

## Reduction in maternal mortality depends on a regular audit of obstetric services

Maternal and perinatal (neonatal) mortality remains unacceptably high in LMICs. Efforts are being made all over the world to address the problem but the progress is slow and the danger is that sustainable development goals may not be reached in the remaining time. The difference in maternal mortality between high- and low-income countries is stark; as low as single digit per 100,000 Live Births (LBs) to many hundreds per 100,000 LBs respectively. Neonatal mortality also demonstrates the similar differences. (See pictures below). These differences are largely due to the lack of adequate services available during pregnancy and child birth; improvements in these services are the key to bring about changes, however without knowing what to change is groping in the dark.

Statutory requirements are almost universal in registering births in all health institutions. Even births at home are required to be notified to the authorities through village administration. With emphasis on institutional births, home deliveries are rapidly declining and greater proportion of births are taking place in health centers and hospitals.

Although reliance on hospital deliveries are increasing constantly, this alone will not be enough to reduce the mortality among women and newborns. Some level of audit is required so that healthcare providers identify the problem areas. Birth registers maintained by health facilities must be reviewed regularly and data analysed to monitor trends so that measures are taken to address causes of morbidity and mortality. Once data is analysed at monthly, yearly and over several years, trends emerge to demonstrate improvements or deterioration taking place and required actions to be taken to improve the situation.

Global monitoring of intervention coverage is a cornerstone of international efforts to improve reproductive, maternal newborn, and child health (RMNCH). [\[1\]](#) Application of monitoring at primary health care level is the starting point. Such an approach was taken in WHO Reproductive Health Strengthening project in Papua New Guinea (PNG) in 1995-2000 and replicated in Laos in 2005-2013 (see links below). Disciplined and accurate recording of birth and death events and periodical analysis and audit is the starting point. Once established, it is an easy exercise and a great educational tool for health workers. It also gives some purpose for filling those boring registers and encourages service providers to work harder to further improve the situation. Analysis of the data collected through birth/obstetric register provides valuable information for monitoring health of women and children. Increasing use of information technology is making this task even simpler. A selection of most significant indicators directly affecting the improvements in health are discussed here.

**General characters:** Age of the mother, too young (teen pregnancies) and too old (35+ women with pregnancy), too many and too frequent pregnancies are well known associations with maternal morbidity and mortality. Delays in getting the women in labor, especially long labor with lack of progress, to health facility is one of the common reasons for maternal and/or fetal death. Regular monitoring of these indicators provides opportunity to review existing programs

and eliminating any obstructions. Training of primary care health workers and robust referral system are fundamental to improvements. Importance of understanding pregnancy, when and how many children to have, requires awareness and knowledge of modern contraceptive choices for women in reproductive age.

**Stillbirths:** One of the saddest outcomes of pregnancy is a still born child. A small number of stillbirths may be due to congenital and unavoidable causes, but vast majority of stillbirths are related to poor antenatal care. Child birth complications, post-term pregnancy, maternal infections in pregnancy (malaria, syphilis and HIV), maternal disorders (especially hypertension, obesity and diabetes), fetal growth restriction are some of the conditions that can be detected and necessary measures taken to save the pregnancy. For health workers to regularly monitor the trends is essential to reduce stillbirths.

**Pregnancy Complications:** Child birth being a physiological phenomenon, great proportion of deliveries are spontaneous requiring watchful expectancy and only about 15% of all births may require skilled intervention. Registering complications of pregnancy is one of the most important function of birth registers. This, however, requires correct diagnosis and recording. Post-partum hemorrhage, the most common complication of child birth, is the commonest cause death in both mother and the unborn child. Recording of the complications of pregnancy and its regular reviews help to understand and manage the complications of pregnancy. Improved antenatal care and skilled supervision during child birth helps reduction in loss of life.

**Cesarean section rate:** Cesarean section (CS) is a lifesaving intervention for a number of complications of pregnancy, both for the mother and the unborn child. Unfortunately, medical intervention of this procedure is greatly abused. In certain countries CS rates are approaching as high as half of all institutional deliveries. Under normal circumstances, if obstetric medicine is practiced honorably, CS rates should not exceed 7-10% of total births in a population. According to WHO a rate higher than 10-15% is not associated with reductions in maternal or infant mortality rates.<sup>[2]</sup> What matters is to both improve access to and reduce the miss use of C-section where possible.

**Birthweight:** measuring birthweight soon after birth is a requirement and is an important indicator. It reflects the nutrition and general care mother received during pregnancy as well as survival of the newborn. A birthweight lower than 2500 Gms. is considered below normal and these newborns are 100 times more likely to die compared to normal birth weight babies. Low birthweight rate of 9% or higher of all births is abnormal and every effort must be made to address the underlying causes in a population.<sup>[3]</sup>

**Maternal deaths:** Maternal death related to pregnancy is a tragic incident. It is of rare occurrence but registering it and learning from the mistakes is critical to its reoccurrence. Compulsory post mortem of maternal deaths, as well as near deaths, must be carried out by full obstetric team and referral units to look into the reasons of death and lessons learnt from it. Review of birth/obstetric register is the most important document for this audit.

There are many other aspects of recording events of childbirth in detail which is essential for further improvements in health service delivery. A well-constructed birth/obstetric register [4] is essential for each health facility providing childbirth services. Often recording becomes a mundane requirement but little is learnt from it. Analysis of data therein must be reviewed at monthly audit meetings where successes and failures should be discussed with all health workers involved.

All health facilities conducting normal deliveries and managing obstetric interventions must use a standard birth register, review data at regular intervals and use information for capacity building for all health workers providing obstetric services. A systematic audit of obstetric care at regular intervals is bound to reduce unacceptable maternal and neonatal mortality.

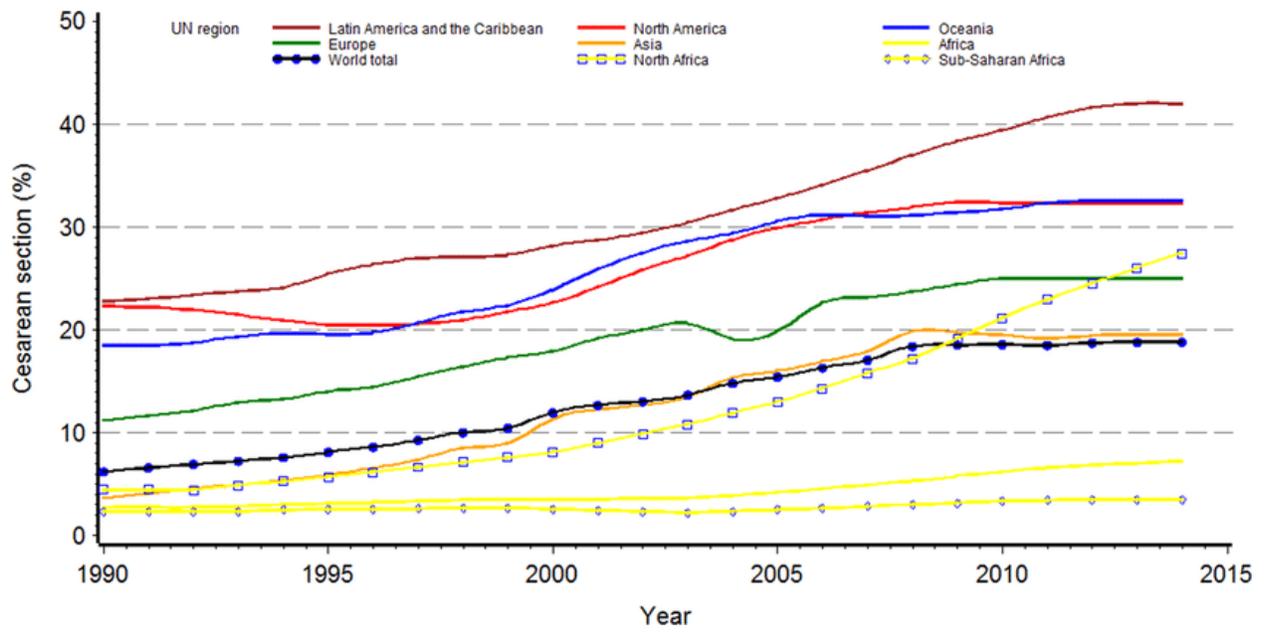
### References:

- [1] Requejo JH, Newby H and Bryce J. Measuring Coverage in MNCH: Challenges and Opportunities in the Selection of Coverage Indicators for Global Monitoring. PLoS Medicine. May 2013 Vol 10 Issue 5.
- [2] "[WHO Statement on Caesarean Section Rates](#)" (PDF). 2015. [Archived](#) (PDF) from the original on 1 May 2015. Retrieved 6 May 2015.
- [3] Child Trends Databank. (2016). *Low and very low birthweight infants*. Available at: <https://www.childtrends.org/?indicators=low-and-very-low-birthweight-infants>
- [4] [Birth register used in NTPC Health Program](#) health centers in Laos. 2013.

### Related links: [Maternal and Child Health > Maternal health: Maternal mortality - a case study](#)

COUNTRY	MMR	NNMR
UNITED KINGDOM	7	3
GERMANY	7	2
FRANCE	8	3
UNITED STATES	19	4
CHINA	29	4
THAILAND	37	5
SOUTH AFRICA	119	11
PAKISTAN	140	42
INDIA	145	23
BANGLADESH	173	17

MMR=Maternal Mortality Ratio/100,000 livebirths;  
NNMR=Neonatal Mortality Rate/1000 livebirths.



MATERNAL MORTALITY RATIO (MATERNAL DEATHS PER 100,000 LIVEBIRTHS)

UNICEF Regions	2000	2005	2010	2015	2017
East Asia and the Pacific	114	100	86	73	69
Europe and Central Asia	27	22	17	14	13
Eastern Europe and Central Asia	45	36	26	20	19
Western Europe	8	7	6	6	5
Latin America and Caribbean	96	91	85	77	74
Middle East and North Africa	95	81	63	59	57
North America	12	13	14	17	18
South Asia	395	309	235	179	163
Sub-Saharan Africa	870	746	626	557	533
Eastern and Southern Africa	780	645	494	406	384
West and Central Africa	962	847	755	699	674
Least developed countries	763	635	520	442	415
World	342	296	248	219	211

MATERNAL MORTALITY RATIO (MATERNAL DEATHS PER 100,000 LIVEBIRTHS)

Code	Country	2000	2005	2010	2015	2017
BLR	Belarus	22	11	5	3	2
ITA	Italy	4	3	2	2	2
NOR	Norway	6	5	4	3	2
POL	Poland	7	4	3	2	2
CZE	Czechia	7	5	4	4	3
FIN	Finland	6	5	4	3	3
GRC	Greece	3	3	3	3	3
<b>TOP AND BOTTOM SEVEN COUNTRIES</b>						
MRT	Mauritania	834	826	824	785	766
CAF	Central African Republic	1280	1200	1000	912	829
SOM	Somalia	1210	1040	985	855	829
NGA	Nigeria	1200	1080	978	931	917
SLE	Sierra Leone	2480	1760	1360	1180	1120
TCD	Chad	1420	1330	1240	1160	1140
SSD	South Sudan	1730	1480	1100	1110	1150

**Figure 3: Significant improvement, but a long way to go**

				COMPARATORS				
		India	Change	MDGs	US	Brazil	China	Thailand
Overall Indicators	• <b>Infant mortality rate (1,000 live births, 2012)</b>	44	-50% (1990-2012)	27	6	13	12	11
	• <b>Maternal mortality rate (per 100,000 live births, 2012)</b>	178	-68% (1990-2012)	109	27	68	36	28
Public health indicator	• <b>DTP3 vaccination (% immunized, 2013)</b>	72%	20% (2000-2013)	100%	94%	95%	99%	99%
CD prevalence	• <b>Tuberculosis (cases in millions, 2012)</b>	2.8	-38% (2000-2012)	-	0.02	0.12	1.4	0.11
	• <b>Malaria (cases in millions)</b>	1.1	-48% (2001-2012)	-	0	0.24	0.003	0.03
NCD prevalence	• <b>Cancer (annual incidence in millions, 2012)</b>	1	25% (2004-2012)	-	1.6	0.4	3.1	0.1

Notes: MDG is Millennium Development Goals; NCD is non-communicable diseases; DTP3- Diphtheria-tetanus-pertussis immunization; in-text malaria and economic growth link from <http://www.ncbi.nlm.nih.gov/books/NBK2622/>

Sources: WHO; World Bank; CBHI; Bain analysis