Table S1: Study characteristics [N=60]

Study	Country (Study Period)	Setting	Study Design	No. Deaths	No. Near Miss	No. Deliveries	No. Live Births	% Near Miss	Near Miss/ Mortality Rate
Brown 2011	USA (1994-2005)	Teaching hospital	Cross-sectional retrospective	5	612	12774	--	4.79	122.40
Cecatti 2011	Brazil (2002-2007)	Tertiary care hospital	Cross-sectional retrospective	18	194	--	14413	1.35	10.78
Jayaratnam 2011	New Zealand (2009-2010)	Referral hospital	Cross-sectional prospective	--	17	--	2833	0.60	--
Morse 2011	Brazil (2009)	Tertiary care hospital	Cross-sectional prospective	3	10	--	1069	0.94	3.33
Jabir 2013	Iraq (2010)	Various public hospitals (municipal)	Cross-sectional prospective	16	129	--	25472	0.51	8.06
Lobato 2013	Brazil (2008)	Maternity hospital	Cross-sectional retrospective	8	27	--	812	3.33	3.38
Nelissen 2013	Tanzania (2009-2011)	Referral hospital	Cross-sectional prospective	32	216	9471	--	2.28	6.75
Oliveira 2013	Brazil (2007-2010)	Tertiary care Hospital	Cross-sectional retrospective	--	255	--	19940	1.28	--
Ps 2013	India (2011-2012)	Tertiary care hospital	Cross-sectional prospective	23	131	7390	--	1.77	5.70
Rana 2013	Nepal (2012)	Various tertiary care hospitals (municipal)	Cross-sectional prospective	26	157	--	41676	0.38	6.04

Table S1: Study characteristics [N=60]

Study	Country (Study Period)	Setting	Study Design	No. Deaths	No. Near Miss	No. Deliveries	No. Live Births	% Near Miss	Near Miss/ Mortality Rate
Shen 2013	China (2008-2012)	Teaching hospital	Cross-sectional retrospective	3	69	--	18104	0.38	23.00
Souza 2013	(2010-2011)	Various hospitals (national)	Cross-sectional prospective						
	Afghanistan			19	421	--	25227	1.67	22.16
	Angola			35	57	--	9966	0.57	1.63
	Argentina			9	51	--	9729	0.52	5.67
	Brazil			1	17	--	7019	0.24	17.00
	Cambodia			5	59	--	4635	1.27	11.80
	China			0	34	--	13242	0.26	--
	Democratic Republic of the Congo			27	88	--	8395	1.05	3.26
	Ecuador			9	30	--	10108	0.30	3.33
	India			109	174	--	30094	0.58	1.60
	Japan			0	21	--	3527	0.60	--
	Jordan			0	5	--	1158	0.43	--
	Kenya			55	77	--	19658	0.39	1.40
	Lebanon			2	18	--	4008	0.45	9.00
	Mexico			4	153	--	13167	1.16	38.25
	Mongolia			1	61	--	7303	0.84	61.00
	Nepal			8	65	--	10999	0.59	8.13
	Nicaragua			6	119	--	6426	1.85	19.83
	Nigeria			73	298	--	11775	2.53	4.08

Table S1: Study characteristics [N=60]

Study	Country (Study Period)	Setting	Study Design	No. Deaths	No. Near Miss	No. Deliveries	No. Live Births	% Near Miss	Near Miss/ Mortality Rate
	Occupied Palestinian Territory			0	3	--	975	0.31	--
	Pakistan			38	94	--	12729	0.74	2.47
	Paraguay			3	8	--	3595	0.22	2.67
	Peru			6	169	--	15021	1.13	28.17
	Philippines			12	29	--	10609	0.27	2.42
	Qatar			0	14	--	3932	0.36	--
	Sri Lanka			3	73	--	17988	0.41	24.33
	Thailand			2	51	--	8894	0.57	25.50
	Uganda			32	120	--	10467	1.15	3.75
	Viet Nam			0	33	--	15411	0.21	--
Abalos 2014	Argentina (2012)	Various hospitals (regional)	Cross-sectional	7	28	--	6024	0.46	4
Aziz 2014	India (2011-2012)	Referral hospital	Prospective observational	6	103	--	13219	0.77	17.17
Bastos Dias 2014	Brazil (2011-2012)	Various hospitals (national)	Cross-sectional	684	23747	--	2325394	1.02	34.72
Galvão 2014	Brazil (2011-2012)	Various hospitals (regional)	Cross-sectional	17	77	--	16243	0.47	4.53
Litorp 2014	Tanzania (2012)	Various hospitals (regional)	Cross-sectional	77	467	--	13121	3.55	6.06

Table S1: Study characteristics [N=60]

Study	Country (Study Period)	Setting	Study Design	No. Deaths	No. Near Miss	No. Deliveries	No. Live Births	% Near Miss	Near Miss/ Mortality Rate
Luexay 2014	Laos (2011)	Various hospitals (regional)	Prospective descriptive	2	11	--	1123	0.98	5.5
Pandey 2014	India (2011-2012)	University hospital	Retrospective	247	633	--	5273	12.0	2.56
Tunçalp 2014	Ghana (2010-2011)	Tertiary care hospital	Prospective cohort	37	94	--	3206	2.93	2.54
Bashour 2015	(2012-2013)	Various hospitals (national)	Cross-sectional						
	Egypt			3	32	--	2641	1.21	11.83
	Lebanon			0	5	--	1171	0.43	--
	Palestine			0	16	--	1244	1.29	--
	Syria			3	18	--	4007	0.45	6.00
Cecatti 2016	Brazil (2009-2010)	Various hospitals (national)	Cross-sectional prospective	140	770	--	82144	0.94	5.50
Karolinski 2015	Argentina (2013-2014)	Various hospitals (national)	Prevalence	8	67	--	9921	0.68	8.38
Kulkarni 2015	India (2012-2013)	Tertiary hospitals (regional)	Prospective observational	94	668	--	14508	4.60	7.11
Madeiro 2015	Brazil (2012-2013)	Tertiary hospital (regional)	Transversal	10	56	--	5841	0.96	5.60
Menezes 2015	Brazil (2011-2012)	Reference hospitals (regional)	Cross-sectional prospective	17	77	--	16243	0.47	4.53

Table S1: Study characteristics [N=60]

Study	Country (Study Period)	Setting	Study Design	No. Deaths	No. Near Miss	No. Deliveries	No. Live Births	% Near Miss	Near Miss/ Mortality Rate
Naderi 2015	Iran (2013)	Various hospitals (regional)	Prospective	2	501	--	19908	2.52	250.50
Oladapo 2015	Nigeria (2012-2013)	Various hospitals (national)	Cross-sectional prospective	998	1451	--	91724	1.58	1.45
Rulisa 2015	Rwanda (2011-2012)	Teaching tertiary hospital	Cross-sectional prospective	50	142	--	1739	8.17	2.84
Shahid 2015	Pakistan (2014)	Tertiary hospital (regional)	Retrospective	7	124	--	2371	5.23	17.71
Soma-Pillay 2015	South Africa (2013-2014)	Various hospitals (regional)	Descriptive population- based	19	117	26614	--	0.44	6.16
Abha 2016	India (2013-2015)	University hospital	Prospective observational	102	211	--	13895	1.52	2.07
De Mucio 2016	(2013)	Various hospitals (national)	Cross-sectional prospective						
	Argentina			0	2	--	762	0.26	--
	Colombia			0	3	--	334	0.90	--
	Dominican Republic			0	3	--	133	2.26	--
	Ecuador			0	2	--	228	0.88	--

Table S1: Study characteristics [N=60]

Study	Country (Study Period)	Setting	Study Design	No. Deaths	No. Near Miss	No. Deliveries	No. Live Births	% Near Miss	Near Miss/ Mortality Rate
	Honduras			1	10	--	613	1.63	10.00
	Nicaragua			0	4	--	477	0.84	--
	Paraguay			1	2	--	334	0.60	2.00
	Peru			0	11	--	315	3.49	--
El Ghardallou 2016	Tunisia (2012)	Tertiary care hospital	Cross-sectional retrospective	1	58	--	9890	0.59	58.00
Ghazivakili 2016	Iran (2012)	Various hospitals (regional)	Cross-sectional prospective	7	192	--	38663	0.50	27.43
Jayaratnam 2016	Australia (2014-2015)	Tertiary teaching hospital	Prospective observational	1	10	--	2080	0.48	10.00
Kalisa 2016	Rwanda (2013-2014)	Provincial referral hospital	Prospective cohort	13	86	--	3994	2.15	6.62
Nakimuli 2016	Uganda (2013-2014)	Referral hospitals (national)	Prospective cohort	130	695	--	25840	2.69	5.35
Nanda 2016	India (2012-2014)	Tertiary hospitals (national)	Prospective observational	60	184	--	13851	1.33	3.07

Table S1: Study characteristics [N=60]

Study	Country (Study Period)	Setting	Study Design	No. Deaths	No. Near Miss	No. Deliveries	No. Live Births	% Near Miss	Near Miss/ Mortality Rate
Norhayati 2016	Malaysia (2014)	Tertiary hospitals (national)	Cross-sectional prospective	2	47	21579	--	0.22	23.50
Parmar 2016	India (2012)	Tertiary care hospital	Cross-sectional prospective	18	40	--	1929	2.07	2.22
Rathod 2016	India (2011-2013)	Tertiary care hospital	Cohort retrospective	66	161	--	22092	0.73	2.44
Tanimia 2016	Papua New Guinea (2012-2013)	Teaching hospital	Prospective observational	9	122	--	13338	0.91	13.56
Akrawi 2017	Iraq (2013)	Tertiary care hospital	Cross-sectional prospective	11	142	--	17353	0.82	12.91
Bolnga 2017	Papua New Guinea (2014-2016	Provincial hospital	Prospective observational study	10	153	--	6019	2.54	15.30
Herklots 2017	Tanzania (2016)	Tertiary care hospital	Cross-sectional prospective	28	37	--	4125	0.90	1.32
Liyew 2017	Ethiopia (2015-2016)	Various hospitals (regional)	Cross-sectional prospective	--	238	29697	--	0.80	--

Table S1: Study characteristics [N=60]

Study	Country (Study Period)	Setting	Study Design	No. Deaths	No. Near Miss	No. Deliveries	No. Live Births	% Near Miss	Near Miss/ Mortality Rate
Mbachu 2017	Nigeria (2014-2015)	Referral hospital	Cross-sectional prospective	5	52	262	--	19.85	10.40
Serruya 2017	Multicountry (2009-2012)	Various hospitals (national)	Cross-sectional retrospective	1028	21985	697820	--	3.15	21.39
Chikadaya 2018	Zimbabwe	Various hospitals (regional)	Prospective descriptive	13	110	11871	--	0.92	8.46
Esparza-Valencia 2018	Mexico (2016)	Secondary care hospital	Cross sectional Retrospective	5	362	--	4691	7.72	72.4
Iwuh 2018	South Africa (2014)	Various hospitals (regional)	Retrospective observational	13	112	19222	--	0.58	8.62
Jayaratnam 2018	Australia	University hospital	Prospective observational	0	19	--	2773	0.69	--
Rana 2018	Nepal (2015)	Various hospitals (regional)	Mixed methods	1	21	--	1386	1.52	21
Reena 2018	India	University hospital	Cross-sectional	5	32	--	3451	0.92	6.4
Schwenck 2018	Brazil (2017-2018)	High-risk maternity	Cross-sectional prospective	4	51	--	1493	3.42	12.75
Sheriar 2018	India	Tertiary care hospital	Prospective observational	15	250	--	8070	3.09	16.67

Table S1: Study characteristics [N=60]

Study	Country (Study Period)	Setting	Study Design	No. Deaths	No. Near Miss	No. Deliveries	No. Live Births	% Near Miss	Near Miss/ Mortality Rate
Tura 2018	Ethiopia (2016-2017)	Referral hospital	Prospective cohort	26	128	--	7404	1.73	4.92
Verschueren 2018	Suriname (2017)	Various hospitals (national)	Prospective cohort	4	32	--	3330	0.96	8
Woldeyes 2018	Ethiopia	Referral hospital	Prospective cross-sectional	24	138	--	2737	5.04	5.75

Table S2: Quality assessment [N=60 studies]

STUDY NAME	FIRST AUTHOR/ YEAR	Was the research question or objective in this paper clearly stated?	Was the study population clearly specified and defined?	Was the participation rate of eligible persons at least 50%?	Were all the subjects selected or recruited from the same or similar populations (including the same time period)?	Were inclusion and exclusion criteria for being in the study prespecified and applied uniformly to all participants?	Was a sample size justification, power description, or variance and effect estimates provided?	Quality Rating (Good, Fair, or Poor)
Near miss maternal mortality in a multiethnic population	Brown 2011	Yes	Yes	Yes	Yes	Yes	Not Reported	Good
Pre-validation of the WHO organ dysfunction based criteria for identification of maternal near miss	Cecatti 2011	Yes	Yes	Yes	Yes	Yes	Not Reported	Good
Developing an assessment tool for maternal morbidity 'near-miss'- a prospective study in a large Australian regional hospital	Jayaratnam 2011	Yes	Yes	Yes	Yes	Yes	Not Reported	Good
Severe maternal morbidity and near misses in a regional reference hospital.	Morse 2011	Yes	Yes	Yes	Yes	Yes	Not Reported	Good
Severe acute maternal morbidity: use of the Brazilian Hospital Information System.	Magalhaes 2012	Yes	Yes	Yes	Yes	Yes	Not Reported	Good
Maternal near miss and quality of maternal health care in Baghdad, Iraq.	Jabir 2013	Yes	Yes	Yes	Yes	Yes	Not Reported	Good
Comparing different diagnostic approaches to severe maternal morbidity and near-miss: a pilot study in a Brazilian tertiary hospital.	Lobato 2013	Yes	Yes	Yes	Yes	Yes	Not Reported	Good
Maternal near miss and mortality in a rural referral hospital in Northern Tanzania: a cross-sectional study.	Nelissen 2013	Yes	Yes	Yes	Yes	Yes	Not Reported	Good
Fetal and neonatal deaths among cases of maternal near miss	Oliveira 2013	Yes	Yes	Yes	Yes	Yes	Yes	Good

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Near miss" obstetric events and maternal deaths in a tertiary care hospital: an audit.	Ps 2013	Yes	Yes	Yes	Yes	Yes	Not Reported	Good
Maternal near-miss: A multicenter surveillance in Kathmandu valley	Rana 2013	Yes	Cannot Determine	Yes	Cannot Determine	Yes	Not Reported	Fair
Factors associated with maternal near-miss morbidity and mortality in Kowloon Hospital, Suzhou, China	Shen 2013	Yes	Yes	Yes	Yes	Yes	Not Reported	Good
Moving beyond essential interventions for reduction of maternal mortality (the WHO Multicountry Survey on Maternal and Newborn Health): a cross-sectional study	Souza 2013	Yes	Yes	Yes	Yes	Yes	Yes	Good
Assessment of maternal near miss and quality of care in a hospital-based study in Accra, Ghana	Tuncalp 2013	Yes	Yes	Yes	Yes	Yes	Yes	Good
Morbilidad severa materna y neonatal: vigilancia en servicios y capacidad de respuesta del sistema de salud	Abalos 2014	Yes	Yes	Yes	Yes	Yes	No	Fair
Comparison of etiology of maternal near miss in a tertiary referral centre in booked and referred population	Aziz 2014	Yes	Yes	Yes	Yes	Yes	No	Fair
Incidence of maternal near miss in hospital childbirth and postpartum: Data from the Birth in Brazil study	Bastos Dias 2014	Yes	Yes	Yes	No	Yes	Yes	Good

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The prevalence of severe maternal morbidity and near miss and associated factors in Sergipe, Northeast Brazil	Galvão 2014	Yes	Yes	Yes	Yes	Yes	No	Fair
Maternal near-miss and death and their association with caesarean section complications: A cross sectional study at a university hospital and a regional hospital in Tanzania	Litorp 2014	Yes	Yes	Yes	Yes	Yes	No	Fair
Maternal near-miss and mortality in Sayaboury Province, Lao PDR	Luexay 2014	Yes	Yes	Yes	Yes	Yes	No	Fair
Evaluation of Obstetric Near Miss and Maternal Deaths in a Tertiary Care Hospital in North India: Shifting Focus from Mortality to Morbidity	Pandey 2014	Yes	Yes	Yes	Yes	Yes	No	Fair
A cross sectional study of maternal 'near-miss' cases in major public hospitals in Egypt, Lebanon, Palestine and Syria.	Bashour 2015	Yes	Yes	Yes	Yes	Yes	Not Reported	Good
Network for Surveillance of Severe Maternal Morbidity: a powerful national collaboration generating data on maternal health outcomes and care	Cecatti 2016	Yes	Yes	Yes	Yes	Yes	Yes	Good
Bases para establecer un sistema de vigilancia activa y respuesta rápida para el manejo de la morbilidad materna severa.	Karolinski 2015	Yes	Yes	Yes	Yes	Yes	Not Reported	Good

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Prospective observational study of near-miss obstetric events at two tertiary hospitals in Mumbai, Maharashtra, India	Kulkarni 2015	Yes	Yes	Yes	Yes	Yes	Not Reported	Good
Incidence and determinants of severe maternal morbidity: a transversal study in a referral hospital in Teresina, Piaui, Brazil.	Madeiro 2015	Yes	Yes	Yes	Yes	Yes	Not Reported	Good
Similarities and differences between WHO criteria and two other approaches for maternal near miss diagnosis	Menezes 2015	Yes	Yes	Yes	Yes	Yes	Not Reported	Good
Incidence and correlates of maternal near miss in southeast Iran.	Naderi 2015	Yes	Yes	Yes	Yes	Yes	Not Reported	Good
When getting there is Not enough: a nationwide cross-sectional study of 998 maternal deaths and 1451 near-misses in public tertiary hospitals in a low-income country	Oladapo 2015	Yes	Yes	Yes	Yes	Yes	Not Reported	Good
Maternal near miss and mortality in a tertiary care hospital in Rwanda	Rulisa 2015	Yes	Yes	Yes	Yes	Yes	No	Good
Near miss events frequency and most common causes.	Shahid 2015	No	No	Yes	Yes	Yes	No	Poor
Maternal near miss and maternal death in the Pretoria Academic Complex, South Africa: A population-based study	Soma-Pillay 2015	Yes	Yes	Yes	Yes	Yes	No	Fair

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Maternal Near Miss: A Valuable Contribution in Maternal Care.	Abha 2016	Yes	No	Yes	Yes	Yes	No	Poor
Maternal near miss and predictive ability of potentially life-threatening conditions at selected maternity hospitals in Latin America.	De Mucio 2016	Yes	Yes	Yes	Yes	Yes	No	Fair
Maternal Near Miss and Quality of Obstetric Care in a Tunisian Tertiary Level Maternity.	El Ghardallou 2016	Yes	Yes	Yes	Yes	Yes	No	Fair
Maternal near miss approach to evaluate quality of care in Alborz province, Iran.	Ghazivakili 2016	Yes	Yes	Yes	Yes	Yes	Yes	Good
Maternal 'near miss' at Royal Darwin Hospital: An analysis of severe maternal morbidity at an Australian regional tertiary maternity unit	Jayaratnam 2016	Yes	Yes	Yes	Yes	Yes	No	Fair
Maternal Near Miss and quality of care in a rural Rwandan hospital	Kalisa 2016	Yes	Yes	Yes	Yes	Yes	No	Fair
Maternal near misses from two referral hospitals in Uganda: a prospective cohort study on incidence, determinants and prognostic factors	Nakimuli 2016	Yes	Yes	Yes	Yes	Yes	Yes	Good
A prospective observational study of near miss events and maternal deaths in a tertiary hospital in India [Conference Abstract]	Nanda 2016	Yes	Yes	Yes	Yes	Yes	No	Fair

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STUDY NAME	FIRST AUTHOR/ YEAR	Was the research question or objective in this paper clearly stated?	Was the study population clearly specified and defined?	Was the participation rate of eligible persons at least 50%?	Were all the subjects selected or recruited from the same or similar populations (including the same time period)?	Were inclusion and exclusion criteria for being in the study prespecified and applied uniformly to all participants?	Was a sample size justification, power description, or variance and effect estimates provided?	Quality Rating (Good, Fair, or Poor)
Severe maternal morbidity and near misses in tertiary hospitals, Kelantan, Malaysia: a cross-sectional study.	Norhayati 2016	Yes	Yes	Yes	Yes	Yes	Yes	Good
Incidence of Maternal "Near-Miss" Events in a Tertiary Care Hospital of Central Gujarat, India.	Parmar 2016	Yes	Cannot Determine	Yes	Yes	Yes	No	Poor
Analysis of near-miss and maternal mortality at tertiary referral centre of rural India.	Rathod 2016	No	Yes	Yes	Yes	Yes	No	Poor
Near-misses at the Port Moresby General Hospital: a descriptive study	Tanimia 2016	Yes	Yes	Yes	Yes	Yes	No	Fair
Major Determinants of Maternal Near-Miss and Mortality at the Maternity Teaching Hospital, Erbil city, Iraq.	Akrawi 2017	Yes	Yes	Yes	Yes	Yes	No	Fair
Maternal near-misses at a provincial hospital in Papua New Guinea: A prospective observational study	Bolnga 2017	Yes	Yes	Yes	Yes	Yes	No	Fair
Severe maternal morbidity in Zanzibar's referral hospital: Measuring the impact of in hospital care	Herklots 2017	Yes	Yes	Yes	Yes	Yes	Yes	Good
Maternal near-miss audit in the Metro West maternity service, Cape Town, South Africa: A retrospective observational study	Iwuh 2017	Yes	Yes	Yes	Yes	Yes	Yes	Good
Incidence and causes of maternal near-miss in selected hospitals of Addis Ababa, Ethiopia.	Liyew 2017	Yes	Yes	Yes	Yes	Yes	Yes	Good

Table S2: Quality assessment [N=60 studies]

STUDY NAME	FIRST AUTHOR/ YEAR	Was the research question or objective in this paper clearly stated?	Was the study population clearly specified and defined?	Was the participation rate of eligible persons at least 50%?	Were all the subjects selected or recruited from the same or similar populations (including the same time period)?	Were inclusion and exclusion criteria for being in the study prespecified and applied uniformly to all participants?	Was a sample size justification, power description, or variance and effect estimates provided?	Quality Rating (Good, Fair, or Poor)
A cross sectional study of maternal near miss and mortality at a rural tertiary centre in southern Nigeria	Mbachu 2017	Yes	Yes	Yes	Yes	Yes	No	Fair
Exploring the Concept of Degrees of Maternal Morbidity as a Tool for Surveillance of Maternal Health in Latin American and Caribbean Setting	Serruya 2017	Yes	Yes	Yes	Yes	Yes	No	Fair
Incidence of maternal near miss in the public health sector of Harare, Zimbabwe: a prospective descriptive study	Chikadaya 2018	Yes	Yes	Yes	Yes	Yes	No	Fair
Prevalence of extreme maternal morbidity in a second-level hospital in san luis potosí, méxico.	Esparza Valencia 2018	Yes	Yes	Yes	Yes	Yes	Yes	Good
Maternal 'near miss' collection at an Australian tertiary maternity hospital	Jayaratnam 2018	Yes	Yes	Yes	Yes	Yes	No	Fair
Assessing maternal and neonatal near-miss reviews in rural Nepal: an implementation research study to inform scale-up	Rana 2018	Yes	Yes	Yes	Yes	Yes	No	Fair
Factors associated with maternal near miss: A study from Kerala	Reena 2018	Yes	Yes	Yes	Yes	Yes	No	Fair
A cross sectional study of maternal near miss cases at a high-risk maternity in Brazil	Schwenck 2018	Yes	Yes	Yes	Yes	Yes	No	Fair
Maternal near miss in a tertiary care hospital	Sheriar 2018	Yes	Yes	Yes	Yes	Yes	No	Fair

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Severe maternal outcomes in eastern Ethiopia: Application of the adapted maternal near miss tool	Tura 2018	Yes	Yes	Yes	Yes	Yes	No	Fair
Severe maternal morbidity & near-miss in suriname-interim of prospective national cohort study	Verschueren 2018	Yes	Yes	Yes	Yes	Yes	No	Fair
Incidence and determinants of severe maternal outcome in Jimma University teaching hospital, south-West Ethiopia: A prospective cross-sectional study	WoldeYes 2018	Yes	Yes	Yes	Yes	Yes	Yes	Good

Table S3: Near miss frequency per 1000 live births* by SDG Region [N=60 studies]

Country	Near miss frequency (range)	No. of studies**
Central and Southern Asia		
Afghanistan	1.67	1
India	5.8 - 120	11
Iran	5.0 - 25.2	2
Nepal	3.8 - 15.2	3
Pakistan	7.4 - 52.3	2
Sri Lanka	4.1	1
Eastern and South Eastern Asia		
Cambodia	12.7	1
China	2.6 - 3.8	2
Japan	6.0	1
Laos	9.8	1
Malaysia	2.2	1
Mongolia	8.4	1
Philippines	2.7	1
Thailand	5.7	1
Vietnam	2.1	1
Sub Saharan Africa		
Angola	5.7	1
Democratic Republic of the Congo	15.0	1
Ethiopia	8.0 - 50.4	3
Ghana	29.3	1
Kenya	0.39	1
Niger	18.3	1
Nigeria	15.8 - 198.5	3
Rwanda	21.5 - 81.7	2
South Africa	4.4 - 5.8	2
Tanzania	9.0 - 35.5	3
Uganda	11.5 - 26.9	2
Zimbabwe	9.2	1
Latin America and the Caribbean		
Argentina	2.6 - 6.8	4
Brazil	2.4 - 34.2	11
Colombia	9.0	1
Dominican Republic	22.6	1
Ecuador	3.0 - 8.8	2
Honduras	16.3	1
Mexico	11.6- 77.2	2
Nicaragua	8.4 - 18.5	2
Paraguay	2.2 - 6.0	2
Peru	11.3- 34.9	2
Suriname	9.6	1
Northern Africa and Western Asia		
Egypt	12.1	1
Iraq	5.1-8.2	2
Jordan	4.3	1
Lebanon	4.3- 4.5	2
Occupied Palestinian Territory	3.1 to 12.9	2

Table S3: Near miss frequency per 1000 live births by SDG Region [N=60 studies]

Country	Near miss frequency (range)	No. of studies
Qatar	3.6	1
Syria	4.5	1
Tunisia	5.9	1
Oceania		
Australia	4.8- 6.9	2
New Zealand	6.0	1
Papua New Guinea	9.1- 25.4	2
Europe and Northern America		
USA	47.9	1

*except 10 studies which reported number of deliveries

** total number of studies exceeds 60 as some studies included data from multiple countries

Table S4a: Near Miss meta-analysis [N=57 studies]

Country	Study	ES	[95% Conf. Interval]	% Weight
Sub-Saharan Africa				
Angola	Souza 2013	0.006	-0.254 0.265	0.16
DRC	Souza 2013	0.010	-0.198 0.219	0.24
Ethiopia	Liyew 2017	0.008	-0.119 0.135	0.65
Ethiopia	Tura 2018	0.017	-0.156 0.191	0.35
Ethiopia	Woldeyes 2018	0.050	-0.116 0.217	0.38
Ghana	Tuncalp 2014	0.029	-0.173 0.231	0.26
Kenya	Souza 2013	0.004	-0.219 0.227	0.21
Niger	Souza 2013	0.018	-0.122 0.158	0.54
Nigeria	Mbachu 2017	0.198	-0.073 0.470	0.14
Nigeria	Oladapo 2015	0.016	-0.036 0.067	3.99
Nigeria	Souza 2013	0.025	-0.088 0.139	0.82
Rwanda	Kalisa 2016	0.022	-0.190 0.233	0.24
Rwanda	Rulisa 2015	0.082	-0.083 0.246	0.39
South Africa	Iwuh 2018	0.006	-0.179 0.191	0.31
South Africa	Soma-P 2015	0.004	-0.177 0.186	0.32
Tanzania	Herklots 2017	0.009	-0.313 0.331	0.10
Tanzania	Litorp 2014	0.036	-0.055 0.126	1.28
Tanzania	Nelissen 2013	0.023	-0.111 0.156	0.59
Uganda	Nakimuli 2016	0.027	-0.047 0.101	1.91
Uganda	Souza 2013	0.011	-0.167 0.190	0.33
Zimbabwe	Chikadaya 2018	0.009	-0.178 0.196	0.30
Sub-total I-V pooled ES		0.024	-0.004 0.052	13.52
Northern Africa & Western Asia				
Egypt	Bashour 2015	0.012	-0.334 0.359	0.09
Iraq	Akrawi 2017	0.008	-0.156 0.173	0.39
Iraq	Jabir 2013	0.005	-0.168 0.178	0.35
Jordan	Souza 2013	0.004	-0.872 0.881	0.01
Lebanon	Bashour 2015	0.004	-0.872 0.881	0.01
Lebanon	Souza 2013	0.004	-0.457 0.466	0.05
OPT	Bashour 2015	0.013	-0.477 0.503	0.04
OPT	Souza 2013	0.003	-1.129 1.135	0.01
Qatar	Souza 2013	0.004	-0.520 0.527	0.04
Syria	Bashour 2015	0.004	-0.457 0.466	0.05
Tunisia	El Ghardall 2016	0.006	-0.251 0.263	0.16
Sub-total I-V pooled ES		0.007	-0.087 0.100	1.21
Central & Southern Asia				
Afghanistan	Souza 2013	0.017	-0.079 0.112	1.16
India	Abha 2016	0.015	-0.120 0.150	0.58
India	Aziz 2014	0.008	-0.185 0.201	0.28
India	Kulkarni 2015	0.046	-0.030 0.122	1.84
India	Nanda 2016	0.013	-0.131 0.158	0.51
India	Parmar 2016	0.021	-0.289 0.331	0.11
India	Ps 2013	0.018	-0.154 0.189	0.36
India	Rathod 2016	0.007	-0.147 0.162	0.44
India	Reena 2018	0.009	-0.337 0.356	0.09
India	Souza 2013	0.006	-0.143 0.154	0.48

Table S4a: Near Miss meta-analysis [N=57 studies]

Iran	Ghazivakili 2012	0.005	-0.136 0.146	0.53
Iran	Naderi 2015	0.025	-0.062 0.113	1.38
Nepal	Rana 2013	0.004	-0.153 0.160	0.43
Nepal	Rana 2018	0.015	-0.413 0.443	0.06
Nepal	Souza 2013	0.006	-0.237 0.249	0.18
Pakistan	Shahid 2015	0.052	-0.124 0.228	0.34
Pakistan	Souza 2013	0.007	-0.195 0.210	0.26
Sri Lanka	Souza 2013	0.004	-0.225 0.233	0.20
Sub-total I-V pooled ES		0.022	-0.012 0.055	9.21
Eastern & South-Eastern Asia				
Cambodia	Souza 2013	0.013	-0.242 0.268	0.16
China	Shen 2013	0.004	-0.232 0.240	0.19
China	Souza 2013	0.003	-0.334 0.339	0.09
Japan	Souza 2013	0.006	-0.422 0.434	0.06
Laos	Luexay 2014	0.010	-0.581 0.601	0.03
Malaysia	Norhayati 2016	0.002	-0.284 0.288	0.13
Mongolia	Souza 2013	0.008	-0.243 0.259	0.17
Philippines	Souza 2013	0.003	-0.361 0.367	0.08
Thailand	Souza 2013	0.006	-0.269 0.280	0.14
Viet Nam	Souza 2013	0.002	-0.339 0.343	0.09
Sub-total I-V pooled ES		0.006	-0.090 0.102	1.14
Latin America & the Caribbean				
Argentina	Abalos 2014	0.005	-0.366 0.375	0.08
Argentina	De Mucio 2016	0.003	-1.383 1.389	0.01
Argentina	Karolinsk 2015	0.007	-0.233 0.246	0.18
Argentina	Souza 2013	0.005	-0.269 0.280	0.14
Brazil	Bastos Dias 2014	0.010	-0.003 0.023	65.25
Brazil	Cecatti 2011	0.013	-0.127 0.154	0.53
Brazil	Cecatti 2015	0.009	-0.061 0.080	2.12
Brazil	Galvao 2014	0.005	-0.219 0.228	0.21
Brazil	Lobato 2013	0.033	-0.344 0.410	0.07
Brazil	Madeiro 2015	0.010	-0.252 0.271	0.15
Brazil	Menezes 2015	0.005	-0.219 0.228	0.21
Brazil	Morse 2011	0.009	-0.610 0.629	0.03
Brazil	Oliveira 2013	0.013	-0.110 0.136	0.70
Brazil	Souza 2013	0.002	-0.473 0.478	0.05
Brazil	Schwenck 2018	0.034	-0.240 0.309	0.14
Colombia	De Mucio 2016	0.009	-1.123 1.141	0.01
DR	De Mucio 2016	0.023	-1.109 1.154	0.01
Ecuador	Souza 2013	0.003	-0.355 0.361	0.08
Ecuador	De Mucio 2016	0.009	-1.377 1.395	0.01
Honduras	De Mucio 2016	0.016	-0.603 0.636	0.03
Mexico	Esparza-Valencia 2018	0.077	-0.026 0.180	0.99
Mexico	Souza 2013	0.012	-0.147 0.170	0.42
Nicaragua	Souza 2013	0.019	-0.161 0.198	0.33
Nicaragua	De Mucio 2016	0.008	-0.972 0.988	0.01
Paraguay	Souza 2013	0.002	-0.691 0.695	0.02
Paraguay	De Mucio 2016	0.006	-1.380 1.392	0.01
Peru	Souza 2013	0.011	-0.140 0.162	0.46
Peru	De Mucio 2016	0.035	-0.556 0.626	0.03

Table S4a: Near Miss meta-analysis [N=57 studies]

Suriname	Verschueren 2018	0.010	-0.337	0.356	0.09
Sub-total I-V pooled ES		0.011	-0.001	0.023	72.36
Oceania					
Australia	Jayaratnam 2016	0.005	-0.615	0.625	0.03
Australia	Jayaratnam 2016	0.007	-0.443	0.456	0.05
New Zealand	Jayaratnam 2016	0.006	-0.469	0.481	0.05
PNG	Bolnga 2017	0.025	-0.133	0.184	0.42
PNG	Tanimia 2016	0.009	-0.168	0.187	0.34
Sub-total I-V pooled ES		0.016	-0.093	0.126	0.88
Europe & Northern America					
USA	Brown 2011	0.048	-0.031	0.127	1.68
Sub-total I-V pooled ES		0.048	-0.031	0.127	1.68
Overall I-V pooled ES		0.014	**0.004**	**0.025**	**100.00**

Table S4b: Test of heterogeneity

Region	**Degrees of Freedom**	**P**	**I-Squared**	**%**
Sub-Saharan Africa	2.59	20	1.000	0.0%
Northern Africa & Western Asia	0.00	10	1.000	0.0%
Central & Southern Asia	0.82	17	1.000	0.0%
Eastern & South-Eastern Asia	0.01	9	1.000	0.0%
Latin America & the Caribbean	1.67	28	1.000	0.0%
Oceania	0.02	4	1.000	0.0%
Europe & Northern America	0.00	0	-	-
Overall	6.74	94	1.000	0.0%
Overall Test for heterogeneity between sub-groups:	**1.62**	**6**	**0.951**	**--**

Significance test of ES=0		
Region	**Z**	**p**
Sub-Saharan Africa	1.67	0.094
Northern Africa & Western Asia	0.14	0.886
Central & Southern Asia	1.25	0.212
Eastern & South-Eastern Asia	0.12	0.907
Latin America & the Caribbean	1.82	0.069
Oceania	0.30	0.768
Europe & Northern America	1.19	0.236
Overall	**2.75**	**0.006**

Table S5: Modifications and adaptions of the WHO MNM criteria [N=20]

Study	Severe Maternal Complications	Adaptations		
		Life Threatening Conditions (near miss criteria)		
		Criteria removed	Criteria added	Modifications made to criteria
Sub-Saharan Africa				
Benimama 2018 (Rwanda)	-Uterine infections leading to hysterectomy -Uterine and debridement repair	None	None	Transfusion of blood of ≥ 2 units orred cells
Herklots 2017 (Tanzania)	None	-Lactate >5 mmol or >45 mg/L -pH < 7.1 -PAO2/FiO2 <200 mmHg	None	None
Kalisa 2016 (Rwanda)	Abortion or ectopic pregnancy	-Lactate >5 mmol or >45 mg/L -pH < 7.1 -PAO2/FiO2 <200 mmHg -ketones in urines -dialysis for acute renal failure (ARF)	None	None
Litorp 2014 (Tanzania)	Cesarean section (CS) complications -complications specific to surgery or anesthesia -complications not specific to surgery or anesthesia but with an increased risk after CS (PPH leading to shock, hysterectomy, blood transfusion) -pre-existing condition that might have affected an outcome	<u>University teaching hospital</u> -Lactate >5 mmol or >45 mg/L -pH < 7.1 -PAO2/FiO2 <200 mmHg - dialysis for ARF <u>Regional hospital</u> -Lactate >5 mmol or >45 mg/L -pH < 7.1 -Oxygen saturation <90% for > 60 mins -PAO2/FiO2 <200 mmHg -Creatinine > 300 mmol/dl or > 3.5 mg/dl -bilirubin >100 umol/l or >6.0mg/dl	None	All types of blood products included in massive transfusion

Table S5: Modifications and adaptions of the WHO MNM criteria [N=20]

Study	Severe Maternal Complications	Adaptations		
		Life Threatening Conditions (near miss criteria)		
		Criteria removed	Criteria added	Modifications made to criteria
		-platelets <50,000 -glucose and ketoacids in urine -use of continuous use of vasoactive drugs -dialysis for ARF		
Mbachu 2017 (Nigeria)	Obstructed labour	None	None	None
Nakamuli 2016 (Uganda)	None	-Uncontrollable fits/status epilepticus	-Hospitalization >7 d -Admission to HDU or ICU -Referral to a more specialized unit -Return to operation theatre -Major operative non-obstetric surgery	Blood transfusion of ≥ 4 units of blood
Nelissen 2013 (Tanzania)	None	-Lactate >5 mmol or >45 mg/L -pH < 7.1 -PAO2/FiO2 <200 mmHg -Creatinine > 300 mmol/dl or > 3.5 mg/dl -bilirubin >100 umol/l or >6.0mg/dl -glucose and ketoacids in urine -use of continuous vasoactive drugs -dialysis for ARF	None	Blood transfusion of ≥ 1 unit of blood

Table S5: Modifications and adaptions of the WHO MNM criteria [N=20]

Study	Severe Maternal Complications	Adaptations		
		Life Threatening Conditions (near miss criteria)		
		Criteria removed	Criteria added	Modifications made to criteria
Owlabi 2017 (Zambia)	Incomplete, complete, missed, septic, inevitable or spontaneous abortion hospitalized for > 24 hours	None	-muco-cutaneous signs -clinical diagnosis of septicemia or one of the following: t> 39°C, t <36°C, genital infection AND one of the following: systolic BP <90 mmHg, icterus, altered consciousness, oliguria <100 mL in 4h -anemia <4 g/dL -anemia in combination with blood transfusion (4-6.9 g/dL) with blood transfused ≥ 1 unit -uterine output <30 ml/h for 4h or <400 ml/24 h -uterine perforation -bowel injury	Blood transfusion of ≥ 2 units of blood
Sayingoza 2017 (Rwanda)	None	-Lactate >5 mmol or >45 mg/L -pH < 7.1 -PAO2/FiO2 <200 mmHg -Creatinine > 300 mmol/dl or > 3.5 mg/dl -bilirubin ≥ 100 umol/l or >6.0mg/dl -glucose and ketoacids in urine -use of continuous -vasoactive drugs -dialysis for ARF	None	Transfusion of ≥ 1 unit of blood

Table S5: Modifications and adaptions of the WHO MNM criteria [N=20]

Study	Severe Maternal Complications	Adaptations		
		Life Threatening Conditions (near miss criteria)		
		Criteria removed	Criteria added	Modifications made to criteria
Tura 2018 (Ethiopia)	-Severe malaria -Pulmonary edema -Severe pre-eclampsia with ICU admission	-lactate >5 mmol or >45 mg/L -pH < 7.1 -PAO2/FiO2 <200 mmHg -bilirubin > 100 umol/l or >6.0mg/dl - use of continuous vasoactive drugs -dialysis for ARF	None	Transfusion of ≥ 2 units of blood
Wittevan 2017 (Malawi & Tanzania)	None	None	None	Transfusion of ≥ 1unit of blood
Van den Akker 2013 (Malawi)	-Uterine rupture after vaginal birth -IUFD leading to laparotomy -Eclampsia or severe pre-eclampsia with maternal indication for termination of pregnancy -Major obstetric hemorrhage (including from complicated abortion and ectopic pregnancies) -Severe obstetric and non-obstetric peripartum infections -Any complications the clinical considered severe	None	None	-Transfusion of ≥ 2 units of blood -Hemoglobin <6 g/dL after vaginal bleeding or an estimated blood loss of >1L
Northern Africa and Western Asia				
Akrawi 2017 (Iraq)	-Severe forms of complications of abortion -Ectopic pregnancy -Abruption placentae -Placenta previa	None	Anemia with Hb <6g/dL or clinical signs of severe anemia in women without severe hemorrhage	Transfusion of ≥ 3 units of bloodproduct

Table S5: Modifications and adaptions of the WHO MNM criteria [N=20]

Study	Severe Maternal Complications	Adaptations		
		Life Threatening Conditions (near miss criteria)		
		Criteria removed	Criteria added	Modifications made to criteria
Central and Southern Asia				
Kulkarni 2016 (India)	None	None	Severe anemia with hemoglobin 60 g/L or clinical signs of severe anemia without hemorrhage	None
Pandey 2014 (India)	None	-pH < 7.1 -PAO2/FiO2 <200 mmHg	None	None
Rana 2018 (Nepal)	Severe PPH ≥ 1000 mL of blood loss (or four fully soaked pads in 30 minutes) APH (placenta praevia) requiring blood transfusion Obstructed/prolonged labour >18 hours	-continuous vasoactive drugs -CPR - Lactate >5 mmol/l or >45 mg/dl -pH <7.1 -intubation and ventilation not related to anaesthesia - PAO2/FiO2 <200 mmHg - dialysis for acute renal failure -Creatinine ≥300 µmol/ml or ≥3.5 mg/dl -massive transfusion of blood or red cells (≥5 units) -platelets <50,000 - bilirubin ≥ 100 umol/l or >6.0mg/dl -Uterine haemorrhage or infection leading to hysterectomy		

Table S5: Modifications and adaptions of the WHO MNM criteria [N=20]

Study	Severe Maternal Complications	Adaptations		
		Life Threatening Conditions (near miss criteria)		
		Criteria removed	Criteria added	Modifications made to criteria
Eastern and South-Eastern Asia				
Luexay 2014 (Lao PDR)	None	-pH < 7.1 -PAO2/FiO2 <200 mmHg -lactate >5 mmol or >45 mg/L -bilirubin ≥ 100 umol/l or >6.0mg/dl -intubation and ventilation not related to anesthesia -continuous use of vasoactive drugs -dialysis for ARF -massive transfusion of blood or PRBCs -CPR -gasping -failure to form clots -uncontrollable fit/status epilepticus -uterine infection or hemorrhage leading to Hysterectomy	None	Excessive bleeding per vagina
Shen 2013 (China)	None	-pH < 7.1 -lactate >5 mmol or >45 mg/L -blood transfusion of less than 5 units -intubation related to anesthesia -loss of consciousness for less than 12 hours	None	Pre-eclampsia without jaundice not included

Table S5: Modifications and adaptions of the WHO MNM criteria [N=20]

Study	Severe Maternal Complications	Adaptations		
		Life Threatening Conditions (near miss criteria)		
		Criteria removed	Criteria added	Modifications made to criteria
Oceania				
Bolgna 2017 (Papua New Guinea)	None	-pH < 7.1 -PAO2/FiO2 <200 mmHg -lactate >5 mmol or >45 mg/L - presence of glucose and ketoacids in urine -continuous use of vasoactive drugs	None	Transfusion ≥3 units of blood
Tanimia 2016 (Papa New Guinea)	None	-pH < 7.1 -PAO2/FiO2 <200 mmHg -lactate >5 mmol or >45 mg/L - presence of glucose and ketoacids in urine -continuous use of vasoactive drugs	None	Transfusion ≥3 units of blood