

Maternal Health Indicators

Further Analysis of the 1998 and 2016 South Africa
Demographic and Health Surveys

Report no: 03-06-03



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Maternal Health Indicators: Further Analysis of the 1998 and 2016 South Africa Demographic and Health Surveys

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Report No. 03-06-03

Risenga Maluleke
Statistician-General

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Table of content

Preface	v
Abbreviations and acronyms	vi
Acknowledgements	vii
Executive summary	viii
Chapter 1: Introduction and methodology	1
1.1 Background and context	1
1.2 Frameworks positioning the report	2
1.3 Objective of the report	3
1.4 Report structure	3
Chapter 2: Materials and Methodology	4
2.1 Data	4
2.2.1 SADHS 1998	4
2.2.2 SADHS 2016	5
2.3 Measurements	6
Chapter 3: Results	7
3.1 Background characteristics	7
3.2 Antenatal Care	8
3.2.1 Antenatal care visits by Age of Mother	9
3.2.2 Antenatal care visits by Mothers Education	9
3.2.3 Antenatal care visits by province	10
3.2.4 ANC by type of place of residence and combined household wealth Index	11
3.2.5. ANC by Population Group	13
3.3 Delivery in health facility	13
3.3.1 Proportion of births delivered in a health facility by type of place of residence	13
3.4 Skilled Birth Attendant	15
3.5 Delivery by Caesarean section	16
3.5.1 Caesarean Section by Mothers Age	17
3.5.2 Caesarean section deliveries by level of Education	17
3.6 Child Weight at Birth	19
3.7 Postnatal care for mother and the child	22
3.7.1 Postnatal Health Check for Mothers	22
3.7.2 Postnatal health check for newborns	23
Chapter 4: Summary of findings and discussions	24
4.1 Antenatal Care	24
4.2 Delivery care	24
4.3 Post-natal care	25
References	26

List of tables

Table 2: Maternal health indicators included in the analysis	6
Table 3: Distribution of women 15–49 with a live birth in the 5 years preceding the survey, according to background characteristics, SADHS 1998 and 2016	7
Table 4: Proportion of women age 15–49 who had a live birth in the 5 years preceding the survey by number of Antenatal care visits for the most recent births	8

List of figures

Figure 1: Proportion of women aged 15–49 who had four or more antenatal care visits for their most recent pregnancy in the five years preceding the survey, by age at child's birth, 1998 and 2016 SADHS	9
Figure 2: Proportion of women aged 15–49 who had four or more antenatal care visits for their most recent pregnancy in the five years preceding the survey, by education, 1998 and 2016 SADHS	10
Figure 3: Proportion of women aged 15–49 who had four or more antenatal care visits for their most recent pregnancy in the five years preceding the survey, by province, 1998 and 2016 SADHS	11
Figure 4: Proportion of women aged 15–49 who had four or more antenatal care visits for their most recent pregnancy in the five years preceding the survey, by type of place of residence, 1998 and 2016 SADHS	12
Figure 5: Percentage of women aged 15–49 who had four or more antenatal care visits for their most recent pregnancy in the five years preceding the survey, by combined household wealth Index, 2016 SADHS	12
Figure 6: Proportion of women aged 15–49 who had four or more antenatal care visits for their most recent pregnancy in the five years preceding the survey, by population group, 1998 and 2016 SADHS	13
Figure 7: Proportion of births delivered in a health facility by type of place of residence	14
Figure 8: Proportion of births delivery in a health facility by province	14
Figure 9: Proportion of births delivery in a health facility by wealth quantile	15
Figure 11: Panel (a-b): Proportion of births by person providing assistance during delivery, SADHS 1998 and 2016	16
Figure 12: Proportion of births delivered by caesarean section by age of mother	17
Figure 13: Proportion of births delivered by caesarean section by education	17
Figure 14: Proportions of births delivered by caesarean section by province	18
Figure 15: Proportion of births that were delivered by Caesarean section by type of place of residence	18
Figure 16: Proportion of births by caesarean section by household wealth	19
Figure 17: Proportion of births delivered by caesarean section by population group	19
Figure 18: Proportion of births weighing less than 2,5 kg by mothers age	20
Figure 19: Proportion of births weighing less than 2,5 kg by birth order	20
Figure 20: Proportion of births weighing less than 2,5 kg by type of place of residence	21
Figure 21: Proportion of births weighing less than 2,5 kg by province	21
Figure 22: Proportion of mother's first postnatal health check during the 2 days after the most recent live birth, by type of provider	22
Figure 23: Proportion of births with a postnatal check during the first 2 days after birth by province	23
Figure 24: Proportion of births with a postnatal check during the first 2 days after birth, household by wealth quantile	23

Preface

The report presents findings from several areas of importance to maternal health care including antenatal, delivery and postnatal care services for women aged 15–49. Findings from this paper are useful since they describe how women in South Africa have utilised maternal health care services for their most recent pregnancy as this has implications for maternal and child mortality. Analysis of this nature adds to the literature of how maternal health indicators are changing over time. This report used data from 1998 and 2016 South Africa Demographic and Health Surveys to determine the prevalence and patterns in maternal health care utilisation.

A handwritten signature in black ink, appearing to read 'Risenga Maluleke', with a stylized, cursive script.

Risenga Maluleke
Statistician-General

Abbreviations and acronyms

ANC - Antenatal care

CARMMA - Campaign on Accelerated Reduction of Maternal and Child Mortality in Africa

DHIS - District Health Information systems

MMR – Maternal mortality ratio

NCCEMD - National Committee on Confidential Enquiries into Maternal Deaths

NHIS/SA - National Health Information System of South Africa

NDP - National development plan

SADHS - South Africa Demographic and Health Surveys

SDGs – Sustainable Development Goals

UNFPA – United Nations Population Fund

WHO – World Health Organisation

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Executive summary

South Africa has made significant progress with regard to the improvement of maternal health and the reduction of maternal mortality in the last two decades. This report used data from South Africa Demographic and Health Surveys 1998 and 2016 to assess changes in selected maternal health care indicators. The results from this study showed that there has been an increase in the use of maternal health care services during the antenatal period, at delivery and after birth between 1998 and 2016 in South Africa.

The results on antenatal care indicate that while the proportion of women attending four or more ANC visits has remained static (74% in 1998 and 76% in 2016), the proportion of women who had ANC in the first trimester increased from 28% in 1998 to 47% in 2016. Over time, the proportion of young women aged 15–19 attending four or more antenatal care visits increased. However, a decrease in the proportion of women attending four or more ANC visits was observed amongst older women aged 35–49 and 45–49. By highest level of education, the proportion of women attending four or more ANC visits was lowest amongst women with no education and those having primary education. Rural provinces showed a marked increase in the proportion of women attending four or more ANC visits (71,3% in 1998 to 79% in 2016). By household wealth quantile, the proportion of women who attended four or more ANC visits was higher amongst women from middle, richer and richest households.

Results on delivery care indicate an increase in births delivered in a health facility from 83% in 1998 to 96% in 2016. The results also indicate that a skilled health provider assists in nearly all deliveries (97%), whilst a nurse or midwife delivers 68% of births and 29% are attended by a doctor. A noted increase in the proportion of births delivered in health facilities increased marginally for rural women, particularly in Eastern Cape, Limpopo, and Mpumalanga provinces. The results further indicates that home deliveries decreased from 14% in 1998 to 4% in 2016. The majority of institutional deliveries took place at public sector health facilities.

The proportion of births delivered by caesarean section increased significantly from 16% in 1998 to 24% in 2016. Caesarean section deliveries were highest amongst women aged 35–44 in 2016. Across provinces, the proportion of births delivered by caesarean section ranged from 17% in Limpopo to 29,4% in Western Cape in 2016. Across provinces, Western Cape, KwaZulu-Natal and Free State provinces had the highest proportion of births by caesarean section in the country. By household wealth, caesarean section delivery is highest amongst the richest and richer households.

Findings from this study also indicate an increasing pattern in the proportion of births weighing less than 2,5 kg, which may have implications for child mortality. The highest proportion of births weighing less than 2,5kg was amongst women aged 35–49. By province, the proportion of births weighing less than 2,5 kg was highest in Northern Cape (20%) and lowest in Limpopo (11%).

Findings on post-natal care indicate that the proportion of newborns with a postnatal check was lowest in KwaZulu-Natal (82%) and highest in Western Cape (94%). A larger proportion of newborns delivered in a health facility received a postnatal health check than those delivered elsewhere (88% versus 36%).

Overall, patterns in the data regarding maternal health care use are as expected and comparable to estimates from District Health Information System (DHIS). Findings from this report will go a long way towards monitoring of developmental frameworks in the country.

Chapter 1: Introduction and methodology

1.1 Background and context

Maternal health refers to the health of women during pregnancy, childbirth and the postpartum period. The major causes of maternal morbidity and mortality include haemorrhage, infection, high blood pressure, unsafe abortion, and obstructed labour (WHO, 2015). Poor maternal and reproductive health outcomes remain a major challenge for most African countries. Literature shows that low-income countries account for most maternal and child deaths, which is due, in part, to low or non-use of maternal and reproductive health services (WHO, 2015). Use of maternal and reproductive health services is crucial for better maternal and child health outcomes as women often receive life-saving information related to their health and that of their children when attending maternal health services (WHO, 2015).

Maternal health care services during pregnancy, childbirth and after delivery are important for the survival and well-being of both the mother and the infant. The maternal health care services during pregnancy is also one of the pillars of safe motherhood in South Africa (NDoH, 2015). Hence improving maternal and child health remains a population health priority in South Africa and globally. Additionally, there is empirical evidence from various studies on the utilisation of maternal healthcare services in the reduction of maternal morbidity and mortality outcomes.

Moreover, the Sustainable Development Goals (SDGs) which builds on the Millennium Development Goals (MDGs) to further the prospects of sustainable development around the world include maternal health and health care indicators as central goals to achieve the SDG targets by 2030. The SDGs emphasize that “*no one should be left behind*” in the achievement of these goals (UN, 2015). Within the 17 SDGs, maternal health-related targets come under SDG 3: ensure healthy lives and promote well-being for all at all ages (UN, 2019). Among the SDGs, SDG 3.1 aims to reduce the global maternal mortality ratio to less than 70 per 100 000 live births by 2030 (UN, 2019). Therefore, this requires sufficient and sustainable efforts to remove various barriers to health care access and utilization, particularly in low and middle income countries.

Globally, an estimated 295 000 maternal deaths occurred in 2017, yielding an overall MMR of 211 maternal deaths per 100, 000 live births for the 185 countries (WHO, 2019). Furthermore, an estimated 3600 HIV-related indirect maternal deaths occurred in 2017, while the global HIV-related indirect MMR was estimated at 3 maternal deaths per 100, 000 live births. HIV and pregnancy interaction accounted for 1,22% of maternal deaths globally (WHO, 2019). According to the 2017 WHO estimates, the MMR for South Africa is estimated at 119 per 100,000 live births (WHO, 2019).

The baseline MMR measured in the 1998 Demographic and Health Survey (DHS) was 150 maternal deaths per 100 000 live births. Estimates from vital registration statistics show that between 2002 and 2009, South Africa experienced a significant increase in maternal deaths, with MMR estimated at 140 per 100,000 in 2002 and 283 per 100 000 live births in 2009 respectively. The MMR started to decline significantly from 2010, and this decline has been sustained.

The SADHS 2016, however estimates the pregnancy related mortality ratio during the 7 year period before the SADHS 2016 as 536 pregnancy related deaths per 100, 000 live births (National Department of Health (NDoH), Statistics South Africa (Stats SA), South African Medical Research Council (SAMRC) and ICF, 2019; Department of Health, 1998).

Various studies have indicated that most maternal deaths are preventable and the 2017 estimates from the World Health Organization (WHO) showed that of the women who died, a majority of them died from severe bleeding, sepsis, eclampsia, obstructed labour and the consequences of unsafe abortions – all causes for which there are highly effective interventions (UNFPA, 2019). Studies within sub-Saharan Africa have attributed such variations in maternal health outcomes and any issues related to pregnancy and childbirth within the region to socioeconomic disparities (Graham et al., 2001; Campbell & Graham, 2006). Another factor that contributes to the increase in the adverse maternal health outcome is the reliance of women on non-institutional maternal health services (Goli et al., 2014).

More importantly, antenatal care is an important health outcome that is essential in preventing many health problems during a woman's pregnancy. Many authors have argued that complete antenatal check-ups and use of skilled antenatal care providers is essential in promoting improved maternal and child health outcomes and in decreasing the risk of maternal mortality among pregnant women (Regassa, 2011; Susuman, 2012; Pell et al., 2013). The World Health Organization (WHO) also recommends that women have at least four antenatal visits during the first trimester (Garrido, 2009).

1.2 Frameworks positioning the report

The following developmental frameworks and strategies highlights maternal health care as an important strategy in the reduction of maternal mortality and morbidity.

Framework	Indicator	Target
Sustainable development goals (SDGs)	3.1.1 Maternal mortality ratio (MMR).	By 2030, reduce the global maternal mortality ratio to less than 70 per 100 000 live births.
	3.1.2 Proportion of births attended by a skilled health personnel.	
	3.1.2 A: Proportion of mothers and children who receive post-natal care either at home or in a facility.	
	3.2. Neonatal mortality rate and still birth rate.	By 2030, end preventable deaths of newborns and children under 5 years and to reduce neonatal mortality to at least 12 per 1000 live births.

African Union Agenda 2063 Aspirations	Aligned to SDG targets with a specific focus to African countries.
The Campaign on Accelerated Reduction of Maternal and Child Mortality in Africa (CARMMA)	<p>The following are the key components of CARMMA in South Africa:</p> <ol style="list-style-type: none"> 1. Strengthen and promote access to comprehensive sexual and reproductive health services, with specific focus on family planning services; 2. Promote early antenatal care and attendance; 3. Improve access to Skilled Birth Attendants; 4. Strengthening Human Resources for Maternal and Child Health; 5. Improve child survival by Intensifying management of HIV positive mothers and children by improving access to treatment for both mothers and children, improving management of co-infections, particularly TB and eliminating Mother to Child Transmission of HIV.
National Development Plan Vision 2030	<p>Identified four strategic outcomes for the health sector:</p> <ol style="list-style-type: none"> 1. Increase life expectancy to at least 70 years, 2. Decrease maternal and child mortality, 3. and combat HIV/AIDS, and TB.
National Committee on Confidential Enquiries into Maternal Deaths (NCCEMD)	Monitor deaths that occur in health facilities during pregnancy and childbirth.
Universal health coverage	United Nations resolution calling for countries to provide affordable and quality health care for all, everywhere.
Global Pregnancy Awareness Week	Observed from 12 to 16 February to promote healthy pregnancy and safe motherhood.

1.3 Objective of the report

The aim of the report is to examine patterns in the utilisation of selected maternal health care services in South Africa by using the South Africa Demographic and Health Surveys (1998 and 2016).

1.4 Report structure

The thematic report has four chapters:

1. Chapter 1 provides the background to the study and frameworks positioning the report;
2. Chapter 2 presents sources of data and methods used in the analysis;
3. Chapter 3 presents analysis of the patterns in the use of antenatal care, delivery care and post-natal care services; and
4. Chapter 4 summarises the findings of report based on the objectives of the report.

Chapter 2: Materials and Methodology

2.1 Data

The study is a cross sectional study which used women's and children's data from the South Africa Demographic and Health Surveys (1998 and 2016). These datasets are nationally representative samples, which permits one to make conclusions about the entire country based on the results obtained from such data.

2.2.1 SADHS 1998

The aim of the 1998 South Africa Demographic and Health Survey (SADHS) was to collect data as part of the National Health Information System of South Africa (NHIS/SA). A variety of demographic and health indicators were collected in order to contribute to the information base for health and population development programme management through accurate and timely data on a range of demographic and health indicators and also to provide baseline data for monitoring programmes and future planning (Department of Health, 1999).

The 1998 SADHS was a joint effort between various organisations. The Department of Health provided the funds and played an active role in the management of the survey. The Medical Research Council (MRC) co-ordinated the survey, provided technical input and undertook the processing and analysis of the data. MACRO International, funded by USAID, provided technical support in questionnaire design, sample design, field staff training, data processing and analysis. USAID provided additional funds for the sample in the Eastern Cape to be increased from the size in the original survey design. The University of Orange Free State's Centre for Health Systems Research and Development in partnership with King Finance Corporation implemented the fieldwork. The Human Sciences Research Council (HSRC) made technical input on the design and quality control of the survey. Statistics South Africa (SSA) provided sampling details in each of the nine provinces (Department of Health, 1999).

The survey utilised three questionnaires: a Household Questionnaire, a Woman's Questionnaire and an Adult Health Questionnaire. The contents of the first two were adapted from the DHS Model Questionnaires to meet the needs of the national and provincial Departments of Health. The Adult Health Questionnaire was developed to obtain information regarding the health of adults. The sample for the 1998 SADHS was designed to be a nationally representative probability sample of approximately 12,000 completed interviews with women between the ages of 15 and 49. The country was stratified into the nine provinces and each province was further stratified into urban and non-urban areas. The sampling frame for the SADHS was created by the Central Statistical Services, now Statistics South Africa (SSA), for the 1996 census. Within each stratum a two-stage sample was selected. Pregnancy history and antenatal and delivery care were also asked in the questionnaire (Department of Health, 1999).

A total of 12,860 households were selected for the sample and 12,247 were successfully interviewed. The shortfall was primarily due to refusals and to dwellings that were vacant or in which the inhabitants had left for an extended period at the time they were visited by interviewing teams. Of the 12,638 households occupied

97 percent were successfully interviewed. In these households, 12,327 women were identified as eligible for the individual women's interview (15–49) and interviews were completed with 11,735 or 95 percent of them (Department of Health, 1999).

2.2.2 SADHS 2016

Statistics South Africa (Stats SA), in partnership with the South African Medical Research Council (SAMRC), conducted the South Africa Demographic and Health Survey 2016 at the request of the National Department of Health (NDoH). Technical assistance was provided through The DHS Program. The primary objective of the SADHS 2016 was to provide up-to-date estimates of basic demographic and health indicators. The sampling frame used for the SADHS 2016 is the Statistics South Africa Master Sample Frame (MSF), which was created using Census 2011 enumeration areas. The SADHS 2016 followed a stratified two-stage sample design with a probability proportional to size sampling of PSUs at the first stage and systematic sampling of DUs at the second stage [National Department of Health (NDoH), Statistics South Africa (Stats SA), South African Medical Research Council (SAMRC) and ICF, 2019].

Five questionnaires were used in the SADHS 2016: the Household Questionnaire, the individual Woman's Questionnaire, the individual Man's Questionnaire, the Caregiver's Questionnaire, and the Biomarker Questionnaire. These questionnaires, based on The DHS Program's standard Demographic and Health Survey questionnaires were adapted to reflect the population and health issues relevant to South Africa [National Department of Health (NDoH), Statistics South Africa (Stats SA), South African Medical Research Council (SAMRC) and ICF, 2019].

The Woman's Questionnaire was used to collect information from all eligible women age 15 years and older. More importantly, section 2 on reproduction asked questions on birth histories, while section 4 asked questions on antenatal, delivery, and postnatal care. In the SADHS 2016, interviewers used tablet computers to record responses during interviews. With regards to response rates, a total of 15,292 households were selected for the sample, of which 13,288 were occupied. Of the occupied households, 11,083 were successfully interviewed, yielding a response rate of 83%. In the interviewed households, 9,878 eligible women age 15–49 were identified for individual interviews; interviews were completed with 8,514 women, yielding a response rate of 86%. During SADHS 2016 the computer-assisted personal interviewing (CAPI) data collection system was employed which was developed by the DHS Program using the mobile version of CSPro. Lastly, the survey protocol was reviewed and approved by the SAMRC Ethics Committee and the ICF Institutional Review Board [National Department of Health (NDoH), Statistics South Africa (Stats SA), South African Medical Research Council (SAMRC) and ICF, 2019].

2.3 Measurements

The indicators assessed in this report provide a snapshot of maternal health care received by women during pregnancy, childbirth and after delivery. Table 2 below presents a list of selected maternal health indicators, and standard definitions from SADHS methodology document, which are used to calculate the indicators across each survey and the sample size.

Table 2: Maternal health indicators included in the analysis

Indicator	Definition	Unit of analysis	Sample size 1998	Sample size 2016
Four or more antenatal care visits (ANC)	Percentage of women with four or more antenatal care visits for their most recent pregnancy	Women age 15–49 with a live birth in the five years preceding the survey	4119	3036
Births assisted by a skilled birth attendant (SBA)	Percentage of births that were assisted by an SBA	Births in the five years preceding the survey	4992	3572
Births delivered by caesarean section	Percentage of births that were delivered by caesarean section	Births in the five years preceding the survey	4992	3572
Birth delivered in a facility	Percentage of births that were delivered in a facility	Births in the five years preceding the survey	4992	3572
Postnatal care for the mother	Percentage of women with a live birth in the 2 years preceding the survey who received a postnatal check during the first 2 days after giving birth.	Women age 15–49 with a live birth in the 2 years preceding the survey	No indicator in the dataset	1386

Chapter 3: Results

3.1 Background characteristics

The proportion of women aged 15-49 with a live birth in the 5 years preceding the survey is reported in table 3 below by selected background characteristics. The results indicate that by age of the mother, the biggest percentage change in the proportion of women with a live birth in the past 5 years was evident amongst women aged 20-24 (10%), 25-29 (8,2%), and 35-39 (-9,9%). Across all the provinces, a decline in the proportion of women with alive birth in the 5 years preceding the survey was evident amongst women who resided in rural areas (-18,8%) and in Limpopo (-6,2%), Eastern Cape (-4,5%), and KwaZulu Natal (-4%) provinces. As evident in the data, there has also been a percentage change in women with a live birth preceding the two SADHS with primary and no education. By population group, a high proportion of black African women gave birth in the 5 years preceding SADHS 1998 and 2016 relative to women in other population groups in both years. By household wealth, the proportion of women who had a live birth 5 years preceding the two surveys were highest amongst the poorer households.

Table 3: Distribution of women 15–49 with a live birth in the 5 years preceding the survey, according to background characteristics, SADHS 1998 and 2016

Age of the Mother	SADHS 1998	SADHS 2016	% Change
15–19	2,8	5,8	3
20–24	13,0	23,0	10
25–29	20,0	28,2	8,2
30–34	22,9	21,4	-1,5
35–39	23,6	13,7	-9,9
40–44	12,9	6,6	-6,3
45–49	4,8	1,4	-3,4
Type of place of residence			
Urban	45,2	64,0	18,8
Rural	54,8	36,0	-18,8
Province			
Western Cape	7,2	9,1	1,9
Eastern Cape	15,5	11,0	-4,5
Northern Cape	1,8	2,0	0,2
Free State	5,0	4,8	-0,2
KwaZulu-Natal	22,3	18,3	-4
North West	6,5	8,0	1,5
Gauteng	17,8	27,7	9,9
Mpumalanga	7,8	9,2	1,4
Limpopo	16,1	9,9	-6,2

Education			
No education	14,5	1,4	-13,1
Primary	34,8	8,2	-26,6
Secondary	45,9	78,9	33
Higher	4,7	11,6	6,9
Population group			
black African	85,9	90,6	4,7
Coloured	7,9	1,5	-6,4
White	3,5	6,8	3,3
Asian/Indian	2,0	1,0	-1
Combined wealth index			
Poorest	*	21,4	*
Poorer	*	24,3	*
Middle	*	22,1	*
Richer	*	18,4	*
Richest	*	13,7	*
Total	100,0	100,0	100,0

Indicates no computed wealth index variable in SADHS 1998 data

3.2 Antenatal care

Table 4 below shows the proportion of women in each survey with a live birth who obtained antenatal care services during their most recent pregnancy. The patterns show little change since 1998 in the proportion of women attending the recommended four or more ANC visits (73,1% in 1998 and 75,5% in 2016). A slight increase is however noted in the proportion of women who attended no antenatal care during their most recent pregnancy (3,2 % in 1998 to 5,7% in 2016).

Table 4: Proportion of women age 15–49 who had a live birth in the 5 years preceding the survey by number of Antenatal care visits for the most recent births

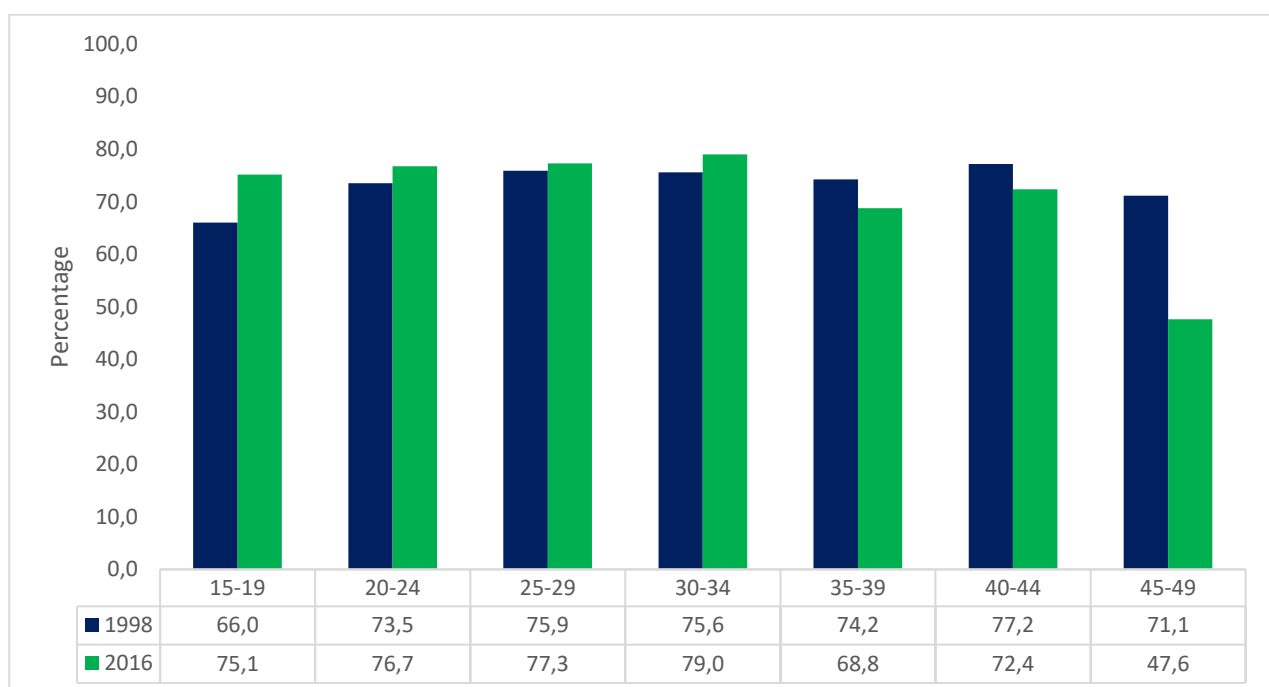
Number of ANC Visits	SADHS 1998	SADHS 2016
None	3,1	5,7
1	1,8	2,1
2–3	13,0	13,4
4+	73,1	75,5
Don't Know	9,0	3,3

Source: National Department of Health (NDoH), Statistics South Africa (Stats SA), South African Medical Research Council (SAMRC) and ICF, 2019; Department of Health, 1998

3.2.1 Antenatal care visits by age of mother

Figure 1 below shows the proportion of women aged 15-49 who had four or more antenatal care visits for their most recent pregnancy in the five years preceding the two SADHS surveys by mothers age at birth. The results indicate a marked increase in the proportion of women aged 15-19 attending four or more antenatal care visits (66% in 1998 to 75% in 2016). However the proportion of women attending four or more antenatal care visits during the SADHS 2016 decreased in older women aged 35-49, with the largest decline noted in women 45-49 (-23.5%)

Figure 1: Proportion of women aged 15-49 who had four or more antenatal care visits for their most recent pregnancy in the five years preceding the survey, by age at child's birth, 1998 and 2016 SADHS

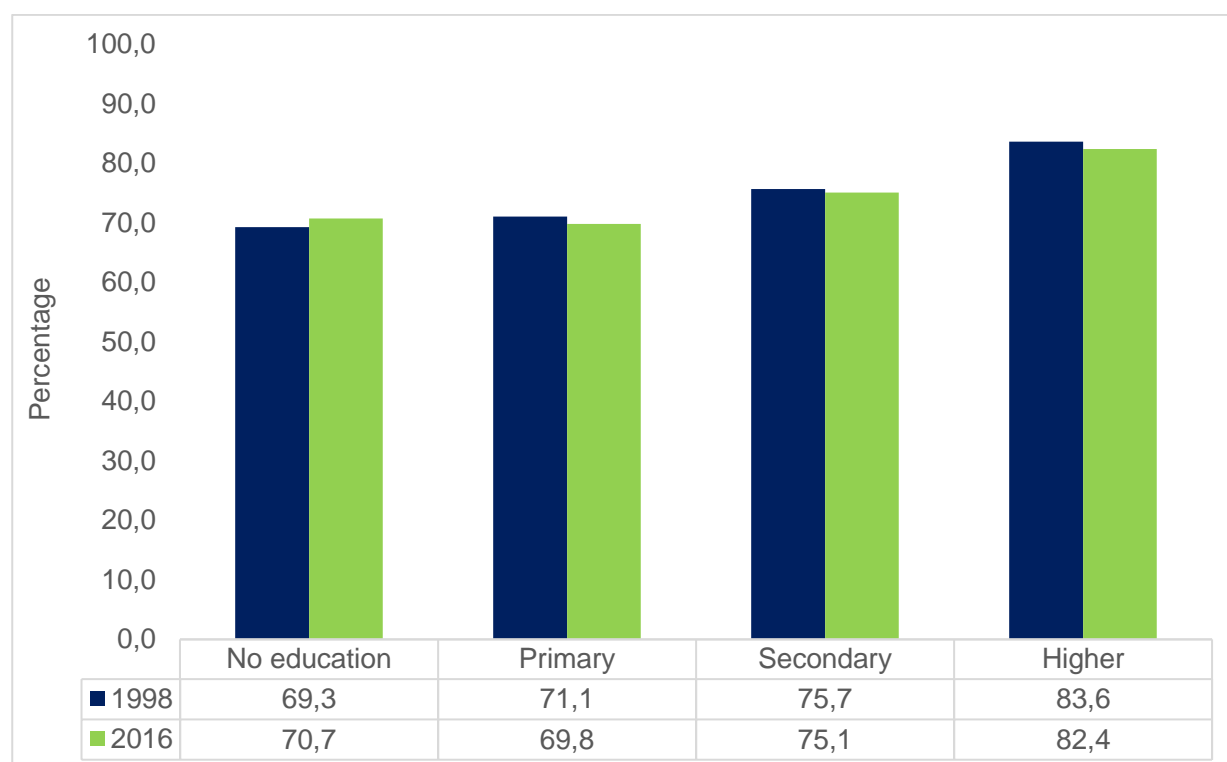


Source: Calculated from SADHS 1998 and 2016 data

3.2.2 Antenatal care visits by mother's education

Figure 2 below shows the proportion of women age 15-49 who had four or more antenatal care visits for their most recent pregnancy in the five years preceding the survey, by level of education from 1998 and 2016 SADHS. The proportion of women with four or more visits increases with higher levels of education. However, there has been little change in the proportion of women attending four or more antenatal visits by education level between 1998 and 2016.

Figure 2: Proportion of women aged 15–49 who had four or more antenatal care visits for their most recent pregnancy in the five years preceding the survey, by education, 1998 and 2016 SADHS

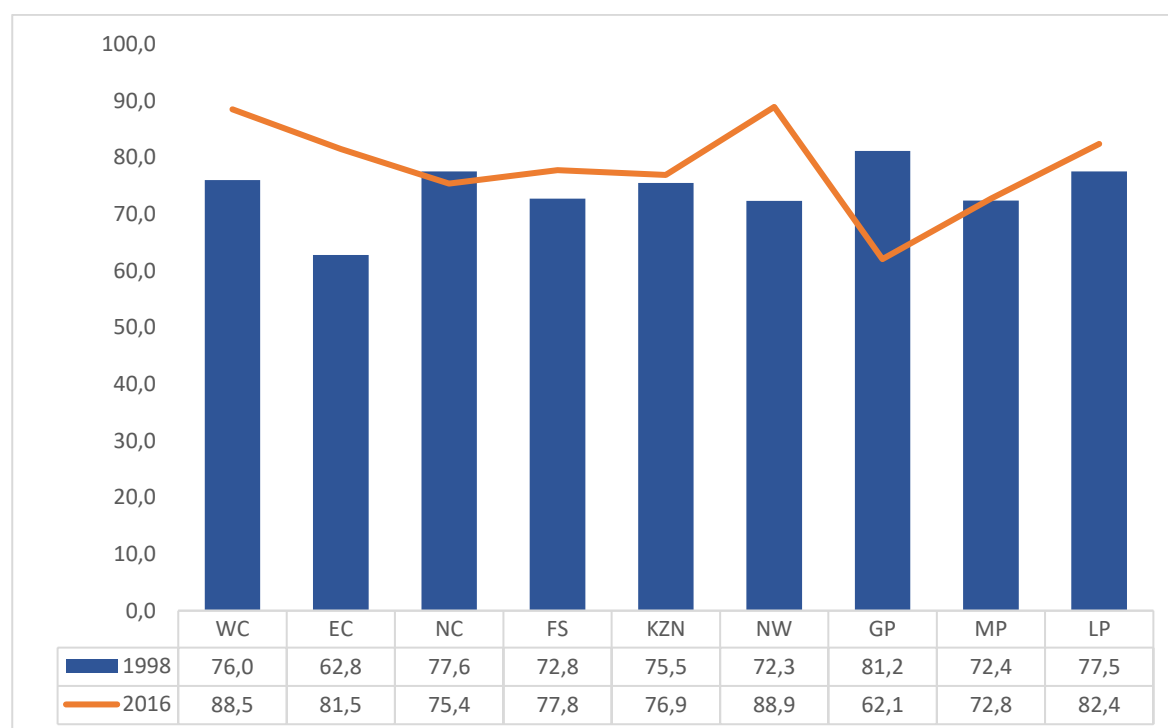


Source: calculated from SADHS 1998 and 2016

3.2.3 Antenatal care visits by province

Figure 3 below presents the proportion of women aged 15–49 who had four or more antenatal care visits for their most recent pregnancy in the five years preceding the survey, by province, 1998 and 2016 SADHS. In 1998 SADHS, Eastern Cape (62,8%) reported the lowest proportion of women who had attended the recommended four or more antenatal care visits, while in 2016 SADHS, Gauteng (62,1%) reported the lowest proportion of women attending four or more visits. Amongst all the provinces, there has been an increase in the proportion of women attending four or more antenatal care visit, except Gauteng.

Figure 3: Proportion of women aged 15-49 who had four or more antenatal care visits for their most recent pregnancy in the five years preceding the survey, by province, 1998 and 2016 SADHS

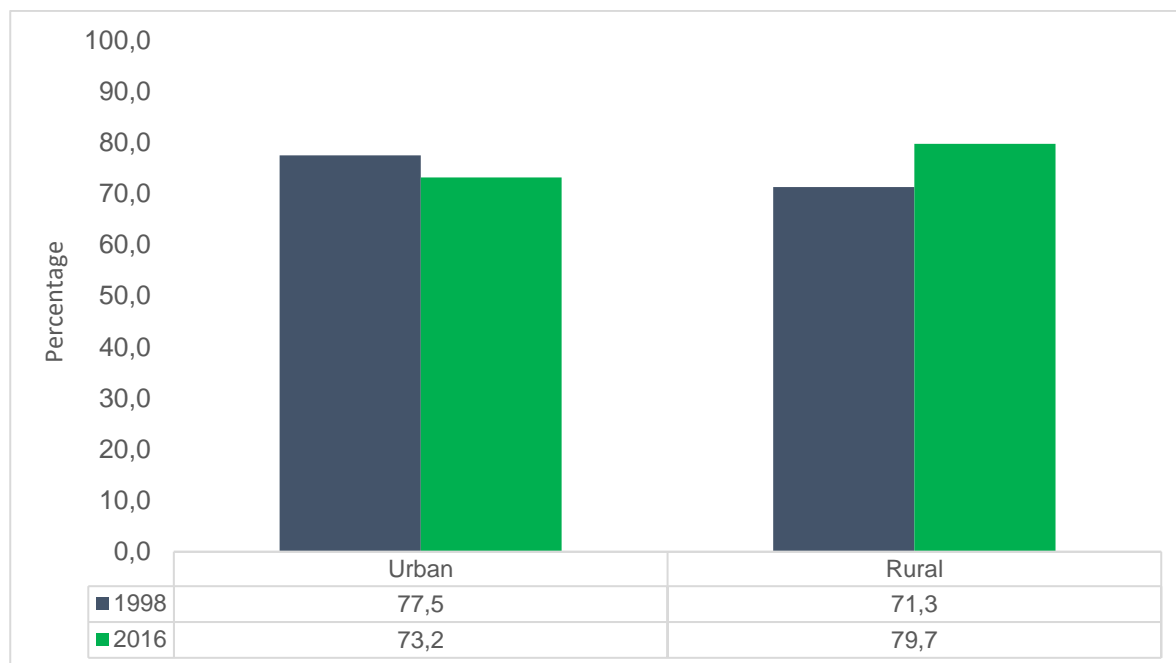


Source: Calculated from SADHS 1998 and 2016 data

3.2.4 ANC by type of place of residence and combined household wealth Index

Figures 4 and 5 show the proportion of women aged 15-49 who had four or more antenatal care visits for their most recent pregnancy in the five years preceding the survey, by type of place of residence and combined wealth index. Overall there was an increase in the proportion of women attending four or more ANC visits in rural areas (71,3% in 1998 to 79,7% in 2016), while there was a decline in attendance of four or more visits by urban area women (77,5% in 1998 to 73,2% in 2016). Analysis of four or more ANC visits by household wealth indicates that higher proportions of women from middle, richer and richest households attended the recommended four or more ANC visits.

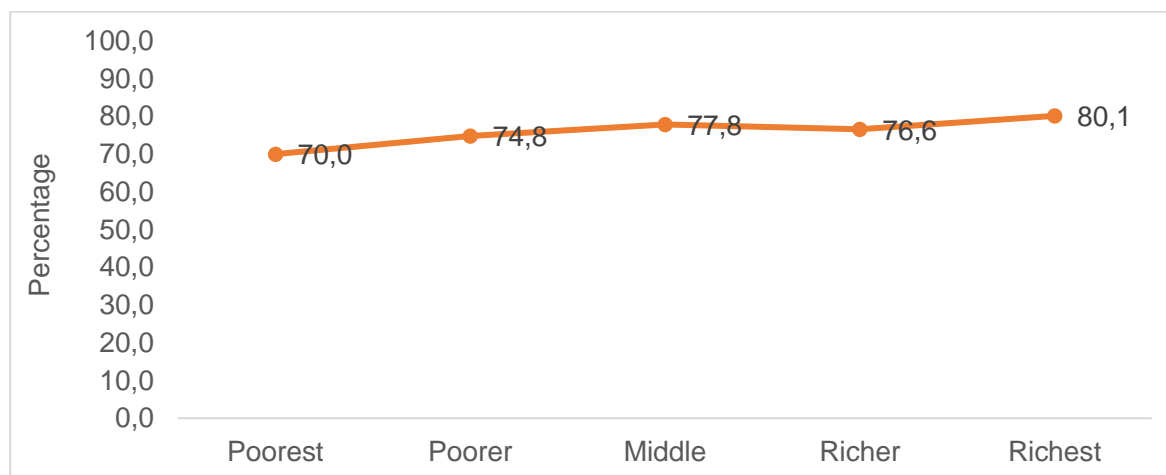
Figure 4: Proportion of women aged 15–49 who had four or more antenatal care visits for their most recent pregnancy in the five years preceding the survey, by type of place of residence, 1998 and 2016 SADHS



Source: Calculated from SADHS 1998 and 2016 data

Figure 5 shows the proportion of women aged 15–49 who had four or more antenatal care visits for their most recent pregnancy in the five years preceding the survey combined wealth index from the 2016 SADHS. Four or more ANC visits by household wealth indicates that middle, richer and richest households had a high proportion of four or more ANC visits.

Figure 5: Percentage of women aged 15–49 who had four or more antenatal care visits for their most recent pregnancy in the five years preceding the survey, by combined household wealth Index, 2016 SADHS

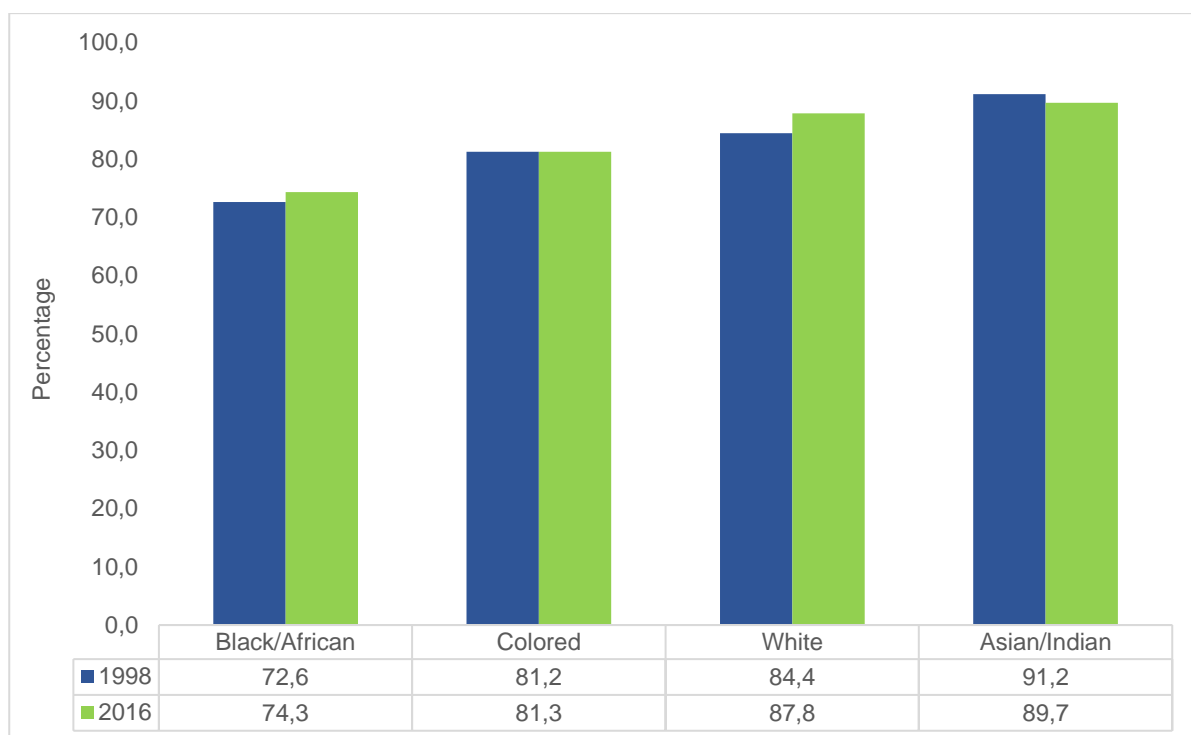


Source: Calculated from SADHS 1998 and 2016 data

3.2.5. ANC by population group

Antenatal care visits by population group is shown in figure 6 below. Across the two SADHS, the Asian/Indian and White population groups reported higher proportions of women attending four or more visits. The black African population group had lower proportion of women attending four or more antenatal care visits (72,6% in 1998, and 74,3% in 2016). *Note: figures for Asian/Indian are based on 25–49 unweighted cases and therefore should thus be interpreted with caution for both surveys.*

Figure 6: Proportion of women aged 15-49 who had four or more antenatal care visits for their most recent pregnancy in the five years preceding the survey, by population group, 1998 and 2016 SADHS

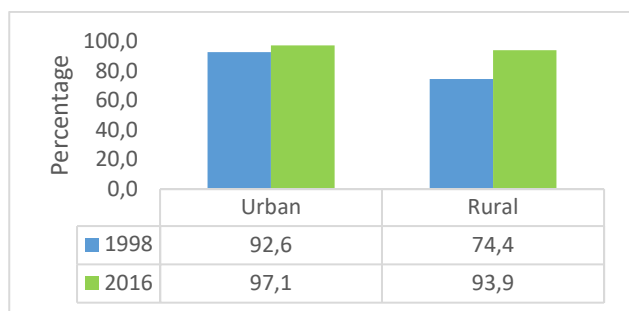


Source: Calculated from SADHS 1998 and 2016 data

3.3 Delivery in health facility

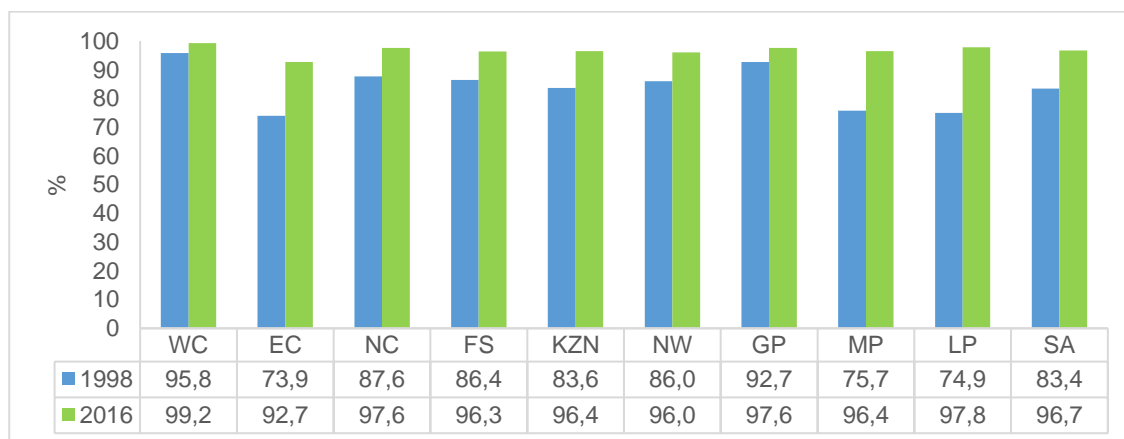
3.3.1 Proportion of births delivered in a health facility by type of place of residence

Figure 7 below shows the proportion of births delivered in a health facility by type of place of residence of the mother. The figure shows that deliveries in a health facilities increased for rural women from 74,4% in 1998 to 93,9% in 2016, and from 92,6% in 1998 to 97,1% in 2016 for urban women.

Figure 7: Proportion of births delivered in a health facility by type of place of residence

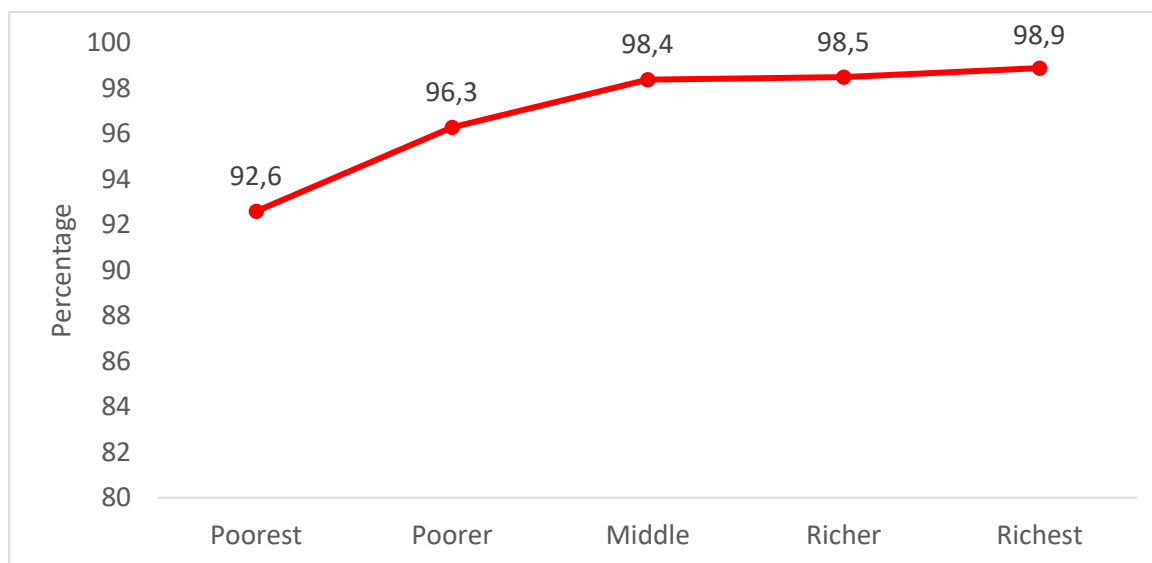
Source: National Department of Health (NDoH), Statistics South Africa (Stats SA), South African Medical Research Council (SAMRC) and ICF, 2019; Department of Health, 1998

Figure 8 below shows the proportion of births delivered in a health facility by province. The figure indicate significant variations amongst provinces in 1998; however by 2016 over 92% of deliveries occurred in a health facilities across all provinces. The significant improvements seen in the predominantly rural provinces including the Eastern Cape, Limpopo and Mpumalanga provinces may be due to the intensive introduction of primary health care services in South Africa over the past 20 years. Western Cape reported the highest proportion of births in a facility from 95,8% in 1998 to 99,2% in 2016. Nationally deliveries in a health facility increased from 83,4% in 1998 to 96,7% in 2016. According to SADHS 2016, home deliveries also decreased from 14% in 1998 to 4% in 2016. The majority of institutional deliveries took place at public sector health facilities.

Figure 8: Proportion of births delivery in a health facility by province

Source: National Department of Health (NDoH), Statistics South Africa (Stats SA), South African Medical Research Council (SAMRC) and ICF, 2019; Department of Health, 1998

Figure 9 below shows the proportion of births delivered in a health facility by wealth quantile. The figure indicates significant variations by wealth with the percentage of births that take place in a health facility increasing with the wealth quantile of the mother.

Figure 9: Proportion of births delivery in a health facility by wealth quantile

Source: National Department of Health (NDoH), Statistics South Africa (Stats SA), South African Medical Research Council (SAMRC) and ICF, 2019; Department of Health, 1998

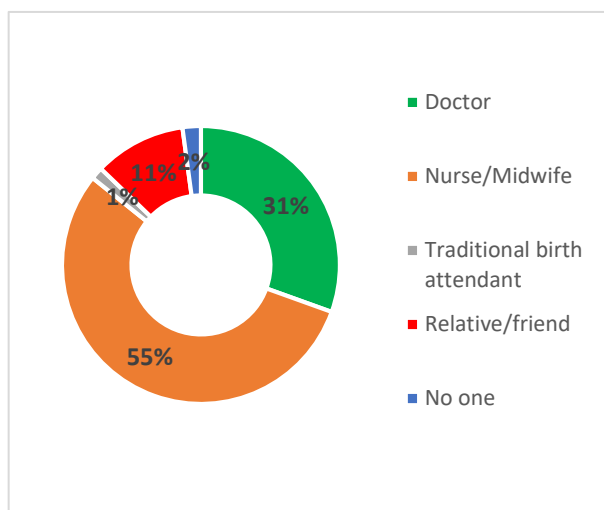
3.4 Skilled Birth Attendant

This indicator shows the percentage of births that were delivered in the presence of a skilled birth attendant. These are the births delivered with the assistance of doctors, nurses, or midwives. The presence of a skilled healthcare professional during delivery is crucial in reducing maternal and child deaths.

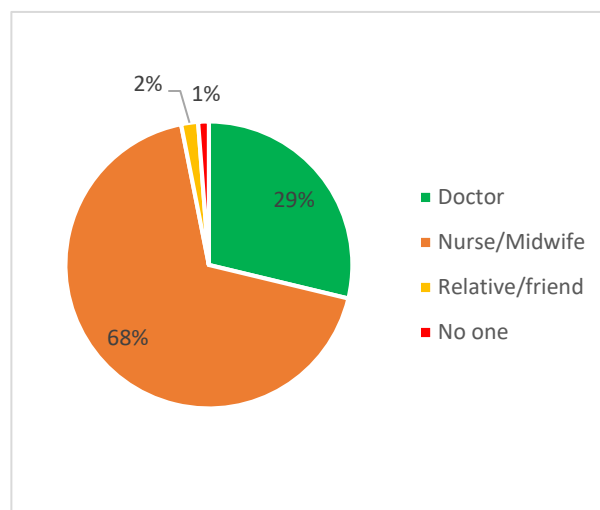
Figure 10 below shows the proportion of births by person providing assistance during delivery from SADHS 1998 and 2016. The results indicate that the percentage of births delivered by a skilled provider rose from 84% in 1998 to 97% in 2016. This improvement is entirely due to an increase in the percentage of births delivered by nurses or midwives (55% in 1998 versus 68% in 2016); there was little change in the percentage delivered by doctors (31% in 1998 versus 29% in 2016).

Figure 11: Panel (a-b): Proportion of births by person providing assistance during delivery, SADHS 1998 and 2016

(a) SADHS 1998



(b) SADHS 2016



Source: calculated from SADHS 1998 and 2016 data

3.5 Delivery by caesarean section

Since 1985, the international healthcare community has considered the ideal rate for caesarean sections to be between 10% and 15% (WHO, 2015). Since then, caesarean sections have become increasingly common in both developed and developing countries. Various studies have shown that access to caesarean sections can reduce maternal and neonatal mortality. However, the use of caesarean sections without a medical need can put women at risk of short- and long-term health problems. The WHO advises that caesarean sections be done only when medically necessary but does not further recommend a target rate for countries to achieve at the population level as a guideline.

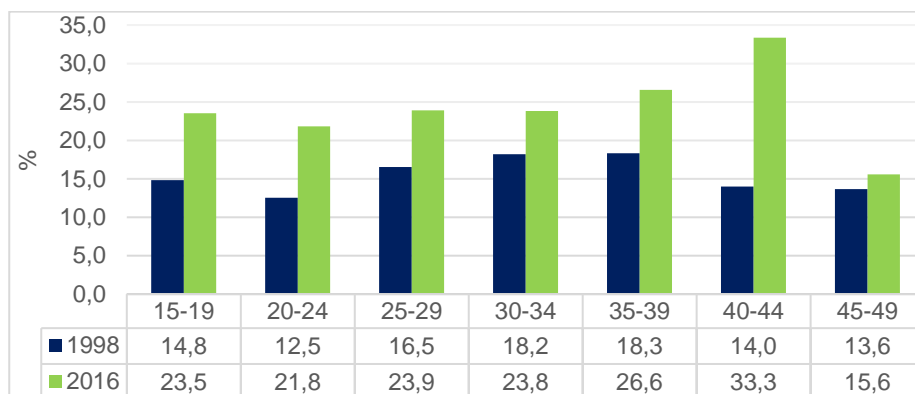
Research conducted by WHO has also shown that increases in countries' caesarean section rates up to 10% are associated with declines in maternal and neonatal mortality. On the other hand, increases in caesarean section rates beyond 10% are not associated with reductions in maternal and newborn mortality rates (WHO 2015).

In South Africa, the proportion of births delivered by caesarean section increased from 16% in 1998 to 24% in 2016 – a 50% increase. Additionally, the SADHS 2016 has shown that six in 10 (61%) of births delivered at private health facilities are caesarean births, as compared with 22% of births delivered at public health facilities (Source: National Department of Health (NDoH), Statistics South Africa (Stats SA), South African Medical Research Council (SAMRC) and ICF, 2019; Department of Health, 1998).

3.5.1 Caesarean section by mothers age

Figure 12 below shows that the proportion of births delivered by caesarean section were highest for women aged 40-44 (33,3%), followed by women aged 35-39 (26,6%) in SADHS 2016. Across all ages, there has been an increase in the proportion of caesarean section deliveries in South Africa.

Figure 12: Proportion of births delivered by caesarean section by age of mother

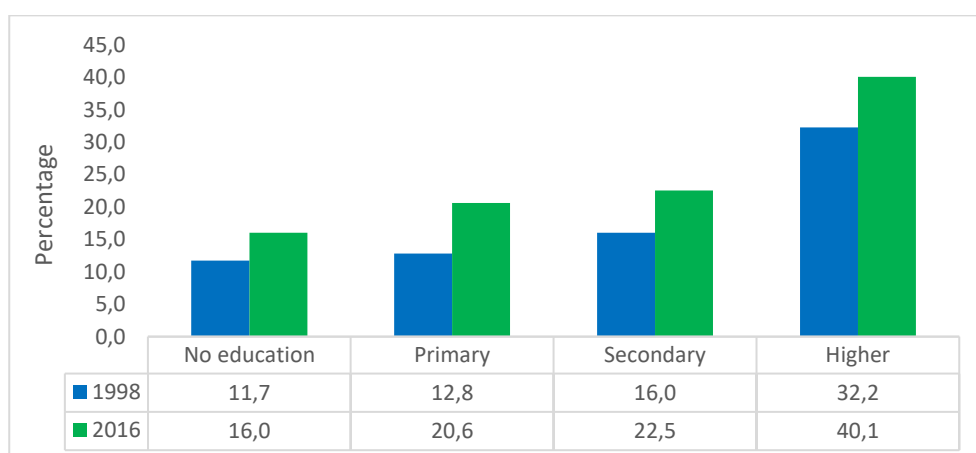


Source: National Department of Health (NDoH), Statistics South Africa (Stats SA), South African Medical Research Council (SAMRC) and ICF, 2019; Department of Health, 1998

3.5.2 Caesarean section deliveries by level of education

Figure 13 shows the proportion of deliveries by caesarean section by level of education of the mother. The results indicate that a higher proportion of deliveries amongst more educated women were by caesarean section.

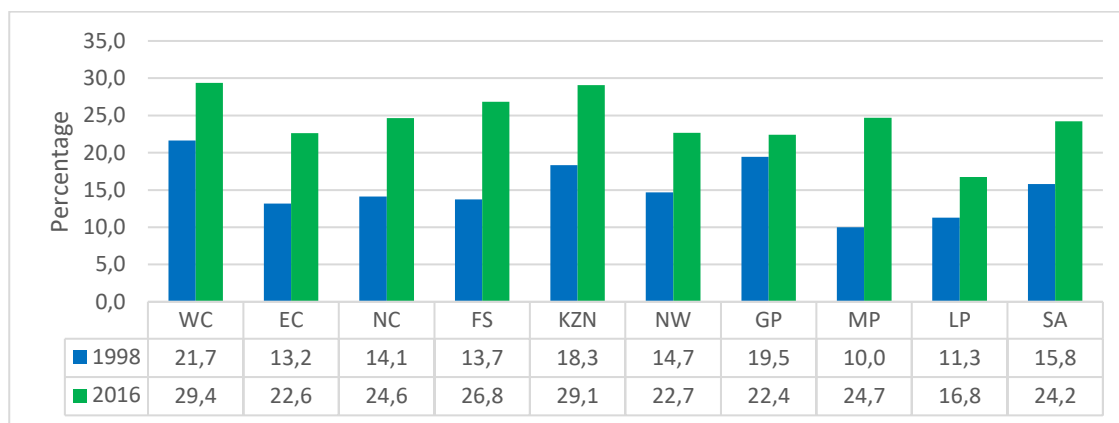
Figure 13: Proportion of births delivered by caesarean section by education



Source: National Department of Health (NDoH), Statistics South Africa (Stats SA), South African Medical Research Council (SAMRC) and ICF, 2019; Department of Health, 1998

Across provinces, the proportion of births delivered by caesarean ranged from a low of 17% in Limpopo to a high of 29,4% in Western Cape in 2016. Western Cape, KwaZulu-Natal and Free State provinces has had the highest proportions of births by caesarean sections in the country.

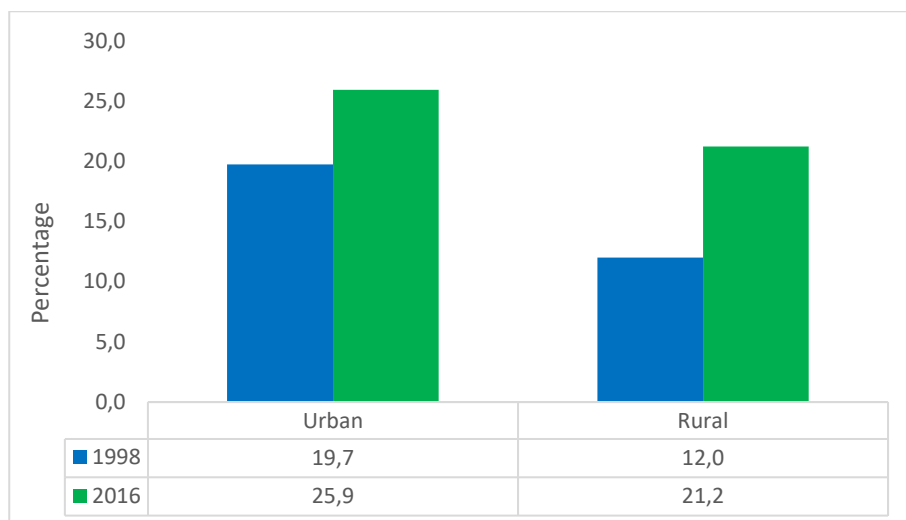
Figure 14: Proportions of births delivered by caesarean section by province



Source: National Department of Health (NDoH), Statistics South Africa (Stats SA), South African Medical Research Council (SAMRC) and ICF, 2019; Department of Health, 1998

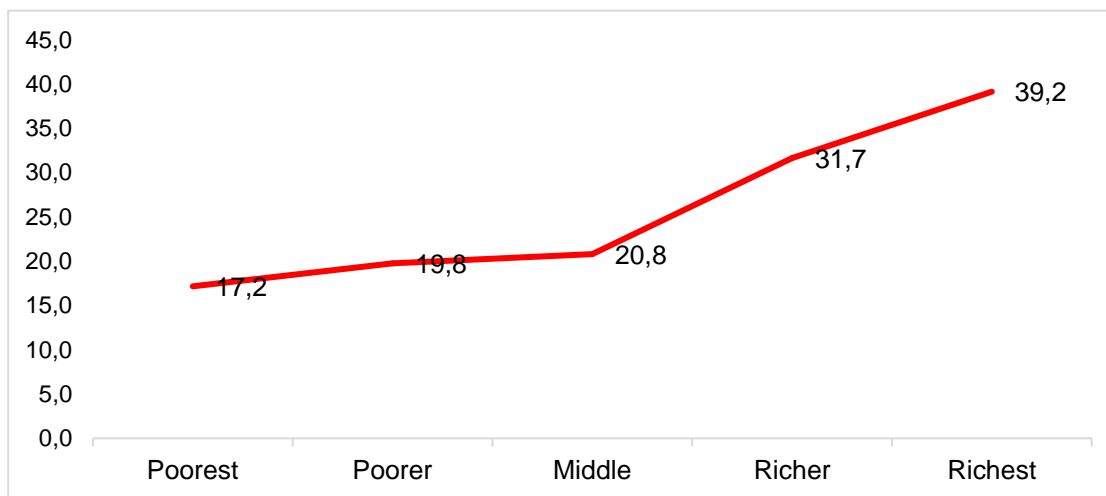
The caesarean delivery rate is higher in urban areas (19,7% in 1998 and 25,9% in 2016) than rural areas (12% in 1998 and 21,2% in 2016%).

Figure 15: Proportion of births that were delivered by Caesarean section by type of place of residence



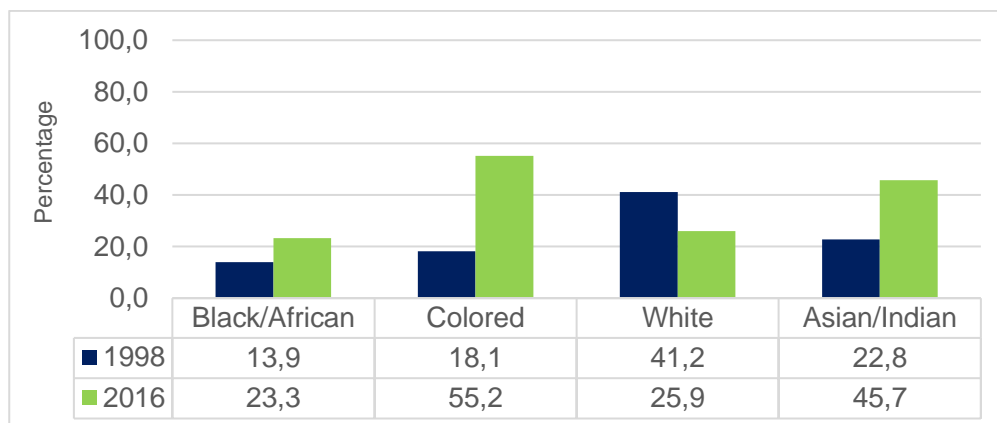
Source: National Department of Health (NDoH), Statistics South Africa (Stats SA), South African Medical Research Council (SAMRC) and ICF, 2019; Department of Health, 1998

By household wealth, the caesarean section delivery rate in 2016 SADHS is higher amongst the richest (31%) followed by richer (25%) wealth quantile households.

Figure 16: Proportion of births by caesarean section by household wealth

Source: National Department of Health (NDoH), Statistics South Africa (Stats SA), South African Medical Research Council (SAMRC) and ICF, 2019

By population group in figure 17, the caesarean section delivery rate in 2016 SADHS is higher amongst coloured women (55,2%) followed by Asian/Indian (45,7%). *Note that figures by population groups should thus be interpreted with caution as the Asian/Indian population group had a smaller sample size.*

Figure 17: Proportion of births delivered by caesarean section by population group

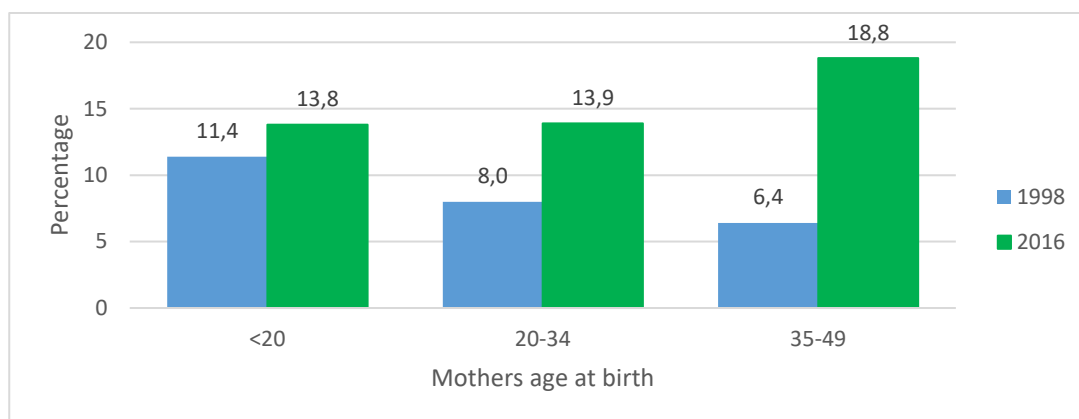
Source: National Department of Health (NDoH), Statistics South Africa (Stats SA), South African Medical Research Council (SAMRC) and ICF, 2019; Department of Health, 1998

3.6 Child weight at birth

Birth weight is the body weight of a baby at its birth. This indicator is a major determinant of infant and child health and mortality. Children who weigh less than 2,5 kilograms (kg) at birth or who are reported to be very small or smaller than average are considered to have a higher than average risk of early childhood death. For births in the 5 years preceding the survey, birth weight was recorded in the questionnaire if available from either a written record or the mother's recall. Because birth weight may not be known for many babies, mothers'

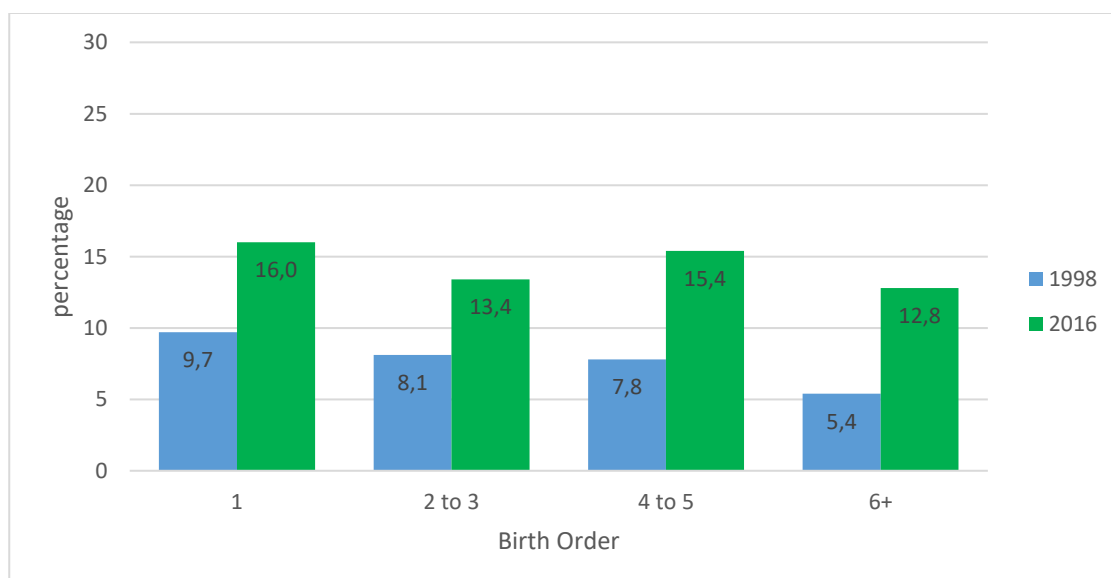
estimates of their baby's size at birth were also obtained. *Although these estimates are subjective, they can be a useful proxy for birth weight.* Figure 18 shows the proportion of births by birth weight by mothers age at birth. The figure indicates that the proportion of births weighing less than 2,5 kg has increased across all age groups between 1998 and 2016. The highest proportion was amongst women aged 20-34 and 35-49.

Figure 18: Proportion of births weighing less than 2,5 kg by mothers age



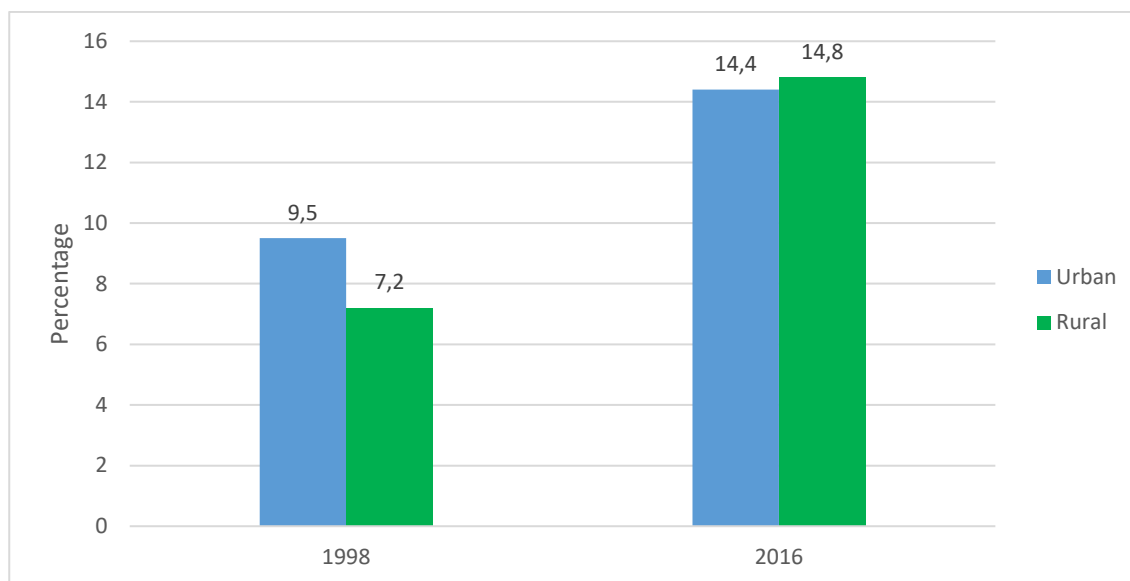
Source: National Department of Health (NDoH), Statistics South Africa (Stats SA), South African Medical Research Council (SAMRC) and ICF, 2019

Figure 19: Proportion of births weighing less than 2,5 kg by birth order



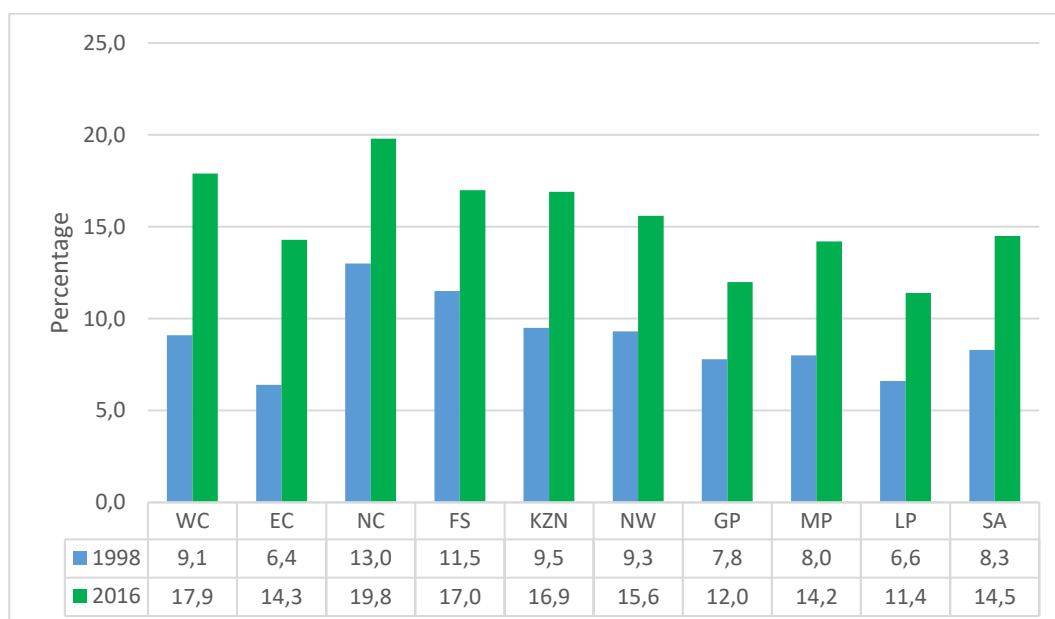
Source: National Department of Health (NDoH), Statistics South Africa (Stats SA), South African Medical Research Council (SAMRC) and ICF, 2019

By type of place of residence, there has been an increase in the percentage of births weighing less than 2,5kg from 1998 to 2016.

Figure 20: Proportion of births weighing less than 2,5 kg by type of place of residence

Source: National Department of Health (NDoH), Statistics South Africa (Stats SA), South African Medical Research Council (SAMRC) and ICF, 2019

As shown in figure 20, by province, the proportion of births with a low birth weight was highest in Northern Cape (20%) in 2016 and lowest in Eastern Cape (6%) in 1998 and in Limpopo (11%) in 2016.

Figure 21: Proportion of births weighing less than 2,5 kg by province

Source: National Department of Health (NDoH), Statistics South Africa (Stats SA), South African Medical Research Council (SAMRC) and ICF, 2019

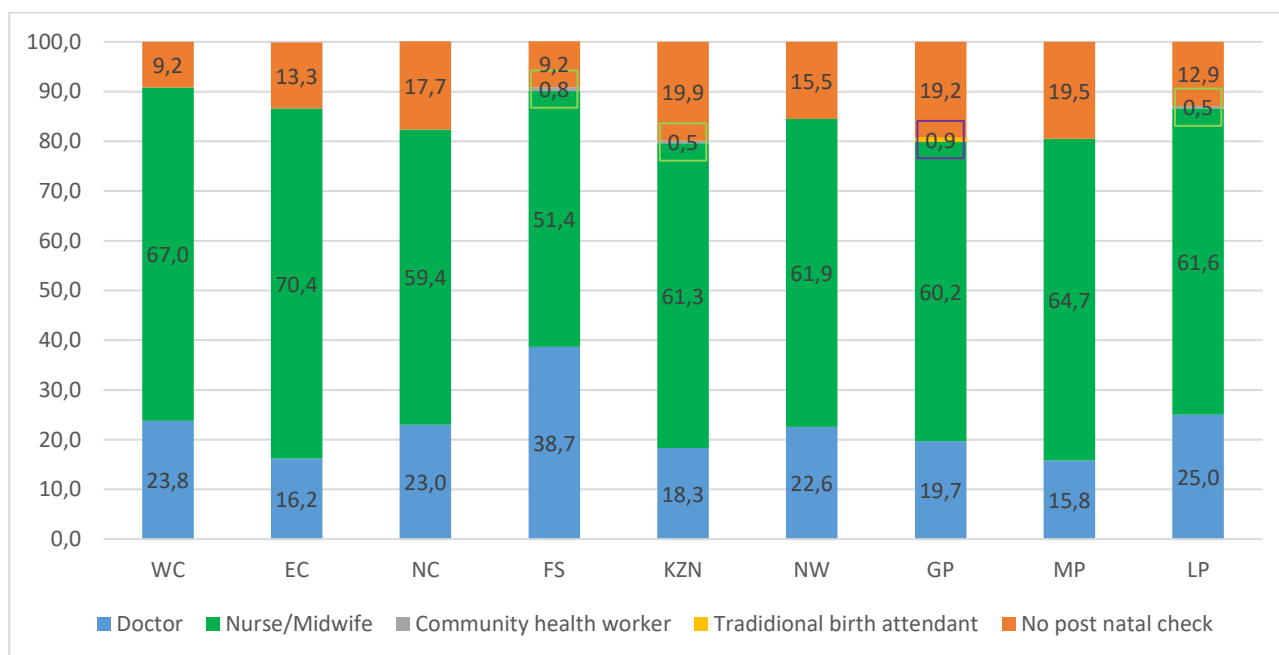
3.7 Postnatal care for mother and the child

The days and weeks following childbirth, (the postnatal period) are a critical phase in the lives of mothers and newborn babies. Most maternal and infant deaths occur in the first month after birth (WHO, 2013). An analysis of Demographic and Health Survey data from 23 sub-Saharan African countries found that only 13% of women who delivered at home received postnatal care within 2 days of birth (Warren et al, 2006).

3.7.1 Postnatal Health Check for Mothers

Safe motherhood programme recommend that women receive a postnatal health check within 2 days after delivery. In South Africa, 84% of mothers and 86% of newborns had a postnatal check during the first 2 days after delivery (SADHS, 2016). By province, Western Cape and Free State have the highest proportions of women who received a timely postnatal health check (91% each), while KwaZulu-Natal has the lowest percentage (80%).

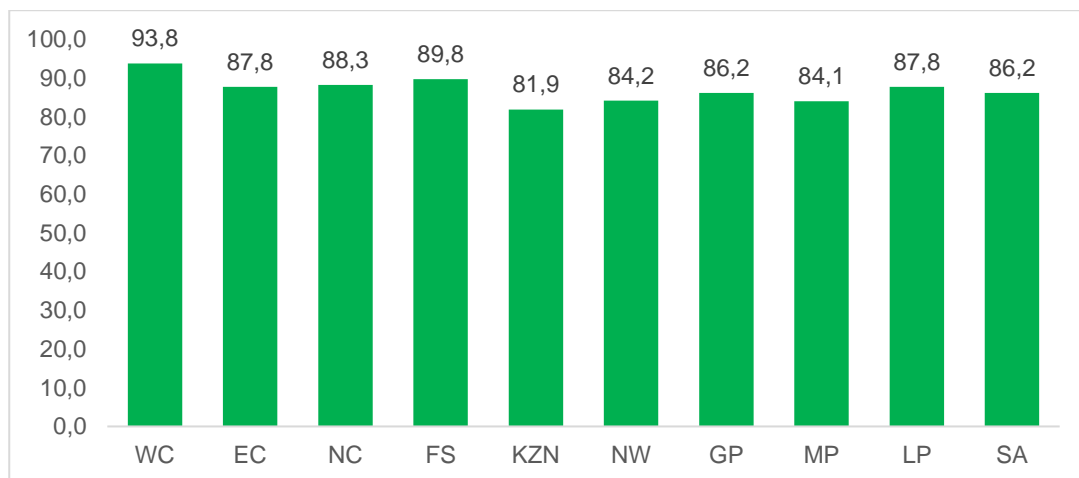
Figure 22: Proportion of mother's first postnatal health check during the 2 days after the most recent live birth, by type of provider



Source: National Department of Health (NDoH), Statistics South Africa (Stats SA), South African Medical Research Council (SAMRC) and ICF, 2019

3.7.2 Postnatal health check for newborns

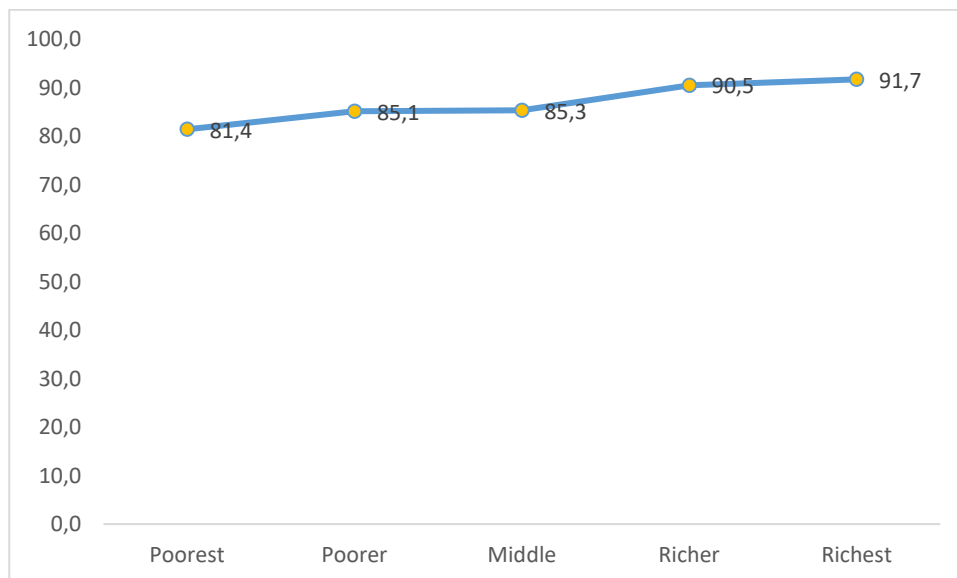
Figure 23: Proportion of births with a postnatal check during the first 2 days after birth by province



In SADHS 2016, the proportion of newborns with a postnatal check was lowest in KwaZulu-Natal (82%) and highest in Western Cape (94%).

By household wealth quantile, the proportion of newborns who received a timely postnatal check, was high among newborns born to women in the highest household wealth quantile (91,7%).

Figure 24: Proportion of births with a postnatal check during the first 2 days after birth, household by wealth quantile



Chapter 4: Summary of findings

This report analysed patterns in the use of maternal health care services based on data from South Africa Demographic and Health Surveys. The surveys were conducted in 1998 and 2016, and the reference periods for the births are the five years before each survey and births in the preceding two years for post-natal care. The analysis focused on three broad coverage indicators directly related to the risk of maternal mortality - antenatal care, delivery care and, postnatal care, by selected socio-demographic characteristics of women. These include women's age, highest level of education, household wealth quantile, type of place of residence (urban-rural) and province. The analysis found significant improvements in the use of antenatal care, delivery and post-natal care between 1998 and 2016, but also identified large disparities in outcomes by women's characteristics, especially by household wealth quantile, type of place of residence, highest level of education, and by province.

4.1 Antenatal care

The results indicate that there has been little changes since 1998 in the proportion of women with the recommended four or more ANC visits since 1998. Over time, the proportion of young women aged 15-19 attending four or more antenatal care visits increased. However, a decrease in the proportion of women attending four or more antenatal care visits was observed amongst older women aged 35-49 and 45-49. By highest level of education, the proportion of women with four or more visit is lowest amongst women with no education and those having primary education. Rural provinces showed a marked increase in the proportion of women attending four or more antenatal care visits. By household wealth quantile, the proportion of women who attended four or more ANC visits was higher amongst women from middle, richer and richest households. According to the 2017 District Health Barometer, attendance of the first antenatal visit before 20 weeks has been increasing nationally over the past three years following the implementation of MomConnect. The increase in the proportion of pregnant women attending their first antenatal visit before 20 weeks is associated with increased access to HIV testing in pregnancy with early initiation of ART in those who test (Department of Health, 2017).

4.2 Delivery care

Deliveries in a health facility increased from 83% in 1998 to 96% in 2016. Furthermore, a skilled provider assists in nearly all deliveries (97%), with a nurse or midwife delivering 68% of births and 29% delivered by a doctor. The proportion of births delivered in health facilities increased for rural women, and women in Eastern Cape, Limpopo, and Mpumalanga provinces. Western Cape reported the highest proportion of births in a facility (99,2% in 2016). The results further indicate that home deliveries decreased from 14% in 1998 to 4% in 2016. The majority of institutional deliveries took place at public sector health facilities. The proportion of births delivered by caesarean section increased from 16% in 1998 to 24% in 2016. The proportion of births delivered by caesarean section were higher amongst women aged 35-44 in 2019. Across provinces, the proportion of births delivered by caesarean ranged from a low of 17% in Limpopo to a high of 29,4% in Western Cape in 2016. Western Cape, KwaZulu-Natal and Free State provinces had the highest proportions of births

by caesarean section in the country. The caesarean delivery rate is highest in urban areas than rural areas. By household wealth, the caesarean section delivery is higher amongst the richest followed by richer wealth quantile households. These findings are in line with the 2017 saving mother's report which observed that the caesarean section rate was 27,8% with the lowest rate being in Limpopo (20,5%) and the highest in KwaZulu-Natal (30,9%). From DHIS data, the rate continues to rise to almost 2% year on year. The rate in public health sector is reported to be much lower than the alarmingly high rate of 67% in the private sector described in the Sixth Triennial Report (Department of Health, 2017).

A newborn's weight at birth is an important marker of maternal and fetal health and nutrition. Low birthweight newborns have a higher risk of dying in the first 28 days of life (UNICEF, 2019). Findings from this study indicate an increasing pattern in the proportion of births weighing less than 2,5 kg. The highest proportion was amongst women aged 35-49. By province, the proportion of births with a low birth weight was highest in Northern Cape (20%) and lowest in Limpopo (11%).

4.3 Post-natal care

In South Africa, 87% of mothers received a postnatal check; 84% had this check within the first 2 days after the birth. By province, Western Cape and Free State have the highest percentage of women receiving a timely postnatal health check (91% each), while KwaZulu-Natal has the lowest percentage (80%).

4.4 Conclusion

This report has highlighted the patterns in the use of maternal healthcare in South Africa by indicating the proportion of women attending four or more antenatal care, proportion of births delivered in a health facility, proportions of births by delivered by caesarean section amongst the births in the last five years preceding the survey. Maternal health care has improved between 1998 and 2018 SADHS in South Africa, and this improvements will go a long way in the achievements of SDG target on reducing Maternal and child mortality in South Africa.

References

- Aa, I., Grove, M. A., Haugsjå, A. H., & Hinderaker, S. G. (2011). High maternal mortality estimated by the sisterhood method in a rural area of Mali. *BMC Pregnancy and Childbirth*, 11(56): 1-6. URL: <http://www.biomedcentral.com/1471-2393/11/56>.
- Adamu, H.S. (2011). Utilization of Maternal Health Care Services in Nigeria: An Analysis of Regional Differences in the Patterns and Determinants of Maternal Health Care Use. Dissertation.
- Addai, I. (2000). Determinants of Use of Maternal-child Health Services in Rural Ghana. *Journal of Biosocial Science*, 32(1), 1-15.
- Ahmed, S., Creanga, A. A., Gillespie, D. G., & Tsui, A. O. (2010). Economic Status, Education and Empowerment: Implications for Maternal Health Service Utilization in Developing Countries. *PLoS ONE*, 5(6): 1-6. e11190. doi:10.1371/journal.pone.0011190
- Alvarez, J.L., Gil, R., Hernández, V., & Gil, A. (2009). Factors associated with maternal mortality in Sub-Saharan Africa: an ecological study. *BMC Public Health*, 9(462): doi:10.1186/1471-2458-9-462.
- Andersen, R., & Newman, J.F. (1973). Societal and Individual Determinants of Medical Care Utilization in the United States, *The Milbank Memorial Fund Quarterly, Health and Society*, 51(1): 95-124. doi:10.2307/3349613.
- Arthur, E. (2012). Wealth and antenatal care use: implications for maternal health care utilisation in Ghana. *Health Economics Review*, 2(14): 1-8. doi:10.1186/2191-1991-2-14. URL: <http://www.healtheconomicsreview.com/content/2/1/14>.
- Babalola, B.I. (2014). Determinants of urban-rural differentials of antenatal care utilization in Nigeria. *African Population Studies*, 28(3): 1263-1273.
- Babalola, S. & Fatusi, A. (2009). Determinants of use of maternal health services in Nigeria – looking beyond individual and household factors. *BMC Pregnancy and Childbirth*, 9(43): 113. URL: <http://www.biomedcentral.com/1471-2393/9/43>
- Beksinska, M., Kunene, B., & Mullick, S. (2006). Maternal Care: Antenatal, peri and postnatal. In: Ijumba, P., Padarath, A., editors. *South African Health Review 2006*. Durban: Health Systems Trust. URL: <http://www.hst.org.za/generic/29>.
- Birmeta, K., Dibaba, Y., & Woldeyohannes, D. (2013). Determinants of maternal health care utilization in Holeta town, central Ethiopia. *BMC Health Services Research*, 13(256): 1-10. <http://www.biomedcentral.com/1472-6963/13/256>.
- Blaauw, D., & Penn-Kekana, M. (2010). Maternal Health. In: Fonn, S., Padarath A, editors. *South African Health Review 2010*. Durban: Health Systems Trust. URL: <http://www.hst.org.za/publications/876>.
- Bradshaw, D. (2008). Determinants of Health and their Trends. In: Barron, P., & RomaReardon, J. editors. *South African Health Review 2008*. Durban: Health Systems Trust. URL: <http://www.hst.org.za/publications/841>.

Burton, R. (2013). Maternal health: There is cause for optimism. *South African Medical Journal*, 103(8): 520-521. doi:10.7196/SAMJ.7237.

Cadegan, M., English, R., Pillay, Y., & Barron, P. (2012). A Brief Summary of the Strategic Plan for Maternal, Newborn, Child and Women's Health (MNCWH) and Nutrition in South Africa 2012 – 2016. Series name: Kwik Skwiz, Issue 2. KwaZulu-Natal: Health Systems Trust.

Celik, Y., & Hotchkiss, D. R. (2000). The socio-economic determinants of maternal health care utilization in Turkey. *Social Science & Medicine*, 50: 1797-1806.

Chakraborty, N., Islam, M.A., Chowdhury, R.I., Bari, W., & Akhter, H.H. (2003). Determinants of the use of maternal health services in rural Bangladesh. *Health Promotion International*, 18(4): 327-337. doi: 10.1093/heapro/dag414.

Chimankar, D. A., & Sahoo, H. (2011). Factors influencing the Utilization of Maternal Health Care Services in Uttarakhand. *Ethno Med*, 5(3): 209-216.

Chopra, M., Lawn, J. E., Sanders, D., Barron, P., Karim, S. S. A., Bradshaw, D., Jewkes, R., Karim, Q. A., Flisher, A. J., Mayosi, B. M., Tollman, S. M., Churchyard, G. J., & Coovadia, H. (2009). Achieving the health Millennium Development Goals for South Africa challenges and priorities. *Lancet*, 374: 1023-1031.

Chweneyagae, D., Delis-Jarrosay, N., Farina, Z., Fawcus, S., Godi, N. P., Khaole, N., Kunene, B., Mhlanga, R. E., Mbambisa, G. Z., Mbombo, N., Molefe, N. E., Moodley, J., Moran, N. F., Pattinson, R. C., Rout, C., Schoon, M., & Seabe, S. J. (2012). The impact of HIV infection on maternal deaths in South Africa. *South African Journal of Obstetrics and Gynaecology*, 18(3): 70-76. doi:10.7196/SAJOG.581.

Cleland, J., Bernstein, S., Ezeh, A., Faundes, A., Glasier, A., & Innis, J. (2006). Family planning: the unfinished agenda. *Lancet*, 368(9549):1810-1827. doi:10.1016/S01406736(06)69480-4.

Dagne, E. (2010). Role of socio-demographic factors on utilization of maternal health care services in Ethiopia. Dissertation. Umeå University: Sweden.

Department of Health. 2017. Saving Mothers 2017. Annual Report on National Committee for Confidential Enquiry into Maternal Deaths in South Africa. Department Health, Pretoria 2017

Department of Health. (1999). South Africa Demographic and Health Survey 1998. Department of Health.

Department of Health, Medical Research Council, OrcMacro. (2007). South Africa Demographic and Health Survey 2003 (Full Report). Pretoria: Department of Health.

Dhaka, S., Chapman, G.N., Simkhada, P.P., van Teijlingen, E.R., Stephens, J., & Raja, A.E. (2007). Utilisation of postnatal care among rural women in Nepal. *BMC Pregnancy and Childbirth*, 7(19): 1-9. doi:10.1186/1471-2393-7-19

Do, M., & Hotchkiss, D. (2013). Relationships between antenatal and postnatal care and postpartum modern contraceptive use: evidence from population surveys in Kenya and Zambia. *BMC Health Services Research*, 13(6): 1-14. <http://www.biomedcentral.com/1472-6963/13/6>.

Doku, D., Neupane, S., & Doku, P.N. (2012). Factors associated with reproductive health care utilization among Ghanaian women. *BMC International Health and Human Rights*, 12(29): 2-8.
<http://www.biomedcentral.com/1472-698X/12/29>.

Ebuehi, O.M., & Akintujoye, I. (2012). Perception and utilization of traditional birth attendants by pregnant women attending primary health care clinics in a rural Local Government Area in Ogun State, Nigeria. *International Journal of Women's Health*, 4: 25– 34.

Elo, I. T. (1992). Utilization of maternal health-care services in Peru: the role of women's education. *Health Transition Review*, 2(1): 1-20. [Online] Available: <http://dSPACE.anu.edu.au/bitstream/1885/41194/1/Elo1.pdf>.

El-Sabaa, H.A., Oweedah, N.A-A., & Alhazmi, J.M. (2012). Competence of Midwives versus Non-Midwives Nurses Regarding Postnatal Care in Saudi Arabia. *Journal of American Science*, 8(12): 217-222.
<http://www.jofamericanscience.org>.

National Department of Health. (2015). Guidelines for maternity care in South Africa: A manual for clinics, community health centres and district hospitals

National Department of Health (NDoH), Statistics South Africa (Stats SA), South African Medical Research Council (SAMRC) and ICF. (2019). South African Demographic and Health Survey 2016.

National Planning Commission. (2012). National Development Plan 2030: Our future- make it work. The Presidency.

Statistics South Africa. (2017). Sustainable Development Goals Indicator Baseline report 2017-South Africa. Statistics South Africa.

Tsawe M. (2019). Inequalities in the use of maternal and reproductive health services in Sierra Leone. Phd Thesis.

World Health Organization. (2015). Trends in maternal mortality 1990 to 2015: estimates by WHO, UNICEF, UNFPA, World Bank Group and the United Nations Population Division. Geneva.

World Health Organization. (2019). Trends in maternal mortality 2000 to 2017: estimates by WHO, UNICEF, UNFPA, World Bank Group and the United Nations Population Division. Geneva.



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