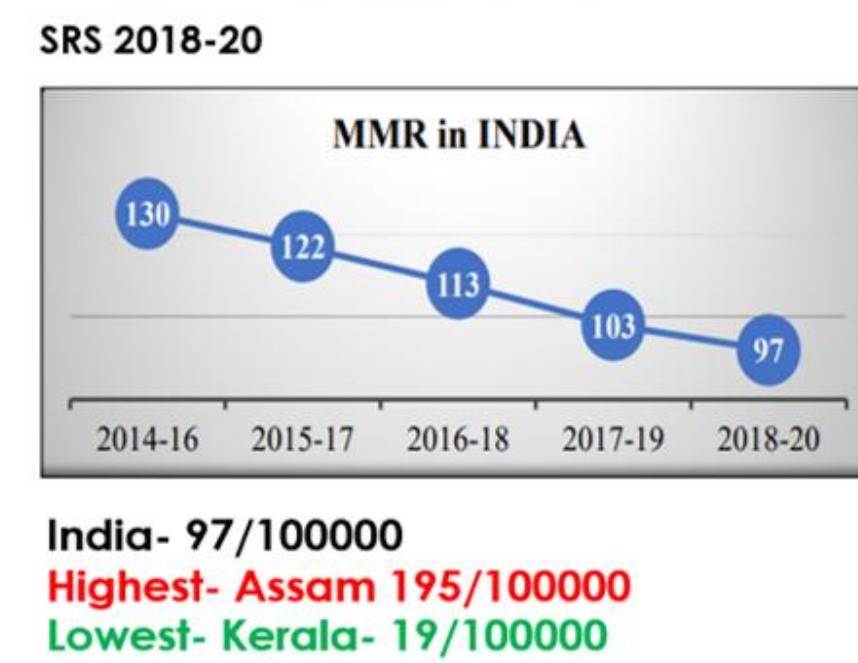
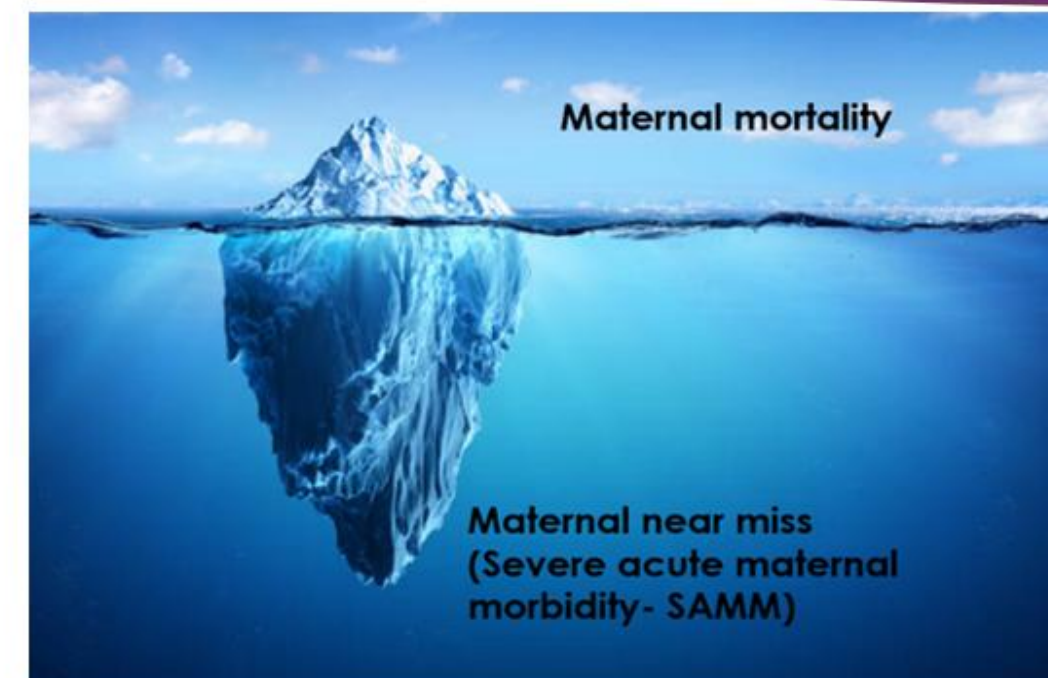


Incidence and Determinants of Maternal Near Miss in a tertiary care hospital in South India

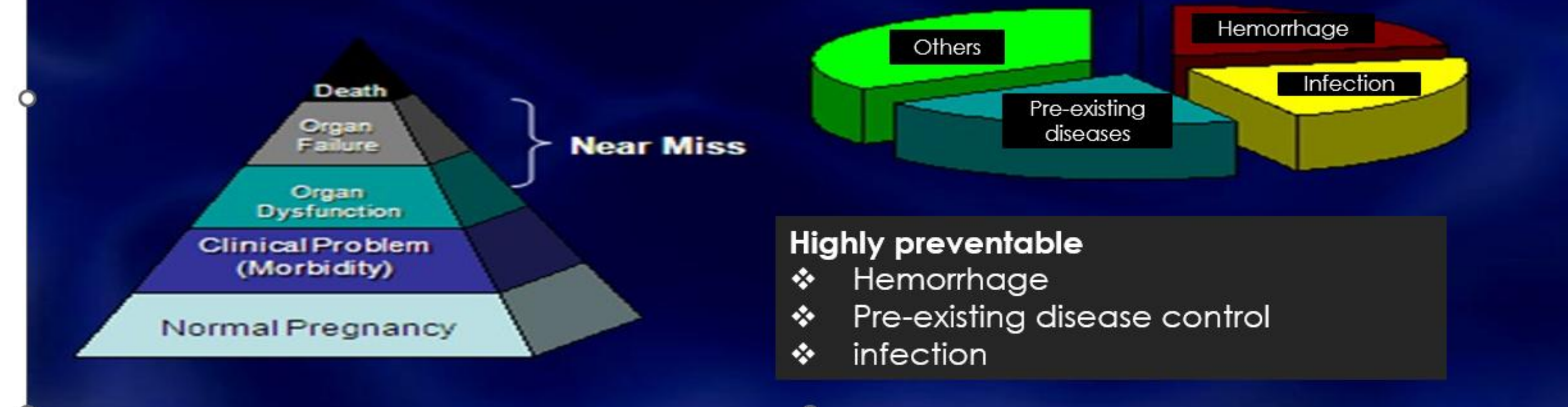
Dhanya R Shenoy, Vidyalekshmy R, Brinda Sabu, Nina Navakumar, Sajith Mohan, Department of Maternal & Fetal Medicine, KIMSHEALTH, Trivandrum, India

Maternal mortality- Where do we stand?



- **Maternal Mortality Ratio(MMR)**= No. of maternal deaths per 100000 live births
- **Target Sustainable Development Goal (by United Nations) = MMR< 70/100,000 live births (by 2030)**
- Globally- 211/100000 livebirths (WHO 2021)
- India- 97/ 100000 live births

The Changing Face of Maternal Morbidity



- Highly preventable**
- ❖ Hemorrhage
 - ❖ Pre-existing disease control
 - ❖ infection

“Maternal near miss case” A woman who nearly died but survived a complication that occurred during pregnancy, childbirth or 42 d of termination of pregnancy(WHO)



Anticipate & prevent predictive factors

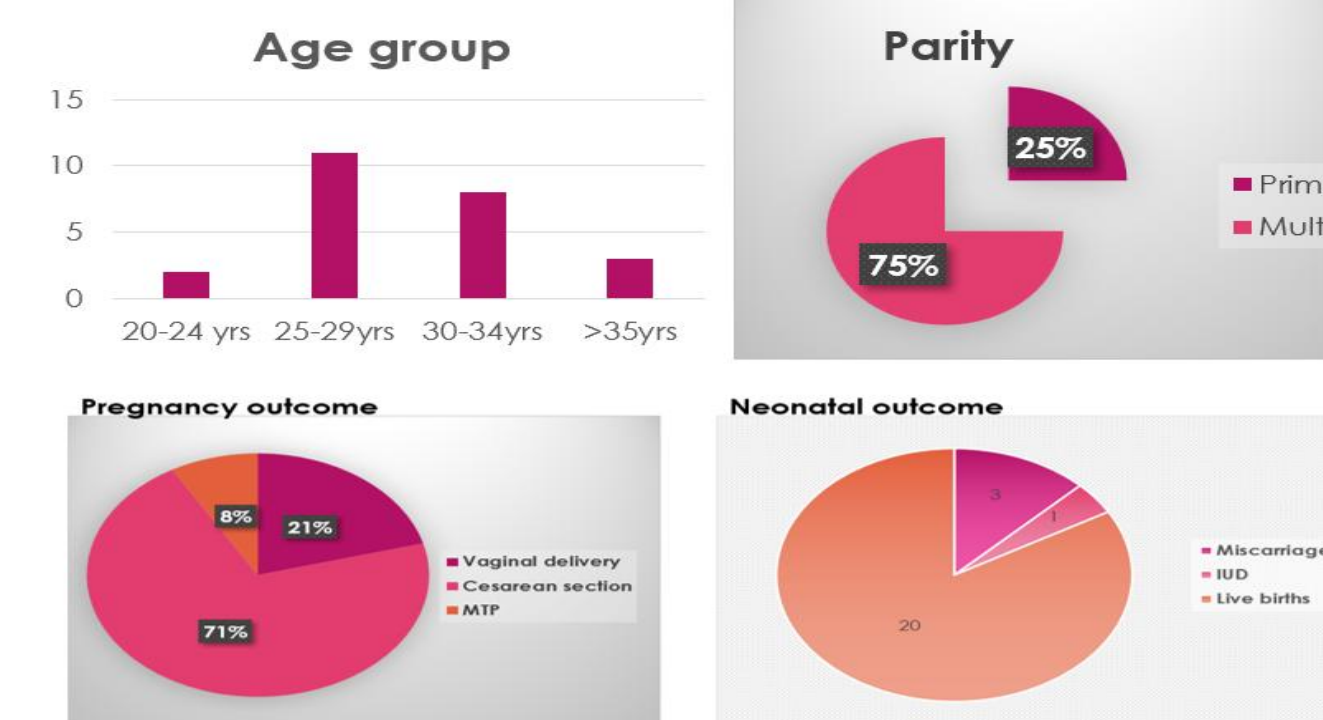
Why maternal near miss?

- More common than maternal deaths
- Share many characteristics with maternal deaths
- Investigating the instances of severe morbidity is less threatening to providers
- The woman herself can be a source of data
- Serves as an adjunct to identify gaps in maternal health services
- Inform about obstacles to be overcome after onset of an acute complication
- **Corrective actions for identified problems can reduce maternal mortality& long term morbidity**

Study Observations, Analysis & Report

- **Our Maternal Near Miss Study**
- Retrospective Cohort
- From Jan 2022 to June 2022
- WHO inclusion criteria

- Total no. of live births-910
- Near miss cases- 24
- Maternal mortality-1



Causes of maternal near miss

Major causes

Hemorrhage (n=8, 33.3%) → 3 APH & 5 PPH
Hypertension (n=6, 25%)
Puerperal sepsis (n=4, 16.6%)

Less common causes

Acute collapse (n=2, 8.3%)
Non pregnancy related infections (n=2, 8.3%)
Chronic medical conditions (n=2, 8.3%)

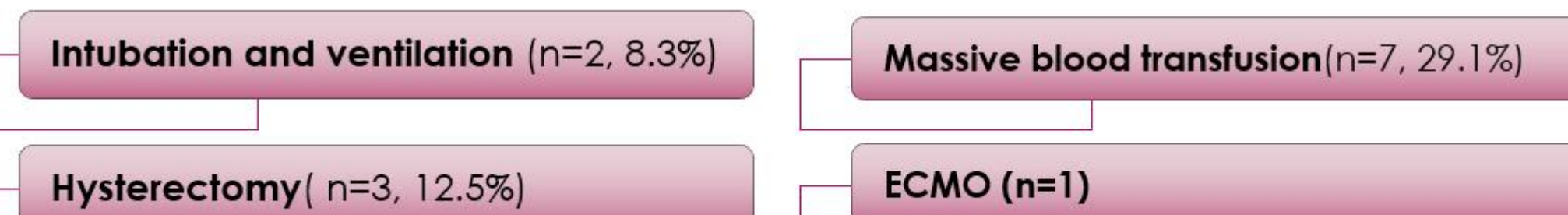
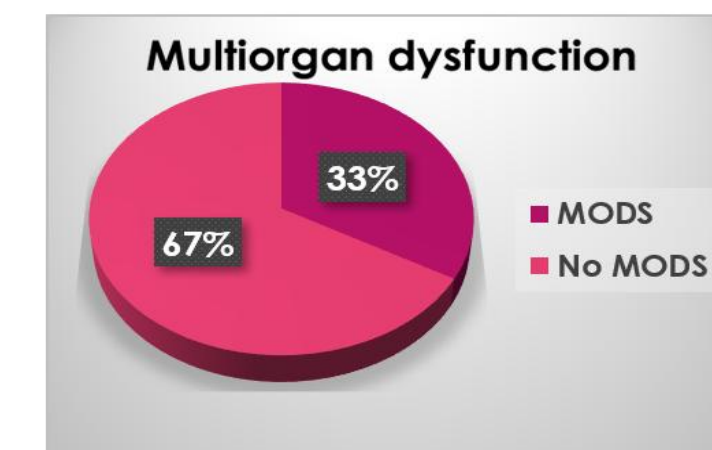
- Due to pregnancy specific issues- Hemorrhage, hypertensive disorders, AFE, puerperal sepsis
- n=19, 79.2%

- Due to pre-existing disorders aggravated during pregnancy
- n=2, 8.3%

- Accidental/ incidental disorders in pregnancy
- n=3, 12.5%

Organ dysfunction & Critical interventions required

- **Cardiovascular dysfunction** (n=7, 29.1%)
- **Hematological dysfunction** (n=10, 41.6%)
- **Respiratory dysfunction** (n=7, 29.1%)
- **Neurological dysfunction** (n= 2, 8.3%)
- **Hepatic dysfunction** (n=3, 12.5%)
- **Multiorgan dysfunction** (n=8, 33.3%)



Morbidity & Mortality Indices

910 live births, 24 near miss & 1 maternal death

Maternal mortality ratio (MMR)= 109/100000 live births

Near miss ratio (NMR)= 26.3/ 1000 live births

Maternal near miss/ maternal death ratio- 24

Mortality index= 0.04

Analysis

- MMR in our hospital is slightly higher- probably because the number of live births were less during the study period.
- Our Near miss rate was also higher than other studies in India, probably because ours is a tertiary care referral centre
- Our mortality index was only 0.04 , suggesting the high quality of care in our hospital

Areas where things could have gone wrong-

- **Patient related factors- Delay in recognition & decision to seek care**
- **Administrative factors- Delay in access to appropriate facility**
 - Transport problems (institution to institution)
 - Delay in initiating care due to overburdened services (e.g. long queues, competing emergencies)
 - Lack of accessible healthcare facilities
 - Lack of available healthcare provision (ICU, blood products)
 - Lack of appropriately trained staff
- **Health care provision- Delay in provision of quality care**
 - Delay in problem recognition
 - Delay in referring
 - Managed at inappropriate level
 - Wrong diagnosis
 - Substandard care (delay in initiating appropriate treatment)

Anticipation & correction of causative factors

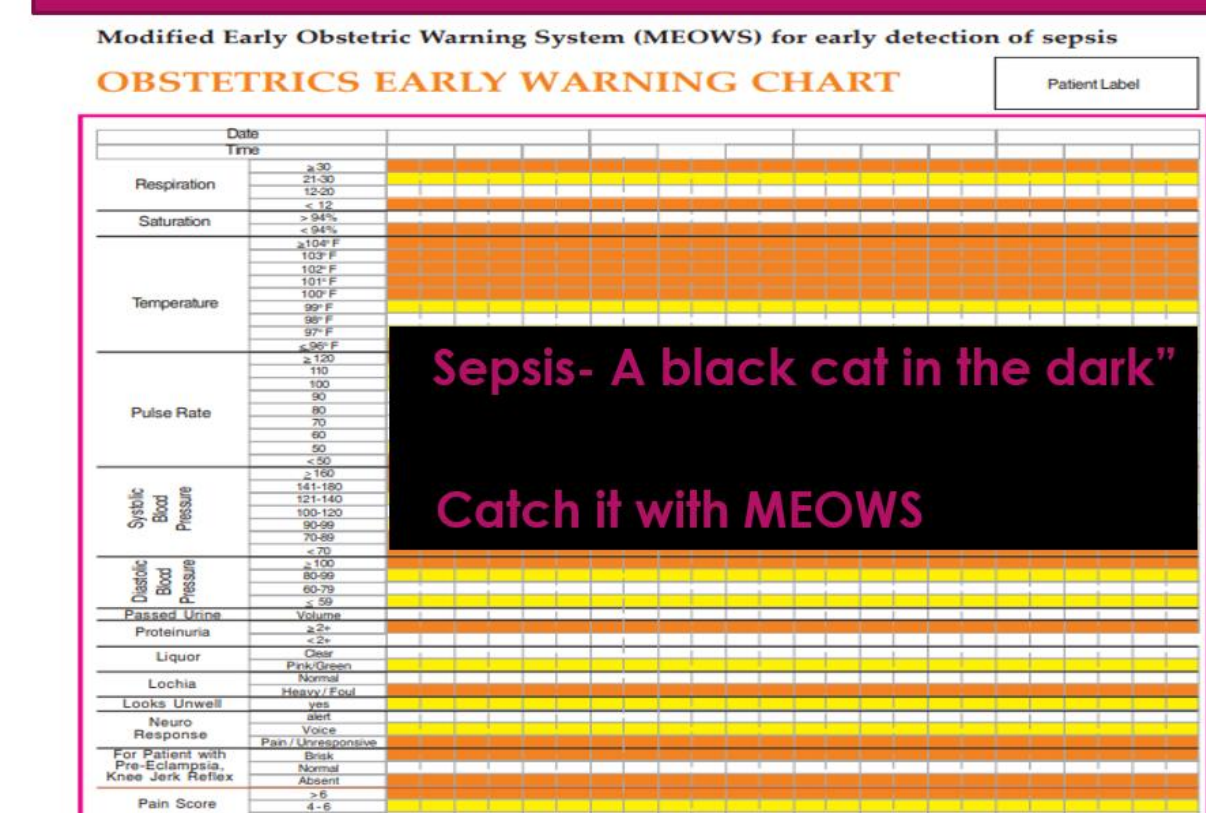
Causative factors	Remedial measures
Haemorrhagic disorders	Identification of at risk patients Identification & correction of anemia in AN period itself AMTSL Early identification & Mx of PPH
Hypertensive Cx	BP monitoring Adequate antihypertensives Educate patient about early warning symptoms
Puerperal sepsis	Antenatal risk factor assessment Urine C&S at least once during pregnancy Follow-up C&S to ensure infection is cleared Appropriate antibiotic policies
Acute collapse	Early initiation of resuscitation BLS, ACLS, ALSO training for staff
Chronic medical diseases	Preconceptional counselling Plan pregnancy in best of maternal health If not correctable- give options of surrogacy/ adoption

Our recommendations

- Awareness classes for pregnant women**
- Training for doctors & staff**
- Multidisciplinary team approach**
- Anticipation and correction of causative factors**
- Critical analysis of every near miss in the Monthly Departmental Meeting**

Tools to improve maternal care

Modified Early Obstetric Warning System



Maternity Dashboard

Clinical activity	Definition	Goal	Real day	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Unassisted pregnancy term	34-36 wks	<1%	<1%	421	422	423	424	425	426	427	428	429	430
Severe pre-eclampsia	Solidifying defining criteria	<1%	<1%	333	334	335	336	337	338	339	340	341	342
Eclampsia	Solidifying defining criteria	<1%	<1%	343	344	345	346	347	348	349	350	351	352
APH	Solidifying defining criteria	<1%	<1%	353	354	355	356	357	358	359	360	361	362
PPH	Blood loss >100ml	<1%	<1%	363	364	365	366	367	368	369	370	371	372
ICU rates	Percentage of total births	<1%	<1%	373	374	375	376	377	378	379	380	381	382
CL rates	Percentage of total births	<1%	<1%	383	384	385	386	387	388	389	390	391	392

❖ Like a traffic light system
❖ To benchmark activity & monitor performance against standards
❖ Helps identify areas of improvement
❖ Improves overall quality of care

Conclusion



- Near miss cases are only a tip of the iceberg
- For every maternal mortality there are atleast 10 near miss cases
- Identification of contributing factors & corrective measures can save a woman's life

References

- 1) Applicability of the WHO maternal near miss criteria in a low-resource setting. Nelissen E, Mduma E, Broerse J, et al., PLoS One. 2013;8(4):e61248
- 2) Trends in maternal mortality in India over two decades in nationally representative surveys. Meh C, Sharma A, Ram U et al. BJOG. 2022 Mar;129(4):550-561