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Preface

Perinatal deaths are a combination of registered stillbirths and early neonatal deaths occurring during the first week of life. Information of perinatal deaths that occurred in South Africa for the year 2016 are highlighted in this statistical release. It also presents perinatal deaths that were registered during the 2016/2017 processing phase, which had occurred during the period 1997 to 2015, to show trends and patterns in the occurrence and registration of perinatal deaths. Information in this release is from perinatal deaths registered and collated through the national civil registration system maintained by the Department of Home Affairs.

A handwritten signature in black ink, appearing to read 'Risenga Maluleke', with a stylized, circular flourish on the left side.

Risenga Maluleke
Statistician-General

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1. Introduction

1.1 Background

The World Health Organization (WHO) defines perinatal mortality as the number of stillbirths (foetal deaths) and deaths in the first week of life per 1 000 total births. The perinatal period as recommended for international comparison starts at 22 completed weeks of gestation for stillbirths and ends on the seventh completed day of life for early neonatal deaths (WHO, 2018). However, in South Africa the Births and Deaths Registration Act (Act No. 51 of 1992) defines a stillbirth as a fetus that had at least 26 weeks of intra-uterine existence but showed no sign of life after complete birth (Republic of South Africa, 1992).

The perinatal mortality indicator is vital in providing information needed to improve the health status of pregnant women, new mothers and newborns. Perinatal mortality is an indicator of maternal care and of maternal health and nutrition; it also reflects the quality of care offered during obstetric and paediatric duration. Analysis of perinatal mortality information allows policymakers to identify problems, track trends and disparities and assess changes in public health policy and practice (WHO, 2006). Information on how many perinatal deaths occur constitutes the basis for evidence-based decision-making, allocation of resources and planning for both child and maternal health programmes (United Nations [UN], 2014). The perinatal death statistics are essential for setting health targets and monitoring demographic indicators such as infant mortality (which includes early neonatal deaths) that are part of this report.

In South Africa for all deaths that occur, a medical practitioner should certify the cause of death, if satisfied that the death was due to natural causes. In the case of a stillbirth however, a registered professional nurse may certify the causes of a natural death (Republic of South Africa, 1992). Both medical practitioners and professional nurses are mandated by the Births and Deaths Registration Act (Act No. 51 of 1992) to report to a police officer any death that was not due to non-natural causes. The police officer then acts in accordance with the provisions of the Inquest Act (Act No. 58 of 1959) and investigates the death circumstances, while a forensic pathologist performs a medico-legal post-mortem to determine the cause of death (Republic of South Africa, 1992).

In 2012, South Africa adopted the National Development Plan (NDP) with an outcome of 'a long and healthy life for all South Africans' and a key developmental objective of 'Health care for all' (National Planning Commission, 2012). The NDP for South Africa asserts that reductions in infant and child mortality are important in the drive towards 'leaving no one behind' in health. Accordingly, the review of perinatal mortality which is a subset of infant mortality allows for the evaluation of the provision of timely and good quality health care services to pregnant women and infants in South Africa (not to be covered in this report). Stillbirths and early neonatal deaths are primarily due to causes that are not only similar but are also amenable to prevention and curative measures.

The United Nations Children's Fund (UNICEF) (2015) report argues that while there has been progress in reducing child mortality during the Millennium Development Goals (MDGs) period, the progress is mostly driven by declines in deaths during the post-neonatal phase. The report presupposes that for accelerated progress in achieving Sustainable Development Goal 3: *"to end preventable deaths of newborns and children under 5 years of age, with all countries aiming to reduce neonatal mortality to at least as low as 12 per 1,000 live births and under 5 mortality to at least as low as 25 per 1,000 live births to by 2030"*, attention should be given to deaths that occur during the perinatal phase, which includes stillbirths and early neonatal deaths (UNICEF, 2015).

1.2 Objectives of the statistical release

Statistics South Africa (Stats SA) annually publishes a statistical release on perinatal deaths registered and collated through the South African civil registration system maintained by the Department of Home Affairs (DHA). This release provides information on levels, patterns, trends and causes of perinatal deaths in South Africa. The publication has two main objectives, which are:

- To present statistics on the stillbirths, early neonatal and perinatal deaths that occurred in 2016, focusing on the underlying causes of death; and
- To outline emerging trends spanning a 20-year period (1997–2016) and differentials in mortality by selected demographic and geographic characteristics for perinatal deaths that occurred in 2016.

1.3 Scope of this statistical release

The statistical release is, based on death notification forms from the DHA for perinatal deaths that occurred in 2016 or earlier and reached Stats SA in time for the 2016/2017 processing phase. The primary focus of this release is on perinatal deaths that occurred in 2016, but further highlights perinatal deaths for the period 1997–2015 as to provide for a discussion on trends in the number of perinatal deaths and causes of perinatal deaths from 2014 to 2016.

It must be noted that analysis on geographic distribution is based only on province of death occurrence. However, information on the distribution of perinatal deaths by district and local municipality levels can be obtained from Stats SA on request. The definitions of technical terms used in this release are provided in Appendix A (See page 34).

1.4 Organisation of this statistical release

There are five sections in this release, namely: introduction, data and methods, registered perinatal deaths, causes of death, as well as the summary and concluding remarks. The introduction section provides an overview of the background, objectives and scope of the statistical release. The second section describes the data source, processing, editing and analysis methods applied in the release. The third section shows information on the levels, trends (from 1997 to 2016) and differentials in perinatal deaths. The differentials particularly focus on demographic, social and geographic characteristics of the stillbirths, early neonatal and perinatal deaths. The fourth section presents the causes of perinatal deaths. The causes for stillbirths and early neonatal mortality are discussed separately as well as combined. Deaths from 2014 to 2015 are also included to show trends and patterns in causes of perinatal deaths in the recent years. The fifth section presents the summary and concluding remarks.

2. Data and methods

Section on data and methods describes the data source, i.e. death notification forms, how they were processed (including sorting and capturing), and how data was edited and thereafter analysed.

2.1 Source of data

Information recorded on death notification forms collected by Stats SA from the DHA are the exclusive data source used to produce this statistical release on perinatal deaths. Two death notification forms are currently used in South Africa to register deaths: Form BI-1663, which was introduced in 1998 as well as DHA-1663, which was introduced in 2009 to replace the BI-1663. However, the old form BI-1663 is still being used in areas where it is still in stock. The main difference between these two forms is that for the BI-1663 form, the causes of death for perinatal deaths and individual deaths are in one section, whereas in the DHA-1663 form, a separate section (section G.2) is used to complete perinatal deaths information. Additionally, section G.2 of the DHA-1663 contains additional information on the details of both the mother and the stillborn/early neonatal. For more information on the two death notification forms refer to the "*Mortality and causes of death in South Africa, 2016 Findings from death notification*" statistical release (Stats SA, 2018).

A total of 18 683 perinatal deaths occurred in 2016 and were registered at the Department of Home Affairs. Information on all registered deaths was processed by Stats SA during the 2016/2017 processing year. In 2016, a total of 18 426 (98,6%) perinatal deaths were registered using the new death notification form (DHA-1663) while 257 (1,4%) remaining deaths were recorded on the old death notification form (BI-1663).

2.2 Data processing

Stats SA collects all death notification forms from the DHA head office for processing at the Data Processing Centre (DPC). Information on stillbirths is processed with other death notification forms received by Stats SA. For further details on data processing of other deaths refer to "*Mortality and cause of death in South Africa, 2016: Findings from death notification*" (Stats SA, 2018).

In this release, the 10th Revision of the 2010 Edition of the International Statistical Classification of Diseases and Related Health Problems (ICD-10) standard developed by the WHO was used to manually code the multiple cause-of-death-statistics. The ICD is designed to permit countries to systematically record, analyse, interpret and compare mortality data in a standard manner. All member states of the United Nations (UN), including South Africa, agreed to use the ICD standard classification system for coding diseases, injuries and a wide range of signs, symptoms and other abnormal findings. The ICD also provides the rules for selecting the underlying cause of death from several diagnoses that may be reported on the death notification form. Definitions, tabulation lists, guidelines for the death notification form and regulations on the use of the classification are also included. Additional information is available on, "*Mortality and cause of death in South Africa, 2016: Findings from death notification*" (Stats SA, 2018).

2.3 Data editing

Assessment on data quality for this release is presented in Appendix B (See pages 35–36). Stats SA has developed a set of data editing rules which check for accuracy of data and highlight cases with implausible causes of death for further investigation and correction. These editing rules are applied to the perinatal deaths data when all the stages of data processing are completed. Data quality was further assessed using two electronic tools developed by the WHO namely:

- i) Version 2.0 of the "Analysing mortality levels and causes-of-death" (ANACoD) (WHO, 2014b)
- ii) Version 1.0 CoDEdit (WHO, 2014c).

Information on how these tools are applied is available from "*Mortality and cause of death in South Africa, 2016: Findings from death notification*" (Stats SA, 2018).

2.4 Data analysis

Analysis conducted in this statistical release is divided into two sections, namely: the mortality trends and the causes of death sections. The former section uses frequency distributions and cross-tabulations to present information on the distribution of perinatal deaths disaggregated by demographic and geographical characteristics. The mortality section also provides demographic indicators on the sex ratios at death as well as unadjusted stillbirths, early neonatal and perinatal mortality rates for the years 2014 to 2016 based on the perinatal deaths from the civil registration system and estimated births derived from the mid-year population estimates produced by Stats SA (Stats SA, 2017). Sex ratios were calculated for all three death types, namely, stillbirths, early neonatal deaths and perinatal deaths. For example, the sex ratios at death for perinatal deaths were calculated by dividing the number of male perinatal deaths by the number of female perinatal deaths and multiplied by 100. Stillbirth and perinatal death rates were calculated by dividing the observed deaths by the total births (combination of live and stillbirths). However, in computing early neonatal mortality rates, only live births were used as the denominator.

The second section focuses on frequencies and cross-tabulations of the causes of death. The underlying natural causes of death were computed by ranking all underlying natural causes of death from highest to lowest, with the highest causes forming part of the leading causes of death. In ranking the natural underlying causes of death, *symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified (R00-R99)*, were excluded as the information is not sufficiently detailed to be used for public health purposes. The section also presents the underlying natural causes of death by selected characteristics of the stillbirths, early neonatal deaths and perinatal deaths, such as sex of the deceased, population group, province of death occurrence, institution or place of death and birth weight.

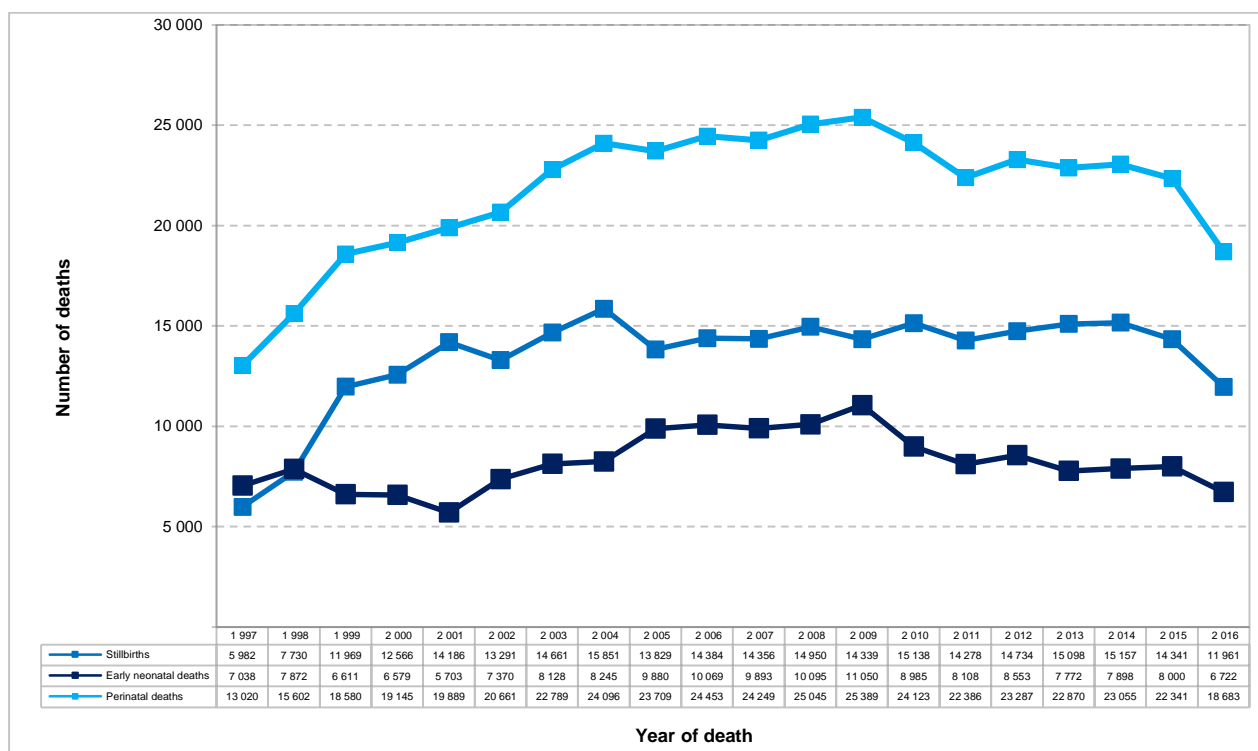
3. Registered perinatal deaths

Analysis on the distribution of stillbirths, early neonatal deaths and perinatal deaths that occurred in 2016 by selected socio-demographic and geographic characteristics are shown in this section. It further presents levels and trends of registered stillbirths, early neonatal deaths and perinatal deaths for the period 1997 to 2016.

3.1 Levels and trends of stillbirths, early neonatal deaths and perinatal deaths

The number of perinatal deaths including stillbirths and early neonatal deaths for the years 1997 to 2016 are presented in Figure 3.1. Overall, the three categories of deaths (stillbirths, early neonatal deaths and perinatal deaths) display the same pattern (of an initial increase before declining to the lowest point) but at different levels. Generally, perinatal deaths occurrence increased from 13 020 in 1997, peaked at 25 389 in 2009 and declined to 18 683 in 2016. Perinatal deaths decreased by 26,4% between 2009 and 2016. In particular, it declined by 16,4% between 2015 and 2016. Perinatal deaths are a combination of foetuses that are born dead (stillbirths) and infants that die within the first week after live birth (early neonatal deaths). It is thus not unexpected that stillbirths followed a similar pattern of perinatal deaths, increasing from 5 982 in 1997 to 15 851 in 2004 and continued to maintain similar levels until 2015 with minimal fluctuation, before dropping to 11 961 in 2016. Early neonatal death occurrence was recorded above that of stillbirth in 1997, however post 1997 stillbirths exceeded early neonatal deaths. Early neonatal deaths declined from 7 872 in 1998 to 5 703 in 2001, thereafter rising and peaking at 11 050 in 2009. Between 2009 and 2014 a general decline in the number of early neonatal deaths is observed. The recorded early neonatal deaths in 2015 is only slightly higher than that of 2014, followed by a small decline in 2016.

Figure 3.1: Number of perinatal deaths by year of death, 1997–2016*



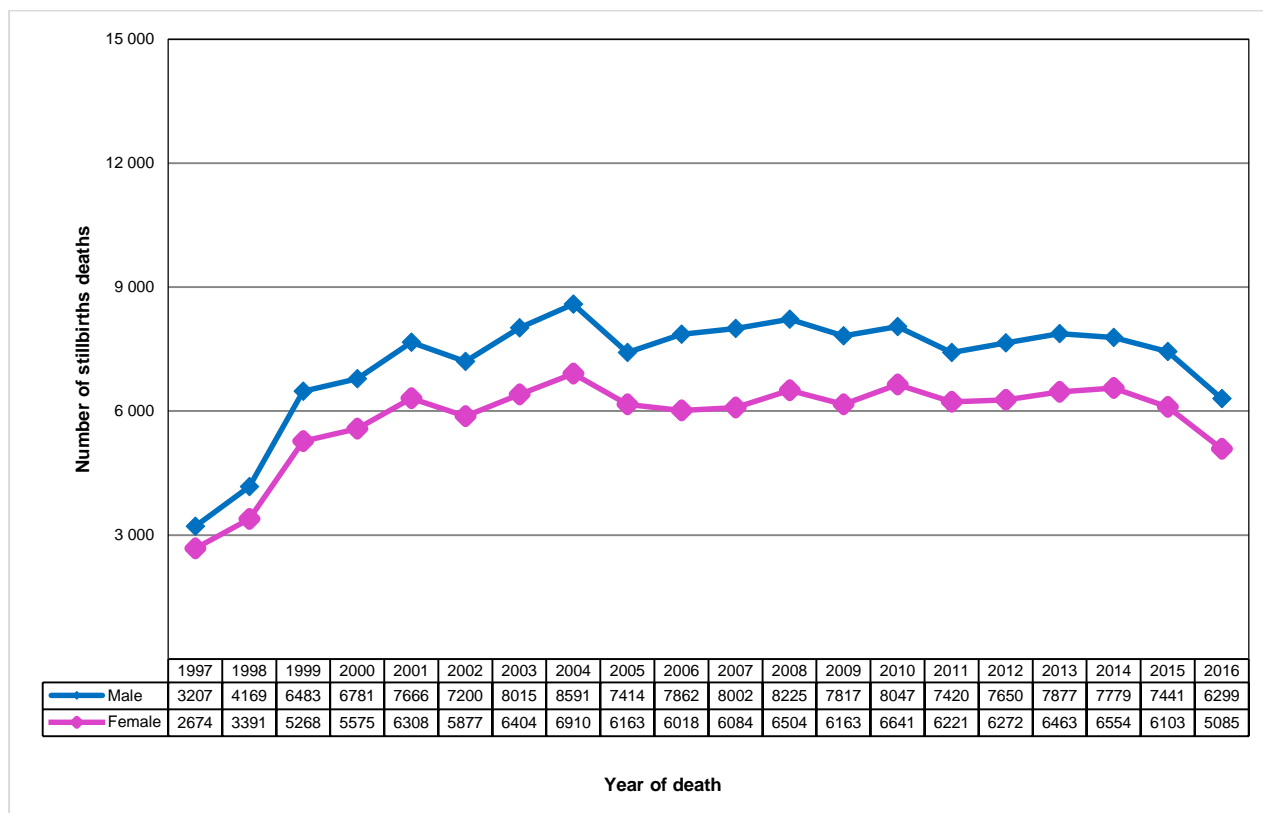
* (1) Data for 1997–2015 have been updated with late registrations/delayed death notification forms processed in 2016/2017.

3.2 Differentials by sex

3.2.1 Stillbirths

The number of stillbirths by sex for the period 1997 to 2016 is shown in Figure 3.2. The number of stillbirths by sex showed more male than female stillbirths throughout the reporting phase. The difference between male and female deaths was marginal in 1997, increasing though over time. The difference between male and female stillbirths peaked in 2007 (24%) with 6 084 female stillbirths to 8 002 male stillbirths (Figure 3.2).

Figure 3.2: Number of stillbirths by sex and year of death, 1997–2016*

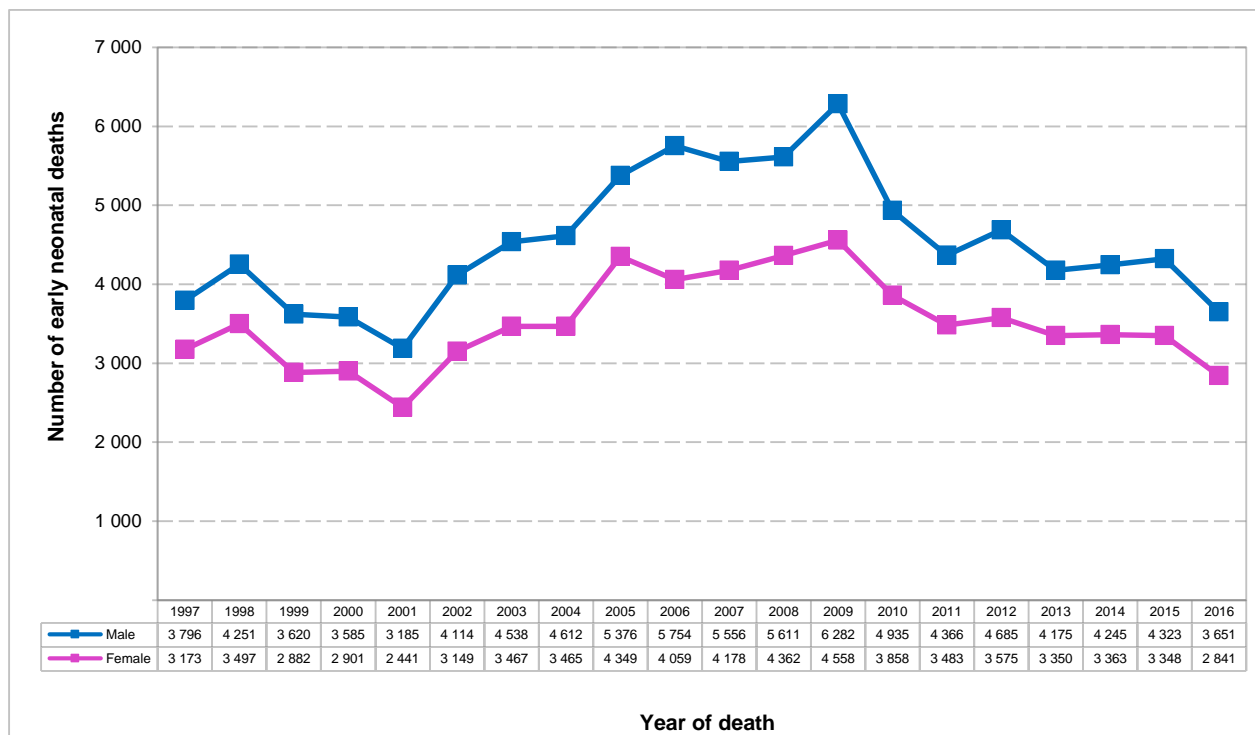


* (1) Data for 1997–2015 have been updated with late registrations/delayed death notification forms processed in 2016/2017.
 (2) Excluding stillbirths with unspecified sex.

3.2.2 Early neonatal deaths

The number of early neonatal deaths by sex and year of death is depicted in this sub-section through Figure 3.3. Consistently higher numbers of male early neonatal deaths are recorded throughout the reporting period with a peak in 2009. In keeping with the general observed trend, there was a higher proportion of male early neonatal deaths than female early neonatal deaths in 2016 (3 651 male deaths to 2 841 females deaths).

Figure 3.3: Number of early neonatal deaths by sex and year of death, 1997–2016*

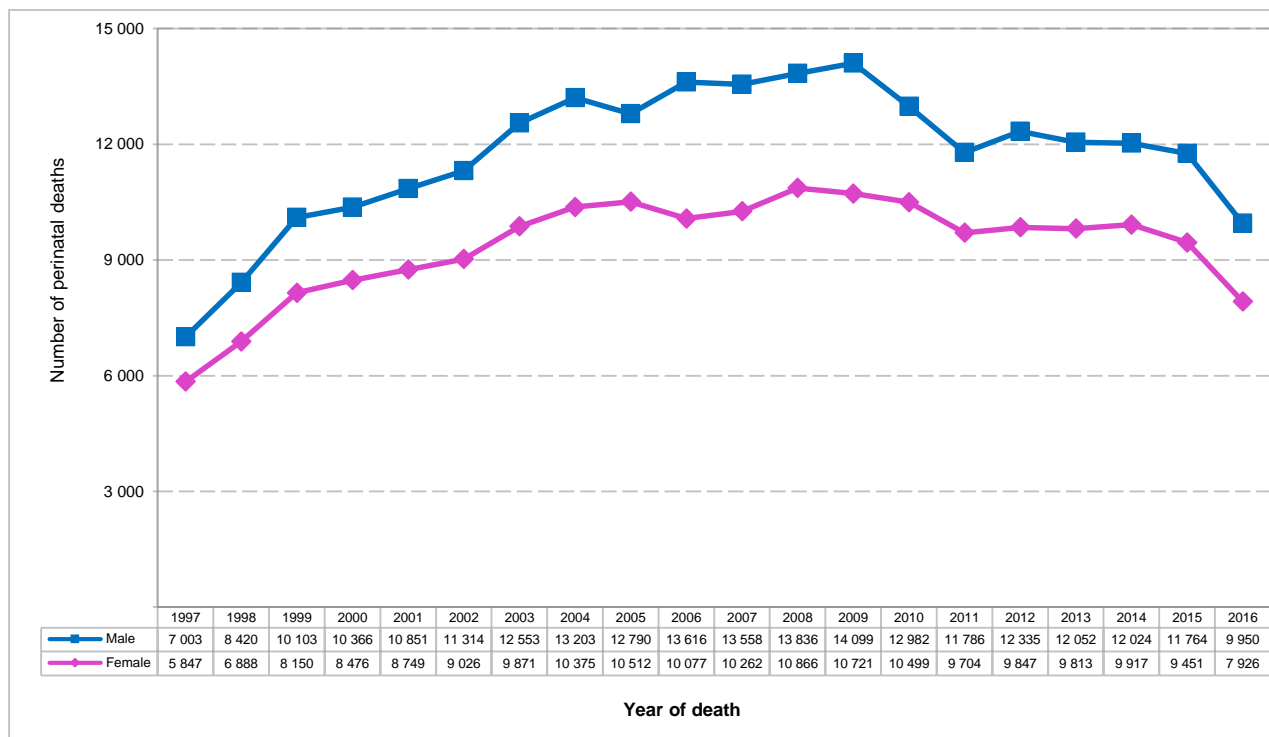


* (1) Data for 1997–2015 have been updated with late registrations/delayed death notification forms processed in 2016/2017.
 (2) Excluding early neonatal deaths with unspecified sex.

3.2.3 Perinatal deaths

The sex distribution of perinatal deaths between 1997 and 2016 is graphically presented in Figure 3.4. Overall, male perinatal deaths follow a similar trend of the female perinatal deaths, although at higher levels. The pattern is similar to those for stillbirths and early neonatal deaths. The difference in male and female perinatal peaked in 2006 and further shows no consistent pattern over the reporting period, although a decline is observed between 2015 and 2016. In 2016 the difference was 9 950 male perinatal deaths vs 7 926 female perinatal deaths.

Figure 3.4: Number of perinatal deaths by sex and year of death, 1997–2016*



* (1) Data for 1997–2015 have been updated with late registrations/delayed death notification forms processed in 2016/2017.
 (2) Excluding perinatal deaths with unspecified sex.

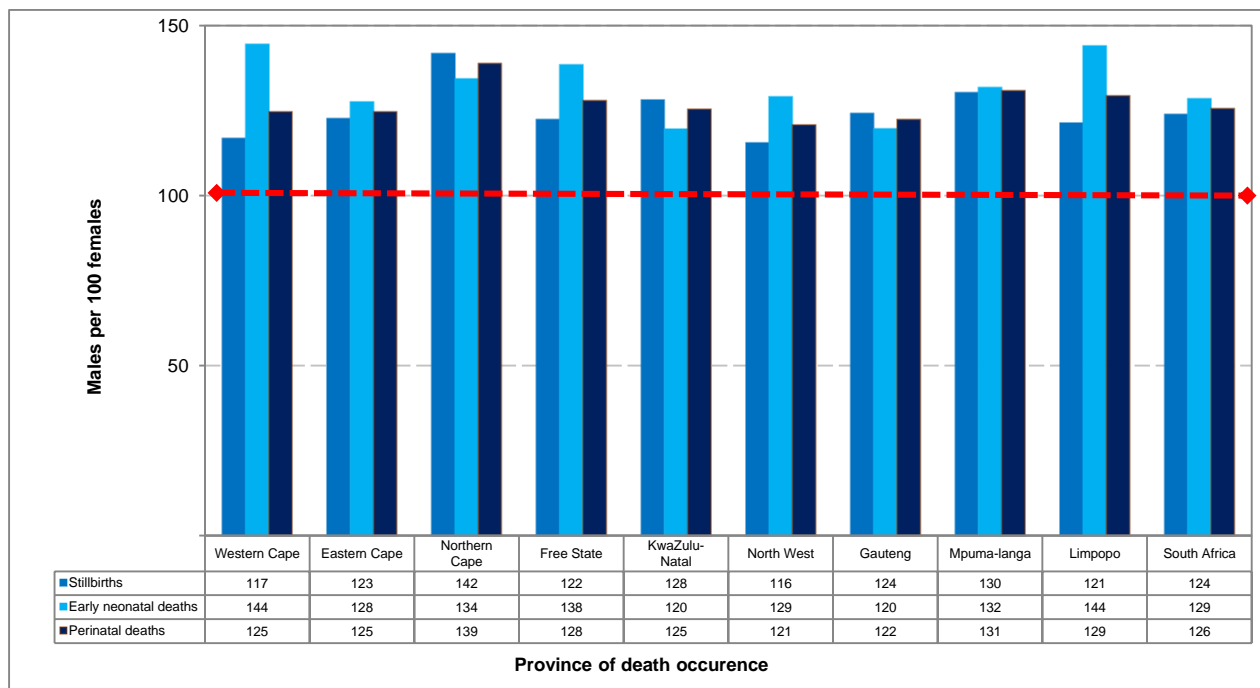
3.2.4 Sex ratios at death by province

Information on the sex ratios at death for stillbirths, early neonatal deaths and perinatal deaths by province of death occurrence for 2016 is discussed in this section as depicted in Figure 3.5. The sex ratio at death (the number of male deaths per 100 female deaths) is a demographic measure that shows the relative number of male deaths to female deaths. A ratio of 100 shows an equal number of male to female deaths, a number less than 100 indicates more female death occurrences; and a number more than 100 indicates more male death occurrences.

In 2016, the national sex ratio for stillbirths was 124 male stillbirths per 100 female stillbirths. Northern Cape had the highest sex ratio of 142 male stillbirth deaths per 100 female deaths, followed by Mpumalanga with 130 male stillbirths to 100 female stillbirths. North West recorded the lowest sex ratio among stillbirths (116 male per 100 female deaths). Among early neonatal deaths, the national sex ratio was 129 male early neonatal deaths per 100 female early neonatal deaths in 2016, which is a slight decrease from 130 males per 100 female deaths in 2015. The highest sex ratio for early neonatal deaths was in Western Cape (144 male deaths to 100 female deaths); followed by Free State with 138 male deaths to 100 female deaths and the lowest was found in both KwaZulu-Natal and Gauteng provinces (120 male deaths to 100 female deaths).

Perinatal deaths had a national sex ratio of 126, an increase from 124 male deaths per 100 female deaths in 2015. The highest perinatal sex ratio was found in Northern Cape (139 male deaths per 100 female deaths), followed by Mpumalanga (131 male deaths per 100 female deaths). Three provinces: Western Cape, Eastern Cape and KwaZulu-Natal had the same sex ratio (125 male deaths per 100 female deaths). The lowest sex ratio was found in the North West (121 male deaths per 100 female deaths).

Figure 3.5: Sex ratios at perinatal deaths by province of death occurrence, 2016



3.3 Differentials by age

The distribution of stillbirths and early neonatal deaths as well as the age in days registered in 2016 is shown in Table 3.1. As previously mentioned, perinatal deaths are a combination of stillbirths and deaths experienced within the first 7 days of life (early neonatal). Table 3.1 indicates that a higher percentage of perinatal deaths can be attributed to stillbirths (64,0%), with early neonatal mortality accounting for only for just over a third (36,0%) of perinatal deaths. It is clear that vulnerability of babies is higher at earlier age, with 35,2% of early neonatal deaths occurring at day zero, decreasing to 3,7% at day 7. More than half of all early neonatal deaths (54,8%) occurred during days zero and 1.

Table 3.1: Number and percentage distribution of stillbirths and early neonatal deaths by age, 2016

Age in days	Number	Percentage	Cumulative Percentage
Stillbirths	11 961	64,0	64,0
Early neonatal deaths	6 722	36,0	100,0
Total	18 683	100,0	
Early neonatal			
0	2 363	35,2	35,2
1	1 320	19,6	54,8
2	1 008	15,0	69,8
3	635	9,5	79,2
4	459	6,8	86,1
5	360	5,4	91,4
6	327	4,9	96,3
7	250	3,7	100,0
Total	6 722	100,0	

3.4 Birth weight of stillbirths

Birth weight is an indicator of both foetal growth and maternal well-being (Swart, 2008). Low birth weight describes babies who are born weighing less than 2 500 grams (UN, 2014). According to the United Nations, there is a strong correlation between birth weight and developmental problems and health risks for a child. Weights recorded for stillbirths that occurred in 2016 are presented in Table 3.2 below. More than half (55%) of all stillbirths were of low birth weight (Less than 2 500 grams), with the highest proportion being those who weighed less than 1 000 grams (17,8% of stillbirths). The second highest proportion (14,5%) of deaths was amongst stillbirths weighing between 1 000–1 499 grams. The information on birth weight has to be interpreted with caution, given the high percentage of unspecified cases (26,4%).

Table 3.2: Number and percentage distribution of stillbirths by birth weight, 2016*

Birth weight	Number	Percentage	Cumulative percentage
Less than 1 000	2 130	17,8	17,8
1 000 - 1 499	1 739	14,5	32,3
1 500 - 1 999	1 449	12,1	44,4
2 000 - 2 499	1 266	10,6	55,0
2 500 - 2 999	1 034	8,6	63,6
3 000 - 3 499	706	5,9	69,5
3 500 - 3 999	305	2,5	72,0
4 000 and above	170	1,4	73,4
Unspecified	3 162	26,4	100
Total	11 961	100,0	-

* Cumulative percentage column may not add up due to rounding off.

3.5 Month of death occurrence

The number and percentage distribution of stillbirths, early neonatal deaths and perinatal deaths by the month of death occurrence are depicted in Table 3.3. The stillbirths are fairly evenly distributed, although there are three distinct peaks in January, March and May. In January the highest proportion of deaths for all the three death types (stillbirths, early neonatal deaths and perinatal deaths) occurred, while the lowest deaths occurrences were in December for the three death types. A similar proportion of stillbirths was recorded for the month of March to that of January with 9,4% occurrences.

Table 3.3: Number and percentage distribution of stillbirths, early neonatal deaths and perinatal deaths by month of death occurrence, 2016

Month of death	Stillbirths		Early neonatal deaths		Perinatal deaths	
	Number	Percentage	Number	Percentage	Number	Percentage
January	1 128	9,4	704	10,5	1 832	9,8
February	1 044	8,7	634	9,4	1 678	9,0
March	1 127	9,4	638	9,5	1 765	9,4
April	1 072	9,0	614	9,1	1 686	9,0
May	1 111	9,3	629	9,4	1 740	9,3
June	1 006	8,4	565	8,4	1 571	8,4
July	998	8,3	541	8,0	1 539	8,2
August	990	8,3	566	8,4	1 556	8,3
September	960	8,0	497	7,4	1 457	7,8
October	983	8,2	548	8,2	1 531	8,2
November	947	7,9	474	7,1	1 421	7,6
December	595	5,0	312	4,6	907	4,9
Total	11 961	100,0	6 722	100,0	18 683	100,0

3.6 Differentials by population group

The distribution of stillbirths, early neonatal deaths and perinatal deaths by population group for 2016 are shown in Table 3.4 below. The highest proportions of deaths for all three death types (stillbirths, early neonatal deaths and perinatal deaths) were observed in the black African population group (all above 80%). Black Africans are the majority in South Africa, and as such the proportional differences by population group is reflective of the overall population distribution. The coloured population group recorded the second highest proportion of deaths for all three death types (5,9% for stillbirths, 6,2% for early neonatal deaths and 6,0% for perinatal deaths). The white and the Indian/Asian population groups accounted for cumulatively less than 4% of deaths for all death types. Since the percentage of unspecified/unknown population group is about 10% for all death types, caution should be exercised when interpreting these numbers.

Table 3.4: Number and percentage distribution of stillbirths, early neonatal deaths and perinatal deaths by population group, 2016

Population group	Stillbirths		Early neonatal deaths		Perinatal deaths	
	Number	Percentage	Number	Percentage	Number	Percentage
Black African	9 652	80,7	5 511	82,0	15 163	81,2
White	181	1,5	122	1,8	303	1,6
Indian or Asian	80	0,7	40	0,6	120	0,6
Coloured	705	5,9	416	6,2	1 121	6,0
Other	23	0,2	14	0,2	37	0,2
Unspecified/Unknown	1 320	11,0	619	9,2	1 939	10,4
Total	11 961	100,0	6 722	100,0	18 683	100,0

3.7 Place or institution of death occurrence for stillbirths, early neonatal deaths and perinatal deaths

Information on the distribution of stillbirths, early neonatal deaths and perinatal deaths by place or institution of death occurrence in 2016 are presented in Table 3.5. The highest percentage (about 72%) for all three categories of deaths occurred at a health facility. The second highest place of death for all death types was the home (around 4%). The percentage of deaths which occurred before they arrived at any health institution ranges from 1,4% for early neonatal deaths to 2,1% for stillbirths. The percentage of unspecified/unknown place of death was high for all death types (18,8% for stillbirths, 16,4% for early neonatal deaths and 18,0% for perinatal deaths).

Table 3.5: Number and percentage distribution of stillbirths, early neonatal deaths and perinatal deaths by place or institution of death occurrence, 2016

Place of death	Stillbirths		Early neonatal deaths		Perinatal deaths	
	Number	Percentage	Number	Percentage	Number	Percentage
Hospital	8 677	72,5	5 080	75,6	13 757	73,6
Emergency room/Out-patient	106	0,9	42	0,6	148	0,8
Dead on arrival	247	2,1	97	1,4	344	1,8
Nursing home	23	0,2	19	0,3	42	0,2
Home	456	3,8	287	4,3	743	4,0
Other	198	1,7	95	1,4	293	1,6
Unknown or unspecified	2 254	18,8	1 102	16,4	3 356	18,0
Total	11 961	100,0	6 722	100,0	18 683	100,0

3.8 Provincial distribution of stillbirths, early neonatal deaths and perinatal deaths

Table 3.6 presents the provincial distribution of stillbirths, early neonatal deaths and perinatal deaths in 2016. The number of deaths are analysed by province of death occurrence and province of usual residence. Gauteng and KwaZulu-Natal recorded the highest proportions of stillbirth occurrences (24,7% and 22,2%, respectively). These two provinces also recorded the highest proportions of early neonatal and perinatal deaths. Northern Cape recorded the lowest proportions for all death types (about 3%).

Table 3.6: Number and percentage distribution of stillbirths, early neonatal deaths and perinatal deaths by province, 2016

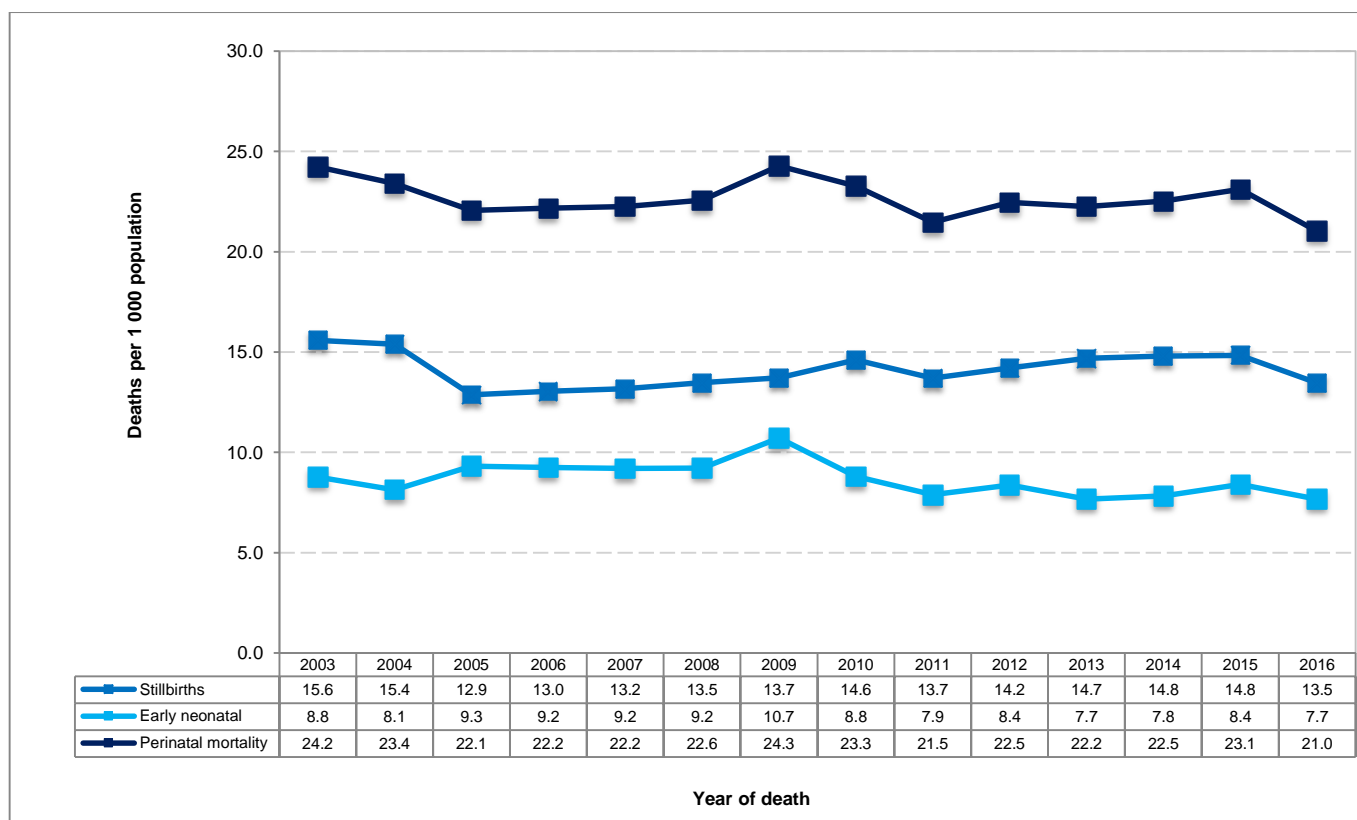
Province of death	Province of death occurrence						Province of usual residence					
	Stillbirths		Early neonatal deaths		Perinatal deaths		Stillbirths		Early neonatal deaths		Perinatal deaths	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Western Cape	1 237	10,3	540	8,0	1 777	9,5	984	8,2	528	7,9	1 512	8,1
Eastern Cape	540	4,5	358	5,3	898	4,8	385	3,2	365	5,4	750	4,0
Northern Cape	361	3,0	229	3,4	590	3,2	282	2,4	227	3,4	509	2,7
Free State	950	7,9	526	7,8	1 476	7,9	720	6,0	513	7,6	1 233	6,6
KwaZulu-Natal	2 659	22,2	1 180	17,6	3 839	20,5	2 060	17,2	1 113	16,6	3 173	17,0
North West	1 049	8,8	698	10,4	1 747	9,4	778	6,5	690	10,3	1 468	7,9
Gauteng	2 953	24,7	1 881	28,0	4 834	25,9	2 194	18,3	1 809	26,9	4 003	21,4
Mpumalanga	909	7,6	530	7,9	1 439	7,7	654	5,5	524	7,8	1 178	6,3
Limpopo	1 302	10,9	775	11,5	2 077	11,1	969	8,1	769	11,4	1 738	9,3
Unspecified/Unknown	1	0,0	5	0,1	6	0,0	2 935	24,5	184	2,7	3 119	16,7
Total	11 961	100,0	6 722	100,0	18 683	100,0	11 961	100,0	6 722	100,0	18 683	100,0

3.9 Observed stillbirths, early neonatal and perinatal deaths rates by year of death

Figure 3.6 graphically presents stillbirths, early neonatal and perinatal mortality rates for the years 2003 to 2016. The absolute numbers for Figure 3.6 are provided in Appendix C (page 37). The rates were unadjusted for completeness of death registrations and therefore the results have to be interpreted with caution. Early neonatal mortality rates (early neonatal deaths per 1 000 live births), stillbirth rates (stillbirths per 1 000 total births) and perinatal mortality rates (perinatal deaths per 1 000 total births) were calculated to obtain their relative importance to the number of births in South Africa.

Stillbirths declined nationally between 2003 and 2005, from 15,6 to 12,9 stillbirths per 1 000 total births, which was the lowest rate recorded in the reporting phase. In 2016 the rate was 13,5 per 1 000 total births. Early neonatal death rates increased between 2004 and 2005 (8,1 to 9,3 early neonatal deaths per 1 000 live births). The highest early neonatal death rate of 10,7 early neonatal deaths per 1 000 live births was observed in 2009. The lowest rate of 7,7 early neonatal deaths per 1 000 live births was observed both in 2013 and 2016. Similarly, the perinatal death rate was highest (24,3) in 2009, but lowest (21,0) in 2016.

Figure 3.6: Observed stillbirths, early neonatal and perinatal mortality rates, 2003–2016*



*(1) Data for 2003–2015 have been updated with late registrations/delayed death notification forms processed in 2016/2017.

(2) Denominators used for the calculations of perinatal mortality rate and stillbirth rate are total deaths, which include both live births (from mid-year estimates) and stillbirths.

4. Causes of death among stillbirths, early neonatal and perinatal deaths

Information on the causes of stillbirths, early neonatal and perinatal deaths that occurred in 2016 and were processed by Stats SA during the 2016/17 phase, is highlighted in this chapter. Additionally, comparisons with deaths for the period 2014–2015 is also provided. For the purpose of this report deaths occurring have been updated with late registrations or death notification forms from previous years that were received and captured during the processing of 2016 deaths. Causes of death are classified using the 10th revision of the International Classification of Diseases (ICD-10). The analysis undertaken focuses mainly on the underlying cause of death, which is defined as the disease or injury that initiated the train of events leading directly to death, or the circumstances of the accident or violence which produced the fatal injury (WHO, 1992). This section presents information on the underlying causes of stillbirths, early neonatal and perinatal deaths by sex, population group and geographic differentials.

4.1 Stillbirths

4.1.1 Main groups of underlying causes of stillbirths

Causes of stillbirths can be classified in 2 major groups, i.e. *certain conditions originating in the perinatal period (P00-P96)* and *congenital malformations (Q00-Q99)*. The number and percentage distribution of stillbirths by main group of underlying cause of death and sex for 2016 is provided in Table 4.1. Nationally, 97,1% of stillbirths can be attributed to *certain conditions originating in the perinatal period* and 2,9% for *congenital malformations*. These proportions remain regardless of the sex of the stillborn.

Table 4.1: Number and percentage distribution of stillbirths by main group of underlying causes of death and sex, 2016*

Main group of underlying causes	Sex of the deceased					
	Male		Female		Total	
	Number	%	Number	%	Number	%
Certain conditions originating in the perinatal period (P00-P96)	6 116	97,1	4 949	97,3	11 617	97,1
Congenital malformations (Q00-Q99)	183	2,9	136	2,7	344	2,9
Total	6 299	100,0	5 085	100,0	11 961	100,0

*Excluding stillbirths with unspecified sex.

4.1.2 Broad groups of underlying natural causes of stillbirths

The most common groups ranked as the ten leading underlying natural causes of stillbirths were derived for the years 2014 to 2016 as presented in Table 4.2. Ill-defined causes such as *symptoms, signs and abnormal clinical and laboratory findings not elsewhere classified (R00-R99)* and *fetal death for unspecified cause (P95)* were excluded from the ranking as these do not add value from a public health perspective (though important for mortality analysis).

Five of the ten leading underlying natural causes of stillbirths were similar for the three consecutive years, with similar rankings for the first top five causes. *Fetus and newborn affected by maternal factors and by complications of pregnancy, labour and delivery* was the leading cause of stillbirths for 2014 to 2016, followed by *respiratory and cardiovascular disorders specific to the perinatal period*. The third ranked cause of stillbirths was *disorders related to length of gestation and fetal growth*, while the fourth and fifth ranks were *other congenital malformations*, and *congenital malformations of the nervous system*, respectively.

Chromosomal abnormalities, not elsewhere classified was not part of the ten leading causes in 2014 but appeared in 2015 and 2016 at the sixth position. *Congenital malformations of the circulatory system* was not in the top ten in 2015 but part of the ten leading causes of stillbirths for 2014 and 2016, ranked eighth and tenth, respectively.

Table 4.2: The ten leading underlying natural causes of stillbirths, 2014–2016*

Underlying broad groups of causes of death (based on ICD-10)	2014			2015			2016		
	Rank	Number	%**	Rank	Number	%**	Rank	Number	%**
Fetus and newborn affected by maternal factors and by complications of pregnancy, labour and delivery (P00-P04)	1	2 873	19,0	1	3 960	27,6	1	3 616	30,2
Respiratory and cardiovascular disorders specific to the perinatal period (P20-P29)	2	1 163	7,7	2	648	4,5	2	613	5,1
Disorders related to length of gestation and fetal growth (P05-P08)	3	862	5,7	3	536	3,7	3	442	3,7
Other congenital malformations (Q80-Q89)	4	192	1,3	4	195	1,4	4	185	1,5
Congenital malformations of the nervous system (Q00-Q07)	5	68	0,4	5	84	0,6	5	59	0,5
Chromosomal abnormalities, not elsewhere classified (Q90-Q99)	...	...	...	6	36	0,3	6	42	0,4
Haemorrhagic and haematological disorders of fetus and newborn (P50-P61)	7	25	0,2	8	27	0,2	7	35	0,3
Infections specific to the perinatal period (P35-P39)	6	35	0,2	10	19	0,1	8	25	0,2
Conditions involving the integument and temperature regulation of fetus and newborn (P80-P83)	8	23	0,2	9	21	0,1	9	22	0,2
Congenital malformations of the circulatory system (Q20-Q28)	8	23	0,2	...	...	...	10	20	0,2
Transitory endocrine and metabolic disorders specific to fetus and newborn (P70-P74)	10	21	0,1	7	28	0,2	...	...	...
Other natural causes		9 872	65,1		8 787	61,3		6 902	57,7
Total		15 157	100,0		14 341	100,0		11 961	100,0

*Data for 2014–2015 have been updated with late registrations/delayed death notification forms processed in 2016/2017.

... Category not in top ten.

4.1.3 Stillbirths differentials

Percentage distribution of the top five leading causes of stillbirths by selected demographic and geographic variables are presented in Table 4.3 below. Please refer to Appendix D (see page 37) for absolute numbers distribution of stillbirths.

According to Table 4.3, the coloured and Indian/Asian population groups recorded the highest proportion of stillbirths due to *fetus and newborn affected by maternal factors and by complications of pregnancy, labour and delivery* (37,9% and 37,5%, respectively).

Regarding provincial differentials, the highest percentage of stillbirths from *respiratory and cardiovascular disorders specific to the perinatal period* was observed in the Free State (8,4%), among the Indian/Asian population group (7,5%), and among those which took place in an emergency or out-patient department (10,4%). Stillbirths due to *disorders related to length of gestation and fetal growth* were high in Northern Cape (5,8%) and Eastern Cape (5,6%) and among those stillbirths that took place in a nursing home (13,0%) and those weighing less than 1000grams (4,0%). Limpopo had the highest percentage of stillbirths from *fetus and newborn affected by maternal factors and by complications of pregnancy, labour and delivery* (41,6%). Minor differences were observed for place of death and birthweight regarding stillbirths from *fetus and newborn affected by maternal factors and by complications of pregnancy, labour and delivery*. *Other congenital malformations and congenital malformations of the nervous system*, respectively, contributed the highest percentage among the white population group.

Table 4.3: Percentage distribution of stillbirths by the top five leading causes and selected socio-demographic and geographic variables, 2016

Variables	Underlying causes of death						
	P00-P04 ¹	P20-P29 ²	P05-P08 ³	Q80-Q89 ⁴	Q00-Q07 ⁵	Others ⁶	Total
Sex							
Male	29,6	5,4	3,7	1,6	0,5	59,3	100,0
Female	31,2	4,8	3,7	1,4	0,5	58,4	100,0
Unknown/unspecified	28,9	4,7	3,5	3,0	0,4	59,6	100,0
Total	30,2	5,1	3,7	1,6	0,5	58,9	100,0
Population group							
Black African	29,8	5,2	3,8	1,5	0,4	59,4	100,0
White	31,5	5,0	3,9	4,4	1,7	53,6	100,0
Indian/Asian	37,5	7,5	3,8	2,5	1,3	47,5	100,0
Coloured	37,9	3,6	3,6	1,3	0,9	52,9	100,0
Other	34,8	4,4	8,7	.	4,4	47,8	100,0
Unknown/unspecified	28,8	5,3	3,1	1,8	0,5	60,5	100,0
Total	30,2	5,1	3,7	1,6	0,5	58,9	100,0
Province of death occurrence							
Western Cape	34,4	2,9	3,1	1,9	0,9	56,8	100,0
Eastern Cape	31,1	7,4	5,6	1,5	0,2	54,3	100,0
Northern Cape	28,0	6,1	5,8	1,4	.	58,7	100,0
Free State	32,3	8,4	3,7	1,4	0,7	53,5	100,0
North West	28,9	4,2	4,8	2,0	0,5	59,7	100,0
KwaZulu-Natal	33,9	6,9	4,6	1,4	0,2	53,0	100,0
Gauteng	22,1	3,6	1,9	1,2	0,5	70,7	100,0
Mpumalanga	32,6	4,7	5,3	1,4	0,4	55,6	100,0
Limpopo	41,6	7,8	3,1	1,3	0,5	45,7	100,0
Unspecified	0,0	0,0	0,0	0,0	0,0	100,0	100,0
Total	30,2	5,1	3,7	1,6	0,5	58,9	100,0
Place of death							
Hospital	31,0	4,9	3,6	1,5	0,6	58,5	100,0
Emergency room/Out-patient	32,1	10,4	4,7	1,9	.	50,9	100,0
Dead on arrival	33,6	5,7	7,7	1,2	0,4	51,4	100,0
Nursing home	13,0	8,7	13,0	.	.	65,2	100,0
Home	24,1	5,5	5,5	0,7	.	64,3	100,0
Other	19,2	4,0	5,6	2,0	0,5	68,7	100,0
Unknown/unspecified	29,3	5,7	3,1	1,7	0,4	59,8	100,0
Total	30,2	5,1	3,7	1,6	0,5	58,9	100,0
Birth weight							
Less than 1 000	33,8	3,1	4,0	2,2	0,5	56,5	100,0
1 000-1 499	35,1	2,6	1,8	1,7	0,6	58,3	100,0
1 500-1 999	35,2	3,2	0,7	1,3	0,7	58,8	100,0
2 000-2 499	34,0	7,8	0,6	1,1	0,1	56,5	100,0
2 500-2 999	31,6	10,1	0,4	1,8	0,3	55,8	100,0
3 000-3 499	31,5	10,8	0,3	1,3	0,3	55,7	100,0
3 500-3 999	22,9	8,8	3,5	1,2	1,2	62,4	100,0
4 000 and above	25,1	4,5	1,8	0,0	0,9	67,7	100,0
Unspecified	21,9	6,2	4,1	1,6	0,6	65,6	100,0
Total	30,2	5,1	3,7	1,6	0,5	58,9	100,0

1 Fetus and newborn affected by maternal factors and by complications of pregnancy, labour and delivery (P00-P04).

2 Respiratory and cardiovascular disorders specific to the perinatal period (P20-P29).

3 Disorders related to length of gestation and fetal growth (P05-P08).

4 Other congenital malformations (Q80-Q89).

5 Congenital malformations of the nervous system (Q00-Q07).

6 'Others' category includes natural causes not in top five, non-natural causes and ill-defined causes.

4.1.4 Leading underlying natural causes of stillbirths by population group

Table 4.4 presents the number and proportion of stillbirths by the five leading underlying natural causes of stillbirths by population group in 2016. The analysis was confined to only three population groups namely: black Africans, Whites and Coloureds. The Indian/Asian population group had such small numbers of records for stillbirth deaths and was therefore excluded in the analysis.

Two of the five leading underlying natural causes of stillbirths were the same for the three population groups under consideration, even though they differed by rank. For the black African population group, the *fetus and newborn affected by maternal factors and by complications of pregnancy, labour and delivery* was ranked first, followed by *respiratory and cardiovascular disorders specific to perinatal period*. *Disorders related to length of gestation and fetal growth, other congenital malformations and congenital malformations of the nervous system* were ranked third, fourth and fifth, respectively, but were not part of the top five leading causes of stillbirths for the white population group.

Among the white population group, *fetus and newborn affected by maternal factors and by complications of pregnancy, labour and delivery*, and *respiratory and cardiovascular disorders specific to perinatal period* were ranked fourth and second, respectively. *Conditions involving the integument and temperature regulation of fetus and newborn* was the main leading underlying cause for the white population group. *Other congenital malformations and congenital malformations of the nervous system* were not part of the top five causes for either the white or coloured population groups.

Table 4.4: The five leading underlying natural causes of stillbirths by population group, 2016*

Underlying broad groups of causes of death (based on ICD-10)	Black African			White			Coloured		
	Rank	Number	%	Rank	Number	%	Rank	Number	%
Fetus and newborn affected by maternal factors and by complications of pregnancy, labour and delivery (P00-P04)	1	2 874	29,8	4	7	3,9	2	25	3,5
Respiratory and cardiovascular disorders specific to the perinatal period (P20-P29)	2	502	5,2	2	9	5,0	...	...	...
Disorders related to length of gestation and fetal growth (P05-P08)	3	364	3,8	...	...	...	2	25	3,5
Other congenital malformations (Q80-Q89)	4	142	1,5	...	...	...	...	...	...
Congenital malformations of the nervous system (Q00-Q07)	5	41	0,4	...	...	...	...	...	...
Conditions involving the integument and temperature regulation of fetus and newborn (P80-P83)				1	82	45,3	1	354	50,2
Other congenital malformations of the digestive system (Q38-Q45)				3	8	4,4	4	9	1,3
Congenital malformation of genital organs (Q50-Q56)				5	6	3,3	...	...	...
Congenital malformations of the circulatory system (Q20-Q28)							5	6	0,9
Other natural causes		5 729	59,4		69	38,1		286	40,6
All causes		9 652	100,0		181	100,0		705	100,0

*Excluding Indian/Asian population group due to small numbers as well as those classified as other/unknown/unspecified population group.

...Category not in the top ten.

4.2 Early neonatal deaths

4.2.1 Main groups of underlying causes of early neonatal deaths

Table 4.5 shows the number and percentage of the main groups of underlying causes for early neonatal deaths by sex in 2016. The most commonly reported underlying cause of early neonatal death in 2016 was *certain conditions originating in the perinatal period* contributing 89,2% and 88,6% for males and females, respectively. The second most common cause of death was *congenital malformations* (9,4% males and 10,1% females). All other causes contributed less than 1% each towards early neonatal deaths.

Table 4.5: Number and percentage distribution of early neonatal deaths by main group of underlying causes of death and sex, 2016*

Main group of underlying causes	Sex of the deceased					
	Male		Female		Total	
	Number	%	Number	%	Number	%
Certain conditions originating in the perinatal period (P00-P96)	3 257	89,2	2 517	88,6	5 774	88,9
Congenital malformations (Q00-Q99)	344	9,4	288	10,1	632	9,7
Symptoms and signs not elsewhere classified (R00-R99)	20	0,5	13	0,5	33	0,5
External causes of morbidity and mortality (V01-Y98)	17	0,5	15	0,5	32	0,5
Certain infectious and parasitic diseases (A00-B99)	6	0,2	5	0,2	11	0,2
Other main groups of Underlying causes	7	0,2	3	0,1	10	0,2
Total	3 651	100,0	2 841	100,0	6 492	100,0

*Excluding early neonatal deaths with unspecified sex.

4.2.2 Broad groups of underlying causes of early neonatal deaths

Table 4.6 presents the top ten leading underlying natural causes for early neonatal deaths in South Africa for the period 2014 to 2016. Results shows that nine of the ten leading underlying causes of death were similar although some differed by rankings from what it was in the 2015 deaths. *Respiratory and cardiovascular disorders specific to the perinatal period* is still the leading (36,2%) underlying cause of early neonatal deaths in 2016, although it slightly declined from 38,3% in 2015.

Disorders related to length of gestation and fetal growth has swapped ranks with *fetus and newborn affected by maternal factors and by complications of pregnancy, labour and delivery* from the second position in 2015 to the third position in 2016. *Infections specific to the perinatal period, congenital malformations of the circulatory system and digestive system disorders of fetus and newborn* remained at the same positions, respectively, for the three reporting years. *Congenital malformations of the nervous system* has dropped out of the top ten leading causes of early neonatal deaths in 2015 and 2016. *Conditions involving the integument and temperature regulation of fetus and newborn* was first seen in the top ten leading causes in 2015 and remained in 2016 at the ninth position.

Table 4.6: The ten leading underlying natural causes of death for early neonates, 2014–2016*

Underlying broad groups of causes of death (based on ICD-10)	2014			2015			2016		
	Rank	Number	%	Rank	Number	%	Rank	Number	%
Respiratory and cardiovascular disorders specific to the perinatal period (P20-P29)	1	3 047	38,6	1	3 066	38,3	1	2 436	36,2
Fetus and newborn affected by maternal factors and by complications of pregnancy, labour and delivery (P00-P04)	3	870	11,0	3	848	10,6	2	868	12,9
Disorders related to length of gestation and fetal growth (P05-P08)	2	1 006	12,7	2	1 097	13,7	3	834	12,4
Infections specific to the perinatal period (P35-P39)	4	610	7,7	4	613	7,7	4	552	8,2
Other congenital malformations (Q80-Q89)	6	244	3,1	6	243	3,0	5	231	3,4
Haemorrhagic and haematological disorders of fetus and newborn (P50-P61)	5	309	3,9	5	335	4,2	6	229	3,4
Congenital malformations of the circulatory system (Q20-Q28)	7	147	1,9	7	148	1,9	7	151	2,2
Digestive system disorders of fetus and newborn (P75-P78)	8	132	1,7	8	142	1,8	8	114	1,7
Conditions involving the integument and temperature regulation of fetus and newborn (P80-P83)	...	...	...	9	84	1,1	9	83	1,2
Chromosomal abnormalities, not elsewhere classified (Q90-Q99)	10	69	0,9	10	81	1,0	10	81	1,2
Congenital malformations of the nervous system (Q00-Q07)	9	79	1,0	...	...	...	...	...	...
Other natural		1 304	16,5		1 276	16,0		1 104	16,4
non-natural		81	1,0		67	0,8		39	0,6
Total		7 898	100,0		8 000	100,0		6 722	100,0

*Data for 2014–2015 have been updated with late registrations/delayed death notification forms processed in 2016/2017.
 ...Category not in the top ten.

4.2.3 Early neonatal deaths differentials

The top five leading underlying natural causes of early neonatal deaths by selected demographic and geographic variables are presented in Table 4.7 of this sub-section. The absolute numbers of the early neonatal deaths are presented in Appendix E (see page 38).

There was a marginal difference in the number of early neonatal deaths by sex for the different underlying causes. Deaths due to *respiratory and cardiovascular disorders specific to the perinatal period* were 37,3% and 35,2% for males and females respectively, showing a decrease from 2015 deaths. Early neonatal deaths attributed to *respiratory and cardiovascular disorders specific to the perinatal period* were also higher among the black African population group (37,5%), and those who died before reaching the hospital (39,2%).

Deaths due to disorders related to length of gestation and fetal growth were the highest among the Indian/Asian population group (20,0%) and those who died in hospital and the out-patient/emergency rooms (13,4% and 14,3%, respectively). *Early neonatal deaths from fetus and newborn affected by maternal factors and by complications of pregnancy, labour and delivery* were high among both the white and the coloured population groups (18,9% and 17,1%, respectively), in Western Cape (18,7%) and for deaths which occurred in hospital (14,0%).

Infections specific to the perinatal period was the highest among the Indian/Asian (10,0%) population group. These perinatal deaths were also high (11,4%) in Gauteng with notable differences for place of death (9,2% for hospital, 9,5% for emergency room, 5,2% for dead on arrival and 0% for nursing home and 3,5% for home).

Table 4.7: Percentage distribution of early neonatal deaths by top five leading causes and selected socio-demographic and geographic variables, 2016

Variables	Underlying causes of death						Total
	P20-P29 ¹	P05-P08 ²	P00-P04 ³	P35-P39 ⁴	Q80-Q89 ⁵	Others ⁶	
Sex							
Male	37,3	11,1	13,2	8,3	3,3	26,9	100,0
Female	35,2	13,8	12,9	8,4	3,4	26,3	100,0
Unknown/unspecified	32,2	15,2	10,0	4,4	7,0	31,3	100,0
Total	36,2	12,4	12,9	8,2	3,4	26,8	100,0
Population group							
Black African	37,5	12,4	12,8	8,8	3,6	25,0	100,0
White	28,7	5,7	18,9	6,6	4,1	36,1	100,0
Indian/Asian	25,0	20,0	12,5	10,0	0,0	32,5	100,0
Coloured	28,1	16,6	17,1	6,0	3,9	28,4	100,0
Other	35,7	0,0	7,1	0,0	7,1	50,0	100,0
Unknown/unspecified	32,3	10,5	10,3	5,3	2,1	39,4	100,0
Total	36,2	12,4	12,9	8,2	3,4	26,8	100,0
Province of death							
Western Cape	23,0	16,7	18,7	6,9	3,5	31,3	100,0
Eastern Cape	35,2	12,6	12,3	7,5	2,2	30,2	100,0
Northern Cape	32,3	16,6	12,2	6,6	1,8	30,6	100,0
Free State	39,7	8,0	14,5	6,5	2,1	29,3	100,0
North West	32,5	16,9	16,1	7,6	4,5	22,4	100,0
KwaZulu-Natal	38,7	12,8	11,0	9,3	2,0	26,2	100,0
Gauteng	36,3	10,1	9,7	11,4	3,7	28,8	100,0
Mpumalanga	43,8	13,0	11,3	5,5	3,8	22,6	100,0
Limpopo	42,8	9,3	14,1	5,2	4,3	24,4	100,0
Unspecified	40,0	0,0	0,0	0,0	0,0	60,0	100,0
Total	36,2	12,4	12,9	8,2	3,4	26,8	100,0
Place of death							
Hospital	37,3	13,4	14,0	9,2	4,0	22,2	100,0
Emergency room/Out-patient	35,7	14,3	11,9	9,5	0,0	28,6	100,0
Dead on arrival	39,2	9,3	1,0	5,2	1,0	44,3	100,0
Nursing home	31,6	10,5	10,5	0,0	0,0	47,4	100,0
Home	35,9	4,5	5,9	3,5	0,4	49,8	100,0
Other	31,6	4,2	8,4	4,2	1,1	50,5	100,0
Unknown/unspecified	31,8	11,1	11,3	5,4	2,3	38,1	100,0
Total	36,2	12,4	12,9	8,2	3,4	26,8	100,0

1 Respiratory and cardiovascular disorders specific to the perinatal period (P20-P29).

2 Disorders related to length of gestation and fetal growth (P05-P08).

3 Fetus and newborn affected by maternal factors and by complications of pregnancy, labour and delivery (P00-P04).

4 Infections specific to the perinatal period (P35-P39).

5 Haemorrhagic and haematological disorders of fetus and newborn (P50-P61).

6 'Others' category includes natural causes not in top five, non-natural causes and ill-defined causes.

4.2.4 Leading underlying natural causes of early neonatal deaths by population group

Table 4.8 presents the top five leading underlying natural causes for early neonatal deaths by population group. Analysis in this sub-section excludes information on Indian/Asians due to low numbers for early neonatal deaths for this population group.

The two underlying causes which maintained the same ranks in 2016 as the leading underlying cause for all three the population groups were (i) respiratory and cardiovascular disorders specific to the perinatal period and (ii) fetus newborn affected by maternal factors and by complications of pregnancy, labour and delivery.

Table 4.8: The five leading underlying natural causes of early neonatal deaths by population group, 2016*

Underlying broad groups of causes of death (based on ICD-10)	Black African			White			Coloured		
	Rank	Number	%	Rank	Number	%	Rank	Number	%
Respiratory and cardiovascular disorders specific to the perinatal period (P20-P29)	1	2 069	37,5	1	35	28,7	1	117	28,1
Fetus and newborn affected by maternal factors and by complications of pregnancy, labour and delivery (P00-P04)	2	704	12,8	2	23	18,9	2	71	17,1
Disorders related to length of gestation and fetal growth (P05-P08)	3	685	12,4	5	7	5,7	3	69	16,6
Infections specific to the perinatal period (P35-P39)	4	482	8,7	4	8	6,6	4	25	6,0
Haemorrhagic and haematological disorders of fetus and newborn (P50-P61)	5	197	3,6	...	...	...	...	...	...
Congenital malformations of the circulatory system (Q20-Q28)	...	...	...	3	10	8,2	5	19	4,6
Other natural causes		1348	24,5		38	31,1		112	26,9
Non-natural causes		26	0,5		1	0,8		3	0,7
All causes		5 511	100,0		122	100,0		416	100,0

*Excluding Indian/Asian population group due to small numbers as well as those classified as other/unknown/unspecified.

...Category not in the top ten.

4.3 Perinatal deaths

4.3.1 Main groups of underlying causes of perinatal deaths

The distribution of perinatal deaths can be grouped into five main causes as depicted in Table 4.9 below. The most common cause of perinatal death are *certain conditions originating in the perinatal period* (94,2%) for both males and females. The second most common underlying cause for male and female perinatal deaths was *congenital malformations* (5,3%). The other three remaining causes all constituted a cumulative 0,5% of the underlying causes of perinatal deaths.

Table 4.9: Number and percentage distribution of perinatal deaths by main group of underlying causes of death and sex, 2016*

Main group of underlying causes	Sex of the deceased					
	Male		Female		Both sexes	
	Number	%	Number	%	Number	%
Certain conditions originating in the perinatal period (P00-P96)	9 373	94,2	7 466	94,2	16 839	94,2
Congenital malformations (Q00-Q99)	527	5,3	424	5,3	951	5,3
Symptoms and signs not elsewhere classified (R00-R99)	20	0,2	13	0,2	33	0,2
External causes of morbidity and mortality (V01-Y98)	17	0,2	15	0,2	32	0,2
Certain infectious and parasitic diseases (A00-B99)	6	0,1	5	0,1	11	0,1
Other main groups of underlying causes	7	0,1	3	0,0	10	0,1
Total	9 950	100,0	7 926	100,0	17 876	100,0

*Excluding perinatal deaths with unspecified sex.

4.3.2 Broad groups of underlying causes of perinatal deaths

The top ten leading underlying natural causes of perinatal deaths for the period 2014 to 2016 are shown in table 4.10. The breakdown of individual broad groups of leading underlying causes of death which were in the top ten perinatal deaths in 2016 is provided in Appendix F (see pages 39–40).

All ten leading underlying causes of perinatal deaths retained their positions for the period 2014 to 2016 but ranked differently. *Fetus and newborn affected by maternal factors and by complications of pregnancy, labour and delivery; respiratory and cardiovascular disorders specific to the perinatal period; and disorders related to length of gestation and fetal growth* were ranked one to three, respectively, in 2015 and 2016. However in 2014, *respiratory and cardiovascular disorders specific to the perinatal period* was ranked number one. *Infections specific to the perinatal period, other congenital malformations, haemorrhagic and haematological disorders of fetus and newborn* retained fourth to sixth positions, respectively, over the 2014 – 2016 period. *Digestive system disorders of fetus and newborn* moved a rank down from position nine in 2015 to position ten in 2016, while *chromosomal abnormalities, not elsewhere classified* moved one rank up from the tenth position in 2015 to ninth in 2016.

Table 4.10: The ten leading underlying natural causes of perinatal deaths, 2014–2016*

Underlying broad groups of causes of death (based on ICD-10)	2014			2015			2016		
	Rank	Number	%	Rank	Number	%	Rank	Number	%
Fetus and newborn affected by maternal factors and by complications of pregnancy, labour and delivery (P00-P04)	2	3 743	19,2	1	4 808	21,3	1	4 484	21,4
Respiratory and cardiovascular disorders specific to the perinatal period (P20-P29)	1	4 210	15,5	2	3 714	17,0	2	3 049	16,8
Disorders related to length of gestation and fetal growth (P05-P08)	3	1 868	8,4	3	1 633	7,6	3	1 276	7,3
Infections specific to the perinatal period (P35-P39)	4	645	2,4	4	632	2,8	4	577	2,8
Other congenital malformations (Q80-Q89)	5	436	1,8	5	438	2,0	5	416	1,9
Haemorrhagic and haematological disorders of fetus and newborn (P50-P61)	6	334	1,4	6	362	1,5	6	264	1,6
Congenital malformations of the circulatory system (Q20-Q28)	7	170	0,6	8	163	0,7	7	171	0,7
Congenital malformations of the nervous system (Q00-Q07)	8	147	0,7	7	164	0,7	8	133	0,7
Chromosomal abnormalities, not elsewhere classified (Q90-Q99)	10	90	0,5	10	117	0,4	9	125	0,5
Digestive system disorders of fetus and newborn (P75-P78)	9	138	0,6	9	144	0,6	10	118	0,7
Other natural causes		11 193	48,6		10 099	45,1		8 031	45,3
Non-natural causes		81	0,2		67	0,3		39	0,3
Total		23 055	100,0		22 341	100,0		18 683	100,0

*Data for 2014–2015 have been updated with late registrations/delayed death notification forms processed in 2016/2017.

4.3.3 Perinatal deaths differentials

The percentage distribution of perinatal deaths by the top five leading causes and selected geographic as well as demographic variables are presented in Table 4.11. Their absolute numbers are presented in Appendix G (see page 41).

The percentages of perinatal deaths due to *fetus and newborn affected by maternal factors and by complications of pregnancy, labour and delivery* varied by sex, population group, province and place of death. Perinatal deaths due to this underlying cause (*fetus and newborn affected by maternal factors and by complications of pregnancy, labour and delivery*) were highest in the coloured (30,2%) population group, in Limpopo (31,3%) by province and at by place of death, respectively. Deaths that occurred at the emergency room/out-patient facility was as high as 26,4%. Regarding deaths by *respiratory and cardiovascular disorders specific to the perinatal period*, the highest proportion (19,1%) occurred at a nursing home. Noticeable higher percentages of perinatal deaths due to *disorders related to length of gestation and fetal growth* among the Indian/Asian population group (9,2%), in the Northern Cape (10,0%) province and at a nursing home (11,9 %) were observed. Perinatal deaths due to *infections specific to the perinatal period* were higher among both the black African (3,3%) and Indian/Asian population groups (3,3%), in the Gauteng (4,7%) province and hospital (3,6%) as a place of occurrence. Proportions of perinatal deaths due to *Other congenital malformations* as an underlying cause were highest (4,3%) in the white population group, in the North West (2,8%) province and at the hospital (2,5%) as a place of death.

Table 4.11: Percentage distribution of perinatal deaths by top five leading causes and selected socio-demographic and geographic variables, 2016

Variables	Underlying causes of death						Total
	P00-P04 ¹	P20-P29 ²	P05-P08 ³	P35-P39 ⁴	Q80-Q89 ⁵	Others ⁶	
Sex							
Male	23,5	17,1	6,4	3,2	2,2	47,6	100,0
Female	24,6	15,7	7,4	3,1	2,1	47,1	100,0
Unknown/unspecified	23,5	12,5	6,8	1,6	4,1	51,4	100,0
Total	24,0	16,3	6,8	3,1	2,2	47,5	100,0
Population group							
Black African	23,6	17,0	6,9	3,3	2,2	47,0	100,0
White	26,4	14,5	4,6	2,6	4,3	47,5	100,0
Indian/Asian	29,2	13,3	9,2	3,3	1,7	43,3	100,0
Coloured	30,2	12,7	8,4	2,4	2,2	44,2	100,0
Other	24,3	16,2	5,4	0,0	2,7	51,4	100,0
Unknown/unspecified	22,9	13,9	5,5	1,7	1,9	54,1	100,0
Total	24,0	16,3	6,8	3,1	2,2	47,5	100,0
Province of death							
Western Cape	29,6	9,0	7,2	2,3	2,4	49,5	100,0
Eastern Cape	23,6	18,5	8,4	3,1	1,8	44,7	100,0
Northern Cape	21,9	16,3	10,0	2,5	1,5	47,8	100,0
Free State	26,0	19,6	5,2	2,4	1,6	45,2	100,0
North West	25,0	12,9	8,5	2,4	2,8	48,5	100,0
KwaZulu-Natal	24,8	19,6	7,8	3,8	1,7	42,4	100,0
Gauteng	17,3	16,3	5,1	4,7	2,2	54,5	100,0
Mpumalanga	24,7	19,1	8,1	2,2	2,3	43,5	100,0
Limpopo	31,3	20,9	5,4	2,0	2,4	38,0	100,0
Unspecified	0,0	33,3	0,0	0,0	0,0	66,7	100,0
Total	24,0	16,3	6,8	3,1	2,2	47,5	100,0
Place of death							
Hospital	24,7	16,9	7,2	3,6	2,5	45,3	100,0
Emergency room/Out-patient	26,4	17,6	7,4	2,7	1,4	44,6	100,0
Dead on arrival	24,4	15,1	8,1	2,0	1,2	49,1	100,0
Nursing home	11,9	19,1	11,9	0,0	0,0	57,1	100,0
Home	17,1	17,2	5,1	1,5	0,5	58,6	100,0
Other	15,7	13,0	5,1	1,4	1,7	63,1	100,0
Unknown/unspecified	23,4	14,3	5,7	1,9	1,9	52,9	100,0
Total	24,0	16,3	6,8	3,1	2,2	47,5	100,0

1 Fetus and newborn affected by maternal factors and by complications of pregnancy, labour and delivery (P00-P04).

2 Respiratory and cardiovascular disorders specific to the perinatal period (P20-P29).

3 Disorders related to length of gestation and fetal growth (P05-P08).

4 Infections specific to the perinatal period (P35-P39).

5 Other congenital malformations (Q80-Q89).

6 'Others' category includes natural causes not in top five, non-natural causes and ill-defined causes.

4.3.4 Leading underlying natural causes of perinatal deaths by population group

The top five rankings of the leading underlying causes of perinatal deaths plus other natural causes by population group is presented in Table 4.12. As was the case with previous analyses on population groups, the Indian/Asian population group has been excluded due to their small numbers. The results showed the same ranking pattern across the population groups, for the first three leading underlying causes of perinatal. *Fetus and newborn affected by maternal factors and by complications of pregnancy, labour and delivery* ranked first as the leading underlying cause of perinatal deaths accounting for 23,6% amongst black Africans, 26,4% amongst the white population group and 30,2% amongst coloured population group.

Respiratory and cardiovascular disorders specific to the perinatal period was the second leading underlying cause of perinatal deaths for all three population groups. Black Africans and coloureds were the only population groups which had *infections specific to the perinatal period* amongst the five leading underlying causes of perinatal deaths; ranking fourth for both population groups. While *other congenital malformations* and was among the five leading underlying causes of perinatal deaths for the three population groups (black African, white and coloured); *congenital malformations of the circulatory system* was among the five leading causes only for the white population group.

Table 4.12: The five leading underlying natural causes of perinatal deaths by population group, 2016

Underlying broad groups of causes of death (based on ICD-10)	Black African			White			Coloured		
	Rank	Number	%	Rank	Number	%	Rank	Number	%
Fetus and newborn affected by maternal factors and by complications of pregnancy, labour and delivery (P00-P04)	1	3 578	23,6	1	80	26,4	1	338	30,2
Respiratory and cardiovascular disorders specific to the perinatal period (P20-P29)	2	2 571	17,0	2	44	14,5	2	142	12,7
Disorders related to length of gestation and fetal growth (P05-P08)	3	1 049	6,9	3	14	4,6	3	94	8,4
Infections specific to the perinatal period (P35-P39)	4	505	3,3	...	...	...	4	27	2,4
Other congenital malformations (Q80-Q89)	5	338	2,2	4	13	4,3	5	25	2,2
Congenital malformations of the circulatory system (Q20-Q28)	...	...	...	4	13	4,3	...	...	...
Other natural causes		7 096	46,8		138	45,5		492	43,9
Non-natural causes		26	0,2		1	0,3		3	0,3
All causes		15 163	100,0		303	100,0		1 121	100,0

*Excluding Indian/Asian population group due to small numbers as well as those classified as other/unknown/unspecified.

... Category not in the top ten.

5. Summary and concluding remarks

Statistics South Africa collects the death notification forms from the Department of Home Affairs (DHA) for processing, analysis and dissemination of statistics on mortality and causes of death. Information on mortality and causes of stillbirths, early neonatal and perinatal deaths published in this release are based on data collected through the civil registration system in South Africa by the DHA. This statistical release focused on the 2016 perinatal deaths. However, perinatal deaths for the previous years (1997–2015) were included as they provide the overall trends in perinatal deaths.

The total number of perinatal deaths which occurred and were registered by the DHA in 2016 was 18 683. This marked a 12,6% decline from perinatal deaths (21 378) which occurred in 2015. There were 11 961 stillbirths and 6 722 early neonatal deaths registered in 2016. Stillbirths constituted 64% of perinatal deaths, while neonatal deaths contributed about 36%. Stillbirths have always been higher than early neonatal deaths since 1999, which was still the case in 2016. The 2016 pattern of higher number of male stillbirths than female stillbirths has also been persistent since 1997. Overall, the number of female perinatal deaths declined in 2016.

The national sex ratio for stillbirths was 124 male stillbirths per 100 female stillbirths, 129 male early neonatal deaths per 100 female and 126 male perinatal deaths per 100 female perinatal deaths. The highest perinatal sex ratio was observed in the Northern Cape (139) whilst the lowest was noted in the North West Province (121). The highest proportion of deaths for all three categories were observed among black Africans. Perinatal death predominantly occurred in health care facilities. Similar to 2015, stillbirths due to *fetus and newborn affected by maternal factors and by complications of pregnancy, labour and delivery* were the first leading underlying cause of death in 2016, responsible for more than a quarter of deaths for each variable.

Amid stillbirths, *certain conditions originating in the perinatal period* was responsible for 97,1% of stillbirths in 2016, with the other 2,9% attributed to *congenital malformations*. A proportion of 97,1% of male stillbirths were attributed to *certain conditions originating in the perinatal period*, while for females it was 97,3%.

The three leading underlying causes of perinatal deaths which retained the same rankings across three population groups (black African, white and coloured) were *fetus and new-born affected by maternal factors and by complications of pregnancy, labour and delivery* (rank one), *respiratory and cardiovascular disorders specific to the perinatal period* (rank two) and *disorders related to length of gestation and fetal growth* (rank three).

Early neonatal deaths, experienced the same pattern as perinatal deaths regarding ranking of the 3 top underlying causes (*respiratory and cardiovascular disorders specific to the perinatal period* (rank one), *fetus and newborn affected by maternal factors and by complications of pregnancy, labour and delivery* (rank two) and *disorders related to length of gestation and fetal growth* (rank three) and effected all the three population groups (black African, white and coloured), but at different rankings.

Statistics on perinatal deaths are important for planning, monitoring and evaluation of interventions and programs aimed at improving the health and survival of infants. Their usefulness may however, be undermined if data are not of high quality. As such, efforts need to be made to enhance the completeness and quality of information. In particular, reductions in unknown and unspecified information on socio-demographic characteristics of both the perinatal deaths and the mothers, including detailed information on causes of death. Addressing gaps in perinatal deaths data will go a long way towards in-depth analysis of the perinatal deaths and adequate understanding of the status of perinatal deaths in the country. Notwithstanding the quality issues highlighted in this statistical release, the data on perinatal deaths are an invaluable source of information on both the characteristics and causes of death for stillbirths and early neonatal deaths.

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Appendices

Appendix A: Definitions of concepts used

1.1 Death

The permanent disappearance of all evidence of life at any time after a live birth has taken place. This definition excludes fetal deaths.

1.2 Stillbirth

A stillborn in relation to a child, means that it has at least 26 weeks of intra-uterine existence but showed no sign of life after complete birth.

1.3 Early neonatal death

The death of live-born infant during the first seven completed days of life.

1.4 Perinatal death

Perinatal deaths are a combination of fetuses of at least 26 weeks that are born dead (stillbirths) and infants that die within the first week after live birth (early neonatal deaths).

1.5 Neonatal death

The death of a live-born infant during the first 28 completed days of life.

1.6 Live birth

The complete expulsion or extraction from its mother's womb of a product of conception, irrespective of the duration of pregnancy, which after such separation, breathes or shows any other evidence of life, such as, beating of the heart, pulsation of the umbilical cord or definite movement of voluntary muscles, whether or not the umbilical cord has been cut or the placenta is attached.

Appendix B: Assessment of data on perinatal deaths

Data availability on perinatal deaths remains a challenge, especially in developing countries where it is estimated that the majority of perinatal deaths occur (approximately 98% of the 6 million perinatal deaths worldwide occur in developing countries [WHO, 2006]). In South Africa, the section on perinatal deaths was only included in the death notification form (DHA-1663) in 2010. Although perinatal deaths are registered and the statistics published in South Africa; the information is limited as many variables related to perinatal deaths have a high number of cases with unspecified or unknown cases, especially for stillbirths. While the civil registration data provide insights into the number of perinatal deaths registered at the DHA for the period 1997 to 2016, the following have to be noted:

- The definition of stillbirths based on the Births and Deaths Registration Act, 1992 (Act No. 51 of 1992) is not the same as the definition recommended by the WHO. The Births and Deaths Registration Act (Act No. 51 of 1992) states that '*A stillborn in relation to a child, means that it has at least 26 weeks of intra-uterine existence but showed no sign of life after complete birth* (Republic of South Africa, 1992). The WHO defines stillbirths as deaths which occurred with a mass of 500 grams or at 22 complete weeks of pregnancy (WHO, 2006). The WHO recommends that, if possible, all fetuses and infants weighing at least 500g at birth, whether alive or dead, should be included in the national statistics as it will allow for the inclusion of inherently valuable data and improve the coverage of reporting perinatal deaths. For international comparison, the WHO recommends the use of a more conservative definition which restricts still births to deaths weighing 1 000 g and/or 28 weeks gestation (WHO, 2006).
- There is a limited number of variables for in-depth analysis, particularly factors related to the mother. The information on the maternal characteristic is not conclusive as it has a high percentage of missing information.
- Completeness levels for the registration of perinatal deaths have not been estimated, which may differ by year of death and geographic areas.

Table B.1 provides information on missing data or proportion of unknown or unspecified information for variables where these are large. The term 'unknown cases' refers to cases where more than one option was ticked on the death notification form while 'unspecified cases' refers to missing information for that variable.

Missing information was more than 10% for the variables population group (10,4%); duration of pregnancy (11,3%); province of usual residence (16,7%) and place or institution of death occurrence (18,0%). For the rest of the variables, information was missing in over 25% of the cases and as such were excluded from further analysis. Overall, the characteristics of the mother were poorly reported.

Table B.1: Percentage of perinatal deaths classified as unknown/unspecified for selected variables, 2016

Variable	Applicable Group	Percentage unspecified or unknown
Population group	Perinatal death	10,4
Province of usual residence	Perinatal death	16,7
Place or institution of death occurrence	Perinatal death	18,0
Method used to ascertain cause of death	Perinatal death	74,3
Pregnancy duration in weeks	Mother	11,3
Birth type	Mother	41,3
Birth attendant	Mother	47,0
Age of mother	Mother	59,2
Delivery method	Mother	62,9
Antenatal care	Mother	52,5
Outcome of previous pregnancy	Mother	72,8

The quality of the data was assessed using the model proposed by Mahapatra et al. (2007). The model proposes that at most, 10% of cause-of-death statistics should be assigned to ill-defined causes. Although ill-defined causes still provide the overall picture on mortality, they fail to provide a concise picture because they poorly attribute the underlying cause of death. The ill-defined causes consist of *symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified (R00-R99)* and *fetal death of unspecified cause (P95)*.

Table B.2 shows the distribution of deaths assigned to ill-defined causes by place of death occurrence. Almost 40% (36,8%) total proportion of perinatal deaths were assigned to ill-defined cause of death for place of death, which is a large margin from the recommended proportion. Stillbirths had the highest proportion of ill-defined cause of death at place of death occurrence (78,9%) while early neonatal deaths had the lowest proportion of 0,7%. Ill-defined causes of deaths for stillbirths which occurred in a hospital were 56,8% while it was 0,1% for early neonatal deaths.

Table B.2: Ill-defined causes of death by place of death occurrence, 2016*

Place of death	Stillbirths			Early neonatal deaths			Perinatal deaths		
	No. of ill-defined	Total no. of deaths in the place of death	%	No. of ill-defined	Total no. of deaths in the place of death	%	No. of ill-defined	Total no. of deaths in the place of death	%
Hospital	4 928	8 677	56,8	7	5 080	0,1	4 935	13 757	35,9
Emergency room/Out-patient	52	106	0,6	2	42	0,0	54	148	36,5
Dead on arrival	123	247	1,4	4	97	0,1	127	344	36,9
Nursing home	15	23	0,2	1	19	0,0	16	42	38,1
Home	290	456	3,3	11	287	0,2	301	743	40,5
Other	130	198	1,5	2	95	0,0	132	293	45,1
Unknown/unspecified	1 305	2 254	15,0	7	1 102	0,1	1 312	3 356	39,1
Total	6 843	11 961	78,9	34	6 722	0,7	6 877	18 683	36,8

Appendix C: Stillbirths, early neonatal and perinatal mortality rates, 2003–2015*

Death year	Number					Rate		
	Early neonatal deaths	Stillbirths	Perinatal deaths	Live births	Total births*	Early neonatal	Stillbirths	Perinatal mortality
2003	8 128	14 661	22 789	926 061	940 722	8,8	15,6	24,2
2004	8 245	15 851	24 096	1 013 907	1 029 758	8,1	15,4	23,4
2005	9 880	13 829	23 709	1 060 494	1 074 323	9,3	12,9	22,1
2006	10 069	14 384	24 453	1 088 789	1 103 173	9,2	13,0	22,2
2007	9 893	14 356	24 249	1 075 538	1 089 894	9,2	13,2	22,2
2008	10 095	14 950	25 045	1 094 656	1 109 606	9,2	13,5	22,6
2009	11 050	14 339	25 389	1 031 710	1 046 049	10,7	13,7	24,3
2010	8 985	15 138	24 123	1 021 362	1 036 500	8,8	14,6	23,3
2011	8 108	14 278	22 386	1 028 401	1 042 679	7,9	13,7	21,5
2012	8 553	14 734	23 287	1 022 301	1 037 035	8,4	14,2	22,5
2013	7 772	15 098	22 870	1 012 808	1 027 906	7,7	14,7	22,2
2014	7 898	15 157	23 055	1 008 740	1 023 897	7,8	14,8	22,5
2015	8 000	14 341	22 341	952 242	966 583	8,4	14,8	23,1
2016	6 722	11 961	18 683	876 435	888 396	7,7	13,5	21,0

Appendix D: Number distribution of stillbirths by top five leading causes and selected socio-demographic and geographic variables, 2016

Variables	Underlying causes of death						
	P00-P04 ¹	P20-P29 ²	P05-P08 ³	Q80-Q89 ⁴	Q00-Q07 ⁵	Others ⁶	Total
Sex							
Male	1 862	341	232	98	31	3 735	6 299
Female	1 587	245	190	70	26	2 967	5 085
Unknown/unspecified	167	27	20	17	2	344	577
Total	3 616	613	442	185	59	7 046	11 961
Population group							
Black African	2 874	502	364	142	41	5 729	9 652
White	57	9	7	8	3	97	181
Indian/Asian	30	6	3	2	1	38	80
Coloured	267	25	25	9	6	373	705
Other	8	1	2	0	1	11	23
Unknown/unspecified	380	70	41	24	7	798	1 320
Total	3 616	613	442	185	59	7 046	11 961
Province of death							
Western Cape	425	36	38	24	11	703	1 237
Eastern Cape	168	40	30	8	1	293	540
Northern Cape	101	22	21	5		212	361
Free State	307	80	35	13	7	508	950
North West	768	111	127	54	13	1 586	2 659
KwaZulu-Natal	356	72	48	15	2	556	1 049
Gauteng	653	107	55	36	15	2 087	2 953
Mpumalanga	296	43	48	13	4	505	909
Limpopo	542	102	40	17	6	595	1 302
Unspecified		0	0	0		1	1
Total	3 616	613	442	185	59	7 046	11 961
Place of death							
Hospital	2 688	424	310	134	48	5 073	8 677
Emergency room/Out-patient	34	11	5	2		54	106
Dead on arrival	83	14	19	3	1	127	247
Nursing home	3	2	3	0	0	15	23
Home	110	25	25	3	0	293	456
Other	38	8	11	4	1	136	198
Unknown/unspecified	660	129	69	39	9	1 348	2 254
Total	3 616	613	442	185	59	7 046	11 961
Birth weight							
Less than 1 000	671	87	192	24	9	1 147	2 130
1 000–1 499	588	53	69	39	8	982	1 739
1 500–1 999	509	37	26	25	8	844	1 449
2 000–2 499	446	41	9	17	9	744	1 266
2 500–2 999	351	81	6	11	1	584	1 034
3 000–3 499	223	71	3	13	2	394	706
3 500–3 999	96	33	1	4	1	170	305
4 000 and above	39	15	6	2	2	106	170
Unspecified	693	195	130	50	19	2 075	3 162
Total	3 616	613	442	185	59	7 046	11 961

¹ Fetus and newborn affected by maternal factors and by complications of pregnancy, labour and delivery (P00-P04).

² Respiratory and cardiovascular disorders specific to the perinatal period (P20-P29).

³ Disorders related to length of gestation and fetal growth (P05-P08).

⁴ Other congenital malformations (Q80-Q89).

⁵ Congenital malformations of the nervous system (Q00-Q07)

⁶ Others' category includes natural causes not in top five, non-natural causes and ill-defined causes.

Appendix E: Number distribution of early neonatal deaths by top five leading causes and selected socio-demographic and geographic variables, 2016

Variables	Underlying causes of death						Total
	P00-P04 ¹	P05-P08 ²	P20-P29 ³	P35-P39 ⁴	Q80-Q89 ⁵	Others ⁶	
Sex							
Male	480	406	1 361	303	119	982	3 651
Female	365	393	1 001	239	96	747	2 841
Unknown/unspecified	23	35	74	10	16	72	230
Total	868	834	2 436	552	231	1 801	6 722
Population group							
Black African	704	685	2 069	482	196	1 375	5 511
White	23	7	35	8	5	44	122
Indian/Asian	5	8	10	4	.	13	40
Coloured	71	69	117	25	16	118	416
Other	1	.	5	.	1	7	14
Unknown/unspecified	64	65	200	33	13	244	619
Total	868	834	2 436	552	231	1 801	6 722
Province of death							
Western Cape	101	90	124	37	19	169	540
Eastern Cape	44	45	126	27	8	108	358
Northern Cape	28	38	74	15	4	70	229
Free State	76	42	209	34	11	154	526
North West	190	199	384	90	53	264	1 180
KwaZulu-Natal	77	89	270	65	14	183	698
Gauteng	183	190	683	215	69	541	1 881
Mpumalanga	60	69	232	29	20	120	530
Limpopo	109	72	332	40	33	189	775
Unspecified	.	.	2	.	.	3	5
Total	868	834	2 436	552	231	1 801	6 722
Place of death							
Hospital	710	678	1 894	469	203	1 126	5 080
Emergency room/ Out-patient	5	6	15	4	.	12	42
Dead on arrival	1	9	38	5	1	43	97
Nursing home	2	2	6	.	.	9	19
Home	17	13	103	10	1	143	287
Other	8	4	30	4	1	48	95
Unknown/unspecified	125	122	350	60	25	420	1 102
Total	868	834	2 436	552	231	1 801	6 722

¹ Fetus and newborn affected by maternal factors and by complications of pregnancy, labour and delivery (P00-P04).

² Disorders related to length of gestation and fetal growth (P05-P08).

³ Respiratory and cardiovascular disorders specific to the perinatal period (P20-P29).

⁴ Infections specific to the perinatal period (P35-P39).

⁵ Other congenital malformations (Q80-Q89).

⁶ Others' category includes natural causes not in top five, non-natural causes and ill-defined causes.

Appendix F: Detailed description of the broad groups of causes of perinatal deaths which were among the ten leading underlying natural causes in 2016

Underlying cause of death	Number	Percentage
Foetus and newborn affected by maternal factors and by complications of pregnancy, labour and delivery (P00-P04)		
Foetus and newborn affected by maternal conditions that may be unrelated to present pregnancy (P00)	2 478	55,3
Foetus and newborn affected by complications of placenta, cord and membranes (P02)	1 511	33,7
Foetus and newborn affected by maternal complications of pregnancy (P01)	260	5,8
Foetus and newborn affected by other complications of labour and delivery (P03)	203	4,5
Foetus and newborn affected by noxious influences transmitted via placenta or breast milk (P04)	32	0,7
Total	4 484	100,0
Disorders related to length of gestation and foetal growth (P05-P08)		
Disorders related to short gestation and low birth weight, not elsewhere classified (P07)	1 244	97,5
Slow foetal growth and foetal malnutrition (P05)	32	2,5
Total	1 276	100,0
Respiratory and cardiovascular disorders specific to the perinatal period (P20-P29)		
Respiratory distress of newborn (P22)	1 038	34,0
Birth asphyxia (P21)	529	17,3
Intrauterine hypoxia (P20)	488	16,0
Neonatal aspiration syndromes (P24)	405	13,3
Pulmonary haemorrhage originating in the perinatal period (P26)	152	5,0
Congenital pneumonia (P23)	151	5,0
Other respiratory conditions originating in the perinatal period (P28)	138	4,5
Cardiovascular disorders originating in the perinatal period (P29)	132	4,3
Interstitial emphysema and related conditions originating in the perinatal period (P25)	15	0,5
Chronic respiratory disease originating in the perinatal period (P27)	1	0,0
Total	3 049	100,0
Infections specific to the perinatal period (P35-P39)		
Bacterial sepsis of newborn (P36)	540	93,6
Other infections specific to the perinatal period (P39)	28	4,9
Congenital viral diseases (P35)	4	0,7
Other congenital infectious and parasitic diseases (P37)	3	0,5
Omphalitis of newborn with or without mild haemorrhage (P38)	2	0,4
Total	577	100,0
Haemorrhagic and haematological disorders of foetus and newborn (P50-P61)		
Intracranial non traumatic haemorrhage of foetus and newborn (P52)	83	31,4
Other perinatal haematological disorders (P61)	54	20,5
Neonatal jaundice from other and unspecified causes (P59)	40	15,2
Disseminated intravascular coagulation of foetus and newborn (P60)	20	7,6
Haemolytic disease of foetus and newborn (P55)	17	6,4
Neonatal jaundice due to other excessive haemolysis (P58)	16	6,1
Kernicterus (P57)	13	4,9
Haemorrhagic disease of foetus and newborn (P53)	7	2,7
Other neonatal haemorrhages (P54)	7	2,7
Other underlying causes	7	2,7
Total	264	100,0

Appendix F: Detailed description of the broad groups of causes of perinatal deaths which were among the ten leading underlying natural causes in 2016 (concluded)

Underlying cause of death	Number	Percentage
Digestive system disorders of foetus and newborn (P75-P78)		
Necrotizing enterocolitis of foetus and newborn (P77)	73	61,9
Other perinatal digestive system disorders (P78)	43	36,4
Other intestinal obstruction of newborn (P76)	2	1,7
Total	118	100,0
Congenital malformations of the nervous system (Q00-Q07)		
Anencephaly and similar malformations (Q00)	62	46,6
Congenital hydrocephalus (Q03)	35	26,3
Other congenital malformations of brain (Q04)	16	12,0
Spina bifida (Q05)	13	9,8
Other underlying causes	7	5,3
Total	133	100,0
Congenital malformations of the circulatory system (Q20-Q28)		
Other congenital malformations of heart (Q24)	129	75,4
Congenital malformations of great arteries (Q25)	13	7,6
Congenital malformations of cardiac septa (Q21)	13	7,6
Other underlying causes	16	9,4
Total	171	100,0
Other congenital malformations (Q80-Q89)		
Other congenital malformations, not elsewhere classified (Q89)	346	83,2
Congenital malformation syndromes due to known exogenous causes, not elsewhere classified (Q86)	59	14,2
Other underlying causes	11	2,6
Total	416	100,0
Chromosomal abnormalities, not elsewhere classified (Q90-Q99)		
Edward's syndrome and Patau's syndrome (Q91)	75	60,0
Down's syndrome (90)	31	24,8
Other chromosome abnormalities, not elsewhere classified (Q99)	14	11,2
Other underlying causes	5	4,0
Total	125	100,0

Appendix G: Number distribution of perinatal deaths by top five leading causes and selected socio-demographic and geographic variables, 2016

Variables	Underlying causes of death						
	P00-P04 ¹	P20-P29 ²	P05-P08 ³	P35-P39 ⁴	Q80-Q89 ⁵	Others ⁶	Total
Sex							
Male	2 342	1 702	638	317	217	4 734	9 950
Female	1 952	1 246	583	247	166	3 732	7 926
Unknown/unspecified	190	101	55	13	33	415	807
Total	4 484	3 049	1 276	577	416	8 881	18 683
Population group							
Black African	3 578	2 571	1 049	505	338	7 122	15 163
White	80	44	14	8	13	144	303
Indian/Asian	35	16	11	4	2	52	120
Coloured	338	142	94	27	25	495	1 121
Other	9	6	2	0	1	19	37
Unknown/unspecified	444	270	106	33	37	1 049	1 939
Total	4 484	3 049	1 276	577	416	8 881	18 683
Province of death							
Western Cape	526	160	128	41	43	879	1 777
Eastern Cape	212	166	75	28	16	401	898
Northern Cape	129	96	59	15	9	282	590
Free State	383	289	77	36	24	667	1 476
North West	958	495	326	92	107	1 861	3 839
KwaZulu-Natal	433	342	137	66	29	740	1 747
Gauteng	836	790	245	226	105	2 632	4 834
Mpumalanga	356	275	117	32	33	626	1 439
Limpopo	651	434	112	41	50	789	2 077
Unspecified	0	2	0	0	0	4	6
Total	4 484	3 049	1 276	577	416	8 881	18 683
Place of death							
Hospital	3 398	2 318	988	488	337	6 228	13 757
Emergency room/Out-patient	39	26	11	4	2	66	148
Dead on arrival	84	52	28	7	4	169	344
Nursing home	5	8	5	0		24	42
Home	127	128	38	11	4	435	743
Other	46	38	15	4	5	185	293
Unknown/unspecified	785	479	191	63	64	1 774	3 356
Total	4 484	3 049	1 276	577	416	8 881	18 683

¹ Fetus and newborn affected by maternal factors and by complications of pregnancy, labour and delivery (P00-P04).

² Respiratory and cardiovascular disorders specific to the perinatal period (P20-P29).

³ Disorders related to length of gestation and fetal growth (P05-P08).

⁴ Infections specific to the perinatal period (P35-P39).

⁵ Other congenital malformations (Q80-Q89).

⁶ Others' category includes natural causes not in top five, non-natural causes and ill-defined causes.

Appendix H: Perinatal deaths by selected characteristics of the mothers and perinatal deaths

Collection of information on the cause of death for perinatal deaths was collected using two types of forms as previously mentioned. The old form (BI-1663) does not have a section which focuses specifically on perinatal deaths while form type DHA-1663 has a section which collects information about the perinatal death as well as about the mother of the child. Accordingly, this section provides analysis and information based only on the DHA-1663 form. The questions on the DHA-1663 which are not on the BI-1663 are on the birth type, outcome of previous pregnancies, duration of current pregnancy in weeks, age of the mother, antenatal care visits, birth attendant and method of delivery. A total of 257 (1,4%) perinatal deaths were registered using the BI-1663, while 18 426 (98,6%) were registered using the DHA-1663. In total, based on the DHA-1663 there were 18 134 mothers who experienced a perinatal loss in 2016. This number is less the women who experienced loss of more than one perinatal death.

Perinatal characteristics

H.1 Birth type

The percentage distribution of perinatal deaths by birth type are depicted in Table H.1. About 40% (41,3%) of the deliveries had unknown or missing birth type. In analysing the cases where the birth type was specified, in 2016, more than 90% (91,8%) were single births, 4,1% were second twin perinatal deaths and 3,6% were first twin perinatal deaths. Other multiple were only 0,5%.

Table H.1: Number and percentage distribution of perinatal deaths by birth type, 2016

Birth type	Cases including unspecified or unknown		Cases excluding unspecified or unknown	
	Number	Percentage	Number	Percentage
Single	9 940	54,0	9940	91,8
First twin	390	2,1	390	3,6
Second twin	441	2,4	441	4,1
Other multiple	53	0,3	53	0,5
Unknown/unspecified	7 602	41,3	0	0,0
Total	18 426	100,0	10 824	100,0

H.2 Birth attendant

The United Nations advocates for the use of medical facilities and trained attendants in the delivery process as these are normally practitioners trained in delivering a child (UN, 2014). Table H.2 shows the distribution of perinatal deaths by birth attendant for 2016 perinatal deaths. It is important to note that 47,0% perinatal deaths did not have information about the person who attended to the birth and as such, the results should be interpreted with caution. The categories indicate whether a physician (*certified medical practitioner*), trained midwife (*professional nurse*), other trained person (*staff nurse, clinical associate, emergency medical staff*) or other (*traditional birth attendant, family member, etc.*) attended to the birth (Stats SA, 2012). Concentrating on records where the birth attended was specified, the results show that trained mid-wives delivered the highest percentage of perinatal deaths (49,2%), followed by physicians (43,2%). Perinatal deaths attended by other trained persons were 2,2% while those in the 'other' category constituted 5,4% of all perinatal deaths.

Table H.2: Number and percentage distribution of perinatal deaths by birth attendant, 2016

Birth attendant	Cases including unspecified or unknown		Cases excluding unspecified or unknown	
	Number	Percentage	Number	Percentage
Physician	4 223	22,9	4223	43,2
Trained midwife	4 806	26,1	4806	49,2
Other trained person	214	1,2	214	2,2
Other	528	2,9	528	5,4
Unknown/unspecified	8 655	47,0	0	0,0
Total	18 426	100,0	9 771	100,0

Mother characteristics

H.3 Age of the mother

Table H.3 shows the age distribution of mothers who experienced perinatal loss in 2016. This information gives an age pattern of mothers who experienced a perinatal loss as well as an average age of these mothers. There was however a high proportion of mothers who experienced perinatal loss whose ages were unknown or not specified. A total of 59,2% mothers had missing information on the age variable. The distribution should be treated with caution given the high proportion of missing information. Amongst those whose ages were specified, mothers in the age group 25–29 had the highest proportion of perinatal deaths (25,9%), closely followed by those aged 20–24 (25,0%) and age group 30–34 which constituted 20,3% of the total perinatal deaths with specified information. The lowest proportions of perinatal deaths were observed amongst mothers aged 10–14, 45–49 and 50–54.

Table H.3: Number and percentage distribution of mothers experiencing perinatal loss by age of the mother, 2016

Age mother	Cases including unspecified or outside 10–54 age range		Cases excluding unspecified or outside 10–54 age range	
	Number	Percentage	Number	Percentage
10–14	12	0,1	12	0,2
15–19	793	4,4	793	10,7
20–24	1 849	10,2	1 849	25,0
25–29	1 914	10,6	1 914	25,8
30–34	1 507	8,3	1 507	20,3
35–39	902	5,0	902	12,2
40–44	384	2,1	384	5,2
45–49	39	0,2	39	0,5
50–54	6	0,0	6	0,1
Unknown/unspecified	10 728	59,2	0	0,0
Total	18 134	100,0	7 406	100,0

H.4 Outcome of last previous pregnancy

Table H.4 shows the distribution of the mothers who experienced perinatal loss in 2016 by the outcome of their last previous pregnancy. Information on outcomes of women's previous pregnancies is important in relation to their current pregnancy. This is because during prenatal care, certain risk factors can be flagged from the pregnancy history to ensure survival of both the mother and the child. Approximately, 72,8% of the mothers did not provide information about the outcome of their previous pregnancy. The table indicates that 70,3% of the mothers had a live birth in their last previous pregnancy. As much as 22,3% had a stillbirth and 7,4% had an abortion in their last pregnancy.

Table H.4: Number and percentage distribution of mothers experiencing perinatal loss by outcome of last previous pregnancy, 2016

Birth attendant	Cases including unspecified or unknown		Cases excluding unspecified or unknown	
	Number	Percentage	Number	Percentage
Live birth	3 464	19,1	3 464	70,3
Still birth	1 098	6,1	1 098	22,3
Abortion	365	2,0	365	7,4
Unknown/unspecified	13 207	72,8	0	0,0
Total	18 134	100	4 927	100,0

H.5 Antenatal care during pregnancy

Antenatal care is very important for women who are pregnant as it gives them the opportunity to have their pregnancies monitored by health professionals and potential complications addressed gets addressed early (WHO, 2014a). A high proportion of mothers (52,5%) had no information on antenatal care. When focusing on the 8 619 mothers with information, 46,5% had at least two antenatal care visits and 53,5% had not had any antenatal care visit during pregnancy.

Table H.5: Number and percentage distribution of mothers experiencing perinatal loss by antenatal visits, 2016

Two or more antenatal visits	Cases including unspecified or unknown		Cases excluding unspecified or unknown	
	Number	Percentage	Number	Percentage
Yes	4 007	22,1	4 007	46,5
No	4 612	25,4	4 612	53,5
Unknown/unspecified	9 515	52,5	0	0,0
Total	18 134	100,0	8 619	100,0

H.6 Delivery method

Table H.6 shows the number of mothers experiencing perinatal loss by method of delivery. Almost two-thirds of the mothers (62,9%) had unspecified or unknown information on method of delivery. This has huge implications on the quality of the data. When excluding missing cases, 71,0% of the mothers had spontaneous deliveries and 20,6% delivered perinatal deaths through the caesarean section delivery method.

Table H.6: Number and percentage distribution of mothers experiencing perinatal loss by delivery method, 2016

Delivery method	Cases including unspecified or unknown		Cases excluding unspecified or unknown	
	Number	Percentage	Number	Percentage
Spontaneous	5 001	27,6	5001	71,0
Forceps delivery and rotation	27	0,1	27	0,4
Vacuum extractor	7	0,0	7	0,1
Caesarean section	1 454	8,0	1454	20,6
Other	236	1,3	236	3,4
Unknown/unspecified	11 409	62,9	0	0,0
Total	18 134	100,0	7 044	100,0