The incidence of incomplete abortion and the prevalence of abortion-related morbidity in South African public hospitals, 2018

D N Conco,[1] PhD; **J Levin,**[1] PhD; **B Komane,**[2] MSc; **K Blanchard,**[3] MSc; **T Bessenaar,**[4] MA; **N G Nkosi,**[5] PhD; **S Fonn,**[1,6] PhD

[1] *School of Public Health, Faculty of Health Sciences, University of the Witwatersrand, Johannesburg, South Africa*
[2] *MRC-Wits Developmental Pathways for Health Research Unit (DPHRU), Faculty of Health Sciences, University of the Witwatersrand, Johannesburg, South Africa*
[3] *Ibis Reproductive Health, Cambridge, USA*
[4] *Ibis Reproductive Health, Johannesburg, South Africa*
[5] *Department of Nursing Education, Faculty of Health Sciences, University of the Witwatersrand, Johannesburg, South Africa*
[6] *School of Public Health and Community Medicine, Institute of Medicine, University of Gothenburg, Sweden*

Corresponding author: *D N Conco (daphney.conco@wits.ac.za)*

Background. The occurrence of abortion-related morbidity indicates limited access to safe abortion. Globally, unsafe abortions remain a persistent, yet preventable, cause of maternal mortality. South Africa (SA) is internationally recognised for its progressive reproductive rights framework, supported by its Constitution and laws. However, evidence suggests that women encounter barriers to accessing safe abortions, including stigma, resistance from healthcare providers, a shortage of trained professionals and a lack of awareness of their rights. We hypothesised that, 20 years after the promulgation of the Choice on Termination of Pregnancy Act, the incidence of incomplete abortion (ICA) and the prevalence of abortion-related morbidity would change, influenced by access to safe abortion and the introduction of medication abortion. We wanted to compare our data with 2000 and 1994 survey results to assess change.
Objectives. To estimate the incidence of incomplete abortion and describe the prevalence of abortion-related morbidity in SA public hospitals in 2018.
Methods. This was a cross-sectional, retrospective study. We selected a stratified random sample of public hospitals. We extracted data from medical records of women who presented with ICA during a predetermined 21-day period in 2018. Data were captured directly into a REDCap database. To estimate the national incidence of ICA, we used population estimates for 2018, comprising 17 199 227 women aged 12 - 49 years, and 1 200 436 live births. The prevalence of ICA morbidity is reported. We compared the rates in this study with those reported from similar studies in 2000 and 1994.
Results. We found 913 medical records of women presenting with ICA in the 56 public hospitals. ICA incidence was 367 (274 - 459) per 100 000 women aged 12 - 49 years. The average age of the women was 27 years, and the majority had a previous pregnancy before the ICA. A large proportion (73.9%) of women were in the first trimester. There was no sign of infection in 92.5% of records, no organ failure in 99.1% of records and there were no deaths. There was no change in the ICA incidence when compared with the 1994 and 2000 results. Women's mean age and having a previous pregnancy were similar in the three studies (1994, 2000 and 2018). The proportion of women presenting in the first trimester increased over time: 60.5% in 1994, 67.1% in 2000 and 73.9% in 2018. There has been a decline in the prevalence of abortion-related morbidity, demonstrated by lower levels of severity, no signs of infections and no organ failure.
Conclusion. ICA incidence has not changed, but related morbidity is declining. Various factors could explain our findings, but the lack of change in ICA incidence indicates that access to formal abortion care has not improved over the past 20 years.

Keywords: incomplete abortion, South Africa, public hospitals, safe abortion, abortion-related morbidity

S Afr Med J 2025;115(1):e1987. https://doi.org/10.7196/SAMJ.2025.v115i1.1987

Abortion-related morbidity indicates limited access to safe abortions.[1,2] The World Health Organization states that unsafe abortions have remained a leading yet preventable cause of maternal deaths.[3] Efforts to address unsafe abortion in South Africa (SA) date back to the early 1990s, when those advocating for reproductive rights successfully seized the opportunity created by the transition to democracy, and safe legal abortion became available.[4] SA is globally renowned for its formal reproductive rights framework, embedded in the 1996 Constitution[5] and its Choice on Termination of Pregnancy Act 92 of 1996 (CTOPA),[6] an Act that effectively enabled abortion on request up to 20 weeks of pregnancy at designated approved facilities.[4]

Following the promulgation of CTOPA, there was a significant decrease in abortion-related morbidity, especially among younger women[7,8] while no statistically significant change was observed in the ICA incidence between the years 1994 and 2000.[9] No change in the rate of incomplete abortions managed in public hospitals was interpreted to imply that a substantial number of women sought abortion care outside formal settings.[7]

A 5-year review of the implementation of the Act in 2002 by the SA Reproductive Rights Alliance (RRA) revealed that access to abortion had expanded rapidly but unevenly.[10] The RRA Barometer reported that the public health sector had recorded 220 888 terminations of

pregnancy (TOPs) in 2002, and that 73% of the TOPs were done in the first trimester and 12% were for women aged <18 years.[4,10]

A retrospective audit between January 2008 and December 2010 found that 30% of maternal deaths in one SA academic hospital were due to septic incomplete abortions.[11] This was an indication of a lack of access to safe abortion in SA, and that women's lives and rights were compromised. Documented barriers to safe abortion included stigma, provider opposition, lack of trained providers and designated facilities, particularly outside urban areas, as well as women not knowing their rights.[11-14] However, a decline in the percentage of all maternal deaths due to unsafe abortion in SA has been observed. The 2020 - 2022 triennium reported that 1.2% of all maternal deaths were due to unsafe abortions,[15] a decrease from 3.8% reported in the 2008 - 2010 triennium.[16]

Nearly 30 years after CTOPA has passed, evidence suggests that women are still facing challenges to access safe abortion services from the public sector.[17] The SA health system has been described as being in a state of degeneration.[18-20]

Abortion-related technological changes have occurred in the past ~20 years. In particular, medication abortion has been shown to be safe and effective, and has been approved for use in early TOP in SA since 2001.[21] It was introduced into the public sector in 2023, but was not universally available. Research found that it was acceptable to both users and providers.[22] This may have influenced access to safe abortion services.

Our research sought to determine the incidence of incomplete abortion (ICA) and prevalence of related morbidity in SA in 2018, 22 years post CTOPA. We hypothesised that there was a change in ICA incidence influenced by access to safe abortion services and the introduction of medication abortion. We sought to replicate, as far as possible, a 2000 study of incomplete abortions presenting to public hospitals in SA,[9] to compare our 2018 findings with the 1994 and 2000 results.

This research, similar to the 2000 study, collected data for 21 days. The 2000 study period was any consecutive 21 days between May and August[9] while our study had fixed dates of 1 - 21 November 2018. The 1994 data were collected during the last 2 weeks of September.[23] The 1994 and 2000 study designs were prospective, patients were identified on admission and data were collected by hospital-based clinicians once the patient was discharged. Our study relied on finding patient records, sometimes long after discharge, owing to, among other things, the delay imposed by the COVID-19 pandemic, and data were extracted by a clinical researcher. Between 2000 and 2018, district demarcation was completed, which allowed us to sample using a rural or urban classification. This led to a higher number of sampled hospitals in our study. To ensure comparability with the 2000 study, we included incomplete abortions up to 22 weeks' gestation. We also used the same three clinical severity categories: low (temperature ≤37.2°C, no signs of infection, no organ failure and no suspicious findings on evacuation), medium (temperature 37.3°C - 37.9°C, or tender uterus, or offensive discharge, or localised peritonitis), and high (any of temperature >37.9°C, pulse rate >119 beats/min, any sign of interference, organ failure, peritonitis, or death).

Methods

The research design was a cross-sectional, retrospective, medical record review. A stratified random sample of public hospitals responsible for treating gynaecological problems in 2018 in the nine provinces of SA was selected. The hospitals were stratified by province and, within each province, by hospital category (central/tertiary, regional or district). The central and tertiary hospitals were combined into a single stratum owing to the small number of these two types of hospital. At the district level, hospitals were classified as either rural or urban. Hospitals were designated as rural if their staff were listed as eligible for rural allowances.[24] In each stratum, at least two hospitals were randomly sampled, with four hospitals sampled in the district stratum, and if possible, two urban and two rural district hospitals were sampled per province. Within provinces, if there was any stratum with only one hospital, then strata were combined to ensure that every stratum had at least two hospitals.

We collected data from the medical records of women who were treated for ICA in the sampled public hospitals during a fixed 21-day period. Our sample included women admitted with a diagnosis of incomplete, complete, missed or inevitable abortion during the study period, but excluded women with gestation >22 weeks, cases of ectopic pregnancy and cases of threatened abortion. Researchers captured the data directly into a REDCap database from the hospital medical records.

To estimate the national incidence of incomplete abortion, we first estimated the total number of abortions in the 21-day period, using the formula for estimating a total from a stratified random sample, in which the sampling unit was a hospital and the target variable was the total number of incomplete abortions in that hospital for the 21-day period. This was then converted into the estimated total number of abortions for the year by multiplying by 365/21. Confidence limits for the estimated total number of incomplete abortions for the 21-day period were obtained using standard methods for estimating a total from a stratified random sample.[25] The confidence limits were obtained using the 'survey' commands in Stata Release 18.0 (StataCorp, USA). We used the mid-year population estimates for 2018, comprising 17 199 227 women aged 12 - 49 years, and 1 200 436 live births[26] in order to estimate the national incidence of ICAs. More details of the sample and the method of estimation are given in the appendix (https://www.samedical.org/file/2312).

Ethical approval

This study was given ethical clearance by the University of the Witwatersrand Human Research Ethics Committee (Medical) (ref. no. M180724). An application on the National Health Research Database (NHRD) generated approvals by provincial Departments of Health research committees. Hospitals granted us permission to access medical records and collect data.

Results

Our sample consisted of 60 public hospitals, which included 4 categories of hospital (central/tertiary, regional, rural and urban district), and aimed for two hospitals in each category. Three selected hospitals (Livingstone, Bongani and Mowbray) were excluded because they did not admit women with gynaecological conditions. We were refused entry to one hospital despite having ethical clearance and approval from the provincial Department of Health and the district office. The Ceres district hospital chief executive officer did not allow us entry, citing a lack of space to accommodate researchers. This resulted in 56 hospitals being included (Fig. 1). Eight hospitals (SS Gida, Bedford, Molteno, Diamant, Phumelela, Dr Harry Surtie, Niemeyer Memorial and Koster) had zero cases, and were included in the analysis. Four provinces (Free State, Mpumalanga, Northern Cape and North West) had only one tertiary hospital, one province (Gauteng) had one rural hospital, while two provinces (Northern Cape and North West) did not have two hospitals in more than one category. Helen Joseph Hospital was included in the sample in the tertiary hospital category. However, obstetric and gynaecological patients are not treated there, but are admitted to Rahima Moosa Mother and Child Hospital, which is a regional hospital. As this

facility was associated with Helen Joseph Hospital, we maintained it as a tertiary facility irrespective of its *de facto* regional status.

In the tables, we present the findings from our 2018 study, as well as comparative data from 2000 and 1994 data for ease of comparison. We used results reported in the 2000 and 1994 articles, and did not have access to raw data. Comparisons are therefore presented at that level only, and data for all years are not always available for every indicator.

Table 1 presents the incidence of ICAs in SA public hospitals. We found 913 medical records of women presenting with ICA in the sampled 56 public hospitals. The national incidence of ICAs for 2018 is 367 (274 459) per 100 000 women aged 12 - 49 years. No ICA deaths were found. There was no difference in the incidence of ICAs comparing 2018 with 2000 and 1994.

The mean age at which women were admitted for ICA was 27 years, and the majority had a previous pregnancy (parity=1) before this ICA. Most women (73.9%) who had ICAs were between 0 and 12 weeks of gestation. These results are similar to those reported in 2000 and 1994 (Table 2).

Table 3 presents the clinical findings reported in records. It should be noted that for our 2018 study, missing data are reported, but we do not have these data for 2000 and 1994. In 2018, gestational age was missing in 12.1% of records. We have calculated the distribution of ICA (≤12 weeks and >12 weeks) with and without the missing data.

Signs of infection decreased over time: 79.5% in 1994, 90.1% in 2000 and 92.5% in 2018 were recorded as having no signs of infection. Similar findings were reported for organ failure: 95.6% in 1994, 97.1% in 2000 and 99.1% in 2018 recorded no organ failure.

The majority of women in the 2018 study were of low severity rating, while 19.8% were of medium and high severity. The levels of severity in 2018 were similar to those in the previous surveys, where most were of low severity but at a higher rate than our study, at 66% (1994) and 72% (2000). However, in our study, we found equal numbers in the medium and high severity categories, which was different from the previous surveys, where their medium severity was higher than their high severity. Temperature was an important variable to determine the level of severity. In our 2018 data, temperature was missing in 18.6% of records, and this may explain

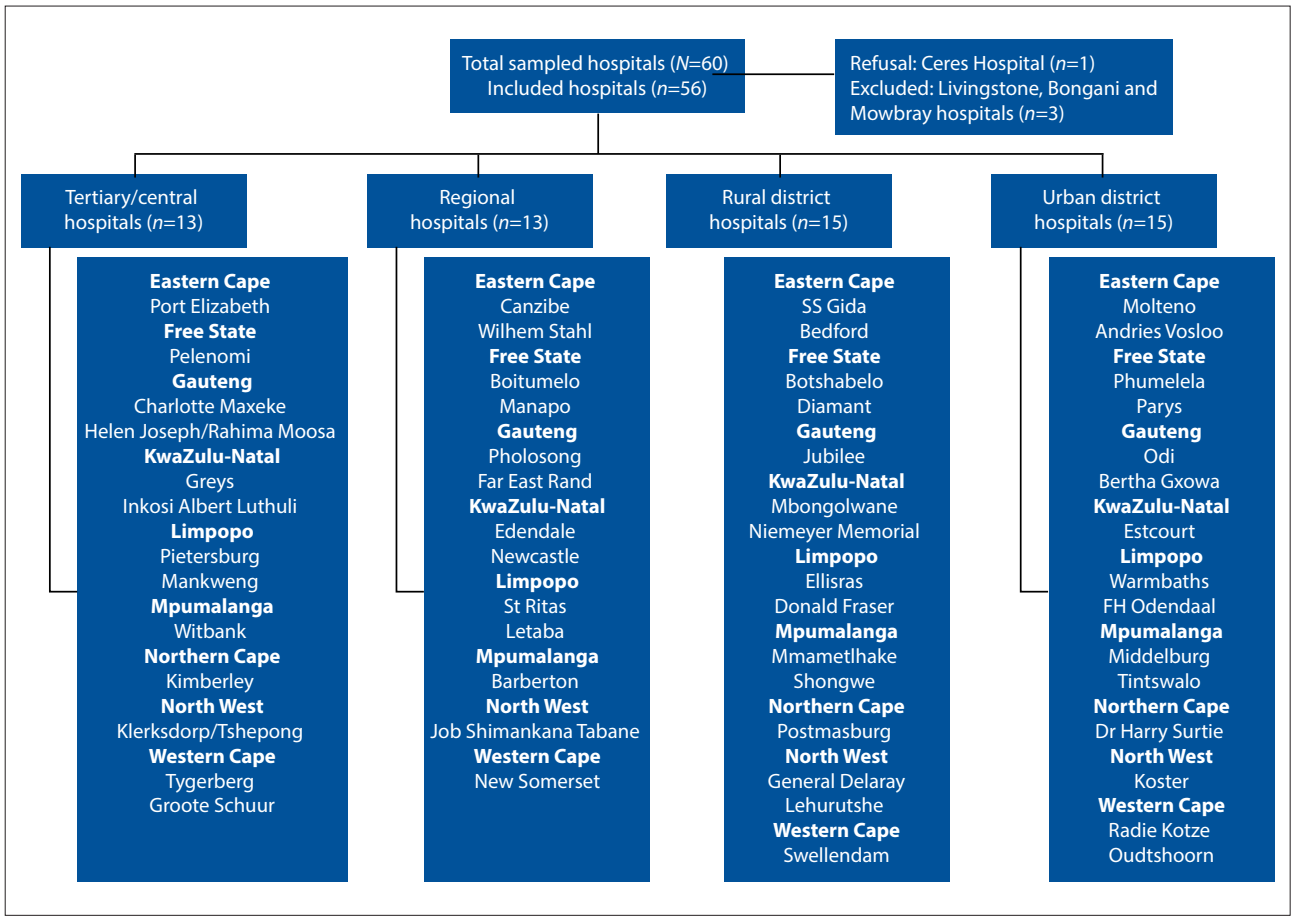

Fig. 1. List of sampled hospitals by province, level of care and rural or urban district setting.

Table 1. ICA: Comparison of results for 1994, 2000 and 2018

Indicator	1994 (*n*=803)	2000 (*n*=761)	2018 (*n*=913)
Women per year admitted to public health facilities with ICA, *n*	44 686 (35 633 - 53 709)	49 653 (38 742 - 60 563)	63 084 (47 204 - 78 965)
Incidence of ICA per 100 000 women aged 12 - 49 years	375 (299 - 451)	362 (282 - 441)	367 (274 - 459)
Rate per 1 000 live births	42 (33 - 50)	44 (34 - 54)	53 (39 - 66)

ICA = incomplete abortion.

Table 2. Characteristics of women presenting with ICA at public hospitals in 2018 compared with 2000 and 1994

Factor	Characteristic	1994	2000	2018
Age (years)	Mean (95% CI)*	27.8	27.0	27.8 (27.0 - 28.7)
Parity				
	Median	1	1	1
	Range	0 - 8	0 - 11	0 - 7
Trimester (missing data excluded), %				
	≤12 weeks	60.5	67.1	73.9 (69.2 - 78.2)
	>12 weeks	39.5	32.9	26.1 (21.8 - 30.8)
Trimester (with missing data), %				
			-	
	≤12 weeks	60.5	67.1	65.0 (60.0 - 69.7)
	>12 weeks	39.5	39.5	22.9 (19.1 - 27.3)
	Missing	-	-	12.1 (8.5 - 16.8)

ICA = incomplete abortion; CI = confidence interval.
*Where available.

some of the differences found in the severity categories. In the 2018 study, there was a lower prevalence of finding of offensive products, mechanical or chemical injury and foreign bodies.

In 2018, just over 50% of ICAs were treated with an abortifacient. Antibiotics were prescribed more often in 2018 (57.3% of cases) than 2000 (33.5%) and 1994 (43.6%). The use of blood products was similar across the years. There was a decreasing trend in the number of uterine evacuations performed, with fewer in 2018 (78.8%) than 2000 (87.8%) and 1994 (88.9%). There was a marked difference in the technology used to perform uterine evacuations. Manual vacuum aspiration (MVA) was the most common method used in 2018 (71.1%), compared with 2000 (14.8%) and 1994 (1.5%). The inverse was true for sharp uterine curettage.

Discussion

We found an ICA incidence of 367 (274 - 459) per 100 000 women aged 12 - 49 years, which was similar to the 2000 incidence of 362 (282 441), but lower than the incidence of 375 (299 451) in 1994. The ICA incidence has remained relatively constant over time: despite fewer designated public health facilities for TOP being available,[27] this has not resulted in an increase of ICA admissions in public hospitals. No change of ICA incidence, in the context of fewer public facilities providing the service, suggests that women continue to utilise informal providers.[13,14]

Women presenting with ICA to the public hospitals had a mean age of 27 years, and most had had a previous pregnancy. The results were similar in the three studies (2018, 2000 and 1994). We found that the proportion of women admitted with a gestation between 0 and 12 weeks seemed to be increasing: 60.5% in 1994, 67.1% in 2000 and 73.9% in 2024. Signs of infection decreased over time, where a higher proportion of women were reported to have no infection and no organ failure across the three studies.

While some women in this study presented with high severity and with disseminated intravascular coagulation, there were overall fewer people with severe illness. We link the finding of fewer people with severe illness with the finding of a lower proportion of ICAs with offensive products. This may be related to the use of medical abortifacients, where noninvasive methods are used to induce abortion. Overall, while the incidence of ICAs has stayed the same, the severity seems to be decreasing, and we posit that this is due to technology advances for abortion induction and treatment. Advances include safer procedures such as medication abortion and MVA.[28]

Technology has changed over time, and between our and previous similar studies. Medication abortion was approved for use in SA in 2001. A survey conducted in 2002 found that medication abortion was not generally available.[10] Therefore the data from the 1994 and 2000 surveys reflect a time when medication abortion was not commonly used. In our 2018 study, the proportion of ICAs during the first trimester (73.9%) was higher than in 1994 (60.5%) and 2000 (67.1%). This, combined with the fact that there was less evidence of mechanical or chemical injury or foreign bodies, is consistent with a conclusion that there is knowledge about and use of medication abortion.

In the 2018 study, MVA in conjunction with abortifacients was the predominant method of treatment. This indicates technological advances in abortion care, since MVA was rarely used in 1994. What is of interest was that, even with most cases not recording any sign of infection, antibiotics were prescribed much more frequently in 2018 than in previous years. This is likely because the national clinical guidelines stipulate antibiotic prophylaxis as a compulsory part of the surgical evacuation regime for managing ICA.[29]

The data did not allow us to separate analgesia from anaesthesia. We assume the decreased use of either reflects that anaesthesia was used less, and relate this to the finding that sharp curettage, which is usually performed under anaesthesia, was rarely used to treat ICAs in 2018.

Our motivation for the present study stemmed from a number of concerns. Access to safe abortion in the public sector has been decreasing, owing to fewer designated facilities.[27] There has been decreased active support for abortion from the National Department of Health over time, and this may reflect a change in attitude to women's rights.[30-32] These circumstances could potentially result in greater use of unsafe methods, resulting in an increasing incidence of ICAs. However, we did not find this. It could be that the change in technology and availability of and access to medication abortion has mitigated the effect of decreased access to and support for abortion

Table 3. Women's clinical findings on admission and treatment received for ICA in 2018, 2000 and 1994

Factor	Level	1994, %	2000, %	2018, % (CI)
Clinical findings on admission				
Signs of infection (multiple responses possible)				
	None	79.5	90.1	92.5 (89.1 - 94.8)
	Offensive discharge	13.5	6.4	5.1 (3.3 - 8.0)
	Tender uterus	8.4	3.7	1.2 (0.6 - 2.3)
	Localised peritonitis	1.7	0.7	0.04 (0.00 - 0.3)
	Generalised peritonitis	0.1	0.1	0.1 (0.03 - 0.5)
	Septicaemic shock	0.3	0.2	0.7 (0.2 - 2.0)
Signs of organ failure (multiple responses possible)				
	None	95.6	97.1	99.1 (98.3 - 99.5)
	Disseminated intravascular coagulation	0.4	0.2	0.3 (0.1 - 1.0)
	Respiratory distress	0.1	0.2	0.08 (0.02 - 0.4)
	Hypovolaemic shock	1.6	2.5	0.7 (0.3 - 1.6)
	Renal failure	1.8	0.1	0.4 (0.1 - 1.1)
	Other	0	0.2	0.06 (0.0 - 0.4)
Findings on evacuation (multiple responses possible)				
	Offensive products	12.6	9.4	3.2 (2.2 - 4.6)
	Mechanical/chemical injury	3.2	0.6	0.1 (0.02 - 0.7)
	Foreign body	1.3	0	0
	Evidence of misoprostol	0	0.4	0.07 (0.00 - 0.6)
Severity				
	Low	66.2	72.4	80.2 (76.1 - 83.7)
	Medium	17.3	17.9	9.4 (7.1 - 12.4)
	High	16.5	9.7	10.4 (7.5 - 14.4)
Temperature data missing	Yes	0	0	18.6 (13.7 - 24.8)
Treatment administered				
Any use of abortifacient*	Yes	0	0	55.2 (48.3 - 62.0)
Antibiotics	Yes	43.6	33.5	57.3 (46.3 - 67.7)
Blood products	Yes	13.4	8.3	10.9 (8.6 - 13.8)
Evacuation				
	Any	88.9	87.8	78.8 (72.9 - 83.7)
	Sharp curettage†	97.5	82.0	19.6 (10.0 - 34.9)
	Suction†	0	2.5	5.2 (2.1 - 12.5)
	MVA†	1.5	14.8	71.1 (55.7 - 82.7)
	Other, not specified†	1.0	0.7	7.8 (4.5 - 13.3)
Analgesia/anaesthetic				
	None†	4.5	7.8	29.1 (19.2 - 41.5)
	Local†	1.1	3.9	0.4 (0.1 - 1.7)
	General†	70.1	54.2	22.3 (12.3 - 37.0)
	Sedation†	23.7	33.8	38.2% (28.0 - 49.6)
	Other†	0.5	0.2	11.6 (7.0 - 18.7)

ICA = incomplete abortion; CI = confidence interval; MVA = manual vacuum aspiration.
*Only recorded in 2018 survey.
†Women who had evacuation.

services in the public sector. Self-management using medication abortion is safe and effective.[28] Ideally, we would like to see a decrease in the incidence of ICA over time. Yet our data show no change, even with the availability of medication abortion.

Study strengths and limitations

The strength of this study is that it is a representative multicentre study that allowed us to calculate national ICA incidence. Possible limitations include the fact that we collected data from all sites over the same 21-day period, rather than on random days in the year. The fixed 21-day period was chosen to mitigate anticipated difficulties in retrieving hospital records. We did, however, avoid what may be seasonal peaks following major public holidays in the SA context. We believe, however, that there is no reason to imagine that the fixed 21-day period would systematically alter our findings. Our analysis would have been enhanced if we had had access to the previous studies' (1994 and 2000) raw data. Unlike the previous surveys, which were prospective in nature and in which data were collected

by hospital-based clinicians, ours was a retrospective design. As hospital-based service providers knew the earlier studies were ongoing, they may have paid more attention to ensuring complete data. In our study, we relied on archived medical records, and it was common to find some data missing. For example, temperature data were missing in 18.6% of our data entries. This may have influenced the categorisation of severity in our data.

Conclusion

The incidence of ICAs presenting to public hospitals has not changed over an 18-year period. The lack of change suggests that we are not progressively realising our commitment to women's rights. The availability of medical abortion, and its safety,[13,28,33] should have resulted in a decrease in ICAs. Greater attention to making safe abortion accessible to all should be a priority in SA. This would support achieving the SA Bill of Rights, and decrease the load on public sector hospitals and staff. The care provided has kept pace with technological advances known to be cost-effective. Future research should investigate ways to improve access to formal abortion services, with a special focus on the implementation of medication abortion at all primary healthcare facilities in SA.

Data availability. Data are available on request.

Declaration. None.

Acknowledgements. The study was funded mainly by the Gender and Health Unit, Wits School of Public Health. A South African Medical Research Council grant contributed to the costs of data collection, and the Female Academic Leaders Fellowship grant supported the writing up of the results. Special thanks go to the data collection team, Ms Emelda Boikanyo, Ms Zinhle Maneli, and Mr Mothupi Boikanyo, who collected and co-ordinated data with diligence.

Author contributions. DNC, JL and SF conceptualised the research project. DNC, JL, KB, TB and SF collectively designed the study. DNC, BK and NGN collected data. DNC, JL, SF and BK conducted data analysis. All authors contributed to the write-up.

Funding. Gender and Health Unit, School of Public Health, University of the Witwatersrand, Johannesburg. South African Medical Research Council.

Conflicts of interest. None.

1. Shamsi S, Mirza TT, Shejuti TR, et al. An overview of unsafe abortion: Patterns and outcomes in a tertiary level hospital. Mymensingh Med J 2020;29(3):523-529.
2. Gerdts C, Jayaweera RT, Motana R, Bessenaar T, Wesson P. Incidence of and experiences with abortion attempts in Soweto, South Africa: Respondent-driven sampling study. JMIR Public Heal Surveill 2022;8(12):e38045. https://doi.org/10.2196/38045
3. World Health Organization. Health topics – abortion. Geneva: WHO, 2021. https://www.who.int/health-topics/abortion#tab=tab_1 (accessed 21 February 2024).
4. Albertyn C. Claiming and defending abortion rights in South Africa. Rev Direito GV 2015;11:429-454. https://doi.org/10.1590/1808-2432201519
5. Constitution of the Republic of South Africa, 1996.
6. South Africa. Choice on Termination of Pregnancy Act No. 92 of 1996.
7. Jewkes RK, Gumede T, Westaway MS, Dickson K, Brown H, Rees H. Why are women still aborting outside designated facilities in metropolitan South Africa? BJOG 2005;112(9):1236-1242. https://doi.org/10.1111/j.1471-0528.2005.00697.x
8. Brown HC, Jewkes R, Levin J, Dickson-Tetteh K, Rees H. Management of incomplete abortion in South African public hospitals. BJOG 2003;110(4):371-377. https://doi.org/10.1046/j.1471-0528.2003.t01-1-02036.x2003;110(4):371–7
9. Jewkes R, Brown H, Dickson-Tetteh K, Levin J, Rees H. Prevalence of morbidity associated with abortion before and after legalisation in South Africa. BMJ 2002;324(7348):1252-1253. https://doi.org/10.1136/bmj.324.7348.1252
10. Reproductive Rights Alliance. Introduction. Johannesburg: RRA, 2002. https://static.pmg.org.za/docs/2000/appendices/000608RRA.htm (accessed 21 February 2024).
11. Lombaard H, Adam S, Makin J, Sebola P. An audit of the initial resuscitation of severely ill patients presenting with septic incomplete miscarriages at a tertiary hospital in South Africa. BMC Pregnancy Childbirth 2015;15(1):1-5. https://doi.org/10.1186/s12884-015-0510-7
12. Varkey SJ. Abortion services in South Africa: Available yet not accessible to all. Int Fam Plan Perspect 2000;26(2):87-88. https://doi.org/10.2307/2648273.
13. Harries J, Gerdts C, Momberg M, Greene Foster D. An exploratory study of what happens to women who are denied abortions in Cape Town, South Africa. Reprod Health 2015;12(1):1-6. https://doi.org/10.1186/s12978-015-0014-y
14. Gerdts C, Raifman S, Daskilewicz K, Momberg M, Roberts S, Harries J. Women's experiences seeking informal sector abortion services in Cape Town, South Africa: A descriptive study. BMC Womens Health 2017;17(1):1-10. https://doi.org/10.1186/s12905-017-0443-6
15. National Department of Health, South Africa. Saving Mothers: Executive summary 2020 -2022. Pretoria: NDoH, 2022. https://www.health.gov.za/wp-content/uploads/2023/10/Saving-Mothers-Executive-Summary-2020-2022-1.pdf (accessed 21 February 2024).
16. National Department of Health, South Africa. Saving Mothers 2011 - 2013: Sixth report on the confidential enquiries into maternal deaths in South Africa. Pretoria: NDoH, 2014.https://www.kznhealth.gov.za/mcwh/Maternal/Saving-Mothers-2011-2013-short-report.pdf (accessed 21 February 2024).
17. Constant D, Kluge J, Harries J, Grossman D. An analysis of delays among women accessing second-trimester abortion in the public sector in South Africa. Contraception 2019;100(3):209-213. https://doi.org/10.1016/j.contraception.2019.04.009
18. Hartel LA, Yazbeck AS, Osewe PL. Responding to health system failure on tuberculosis in southern Africa. Heal Syst Reform 2018;4(2):93-100. https://doi.org/10.1080/23288604.2018.1441621
19. Maphumulo WT, Bhengu BR. Challenges of quality improvement in the healthcare of South Africa post-apartheid: A critical review. Curationis 2019;42(1):1-9. https://doi.org/10.4102/curationis.v42i1.1901
20. Von Holdt K, Murphy M. Public hospitals in South Africa: Stressed institutions, disempowered management. In: Buhlungu S, Daniel J, Southall R, Lutchman J, eds. State of the Nation: South Africa 2007. Cape Town: HSRC Press, 2007;312-341.
21. Cooper D, Dickson K, Blanchard K, et al. Medical abortion: The possibilities for introduction in the public sector in South Africa. Reprod Health Matters 2005;13(26):35-43.
22. Lince-Deroche N, Fetters T, Sinanovic E, Devjee J, Moodley J, Blanchard K. The costs and cost effectiveness of providing first-trimester, medical and surgical safe abortion services in KwaZulu-Natal Province, South Africa. PLoS ONE 2017;12(4):e0174615. https://doi.org/10.1371/journal.pone.0174615
23. Rees H, Katzenellenbogen J, Shabodien R, et al. The epidemiology of incomplete abortion in South Africa. S Afr Med J 1997;87(4):432-437.
24. Public Health and Welfare Sector Bargaining Council, South Africa. Resolution No. 2 of 2004. Revised non-pensionable recruitment allowance, referred to as 'the rural allowance': Public sector health professionals working in hospitals/institutions as managed by the health employer. PHWSBC, 2004.
25. Cochran WG. Sampling Techniques. Hoboken: John Wiley & Sons, 1977. https://doi.org/10.1002/bimj.19650070312
26. Department of Statistics, South Africa. Mid-year population estimates, 2018. Pretoria: Department of Statistics, 2018.
27. Teffo ME, Rispel LC. 'I am all alone': Factors influencing the provision of termination of pregnancy services in two South African provinces. Glob Health Act 2017;10(1):1347369. https://doi.org/10.1080/16549716.2017.1347369
28. Moseson H, Jayaweera R, Egwuatu I, et al. Effectiveness of self-managed medication abortion with accompaniment support in Argentina and Nigeria (SAFE): A prospective, observational cohort study and non-inferiority analysis with historical controls. Lancet Glob Health 2022;10(1):e105-113. https://doi.org/10.1016/s2214-109x(21)00461-7
29. National Department of Health, South Africa. National Clinical Guideline for Implementation of the Choice on Termination of Pregnancy Act. Pretoria: NDoH, 2019.
30. Harries J, Orner P, Gabriel M, Mitchell E. Delays in seeking an abortion until the second trimester: A qualitative study in South Africa. Reprod Health 2007;4(1):1-8. https://doi.org/10.1186/1742-4755-4-7
31. Harries J, Lince N, Constant D, Hargey A, Grossman D. The challenges of offering public second trimester abortion services in South Africa: Health care providers' perspectives. J Biosoc Sci 2012;44(2):197-208. https://doi.org/10.1017/s0021932011000678
32. Favier M, Greenberg JMS, Stevens M. Safe abortion in South Africa: 'We have wonderful laws but we don't have people to implement those laws.' Int J Gynecol Obstet 2018;143(S4):S38-S44. https://doi.org/10.1002/ijgo.12676
33. Constant D, Harries J, Malaba T, et al. Clinical outcomes and women's experiences before and after the introduction of mifepristone into second-trimester medical abortion services in South Africa. PLoS ONE 2016;11(9):e0161843. https://doi.org/10.1371/journal.pone.0161843

Received 18 April 2024; accepted 30 August 2024.