

# Statistical release

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## **Perinatal deaths in South Africa**

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## **Preface**

This statistical release presents information on perinatal deaths which are a combination of registered stillbirths and early neonatal deaths occurring during the first week of life. The release primarily presents information on perinatal deaths that occurred in South Africa for the year 2015 and were registered during the 2015/2016 processing phase. It also provides information on perinatal deaths from 1997 to 2014, to show trends and patterns in the occurrence and registration of perinatal deaths. The release is based on perinatal deaths registered and collated through the national civil registration system that is maintained by the Department of Home Affairs.

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# 1. Introduction

## 1.1 Background

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 and maternal mortality. Perinatal deaths encompass both stillbirths, which are fetuses delivered without signs of life, and early neonatal deaths, which refer to live born babies that die in the first week after birth (World Health Organization [WHO], 2006). The perinatal period as recommended by the WHO 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, 2006). 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 definition used in this release is based on the latter.

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

‘Health care for all by 2030’ is one of the key developmental objectives outlined in the National Development Plan (NDP) adopted by the South African government (National Planning Commission, 2012). This objective calls for an equal standard of health care for everyone, regardless of social status. The plan 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. Stillbirths and early neonatal deaths are primarily due to causes that are not only similar but are also amenable to prevention and curative measures. Moreover, perinatal death statistics present an opportunity that can easily be missed in preventing and tackling the burden of infant mortality. 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 Goals, attention should be given to deaths that occur during the neonatal phase, which generally includes early neonatal deaths as well as – in principle – stillbirths, which are fetuses whose gestation stage was actually viable for a live birth to occur (UNICEF, 2015).

## 1.2 Purpose of the statistical release

This statistical release is an annual publication by Statistics South Africa (Stats SA) on perinatal deaths registered and collated through the South African civil registration system maintained by the Department of Home Affairs (DHA). The overall objective of the statistical release is to provide information on levels, patterns, trends and causes of perinatal deaths in South Africa. The publication has two main objectives:

- To outline differentials in perinatal mortality by selected socio-demographic and geographic characteristics for perinatal deaths that occurred in 2015, as well as trends in perinatal mortality spanning a 19-year period (1997–2015).
- To provide statistics on the causes of death for perinatal deaths that occurred in 2015, focussing mainly on the underlying causes of death.

### **1.3 Scope of this statistical release**

This statistical release covers all perinatal deaths, based on death notification forms from the DHA for perinatal deaths that occurred in 2015 or earlier and reached Stats SA in time for the 2015/2016 processing phase. The primary focus for this release is on perinatal deaths that occurred in 2015, but additional information covering the period 1997–2014 is provided for a discussion on trends in the number of perinatal deaths and causes of perinatal deaths from 2013 to 2015.

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 35).

### **1.4 Organisation and presentation of this statistical release**

The release is organised into five sections: introduction, data and methods, registered perinatal deaths, causes of death, as well as 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, data processing, data editing and data analysis methods applied in the release.

The third section shows information on the levels, trends (from 1997 to 2015) 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 2013 to 2014 are also included to show trends and patterns in causes of perinatal deaths in recent years.

The fifth section presents the summary and concluding remarks.

## 2. Data and methods

In this section the data source, processing methods, editing and analysis procedures are discussed.

### 2.1 Data source

Administrative records from death notification forms collected from the DHA are the exclusive data source used to produce this statistical release on perinatal deaths. There are two death notification forms currently used in South Africa to register deaths: form BI-1663, which was introduced in 1998 as well as form DHA-1663, which was introduced in 2009 to replace form BI-1663. The main difference between these two forms is that for the BI-1663 form the causes of death for stillbirths 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 form DHA-1663 contains additional information on the details of both the mother and the early neonatal/stillborn. For more information on the two death notification forms, refer to the *Mortality and causes of death in South Africa, 2015: Findings from death notification* statistical release (Stats SA, 2017).

A total of 21 378 perinatal deaths occurred in 2015 and were registered at the Department of Home Affairs. Information on deaths was processed by Stats SA during the 2015/2016 processing year. A total of 20 665 (96,7%) were registered using the new death notification form DHA-1663, while 713 (3,3%) were registered using the old death notification form BI-1663.

### 2.2 Data processing

All completed death notification forms are collected from the DHA head office for data processing at the Stats SA Data Processing Centre. The information on stillbirths is processed with other death notification forms received by Stats SA. For further details on data processing of other deaths, see *Mortality and cause of death in South Africa, 2015: Findings from death notification* (Stats SA, 2017).

The 10<sup>th</sup> 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 in this release. 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 from *Mortality and cause of death in South Africa, 2015: Findings from death notification* (Stats SA, 2017).

### 2.3 Data editing

Appendix B on page 36 presents the assessment on data quality. 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 were then applied to the perinatal deaths data when all the stages of data processing had been 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, 2015: Findings from death notification* (Stats SA, 2017).



## 2.4 Data analysis

The analysis conducted in this statistical release is divided into two sections: the mortality section and the causes of death section. 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 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 2013 to 2015 based on the perinatal deaths from the civil registration system and population data from the mid-year population estimates produced by Stats SA. 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 multiplying 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 on causes of death focuses on frequencies and cross-tabulations of the causes of death. The underlying natural causes of death were computed by ranking the underlying natural causes of death from highest to lowest, with the highest 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, institution or place of death and birth weight.

### 3. Registered perinatal deaths

This section presents the analysis of the distribution of stillbirths, early neonatal and perinatal deaths that occurred in 2015 by selected socio-demographic and geographic characteristics. It further looks at the levels and trends of registered stillbirths, early neonatal deaths and perinatal deaths for the period 1997 to 2015. The latter part of this section presents observed stillbirth rates, early neonatal rates and perinatal death rates for 2015.

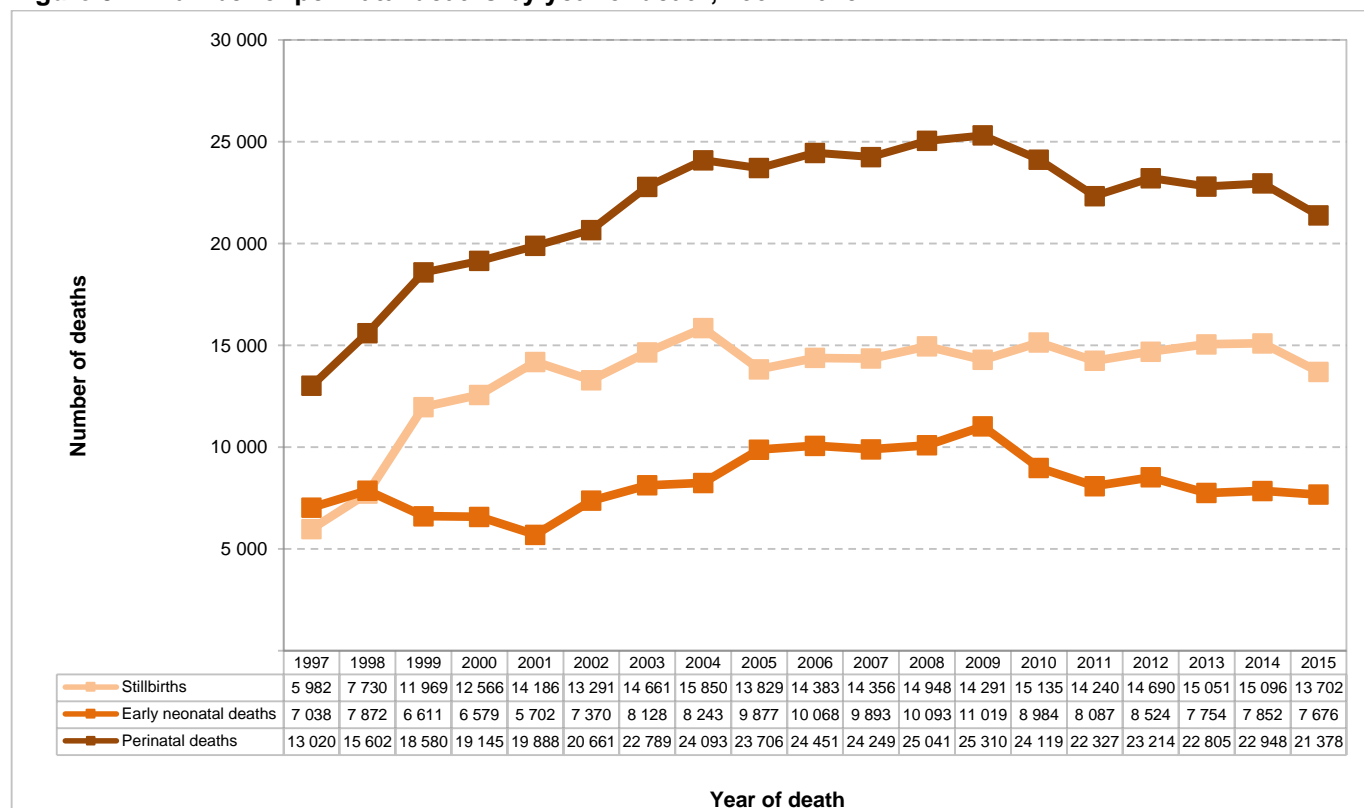
#### 3.1 Levels and trends of stillbirths, early neonatal deaths and perinatal deaths

Figure 3.1 shows the number of perinatal deaths including stillbirths and early neonatal deaths which were registered at the Department of Home Affairs (DHA) and processed by Stats SA for the years 1997 to 2015. Overall, the figure shows that the number of perinatal deaths, apart from a slight decline in 2005, increased consistently from a low of 13 020 in 1997 to a high of 25 310 in 2009; thereafter there was no consistent pattern. In 2015 there were 21 378 perinatal deaths, which was a 6,8% decline from 22 948 perinatal deaths that occurred in 2014.

Stillbirths increased from 1997 up to 2001 and subsequently fluctuated from 2002 until 2015. The highest number of stillbirths occurred in 2004 with 15 850 stillbirths. In 2015, there were 13 702 stillbirths, which was a slight decline of 9,2% from 15 096 in 2014. In the 19-year period, the number of stillbirths was consistently higher than that of early neonatal deaths, with the exception of 1997 and 1998 (though marginally so), where the number of early neonatal deaths was higher than the number of stillbirths.

The general trend in the number of early neonatal deaths indicates an increase between 1997 and 1998. Subsequently, the number of early neonatal deaths declined steadily between 1999 and 2001, after which they increased from 7 370 in 2002 to 10 068 in 2006. In 2007 early neonatal deaths decreased to 9 893, after which they increased to as high as 11 019 in 2009. Early neonatal deaths were 7 676 in 2015.

**Figure 3.1: Number of perinatal deaths by year of death, 1997–2015\***



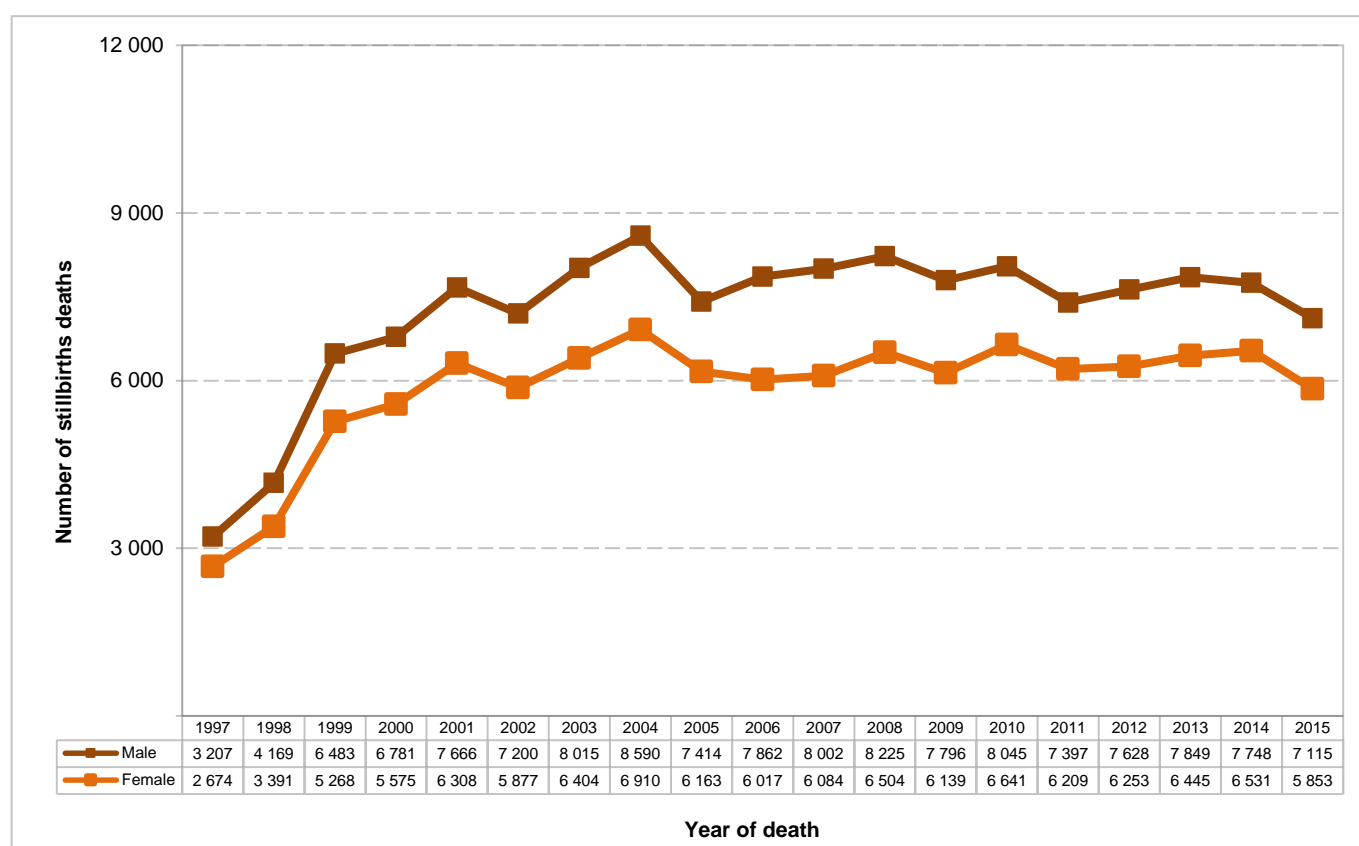
\* (1) Data for 1997–2014 have been updated with late registrations/delayed death notification forms processed in 2015/2016.

## 3.2 Sex differentials

### 3.2.1 Stillbirths

Figure 3.2 depicts the number of stillbirths by sex for the period 1997 to 2015. It is observed that throughout this period there were more male stillbirths compared to female stillbirths. The gap was narrower in 1997, becoming wider as the years progressed. The widest gap was observed in 2007 where there were 6 084 female stillbirths compared to 8 002 male stillbirths. The graph further shows that between 2013 and 2015 the gap narrowed.

**Figure 3.2: Number of stillbirths by sex and year of death, 1997–2015\***



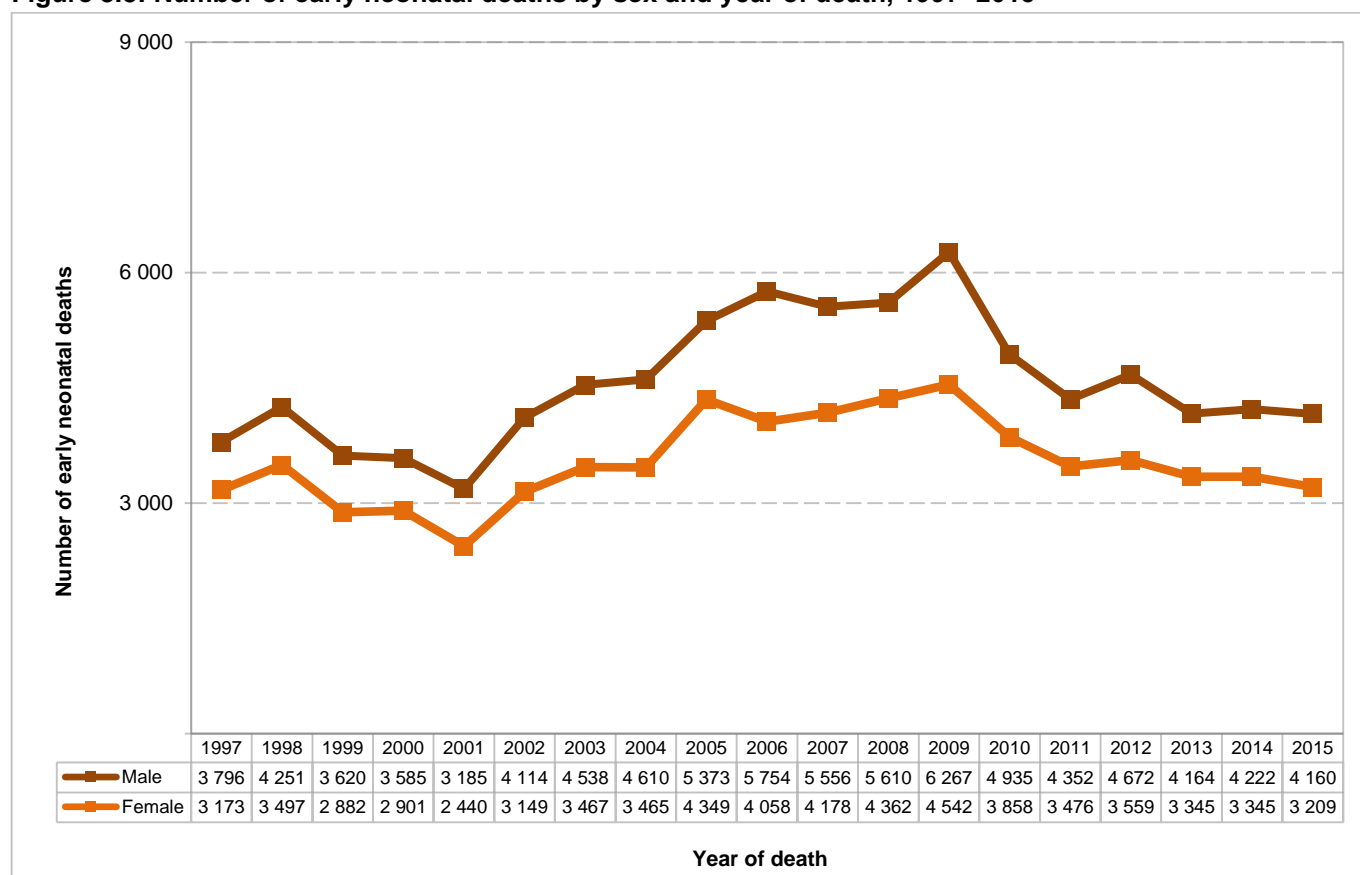
\* (1) Data for 1997–2014 have been updated with late registrations/delayed death notification forms processed in 2015/2016.

(2) Excluding stillbirths with unspecified sex.

### 3.2.2 Early neonatal deaths

Figure 3.3 shows the number of early neonatal deaths by sex and year of death. The trends in early neonatal deaths shown in Figure 3.3 illustrate the same pattern as that observed for stillbirths, in that there were higher male deaths relative to female deaths. The number of female early neonatal deaths decreased in 2006 compared to 2005, while male deaths continued to increase between these two years. Early neonatal deaths for both sexes peaked in 2009 and thereafter there was a consistent decline until 2011, then early neonatal deaths peaked again in 2012 for both sexes. Male deaths peaked much higher in 2009 than female deaths, and drastically declined in 2010. There is no noticeable pattern in early neonatal deaths after 2013 amongst males while for females, the number of early neonatal deaths remained constant at 3 345 between 2013 and 2014, thereafter decreasing to 3 209 in 2015.

**Figure 3.3: Number of early neonatal deaths by sex and year of death, 1997–2015\***



\* (1) Data for 1997–2014 have been updated with late registrations/delayed death notification forms processed in 2015/2016.

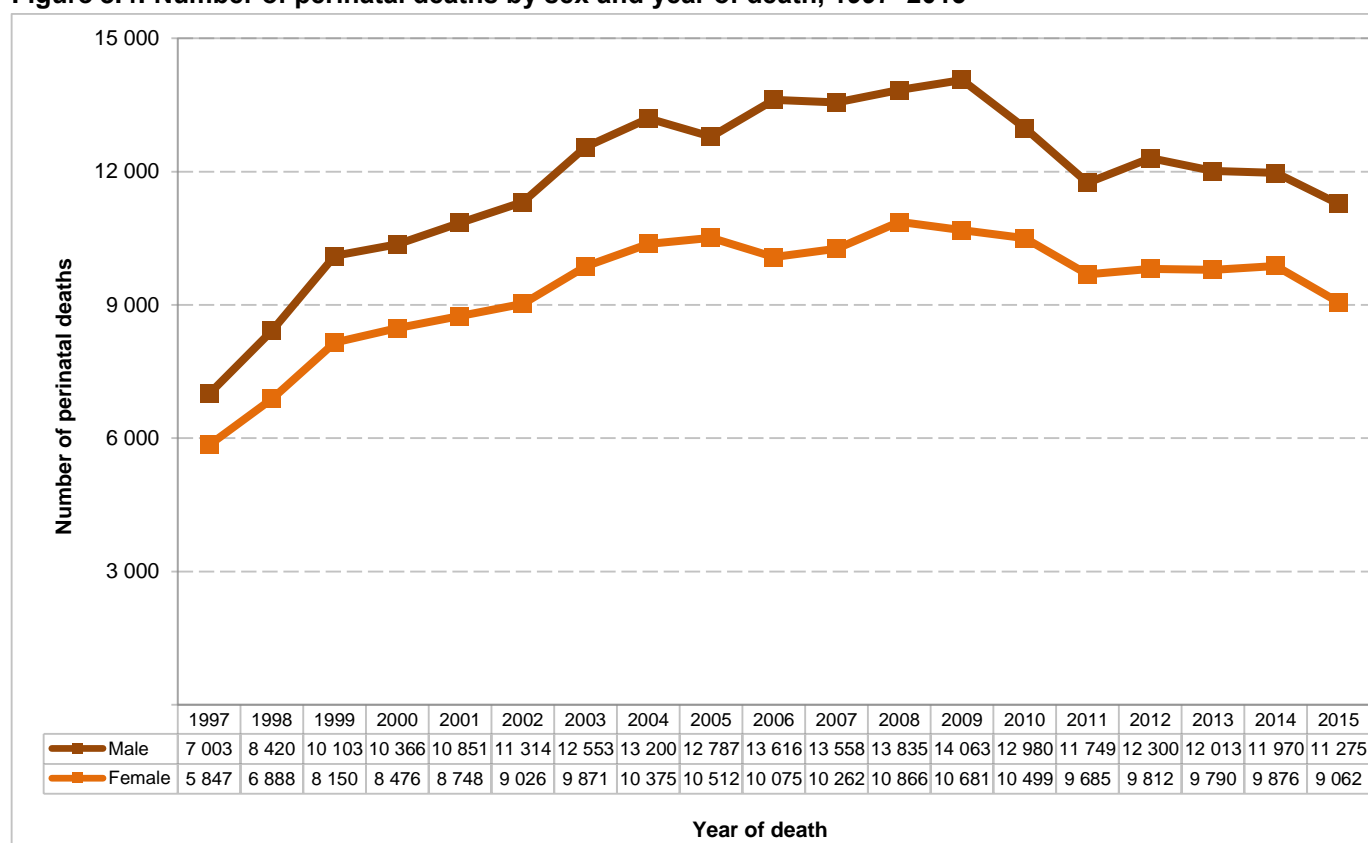
(2) Excluding early neonatal deaths with unspecified sex.

### 3.2.3 Perinatal deaths

Figure 3.4 shows the sex distribution of perinatal deaths over the years 1997 to 2015. The number of male deaths was consistently higher than that of females since 1997. However, the gap was narrower in 1997, becoming wider over the subsequent years. There was a drastic decline in the number of male perinatal deaths between 2009 and 2011, from 14 063 in 2009 to 11 749 in 2011 (16,5% decrease). Between 2014 and 2015, the number of male perinatal deaths decreased by 2,0% (from 11 970 in 2014 to 11 275 in 2015).

Perinatal deaths among females increased from 1997 until 2005. A slight dip was observed in 2006, and then deaths increased and peaked to 10 866 in 2008. Hereafter, deaths have fluctuated between 9 062 and 10 681. The number of female perinatal deaths declined by 8,2% (from 9 876 in 2014 to 9 062 in 2015).

**Figure 3.4: Number of perinatal deaths by sex and year of death, 1997–2015\***



\* (1) Data for 1997–2014 have been updated with late registrations/delayed death notification forms processed in 2015/2016.

(2) Excluding perinatal deaths with unspecified sex.

### 3.2.4 Sex ratios at death by province

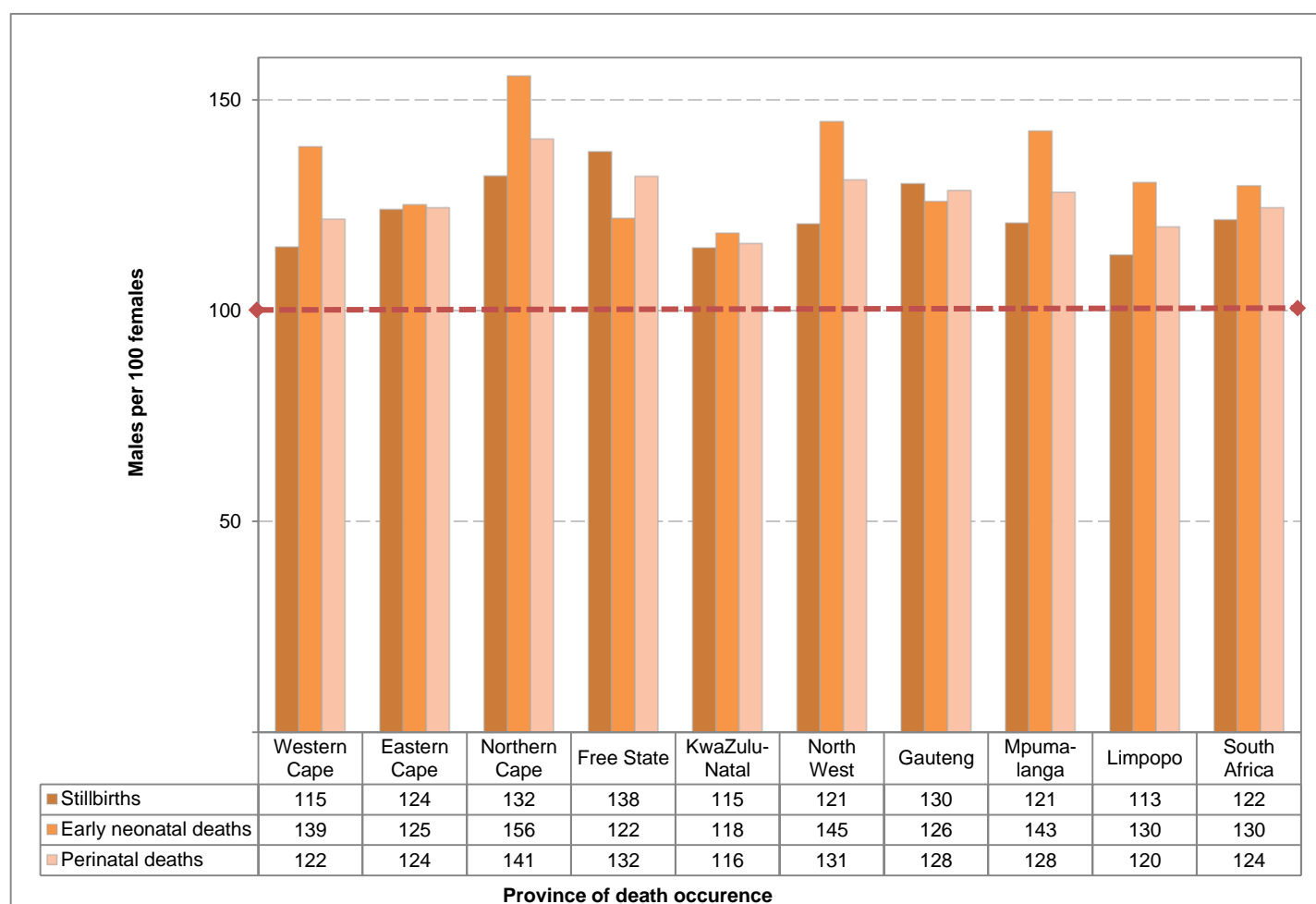
Figure 3.5 presents the sex ratios at death for stillbirths, early neonatal deaths and perinatal deaths by province of death occurrence. The sex ratio at death (the number of male deaths per 100 female deaths) is a demographic measure that shows the relative number of male deaths to female deaths. A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

For stillbirths, the national sex ratio was 122 male stillbirths per 100 female stillbirths. Free State had the highest sex ratio (138) followed by Northern Cape (132), while Limpopo had the lowest sex ratio of 113 male stillbirths per 100 female stillbirths.

Among early neonatal deaths, the national sex ratio was 130 male early neonatal deaths per 100 female early neonatal deaths. Northern Cape had the highest sex ratio, with 156 male early neonatal deaths per 100 female early neonatal deaths followed by North West (145), then Mpumalanga (143). The province with the lowest sex ratio for early neonatal deaths was KwaZulu-Natal (118).

With regard to perinatal deaths, the results show that nationally, there were 124 male perinatal deaths per 100 female perinatal deaths in 2015. In general, all provinces had perinatal sex ratios at death that were above 100, ranging from a low of 116 in KwaZulu-Natal to a high of 141 in Northern Cape. Five provinces (Northern Cape, Free State, North West, Gauteng and Mpumalanga) had a sex ratio higher than the national average. Eastern Cape had a perinatal sex ratio of 124, equalling the national perinatal sex ratio, and three provinces (Western Cape, KwaZulu-Natal, and Limpopo) had a sex ratio lower than the national sex ratio.

**Figure 3.5: Sex ratios at perinatal death by province of death occurrence, 2015**



### 3.3 Age differentials

Table 3.1 shows the distribution of stillbirths and early neonatal as well as perinatal deaths by age in days. Stillbirths accounted for 64,1% of perinatal deaths, while early neonatal mortality accounted for 35,9% of perinatal deaths. A closer look at early neonatal deaths shows that deaths decrease with an increase in age. Most early neonatal deaths occurred during the first day of birth. In 2015, more than half (56,9%) of early neonatal deaths occurred by the first day and over 70% were deceased by the end of the second day.

**Table 3.1: Number and percentage distribution of stillbirths, early neonatal deaths and perinatal deaths by age, 2015**

Age in days	Number	Percentage	Cumulative percentage
Stillbirth	13 702	64,1	64,1
Early neonatal deaths	7 676	35,9	100,0
<b>Total</b>	<b>21 378</b>	<b>100,0</b>	
Age in days among early neonatal deaths			
0	2 884	37,6	37,6
1	1 486	19,4	57,0
2	1 109	14,4	71,4
3	703	9,2	80,6
4	486	6,3	86,9
5	409	5,3	92,2
6	329	4,3	96,5
7	270	3,5	100,0
<b>Total</b>	<b>7 676</b>	<b>100,0</b>	

### 3.4 Stillbirths' birth weight

Low birth weight is a term used to describe 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. Birth weight is an indicator of both foetal growth and maternal well-being (Swart, 2008).

Stillbirths' weights for 2015 are shown in Table 3.2. More than half of all stillbirths were of low birth weight (53,2%), with the highest proportion being those who weighed less than 1 000 grams (these accounted for 16,8% of stillbirths). The second highest proportion (13,9%) of deaths was amongst stillbirths weighing between 1 000 and 1 499 grams. The general trend observed was that proportion of stillbirths decreased as birthweight increased, suggesting that chances of survival increased with an increase in birth weight. The information on birth weight has to be interpreted with caution, given the high percentage of missing cases (27,9%).

**Table 3.2: Number and percentage distribution of stillbirths by birth weight, 2015\***

Birth weight	Number	Percentage	Cumulative percentage
Less than 1 000	2 298	16,8	16,8
1 000 - 1 499	1 898	13,9	30,6
1 500 - 1 999	1 690	12,3	43,0
2 000 - 2 499	1 403	10,2	53,2
2 500 - 2 999	1 213	8,9	62,0
3 000 - 3 499	835	6,1	68,1
3 500 - 3 999	324	2,4	70,5
4 000 and above	223	1,6	72,1
Unspecified	3 818	27,9	100,0
<b>Total</b>	<b>13 702</b>	<b>100,0</b>	

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



### 3.5 Month of death occurrence

Table 3.3 shows the number and percentage distribution of stillbirths, early neonatal deaths and perinatal deaths classified by the month of death occurrence. The months March and May had the highest proportion of deaths for all three death types (stillbirths, early neonatal deaths and perinatal deaths), while the lowest for the three death types was December and November. The month with the third highest number of stillbirths was January, accounting for 8,9% stillbirths. The month of June had the third highest number of deaths for early neonatal deaths, accounting for 8,7%. January and April had the third highest proportions of perinatal deaths, responsible for 8,7% of perinatal deaths.

**Table 3.3: Number and percentage distribution of stillbirths, early neonatal deaths and perinatal deaths by month of death occurrence, 2015\***

Month of death	Stillbirths		Early neonatal deaths		Perinatal deaths	
	Number	Percentage	Number	Percentage	Number	Percentage
January	1 222	8,9	634	8,3	1 856	8,7
February	1 125	8,2	613	8,0	1 738	8,1
March	1 271	9,3	753	9,8	2 024	9,5
April	1 206	8,8	660	8,6	1 866	8,7
May	1 266	9,2	710	9,2	1 976	9,2
June	1 151	8,4	664	8,7	1 815	8,5
July	1 178	8,6	639	8,3	1 817	8,5
August	1 151	8,4	598	7,8	1 749	8,2
September	1 090	8,0	644	8,4	1 734	8,1
October	1 050	7,7	605	7,9	1 655	7,7
November	1 032	7,5	578	7,5	1 610	7,5
December	960	7,0	578	7,5	1 538	7,2
<b>Total</b>	<b>13 702</b>	<b>100,0</b>	<b>7 676</b>	<b>100,0</b>	<b>21 378</b>	<b>100,0</b>

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

### 3.6 Population group differences

The distribution of stillbirths, early neonatal deaths and perinatal deaths by population group for 2015 are shown in Table 3.4 below. The highest proportion of deaths for all three death types (stillbirths, early neonatal deaths and perinatal deaths) was observed in the black African population group, with 77,8% stillbirths, 81,5% early neonatal deaths and 79,1% perinatal deaths. The second highest proportion of deaths for all three death types was amongst the coloured population group, which accounted for 6,2% of stillbirths, 5,2% of early neonatal deaths and 5,8% of perinatal deaths. The white population group accounted for 1,3% of stillbirths, 1,1% of early neonatal deaths and 1,2% of perinatal deaths. The Indian/Asian population contributed the lowest numbers for stillbirths, early neonatal deaths and perinatal deaths, each contributing less than 1% in all categories. This information needs to be interpreted with caution as it is reflective of the structure of the population of South Africa by population group.

**Table 3.4: Number and percentage distribution of stillbirths, early neonatal deaths and perinatal deaths by population group, 2015**

Population group	Stillbirths		Early neonatal deaths		Perinatal deaths	
	Number	Percentage	Number	Percentage	Number	Percentage
Black African	10 662	77,8	6 258	81,5	16 920	79,1
White	178	1,3	88	1,1	266	1,2
Indian or Asian	80	0,6	43	0,6	123	0,6
Coloured	843	6,2	402	5,2	1 245	5,8
Other	23	0,2	11	0,1	34	0,2
Unspecified/Unknown	1 916	14,0	874	11,4	2 790	13,1
<b>Total</b>	<b>13 702</b>	<b>100,0</b>	<b>7 676</b>	<b>100,0</b>	<b>21 378</b>	<b>100,0</b>

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

Table 3.5 shows the distribution of stillbirths, early neonatal deaths and perinatal deaths by place or institution of death occurrence in 2015. Most deaths occurred in a health care facility, with the majority of deaths occurring in a hospital for all three death types. These ranged from 66,4% for stillbirths and 68,1% for perinatal deaths to 71,2% for early neonatal deaths. These were followed by home deaths with 3,1% of stillbirths occurring at home, 4,1% for early neonatal deaths and 3,5% for perinatal deaths. The lowest proportion of stillbirths, early neonatal deaths as well as perinatal deaths occurred in nursing homes. This is expected as child birth is unlikely to take place in a nursing home. There were 25,5% stillbirths, 21,2% early neonatal deaths and 24,0% perinatal deaths where the place of death occurrence was unknown or unspecified.

**Table 3.5: Number and percentage distribution of stillbirths, early neonatal deaths and perinatal deaths by place or institution of death occurrence, 2015\***

Place of death	Stillbirths		Early neonatal deaths		Perinatal deaths	
	Number	Percentage	Number	Percentage	Number	Percentage
Hospital	9 094	66,4	5 466	71,2	14 560	68,1
Emergency room/outpatient	260	1,9	105	1,4	365	1,7
Dead on arrival	131	1,0	55	0,7	186	0,9
Nursing home	50	0,4	30	0,4	80	0,4
Home	426	3,1	312	4,1	738	3,5
Other	244	1,8	77	1,0	321	1,5
Unknown or unspecified	3 497	25,5	1 631	21,2	5 128	24,0
<b>Total</b>	<b>13 702</b>	<b>100,0</b>	<b>7 676</b>	<b>100,0</b>	<b>21 378</b>	<b>100,0</b>

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

### 3.8 Geographic differences for stillbirths, early neonatal deaths and perinatal deaths

The number and percentage distribution of stillbirths, early neonatal deaths and perinatal deaths by province of death occurrence and province of usual residence for 2015 are presented in Table 3.6.

The table shows that about a quarter of early neonatal deaths and perinatal deaths occurred in Gauteng. KwaZulu-Natal (24,3%) had slightly more stillbirths compared to Gauteng (24,1%). The lowest proportion of all death types occurred in Northern Cape, followed by Eastern Cape.

For deaths by province of usual residence, Gauteng also had the highest proportion of early neonatal and perinatal deaths, accounting for 24,1% and 19,1%, respectively. KwaZulu-Natal had the highest proportion of stillbirths (16,6%), followed closely by Gauteng (16,3%). The proportions for Gauteng, KwaZulu-Natal and Northern Cape could be a reflection of the population size in these provinces. Results on province of usual residence should be interpreted with caution as there is a high proportion of unspecified/unknown. Further, usual residence for stillbirths could refer to the mother's usual residence rather than that of the stillbirth.

**Table 3.6: Number and percentage distribution of stillbirths, early neonatal deaths and perinatal deaths by province, 2015**

Province	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	1 551	11,3	666	8,7	2 217	10,4	1 124	8,2	629	8,2	1 753	8,2
Eastern Cape	724	5,3	459	6,0	1 183	5,5	502	3,7	467	6,1	969	4,5
Northern Cape	392	2,9	254	3,3	646	3,0	270	2,0	248	3,2	518	2,4
Free State	1 000	7,3	538	7,0	1 538	7,2	675	4,9	522	6,8	1 197	5,6
KwaZulu-Natal	3 329	24,3	1 452	18,9	4 781	22,4	2 278	16,6	1 397	18,2	3 675	17,2
North West	1 004	7,3	839	10,9	1 843	8,6	694	5,1	865	11,3	1 559	7,3
Gauteng	3 304	24,1	1 974	25,7	5 278	24,7	2 239	16,3	1 847	24,1	4 086	19,1
Mpumalanga	987	7,2	550	7,2	1 537	7,2	672	4,9	547	7,1	1 219	5,7
Limpopo	1 370	10,0	934	12,2	2 304	10,8	915	6,7	919	12,0	1 834	8,6
Outside South Africa	0	0	2	0,0	2	0,0	0	0	11	0,1	11	0,1
Unspecified/Unknown	41	0,3	8	0,1	49	0,2	4 333	31,6	224	2,9	4 557	21,3
<b>Total</b>	<b>13 702</b>	<b>100,0</b>	<b>7 676</b>	<b>100,0</b>	<b>21 378</b>	<b>100,0</b>	<b>13 702</b>	<b>100,0</b>	<b>7 676</b>	<b>100,0</b>	<b>21 378</b>	<b>100,0</b>

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

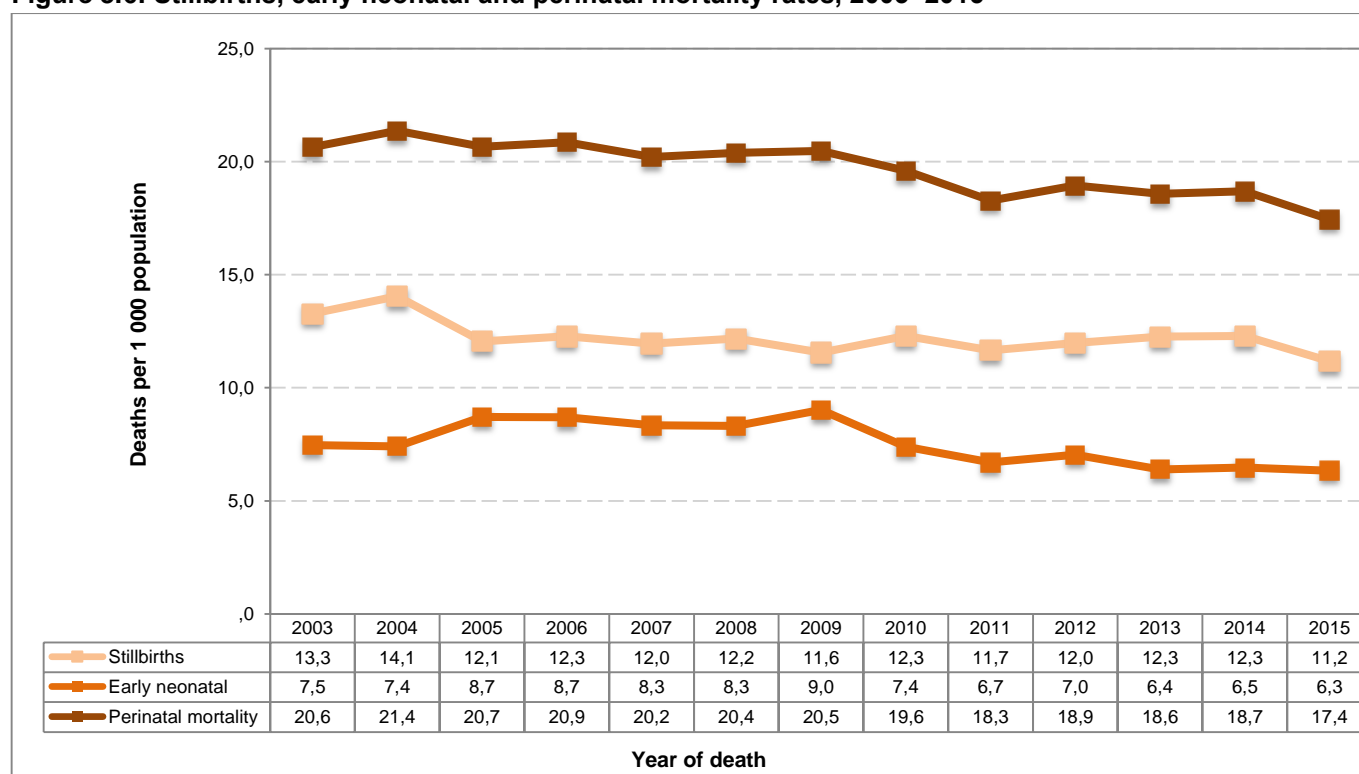
Figure 3.6 graphically presents stillbirths, early neonatal and perinatal mortality rates for the years 2003 to 2015. The absolute numbers for Figure 3.6 are provided in Appendix C (page 38). The rates were unadjusted for completeness of death registrations and therefore the results have to be interpreted 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.

For stillbirths, the pattern shows that the stillbirth rate increased between 2003 and 2004, from 13,3 stillbirths per 1 000 total births in 2003 to 14,1 stillbirths per 1 000 total births in 2004. This was the highest ever recorded stillbirth rate in the period 2003–2015. Thereafter the stillbirth rate fluctuated between 11,0 and 12,3 stillbirths per 1 000 total births. The lowest stillbirth rate was observed in 2015, where there were 11,2 stillbirths per 1 000 total births.

The trend in early neonatal death rates shows that between 2003 and 2004, the early neonatal mortality rates decreased from 7,5 early neonatal deaths per 1 000 live births in 2003 to 7,4 early neonatal deaths per 1 000 live births in 2004. The highest early neonatal death rate was observed in 2009, where there were 9,0 early neonatal deaths per 1 000 live births. After 2009, the rates remained below 9,0 early neonatal deaths per 1 000 live births. Similar with the stillbirth rate, the lowest early neonatal death rate was observed in 2015, where there were 6,3 early neonatal deaths per 1 000 live births.

Among perinatal deaths, rates increased slightly between 2003 and 2004 from 20,6 perinatal deaths per 1 000 total births in 2003 to 21,4 perinatal deaths per 1 000 total births in 2004. This was followed by a decline in 2005 to 20,7 perinatal deaths per 1 000 total births. Between the years 2003 and 2009, perinatal death rates were above 20 perinatal deaths per 1 000 total births. However, after 2009 the rate remained below 20 perinatal deaths per 1 000 total births. The lowest rate was observed in 2015, where there were 17,4 perinatal deaths per 1 000 total births.

**Figure 3.6: Stillbirths, early neonatal and perinatal mortality rates, 2003–2015\***



\* (1) Data for 2003–2014 have been updated with late registrations/delayed death notification forms processed in 2015/2016.

(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 (from death notification forms). The denominators used for early neonatal mortality rates are live births only (from mid-year estimates).

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

This section presents information on the causes of death for stillbirths, early neonatal and perinatal deaths that occurred in 2015 and were processed by Stats SA during the 2015/16 phase. Additional information on comparisons with deaths for the period 2013–2014 is provided, updated with late registrations or death notification forms from previous years that were received and captured during the processing of 2015 deaths.

As mentioned earlier in this publication, causes of death are classified using the 10<sup>th</sup> 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).

Analysis carried out in this section includes causes for 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

Table 4.1 provides the number and percentage distribution of stillbirths by main group of underlying causes of death and sex for 2015. *Certain conditions originating in the perinatal period* contributed the highest percentage of stillbirths for both sexes, accounting for almost 98% of stillbirths. Stillbirths due to *congenital malformations* were 2,4% amongst males and 2,2% amongst females.

**Table 4.1: Number and percentage distribution of stillbirths by main group of underlying causes of death and sex, 2015\***

Main group of underlying causes	Sex of the deceased					
	Male		Female		Total	
	Number	%	Number	%	Number	%
Certain conditions originating in the perinatal period (P00-P96)	6 942	97,6	5 722	97,8	12 664	97,7
Congenital malformations (Q00-Q99)	173	2,4	131	2,2	304	2,3
<b>Total</b>	<b>7 115</b>	<b>100,0</b>	<b>5 853</b>	<b>100,0</b>	<b>12 968</b>	<b>100,0</b>

\*Excluding stillbirths with unspecified sex.

#### 4.1.2 Broad groups of underlying natural causes of stillbirths

The ten leading underlying natural causes of stillbirths for the years 2013 to 2015 are provided in Table 4.2. The years 2013 and 2014 were included to provide a comparison of the ten leading underlying natural causes of stillbirths. The ranking of causes of death for stillbirths excluded ill-defined causes, i.e. *symptoms, signs and abnormal clinical and laboratory findings not elsewhere classified (R00-R99)* and *fetal death for unspecified cause (P95)*, as these do not add any value from a public health perspective but are important for mortality analysis.

Overall, eight of the ten leading underlying natural causes of stillbirths were similar for the three years, with similar rankings for the first top five causes except for *respiratory and cardiovascular disorders specific to the perinatal period*, which was ranked third in 2013 and was the second leading cause of death for 2014 and 2015. *Disorders related to length of gestation and fetal growth* were ranked third in 2014 and 2015 and second in 2013.

*Fetus and newborn affected by maternal factors and by complications of pregnancy, labour and delivery* maintained the same rank as the first leading underlying cause of death amongst stillbirths in the three-year period, accounting for 24,1% of all stillbirths in 2013, 26,7% in 2014 and 27,5% in 2015. This shows that deaths due to this cause have been on a steady increase during the observation period. It is also worth noting that for the years 2014 and 2015,

even though the first five leading underlying natural causes of stillbirths remained the same in terms of ranking, they differed by proportion. For example, proportions of *fetus and newborn affected by maternal factors and by complications of pregnancy, labour and delivery* and *congenital malformations of the nervous system* increased in 2015, whereas *respiratory and cardiovascular disorders specific to the perinatal period*, *disorders related to length of gestation and fetal growth* and *other congenital malformations* declined in 2015.

*Conditions involving the integument and temperature regulation of newborn* did not feature amongst the ten leading underlying causes of stillbirths in 2014. However, it was among the ten leading underlying natural causes for 2013 and 2015. Similarly, *infections specific to the perinatal period* were not part of the ten leading underlying causes of stillbirths in 2013, but were in the top ten leading underlying natural causes in 2014 and 2015 and were responsible for 0,2% and 0,1% stillbirths, respectively. *Congenital malformations of the circulatory system* appeared in the top ten causes of stillbirths only for 2014, while *congenital malformations and deformations of the musculoskeletal system* were in the top ten causes of stillbirths only for 2013.

**Table 4.2: The ten leading underlying natural causes of stillbirths, 2013–2015\***

Underlying broad groups of causes of death (based on ICD-10)	2013			2014			2015		
	Rank	No	%	Rank	No	%	Rank	No	%
Fetus and newborn affected by maternal factors and by complications of pregnancy, labour and delivery (P00-P04)	1	3 624	24,1	1	4 026	26,7	1	3 764	27,5
Respiratory and cardiovascular disorders specific to the perinatal period (P20-P29)	3	591	3,9	2	878	5,8	2	630	4,6
Disorders related to length of gestation and fetal growth (P05-P08)	2	731	4,9	3	750	5,0	3	502	3,7
Other congenital malformations (Q80-Q89)	4	196	1,3	4	212	1,4	4	184	1,3
Congenital malformations of the nervous system (Q00-Q07)	5	87	0,6	5	80	0,5	5	77	0,6
Chromosomal abnormalities, not elsewhere classified (Q90-Q99)	6	35	0,2	9	24	0,2	6	36	0,3
Transitory endocrine and metabolic disorders specific to fetus and newborn (P70-P74)	7	34	0,2	6	43	0,3	7	28	0,2
Haemorrhagic and haematological disorders of fetus and newborn (P50-P61)	10	19	0,1	7	29	0,2	8	26	0,2
Conditions involving the integument and temperature regulation of fetus and newborn (P80-P83)	8	22	0,1	...	...	...	9	20	0,1
Infections specific to the perinatal period (P35-P39)	...	...	...	7	29	0,2	10	19	0,1
Congenital malformations of the circulatory system (Q20-Q28)	...	...	...	10	22	0,1	...	...	...
Congenital malformations and deformations of the musculoskeletal system (Q65-Q79)	9	21	0,1	...	...	...	...	...	...
Other natural causes		9 691	64,4		9 003	59,6		8 416	61,4
<b>Total</b>		<b>15 051</b>	<b>100,0</b>		<b>15 096</b>	<b>100,0</b>		<b>13 702</b>	<b>100,0</b>

\*Data for 2013–2014 have been updated with late registrations/delayed death notification forms processed in 2015/2016.

...Category not in top ten.

### 4.1.3 Stillbirths differentials

Table 4.3 presents the percentage distribution of the top five leading causes of death for stillbirths by selected socio-demographic and geographic variables. Please refer to Appendix D (see page 39) for absolute numbers distribution of stillbirths. Table 4.3 only includes socio-demographic information on sex, population group, province of death occurrence, institution where death took place and birth weight.

Across all the selected variables, 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 responsible for more than a quarter of deaths for each variable. These were followed by 4,6% stillbirths due to *respiratory and cardiovascular disorders specific to the perinatal period*.

*Fetus and newborn affected by maternal factors and by complications of pregnancy, labour and delivery* were responsible for 26,5% male stillbirths and 29,0% female stillbirths. *Respiratory and cardiovascular disorders specific to the perinatal period* was the second most common underlying cause of stillbirths for both sexes.

By population groups, the white population had the highest proportion of stillbirths due to *fetus and newborn affected by maternal factors and by complications of pregnancy, labour and delivery* at 33,7%. Differentials by population group also show that the second most reported underlying cause of stillbirths was *disorders related to length of gestation and fetal growth* for all population groups with the exception of black Africans, where *respiratory and cardiovascular disorders specific to the perinatal period* was the second most common underlying cause of stillbirths. For the black African population group, *disorders related to length of gestation and fetal growth* was the third most reported underlying cause of stillbirths.

Within the provinces, Eastern Cape had the highest proportion of stillbirths due to *respiratory and cardiovascular disorders specific to the perinatal period*, accounting for 7,7% of stillbirths. Limpopo was the second highest with 7,6%. Two provinces, Western Cape and Northern Cape, had *disorders related to length of gestation and fetal growth* as the second leading cause of stillbirths.

Most stillbirths due to *fetus and newborn affected by maternal factors and by complications of pregnancy, labour and delivery* occurred in a hospital (29,1%) while for stillbirths due to *respiratory and cardiovascular disorders specific to the perinatal period*, most stillbirths occurred at a nursing home (6,0%). The place of institution or death shows mixed results, with *disorders related to length of gestation and fetal growth* higher among stillbirths dead on arrival and deaths occurring at home, whereas *respiratory and cardiovascular disorders specific to the perinatal period* were the second most common cause for stillbirths occurring in a hospital and nursing home.

With regard to birth weight, most stillbirths were due to *fetus and newborn affected by maternal factors and by complications of pregnancy, labour and delivery* weighed between 1 500 and 1 999 grams, accounting for 32,6% stillbirths due to this cause. Stillbirths weighing between 3 000 and 3 499 grams (8,0%) had the highest proportion of deaths due to *respiratory and cardiovascular disorders specific to the perinatal period*, followed by stillbirths weighing between 3 500 and 3 999 grams. *Disorders related to length of gestation and fetal growth (P05-P29)* is seen among stillbirths weighing less than 1 000 grams (9,1%).



**Table 4.3: Percentage distribution of stillbirths by top five leading causes and selected socio-demographic and geographic variables, 2015**

Variables	Underlying causes of death						Total
	P00-P04 <sup>1</sup>	P20-P29 <sup>2</sup>	P05-P08 <sup>3</sup>	Q80-Q89 <sup>4</sup>	Q00-Q07 <sup>5</sup>	Others <sup>6</sup>	
Sex							
Male	26,5	4,3	4,0	1,3	0,5	63,3	100,0
Female	29,0	4,9	3,2	1,2	0,6	61,1	100,0
Unknown/unspecified	24,0	5,3	4,5	2,6	0,5	63,1	100,0
Total	27,5	4,6	3,7	1,3	0,6	62,4	100,0
Population group							
Black African	27,1	4,8	3,5	1,3	0,5	62,8	100,0
White	33,7	1,7	5,6	2,2	3,9	52,8	100,0
Indian/Asian	28,8	2,5	3,8	3,8	1,3	60,0	100,0
Coloured	31,1	3,4	4,9	1,5	0,4	58,7	100,0
Other	39,1	0,0	0,0	0,0	0,0	60,9	100,0
Unknown/unspecified	27,3	4,6	3,8	1,3	0,5	62,5	100,0
Total	27,5	4,6	3,7	1,3	0,6	62,4	100,0
Province of death							
Western Cape	28,0	1,9	4,0	1,7	0,4	64,0	100,0
Eastern Cape	29,4	7,7	5,9	1,4	0,6	55,0	100,0
Northern Cape	32,9	5,4	7,7	1,8	0,0	52,3	100,0
Free State	29,2	5,5	3,7	0,5	0,7	60,4	100,0
North West	31,1	4,2	3,7	1,5	0,6	58,9	100,0
KwaZulu-Natal	30,8	6,9	4,8	1,2	0,8	55,6	100,0
Gauteng	17,5	3,6	2,0	1,3	0,5	75,1	100,0
Mpumalanga	26,8	3,7	3,5	1,4	0,6	63,8	100,0
Limpopo	36,4	7,6	3,8	1,2	0,6	50,4	100,0
Outside South Africa	0,0	0,0	0,0	0,0	0,0	0,0	100,0
Unspecified	24,4	2,4	9,8	0,0	0,0	63,4	100,0
Total	27,5	4,6	3,7	1,3	0,6	62,4	100,0
Place of death							
Hospital	29,1	4,7	3,7	1,5	0,6	60,5	100,0
Emergency room/outpatient	25,8	5,8	5,8	1,2	1,2	60,4	100,0
Dead on arrival	19,1	4,6	9,2	1,5	0,0	65,6	100,0
Nursing home	14,0	6,0	4,0	0,0	0,0	76,0	100,0
Home	20,2	4,0	4,7	0,5	0,0	70,7	100,0
Other	25,0	4,5	4,5	0,0	0,4	65,6	100,0
Unknown/unspecified	25,0	4,4	3,1	1,2	0,5	65,8	100,0
Total	27,5	4,6	3,7	1,3	0,6	62,4	100,0
Birth weight							
Less than 1 000	27,4	3,1	9,1	1,0	0,5	58,9	100,0
1 000-1 499	31,5	2,3	3,6	1,6	0,6	60,4	100,0
1 500-1 999	32,6	3,1	2,0	2,2	0,9	59,2	100,0
2 000-2 499	30,7	4,1	1,1	1,9	0,5	61,7	100,0
2 500-2 999	30,5	6,1	0,4	1,2	0,6	61,3	100,0
3 000-3 499	29,9	8,0	0,0	0,8	0,2	61,0	100,0
3 500-3 999	29,0	7,7	0,6	0,3	1,2	61,1	100,0
4 000 and above	25,1	4,5	1,8	0,0	0,9	67,7	100,0
Unspecified	20,6	6,0	4,3	1,2	0,4	67,5	100,0
Total	27,5	4,6	3,7	1,3	0,6	62,4	100,0

<sup>1</sup> Fetus and newborn affected by maternal factors and by complications of pregnancy, labour and delivery (P00-P04).<sup>2</sup> Respiratory and cardiovascular disorders specific to the perinatal period (P20-P29).<sup>3</sup> Disorders related to length of gestation and fetal growth (P05-P08).<sup>4</sup> Other congenital malformations (Q80-Q89).<sup>5</sup> Congenital malformations of the nervous system (Q00-Q07).<sup>6</sup> 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, 2015

The number and proportion of stillbirths by the five leading underlying natural causes of stillbirths by population group in 2015 is presented in Table 4.4. Only three population groups were analysed, namely black Africans, whites and coloureds. The Indian/Asian population group had a small number of records for stillbirth deaths, and was therefore excluded from the analysis.

Three of the five leading underlying natural causes of stillbirths were the same for the three population groups under consideration, even though two differed on rankings. These were (i) *fetus and newborn affected by maternal factors and by complications of pregnancy, labour and delivery*; (ii) *disorders related to length of gestation and fetal growth*; and (iii) *Other congenital malformations*.

*Fetus and newborn affected by maternal factors and by complications of pregnancy, labour and delivery* was ranked as the number one leading underlying cause of stillbirths for all population groups. *Respiratory and cardiovascular disorders specific to the perinatal period* was the second leading underlying natural cause of stillbirths amongst the black African population group, while *disorders related to length of gestation and fetal growth* were the second leading underlying natural cause for the white and coloured population groups, responsible for 5,6% stillbirths in the white population group and 4,9% stillbirths in the coloured population group. *Disorders related to length of gestation and fetal growth* was the third leading underlying natural cause of stillbirths for the black African population group responsible, for 3,5% stillbirths.

*Respiratory and cardiovascular disorders specific to the perinatal period* was not among the five leading underlying natural cause of death for the white population group. Similarly, *congenital malformations of the nervous system* was not in the top five leading underlying natural causes of stillbirths for the coloured population.

*Chromosomal abnormalities, not elsewhere classified* were among the five leading underlying natural causes of death only for the white population group, while *transitory endocrine and metabolic disorders specific to fetus and newborn* was among the five leading underlying natural causes of stillbirths only for the coloured population group.

**Table 4.4: The five leading underlying natural causes of stillbirths by population group, 2015\***

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	2 887	27,1	1	60	33,7	1	262	31,1
Respiratory and cardiovascular disorders specific to the perinatal period (P20-P29)	2	508	4,8	...	...	...	3	29	3,4
Disorders related to length of gestation and fetal growth (P05-P08)	3	375	3,5	2	10	5,6	2	41	4,9
Other congenital malformations (Q80-Q89)	4	139	1,3	4	4	2,2	4	13	1,5
Congenital malformations of the nervous system (Q00-Q07)	5	56	0,5	3	7	3,9	...	...	...
Chromosomal abnormalities, not elsewhere classified (Q90-Q99)	...	...	...	4	4	2,2	...	...	...
Transitory endocrine and metabolic disorders specific to fetus and newborn (P70-P74)	...	...	...	...	...	...	5	4	0,5
Other natural causes		6 697	62,8		93	52,2		494	58,6
<b>All causes</b>		<b>10 662</b>	<b>100,0</b>		<b>178</b>	<b>100,0</b>		<b>843</b>	<b>100,0</b>

\*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

The number and proportion of the main groups of underlying causes of early neonatal deaths by sex for 2015 are presented in Table 4.5. In 2015, the most commonly reported main group of underlying causes was *certain conditions originating in the perinatal period*, accounting for 89,4% and 89,3% of male and female early neonatal deaths, respectively. *Congenital malformations* were the second most common main group of causes of death for both males (8,1%) and females (8,4%). The rest of the other main groups of underlying causes contributed less than 2% each to early neonatal deaths.

**Table 4.5: Number and percentage distribution of early neonatal deaths by main group of underlying causes of death and sex, 2015\***

Main group of underlying causes	Sex of the deceased					
	Male		Female		Total	
	Number	%	Number	%	Number	%
Certain conditions originating in the perinatal period (P00-P96)	3 719	89,4	2 867	89,3	6 586	89,4
Congenital malformations (Q00-Q99)	336	8,1	269	8,4	605	8,2
Symptoms and signs not elsewhere classified (R00-R99)	41	1,0	35	1,1	76	1,0
External causes of morbidity and mortality (V01-Y98)	33	0,8	17	0,5	50	0,7
Certain infectious and parasitic diseases (A00-B99)	18	0,4	9	0,3	27	0,4
Diseases of the nervous system (G00-G99)	7	0,2	7	0,2	14	0,2
Other main groups of underlying causes	6	0,1	5	0,2	11	0,1
<b>Total</b>	<b>4 160</b>	<b>100,0</b>	<b>3 209</b>	<b>100,0</b>	<b>7 369</b>	<b>100,0</b>

\*Excluding early neonatal deaths with unspecified sex.

## 4.2.2 Broad groups of underlying causes of early neonatal deaths

The top ten leading underlying natural causes of early neonatal deaths in South Africa for the period 2013 to 2015 are presented in Table 4.6 below. The table shows that over the three-year period, nine of the ten leading underlying causes of death were similar, although some differed by rankings. However, the ranking of the first six leading causes of death were the same during this period, but proportions fluctuated with no consistent pattern. *Respiratory and cardiovascular disorders specific to the perinatal period* was the leading underlying cause of early neonatal deaths responsible for 38,0% of deaths in 2013, 38,6% of deaths in 2014 and 38,5% of deaths in 2015. *Disorders related to length of gestation and fetal growth* was the second leading underlying cause for the three years and was responsible for 15,3% of early neonatal deaths in 2013, 12,8% in 2014 and 13,8% in 2015. *Fetus and newborn affected by maternal factors and by complications of pregnancy, labour and delivery* ranked third over the three-year period and accounted for 9,8% of early neonatal deaths in 2013, 11,0% in 2014 and 10,4% in 2015. *Infections specific to the perinatal period* was the fourth leading cause of early neonatal deaths, accounting for 7,1% of early neonatal deaths in 2013, 7,7% in 2014 and 7,6% in 2015.

*Conditions involving the integument and temperature regulation of fetus and newborn*, which was not in the top ten leading underlying causes of death in 2013 and 2014, ranked ninth in 2015 and was responsible for 1,1% of early neonatal deaths. *Congenital malformations of the nervous system* was part of the ten leading underlying causes of death in both 2013 and 2014, but it dropped out of the ten leading underlying causes of death in 2015. *Chromosomal abnormalities, not elsewhere classified* moved from ninth rank in 2013 to tenth rank in 2014 and 2015, responsible for 1,0% of early neonatal deaths in 2015. *Digestive system disorders of fetus and newborn and congenital malformations of the circulatory system* were ranked seventh and eighth respectively in 2013, but swapped positions in 2014 only to revert back to their 2013 positions in 2015.

**Table 4.6: The ten leading underlying natural causes of death for early neonatal deaths, 2013–2015\***

Underlying broad groups of causes of death (based on ICD-10)	2013			2014			2015		
	Rank	Number	%	Rank	Number	%	Rank	Number	%
Respiratory and cardiovascular disorders specific to the perinatal period (P20-P29)	1	2 948	38,0	1	3 032	38,6	1	2 954	38,5
Disorders related to length of gestation and fetal growth (P05-P08)	2	1 186	15,3	2	1 002	12,8	2	1 057	13,8
Fetus and newborn affected by maternal factors and by complications of pregnancy, labour and delivery (P00-P04)	3	762	9,8	3	862	11,0	3	802	10,4
Infections specific to the perinatal period (P35-P39)	4	548	7,1	4	606	7,7	4	585	7,6
Haemorrhagic and haematological disorders of fetus and newborn (P50-P61)	5	300	3,9	5	308	3,9	5	321	4,2
Other congenital malformations (Q80-Q89)	6	224	2,9	6	243	3,1	6	227	3,0
Digestive system disorders of fetus and newborn (P75-P78)	7	130	1,7	8	131	1,7	7	140	1,8
Congenital malformations of the circulatory system (Q20-Q28)	8	112	1,4	7	146	1,9	8	139	1,8
Conditions involving the integument and temperature regulation of fetus and newborn (P80-P83)	...	...	...	...	...	...	9	83	1,1
Chromosomal abnormalities, not elsewhere classified (Q90-Q99)	9	80	1,0	10	69	0,9	10	78	1,0
Congenital malformations of the nervous system (Q00-Q07)	10	74	1,0	9	79	1,0	...	...	...
Other natural causes		1 345	17,3		1 296	16,5		1 224	15,9
Non-natural causes		45	0,6		78	1,0		66	0,9
<b>Total</b>		<b>7 754</b>	<b>100,0</b>		<b>7 852</b>	<b>100,0</b>		<b>7 676</b>	<b>100,0</b>

\*Data for 2013–2014 have been updated with late registrations/delayed death notification forms processed in 2015/2016.

...Category not in the top ten.

### 4.2.3 Early neonatal deaths differentials

Table 4.7 presents the top five leading underlying natural causes of early neonatal deaths by selected socio-geographic and socio-demographic variables. The absolute numbers of the early neonatal deaths are presented in Appendix E (see page 40).

The pattern of the top five causes of early neonatal deaths was largely similar by sex for the different underlying causes. Early neonatal deaths attributed to *respiratory and cardiovascular disorders specific to the perinatal period* were 38,1% and 39,4% for males and females, respectively. *Disorders related to length of gestation and fetal growth* accounted for 14,5% for females and 13,4% for males, meaning that a marginally higher proportion of females died from these two causes than males. On the contrary, there were more male early neonatal deaths due to *fetus and newborn affected by maternal factors and by complications of pregnancy, labour and delivery* compared to females (10,8% for males compared to 10,3% for females).

Differentials by population group show that black Africans had the highest proportion of early neonatal deaths due to *respiratory and cardiovascular disorders specific to the perinatal period* (40,3%), followed by the white population group (35,2%). There were 32,6% Indian/Asian and 30,6% coloured early neonatal deaths due to *respiratory and cardiovascular disorders specific to the perinatal period*. *Disorders related to length of gestation and fetal growth* was the second most common underlying cause of death amongst black Africans, responsible for 13,7% of early neonatal deaths in this population group, while it was responsible for the lowest proportion of early neonatal deaths in the white population group. *Infections specific to the perinatal period* was the second most common underlying cause of death amongst the Indian/Asian population group, accounting for 14,0% of early neonatal deaths.

Province of death occurrence differentials show that *respiratory and cardiovascular disorders specific to the perinatal period* accounted for the highest percentage of early neonatal deaths in Limpopo (45,3%), followed narrowly by Mpumalanga (44,5%), then Gauteng at 43,3%. Northern Cape and Western Cape were the only provinces with less than 30% of early neonatal deaths attributed to *respiratory and cardiovascular disorders specific to the perinatal period*. North West had the highest proportion of deaths due to *disorders related to length of gestation and fetal growth* compared to the rest of the other provinces, with 21,2% of early neonatal deaths due to this cause in this province.

The distribution of early neonatal deaths by place of death shows that most early neonatal deaths due to *respiratory and cardiovascular disorders specific to the perinatal period* occurred in nursing homes (43,3%), followed by hospitals (40,2%) and those who were dead on arrival at the health facility (40,0%).

**Table 4.7: Percentage distribution of early neonatal deaths by top five leading causes and selected socio-demographic and geographic variables, 2015**

Variables	Underlying causes of death						
	P20-P29 <sup>1</sup>	P05-P08 <sup>2</sup>	P00-P04 <sup>3</sup>	P35-P39 <sup>4</sup>	P50-P61 <sup>5</sup>	Others <sup>6</sup>	Total
<b>Sex</b>							
Male	38,1	13,4	10,8	7,9	4,8	24,9	100,0
Female	39,4	14,5	10,3	7,5	3,5	24,9	100,0
Unknown/unspecified	33,9	11,1	7,5	5,5	2,6	39,4	100,0
<b>Total</b>	<b>38,5</b>	<b>13,8</b>	<b>10,4</b>	<b>7,6</b>	<b>4,2</b>	<b>25,5</b>	<b>100,0</b>
<b>Population group</b>							
Black African	40,3	13,7	10,2	7,8	4,1	23,8	100,0
White	35,2	5,7	10,2	10,2	8,0	30,7	100,0
Indian/Asian	32,6	11,6	11,6	14,0	7,0	23,3	100,0
Coloured	30,6	21,4	12,2	7,2	4,0	24,6	100,0
Other	45,5	9,1	9,1	9,1	0,0	27,3	100,0
Unknown/unspecified	29,7	11,7	11,1	5,6	4,1	37,8	100,0
<b>Total</b>	<b>38,5</b>	<b>13,8</b>	<b>10,4</b>	<b>7,6</b>	<b>4,2</b>	<b>25,5</b>	<b>100,0</b>
<b>Province of death</b>							
Western Cape	24,0	18,9	16,8	8,4	3,3	28,5	100,0
Eastern Cape	33,8	12,6	13,5	3,5	3,9	32,7	100,0
Northern Cape	29,9	16,5	9,1	9,1	5,5	29,9	100,0
Free State	42,0	11,0	11,9	7,2	3,5	24,3	100,0
North West	34,4	21,2	10,1	7,4	3,7	23,2	100,0
KwaZulu-Natal	37,3	11,9	10,1	9,3	4,3	27,1	100,0
Gauteng	43,3	9,6	8,0	9,0	4,8	25,3	100,0
Mpumalanga	44,5	14,0	8,2	4,0	5,5	23,8	100,0
Limpopo	45,3	10,2	11,1	7,1	3,5	22,8	100,0
Outside South Africa	0,0	0,0	100,0	0,0	0,0	0,0	100,0
Unspecified	25,0	25,0	0,0	0,0	12,5	37,5	100,0
<b>Total</b>	<b>38,5</b>	<b>13,8</b>	<b>10,4</b>	<b>7,6</b>	<b>4,2</b>	<b>25,5</b>	<b>100,0</b>
<b>Place of death</b>							
Hospital	40,2	15,1	11,0	8,6	4,1	21,0	100,0
Emergency room/outpatient	37,1	9,5	1,9	1,9	2,9	46,7	100,0
Dead on arrival	40,0	16,4	3,6	9,1	7,3	23,6	100,0
Nursing home	43,3	0,0	3,3	6,7	0,0	46,7	100,0
Home	35,6	5,1	6,7	4,2	2,9	45,5	100,0
Other	32,5	5,2	16,9	2,6	2,6	40,3	100,0
Unknown/unspecified	33,7	11,9	9,8	5,6	4,8	34,3	100,0
<b>Total</b>	<b>38,5</b>	<b>13,8</b>	<b>10,4</b>	<b>7,6</b>	<b>4,2</b>	<b>25,5</b>	<b>100,0</b>

<sup>1</sup> Respiratory and cardiovascular disorders specific to the perinatal period (P20-P29).<sup>2</sup> Disorders related to length of gestation and fetal growth (P05-P08).<sup>3</sup> Fetus and newborn affected by maternal factors and by complications of pregnancy, labour and delivery (P00-P04).<sup>4</sup> Infections specific to the perinatal period (P35-P39).<sup>5</sup> Haemorrhagic and haematological disorders of fetus and newborn (P50-P61).<sup>6</sup> 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, 2015

The five leading underlying natural causes of early neonatal deaths which occurred in 2015 are presented in Table 4.8 below, by population group. The analysis excludes the Indian/Asian population group due to low numbers for early neonatal deaths for this population group.

All three population groups had similar causes of death for the top five leading underlying causes of death, but differed in proportions for black African and coloured population and differed in terms of ranking for the white population group. The only underlying cause which maintained the same rank as the leading underlying cause for all three population groups was *respiratory and cardiovascular disorders specific to the perinatal period*, though the proportions varied by population group. For black Africans, it was responsible for 40,3% of deaths, while it accounted for 35,2% amongst the white population and 30,6% amongst the coloured population. However, the black African and coloured populations had *disorders related to length of gestation and fetal growth* ranked second for the two groups and fifth for the white population group. *Fetus and newborn affected by maternal factors and by complications of pregnancy, labour and delivery* and *infections specific to the perinatal period* ranked second for the white population group responsible for 10,2% of early neonatal deaths. *Fetus and newborn affected by maternal factors and by complications of pregnancy, labour and delivery* was ranked third for the black African and coloured population groups, responsible for 10,2% and 12,2% of early neonatal deaths respectively.

**Table 4.8: The five leading underlying natural causes of early neonatal deaths by population group, 2015\***

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	2 521	40,3	1	31	35,2	1	123	30,6
Disorders related to length of gestation and fetal growth (P05-P08)	2	858	13,7	5	5	5,7	2	86	21,4
Fetus and newborn affected by maternal factors and by complications of pregnancy, labour and delivery (P00-P04)	3	641	10,2	2	9	10,2	3	49	12,2
Infections specific to the perinatal period (P35-P39)	4	491	7,8	2	9	10,2	4	29	7,2
Haemorrhagic and haematological disorders of fetus and newborn (P50-P61)	5	259	4,1	4	7	8,0	5	16	4,0
Other natural causes		1447	23,1		26	29,5		95	23,6
Non-natural causes		41	0,7		1	1,1		4	1,0
<b>All causes</b>		<b>6 258</b>	<b>100,0</b>		<b>88</b>	<b>100,0</b>		<b>402</b>	<b>100,0</b>

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

...Category not in the top ten.

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



## 4.3 Perinatal deaths

### 4.3.1 Main groups of underlying causes of perinatal deaths

Table 4.9 presents the distribution of perinatal deaths by the main group of underlying causes of death and sex. Over 90% of perinatal deaths (94,6% for males and 94,8% for females) were due to *certain conditions originating in the perinatal period*. The second most common main group of underlying causes for perinatal deaths was *congenital malformations* for both sexes, responsible for 4,5% deaths among males and 4,4% amongst females.

**Table 4.9: Number and percentage distribution of perinatal deaths by main group of underlying causes of death and sex, 2015\***

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)	10 661	94,6	8 589	94,8	19 250	94,7
Congenital malformations (Q00-Q99)	509	4,5	400	4,4	909	4,5
Certain infectious and parasitic diseases (A00-B99)	18	0,2	9	0,1	27	0,1
Symptoms and signs not elsewhere classified (R00-R99)	41	0,4	35	0,4	76	0,4
External causes of morbidity and mortality (V01-Y98)	33	0,3	17	0,2	50	0,2
Other main groups of underlying causes	13	0,1	12	0,1	25	0,1
<b>Total</b>	<b>11 275</b>	<b>100,0</b>	<b>9 062</b>	<b>100,0</b>	<b>20 337</b>	<b>100,0</b>

\*Excluding perinatal deaths with unspecified sex.

### 4.3.2 Broad groups of underlying causes of perinatal deaths

Table 4.10 shows the top ten leading underlying natural causes of perinatal deaths for the period 2013 to 2015. The breakdown of individual causes for broad groups of causes of death that were in the top ten leading causes for total perinatal deaths in 2015 is provided in Appendix F (see pages 41).

In the three-year period, the top ten leading underlying natural causes of death for perinatal deaths remained the same but rankings changed for some of the causes. Nine of the ten leading natural underlying causes of death maintained their rankings, though proportions differed from year to year. These were *fetus and newborn affected by maternal factors and by complications of pregnancy, labour and delivery* (first position); *respiratory and cardiovascular disorders specific to the perinatal period* (second position); *disorders related to length of gestation and fetal growth* (third position), *infections specific to the perinatal period* (fourth position), *other congenital malformations* (fifth position), *haemorrhagic and haematological disorders of fetus and newborn* (sixth position), *congenital malformations of the circulatory system* (seventh position), *digestive system disorders of fetus and newborn* (ninth position) and *chromosomal abnormalities, not elsewhere classified* (tenth position). The most obvious change in ranking was *congenital malformations of the nervous system*. In 2013, it was ranked seventh and then moved up to eight position in 2014 and then moved back to seventh position in 2015, responsible for 0,7% of perinatal deaths in 2015.



**Table 4.10: The ten leading underlying natural causes of perinatal deaths, 2013–2015\***

Underlying broad groups of causes of death (based on ICD-10)	2013**			2014			2015		
	Rank	Number	%	Rank	Number	%	Rank	Number	%
Fetus and newborn affected by maternal factors and by complications of pregnancy, labour and delivery (P00-P04)	1	4 386	19,2	1	4 888	21,3	1	4 566	21,4
Respiratory and cardiovascular disorders specific to the perinatal period (P20-P29)	2	3 539	15,5	2	3 910	17,0	2	3 584	16,8
Disorders related to length of gestation and fetal growth (P05-P08)	3	1 917	8,4	3	1 752	7,6	3	1 559	7,3
Infections specific to the perinatal period (P35-P39)	4	557	2,4	4	635	2,8	4	604	2,8
Other congenital malformations (Q80-Q89)	5	420	1,8	5	455	2,0	5	411	1,9
Haemorrhagic and haematological disorders of fetus and newborn (P50-P61)	6	319	1,4	6	337	1,5	6	347	1,6
Congenital malformations of the nervous system (Q00-Q07)	7	161	0,7	8	159	0,7	7	153	0,7
Congenital malformations of the circulatory system (Q20-Q28)	8	134	0,6	7	168	0,7	7	153	0,7
Digestive system disorders of fetus and newborn (P75-P78)	9	132	0,6	9	133	0,6	9	142	0,7
Chromosomal abnormalities, not elsewhere classified (Q90-Q99)	10	115	0,5	10	93	0,4	10	114	0,5
Other natural causes		11 080	48,6		10 340	45,1		9 679	45,3
Non-natural causes		45	0,2		78	0,3		66	0,3
<b>Total</b>		<b>22 805</b>	<b>100,0</b>		<b>22 948</b>	<b>100,0</b>		<b>21 378</b>	<b>100,0</b>

\*Data for 2013–2014 have been updated with late registrations/delayed death notification forms processed in 2015/2016.

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

### 4.3.3 Perinatal deaths differentials

Table 4.11 shows the percentage distribution of perinatal deaths by the top five leading causes and selected socio-geographic as well as socio-demographic variables for 2015. Their absolute numbers are presented in Appendix G (see page 43).

For both sexes, *fetus and newborn affected by maternal factors and by complications of pregnancy, labour and delivery* was the most common underlying cause of death, contributing to 20,7% of perinatal deaths amongst males and 22,4% amongst females. The second most common underlying cause of death for both sexes was *respiratory and cardiovascular disorders specific to the perinatal period*, which accounted for 16,8% of male perinatal deaths and 17,1% of female perinatal deaths.

*Fetus and newborn affected by maternal factors and by complications of pregnancy, labour and delivery* was the leading cause of death for all population groups. It was the highest contributor to perinatal deaths among the white population group (25,9%), closely followed by the coloured population group (25,0%) and then the Indian/Asian population group (22,8%). The second leading underlying cause of perinatal deaths was *respiratory and cardiovascular disorders specific to the perinatal period* for all population groups. The highest proportion of *disorders related to length of gestation and fetal growth* was found among the coloured population group, responsible for 10,2% of deaths in this population group.

Geographical differentials by province show that *fetus and newborn affected by maternal factors and by complications of pregnancy, labour and delivery* was the most common cause of death in all provinces except in Gauteng, where *respiratory and cardiovascular disorders specific to the perinatal period* was the most common leading underlying cause of death, responsible for 18,4% of perinatal deaths in the province. Perinatal deaths due to *fetus and newborn*

*affected by maternal factors and by complications of pregnancy, labour and delivery* ranged from 13,9% in Gauteng to 26,1% in Limpopo.

The five leading underlying natural causes of death by place of death occurrence show that *fetus and newborn affected by maternal factors and by complications of pregnancy, labour and delivery* had the highest proportion of perinatal deaths occurring in hospitals (22,3%). *Respiratory and cardiovascular disorders specific to the perinatal period* had the highest proportions for deaths occurring in a nursing home.

**Table 4.11: Percentage distribution of perinatal deaths by top five leading causes and selected socio-demographic and geographic variables, 2015**

Variables	Underlying causes of death						
	P00-P04 <sup>1</sup>	P20-P29 <sup>2</sup>	P05-P08 <sup>3</sup>	P35-P39 <sup>4</sup>	Q80-Q89 <sup>5</sup>	Others <sup>6</sup>	Total
<b>Sex</b>							
Male	20,7	16,8	7,5	3,0	1,8	50,2	100,0
Female	22,4	17,1	7,2	2,7	1,9	48,8	100,0
Unknown/unspecified	19,1	13,7	6,4	1,6	3,5	55,6	100,0
<b>Total</b>	<b>21,4</b>	<b>16,8</b>	<b>7,3</b>	<b>2,8</b>	<b>1,9</b>	<b>49,8</b>	<b>100,0</b>
<b>Population group</b>							
Black African	20,9	17,9	7,3	3,0	2,0	49,0	100,0
White	25,9	12,8	5,6	3,4	2,3	50,0	100,0
Indian/Asian	22,8	13,0	6,5	5,7	2,4	49,6	100,0
Coloured	25,0	12,2	10,2	2,4	1,9	48,3	100,0
Other	29,4	14,7	2,9	2,9	5,9	44,1	100,0
Unknown/unspecified	22,2	12,5	6,3	1,8	1,6	55,6	100,0
<b>Total</b>	<b>21,4</b>	<b>16,8</b>	<b>7,3</b>	<b>2,8</b>	<b>1,9</b>	<b>49,8</b>	<b>100,0</b>
<b>Province of death</b>							
Western Cape	24,7	8,5	8,5	2,5	1,8	53,9	100,0
Eastern Cape	23,2	17,8	8,5	1,6	2,5	46,2	100,0
Northern Cape	23,5	15,0	11,1	3,6	1,2	45,5	100,0
Free State	23,1	18,3	6,2	2,6	1,3	48,4	100,0
North West	24,7	13,4	9,0	2,4	2,3	48,3	100,0
KwaZulu-Natal	21,4	20,7	8,0	4,4	1,2	44,2	100,0
Gauteng	13,9	18,4	4,9	3,4	1,8	57,5	100,0
Mpumalanga	20,2	18,3	7,3	1,5	1,9	50,8	100,0
Limpopo	26,1	22,9	6,4	2,9	2,4	39,3	100,0
Outside South Africa	0,0	0,0	0,0	0,0	0,0	0,0	100,0
Unspecified	20,4	6,1	12,2	0,0	0,0	61,2	100,0
<b>Total</b>	<b>21,4</b>	<b>16,8</b>	<b>7,3</b>	<b>2,8</b>	<b>1,9</b>	<b>49,8</b>	<b>100,0</b>
<b>Place of death</b>							
Hospital	22,3	18,0	7,9	3,3	2,2	46,2	100,0
Emergency room/outpatient	18,9	14,8	6,8	0,5	1,1	57,8	100,0
Dead on arrival	14,5	15,1	11,3	2,7	1,1	55,4	100,0
Nursing home	10,0	20,0	2,5	2,5	1,3	63,8	100,0
Home	14,5	17,3	4,9	1,8	0,3	61,2	100,0
Other	23,1	11,2	4,7	0,6	0,0	60,4	100,0
Unknown/unspecified	20,2	13,7	5,9	1,8	1,6	56,8	100,0
<b>Total</b>	<b>21,4</b>	<b>16,8</b>	<b>7,3</b>	<b>2,8</b>	<b>1,9</b>	<b>49,8</b>	<b>100,0</b>

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

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

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

<sup>4</sup> Infections specific to the perinatal period (P35-P39).

<sup>5</sup> Other congenital malformations (Q80-Q89).

<sup>6</sup> Excluding unknown or unspecified cases.

#### 4.3.4 Leading underlying natural causes of perinatal deaths by population group, 2015

Table 4.12 shows the underlying causes of perinatal deaths by population group. As was the case with previous analyses on population groups, the Indian/Asian group has been excluded. Results indicate that the first four of the five leading underlying causes of perinatal deaths were the same for the three population groups. For all three population groups under consideration, *fetus and newborn affected by maternal factors and by complications of pregnancy, labour and delivery* was the leading cause of perinatal deaths, accounting for 20,9% amongst black Africans, 25,9% amongst the white population group and 24,9% amongst the coloured population group.

*Respiratory and cardiovascular disorders specific to the perinatal period* was the second leading cause of perinatal deaths for all three population groups, accounting for 17,9% of perinatal deaths amongst the black African population group, 12,8% among the white population group and 12,2% among the coloured population group. Black Africans and coloureds were the only population groups that had *other congenital malformations* amongst the five leading causes of perinatal deaths, ranking fifth for both population groups, whereas *haemorrhagic and haematological disorders of fetus and newborn* was among the five leading causes only for the white population group, accounting for 3,0% of perinatal deaths in this population group.

**Table 4.12: The five leading underlying natural causes of perinatal deaths by population group, 2015\***

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	3 528	20,9	1	69	25,9	1	311	24,9
Respiratory and cardiovascular disorders specific to the perinatal period (P20-P29)	2	3 029	17,9	2	34	12,8	2	152	12,2
Disorders related to length of gestation and fetal growth (P05-P08)	3	1 233	7,3	3	15	5,6	3	127	10,2
Infections specific to the perinatal period (P35-P39)	4	507	3,0	4	9	3,4	4	30	2,4
Other congenital malformations (Q80-Q89)	5	331	2,0	...	...	...	5	24	1,9
Haemorrhagic and haematological disorders of fetus and newborn (P50-P61)	...	...	...	5	8	3,0	...	...	...
Other natural causes		8 251	48,8		130	48,9		597	47,9
Non-natural causes		41	0,2		1	0,4		6	0,5
<b>All causes</b>		<b>16 920</b>	<b>100,0</b>		<b>266</b>	<b>100,0</b>		<b>1 247</b>	<b>100,0</b>

\*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.

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

## 5. Summary and concluding remarks

Information on perinatal deaths and causes of death published in this release is based on data collected through the civil registration system in South Africa by the Department of Home Affairs. Statistics South Africa collects all the death notification forms from DHA for processing, analysis and dissemination of statistics on mortality and causes of death. This statistical release focuses on 2015 perinatal deaths. However, perinatal deaths for the previous years (1997–2014) were included as they provide the overall trends in perinatal deaths. Analysing trends in perinatal deaths assists in monitoring the patterns and aids in informing future patterns of likely occurrences. Statistics on perinatal deaths provide the information needed for evidence-based decision-making, particularly for maternal and newborn health.

The total number of perinatal deaths that occurred in 2015 and were registered at DHA was 21 378, which was a decline of 6,8% from the 22 948 perinatal deaths that occurred in 2014. Almost two-thirds of the 21 378 perinatal deaths in 2015 were stillbirths (64,1%) and the remaining third were early neonatal deaths (35,9%). Stillbirths have been higher than early neonatal deaths since 1999, and this was still the case in 2015. Throughout the 19-year period, stillbirth differentials by sex show that the number of male stillbirths have always been higher than that of female stillbirths and the same applies for early neonatal deaths. This was also confirmed by the sex ratios at death. Sex ratios at death for stillbirths, early neonatal deaths as well as perinatal deaths were consistently higher than 100 male deaths per 100 female births nationally and for all the provinces, which indicates that across the country there are more males dying than females. The highest sex ratio at death for stillbirths was observed in Free State; for both early neonatal deaths and perinatal deaths it was observed in Northern Cape.

Differentials by population group indicated that for all three categories (stillbirths, early neonatal and perinatal deaths), black Africans had the highest proportion of deaths at 77,8% for stillbirths, 81,5% for early neonatal deaths and 79,1% for perinatal deaths. This is indicative of the South African population, which is dominated mainly by the black African population. The majority of perinatal deaths occurred in a hospital (68,1%).

Amongst stillbirths, *certain conditions originating in the perinatal period* was responsible for 97,7% of stillbirths in 2015, with the other 2,3% attributed to *congenital malformations*. A proportion of 97,6% of male stillbirths were attributed to *certain conditions originating in the perinatal period*, while for females it was 97,8%. Results from the leading underlying natural causes of death indicated that in the three-year period (2013–2015), *fetus and newborn affected by maternal factors and by complications of pregnancy, labour and delivery* remained the leading underlying natural cause of death. Second was *respiratory and cardiovascular disorders specific to the perinatal period* for 2014 and 2015 but third in 2013. In third position was *disorders related to length of gestation and fetal growth* in 2014 and 2015 but was second in 2013. In 2015, *fetus and newborn affected by maternal factors and by complications of pregnancy, labour and delivery* was the leading cause of death for both male and female stillbirths. *Fetus and newborn affected by maternal factors and by complications of pregnancy, labour and delivery* was the leading underlying natural cause of death for all the provinces and was lowest for Gauteng, where 17,5% of stillbirths were due to this cause. For stillbirths, the number of stillbirths decreased with an increase in birthweight.

*Certain conditions originating in the perinatal period* were the leading main group of underlying causes of death amongst early neonatal deaths, accounting for almost 90% of early neonatal deaths. These were followed by *congenital malformations*, accounting for 8,2% of early neonatal deaths. The same pattern was observed for each of the two sexes whereby most of the early neonatal deaths were from *certain conditions originating in the perinatal period*, followed by *congenital malformations*. For the period 2013 to 2015, the first six leading underlying natural causes of death for early neonatal deaths remained the same in ranking, even though they differed by proportions in each year. The leading underlying natural cause of death was *respiratory and cardiovascular disorders specific to the perinatal period*, followed by *disorders related to the length of gestation and fetal growth*. These accounted for 38,5% and 13,8% of early neonatal deaths in 2015, respectively.

Limpopo had the highest proportion of early neonatal deaths due to *respiratory and cardiovascular disorders specific to the perinatal period*, accounting for 45,3% of early neonatal deaths in the province, followed closely by Mpumalanga (44,5%), then Gauteng at 43,3%. Across all population groups, *respiratory and cardiovascular disorders specific to the perinatal period* was the leading underlying natural cause of early neonatal deaths, though differing by proportions between the population groups. The second most common underlying cause of death for black African

and coloured population groups in 2015 was *disorders related to length of gestation and fetal growth*, while the second amongst the white population was *fetus and new-born affected by maternal factors and by complications of pregnancy, labour and delivery*.

Perinatal deaths results indicated that the main group *certain conditions originating in the perinatal period* had the highest proportion of perinatal deaths, accounting for 94,7% of perinatal deaths in 2015. Less than 1% of perinatal deaths were due to external causes of morbidity and mortality, which are non-natural causes of death. *Fetus and new-born affected by maternal factors and by complications of pregnancy, labour and delivery* was the leading underlying non-natural cause of perinatal death for the three-year period (2013 to 2015), accounting for around 20% of perinatal deaths in each year.

Differentials by population group showed that there was no difference in the ranking on four of the five leading underlying causes of death for the three population groups (whites, black Africans and coloureds). The only difference was the fifth leading underlying cause of death whereby *other congenital malformations* was on the top five only for black Africans and coloureds, but not for white population group.

*Fetus and new-born affected by maternal factors and by complications of pregnancy, labour and delivery* was the leading underlying cause of perinatal deaths in all the provinces except Gauteng, where the leading underlying cause of death was *respiratory and cardiovascular disorders specific to the perinatal*, accounting for 18,4% of perinatal deaths in the province. *Fetus and new-born affected by maternal factors and by complications of pregnancy, labour and delivery* was also the leading cause of death for both males and females in 2015.

Data quality in terms of mortality as well as causes of death statistics for the perinatal death report is good. However, there is still room for improvement in the collection of data on the mother's socio-demographic profile. This is likely to improve as more perinatal deaths are captured on the new death notification form, which has a section (Section G) that provides for the capturing of information about the maternal mother of the deceased child.

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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 a 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 big 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 2015, 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 500 grams 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 grams 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 characteristics 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 (13,1%); duration of pregnancy (16,4%); province of usual residence (21,2%); and place or institution of death occurrence (24,0%). 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, 2015**

Variable	Applicable group	Percentage including unspecified or unknown
Population group	Perinatal death	13,1
Province of usual residence	Perinatal death	21,2
Place or institution of death occurrence	Perinatal death	24,0
Method used to ascertain cause of death	Perinatal death	76,4
Pregnancy duration in weeks	Mother	16,4
Birth type	Mother	44,7
Birth attendant	Mother	51,9
Age of mother	Mother	60,9
Delivery method	Mother	66,7
Antenatal care	Mother	67,1
Outcome of previous pregnancy	Mother	75,4

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% (39,4%) of the total proportion of perinatal deaths was assigned to ill-defined causes, which is a large margin from the recommended proportion. Stillbirths had the highest proportion of ill-defined cause at 60,8% while early neonatal deaths had a minimum of 1,1%. Ill-defined causes for stillbirths which occurred in a hospital were 59% while it was 0,3% for early neonatal deaths. There were very few cases for deaths which occurred on arrival as well as those occurring at home for perinatal deaths.

**Table B.2: Ill-defined causes of death by place of death occurrence, 2015\***

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	5 364	9 094	59,0	15	5 466	0,3	5 379	14 560	36,9
Emergency room/outpatient	153	260	58,8	3	105	2,9	156	365	42,7
Dead on arrival	84	131	64,1		55	0,0	84	186	45,2
Nursing home	37	50	74,0		30	0,0	37	80	46,3
Home	293	426	68,8	6	312	1,9	299	738	40,5
Other	157	244	64,3	4	77	5,2	161	321	50,2
Unknown/unspecified	2 245	3 497	64,2	54	1 631	3,3	2 299	5 128	44,8
<b>Total</b>	<b>8 333</b>	<b>13 702</b>	<b>60,8</b>	<b>82</b>	<b>7 676</b>	<b>1,1</b>	<b>8 415</b>	<b>21 378</b>	<b>39,4</b>

**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	1 089 307	1 103 968	7,5	13,3	20,6
2004	8 243	15 850	24 093	1 112 009	1 127 859	7,4	14,1	21,4
2005	9 877	13 829	23 706	1 133 578	1 147 407	8,7	12,1	20,7
2006	10 068	14 383	24 451	1 157 720	1 172 103	8,7	12,3	20,9
2007	9 893	14 356	24 249	1 186 149	1 200 505	8,3	12,0	20,2
2008	10 093	14 948	25 041	1 213 007	1 227 955	8,3	12,2	20,4
2009	11 019	14 291	25 310	1 221 737	1 236 028	9,0	11,6	20,5
2010	8 984	15 135	24 119	1 216 150	1 231 285	7,4	12,3	19,6
2011	8 087	14 240	22 327	1 207 511	1 221 751	6,7	11,7	18,3
2012	8 524	14 690	23 214	1 210 987	1 225 677	7,0	12,0	18,9
2013	7 754	15 051	22 805	1 212 947	1 227 998	6,4	12,3	18,6
2014	7 852	15 096	22 948	1 213 213	1 228 309	6,5	12,3	18,7
2015	7 676	13 702	21 378	1 212 055	1 225 757	6,3	11,2	17,4

## Appendix D: Number distribution of stillbirths by top five leading causes and selected socio-demographic and geographic variables, 2015

Variables	Underlying causes of death						
	P00-P04 <sup>1</sup>	P20-P29 <sup>2</sup>	P05-P08 <sup>3</sup>	Q80-Q89 <sup>4</sup>	Q00-Q07 <sup>5</sup>	Others <sup>6</sup>	Total
<b>Sex</b>							
Male	1 889	307	284	92	39	4 504	7 115
Female	1 699	284	185	73	34	3 578	5 853
Unknown/unspecified	176	39	33	19	4	463	734
<b>Total</b>	<b>3 764</b>	<b>630</b>	<b>502</b>	<b>184</b>	<b>77</b>	<b>8 545</b>	<b>13 702</b>
<b>Population group</b>							
Black African	2 887	508	375	139	56	6 697	10 662
White	60	3	10	4	7	94	178
Indian/Asian	23	2	3	3	1	48	80
Coloured	262	29	41	13	3	495	843
Other	9	0	0	0	0	14	23
Unknown/unspecified	523	88	73	25	10	1 197	1 916
<b>Total</b>	<b>3 764</b>	<b>630</b>	<b>502</b>	<b>184</b>	<b>77</b>	<b>8 545</b>	<b>13 702</b>
<b>Province of death</b>							
Western Cape	435	29	62	27	6	992	1 551
Eastern Cape	213	56	43	10	4	398	724
Northern Cape	129	21	30	7		205	392
Free State	292	55	37	5	7	604	1 000
North West	1 035	140	124	50	20	1 960	3 329
KwaZulu-Natal	309	69	48	12	8	558	1 004
Gauteng	578	118	67	42	18	2 481	3 304
Mpumalanga	265	37	35	14	6	630	987
Limpopo	498	104	52	17	8	691	1 370
Outside South Africa	0	0	0	0	0	0	0
Unspecified	10	4	1	0		26	41
<b>Total</b>	<b>3 764</b>	<b>630</b>	<b>502</b>	<b>184</b>	<b>77</b>	<b>8 545</b>	<b>13 702</b>
<b>Place of death</b>							
Hospital	2 643	425	333	135	57	5 501	9 094
Emergency room/outpatient	67	15	15	3	3	157	260
Dead on arrival	25	6	12	2	0	86	131
Nursing home	7	3	2	0	0	38	50
Home	86	17	20	2	0	301	426
Other	61	11	11		1	160	244
Unknown/unspecified	875	153	109	42	16	2 302	3 497
<b>Total</b>	<b>3 764</b>	<b>630</b>	<b>502</b>	<b>184</b>	<b>77</b>	<b>8 545</b>	<b>13 702</b>
<b>Birth weight</b>							
Less than 1 000	630	72	210	22	11	1 353	2 298
1 000–1 499	597	44	69	30	11	1 147	1 898
1 500–1 999	551	52	33	38	16	1 000	1 690
2 000–2 499	431	57	16	27	7	865	1 403
2 500–2 999	370	74	5	14	7	743	1 213
3 000–3 499	250	67		7	2	509	835
3 500–3 999	94	25	2	1	4	198	324
4 000 and above	56	10	4		2	151	223
Unspecified	785	229	163	45	17	2 579	3 818
<b>Total</b>	<b>3 764</b>	<b>630</b>	<b>502</b>	<b>184</b>	<b>77</b>	<b>8 545</b>	<b>13 702</b>

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

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

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

<sup>4</sup> Other congenital malformations (Q80-Q89).

<sup>5</sup> Congenital malformations of the nervous system (Q00-Q07).

<sup>6</sup> 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, 2015

Variables	Underlying causes of death						
	P00-P04 <sup>1</sup>	P05-P08 <sup>2</sup>	P20-P29 <sup>3</sup>	P35-P39 <sup>4</sup>	Q80-Q89 <sup>5</sup>	Others <sup>6</sup>	Total
<b>Sex</b>							
Male	1 587	559	449	328	200	1 037	4 160
Female	1 263	464	330	240	113	799	3 209
Unknown/unspecified	104	34	23	17	8	121	307
<b>Total</b>	<b>2 954</b>	<b>1 057</b>	<b>802</b>	<b>585</b>	<b>321</b>	<b>1 957</b>	<b>7 676</b>
<b>Population group</b>							
Black African	2 521	858	641	491	259	1 488	6 258
White	31	5	9	9	7	27	88
Indian/Asian	14	5	5	6	3	10	43
Coloured	123	86	49	29	16	99	402
Other	5	1	1	1	0	3	11
Unknown/unspecified	260	102	97	49	36	330	874
<b>Total</b>	<b>2 954</b>	<b>1 057</b>	<b>802</b>	<b>585</b>	<b>321</b>	<b>1 957</b>	<b>7 676</b>
<b>Province of death</b>							
Western Cape	160	126	112	56	22	190	666
Eastern Cape	155	58	62	16	18	150	459
Northern Cape	76	42	23	23	14	76	254
Free State	226	59	64	39	19	131	538
North West	499	308	147	107	54	337	1 452
KwaZulu-Natal	313	100	85	78	36	227	839
Gauteng	855	190	158	178	94	499	1 974
Mpumalanga	245	77	45	22	30	131	550
Limpopo	423	95	104	66	33	213	934
Outside South Africa	0	0	2	0	0	0	2
Unspecified	2	2	0	0	1	3	8
<b>Total</b>	<b>2 954</b>	<b>1 057</b>	<b>802</b>	<b>585</b>	<b>321</b>	<b>1 957</b>	<b>7 676</b>
<b>Place of death</b>							
Hospital	2 195	824	603	470	225	1 149	5 466
Emergency room/outpatient	39	10	2	2	3	49	105
Dead on arrival	22	9	2	5	4	13	55
Nursing home	13		1	2		14	30
Home	111	16	21	13	9	142	312
Other	25	4	13	2	2	31	77
Unknown/unspecified	549	194	160	91	78	559	1 631
<b>Total</b>	<b>2 954</b>	<b>1 057</b>	<b>802</b>	<b>585</b>	<b>321</b>	<b>1 957</b>	<b>7 676</b>

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

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

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

<sup>4</sup>Infections specific to the perinatal period (P35-P39).

<sup>5</sup>Other congenital malformations (Q80-Q89).

<sup>6</sup>'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 2015

Underlying cause of death	Number	Percentage
<b>Foetus and newborn affected by maternal factors and by complications of pregnancy, labour and delivery (P00-P04)</b>		
Foetus and newborn affected by maternal conditions that may be unrelated to present pregnancy (P00)	2 394	52,4
Foetus and newborn affected by complications of placenta, cord and membranes (P02)	1 663	36,4
Foetus and newborn affected by maternal complications of pregnancy (P01)	249	5,5
Foetus and newborn affected by other complications of labour and delivery (P03)	236	5,2
Foetus and newborn affected by noxious influences transmitted via placenta or breast milk (P04)	24	0,5
<b>Total</b>	<b>4 566</b>	<b>100,0</b>
<b>Disorders related to length of gestation and foetal growth (P05-P08)</b>		
Disorders related to short gestation and low birth weight, not elsewhere classified (P07)	1 506	96,6
Slow foetal growth and foetal malnutrition (P05)	47	3,0
Disorders related to long gestation and high birth weight (P08)	6	0,4
<b>Total</b>	<b>1 559</b>	<b>100,0</b>
<b>Respiratory and cardiovascular disorders specific to the perinatal period (P20-P29)</b>		
Respiratory distress of newborn (P22)	1 095	30,6
Birth asphyxia (P21)	736	20,5
Intrauterine hypoxia (P20)	594	16,6
Neonatal aspiration syndromes (P24)	368	10,3
Other respiratory conditions originating in the perinatal period (P28)	206	5,7
Cardiovascular disorders originating in the perinatal period (P29)	199	5,6
Congenital pneumonia (P23)	186	5,2
Pulmonary haemorrhage originating in the perinatal period (P26)	169	4,7
Interstitial emphysema and related conditions originating in the perinatal period (P25)	26	0,7
Chronic respiratory disease originating in the perinatal period (P27)	5	0,1
<b>Total</b>	<b>3 584</b>	<b>100,0</b>
<b>Infections specific to the perinatal period (P35-P39)</b>		
Bacterial sepsis of newborn (P36)	563	93,2
Other infections specific to the perinatal period (P39)	32	5,3
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	0,3
<b>Total</b>	<b>604</b>	<b>100,0</b>
<b>Haemorrhagic and haematological disorders of foetus and newborn (P50-P61)</b>		
Intracranial nontraumatic haemorrhage of foetus and newborn (P52)	122	35,2
Other perinatal haematological disorders (P61)	47	13,5
Neonatal jaundice from other and unspecified causes (P59)	37	10,7
Disseminated intravascular coagulation of foetus and newborn (P60)	36	10,4
Other neonatal haemorrhages (P54)	22	6,3
Neonatal jaundice due to other excessive haemolysis (P58)	22	6,3
Kernicterus (P57)	20	5,8
Haemolytic disease of foetus and newborn (P55)	19	5,5
Haemorrhagic disease of foetus and newborn (P53)	15	4,3
Other underlying causes	7	2,0
<b>Total</b>	<b>347</b>	<b>100,0</b>

## Appendix F: Detailed description of the broad groups of causes of perinatal deaths which were among the ten leading underlying natural causes in 2015 (concluded)

Underlying cause of death	Number	Percentage
<b>Digestive system disorders of foetus and newborn (P75-P78)</b>		
Necrotizing enterocolitis of foetus and newborn (P77)	80	56,3
Other perinatal digestive system disorders (P78)	53	37,3
Other intestinal obstruction of newborn (P76)	9	6,3
<b>Total</b>	<b>142</b>	<b>100,0</b>
<b>Congenital malformations of the nervous system (Q00-Q07)</b>		
Anencephaly and similar malformations (Q00)	57	37,3
Congenital hydrocephalus (Q03)	54	35,3
Spina bifida (Q05)	20	13,1
Other congenital malformations of brain (Q04)	14	9,2
Other underlying causes	8	5,2
<b>Total</b>	<b>153</b>	<b>100,0</b>
<b>Congenital malformations of the circulatory system (Q20-Q28)</b>		
Other congenital malformations of heart (Q24)	116	75,8
Congenital malformations of great arteries (Q25)	14	9,2
Congenital malformations of cardiac septa (Q21)	13	8,5
Other underlying causes	10	6,5
<b>Total</b>	<b>153</b>	<b>100,0</b>
<b>Other congenital malformations (Q80-Q89)</b>		
Other congenital malformations, not elsewhere classified (Q89)	355	86,4
Congenital malformation syndromes due to known exogenous causes, not elsewhere classified (Q86)	53	12,9
Other underlying causes	3	0,7
<b>Total</b>	<b>411</b>	<b>100,0</b>
<b>Chromosomal abnormalities, not elsewhere classified (Q90-Q99)</b>		
Edward's syndrome and Patau's syndrome	54	47,4
Down's syndrome	29	25,4
Other chromosome abnormalities, not elsewhere classified	18	15,8
Other trisomies and partial trisomies of the autosomes, not elsewhere classified	11	9,6
Other underlying causes	2	1,8
<b>Total</b>	<b>114</b>	<b>100,0</b>

## Appendix G: Number distribution of perinatal deaths by top five leading causes and selected socio-demographic and geographic variables, 2015

Variables	Underlying causes of death						
	P00-P04 <sup>1</sup>	P20-P29 <sup>2</sup>	P05-P08 <sup>3</sup>	P35-P39 <sup>4</sup>	Q80-Q89 <sup>5</sup>	Others <sup>6</sup>	Total
<b>Sex</b>							
Male	2 338	1 894	843	341	203	5 656	11 275
Female	2 029	1 547	649	246	172	4 419	9 062
Unknown/unspecified	199	143	67	17	36	579	1 041
<b>Total</b>	<b>4 566</b>	<b>3 584</b>	<b>1 559</b>	<b>604</b>	<b>411</b>	<b>10 654</b>	<b>21 378</b>
<b>Population group</b>							
Black African	3 528	3 029	1 233	507	331	8 292	16 920
White	69	34	15	9	6	133	266
Indian/Asian	28	16	8	7	3	61	123
Coloured	311	152	127	30	24	601	1 245
Other	10	5	1	1	2	15	34
Unknown/unspecified	620	348	175	50	45	1 552	2 790
<b>Total</b>	<b>4 566</b>	<b>3 584</b>	<b>1 559</b>	<b>604</b>	<b>411</b>	<b>10 654</b>	<b>21 378</b>
<b>Province of death</b>							
Western Cape	547	189	188	56	41	1 196	2 217
Eastern Cape	275	211	101	19	30	547	1 183
Northern Cape	152	97	72	23	8	294	646
Free State	356	281	96	40	20	745	1 538
North West	1 182	639	432	113	108	2 307	4 781
KwaZulu-Natal	394	382	148	82	22	815	1 843
Gauteng	736	973	257	181	97	3 034	5 278
Mpumalanga	310	282	112	23	29	781	1 537
Limpopo	602	527	147	67	56	905	2 304
Outside South Africa	2	0	0	0	0	0	2
Unspecified	10	3	6	0	0	30	49
<b>Total</b>	<b>4 566</b>	<b>3 584</b>	<b>1 559</b>	<b>604</b>	<b>411</b>	<b>10 654</b>	<b>21 378</b>
<b>Place of death</b>							
Hospital	3 246	2 620	1 157	487	320	6 730	14 560
Emergency room/outpatient	69	54	25	2	4	211	365
Dead on arrival	27	28	21	5	2	103	186
Nursing home	8	16	2	2	1	51	80
Home	107	128	36	13	2	452	738
Other	74	36	15	2		194	321
Unknown/unspecified	1 035	702	303	93	82	2 913	5 128
<b>Total</b>	<b>4 566</b>	<b>3 584</b>	<b>1 559</b>	<b>604</b>	<b>411</b>	<b>10 654</b>	<b>21 378</b>

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

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

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

<sup>4</sup> Infections specific to the perinatal period (P35-P39).

<sup>5</sup> Other congenital malformations (Q80-Q89).

<sup>6</sup> Excluding unknown or unspecified cases.



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

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. This section provides analysis and information based only on the DHA-1663 form, which is the reason why most information would be missing (Unknown/Unspecified). The questions on the DHA-1663 form which are not on form BI-1663 asks questions on the outcome of previous pregnancies, duration of current pregnancy in weeks, antenatal care visits, birth attendant and method of delivery.

### Perinatal characteristics

#### H.1 Birth type

The percentage distribution of perinatal deaths by birth type are depicted in Table H.1. Over 42,7% of the deliveries had unknown or missing birth type. In analysing the cases where the birth type was specified, more than 90% (92,1%) in 2015 were single births, followed by 4,0% second twin, then 3,3% for first twin. Other multiple were only 0,5%.

**Table H.1: Number and percentage distribution of perinatal deaths by birth type, 2015**

Birth type	Cases including unspecified or unknown		Cases excluding unspecified or unknown	
	Number	Percentage	Number	Percentage
Single	10 902	52,8	10 902	92,1
First twin	395	1,9	395	3,3
Second twin	470	2,3	470	4,0
Other multiple	64	0,3	64	0,5
Unknown/unspecified	8 834	42,7	0	0,0
<b>Total</b>	<b>20 665</b>	<b>100,0</b>	<b>11 831</b>	<b>100,0</b>

#### 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 2015 perinatal deaths. It is important to note that 53,7% of 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 those records where the person who attended to the birth was specified, the results show that trained midwives delivered 51,3% of perinatal deaths while 40,4% of the perinatal deaths were delivered by physicians. Perinatal deaths attended by other trained persons were 2,3%, while those in the 'other' category constituted 6,0% of all perinatal deaths.

**Table H.2: Number and percentage distribution of perinatal deaths by birth attendant, 2015**

Birth attendant	Cases including unspecified or unknown		Cases excluding unspecified or unknown	
	Number	Percentage	Number	Percentage
Physician	4 154	20,1	4 154	40,4
Trained midwife	5 273	25,5	5 273	51,3
Other trained person	239	1,2	239	2,3
Other	615	3,0	615	6,0
Unknown/unspecified	10 384	53,7	0	0,0
<b>Total</b>	<b>20 665</b>	<b>100,0</b>	<b>10 281</b>	<b>100,0</b>

## Mother characteristics

### H.3 Age of the mother

Table H.3 shows the age distribution of mothers who experienced perinatal loss in 2015. 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 58,8% of mothers had unknown age or was not specified. The distribution should be treated with caution given the high proportion of missing information. Amongst those whose ages were known, mothers in the age group 20–24 had the highest proportion of perinatal deaths at 24,9%, closely followed by those aged 25–29 at 24,5%. The proportions were less than one per cent for 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, 2015**

Age of 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	25	0,1	25	0,3
15–19	1 076	5,2	1 076	12,7
20–24	2 106	10,2	2 106	24,9
25–29	2 072	10,1	2 072	24,5
30–34	1 654	8,0	1 654	19,6
35–39	1 085	5,3	1 085	12,8
40–44	396	1,9	396	4,7
45–49	37	0,2	37	0,4
50–54	7	0,0	7	0,1
Unknown/unspecified	12 091	58,8	0	0,0
<b>Total</b>	<b>20 549</b>	<b>100,0</b>	<b>8 458</b>	<b>100,0</b>

### H.4 Outcome of last previous pregnancy

Birth history, especially the outcome of the last pregnancy, is important because during prenatal care, certain risk factors can be flagged from the pregnancy history to ensure survival of both the mother and the child. A result of the pregnancy outcome for mothers who experienced perinatal death in 2015 is shown in Table H.4. Results, however, should be interpreted with caution as more than a third of the last pregnancy outcome of the mothers who experienced perinatal loss in 2015 was unknown. In cases where the outcome of the previous pregnancy outcome was known, almost 70% (68,5%) had a live birth while 23,3% had stillbirths.

**Table H.4: Number and percentage distribution of mothers experiencing perinatal loss by outcome of last previous pregnancy, 2015**

Birth attendant	Cases including unspecified or unknown		Cases excluding unspecified or unknown	
	Number	Percentage	Number	Percentage
Live birth	3 579	17,4	3 579	68,5
Stillbirth	1 217	5,9	1 217	23,3
Abortion	338	1,6	338	6,5
Unknown/unspecified	15 415	75,0	0	0,0
<b>Total</b>	<b>20 549</b>	<b>100,0</b>	<b>5 225</b>	<b>100,0</b>

**H.5 Antenatal care during pregnancy**

Antenatal care (ANC) 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 early (WHO, 2014a). There is a significantly high proportion of mothers for whom there is no information on antenatal care. When focusing on those where there was an indication whether they did visit a health professional for ANC, 83,1% indicated that they had at least one visit compared to 16,9% who did not see any health professional for ANC.

**Table H.5: Number and percentage distribution of mothers experiencing perinatal loss by antenatal visits, 2015**

Two or more antenatal visits	Cases including unspecified or unknown		Cases excluding unspecified or unknown	
	Number	Percentage	Number	Percentage
Yes	5 523	26,9	5 523	83,1
No	1 123	5,5	1 123	16,9
Unknown/unspecified	13 903	67,7	0	0,0
<b>Total</b>	<b>20 549</b>	<b>100,0</b>	<b>6 646</b>	<b>100,0</b>

**H.6 Delivery method**

Table H.6 shows the number of mothers experiencing perinatal loss by method of delivery. Only a third of the mother's delivery method was known for those who experienced perinatal loss in 2015. The rest had unspecified or unknown information on method of delivery. This has huge implications for the quality of the data. When focusing on only the 33,3 mothers, 74,1% of the mothers had spontaneous deliveries and 21,4% delivered perinatal deaths through the caesarean section delivery method.

**Table H.6: Number and percentage distribution of mothers experiencing perinatal loss by delivery method, 2015**

Delivery method	Cases including unspecified or unknown		Cases excluding unspecified or unknown	
	Number	Percentage	Number	Percentage
Spontaneous	5 219	25,4	5 219	74,1
Forceps delivery and rotation	37	0,2	37	0,5
Vacuum extractor	43	0,2	43	0,6
Caesarean section	1 511	7,4	1 511	21,5
Other	234	1,1	234	3,3
Unknown/unspecified	13 505	65,7	0	0,0
<b>Total</b>	<b>20 549</b>	<b>100,0</b>	<b>7 044</b>	<b>100,0</b>

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