

Chapter 4. How do contextual changes affect trends in abortion-related complications? A time series analysis of Zambian hospital data

Introduction

This chapter presents the first of three research papers, which form the results section in my PhD thesis. The aim of this paper is to examine trends in admission for abortion-related complications in Lusaka over 10 years (2006-2015) and to examine the impact of contextual changes on these trends. This paper uses routine data from hospital registers to assess the impact of changes in the abortion policy and environment on hospitalizations trends for abortion-related morbidity and mortality. The use of this kind of routine count data is important, because it is more readily available than detailed datasets in contexts with a high burden of unsafe abortion. I conducted segmented regression analysis to analyse this data. Segmented regression is a robust method that offers a practical approach to examine for immediate and longer-term effects of policy change on longitudinal data whilst accounting for pre-existing trends.

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As first author on this paper, I developed the idea for the paper, undertook the analysis, wrote the first draft of the manuscript and incorporated co-author comments

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4.1 Introduction to the paper

Seven million women in low- and middle-income countries were treated for complications attributed to terminations of pregnancy (TOPs) conducted unsafely in 2012 (6). These acute complications generated in all likelihood unnecessary direct and indirect costs to women, their families, the health system and their countries (7,81). They were also almost entirely avoidable as there is minimal risk of morbidity and mortality when TOPs are conducted safely - in other words when they are conducted legally, by an appropriately trained provider using evidence-based methods and in a recommended environment (4,48).

Whilst legality is a key factor associated with morbidity and mortality risks after pregnancy termination (146,147), evidence from contexts with liberal laws such as India, suggests that legality is not sufficient to avert the occurrence of unsafe TOPs without the implementation of accompanying policies that support the availability of, and access to safe TOP services (81,148). Another major factor affecting access to safe TOPs and our understanding of safety in restrictive contexts is the increased availability of and access to medical abortion (MA). As of 2015, mifepristone was registered in 61 countries(149), and as of 2012 misoprostol was registered in over 90 countries(53). Misoprostol is less effective alone as a medical abortion drug (73-95%) than in combination with mifepristone (94-97%)(54). However, misoprostol alone is often registered conditions including- peptic ulcer disease, postpartum haemorrhage and cervical ripening in labour. It is also cheaper than when it is in combination with mifepristone for pregnancy termination. Studies show that in restrictive contexts, private pharmacies and drug stores which are often poorly regulated are a particularly important source of these MA drugs for women seeking to terminate pregnancies(63). Increased access to MA (50,65,138) has transformed how women access terminations of pregnancy, reduced the severity of abortion-related complications (46) and is influencing how researchers interpret hospital data on abortion-related complications (69).

Zambia's abortion law and policy context is relatively liberal compared to most countries in Sub-Saharan Africa. The 1972 Termination of Pregnancy Act, which was amended in 1994 and 2005, permits termination when: (i) the pregnancy constitutes a risk to a

woman's physical or mental health, or constitutes a risk to her life; (ii) the pregnancy involves a risk to the physical or mental health of any of a woman's existing children; (iii) there is substantial risk that the child to be born will suffer from physical or mental abnormalities as to be seriously handicapped; or (iv) the pregnancy is the result of rape (17). Furthermore, abortion-related services should be provided free per regulations at public health facilities with the exception of a registration fee which may range from \$2 to \$15(8,150).

Despite the status of abortion de jure, de facto there have been significant barriers to the implementation of the abortion law and service access in Zambia. These include: the legal requirement for endorsement by three medical practitioners before a woman can receive an elective TOP in non-emergency circumstances; the substantial societal stigma associated with procuring a TOP for women (141,151); and low levels of knowledge about the laws on TOP within the community (20,21). A 2009 study showed that hospital admissions for abortion-related complications in three tertiary facilities almost doubled between 2003 and 2008 whilst there were very few TOPs provided within this period (152).

There has been progress over the past few years. After a strategic assessment of the contribution of unsafe TOPs to maternal morbidity and mortality in May 2008, the Ministry of Health (MoH) and its partners developed standards and guidelines to facilitate the reduction of abortion-related morbidity and mortality in May 2009 (17). These evidence-based guidelines clearly outline the national policy for providing legal TOPs when three signatures are available and in emergency cases when one signature is sufficient. They also state clearly that appropriately trained mid-level providers can legally provide first trimester TOPs using manual vacuum aspiration (MVA) and MA. This is important for Zambia, which has a low physician-to-population ratio, especially for smaller facilities and in rural areas, which are less likely to have three medical practitioners close by. The launch of the guidelines was accompanied by a collaboration by Ministry of Health and Ipas to strengthen the capacity of 28 hospitals and health centres in Lusaka and Copperbelt provinces to provide post-abortion care (PAC) and safe TOPs primarily using medical abortion (MA)(20). Staff at the University Teaching Hospital Lusaka were educated on the legislation governing TOP in Zambia in order to increase

access to legal TOP within health facilities and the public was informed about the availability of safe TOP services (18). These interventions appear to have paved the way for increased access to safe TOPs. In addition, Zambia is now one of the few countries in Sub-Saharan Africa where both misoprostol and mifepristone are registered and approved for TOP. Misoprostol was initially registered for postpartum haemorrhage in 2008(153) and mifepristone with misoprostol (the combination pill) was approved for medical abortion in 2010 (149). The first importation of mifepristone for public facilities occurred in July 2010 after the guideline launch, and early in 2012 a pre-packaged combination of misoprostol and mifepristone was available for distribution by local pharmacies (138). There is no national evidence of the level of uptake of medical abortion in the country since it was registered or after the interventions. However, a recent study interviewing 112 women who accessed abortion-related care in a tertiary hospital in one province reported that 39% of these women were admitted with complications of unsafe abortion and a third of them reported using medical abortion clandestinely(8). Furthermore, data from other studies conducted as part of this PhD suggest that as much as 25% of women may use medical abortion to terminate their pregnancies in Zambia.³

Evidence from the other countries suggest that reducing recourse to unsafe TOPs by reforming laws, policies and regulations, reduces the subsequent burden of abortion morbidity and mortality (75,154). The introduction of the MoH guideline document, the interventions that accompany its launch, and the availability of the combination medical abortion pill in the public sector and for sale by private pharmacies are important policy and regulatory steps Zambia has taken as a country to address the problem of unsafe TOPs. The objective of our study was to describe trends in abortion-related hospital admissions and abortion-related deaths in hospital in Lusaka, Zambia between 2007 and 2015 and the impact of these two policy and regulatory events on these trends.

³ Information is derived from health professional survey data in chapter 6

4.2 Methods

4.2.1 Setting

Data collection was conducted at the Obstetrics and Gynaecology department of the University Teaching hospital, Lusaka, Zambia. Lusaka has a population of over two million people and is Zambia's most densely populated province (155). Between 2000 and 2010, the annual rate of population growth was 4.6% (Central Statistical Office website). The total fertility rate in Lusaka Province is 3.7 and the unmet need for contraception is 16.1% (136). UTH is the largest tertiary hospital in Zambia and sees the highest number of PAC cases in Lusaka and within the entire country. The Obstetrics and Gynaecology Department delivers about 17,000 babies a year, and is housed in 11 wards with a total of 464 beds. Most women admitted for abortion-related reasons are seen or kept for observation within a dedicated ward in the Obstetrics and Gynaecology Department. This ward has 12 beds and eight comprehensive abortion care providers other than doctors in the department.

4.2.2 Study design

Retrospective data extraction from hospital registers on abortion-related hospitalizations from January 2007 till November 2015.

4.2.3 Data collection tools

Data collection logistics were pre-tested at UTH in October-November 2012. During this period, we extracted data for the period between 14th to 31st October 2012, from different registers to examine the number of cases admitted; understand how UTH doctors record diagnoses of abortion-related complications; check the quality of information; and compare the number of recorded cases within different registers, and with data extracted from patient case files. In October 2013, we carried out an assessment of all potential sources of information on admissions for abortion-related complications (due to TOPs or miscarriages) and legal TOPs hospital registers recording admissions for abortion-related complications. We then determined which yielded the most useful and complete data. The "in-patient" register within the dedicated ward was found to be the most comprehensive data source for abortion-related complications hence data was extracted from this source alone. This register contains information on

all admissions to UTH with an eligible diagnosis regardless of whether they spent the night at the hospital or not. We collected data on patient's age, area of residence, date of admission, complication recorded, and referring hospital. Thereafter we developed the data collection and entry tool in EpiData, piloted it and hired research assistants to carry out data extraction from the registers (see appendix 3 for the variables extracted from the hospital registers).

4.2.4 Data collection

All women admitted with a recorded diagnosis of incomplete, complete, missed, septic, inevitable, or spontaneous abortion from January 2007 till November 2015 were eligible for inclusion as an abortion-related complication. Other than age, there was no data on the socio-demographic characteristics in these registers or the severity of complications they were admitted for.

Sometimes women were mistakenly recorded more than once in the registers on a single day of admission. To avoid over-counting cases, we checked names, ages and hospital numbers within the registers whilst extracting data and subsequently within the database to identify duplicate cases. We also collected data from the hospital management information system on numbers of abortion-related deaths and number of all gynaecological admissions from 2007-2015.

Fieldwork for the retrospective hospitalization study was conducted in two phases. The first phase (November 2013-March 2014) focused on registers for the period of January 2007 till October 2013. The second phase (January-March 2016) concentrated on registers from November 2013 till November 2015.

4.3 Analysis

4.3.1 Outcome measure:

The primary outcome variables were the number of admissions for abortion-related complications and the rate of admissions for abortion-related complications per 1000 gynaecological admissions hereafter called abortion complication rate. Abortion-related complications include complications of both induced and spontaneous abortions because they cannot be differentiated accurately in hospital records(9). We used the

abortion complication rate as the primary outcome to account for broader trends in health care use over time. We used gynaecological admissions as the denominator for the rate because it is likely to be more representative of trends in care seeking over time amongst women for reproductive health services similar to abortion than live births. We also conducted analysis using deaths per 1000 abortion-related complications (hereafter called death rate) as the outcome variable.

4.3.2 Missing data

We were unable to find the hospital registers containing data on abortion-related complications from the 1st of May till the 30th of September 2014. We predicted values for the missing data points using an autoregressive integrated moving average (ARIMA) model on the log-transformed series for monthly number of abortion-related complications. We examined the series for stationarity using the Dickey-Fuller unit root test and there was strong evidence of stationarity ($p= 0.0001$). Correlogram and partial correlogram graphs were used to help identifying the order of moving average (MA) and auto-regressive (AR) terms needed (see appendix 4). The ARIMA (1,0,2) model with autoregressive terms of 1 and moving average terms of 2 was found to be the most parsimonious model with the best fit using the Akaike information criteria (AIC). We predicted the log of admissions in the five months with missing data from this model and back transformed to the number of admissions with the exponential function. A complete series (with no missing data) was then obtained. The complete data was used to calculate the abortion complication rate and death rate.

4.3.3 Key intervention events

The first intervention considered consists of the release of the MoH guideline documents for health facilities in May 2009 and the accompanying capacity strengthening of health staff from 28 facilities to provide medical abortion and PAC. The second intervention considered is the availability of mifepristone for sale in pharmacies in early 2012. Since in-country stakeholders did not provide a specific date for the roll-out of the intervention, we chose March 2012 as the point of intervention. We hypothesized that the availability of medical abortion in pharmacies would have a more significant effect on admissions for abortion-related complications than the availability of misoprostol in public health

facilities, because pharmacies are more accessible to individuals within the community than health facilities and their ability to provide combination MA is likely to herald increased access and uptake by women(63).

4.3.4 Data analysis

Descriptive statistics were used to summarize the total number of admissions for abortion-related complications and deaths for each month of observation. We also summarize the yearly number of abortion-related complications deaths and gynaecological admissions, the abortion complication rate and the death rate.

We examined the series of each outcome measure for stationarity using the Dickey-Fuller unit root test. Partial correlogram graphs were used to help identifying the order of autoregressive (AR) terms needed for the time series model.

We assessed trends in admissions for the number of abortion-related complications, abortion complication rate, and death rate between 2007 and 2015 using an interrupted time series analysis. We estimated the changes in level and trends of (i) abortion complication rates and; (ii) deaths rates after the two key intervention events. Our models described trends for three periods: i) between 2007 and the release of the MoH guideline document for health facilities in May 2009; ii) between the release of the MoH guideline document for health facilities in May 2009 and the availability of mifepristone for sale to pharmacies in early 2012; and iii) after the availability of mifepristone for sale to pharmacies in early 2012. We applied the simplest approach and modelled the MoH intervention as a precise change point in May 2009 without any lag time for it to take effect, because there was insufficient information from our in-country experts on the exact dates of each component of the intervention to allow us choose an appropriate lag.

We fit the model for number of abortion-related complications using the Prais-Winsten estimator as only first-order autocorrelation was significant. For the abortion complication rate, we fit a model with the Newey-West estimator to control for autocorrelation. Then, we performed a Cumby-Huizinga's test for autocorrelation. There was no evidence of auto-correlation so this was our final model. There were differences

in the direction of the effect or slope after the interventions or their statistical significance for the number of abortion-related complications when compared with the abortion complication rate. We present the results below. We fit our final model for the death rate with the Newey-West estimator to control for autocorrelation. Statistical analyses were conducted in Stata 13.1.

4.4 Results

A total of 36,768 women were admitted for abortion-related complications, whilst 232 TOPs were conducted between January 2007 and November 2015 at UTH. Altogether, 175 abortion-related deaths took place during this period. From 2007 to 2015, the number of complications admitted fell from 4971 to 3382. Over the 10-year period examined, 49% of gynaecological admissions were the result of abortion-related complication and the proportion of that were abortion-related fell over time from 0.77 in 2007 to 0.44 in 2015 (Table 4-1). The monthly number of deaths were few with the death rate increasing from 3.82 in 2008 to 6.07 in 2010 when it started to fall.

Table 4-1 Admissions for abortion-related complications and gynaecological indications at UTH between 2006 and 2015

Year	Number of admissions for abortion-related complications	Number of abortion-related deaths	Number of gynaecological admissions	Proportion of gynaecological admissions that are abortion-related	Abortion-related deaths as a proportion of abortion complications
2007	4971	19	6447	0.77	3.82
2008	5175	24	8055	0.64	4.64
2009	4960	32	10208	0.49	6.45
2010	4119	25	10137	0.41	6.07
2011	4009	15	9122	0.44	3.74
2012	3897	18	8221	0.47	4.62

2013	4168	17	7684	0.54	4.08
2014	3510*	9	7949	0.44	2.56
2015	3382	13	7622	0.44	3.84

**This included imputed values for the missing months*

Table 4-2 shows the results of the interrupted time series model investigating change in the absolute number of admissions for abortion-related complications accompanying two contextual events. Before the first intervention in May 2009, there was evidence of an increase in the monthly number of admissions by 3 cases (95% CI: 0.4; 6) per month ($p=0.023$). Additionally, after the May 2009 intervention there was strong evidence of an immediate reduction in the number of admissions by 86 cases (95% CI: -144, -29) ($p=0.003$) with a gradual reduction in the monthly number of abortion-related admissions by 5 (95% CI: -8; -1) cases ($p=0.006$). There was no evidence of a change in number of admissions accompanying the availability of medical abortion in pharmacies.

Table 4-3 presents the results of the interrupted time series model investigating change in the abortion complication rate. These changes are in a different direction from the changes observed in the absolute number of complications. Before the introduction of the Ministry of Health guidelines in May 2009, there was a decline in the monthly rate of admissions by 11 cases per 1000 admissions ($p<0.001$). After the introduction of the guidelines in May 2009 and its accompanying interventions, there was a significant increase in the monthly abortion complication rate by 11 cases per 1000 admissions (95% CI: 5,17) ($p=0.001$). Following the availability of mifepristone for sale to pharmacies in early 2012, there was also a significant immediate increase in the abortion complication rate by 67 cases per 1000 admissions (95% CI: 19,115) ($p=0.007$). However, there was no evidence of change in the monthly abortion complication rate over time ($p=0.973$).

Table 4-2 Interrupted time series analysis on UTH admissions for abortion-related complications (count) between two important contextual events affecting access to abortion care

Admissions for abortion-related complications in UTH	Coefficient	95% CI	p-value
Constant	378	334, 423	<0.001
Pre-intervention slope (<i>Secular trend per month</i>)	3	0.4, 6	0.023
Change in level after Ministry of Health guidelines (<i>Immediate effect</i>)	-87	-144, 30	0.003
Change in slope after Ministry of Health guidelines (<i>Gradual effect per month</i>)	-4	-8, -1	0.006
Change in level after availability of mifepristone for pharmacies (<i>Immediate effect</i>)	11	-40, 64	0.650
Change in slope after availability of mifepristone for pharmacies (<i>Gradual effect per month</i>)	1	-1, 4	0.344

Figure 4-1 Data series showing the segmented regression model examining the effect of contextual changes between 2009 and 2015 on UTH admissions for abortion related complications (count)

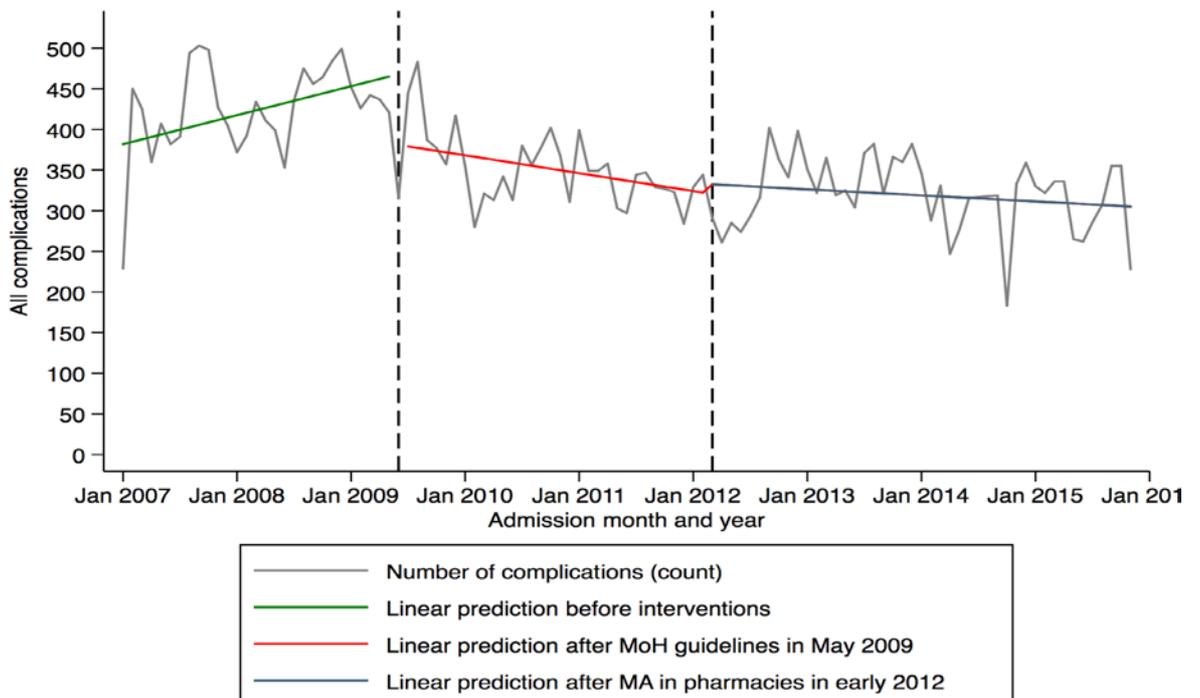


Table 4-3 Interrupted time series analysis on UTH admissions for abortion-related complications per 1000 gynaecological admissions between two important contextual changes affecting access to abortion care

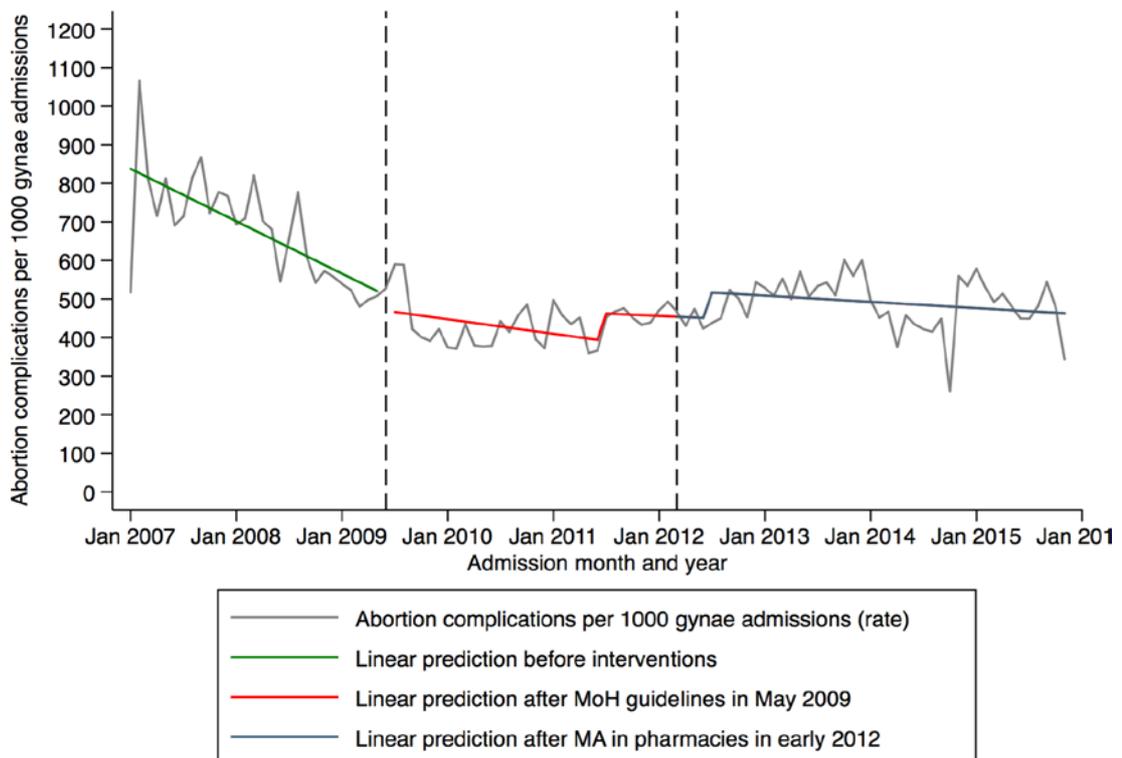
Abortion-related complications per 1000 gynaecological admissions in UTH	Coefficient	95% CI	p-value
Constant	848	730, 967	<0.001
Pre-intervention slope <i>(Secular trend per month in abortion complication rate)</i>	-11	-17, -5	<0.001
Change in level after Ministry of Health guidelines <i>(Immediate effect)</i>	-64	-151, 22	0.144
Change in slope after Ministry of Health guidelines <i>(Gradual effect per month)</i>	11	5, 17	0.001
Change in level after availability of mifepristone for pharmacies <i>(Immediate effect)</i>	67	19, 115	0.007
Change in slope after availability of mifepristone for pharmacies <i>(Gradual effect per month)</i>	-0.1	-3, 3	0.973

Figure 4-1 and

Figure 4-2 present the results of the interrupted time series model investigating changes in the absolute count of abortions and the abortion complication rate for both contextual changes examined.

The model investigating change in the death rate for the two contextual events showed no evidence of any change in the secular trend in the death rate prior to the interventions and no evidence of change in the trend after both interventions (see appendix 5).

Figure 4-2 Observed UTH abortion complication rate per 1000 gynaecological admissions and interrupted linear trends assessing the effect of contextual changes between 2006 and 2015



4.5 Discussion

Our results show that the number of hospitalizations for all gynecological conditions and abortion-related complications fell between 2007 and 2015. The time series analysis indicates that there was a significant decline in the absolute number of admissions for abortion-related complications after the guideline intervention in May 2009. Since the proportion of abortion-related complications due to spontaneous abortions out of all abortions are likely to remain the same in a population, the decline is likely to be in hospitalizations for complications of unsafe induced abortions (74). However, admissions for abortion-related complications increased compared to all gynecological admissions after the guideline and medical abortion interventions suggesting greater care seeking for abortions over time relative to other gynaecological conditions. The interventions examined had no impact on the abortion death rate because the monthly number of deaths was very low over the period examined. These numbers, which were extracted from the hospital information system, almost certainly underestimate the actual number

of abortion-related deaths occurring at the hospital. Mortality is poorly recorded in this context and cause of death may not always be assigned appropriately particularly in the case of abortion which is associated with sociocultural stigma for the woman and her family.

The steep decrease and continued decline in the number of abortions after the guideline launch in May 2009 suggests that the intervention had an important effect on the secular admission trend. Our hypothesis is that the decline is indicative of a reduction in admissions for severe complications of abortion. This is most likely because the widespread implementation of the guidelines and the accompanying interventions improved the capacity of lower-level health facilities such as health centres and district hospitals to provide comprehensive abortion care (CAC). This may have increased women's access to safe abortion services within their communities and reduced utilization of unsafe providers hence reducing admission for complications and PAC. Furthermore, the community sensitization on the abortion law accompanying the guideline launch may also have increased awareness of the availability of safe CAC services locally. The distribution of the guidelines may have also encouraged a reduction in the use of less safe methods of pregnancy termination such dilatation and curettage which was frequently used in Zambia (156) but is against WHO recommendations (146), and greater use of MA and MVA at health facilities (157). However, while the absolute number of admissions reduced, the interventions around the guideline launch may have increased the capacity of women to seek and access care for their abortion-related complications- even those induced clandestinely. This may account for the significant increase in the admission rate for abortion complications relative to other gynecological indications over time.

These results highlight the role evidence-based clinical guidelines can play in improving quality of care in health facilities and patient outcomes (158) when they are relevant to the local context, adequately disseminated and followed by staff. A hospital-based study in South Africa implementing a strict protocol for managing severe complications of unsafe abortions resulted in a reduction in the mortality index after a year of implementation (159). However, getting guidelines to change clinical practice can be challenging and they are usually only one part of the solution(160). It is likely that the

CAC trainings accompanying the launch of the guidelines in our study, facilitated the uptake of these recommendations by clinical staff and helped improve patient care and outcomes. Going forward, it is important that these guidelines are updated frequently to reflect best evidence and that they are integrated into refresher trainings for clinical staff to ensure their recommendations are implemented.

Following the availability of the combination MA pill in pharmacies, our analysis showed no strong evidence of a significant change in the absolute number of admissions for abortion-related complications while the number of admissions relative to gynaecological admissions increased. Studies examining changes in trends in all abortion-related complications following greater access to medical abortion have reported different results on the subsequent number of hospital admissions. Some have shown a rise in admissions which is usually due to an increase in non-severe complications (50,65,73,161). A 1998 paper on Brazil reported that the numbers of women admitted for PAC suddenly increased after 1990 around the time misoprostol became freely available and the proportion of women stating misoprostol use increased from 12% in 1988 to 70% in 1990 (50). Conversely, some have shown a reduction in hospitalizations. For example, after the introduction of misoprostol in the Dominican Republic in 1986, the overall number of abortion-related admissions reduced between 1986 and 2001 (65). Similarly, a 2012 study in Brazil records a reduction in abortion-related hospitalization between 1992 and 2009 wherein the use of misoprostol increased starting in the early 1990s (69).

Although our initial hypothesis was that the number hospitalizations would reduce significantly, it is possible that the health worker trainings to increase medical abortion provision (11) and that the availability of the combination pill was available in health facilities attenuated the impact of the availability of the combination pill in pharmacies in 2012 on access for women. Similarly, pharmacies may have already been prescribing misoprostol for TOPs legally or clandestinely moderating the effect of the intervention (139). Additionally, because mifepristone is relatively expensive or due to the legal requirement for a prescription, few pharmacies in the community may have been willing to stock and sell the drugs when it became available so access may not have changed considerably after the intervention.

The abortion rate in a country is affected by the age distribution of the population, unmet need for contraception and contraceptive prevalence. Data from the Zambian Demographic and Health Surveys show that from 2001 to 2013/14 modern contraceptive prevalence rate amongst all women increased from 19% to 33%. Whilst the fertility rate decreased slightly from 5.9 to 5.3 if it still higher than desired fertility (136). This suggests that women are not yet meeting their full reproductive intentions and are hence likely to obtain more induced abortions. The very small number of TOP's compared with PAC cases at UTH, indicate that accessing safe abortion is still difficult for many women. As Zambia takes steps to improve the quality of CAC available in health facilities, it is important to mobilize the community to understand the law and empower women to seek safe TOP services when they require them.

4.5.1 Methodological strengths and challenges

To our knowledge, this is the first study in Sub-Saharan Africa to examine trends in abortion-related admissions over 10 years and to explore the impact of contextual changes on these trends using robust methods that take account of the longitudinal nature of the data. The period examined provides enough data points to explore the impact of the contextual changes we have explored, and by describing both the absolute number of admissions and the proportion of abortion complications relative to all gynaecological admissions we have attempted to account for broader trends in healthcare use and population growth. However, our study has several limitations. First, it was only conducted in one tertiary hospital in a highly urbanized setting, which is unlikely to reflect the situation within all of Zambia. Second, because it was a retrospective review of hospital registers, we were unable to classify the level of severity of each hospitalization to explore if there were changes in admission patterns for severe complications compared with all abortion-related admissions as some other studies have done (69,74,75). This can provide greater insight into the impact of contextual changes on the safety of abortions. Additionally, whilst we have attempted to avoid double counting within data entry it is possible we missed some repeated cases. It was difficult to capture and accurately quantify abortion-related mortality using hospital data, as many deaths occur outside of hospitals, and those occurring in the facility may be missed due to misclassification or poor recording systems (9). Unlike abortion-related

complications, these patterns are unlikely to show substantial change due to health care usage patterns. Hence, the number of abortion-related deaths reported in this study are most likely underestimated and even after expressing as a rate were not helpful to understand trends in admissions for the most unsafe abortions.

4.5.2 Conclusion

This study illustrates the usefulness of evaluating the impact of policy relevant changes on sensitive issues like pregnancy termination. There are still a high number of abortion-related hospitalizations occurring in Lusaka. This suggests that many women have challenges meeting their reproductive needs and that there is insufficient access to family planning driving women to regulate their fertility by abortions. Going forward, it is important that the policies and interventions aim to: expand access to modern contraceptives to reduce unmet need for contraception and the occurrence of unintended pregnancies and improve the quality of comprehensive abortion care. There is also a need to establish adequate regulatory mechanisms for non-hospital providers of medical abortion particularly pharmaceutical retailers to ensure services are of high quality and provide sufficient information on drug use and referral to women.