

An illustration of a woman with dark hair tied back, wearing a purple top and a gold hoop earring. She is looking down at a baby she is holding. The baby has dark hair and is looking up with its mouth open. The background is a light yellow color.

Saving Mothers 2011-2013: Sixth report on the Confidential Enquiries into Maternal Deaths in South Africa

Facts Sheet

Compiled by the National Committee for Confidential Enquiry into
Maternal Deaths



**Saving Mothers 2011-2013: Sixth
report on confidential enquiries into
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Fact sheet**

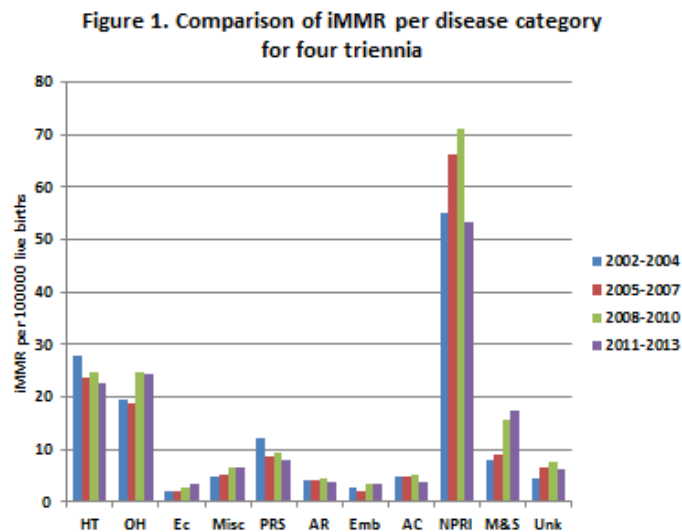
This Fact Sheet gives summary of the key findings of the confidential enquiries into maternal deaths that occurred in health institutions in South Africa from 2011-2013; provides the key recommendations that if wholly implemented would reduce the number of deaths; and gives the institutional Maternal Mortality Ratio's (iMMRs) for provinces and districts.

The report covers the maternal deaths that were reported to the NCCEMD secretariat by 15th May 2014 and births recorded in DHIS on 2nd June 2014. The same definitions used in previous Saving Mothers reports were used in this report.

Key findings

- There were 4452 maternal deaths entered on the database for 2011-2013 by 15th May 2014
- The Institutional Maternal Mortality Ratio (iMMR) has decreased from 176.22 per 100000 live births in 2008-2010 to an iMMR of 154.06 per 100000 live births in 2011-2013 (a 12.6% decrease). There was a decrease in iMMR at district hospitals and tertiary hospitals, but a slight increase in regional hospitals.
- Non-pregnancy related infections (mainly deaths in HIV infected pregnant women complicated by tuberculosis and pneumonia) accounted for 34.7% of maternal deaths, a considerable decrease from 40.5% in 2008-2010. The iMMR for 2008-2010 was 71.29 per 100000 live births compared with 53.47 per 100000 live births in 2011-2013 (a 25% reduction in deaths).
- Maternal deaths due to obstetric haemorrhage and hypertension accounted for 30.4% of deaths (15.8% and 14.8% respectively). There has been a steady decline in maternal deaths due to complications of hypertension which have dropped 18% from 2002-2004 (from an iMMR of 27.72 to 22.75 per 100000 live births) but the deaths due obstetric haemorrhage have increased 24.7% from an iMMR of 19.51 per 100000 live births in 2002-2004 to an iMMR of 24.32 per 100000 live births in 2011-2013. In 2011-2013 a third of the maternal deaths due to obstetric haemorrhage were due to bleeding at or after caesarean section.
- There has been a significant reduction in deaths due to complications of antiretroviral therapy
- The top three causes of maternal death (non-pregnancy related infections, obstetric haemorrhage and hypertension) accounted for just more than two thirds of all maternal deaths.
- There has been a doubling of maternal deaths due to pre-existing medical and surgical conditions from 2002-2004 to 2011-2013. They now account for 11.4% of maternal deaths.
- Obesity conveys a significant risk of pulmonary embolism especially after caesarean section
- The iMMR causally related to mode of delivery was three times higher for operative delivery; 66.6 per 100000 live births for vaginal birth and 185.8 per 100000 live births for caesarean section.
- Deaths in private hospitals follow the same pattern as public hospitals, and the recommendations are as applicable to private institutions as public ones.
- Maternal deaths due to obstetric haemorrhage and hypertension were thought to be possibly and probably preventable in 89% and 67% of cases respectively.
- Maternal deaths due to non-pregnancy related infections, obstetric haemorrhage and hypertension were the three biggest contributors to preventable maternal deaths, accounting for 65% of avoidable deaths
- Poor clinical assessment, delays in referral, not following standard protocols and not responding to abnormalities in monitoring of patients were the most common health care provider avoidable factors.
- Lack of appropriately trained doctors and nurses was thought to be a significant contributory factor in 15.6% and 8.8% of assessable maternal deaths, up from 9.3% and 4.5% in 2008-2010 respectively. Lack of appropriately trained doctors and nurses was combined in 2002-2004 and was 8.9%. Lack of appropriately trained doctors was recorded as a significant factor in 47%, 27% 24% and 19% of maternal deaths due to anaesthesia, obstetric haemorrhage, pregnancy related sepsis and complications of hypertension.

Figure 1 shows the trends over 4 triennia of the underlying causes of maternal death.



Recommendations (What, how, who)

The NCEMD reviewed its recommendations of the Fifth Saving Mothers report covering 2008-2010 and decided the **5H** recommendations are still valid for 2014 onwards. Two of the 5H's (improve health worker training and strengthen the health system) comprise the three **Basic Building Blocks** of a health system namely:

- Knowledgeable and skilled health care workers
- Appropriately resourced health care facilities (including equipment and human resources)
- Rapid, reliable emergency transport system

These three key functions must be available to all pregnant women (including the less informed and most disadvantaged people). These building blocks are based on the highly successful Free State model which saw a 43% reduction in of maternal deaths in one year.

The other three H's are disease specific and are the leading factors in maternal deaths in South Africa namely; HIV and TB, hypertension and haemorrhage. The NCEMD has added new recommendations on how to achieve all the **5H's**, these are summarised as the **5C's**. The what, how and who are now specified. The **5 C's** give implementation strategies to move from the **2H's** (Basic Building Blocks of the health system) to achieve the **3H's** (reduction in maternal deaths due the HIV and TB, Haemorrhage and Hypertension).

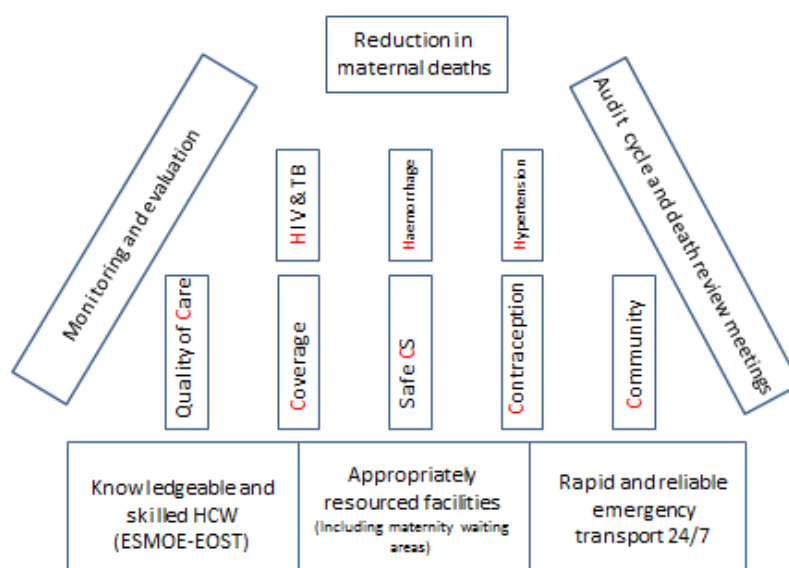
The **5C's** are shown in the table below.

How	Who
Care: Commitment to quality	<ul style="list-style-type: none"> • DCSTs and clinical heads of department to improve clinical governance, clinical supervision, response to local audit findings, and leadership functions • Managers to ensure emergency drills performed regularly • HCW to make themselves available for training and to participate in drills: behave in professional manner • Managers need to evaluate and accredit HCWs to ensure they have appropriate skills
Coverage	<ul style="list-style-type: none"> • District managers to ensure all effective interventions are implemented in maternity, especially for the poorest section of the population • EMS to ensure transport home to institution and between institutions • CEOs to include maternity waiting areas where appropriate • (MomConnect)
Caesarean section safety	<ul style="list-style-type: none"> • CEOs and district managers rationalise resources to ensure skills and facilities available 24/7 • HCW have skills to perform safe CS, including safe anaesthesia • DCSTs specific training package to be implemented
Contraception	<ul style="list-style-type: none"> • All HCW to motivate people to prevent unwanted pregnancies • Managers to ensure various modalities are always available • WBOTs to identify women requiring contraception, and refer • (MomConnect)
Community involvement	<ul style="list-style-type: none"> • Health facility management to engage with community health committees • WBOTs convey the essential maternity and baby care messages to all pregnant and postnatal women • (MomConnect)

DCSTs – District Clinical Specialist Teams; CEOs – Chief Executive Officers; WBOTs – Ward Based Outreach Teams; CS - Caesarean Section

The **What** consists of the **5H's** as shown below:

What	Priority activities to be implemented.
- Three Basic Building Blocks for the Health system	
Improve Health worker training	<ul style="list-style-type: none"> - Train all HCW involved in maternity care in the ESMOE-EOST programme and obstetric anaesthetic module, - Train all HCW HIV screening and treatment protocols
Strengthen Health system	<ul style="list-style-type: none"> - Ensure 24 hour access to functioning emergency obstetric care (both basic and comprehensive) - Promote where appropriate maternity waiting areas - Accessible and appropriate contraceptive services for all women
- Targeted activities	
Reduce deaths due to HIV and TB	<ul style="list-style-type: none"> - Promote preventive measures - Health care workers(HCW) actively screen for HIV co-infections and treat especially TB
Reduce deaths due to Haemorrhage	<ul style="list-style-type: none"> - Promote preventive interventions: - HCW involved in EOST exercises on haemorrhage
Reduce deaths due to Hypertension	<ul style="list-style-type: none"> - Promote preventative measures: e.g. calcium supplementation, - HCW involved in EOST exercises on haemorrhage



The above figure illustrates the recommendations.

Monitoring and evaluation

The effect of implementation of these recommendations can be **monitored and evaluated** by assessing the emergency obstetric care signal functions. This can be linked with the neonatal emergency care signal functions as some of the major neonatal emergency care signal functions occur in the antenatal period. This will promote the integration of maternal and neonatal services. Table 1 shows the obstetric and neonatal signal functions.

Table 1. Obstetric and neonatal signal functions.¹

Dimensions of Facility Care	Obstetric	Neonatal
General requirements for health facility		
	Service availability 24/7	
	Skilled providers in sufficient numbers	
	Referral service to higher-level care, communication tools	
	Reliable electricity and water supply, heating in cold climates, clean toilets	
A. Routine care (for all mothers and babies)		
	Monitoring and management of labour using partograph	Thermal protection
	Infection prevention measures (hand-washing, gloves)	Immediate and exclusive breastfeeding
	Active management of third stage of labour (AMTSL)	Infection prevention including hygienic cord care
	HIV and TB Screening and treatment	PMTCT if HIV-positive mother
B. Basic emergency care (for mothers and babies with complications)		
	Parenteral magnesium sulphate for (pre-) eclampsia	Antibiotics for preterm or prolonged PROM to prevent infection
	Assisted vaginal delivery	Corticosteroids in preterm labour
	Parenteral antibiotics for maternal infection	Resuscitation with bag and mask of non-breathing baby
	Parenteral oxytocic drugs for haemorrhage	KMC for premature/very small babies
	Manual removal of placenta for retained placenta	Alternative feeding if baby unable to breastfeed
	Removal of retained products of conception	Injectable antibiotics for neonatal sepsis
	ARVs for mother	
C. Comprehensive emergency care (functions in addition to Basic)		
	Surgery (e.g., C-section) including anaesthesia	Intravenous fluids
	Blood transfusion	Safe administration of oxygen

¹Adapted from Gabrysch S, Civitelli G, Edmond KM, Mathai M, Ali M, et al. (2012) New Signal Functions to Measure the Ability of Health Facilities to Provide Routine and Emergency Newborn Care. PLoS Med 9(11): e1001340.doi:10.1371/journal.pmed.1001340

Table 2. Deaths during pregnancy and puerperium, facility live births and iMMR per district, per year

	Deaths during pregnancy and puerperium				Facility live births (DHIS)				iMMR			
	2011	2012	2013	2011-2013	2011	2012	2013	2011-2013	2011	2012	2013	2011-2013
A Nzo (DC44)	16	5	15	36	22614	12724	12732	48070	70.75	39.30	117.81	74.89
Amathole combined*	45	42	42	129	26681	26884	26769	80334	168.66	156.23	156.90	160.58
C Hani (DC13)	18	21	22	61	13422	13168	12561	39151	134.11	159.48	175.15	155.81
Cacadu (DC10)	6	10	9	25	6308	6440	6424	19172	95.12	155.28	140.10	130.40
N Mandela (NMM)	27	25	25	77	21202	21095	20052	62349	127.35	118.51	124.68	123.50
O Tambo (DC15)	90	72	77	239	31521	32996	31547	96064	285.52	218.21	244.08	248.79
Joe Qabi - Ukhahlamba (DC14)	8	8	10	26	5724	5749	5700	17173	139.76	139.15	175.44	151.40
Eastern Cape	210	183	200	593	127472	119056	115785	362313	164.74	153.71	172.73	163.67
Fezile Dabi (DC20)	21	7	16	44	8245	8023	7694	23962	254.70	87.25	207.95	183.62
Lejweleputswa (DC18)	33	18	26	77	11239	10632	10022	31893	293.62	169.30	259.43	241.43
Mangaung - Motheo (DC17)	35	27	23	85	14556	14633	14319	43508	240.45	184.51	160.63	195.37
T Mofutsanyane (DC19)	34	20	20	74	14801	13885	12947	41633	229.71	144.04	154.48	177.74
Xhariep (DC16)	1	0	0	1	1393	1039	945	3377	71.79	0.00	0.00	29.61
Free State	124	72	85	281	50234	48212	45927	144373	246.84	149.34	185.08	194.63
Ekurhuleni	86	140	97	323	53132	59183	61327	173642	161.86	236.55	158.17	186.01
Johannesburg	84	70	54	208	67552	66803	65921	200276	124.35	104.79	81.92	103.86
Sedibeng (DC42)	19	42	24	85	14123	14927	14773	43823	134.53	281.37	162.46	193.96
Tshwane	59	74	50	183	47125	49615	50539	147279	125.20	149.15	98.93	124.25
West Rand (CBDC8)	22	13	15	50	15953	16602	16150	48705	137.91	78.30	92.88	102.66
Gauteng	270	339	240	849	197885	207130	208710	613725	136.44	163.67	114.99	138.34

* - Amathole district was split into Buffalo Bay Metropolitan area and Amathole district during the triennium. The database could not be changed during the triennium to accommodate this and Amathole is presented as both districts in this Facts Sheet.

	Deaths during pregnancy and puerperium				Facility live births (DHIS)				iMMR			
	2011	2012	2013	2011-2013	2011	2012	2013	2011-2013	2011	2012	2013	2011-2013
Amajuba (DC25)	14	7	11	32	8395	8874	9023	26292	166.77	78.88	121.91	121.71
eThekweni (Durban)	124	114	103	341	57242	58103	57220	172565	216.62	196.20	180.01	197.61
iLembe (DC29)	12	11	20	43	10265	10633	10553	31451	116.90	103.45	189.52	136.72
Sisonke (DC43)	13	14	11	38	8493	8583	8385	25461	153.07	163.11	131.19	149.25
Ugu (DC21)	22	20	23	65	11206	13423	13573	38202	196.32	149.00	169.45	170.15
uMgungundlovu (DC22)	49	59	29	137	16596	17031	16280	49907	295.25	346.43	178.13	274.51
Umkhanyakude (DC27)	10	10	3	23	13733	14430	14847	43010	72.82	69.30	20.21	53.48
Umzinyathi (DC24)	12	7	7	26	11262	11566	11209	34037	106.55	60.52	62.45	76.39
Uthukela (DC23)	17	23	16	56	12579	12583	12323	37485	135.15	182.79	129.84	149.39
Uthungulu (DC28)	58	53	33	144	18068	19949	20129	58146	321.01	265.68	163.94	247.65
Zululand (DC26)	29	8	22	59	14345	16377	16168	46890	202.16	48.85	136.07	125.83
KwaZulu-Natal	360	326	278	964	182184	191552	189710	563446	197.60	170.19	146.54	171.09
Capricorn (DC35)	98	75	116	289	27685	27867	27715	83267	353.98	269.14	418.55	347.08
Gr Sekhukhune (CBDC3)	42	47	40	129	27308	24909	25978	78195	153.80	188.69	153.98	164.97
Mopani (DC33)	40	50	35	125	24926	26792	26030	77748	160.48	186.62	134.46	160.78
Vhembe (DC34)	42	44	43	129	32221	32682	32777	97680	130.35	134.63	131.19	132.06
Waterberg (DC36)	27	29	22	78	14645	14766	14733	44144	184.36	196.40	149.32	176.69
Limpopo	249	245	256	750	126785	127016	127233	381034	196.40	192.89	201.21	196.83
Ehlanzeni DC32)	65	52	40	157	37143	38574	38537	114254	175.00	134.81	103.80	137.41
G Sibande (DC30)	43	37	30	110	17339	18045	17684	53068	248.00	205.04	169.64	207.28
Nkangala (DC31)	40	47	45	132	19619	20049	20317	59985	203.88	234.43	221.49	220.06
Mpumalanga	148	136	115	399	74098	76668	76538	227304	199.74	177.39	150.25	175.54
Bojanala Platinum (DC37)	38	42	33	113	19805	20462	21264	61531	191.87	205.26	155.19	183.65
K Kaunda Southern (DC40)	16	10	30	56	11905	12181	11764	35850	134.40	82.10	255.02	156.21
NM Molema Central (DC38)	34	31	26	91	16540	16257	15732	48529	205.56	190.69	165.27	187.52
R S Mompoti Bophirima (DC39)	11	13	8	32	8959	9353	8815	27127	122.78	138.99	90.75	117.96
North West	99	96	97	292	57209	58253	57575	173037	173.05	164.80	168.48	168.75

	Deaths during pregnancy and puerperium				Facility live births (DHIS)				iMMR			
	2011	2012	2013	2011-2013	2011	2012	2013	2011-2013	2011	2012	2013	2011-2013
Frances Baard (DC9)	20	18	21	59	8020	8344	8083	24447	249.38	215.72	259.80	241.34
JT Gaetsewe Kgalagadi (CBDC1)	7	11	6	24	4704	4586	4877	14167	148.81	239.86	123.03	169.41
Namakwa (DC6)	0	1	0	1	1488	1557	1628	4673	0.00	64.23	0.00	21.40
Pixley ka Seme (DC7)	5	2	2	9	2866	3079	3023	8968	174.46	64.96	66.16	100.36
Siyanda (DC8)	8	4	5	17	3581	4052	3864	11497	223.40	98.72	129.40	147.86
Northern Cape	40	36	34	110	20659	21618	21475	63752	193.62	166.53	158.32	172.54
Cape Town	46	58	60	164	65040	62548	62671	190259	70.73	92.73	95.74	86.20
Cape Winelands (DC2)	6	5	9	20	12435	11848	13356	37639	48.25	42.20	67.39	53.14
Central Karoo (DC5)	0	0	0	0	1175	1095	1078	3348	0.00	0.00	0.00	0.00
Eden (DC4)	7	6	4	17	8892	8357	9113	26362	78.72	71.80	43.89	64.49
Overberg (DC3)	0	1	2	3	3039	2891	2991	8921	0.00	34.59	66.87	33.63
West Coast (DC1)	1	5	4	10	5200	4938	4935	15073	19.23	101.26	81.05	66.34
Western Cape	60	75	79	214	95781	91677	94144	281602	62.64	81.81	83.91	75.99
South Africa	1560	1508	1384	4452	934318	941182	937097	2812597	166.97	160.22	147.69	158.29

Table 3. Underlying causes of maternal deaths per district for 2011-2013 (expressed as iMMR per cause)

Underlying causes	M&S	NPRI	Ec	Misc	HG	PRS	OH	HT	AR	Emb	AC	Unk	Total iMMR
Eastern Cape	20.98	54.92	1.66	2.48	0.00	7.73	24.29	29.26	4.14	3.31	3.86	6.90	159.53
Alfred Nzo	6.24	35.37	2.08	0.00	0.00	2.08	10.40	6.24	4.16	0.00	4.16	2.08	72.81
Amathole combined*	22.41	53.53	2.49	2.49	0.00	7.47	12.45	41.08	2.49	3.73	4.98	6.22	159.33
C Hani	20.43	35.76	2.55	5.11	0.00	7.66	30.65	22.99	12.77	2.55	0.00	12.77	153.25
Cacadu	26.08	52.16	5.22	0.00	0.00	0.00	20.86	10.43	10.43	0.00	0.00	5.22	130.40
NM Metro	17.64	49.72	0.00	1.60	0.00	1.60	19.25	14.43	0.00	8.02	4.81	6.42	123.50
OR Tambo	31.23	80.15	1.04	4.16	0.00	16.66	39.56	47.88	3.12	2.08	3.12	7.29	236.30
Ukhahlamba/ Joe Qwabe	5.82	40.76	0.00	0.00	0.00	5.82	40.76	23.29	5.82	5.82	11.65	11.65	151.40
Free State	27.71	58.88	4.85	6.23	1.39	6.23	23.55	33.25	2.77	8.31	4.85	8.31	186.32
Fezile Dabe	33.39	37.56	8.35	8.35	4.17	8.35	20.87	25.04	4.17	12.52	0.00	8.35	171.10
Lejwelseputsjwa	28.22	81.52	9.41	3.14	0.00	6.27	34.49	40.76	3.14	12.54	6.27	6.27	232.03
Mangaung	34.48	73.55	0.00	11.49	2.30	0.00	6.90	43.67	2.30	2.30	6.90	2.30	186.17
T Mofutsanyane	19.22	43.23	4.80	2.40	0.00	12.01	36.03	24.02	2.40	9.61	4.80	14.41	172.94
Xhariep	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	29.61	29.61
Gauteng	16.29	44.97	3.91	8.47	0.00	4.89	24.12	18.90	1.47	3.75	6.03	2.44	135.24
Ekhuruleni	12.67	70.84	8.06	18.43	0.00	7.49	28.22	19.00	1.73	2.88	7.49	2.30	179.10
Johannesburg	18.97	32.46	2.50	4.49	0.00	3.50	14.48	17.98	1.50	2.00	3.50	1.50	102.86
Sedibeng	15.97	70.74	0.00	6.85	0.00	11.41	47.92	18.26	0.00	6.85	13.69	2.28	193.96
Tshwane	21.05	29.20	2.72	4.07	0.00	2.72	23.09	22.41	1.36	6.79	4.07	4.75	122.22
West Rand	4.11	26.69	2.05	4.11	0.00	2.05	30.80	12.32	2.05	2.05	10.27	0.00	96.50

* - Amathole district was split into Buffalo Bay Metropolitan area and Amathole district during the triennium. The database could not be changed during the triennium to accommodate this and Amathole is presented as both districts in this Facts Sheet.

Underlying causes	M&S	NPRI	Ec	Misc	HG	PRS	OH	HT	AR	Emb	AC	Unk	Total iMMR
KwaZul-Natal	20.23	71.70	3.73	9.41	0.35	8.87	21.65	14.02	3.73	1.95	3.19	9.76	168.61
Amajuba	3.80	57.05	0.00	0.00	0.00	11.41	19.02	11.41	3.80	3.80	0.00	7.61	117.91
eThekweni	31.87	90.98	2.32	11.01	0.00	12.75	13.91	11.59	4.06	2.32	6.37	7.53	194.71
Ilembe	12.72	47.69	9.54	0.00	0.00	9.54	19.08	9.54	19.08	0.00	0.00	3.18	130.36
Sisonke	15.71	47.13	3.93	11.78	0.00	3.93	27.49	15.71	0.00	0.00	0.00	23.57	149.25
Ugu	13.09	60.21	2.62	7.85	2.62	10.47	20.94	26.18	5.24	0.00	5.24	13.09	167.53
UmGungunglovu	40.07	130.24	2.00	26.05	0.00	6.01	22.04	30.06	4.01	0.00	0.00	10.02	270.50
Umkanyakude	6.98	20.93	2.33	0.00	0.00	4.65	9.30	0.00	0.00	0.00	0.00	9.30	53.48
Umkhanyakude	2.94	35.26	0.00	2.94	0.00	0.00	8.81	5.88	2.94	5.88	0.00	11.75	76.39
Uthukela	18.67	53.35	0.00	5.34	0.00	10.67	29.35	10.67	0.00	2.67	2.67	13.34	146.73
Uthungulu	15.48	96.31	13.76	15.48	1.72	10.32	43.00	25.80	3.44	1.72	3.44	13.76	244.21
Zululand	10.66	42.65	4.27	6.40	0.00	4.27	38.39	6.40	0.00	4.27	4.27	4.27	125.83
Limpopo	17.32	59.84	6.30	8.40	0.26	10.24	33.59	31.23	8.92	2.10	2.89	9.97	191.06
Capricorn	38.43	97.28	4.80	16.81	0.00	21.62	63.65	73.26	7.21	1.20	3.60	8.41	336.27
Gr Sekekhune	12.79	48.60	6.39	5.12	0.00	7.67	26.86	26.86	10.23	1.28	3.84	12.79	162.41
Mopani	10.29	54.02	3.86	9.00	0.00	5.14	34.73	18.01	7.72	2.57	2.57	6.43	154.34
Vhembe	11.26	41.97	7.17	4.10	1.02	6.14	19.45	8.19	10.24	3.07	2.05	14.33	128.99
Waterberg	11.33	58.90	11.33	6.80	0.00	11.33	18.12	33.98	9.06	2.27	2.27	4.53	169.90
Mpumalanga	8.80	55.43	5.72	6.60	0.00	12.76	33.00	30.80	7.92	4.40	1.32	6.16	172.90
Ehlanzeni	5.25	43.76	1.75	7.00	0.00	14.88	23.63	24.51	7.00	4.38	0.00	5.25	137.41
G Sibande	11.31	75.37	11.31	1.88	0.00	9.42	37.69	26.38	7.54	7.54	1.88	13.19	203.51
Nkangala	13.34	60.02	8.34	10.00	0.00	11.67	46.68	46.68	10.00	1.67	3.33	1.67	213.39
North West	13.87	49.70	2.89	5.20	0.00	11.56	35.83	30.05	1.73	4.05	4.62	6.93	166.44
Bojanala Platinum (DC 37)	17.88	48.76	6.50	8.13	0.00	16.25	26.00	32.50	3.25	3.25	4.88	13.00	180.40
K Kaunda DC 40	5.58	41.84	0.00	11.16	0.00	16.74	44.63	27.89	0.00	2.79	2.79	0.00	153.42
NM Molema (DC38)	18.55	65.94	0.00	0.00	0.00	8.24	39.15	39.15	0.00	6.18	2.06	6.18	185.46
RS Mompoti (DC 39)	7.37	33.18	3.69	0.00	0.00	0.00	40.55	11.06	3.69	3.69	11.06	3.69	117.96

Underlying causes	M&S	NPRI	Ec	Misc	HG	PRS	OH	HT	AR	Emb	AC	Unk	Total iMMR
Northern Cape	21.96	51.76	1.57	1.57	0.00	7.84	20.39	21.96	0.00	14.12	1.57	9.41	152.15
Francis Baard	28.63	94.08	0.00	0.00	0.00	16.36	16.36	40.90	0.00	12.27	4.09	8.18	220.89
JT Gaetsewe Kgalagadi	28.23	28.23	7.06	7.06	0.00	0.00	35.29	0.00	0.00	21.18	0.00	14.12	141.17
Namakwa	0.00	0.00	0.00	0.00	0.00	0.00	21.40	0.00	0.00	0.00	0.00	0.00	21.40
Pixley ka Seme	0.00	33.45	0.00	0.00	0.00	0.00	11.15	22.30	0.00	11.15	0.00	0.00	78.06
Siyande	26.09	26.09	0.00	0.00	0.00	8.70	17.40	17.40	0.00	17.40	0.00	17.40	130.47
Western Cape	13.85	23.79	0.36	1.78	0.00	5.68	4.97	12.78	0.36	3.55	2.49	1.42	71.02
Cape Town	16.82	27.86	0.00	2.10	0.00	7.36	5.26	14.19	0.00	3.15	2.10	2.10	80.94
Cape Winelands	7.97	13.28	2.66	0.00	0.00	0.00	2.66	5.31	0.00	7.97	5.31	0.00	45.17
Central Karoo	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Eden	11.38	15.17	0.00	3.79	0.00	3.79	7.59	15.17	3.79	0.00	3.79	0.00	64.49
Overberg	0.00	11.21	0.00	0.00	0.00	0.00	0.00	22.42	0.00	0.00	0.00	0.00	33.63
West Coast	6.63	26.54	0.00	0.00	0.00	6.63	6.63	6.63	0.00	6.63	0.00	0.00	59.71
South Africa	17.53	53.47	3.63	6.58	0.18	8.04	24.32	22.75	3.73	3.63	3.77	6.44	154.06

M&S – pre-existing medical and surgical conditions; NPRI – non-pregnancy related infections; Ec – Ectopic pregnancies; Misc – miscarriage; HG – Hyperemesis gravidarum; PRS – pregnancy related sepsis; OH – Obstetric Haemorrhage; HT – Hypertension; AR – anaesthetic related complications; Emb – embolism; AC – acute collapse; Unk – unknown

Table 4. Distribution of districts and provinces with respect to iMMR for the underlying cause

District	NPRI	District	OH	District	HT	District	AR
UmGungunglovu	130.24	Capricorn	63.65	Capricorn	73.26	Ilembe	19.08
Capricorn	97.28	Sedibeng	47.92	OR Tambo	47.88	C Hani	12.77
Uthungulu	96.31	Nkangala	46.68	Nkangala	46.68	Cacadu	10.43
Francis Baard	94.08	K Kaunda DC 40	44.63	Mangaung	43.67	Vhembe	10.24
eThekweni	90.98	Uthungulu	43.00	Amathole	41.08	Gr Sekekhune	10.23
Lejwelseputsjwa	81.52	Ukhahlamba	40.76	Francis Baard	40.90	Nkangala	10.00
OR Tambo	80.15	RS Mompoti (DC 39)	40.55	Lejwelseputsjwa	40.76	Waterberg	9.06
G Sibande	75.37	OR Tambo	39.56	NM Molema (DC38)	39.15	iMMR Limpopo	8.92
Mangaung	73.55	NM Molema (DC38)	39.15	Waterberg	33.98	iMMR Mpumalanga	7.92
iMMR KZN	71.70	Zululand	38.39	iMMR Free State	33.25	Mopani	7.72
Ekhuruleni	70.84	G Sibande	37.69	Bojanala Platinum (DC 37)	32.50	G Sibande	7.54
Sedibeng	70.74	T Mofutsanyane	36.03	iMMR Limpopo	31.23	Capricorn	7.21
NM Molema (DC38)	65.94	iMMR North West	35.83	iMMR Mpumalanga	30.80	Ehlanzeni	7.00
Ugu	60.21	JT Gaetsewe Kgalagadi (CBDC1)	35.29	UmGungunglovu	30.06	Ukhahlamba	5.82
Nkangala	60.02	Mopani	34.73	iMMR North West	30.05	Ugu	5.24
iMMR Limpopo	59.84	Lejwelseputsjwa	34.49	iMMR Eastern Cape	29.26	Fezile Dabe	4.17
Waterberg	58.90	iMMR Limpopo	33.59	K Kaunda DC 40	27.89	Alfred Nzo	4.16
iMMR Free State	58.88	iMMR Mpumalanga	33.00	Gr Sekekhune	26.86	iMMR Eastern Cape	4.14
Amajuba	57.05	West Rand	30.80	G Sibande	26.38	eThekweni	4.06
iMMR Mpumalanga	55.43	C Hani	30.65	Ugu	26.18	UmGungunglovu	4.01
iMMR Eastern Cape	54.92	Uthukela	29.35	Uthungulu	25.80	Amajuba	3.80
Mopani	54.02	Ekhuruleni	28.22	Fezile Dabe	25.04	Eden	3.79
Amathole	53.53	Sisonke	27.49	Ehlanzeni	24.51	South Africa	3.73
South Africa	53.47	Gr Sekekhune	26.86	T Mofutsanyane	24.02	iMMR KwaZulu-Natal	3.73
Uthukela	53.35	Bojanala Platinum (DC 37)	26.00	Ukhahlamba	23.29	RS Mompoti (DC 39)	3.69
Cacadu	52.16	South Africa	24.32	C Hani	22.99	Uthungulu	3.44
iMMR Northern Cape	51.76	iMMR Eastern Cape	24.29	South Africa	22.75	Bojanala Platinum (DC 37)	3.25
NM Metro	49.72	iMMR Gauteng	24.12	Overberg	22.42	Lejwelseputsjwa	3.14
iMMR North West	49.70	Ehlanzeni	23.63	Tshwane	22.41	OR Tambo	3.12
Bojanala Platinum (DC 37)	48.76	iMMR Free State	23.55	Pixley ka Seme	22.30	Umzinyathi	2.94
Gr Sekekhune	48.60	Tshwane	23.09	iMMR Northern Cape	21.96	iMMR Free State	2.77
Ilembe	47.69	UmGungunglovu	22.04	Ekhuruleni	19.00	Amathole	2.49
Sisonke	47.13	iMMR KwaZulu-Natal	21.65	iMMR Gauteng	18.90	T Mofutsanyane	2.40
iMMR Gauteng	44.97	Namakwa	21.40	Sedibeng	18.26	Mangaung	2.30
Ehlanzeni	43.76	Ugu	20.94	Mopani	18.01	West Rand	2.05

District	NPRI	District	OH	District	HT	District	AR
T Mofutsanyane	43.23	Fezile Dabe	20.87	Johannesburg	17.98	iMMR North West	1.73
Zululand	42.65	Cacadu	20.86	Siyande	17.40	Ekhuruleni	1.73
Vhembe	41.97	iMMR Northern Cape	20.39	Sisonke	15.71	Johannesburg	1.50
K Kaunda DC 40	41.84	Vhembe	19.45	Eden	15.17	iMMR Gauteng	1.47
Ukhahlamba	40.76	NM Metro	19.25	NM Metro	14.43	Tshwane	1.36
Fezile Dabe	37.56	Ilembe	19.08	Cape Town	14.19	iMMR Western Cape	0.36
C Hani	35.76	Amajuba	19.02	iMMR KwaZulu-Natal	14.02	NM Metro	0.00
Alfred Nzo	35.37	Waterberg	18.12	iMMR Western Cape	12.78	Xhariep	0.00
Umzinyathi	35.26	Siyande	17.40	West Rand	12.32	Sedibeng	0.00
Pixley ka Seme	33.45	Francis Baard	16.36	eThekweni	11.59	Sisonke	0.00
RS Mompoti (DC 39)	33.18	Johannesburg	14.48	Amajuba	11.41	Umkanyakude	0.00
Johannesburg	32.46	eThekweni	13.91	RS Mompoti (DC 39)	11.06	Uthukela	0.00
Tshwane	29.20	Amathole	12.45	Uthukela	10.67	Zululand	0.00
JT Gaetsewe Kgalagadi (CBDC1)	28.23	Pixley ka Seme	11.15	Cacadu	10.43	K Kaunda DC 40	0.00
Cape Town	27.86	Alfred Nzo	10.40	Ilembe	9.54	NM Molema (DC38)	0.00
West Rand	26.69	Umkanyakude	9.30	Vhembe	8.19	iMMR Northern Cape	0.00
West Coast	26.54	Umzinyathi	8.81	West Coast	6.63	Francis Baard	0.00
Siyande	26.09	Eden	7.59	Zululand	6.40	JT Gaetsewe Kgalagadi (CBDC1)	0.00
iMMR Western Cape	23.79	Mangaung	6.90	Alfred Nzo	6.24	Namakwa	0.00
Umkanyakude	20.93	West Coast	6.63	Umzinyathi	5.88	Pixley ka Seme	0.00
Eden	15.17	Cape Town	5.26	Cape Winelands	5.31	Siyande	0.00
Cape Winelands	13.28	iMMR Western Cape	4.97	Xhariep	0.00	Cape Town	0.00
Overberg	11.21	Cape Winelands	2.66	Umkanyakude	0.00	Cape Winelands	0.00
Xhariep	0.00	Xhariep	0.00	JT Gaetsewe Kgalagadi (CBDC1)	0.00	Central Karoo	0.00
Namakwa	0.00	Central Karoo	0.00	Namakwa	0.00	Overberg	0.00
Central Karoo	0.00	Overberg	0.00	Central Karoo	0.00	West Coast	0.00

Table 5. Comparison of the iMMR per district between 2008-2010 and 2011-2013

Districts	2008-2010	Districts	2011-2013
Frances Baard DM	325.92	Capricorn	336.27
Lejweleputswa DM	314.64	UmGungunglovu	270.50
Bojanala Platinum DM	310.79	Uthungulu	244.21
T Mofutsanyane DM	301.18	OR Tambo	236.30
Ugu DM	299.45	Lejwelseputsjwa	232.03
Xhariep DM	284.02	Francis Baard	220.89
Fezile Dabi DM	282.79	Nkangala	213.39
Motheo DM	281.35	G Sibande	203.51
J T Gaetsewe DM	276.50	eThekwini	194.71
Capricorn DM	275.86	Sedibeng	193.96
O Tambo DM	272.77	Mangaung	186.17
Uthungulu DM	266.62	NM Molema (DC38)	185.46
Pixley ka Seme DM	260.22	Bojanala Platinum (DC 37)	180.40
uMgungundlovu DM	229.20	Ekhuruleni	179.10
G Sibande DM	223.82	T Mofutsanyane	172.94
Uthukela DM	221.58	Fezile Dabe	171.10
A Nzo DM	220.56	Waterberg	169.90
eThekwini MM	217.25	Ugu	167.53
Amathole DM	211.98	Gr Sekekhune	162.41
Siyanda DM	206.75	Amathole	159.33
Ngaka Modiri Molema DM	196.25	Mopani	154.34
Ekurhuleni MM	192.28	South Africa (2011-2013)	154.06
Waterberg DM	191.85	K Kaunda DC 40	153.42
Central Karoo DM	184.62	C Hani	153.25
Dr K Kaunda DM	184.16	Ukhahlamba	151.40
iLembe DM	180.91	Sisonke	149.25
South Africa (2008-2010)	179.47	Uthukela	146.73
Gr Sekhukhune DM	175.85	JT Gaetsewe Kgalagadi (CBDC1)	141.17
Ehlanzeni DM	174.15	Ehlanzeni	137.41
Nkangala DM	172.32	Siyande	130.47
N Mandela MM	162.91	Cacadu	130.40
Sedibeng DM	156.30	Ilembe	130.36
Ukhahlamba DM	155.84	Vhembe	128.99
Zululand DM	150.11	Zululand	125.83
Ruth Segomotsi Mompati DM	149.46	NM Metro	123.50
Mopani DM	147.89	Tshwane	122.22
Amajuba DM	139.85	RS Mompati (DC 39)	117.96
Johannesburg MM	136.01	Amajuba	117.91
Tshwane MM	133.70	Johannesburg	102.86
West Rand DM	125.40	West Rand	96.50
Umzinyathi DM	113.59	Cape Town	80.94
Eden DM	109.02	Pixley ka Seme	78.06
C Hani DM	101.90	Umzinyathi	76.39
Cape Town MM	95.01	Alfred Nzo	72.81
Umkhanyakude DM	91.30	Eden	64.49
Vhembe DM	71.84	West Coast	59.71
Namakwa DM	60.77	Umkanyakude	53.48
Cacadu DM	59.38	Cape Winelands	45.17
Overberg DM	53.74	Overberg	33.63
Cape Winelands DM	53.65	Xhariep	29.61
West Coast DM	51.56	Namakwa	21.40
Sisonke DM	40.73	Central Karoo	0.00

Table 6. Percent change between 2008-10 and 2011-13

District	% difference 2008-10 and 2011-13
Sisonke	266.4
Cacadu	119.6
Vhembe	79.6
C Hani	50.4
Sedibeng	24.1
Nkangala	23.8
Capricorn	21.9
UmGungunglovu	18.0
West Coast	15.8
Mopani	4.4
Ukhahlamba	-2.8
NM Molema (DC38)	-5.5
Ekhuruleni	-6.9
Gr Sekekhune	-7.6
Uthungulu	-8.4
Tshwane	-8.6
G Sibande	-9.1
eThekweni	-10.4
Waterberg	-11.4
OR Tambo	-13.4
South Africa	-14.2
Cape Town	-14.8
Amajuba	-15.7
Cape Winelands	-15.8
Zululand	-16.2
K Kaunda DC 40	-16.7
RS Mompoti (DC 39)	-21.1
Ehlanzeni	-21.1
West Rand	-23.0
NM Metro	-24.2
Johannesburg	-24.4
Amathole	-24.8
Lejwelseputsjwa	-26.3
Ilembe	-27.9
Francis Baard	-32.2
Umzinyathi	-32.8
Uthukela	-33.8
Mangaung	-33.8
Siyande	-36.9
Overberg	-37.4
Fezile Dabe	-39.5
Eden	-40.9
Umkanyakude	-41.4
Bojanala Platinum (DC 37)	-42.0
T Mofutsanyane	-42.6
Ugu	-44.1
JT Gaetsewe Kgalagadi (CBDC1)	-48.9
Namakwa	-64.8
Alfred Nzo	-67.0
Pixley ka Seme	-70.0
Xhariep	-89.6
Central Karoo	-100.0

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