide statistics and those for IPF and NIPF. We used Hot deck multiple imputation procedures to allocate cases with missing information on the type of perpetrator to the IPF and NIPF groups (Andridge & Little, 2010). The Hot deck imputation is a commonly used imputation method for surveys because it allows for the multilevel structure of the data to be taken into account in the imputation procedure, thus maintaining the original clustering effects across the mortuaries. Ignoring the clustering in the imputation procedure can lead to an inflated effective sample size. To preserve the study design, resampling for Hot deck imputation was carried out within the province and mortuary size strata. For the small mortuaries where resampling was not possible within the province and mortuary strata, pooled province and place of injury data were used instead. The place of injury was included in the imputation as a theoretically known variable (which was also supported by data across all 4 surveys) that predicts intimate partner femicide and non-intimate partner femicide and was also used to improve the classification (prediction) of unknown cases as intimate or non-intimate femicide cases. We performed several sensitivity analyses to compare the extent of clustering within the sample using intraclass correlation coefficient (ICC) derived from different multiple imputation methods. The Hot deck imputation, which maintained the original ICC, was adopted across all 4 surveys, with 30 Hot-deck imputations performed for each survey. The 30 multiple imputed datasets were then used to calculate the pooled parameter estimates and their standard errors. The efficiency of the Hot deck imputation that can be affected by the limitation on the number of variables allowed in the resampling procedure and the proportion of missing data, as was the case for the 2017 and 2020/21 surveys, was improved by performing multiple imputations and by the inclusion of a good predictor of intimate partner femicide in the classification of the unknown cases.

We estimated the femicide age standardised rates for all female homicides and for IPF and NIPF and presented weighted counts and percentages for both imputed and non-imputed data. We used incidence rate ratios (IRR) and their respective 95% confidence intervals (CIs) to compare rates between any two consecutive surveys (i.e. 2009 and 1999, 2017 and 2009, and 2020/21 and 2017, with the standard errors for the rates and IRRs adjusted for the design of each survey.

This study is reported as per the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) checklist for cross-sectional studies (see supplemental file for the STROBE Checklist).

Ethical approval

Ethical approval for all four studies were approved by the Ethics Committee of the South African Medical Research Council, and further approval and access to data were obtained from the National and Provincial Departments of Health, the Forensic Pathology Service and the South African Police Service.

Results

The weighted estimates of females aged 14 years and older murdered across the four surveys are presented in Figure 1. The proportion of cases where interviews with the police could not be completed because the cases could not be identified in the police system, decreased to 8.6% in 2020/21 from 15.7% in 2017. However, there was a progressive increase in the proportion of perpetrators not identified by police during their investigation of the murders from 18.6% in 1999 to 44.2% in 2020/21 (see Table S1). The proportion of

Table 2. Age standardised population rates for 1999, 2009, 2017 and 2020/21 for all female murders: intimate partner femicide and non-intimate partner femicide by age and incidence rate ratios (IRR) of population rate estimates between study years: weighted and imputed data.

	1999 Unweighted = 1052 Weighted = 3793			2009 Unweighted = 930 Weighted = 2363			IRR of population rate estimates: 2009/1999 (95% CI)	2017 Unweighted = 1301 Weighted = 2407			IRR of population rate estimates: 2017/2009 (95% CI)	2020–21 Unweighted = 1441 Weighted = 2409			IRR of population rate estimates: 2020–21/2017 (95% CI)
	N	%	Rate per 100,000 pop (95% CI)	*N*	%	Rate per 100,000 pop (95% CI)		*N*	%	Rate per 100,000 pop (95% CI)		*N*	%	Rate per 100,000 pop (95% CI)	
Overall female murders*	3793		24.2 (15.5–32.9)	2363		12.6 (8.5–16.6)	0.52 (0.48–0.56)	2407		11.1 (9.8–12.4)	0.88 (0.81–0.95)	2409		10.6 (9.7–11.5)	0.95 (0.88–1.03)
Intimate partner femicide	1610	48.9	9.5 (6.4–12.7)	1294	57.1	6.6 (5.3–8.0)	0.69 (0.63–0.77)	1089	55.0	4.9 (4.1–5.8)	0.74 (0.66–0.83)	1253	57.5	5.5 (4.7–6.2)	1.12 (1.00–1.26)
Non-intimate partner femicide	1686	51.1	11.4 (6.9–15.9)	971	42.9	5.4 (4.2–6.6)	0.47 (0.42–0.53)	890	45.0	4.2 (3.4–4.9)	0.78 (0.69–0.88)	924	42.5	4.1 (3.4–4.8)	0.98 (0.86–1.11)
Overall femicide															
14–29 y	1359	35.8	6.8 (4.7–8.9)	867	36.7	3.8 (2.6–5.0)	0.56 (0.50–0.63)	943	39.2	4.2 (3.8–4.6)	1.11 (0.97–1.26)	808	33.6	3.6 (3.3–3.9)	0.86 (0.75–0.98)
30–44 y	1310	34.5	8.1 (5.7–10.5)	784	33.2	4.2 (2.9–5.6)	0.52 (0.46–0.59)	774	32.2	3.4 (2.9–3.8)	0.81 (0.71–0.93)	836	34.7	3.4 (3.2–3.6)	1.00 (0.87–1.15)
45–59 y	512	13.5	4.4 (3.0–5.9)	408	17.3	2.5 (1.7–3.3)	0.57 (0.47–0.68)	365	15.2	1.8 (1.6–2.1)	0.72 (0.59–0.88)	432	18	2.0 (1.8–2.3)	1.13 (0.93–1.37)
60 + y	391	10.3	3.4 (1.2–5.7)	290	12.3	2.0 (1.3–2.7)	0.59 (0.48–0.73)	303	12.6	1.6 (1.4–1.8)	0.80 (0.64–1.00)	311	12.9	1.5 (1.3–1.6)	0.93 (0.74–1.15)
Undetermined age	222	5.8		15	0.6			22	0.3			21	0.9		
Intimate partner femicide															
14–29 y	739	45.9	3.7 (2.7–4.7)	540	41.8	2.4 (1.9–2.8)	0.65 (0.56–0.76)	446	40.9	2.0(1.7–2.3)	0.95 (0.80–1.14)	443	35.3	2.0 (1.7–2.2)	0.99 (0.83–1.18)
30–44 y	579	35.9	3.6 (2.6–4.6)	534	41.3	2.9 (2.4–3.4)	0.81 (0.68–0.95)	417	38.3	1.8 (1.6–2.1)	0.78 (0.65–0.94)	499	39.8	2.0 (1.8–2.2)	1.13 (0.94–1.36)
45–59 y	127	7.9	1.1 (0.6–1.6)	156	12.1	1.0 (0.7–1.2)	0.91 (0.66–1.26)	137	12.5	0.7 (0.5–0.8)	1.00 (0.69–1.45)	203	16.2	1.0 (0.8–1.2)	1.37 (0.95–1.98)
60 + y	63	3.9	0.5 (0.1–1.0)	59	4.6	0.4 (0.2–0.6)	0.80 (0.49–1.31)	76	7.0	0.4 (0.3–0.5)	2.00 (0.84–4.75)	94	7.5	0.4 (0.3–0.6)	1.12 (0.47–2.66)
Undetermined age	102	6.4		4	0.3			14	1.3			14	1.2		
Non-intimate partner femicide															
14–29 y	477	28.3	2.4 (1.5–3.2)	299	30.8	1.3 (1.0–1.6)	0.54 (0.44–0.66)	319	35.9	1.4 (1.2–1.6)	1.08 (0.86–1.34)	294	31.8	1.3 (1.1–1.5)	0.94 (0.75–1.17)
30–44 y	546	32.4	3.4 (2.4–4.4)	234	24.0	1.3 (1.0–1.5)	0.38 (0.31–0.47)	243	27.3	1.1 (0.8–1.3)	0.85 (0.66–1.09)	266	28.8	1.1 (0.9–1.2)	0.98 (0.77–1.25)
45–59 y	323	19.2	2.8 (1.7–3.9)	217	22.4	1.3 (1.0–1.7)	0.46 (0.37–0.59)	149	16.7	0.7 (0.6–0.9)	0.54 (0.40–0.72)	169	18.3	0.8 (0.6–1.0)	1.14 (0.84–1.55)
60 + y	271	16.1	2.4 (1.0–3.7)	222	22.8	1.5 (1.1–1.9)	0.63 (0.49–0.80)	171	19.2	0.9 (0.7–1.1)	0.60 (0.45–0.79)	189	20.4	0.9 (0.7–1.1)	1.00 (0.75–1.33)
Undetermined age	69	4.1						8	0.9			6	0.7		

All analysis on age standardised rates was calculated using the Thembisa model.
1999 female population: Overall: 15,775,803; By age: 14–29 years: 6,976,810; 30–44 years: 4,564,389; 45–59 years: 2,427,045 & 60 + years: 1,807,559.
2009 female population: Overall: 18,982,433; By age: 14–29 years: 7,960,305; 30–44 years: 5,248,792; 45–59 years: 3,460,820 & 60 + years: 2,312,516.
2017 female population: Overall: 21,520,499; By age: 14–29 years: 7,872,159; 30–44 years: 6,459,190; 45–59 years: 4,195,543 & 60 + years: 2,993,607.
2020 female population: Overall: 22,551,381; By age: 14–29 years: 7,809,187; 30–44 years: 6,944,862; 45–59 years: 4,478,441 & 60 + years: 3,318,891.

women killed by an intimate partner increased across the four surveys and was 57.5% ($n = 1253$) of all women killed in 2020/21, compared to 48.9% in 1999. IPF remains the leading type of murder among women in South Africa.

In Table 2, we present the age standardised rates (ASRs) for overall femicide, IPF, and NIPF across the four surveys and the IRRs to compare the rates between 2009 and 1999, 2017 and 2009 and 2020/21 and 2017. We found that the previously reported (Naeemah Abrahams et al., 2024) statistically significant decline in ASR for overall femicide did not continue, and the difference in ASR between 2017 and 2020/21 (11.1/100 000 (95% CI 9.8–12.4) in 2017 and 10.6/100 000 (95% CI 9.7–11.5) in 2020/21) was not statistically significant, and there was no significant change in rate, as shown by an IRR of 0.95 (95% CI 0.88–1.03). The same pattern was found for NIPF, with no significant difference in the ASRs (IRR = 0.98 (95% CI 0.86–1.11)) between 2020/21 and 2017. The findings for IPF were different. There was a statistically significant increase in IPF ASR between 2017 and 2020/21, with an ASR for IPF of 4.9/100 000 (95% CI 4.1–5.8) in 2017 and 5.5/100 000 (95% CI 4.7–6.2) in 2020/21. The IRR was 1.12 (95% CI 1.00–1.26).

We present the ASRs across age groups in Table 2. Although the decline in ASRs among the different age groups showed a decline across all forms of femicide from 1999 to 2009, there have not been clear trends subsequently. Analysis by age group shows persistent increased risk of femicide among younger women (14–29- and 30–44-year age groups) across the four studies and across all forms of femicide.

In Table 3, we present the age-specific population rates by race groups. The overall femicide rate for African women halved from 1999 to 2009 (from 25.8 to 12.9 per 100,000), but thereafter, it has not declined further. In 2020/21, it was 12.0 per 100,000. The decline has been even greater for Coloured women, from 37.5 to 17.7 per 100,000 in 2009, and has since continued to 9.4 per 100,000 in 2020/21. Thus, Coloured women no longer have the highest rates of overall femicide. An increase in IPF rates among African women between 2017 and 2020/21 was statistically significant (IRR = 1.14 (95% CI 1.01–1.28)), changing from 5.6/100 000 (95% CI 4.9–6.3) in 2017 to 6.4/100 000 women (95% CI 5.7–7.0) in 2020/21. The decline in IPF rates for Coloured women were also statistically significant (IRR = 0.61 (95% CI 0.40–0.91)) between 2017 and 2020/21.

Table 4 presents the provincial ASR for 2017 and 2020/21. The table shows 4-fold differences in rates between the provinces with the highest and lowest prevalence rates for all femicides and NIPF, with fewer differences for IPF. The rates of overall femicide and IPF in Eastern Cape Province were nearly twice those in the next highest province (KwaZulu-Natal). There was a statistically significant increase in both overall femicide and IPF (overall femicide IRR1.19 (95% CI: 1.01–1.42)) and IPF (IRR = 1.57/100,000 women (95% CI 1.24–1.99)) in Gauteng Province, with IPF rates increasing from 3.8/100,000 in 2017 to 5.5/100,000 women in 2020/21. The Free State province was the only province that showed a significant decrease, which was for overall femicide (IRR = 0.66 (95% CI: 0.45–0.95) only). Although Limpopo Province continued to have the lowest ASR, in 2020/21, there were non-significant increases in overall femicide and IPF.

In Table 5, we present the ASR for specific mechanisms of death. The initial decrease in firearm-related femicides noted between 1999 and 2009 did not continue, and in 2020/21, statistically significant increases were found across almost all femicide groups, with the greatest increase among women killed by intimate partners, which nearly doubled between 2017 and 2020/21 (IRR = 1.90 (95% CI: 1.51–2.38)). The number of murders stabbing initially declined from 1999 to 2009 and then showed a statistically significant increase in 2017, followed by a significant decrease in 2020/21, for all femicides (IRR = 0.80 (955 CI: 0.70–0.92)). This suggests an underlying pattern of no overall change. Blunt force murders significantly declined across all the femicide groups from 1999 to 2017, but thereafter plateaued. Very little change in ASR patterns was observed in stab and blunt force injuries in the last two surveys.

Table 6 presents an analysis with data imputation of the proportion of rape femicides, legal outcome, history of IPV and suicide of the perpetrator for IPF and NIPF cases. Similar proportions of rape intimate partner femicides were found in two earlier studies (1999 and 2009), after which rape femicide decreased in 2017 and then returned to approximately the previous level in 2020/21. The rape femicide proportion was consistently higher among NIPF across the four surveys and was approximately twice as large as that for IPF in 2009 and 2017, with the highest proportion reported in 2009 (28.7%). It has declined to the 1999 level by 2020/21. The proportion of perpetrators who were convicted was higher for IPF than for NIPF at all time points. There was no significant change in IPF convictions from 1999 to 2017, and this declined significantly

Table 3. Population rates for 1999, 2009, 2017 and 2020–2021 for all female murders: intimate partner femicide and non-intimate partner femicide by race and incidence rate ratios (IRR) of population rate estimates between study years: weighted and imputed data.

	1999 Unweighted = 1052 Weighted = 3793			2009 Unweighted = 930 Weighted = 2363			IRR of population rate estimates: 2009/1999 (95% CI)	2017 Unweighted = 1301 Weighted = 2407			IRR of population rate estimates: 2017/2009 (95% CI)	2020–21 Unweighted = 1441 Weighted = 2409			IRR of population rate estimates: 2020–21/2017 (95% CI)
	N	%	Rate per 100,000 pop (95% CI)	*N*	%	Rate per 100,000 pop (95% CI)		*N*	%	Rate per 100,000 pop (95% CI)		*N*	%	Rate per 100,000 pop (95% CI)	
Overall femicide															
African	3019	80.3	25.8 (14.4–37.3)	1884	80.3	12.9 (9.2–16.5)	0.50 (0.46–0.54)	2078	86.4	12.3 (11.2–13.5)	0.96 (0.88–1.05)	2141	88.9	12.0 (11.1–12.8)	0.97 (0.89–1.06)
Coloured	516	13.7	37.5 (6.7–68.3)	309	13.2	17.7 (3.4–32.0)	0.47 (0.39–0.57)	233	9.7	11.9 (9.5–14.4)	0.67 (0.53–0.85)	193	8	9.4 (7.1–11.7)	0.79 (0.61–1.03)
Indian	41	1.1	9.7 (0.0–19.9)	31	1.3	5.9 (0.0–12.4)	0.61 (0.32–1.16)	21	0.9	3.6 (2.0–5.2)	0.60 (0.28–1.30)	15	0.6	2.4 (1.1–3.6)	0.69 (0.27–1.73)
White	183	4.9	9.3 (2.9–15.7)	116	4.9	5.5 (2.0–9.1)	0.60 (0.43–0.82)	72	3.0	3.4 (2.6–4.3)	0.62 (0.42–0.94)	55	2.3	2.7 (2.1–3.2)	0.77 (0.47–1.25)
Undetermined												5	0.2		
Intimate partner femicide															
African	1255	78.2	10.7 (7.7–13.8)	1041	80.6	7.1 (6.0–8.2)	0.66 (0.59–0.74)	948	86.5	5.6 (4.9–6.3)	0.79 (0.70–0.89)	1144	91.3	6.4 (5.7—7.0)	1.14 (1.01–1.28)
Coloured	271	16.9	19.7 (5.6–33.7)	179	13.9	10.3 (3.4–17.2)	0.52 (0.40–0.68)	115	10.5	5.9 (4.2–7.5)	0.57 (0.41–0.79)	73	5.8	3.6 (2.2–4.9)	0.61 (0.40–0.91)
Indian	22	1.4	5.2 (1.0–9.4)	21	1.6	4.0 (1.1–6.9)	0.76 (0.33–1.76)	9	0.8	1.5 (0.1–2.9)	0.38 (0.13–1.13)	7	0.6	1.1 (0.0–2.4)	0.75 (0.19–2.95)
White	57	3.5	2.9 (1.4–4.4)	48	3.7	2.3 (1.1–3.5)	0.79 (0.46 1.35)	24	2.2	1.1 (0.7–1.6)	0.50 (0.25–0.99)	25	2	1.2 (0.7–1.7)	1.05 (0.48–2.28)
Undetermined												3	0.2		
Non-intimate partner femicide															
African	1296	78.2	11.1 (7.3–14.9)	760	79.0	5.2 (4.2–6.2)	0.47 (0.41–0.53)	788	87.4	4.7 (4.2–5.2)	0.90 (0.78–1.03)	793	85.8	4.4 (3.9–5)	0.95 (0.83–1.09)
Coloured	225	13.6	16.4 (4.1–28.6)	126	13.1	7.2 (2.5–12.0)	0.44 (0.33–0.60)	83	9.2	4.2 (3.4–5.0)	0.59 (0.40–0.86)	102	11.0	5 (3.8–6.2)	1.18 (0.79–1.76)
Indian	15	0.9	3.6 (1.2–6.0)	10	1.1	1.9 (0.0–4.0)	0.53 (0.18–1.62)	0				7	0.8	1.1 (0–2.6)	0 (0–0)
White	121	7.3	6.1 (2.8–9.4)	63	6.6	3.0 (1.5–4.5)	0.49 (0.32–0.75)	31	3.5	1.5 (1.0–2.0)	0.50 (0.27–0.90)	20	2.1	1 (0.5–1.4)	0.65 (0.3–1.42)
Undetermined												3	0.3		

Race groups age specific rates are reported using Statistics South Africa mid population estimates:
1999 female population: Overall: 15,458,162; By race: African: 11,683,651; Coloured: 1,375,413; Indian: 424,331 & White: 1,984,767.
2009 female population: Overall: 19,027,717; By race: African: 14,655,388; Coloured: 1,744,521; Indian: 529,557 & White: 2,098,251.
2017 female population: Overall: 21,501,234; By race: African: 16,862,856; Coloured: 1,958,404; Indian: 595,297 & White: 2,084,677.
2020 female population: Overall: 22,551,381; By race: African: 17,887,689; Coloured: 2,043,141; Indian: 618,770 & White: 2,073,236.
Incidence rate ratio (IRR) is calculated by taking the fractions of the exposed and their total population. The 95% Confidence Intervals are then adjusted from normal approximation calculation to account for the design effect of the survey.

Table 4. Age-standardised population rates for 2017 & 2020/21 for all female murders, intimate partner femicide and non-intimate partner femicides by South African Provinces: weighted and imputed data.

	2017			2020–2021			IRR of population rate estimates: 2020–21/2017 (95% CI)
Provinces	*N* (95% CI)	% (95% CI)	Rate/100,000 population (95% CI)	*N* (95% CI)	% (95% CI)	Rate/100,000 population (95% CI)	
All femicides							
Western Cape	316 (309–323)	13.1 (12.0–14.3)	12.3 (12.0 -12.5)	296 (296–296)	12.3 (11.6–13.1)	10.8 (10.8–10.8)	0.89 (0.71–1.10)
Eastern Cape	565 (506–624)	23.5 (20.9–26.3)	22.3 (20.0–24.6)	559 (508–611)	23.2 (21.2–25.4)	21.5 (17.8–25.1)	0.97 (0.82–1.14)
Northern Cape	43 (21–65)	1.8 (1.1–3.0)	11.1 (5.3–16.8)	30 (18–41)	1.2 (0.8–1.8)	7.6 (1.9–16.2)	0.68 (0.36–1.31)
Free-State	137 (117–158)	5.7 (4.8–6.7)	12.9 (11–14.9)	92 (74–111)	3.8 (3.1–4.7)	8.4 (4.4–12.6)	0.66 (0.45–0.95)
Kwa-Zulu Natal	583 (490–675)	24.2 (20.9–27.8)	14.0 (11.8–16.2)	522 (423–621)	21.7 (18.5–25.2)	12.1 (9.1–15.1)	0.87 (0.74–1.03)
North West	105 (97–113)	4.4 (4.1–4.7)	7.7 (7.1–8.3)	107 (92–122)	4.4 (3.8–5.1)	7.4 (5.2–9.6)	0.97 (0.67–1.42)
Gauteng	458 (299–617)	19.0 (14.2–25.0)	8.1 (5.3–11)	564 (480–648)	23.4 (20.6–26.5)	9.2 (6.4–12)	1.19 (1.01–1.42)
Mpumalanga	96 (69–123)	4.0 (3.0–5.3)	5.7 (4.1–7.3)	122 (91–152)	5.1 (3.9–6.5)	6.7 (4.1–9.4)	1.20 (0.83–1.73)
Limpopo	104 (84–124)	4.3 (3.5–5.3)	4.9 (4.0–5.9)	116 (90–142)	4.8 (3.8–6)	5.4 (2.5–8.4)	1.10 (0.76–1.59)
Intimate partner femicides							
Western Cape	125 (115–135)	49.9 (28.6–71.2)	4.9 (4.5–5.3)	114 (92–137)	43.0(36.7–49.3)	4.1 (2.1–6.3)	0.85 (0.6–1.22)
Eastern Cape	203 (155–252)	44.7 (32.6–56.8)	8.0 (6.1–9.9)	283 (225–341)	55.0(43.4–66.6)	10.8 (4.8–18.6)	1.33 (1.04–1.71)
Northern Cape	24 (11–38)	68.1 (25.7–100.0)	6.3 (2.8–9.7)	13 (6–20)	52.2(41.7–62.6)	3.1 (0–12.5)	0.49 (0.19–1.26)
Free-State	62 (52–71)	54.3 (40.6–67.9)	5.8 (4.9–6.7)	40 (29–52)	52.8(42.7–62.8)	3.6 (1.5–6)	0.63 (0.36–1.1)
Kwa-Zulu Natal	246 (190–302)	52.4 (44.4–60.3)	5.9 (4.6–7.3)	240 (184–296)	51.2(44.4–58.0)	5.5 (3.2–7.7)	0.96 (0.75–1.24)
North West	50 (40–59)	58.5 (17.8–99.2)	3.7 (3–4.4)	72 (62–82)	70.3(60.2–80.3)	5.0 (1.4–8.7)	1.39 (0.84–2.29)
Gauteng	216 (133–299)	58.1 (23.2–93.1)	3.8 (2.4–5.3)	339 (274–404)	66.2(58.5–74.0)	5.5 (2.3–8.7)	1.57 (1.24–1.99)
Mpumalanga	53 (31–74)	62.5 (46.6–78.5)	3.1 (1.9- 4.4)	72 (56–88)	69.3(59.2–79.3)	3.9 (2.4–5.4)	1.39 (0.85–2.28)
Limpopo	49 (29–70)	49.1 (7.7–90.6)	2.3 (1.4–3.3)	79 (58–101)	73.3(58.7–88.0)	3.7 (0.8–7)	1.61 (0.98–2.64)
Non-intimate partner femicides							
Western Cape	126 (116–136)	50.1 (28.8–71.4)	4.9 (4.5–5.3)	152 (131–172)	57.0(50.7–63.3)	5.6 (1.7–9.3)	1.14 (0.82–1.59)
Eastern Cape	252 (217–286)	55.3 (43.2–67.4)	9.9 (8.6–11.3)	232 (175–289)	45.0(33.4–56.6)	8.9 (2.1–16)	0.92 (0.72–1.18)
Northern Cape	11 (6–17)	31.9 (0.0–74.3)	2.9 (1.5–4.4)	12 (6–18)	47.8(37.4–58.3)	3.2 (0.5–14.2)	1.10 (0.35–3.44)
Free-State	52 (40–65)	45.7 (32.1–59.4)	4.9 (3.8–6.1)	36 (29–44)	47.2(37.2–57.3)	3.3 (0.3–7.2)	0.67 (0.37–1.22)
Kwa-Zulu Natal	224 (175–273)	47.6 (39.7–55.6)	5.4 (4.2–6.6)	229 (175–282)	48.8(42.0–55.6)	5.4 (3.2–7.6)	0.96 (0.75–1.25)
North West	35 (28–42)	41.5 (0.8–82.2)	2.6 (2.1–3.1)	30 (20–40)	29.7(19.7–39.8)	2.1 (0.8–9.6)	0.81 (0.41–1.59)
Gauteng	156 (119–193)	41.9 (6.9–76.8)	2.8 (2.1–3.4)	173 (132–214)	33.8(26.0–41.5)	3.0 (0.3–7)	1.11 (0.82–1.50)
Mpumalanga	31 (22–41)	37.5 (21.5–53.4)	1.9 (1.3–2.4)	32 (18–46)	30.7(20.7–40.8)	1.8 (0.3–3.6)	0.95 (0.48–1.88)
Limpopo	51 (32–70)	50.9 (9.4–92.3)	2.4 (1.5–3.3)	29 (12–46)	26.7(12.0–41.3)	1.3 (0–4.3)	0.54 (0.29–1.02)

2017 Female population: Western Cape: 2575176; Eastern Cape: 2533854; Northern Cape: 389291; Free-State: 1060513; Kwa-Zulu Natal: 4165842; North West: 1358271; Gauteng: 5630018; Mpumalanga: 1687111; Limpopo: 2105317.

2020 Female population: Western Cape: 2719001; Eastern Cape: 2603574; Northern Cape: 398075; Free State: 1090551; Kwa-Zulu Natal: 4335916; North West: 1425805; Gauteng: 6003819; Mpumalanga: 1789037; Limpopo: 2170058.

until 2020/21. Only one in five perpetrators were convicted of the murder in 2020/21. The NIPF conviction rate showed considerable changes between the surveys, with a notable increase between 2009 and 2017, from 18.3% to 33.5%. However, it dropped sharply in 2020/21, when only 13.2% of the perpetrators of NIPF were convicted. Similarly, the suicide rate of perpetrators soon after committing the femicide was consistently higher among IPF compared to NIPF patients across the four surveys, but a decrease was

Table 5. Age-standardised population rates for 1999, 2009, 2017 and 2020–2021 for all female murders, intimate partner femicide and non-intimate partner femicide by the mechanism of death and incidence rate ratios (IRR) of population rate estimates between study years: weighted and imputed data.

	1999 Overall unweighted = 1052 Overall weighted = 3793 Intimate partner femicide Weighted = 1610 Non-intimate partner femicide Weighted = 1686			2009 Overall unweighted = 930 Overall weighted = 2363 Intimate partner femicide Weighted = 1294 Non-intimate partner femicide weighted = 971			IRR of population rate estimates: 2009/1999 (95% CI)	2017 Overall weighted = 2407 Intimate partner femicide Weighted = 1089 Non-intimate partner femicide weighted = 890			IRR of population rate estimates: 2017/2009 (95% CI)	2020–21 Overall weighted = 2409 Intimate partner femicide Weighted = 1253 Non-intimate partner femicide weighted = 924			IRR of population rate estimates: 2020–21/2017 (95% CI)
	N	%	Rate per 100000 pop (95%CI)	N	%	Rate per 100000 pop (95%CI)		N	%	Rate per 100000 pop (95%CI)		N	%	Rate per 100000 pop (95%CI)	
Firearm deaths															
All female murders*	1147	33.4	7.2 (2.7–11.7)	462	19.5	2.4 (1.2–3.6)	0.33 (0.29–0.39)	563	23.4	2.6 (2.1–3.1)	1.08 (0.91–1.29)	897	37.3	4.0 (3.4–4.5)	1.54 (1.33–1.78)
Intimate partner femicide	495	31.9	2.9 (1.4–4.5)	259	20.0	1.3 (0.8–1.9)	0.45 (0.36–0.55)	215	19.8	1.0 (0.6–1.4)	0.77 (0.60–0.99)	438	34.9	1.9 (1.4–2.5)	1.90 (1.51–2.38)
Non-intimate partner femicide	556	34.7	3.8 (1.5–6.0)	190	19.6	1.0 (0.5–1.5)	0.26 (0.21–0.33)	213	24.0	1.0 (0.7–1.3)	1.00 (0.76–1.31)	355	38.1	1.6 (1.2–2.0)	1.60 (1.26–2.03)
Stab injury deaths															
All female murders*	¥1049	30.5	6.6 (3.1–10.0)	668	28.3	3.5 (2.0–5.0)	0.53 (0.46–0.61)	¥¥897	37.6	4.1 (3.4–4.8)	1.17 (1.02–1.35)	743	30.9	3.3 (2.8–3.7)	0.80 (0.70–0.92)
Intimate partner femicide	468	30.2	2.8 (1.3–4.4)	356	27.5	1.8 (1.2–2.4)	0.64 (0.53–0.78)	423	38.9	1.9 (1.4–2.4)	1.06 (0.87–1.28)	388	31.0	1.7 (1.3–2.0)	0.89 (0.74–1.08)
Non-intimate partner femicide	509	31.8	3.3 (1.6–5.1)	301	31.0	1.6 (1.1–2.2)	0.48 (0.40–0.59)	331	37.2	1.5 (1.1–2.0)	0.94 (0.75–1.16)	307	33.2	1.4 (1.1–1.7)	0.93 (0.75–1.16)
Blunt force injury deaths															
All female murders*	943	24.9	6.0 (2.5–9.6)	580	24.5	3.1 (1.7–4.5)	0.52 (0.45–0.60)	501	20.8	2.3 (1.9–2.8)	0.74 (0.63–0.88)	472	19.6	2.1 (1.8–2.4)	0.91 (0.77–1.09)
Intimate partner femicide	515	32.0	3.0 (1.4–4.7)	354	27.4	1.8 (1.1–2.5)	0.60 (0.50–0.72)	250	24.6	1.1 (0.8–1.4)	0.61 (0.49–0.77)	277	22.2	1.2 (0.9–1.5)	1.09 (0.86–1.38)
Non-intimate partner femicide	350	20.8	2.5 (0.7–4.3)	209	21.5	1.2 (0.6–1.8)	0.48 (0.38–0.61)	161	16.7	0.8 (0.5–1.0)	0.67 (0.50–0.89)	147	15.9	0.7 (0.4–0.9)	0.88 (0.64–1.19)

1999 female population 14 years and older: Overall: 15,775,803.
2009 female population 14 years and older: Overall: 18,982,433.
2017 female population 14 years and older: Overall: 21,520,499.
2020 female population 14 years and older: Overall: 22,551,381.
¥N=3439; (n=354 missing data on stab injury); ¥¥ (n=2387) (n=20 missing data on stab injury) CI= Confidence interval.

Table 6. Aspects of the murder and the case legal outcome over the four studies for intimate partner femicide and non-intimate partner femicide: weighted and imputed data.

	Intimate partner femicide				Non-intimate partner femicide			
Characteristic	1999 *N* = 1610 % (95%CI)	2009 *N* = 1294 % (95%CI)	2017 *N* = 1089 % (95%CI)	2020–21 *N* = 1253 % (95%CI)	1999 *N* = 1686 % (95%CI)	2009 *N* = 971 % (95%CI)	2017 *N* = 890 % (95%CI)	2020–21 *N* = 924 % (95%CI)
Rape femicides	13.6 (8.7,18.4)	14.6 (11.6,17.7)	4.9 (3.3,6.5)	16.3 (13.5,19.1)	17.0 (9.4,24.6)	28.7 (23.2,34.2)	12.1 (8.8,15.4)	16.3 (13.3,19.3)
Perpetrator convicted	29.4 (20.7,38.2)	29.7 (23.7,35.7)	35.7 (32.6,38.7)	19.4 (17.2,21.7)	25.9 (19.6,32.3)	18.3 (14.2,22.4)	33.5 (30.2,36.8)	13.2 (11.4,15.1)
Perpetrator died by suicide	14.0 (9.1,18.8)	14.5 (11.7,17.3)	12.9 (10.9,14.9)	6.7(5.5,7.9)	2.5 (0.1,4.8)	2.7 (1.1,4.3)	1.8 (1.1,2.5)	0.4 (0.1,0.7)
History of intimate partner violence	31.6 (21.9,41.3)	33.2 (27.7,38.6)	28.6 (25.0,32.2)	13.4(11.0,15.8)				
Injury setting								
Major town/city	47.9(34.4, 61.4)	33.8(27.8, 39.8)	34.6(28.9,40.3)	29.2(24.7,33.8)	46.7(32.6, 60.7)	37.6(29.7, 45.5)	32.4(27.6, 37.2)	34.7(30.2, 39.3)
Rural//Small Town	52.1(38.6, 65.6)	65.7(59.9, 71.6)	65.4(59.7, 71.1)	70.8(66.2–75.3)	53.3(39.3, 67.4)	61.9(54.2, 69.6)	67.6(62.8, 72.4)	65.3(60.7, 69.8)
Unknown		0.5(0.1,0.8)				0.4(0, 0.9)		

reported among IPF cases in 2020/21 (6.7% from 12.9% in 2017). It significantly decreased from 2017 to 2020/21 for both NIPF and IPF cases. Police knowledge of a history of previous IPV among IPF cases showed a decline over the four surveys, with a statistically significant decline reported in 2020/21 (from 28.6% in 2017 to 13.4% in 2020).

Table 7 presents some of the same analysis but without data imputation. This shows a shift over the years in the perpetrator of the IPF, from 1999, when 49.6% were cohabiting partners, to 2020/21, when only 9.5% were identified as such. There was a concomitant increase in current boyfriends, from 28.3% in 1999 to 59.2% in 2020/21. The proportion of ex-boyfriends identified also increased from 2.8% in 1999 to 8.2% in 2020/21. Notable changes among the NIPF cases were the increasing role of family members, from perpetrating 14.2% of cases in 1999 to 28.5% in 2020/21, and a decline in the proportion of friends/acquaintances identified. The proportion of IPF and NIPF found in rural areas rose from 53.1% in 1999 to 71.3% in 2000 (for IPF), with a similar increase in NIPF cases. There was no consistent pattern of rape femicides according to the proportion of murder cases. A third of IPF cases where the perpetrator was identified were closed with a conviction, and this was fairly constant over the years with somewhat better performance in 2017. At all times, performance in NIPF cases was lower, and when a perpetrator was identified, only a quarter were closed with a conviction. The data show that over the years, the proportion of cases of IPF where a history of IPV has been known has declined.

Discussion

The series of national femicide studies over more than 20 years has shown a steep decline in all forms of femicides between 1999 and 2009, whereafter the decline has slowed. Indeed, there are differences by femicide type, with overall femicide and NIPF showing plateaus and IPF most recently significantly increasing from 2017 to 2020/21. It is not possible, as yet, to know if this represents a feature of the highly unusual circumstances during the COVID-19 pandemic or whether it will be a sustained upwards trend. The consequences are that IPF remains the leading cause of murder among women in South Africa and that the 2020/21 IPF rate is five times the global average for intimate partner/family-related homicide for the same year (South African 5.5/100,000 vs Global 1.2/100,000 female population) (United Nations Office on Drugs and Crime, 2021).

The increase in IPF during the COVID-19 period is possible due to the conditions created by the pandemic and the lockdown policies. A more in-depth analysis of trends across the year shows that the increase did not occur during the hard lockdown periods but rather during periods of 'un-locking' when very likely the alcohol was unbanned and the stressors of the lockdown impacted on intimate relations – as warned by many. The impact of COVID-19 conditions on femicide is discussed in more detail elsewhere (Abrahams et al., 2025), but it appears that the strain of COVID-19 conditions, including the devastating economic impact, more than compensated for short-term gains during times of hard lockdown and alcohol sales restrictions. Indeed, we suggest that the decline in all forms of femicide seen up to 2017 in a previous

Table 7. Victim and perpetrator characteristics over the four surveys for intimate partner femicide and non-intimate partner femicide: weighted and non-imputed data.

	Intimate partner femicide				Non-intimate partner femicide			
Characteristic	1999: $N = 1349$ % (95%CI)	2009: $N = 1024$ % (95%CI)	2017: $N = 768$ % (95%CI)	2020–21: $N = 729$ % (95%CI)	1999: $N = 1335$ % (95%CI)	2009: $N = 768$ % (95%CI)	2017: $N = 604$ % (95%CI)	2020–21: $N = 485$ % (95%CI)
Victim perpetrator relationship								
Husband-current	17.1 (11.3–25.1)	17.1 (13.9–21)	17.1 (15.6–18.7)	20.2 (18–22.6)				
Ex-husband	1.3 (0.6–2.7)	0.7 (0.3–2.1)	1.2 (1.1–1.3)	0.7 (0.4–1.2)				
Cohabitating boyfriend-current	49.6 (39.7–59.5)	23.8 (17.2–32)	19.4 (15.8- 23.5)	9.5 (7.8–11.5)				
Ex cohabitating boyfriend	0.6 (0.3–1.2)	1.1 (0.5–2.5)	0.6 (0.3–1.3)	1.9 (1.2–2.9)				
Boyfriend/girlfriend-current*	28.3 (21.9–35.9)	47.8 (41.3–54.5)	53.6 (48.7–58.5)	59.2 (56–62.3)				
Ex-boyfriend	2.8 (1.5–5.2)	7.4 (5.8–9.3)	7.2 (5.9–8.9)	8.2 (6.7–10.1)				
Rejected man proposing a relationship	0.3 (0.1–0.7)	2.0 (1.1–3.5)	1.0 (0.4–2.2)	0.4 (0.1–1.1)				
Family**					14.2 (8.2–23.5)	18.7 (14.7–23.5)	17.4 (15.1–19.9)	28.5 (25–32.2)
Friend/known by sight/acquaintance					51.1 (44.4–57.6)	53.6 (48.3–58.9)	42.1 (37.4–46.9)	39.8 (36.9–42.7)
Stranger/unknown					33.9 (26.9–41.6)	19.9 (15.3–25.4)	31.8 (27.3–36.7)	24.9 (21.5–28.6)
Other***					0.8 (0.5–1.3)	7.8 (5.8–10.5)	8.8 (6.9–11.0)	6.8 (5.2–8.8)
Injury setting								
Major urban	46.9 (30.3–64.2)	32.9 (26.8–39.7)	33.8 (28.3–39.7)	28.8 (24.7–33.3)	44.8 (27.2–63.9)	36.0 (28.7–44.1)	32.7 (29.3–36.2)	33.3 (29.2–37.8)
Rural	53.1 (35.8–69.7)	66.9(60.2–72.9)	66.2 (60.3–71.7)	71.2 (66.7–75.3)	55.2 (36.1–72.8)	64.0 (55.9–71.3)	67.3 (63.8–70.7)	66.7 (62.2–70.8)
Unknown		0.2 (0.1–1.1)						
Suspected rape murder								
No	88.8 (84.8–91.9)	84.7 (81.3–87.5)	97.1 (96–97.9)	82.6 (79.8–85.1)	87.2 (80.1–92.0)	68.5 (62.2–74.2)	87.4 (83.2–90.7)	81.1 (77.5–84.3)
Yes	11.2 (8.1–15.2)	10.5 (8.3–13.2)	2.9 (2.1–4)	17 (14.6–19.9)	12.8 (8.0–19.9)	27.4 (22.6–32.9)	12.6 (9.3–16.8)	18.4 (15.3–21.9)
Missing info		4.8 (3.3–7)		0.3 (0.2–0.7)		4.1 (2.3–7.1)		0.5 (0.3–1)
Perpetrator convicted								
No	64.9 (54.9–73.7)	62.5 (55.9–68.7)	49.4 (45.7–53.2)	66.6 (63.4–69.7)	67.2 (58.7–74.7)	76.9 (71.4–81.6)	50.6 (46.9–54.4)	74.9 (72.2–77.4)
Yes	35.1 (26.3–45.1)	37.5 (31.3–44.1)	50.6 (46.8–54.3)	33.4 (30.3–36.6)	32.8 (25.3–41.3)	23.1 (18.4–28.6)	49.4 (45.6–53.1)	25.1 (22.6–27.8)
Perpetrator died by suicide								
No	83.4 (76.7–88.4)	80.8 (76.5–84.5)	86.9 (84.8–88.8)	88.5 (86.9–90)	96.9 (92.1–98.8)	95.6 (92.4–97.5)	97.8 (96.8–98.5)	98.9 (97.7–99.4)
Yes	16.6 (11.6–23.3)	18 (14.6–21.9)	12.9 (11.0–15.0)	11.5 (10–13.1)	3.1 (1.2–7.9)	3.2 (1.8–5.7)	1.8 (1.2–2.7)	1.1 (0.6–2.3)
Missing info		1.2 (0.5–2.9)	0.2 (0.1–0.6)			1.2 (0.5–2.7)	0.3 (0.1–1.4)	
History of intimate partner violence								
No	68.4 (58.0–77.2)	66.9 (61.2–72.1)	68.8 (65.2–72.2)	54 (50.2–57.7)				
Yes	31.6 (22.8–42)	33.1 (27.9–38.8)	28.1 (24.7–31.8)	22.1 (18.9–25.6)				
Missing info			3.1 (2.3–4.0)	24 (22–26)				

CI = Confidence interval.

* Current boyfriend includes same sex partner: 1999 IF includes 9 same sex partners; 2009-no same sex partner reported; 2017- 1 same sex partner.

** Family includes mother, father, brother, sister, stepfather/mother's boyfriend, relatives and in-laws.

*** Other includes female perpetrator romantically involved with current/ex-husband/boyfriend (love triangle), current/ex client/customer, tenant, community members, employee (gardener, care giver, domestic worker), colleague.

publication has been impacted by general poverty reduction and gender equity-building interventions in the country (Abrahams et al., 2024).

Some other papers have compared femicide rates before and during the pandemic with mixed results. A study of five Latin American countries and Spain compared femicides in the three years before COVID-19 with the COVID-19 year and found no increase during that year (Aebi et al., 2021). A similar study in five Central and South Eastern European countries concluded that there was a decrease in femicides, and no evidence of the lockdown effect was observed (Hacin et al., 2024). The UNODC global study combined killings by intimate partner and family members and showed a mixed picture of such murders during the COVID-19 pandemic, with increases found in some subregions (Northern America, Southern and Western Europe) where trend data were available (United Nations Office on Drugs and Crime, 2022). More interestingly, a further analysis of the countries with higher rates during the COVID-19 showed the increase was driven by killings perpetrated by family members and not intimate partners. Our study also shows an increase in murders committed by family members, and although the increase started from 2009 the largest increase was observed between 2017 and 2020/21. The stressors created by COVID-19 in households could have contributed to this, but the increase over the 20 years needs to be better understood in future research. Similarly, we observed consistently higher levels of both IPF and NIPF in rural settings compared with urban settings. It is possible that the lack of services and support in rural settings for abused women may contribute to their increased risk for severe forms of violence, and a better understanding of women's vulnerability and differences in risk in different settings are required. Our study is thus one of few globally that focused on killings by intimate partners and that has increased during the COVID-19 period. A systematic review of non-fatal domestic violence during the pandemic showed evidence of an increase in violence experienced by women during the pandemic, although the effect size was moderate (Piquero et al., 2021).

Femicide surveillance over the past two decades has revealed some changes in patterns of those at risk. We have seen the risk of IPF shifting to younger women, and the youngest age category is now the group with the highest risk. The risk by racial group has changed significantly. In the early years, Coloured women were most at risk of being murdered by intimate partners, and we have shown that their risk substantially decreased and that African women are now the highest risk group. A complete understanding of the change in risk across races is not clear but may be explained by economic differences between groups (South African Human Rights Commission, 2017). Structural drivers such as poverty, low levels of education and the normative use of violence are recognised IPV risk factors (Gibbs et al., 2020; Jewkes et al., 2002). The increase in both overall femicide prevalence and IPF prevalence in Gauteng Province, which is largely urban and the most populous province, is very likely explained by multiple factors, including the sociopolitical environment, which combined to increase the risk for femicide (Lancaster & Gould, 2025). The increased availability and use of guns is one of these factors. Indeed, the trends in firearm-related femicides across the four studies reflect the poor application of the country's Firearm Control legislation. The initial decline between 1999 and 2009 coincided with the implementation of the South African Firearm Control Act of 2000; however, the increased availability of firearms due to mismanagement drove an upward trend in rates after 2009 (Matzopoulos et al., 2018). Firearm-related murders were the most common way in which women were killed in 2020/21 and were also likely to drive increases in IPF. Responding effectively to firearm-related crime is a priority in the country and requires a reduction in circulating firearms.

Our study has also shown declines in the effectiveness of responses from police and justice processes to femicide over the past two decades, with a consistent decrease in police knowledge of a history of IPV between victim and perpetrator. We have seen a huge decline in the proportion of cases in which a perpetrator was identified and in convictions between 2017 and 2020/21, such that by 2020/21, only 1 in 5 perpetrators of IPF and 1 in 8 perpetrators of NIPF were convicted of the crime. In contrast to the national narrative on the importance of eradicating GBV (South African Government, 2020), the performance of the police and criminal justice system in 2020/21 suggests that removing impunity for the killing of women was not a national priority. COVID-19 may have contributed to the poor performance of the police in 2020/21. The 2017 police data were collected during the COVID-19 period (2020/21), and our staff often reported that police stations were closed because members had been infected or police were deployed to stay at home and alcohol ban restrictions, and these conditions may have presented additional challenges in investigating crime during the COVID-19 pandemic (Manganyi et al., 2024). However, poor performance has been a problem since COVID-19, with the decline of South African criminal justice performance evidenced since 2012 (Institute for Security Studies, 2024).

The increasing amount of missing perpetrator data, a product of poor police investigations of murders, is a key limitation of the study, and we used imputation to address missing data. We present the analysis of the non-imputed data in the supplementary file (Table 7 and Tables S2–S4) and show very little difference and believe that imputation assisted us in describing the different types of femicides better. We have information on a large number of cases with perpetrator data and details on the circumstances of the death to assist us across the four studies, but errors may have been introduced. In a separate analysis of the characteristics of the unknown cases (Table S5), we found such cases to be more common among murders with gunshot injuries and shared similarities with NIPF, such as murders occurring in public spaces and murders with evidence of rape. We also had missing data because we could not locate the cases in the police system (Figure 1) (15.7% in 2017 and 8.6% in 2020/21), but encouragingly, this number improved in 2020/21, which was lower than the 13.1% in 1999. There have been repeated calls to improve police information and data systems over the last 20 years, as planning effective prevention requires reliable data. We also note that the time between surveys differs, with the longest period between the first two studies (from 1999 to 2009) which may account for the largest decline in this period. However, the period from 2009 to 2017 showed a sustained decline. We also acknowledge that for some cases, the perpetrator was only a suspect, and a final definitive legal outcome was not attained by the time we collected data. In crime analysis, if a perpetrator is not identified soon after the crime, the chances of ever doing so become increasingly small. Given our history of poor police investigations, it is unlikely that a different suspect would have been identified. Another limitation is the use of two population data sources to calculate rates. The Thembisa model was used to calculate age standardise rates for all except rates by race groups. For the latter, we used Statistics South Africa mid-year population data, as disaggregation by race is not available in the Thembisa model. We considered the possibility of misclassifying the sex of the victims. This is unlikely, as we included victims identified as female by their biological sex from the autopsy report. Our mortuary samples did not include transgender men, and we believe such victims would have been identified during autopsies and reported in autopsy reports. It is possible that we misclassified the gender of the victim. We asked the police if they knew the gender identities of the victims and the perpetrators, and we probed further to identify the motive for the crime. Our experience over the past 20 years is that gender identity was not a commonly understood concept when we did the first survey (1999) but found improved understanding in the more recent survey.

Our study has many strengths. We used the same study design led by the same team across the four studies. We have also applied the same definition and identification of different femicide cases. It is encouraging to note how the concept of femicide is in the public discourse in the country as a well understood term across multiple stakeholders, including communities and policy makers. Our research has also been identified as an example of global best practices for describing femicide by the UNODC for countries with poor administrative data, and other countries that do not have this information available from police statistics are encouraged to follow our methodology (United Nations Office on Drugs and Crime, 2021).

Conclusion

Over more than two decades, our research has shown that femicide is preventable and amenable to national policy interventions generally aimed at improving the status of the population. In the absence of other monitoring methods, these surveys have become barometers for ensuring the safety of women in South Africa. We have shown that we continue to have the highest recorded rate of IPF globally and that the use of dedicated studies in the absence of reliable data is highly valuable. The increase of IPF during the COVID-19 pandemic highlights the risks associated with pandemic conditions, which need to be reviewed in future pandemics.

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Author contributions

None.

Disclosure statement

No potential conflict of interest was reported by the author(s).

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Data availability statement

A de-identified dataset is available upon reasonable request. The 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.

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