# National Maternal Mortality Reviews - 2016

## *Outcome Dissemination*

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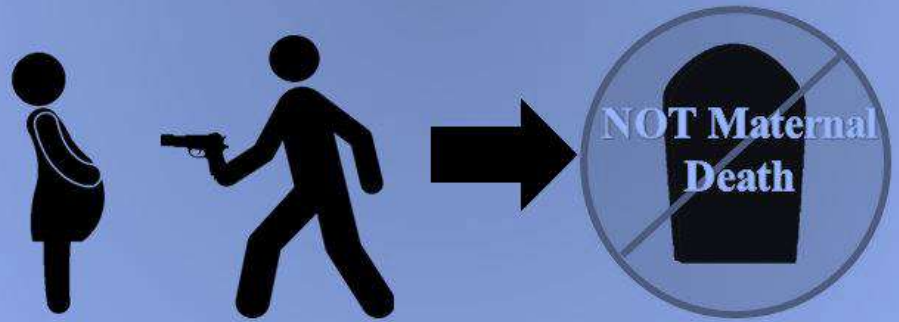
Family Health Bureau – Ministry of Health

**Maternal death**: the death of a woman while pregnant, (or within 42 days of termination of pregnancy).

***Accidental or incidental causes of death are not classified as maternal deaths.***



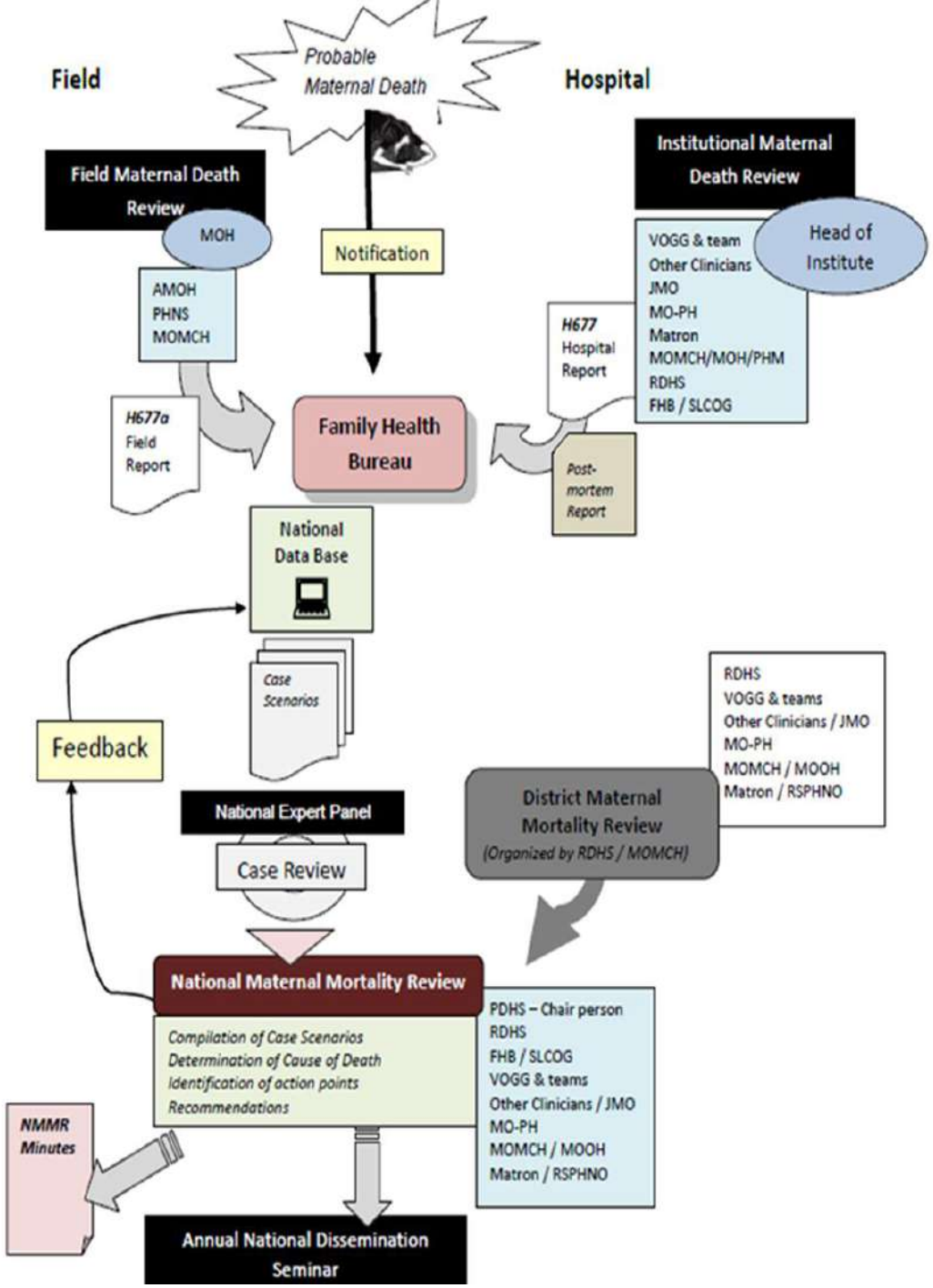

Population Research Institute: pop.org

# Definition

# MDSR Mechanism – Sri Lanka

## Notification Criteria

All females deaths (15 – 49 yrs) during the pregnancy period and until one year after termination of pregnancy



# NMMR Reviews

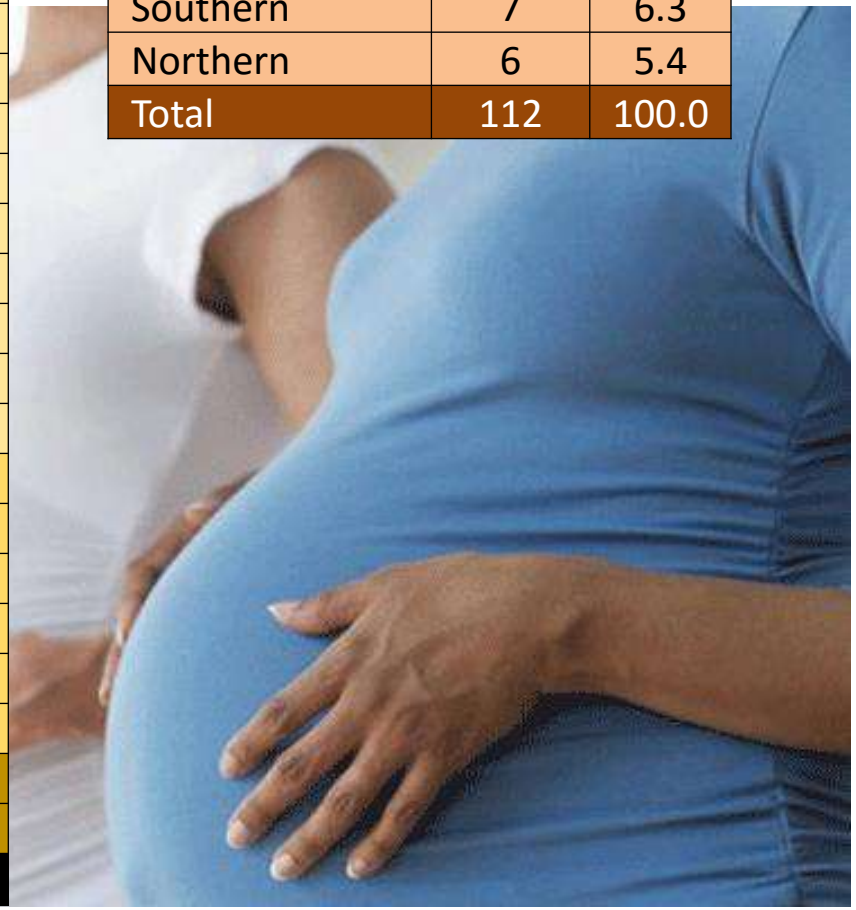
# Number of Maternal Deaths

**112**

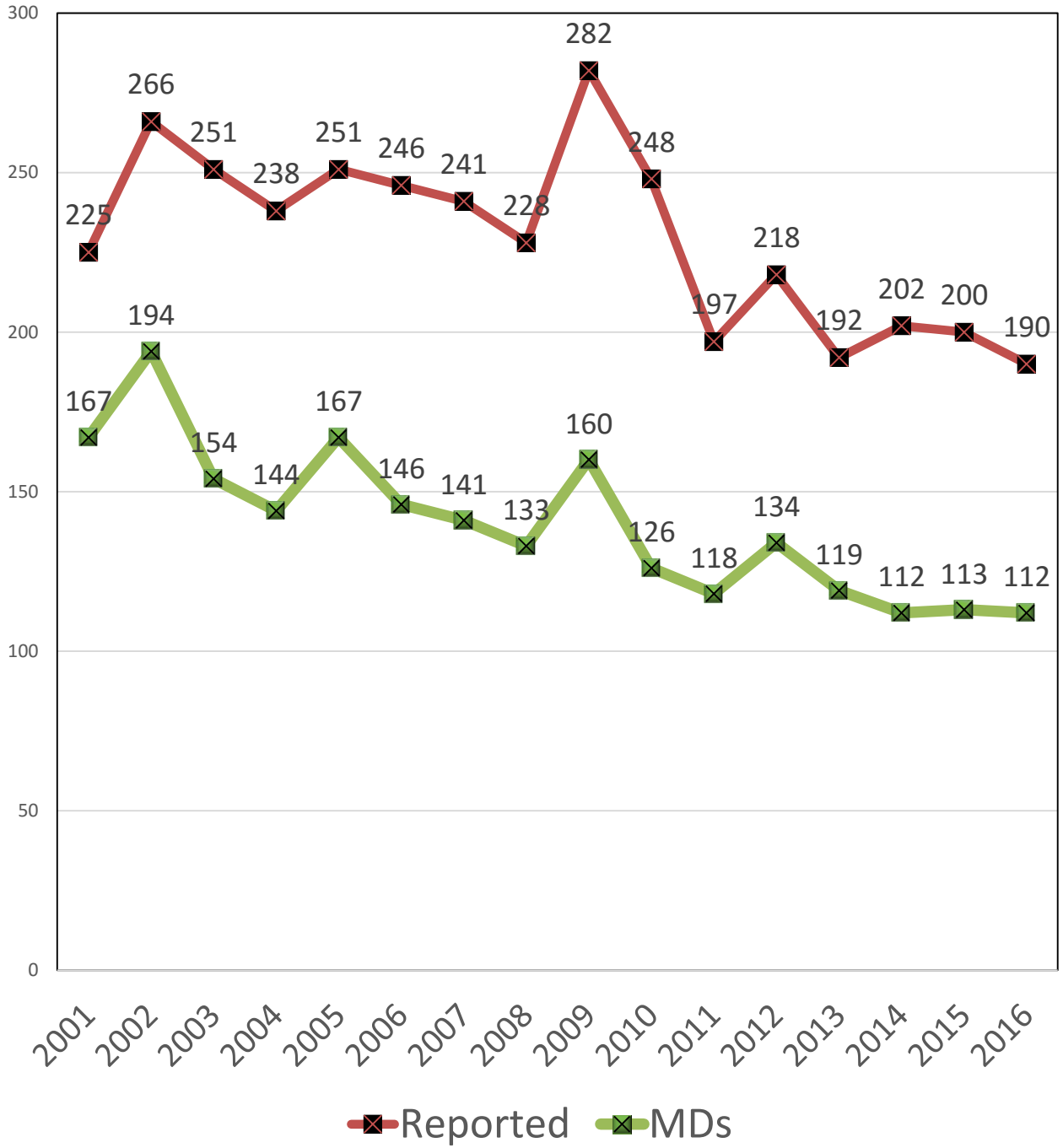
| | |
|---|---|
| **0** Deaths | 3 |
| **< 5** Deaths | 14 |
| **6 – 10** Deaths | 6 |
| **> 10** deaths | 2 |

| District | Deaths |
|---|---|
| Hambantota | 0 |
| Mullativu | 0 |
| Vavuniya | 0 |
| Monaragala | 1 |
| Mannar | 1 |
| Polonnaruwa | 2 |
| Kilinochichi | 2 |
| Galle | 3 |
| Kalutara | 3 |
| Batticaloa | 3 |
| Jaffna | 3 |
| Matara | 4 |
| Kegalle | 4 |
| Matale | 4 |
| Trincomalee | 4 |
| Ratnapura | 5 |
| Ampara / Kalmunai | 5 |
| Anuradhapura | 6 |
| Puttalam | 7 |
| Nuwara-Eliya | 7 |
| Kandy | 8 |
| Kurunegala | 8 |
| Badulla | 8 |
| Colombo | 12 |
| Gampaha | 12 |
| **Sri Lanka** | **112** |

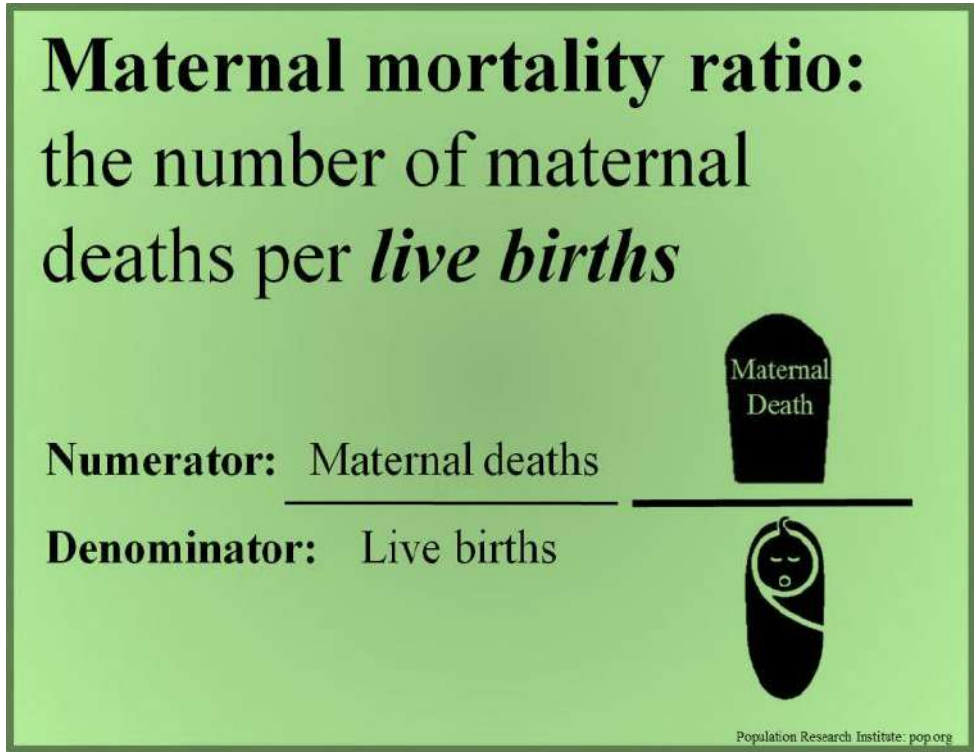
| Province | N | % |
|---|---|---|
| Western | 27 | 24.1 |
| Central | 19 | 17.0 |
| NWP | 15 | 13.4 |
| Eastern | 12 | 10.7 |
| Sabaragamuwa | 9 | 8.0 |
| Uva | 9 | 8.0 |
| NCP | 8 | 7.1 |
| Southern | 7 | 6.3 |
| Northern | 6 | 5.4 |
| Total | 112 | 100.0 |



# Reported and confirmed Maternal Deaths



# Maternal Mortality Ratio




$$MMR = \frac{112}{331{,}073} \times 100000$$

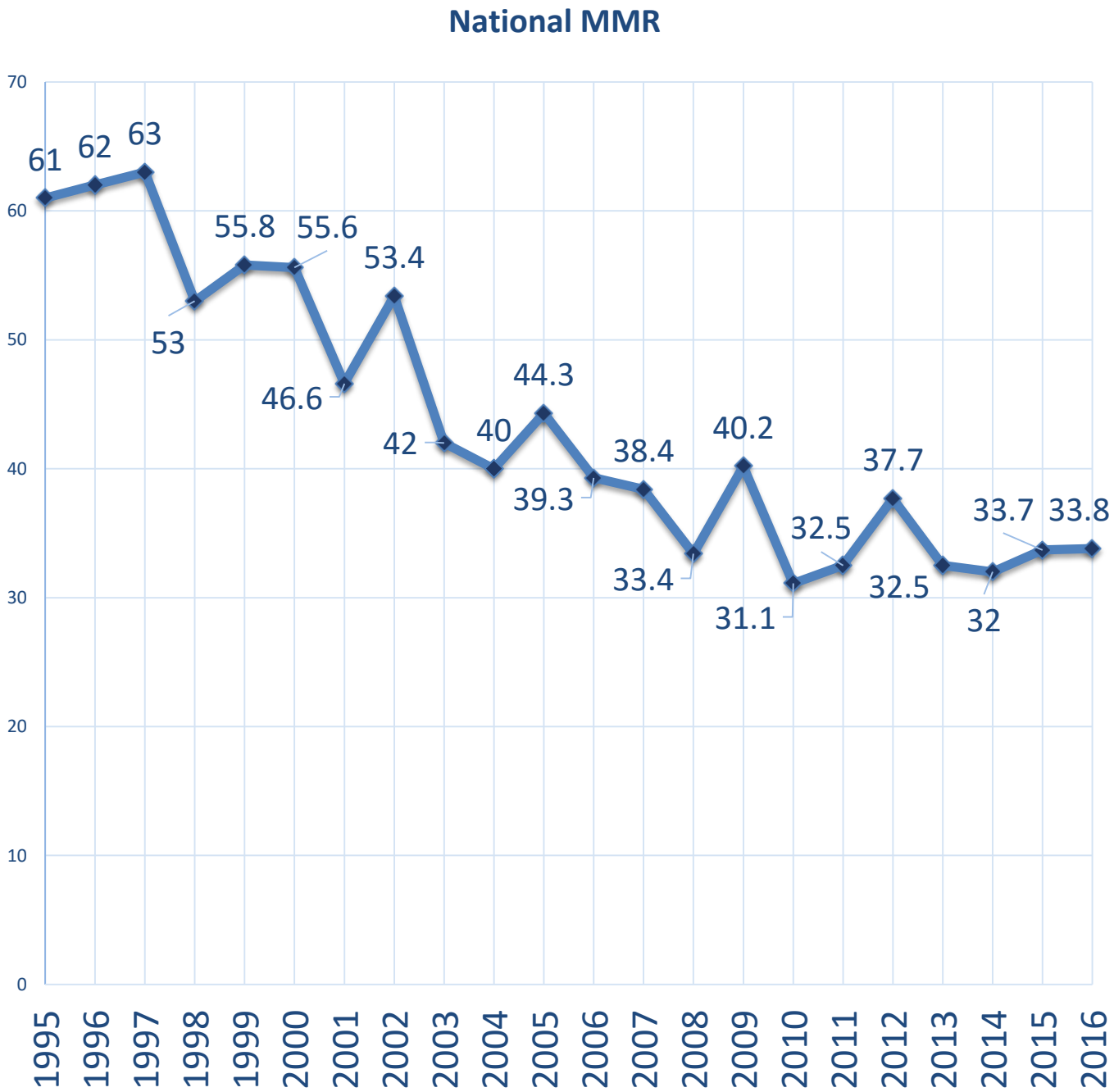
**33.8**

*per 100,000 live births*

**Denominator Reduction = 3748**

(2015 - 334,821, 2016 – 331,073)

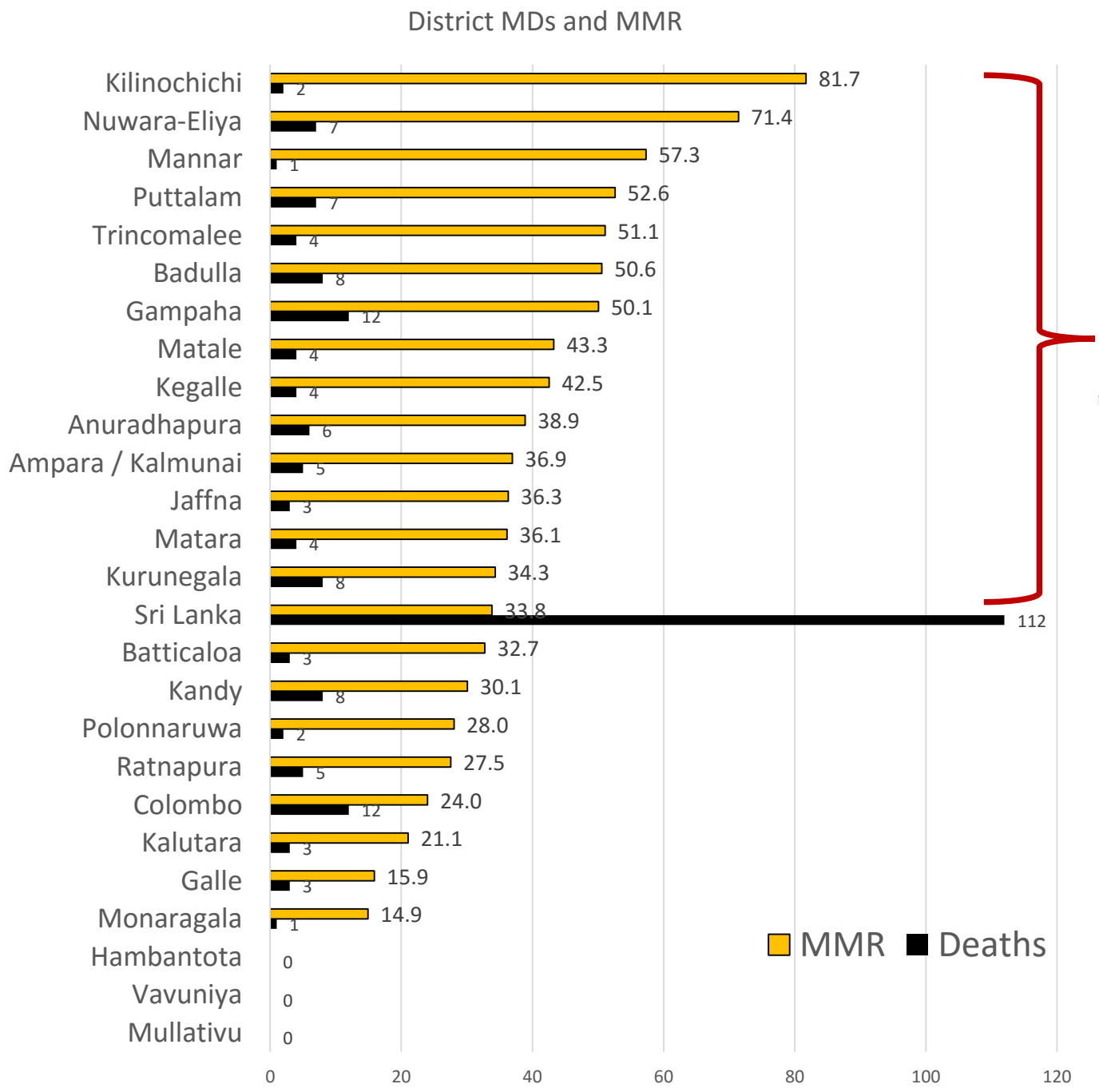
# Progression of National MMR



# District Level Live Births, Maternal Deaths and MMR

| District | Live births | Deaths | MMR |
|---|---|---|---|
| Mullativu | 874 | 0 | 0.0 |
| Mannar | 1,744 | 1 | 57.3 |
| Kilinochichi | 2,447 | 2 | 81.7 |
| Vavuniya | 3,416 | 0 | 0.0 |
| Monaragala | 6,707 | 1 | 14.9 |
| Polonnaruwa | 7,132 | 2 | 28.0 |
| Trincomalee | 7,829 | 4 | 51.1 |
| Jaffna | 8,264 | 3 | 36.3 |
| Batticaloa | 9,167 | 3 | 32.7 |
| Matale | 9,244 | 4 | 43.3 |
| Kegalle | 9,403 | 4 | 42.5 |
| Nuwara-Eliya | 9,799 | 7 | 71.4 |
| Hambantota | 10,732 | 0 | 0.0 |
| Matara | 11,075 | 4 | 36.1 |
| Puttalam | 13,307 | 7 | 52.6 |
| Ampara / Kalmunai | 13,538 | 5 | 36.9 |
| Kalutara | 14,251 | 3 | 21.1 |
| Anuradhapura | 15,423 | 6 | 38.9 |
| Badulla | 15,817 | 8 | 50.6 |
| Ratnapura | 18,155 | 5 | 27.5 |
| Galle | 18,905 | 3 | 15.9 |
| Kurunegala | 23,307 | 8 | 34.3 |
| Gampaha | 23,957 | 12 | 50.1 |
| Kandy | 26,587 | 8 | 30.1 |
| Colombo | 49,993 | 12 | 24.0 |
| Sri Lanka | 331,073 | 112 | 33.8 |

# District MMR



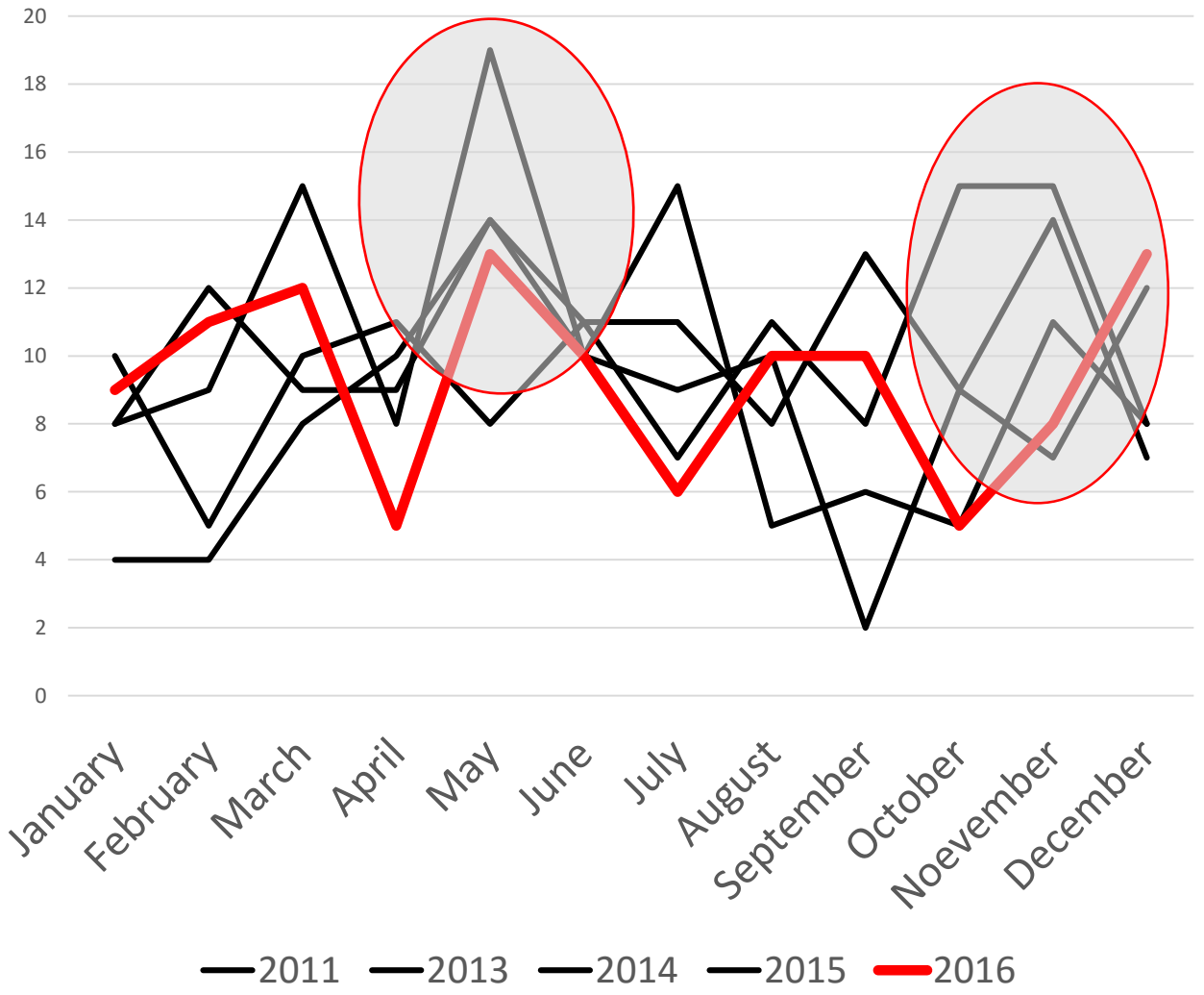

**14 districts > national MMR**

**Leading districts:**

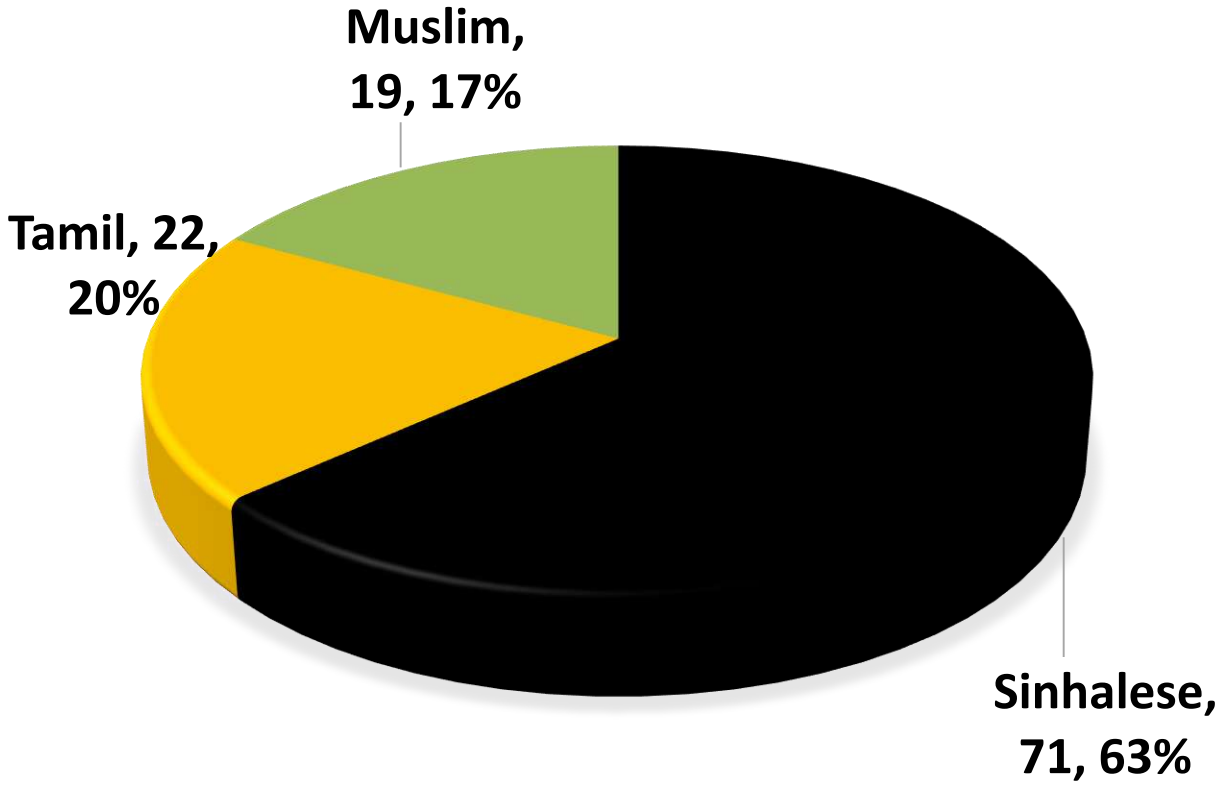
1. Kilinochchi
2. Nuwara Eliya
3. Mannar
4. Puttlam
5. Trincomalee

# Seasonality

| Month | N |
|---|---|
| January | 9 |
| February | 11 |
| March | 12 |
| April | 5 |
| May | 13 |
| June | 10 |
| July | 6 |
| August | 10 |
| September | 10 |
| October | 5 |
| November | 8 |
| December | 13 |
| Total | 112 |



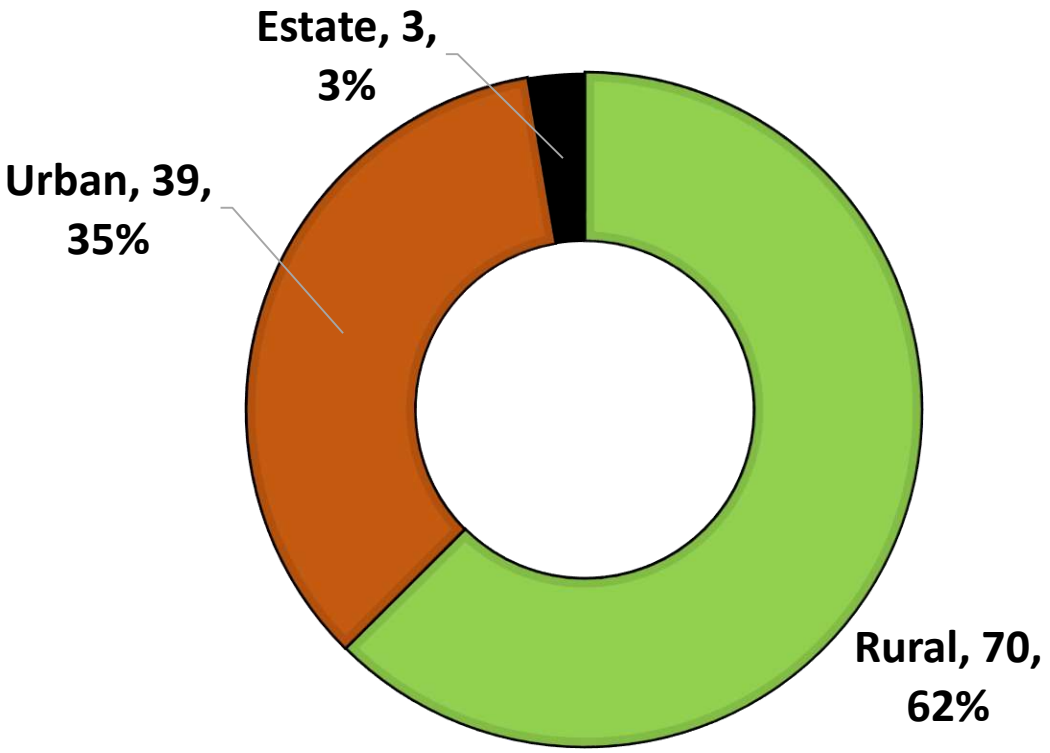
# Ethnicity



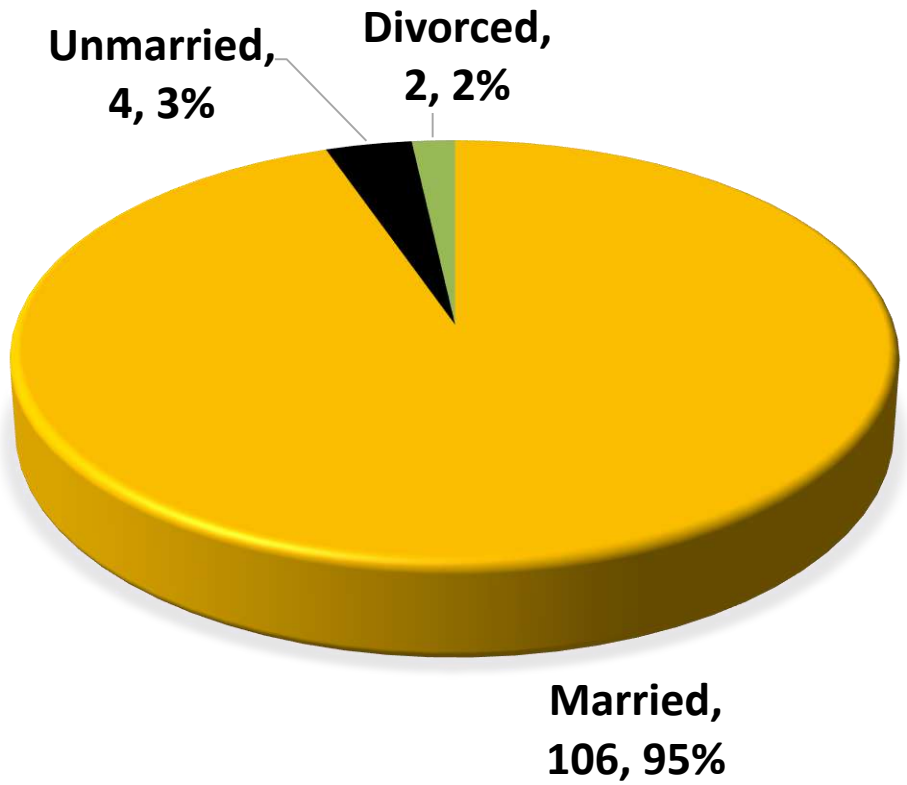

**Ethnic composition of the population** *(2012)*

| | |
|---|---|
| Sinhalese | 74.9% |
| Tamil | 15.3% |
| Muslim | 9.3% |

# Sector




# Marital Status



# Educational Level

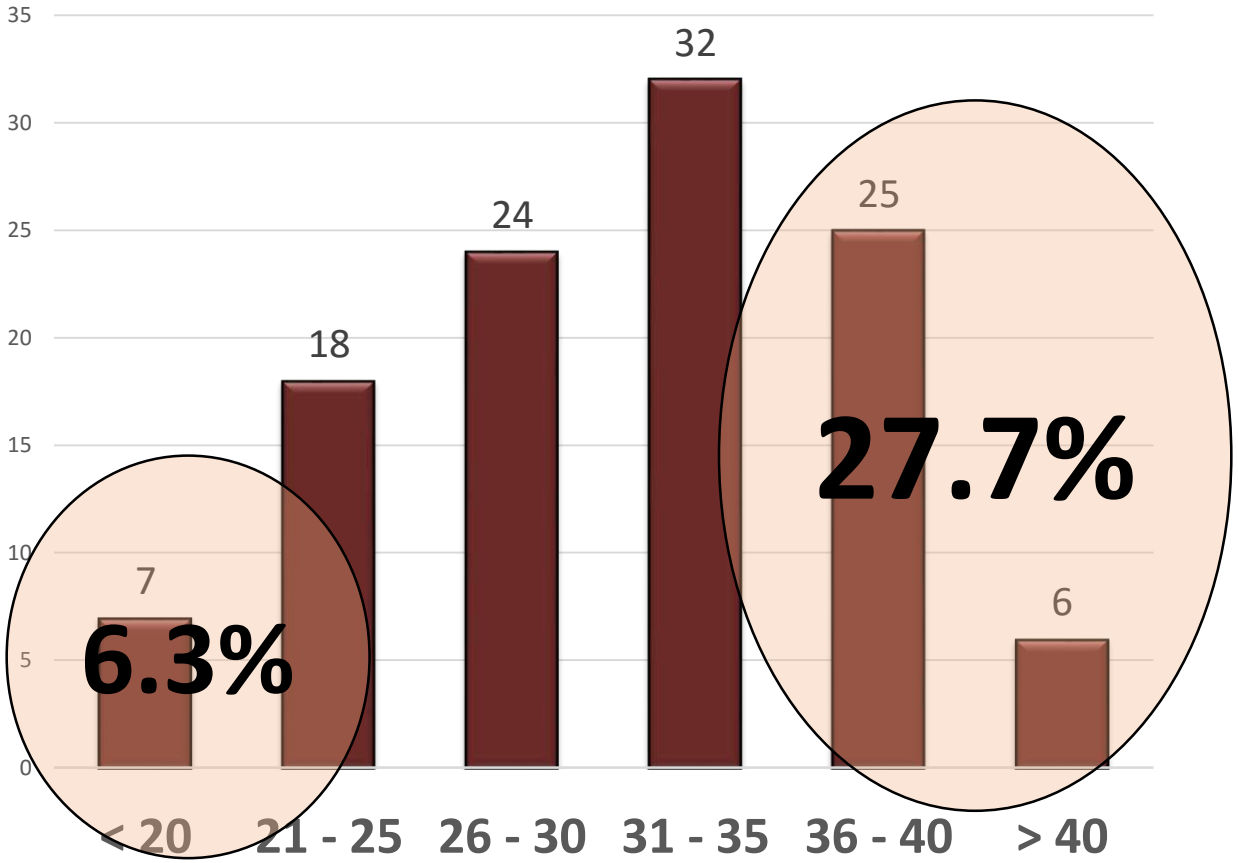
| Education | N | % |
|---|---|---|
| No education | 2 | 1.8 |
| Primary | 8 | 7.1 |
| Secondary | 91 | 81.3 |
| Tertiary | 8 | 7.1 |
| Unknown | 3 | 2.7 |
| Total | 112 | 100.0 |

**88.4%**

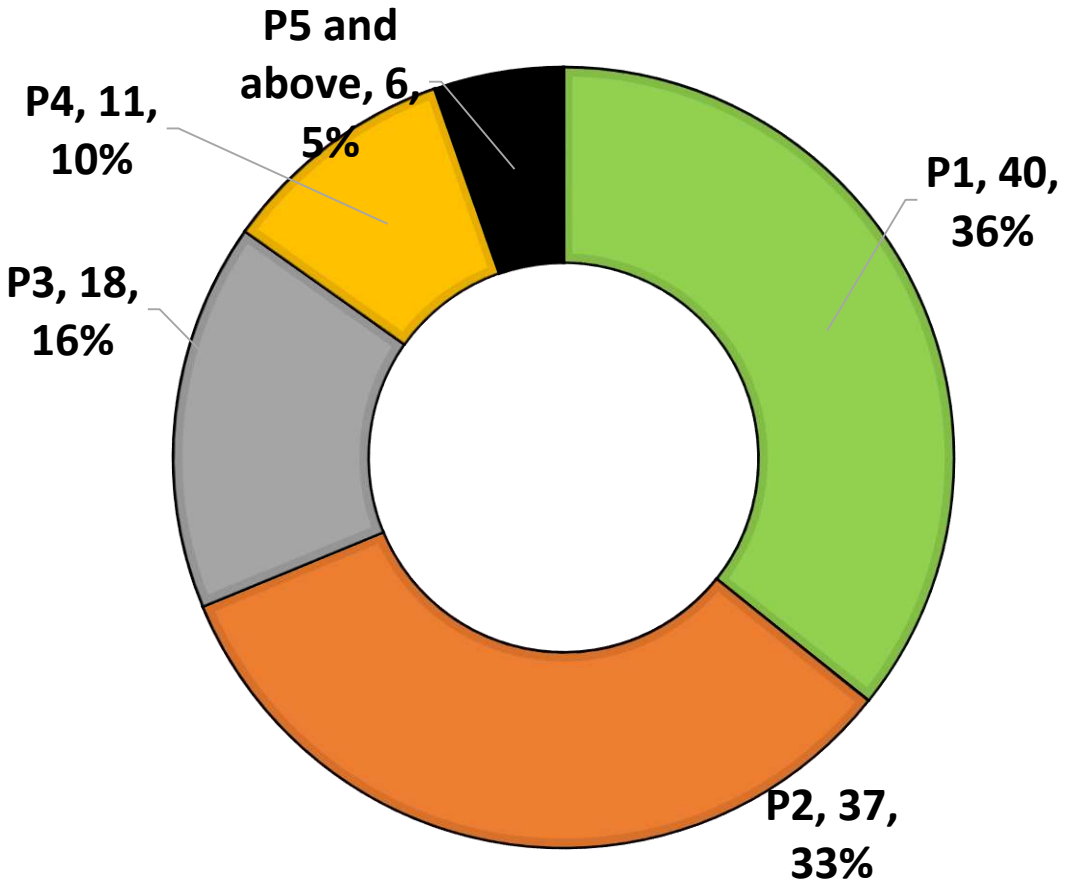
# Employment

| Occupation | N | % |
|---|---|---|
| Yes | 21 | 18.8 |
| No | 91 | 81.3 |
| Total | 112 | 100.0 |

# Age Group




# Parity



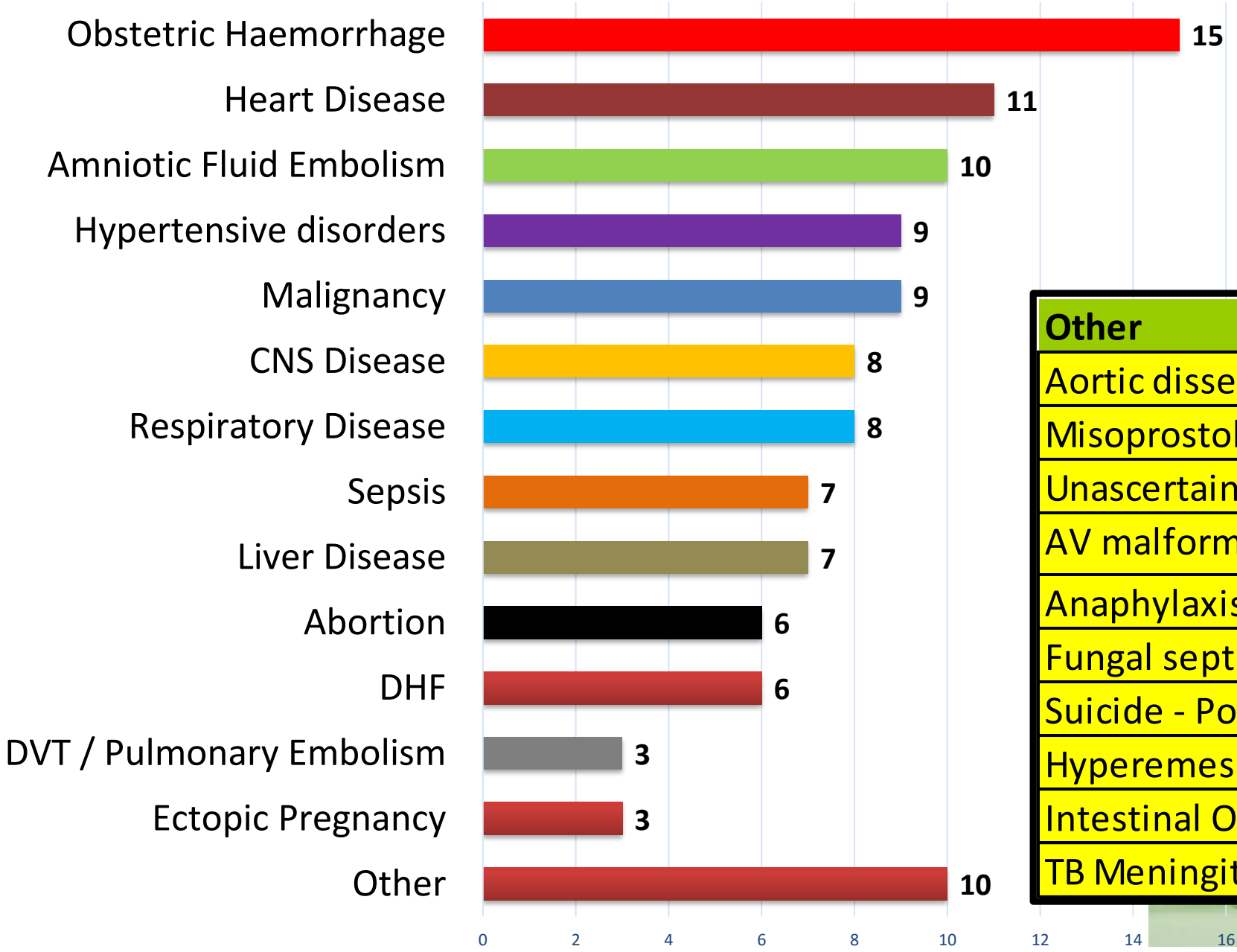
# Conducting Post-Mortems

| Year | MDs | % |
|---|---|---|
| 2011 | 134 | 94% |
| 2012 | 118 | 92% |
| 2013 | 119 | 96% |
| 2014 | 112 | 95% |
| 2015 | 113 | 96% |
| 2016 | 112 | 94% |

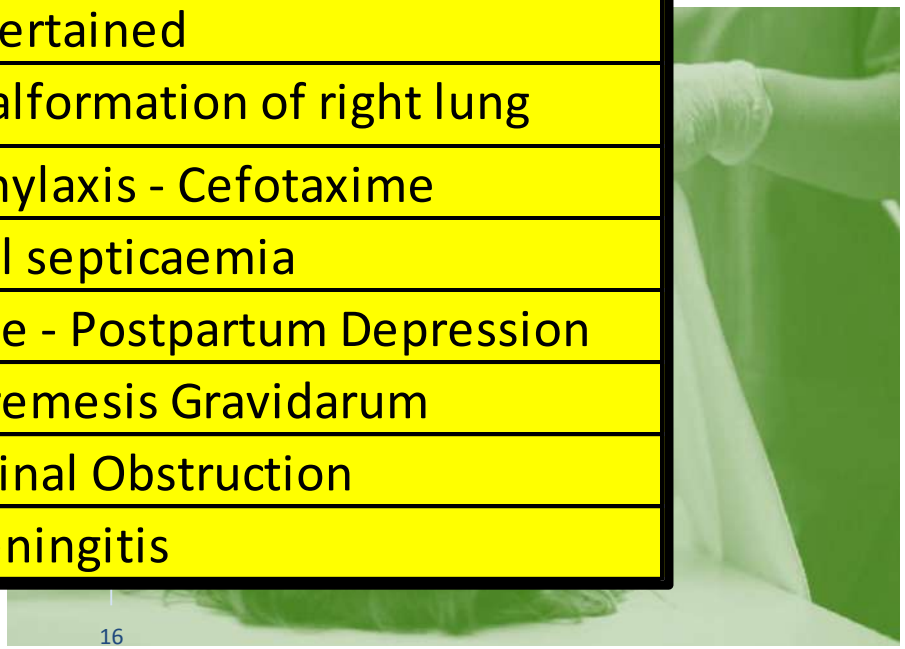
**Final determination of Cause of Death**

*-through a consensus reaching process*

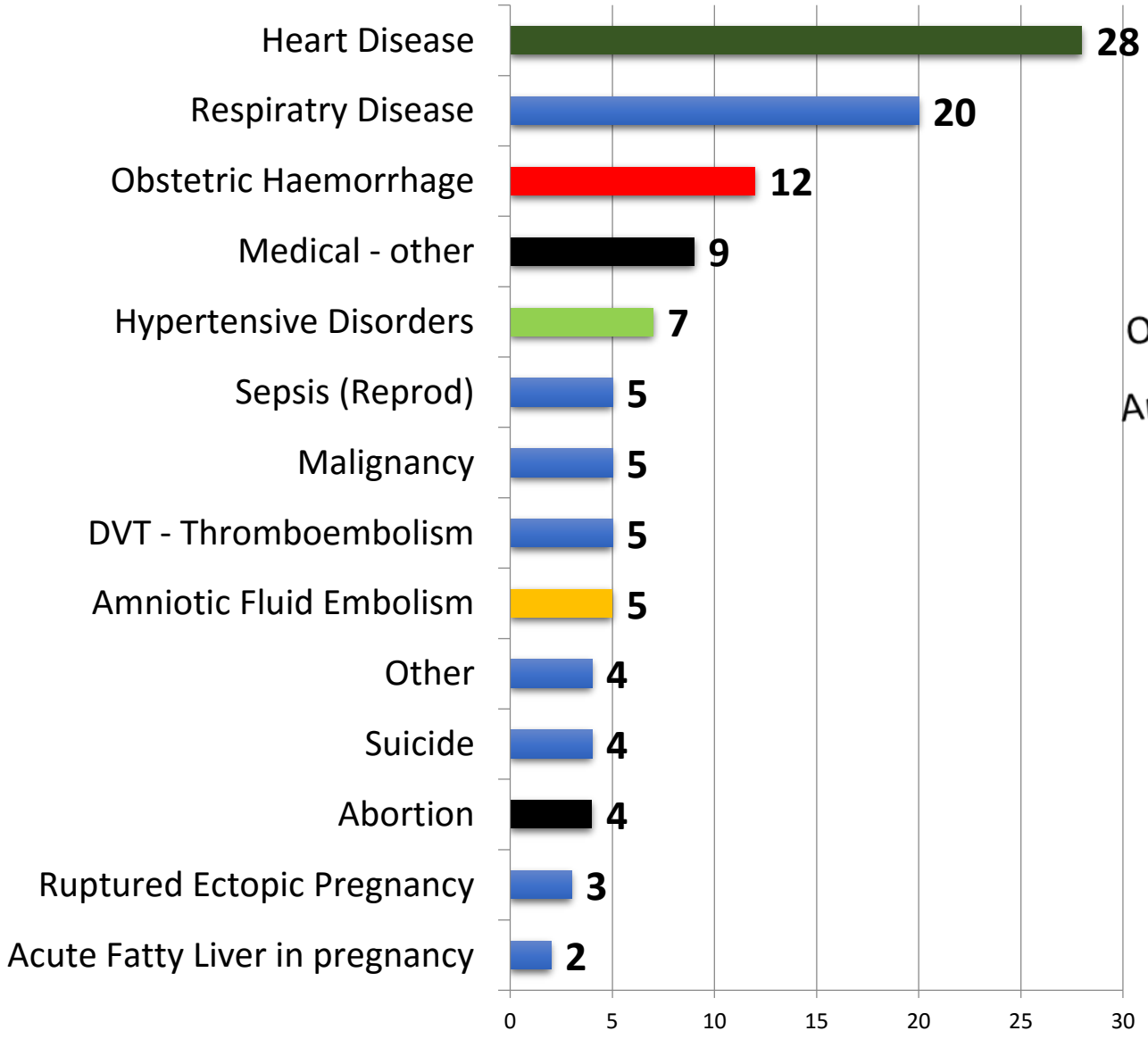
# Causes of Maternal deaths



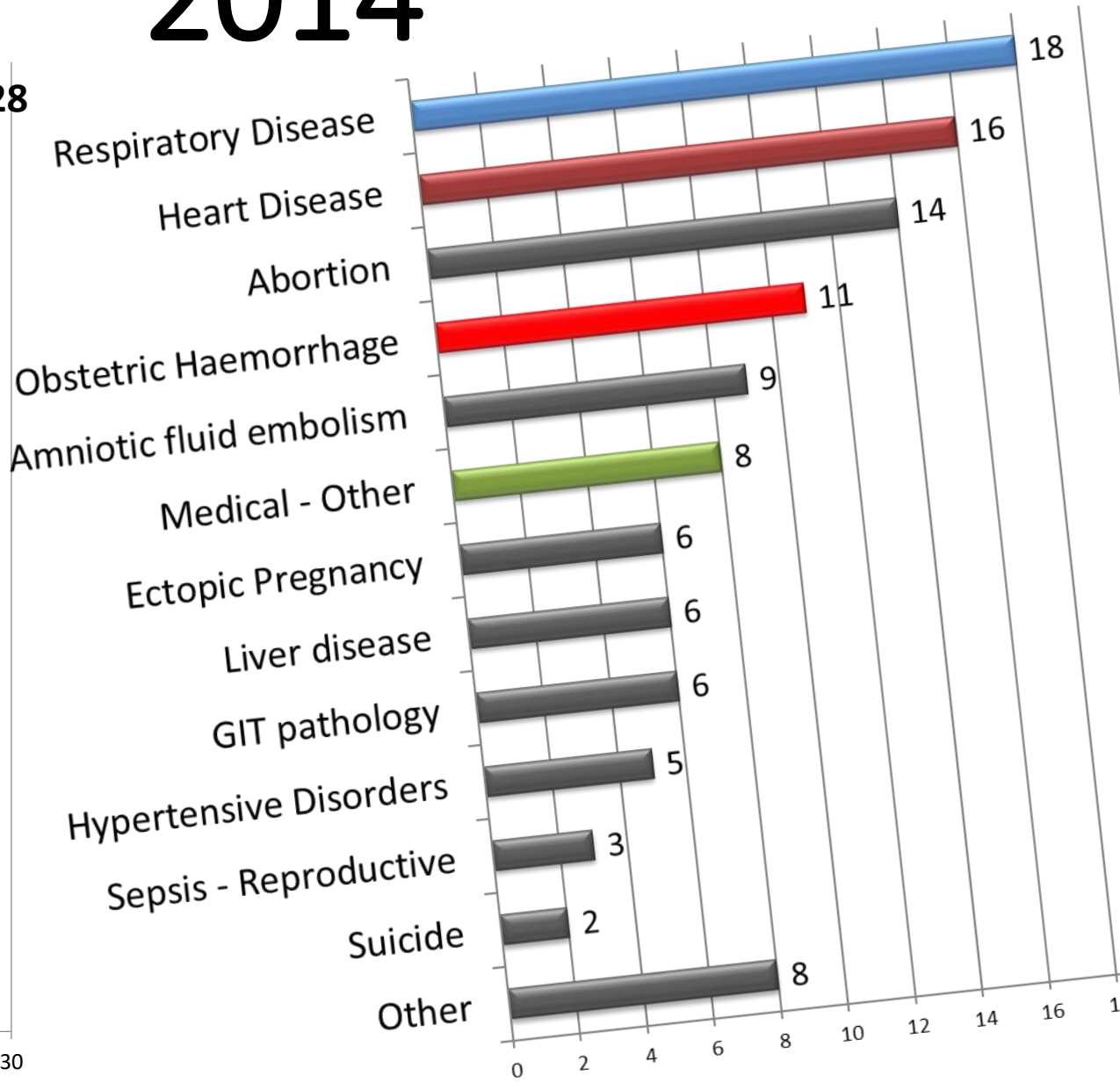

| Other |
| --- |
| Aortic dissection |
| Misoprostol overdose |
| Unascertained |
| AV malformation of right lung |
| Anaphylaxis - Cefotaxime |
| Fungal septicaemia |
| Suicide - Postpartum Depression |
| Hyperemesis Gravidarum |
| Intestinal Obstruction |
| TB Meningitis |

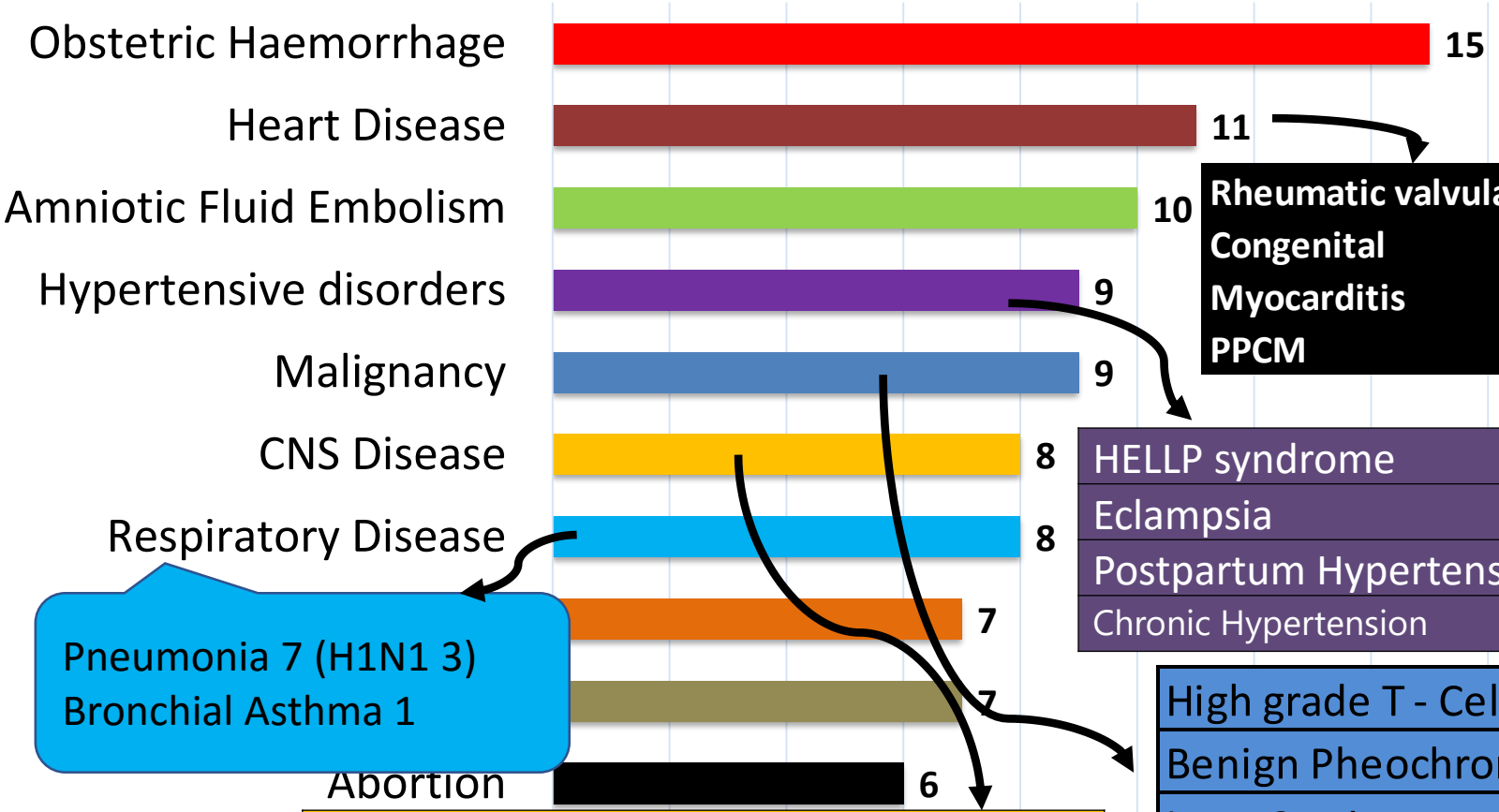


# 2015


Heart Disease 28
Respiratry Disease 20
Obstetric Haemorrhage 12
Medical - other 9
Hypertensive Disorders 7
Sepsis (Reprod) 5
Malignancy 5
DVT - Thromboembolism 5
Amniotic Fluid Embolism 5
Other 4
Suicide 4
Abortion 4
Ruptured Ectopic Pregnancy 3
Acute Fatty Liver in pregnancy 2
0 5 10 15 20 25 30

# 2014


Respiratory Disease 18
Heart Disease 16
Abortion 14
Obstetric Haemorrhage 11
Amniotic fluid embolism 9
Medical - Other 8
Ectopic Pregnancy 6
Liver disease 6
GIT pathology 6
Hypertensive Disorders 5
Sepsis - Reproductive 3
Suicide 2
Other 8
0 2 4 6 8 10 12 14 16




| Haemorrhage | N |
|---|---|
| PPH | 8 |
| Uterine rupture | 4 |
| Placental disorders | 1 |
| Placental abruption | 1 |
| Uterine haematoma | 1 |
| | 15 |

| | |
|---|---|
| Rheumatic valvular | 3 |
| Congenital | 5 |
| Myocarditis | 2 |
| PPCM | 1 |

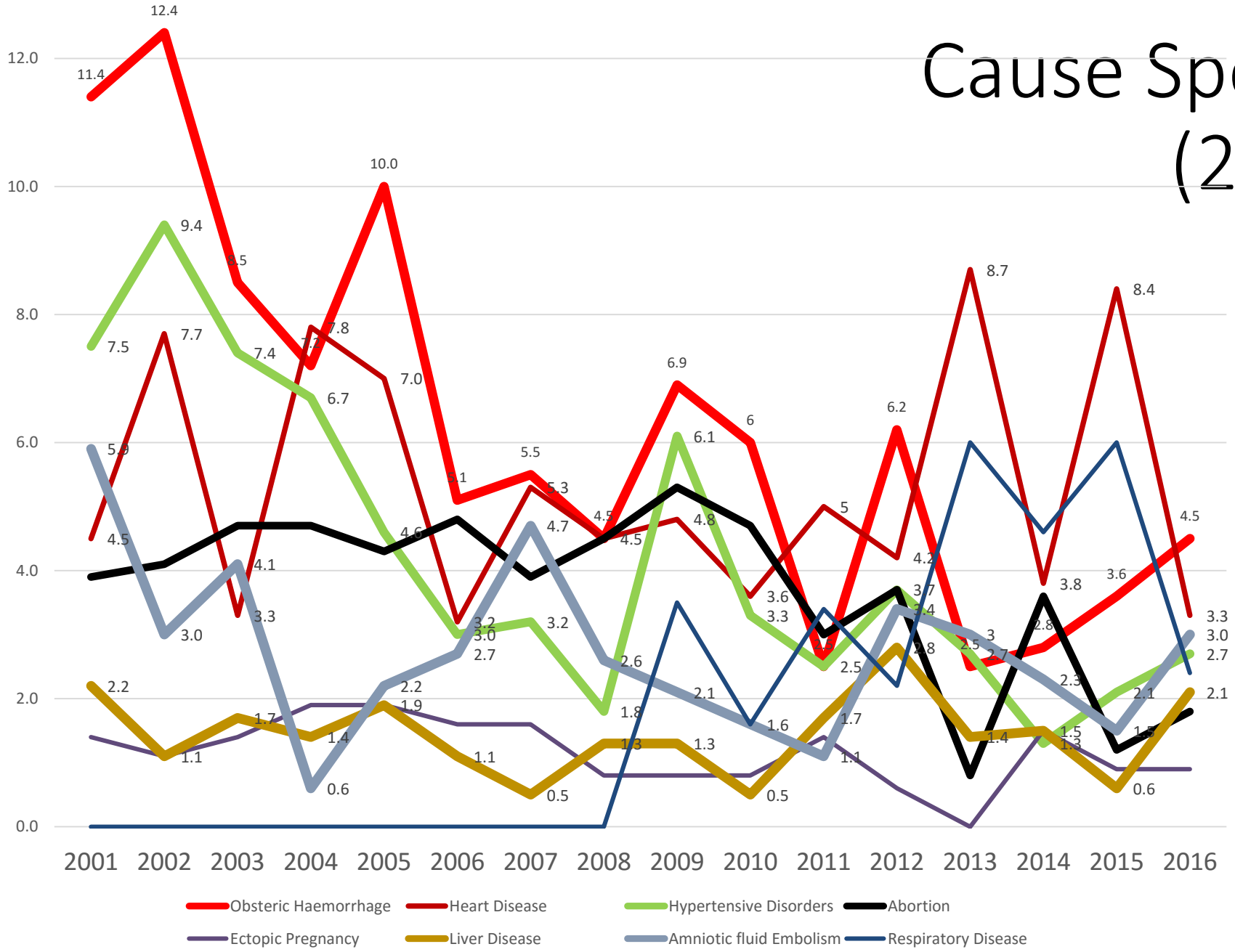
| | |
|---|---|
| HELLP syndrome | 3 |
| Eclampsia | 4 |
| Postpartum Hypertension | 1 |
| Chronic Hypertension | 1 |

Pneumonia 7 (H1N1 3)
Bronchial Asthma 1

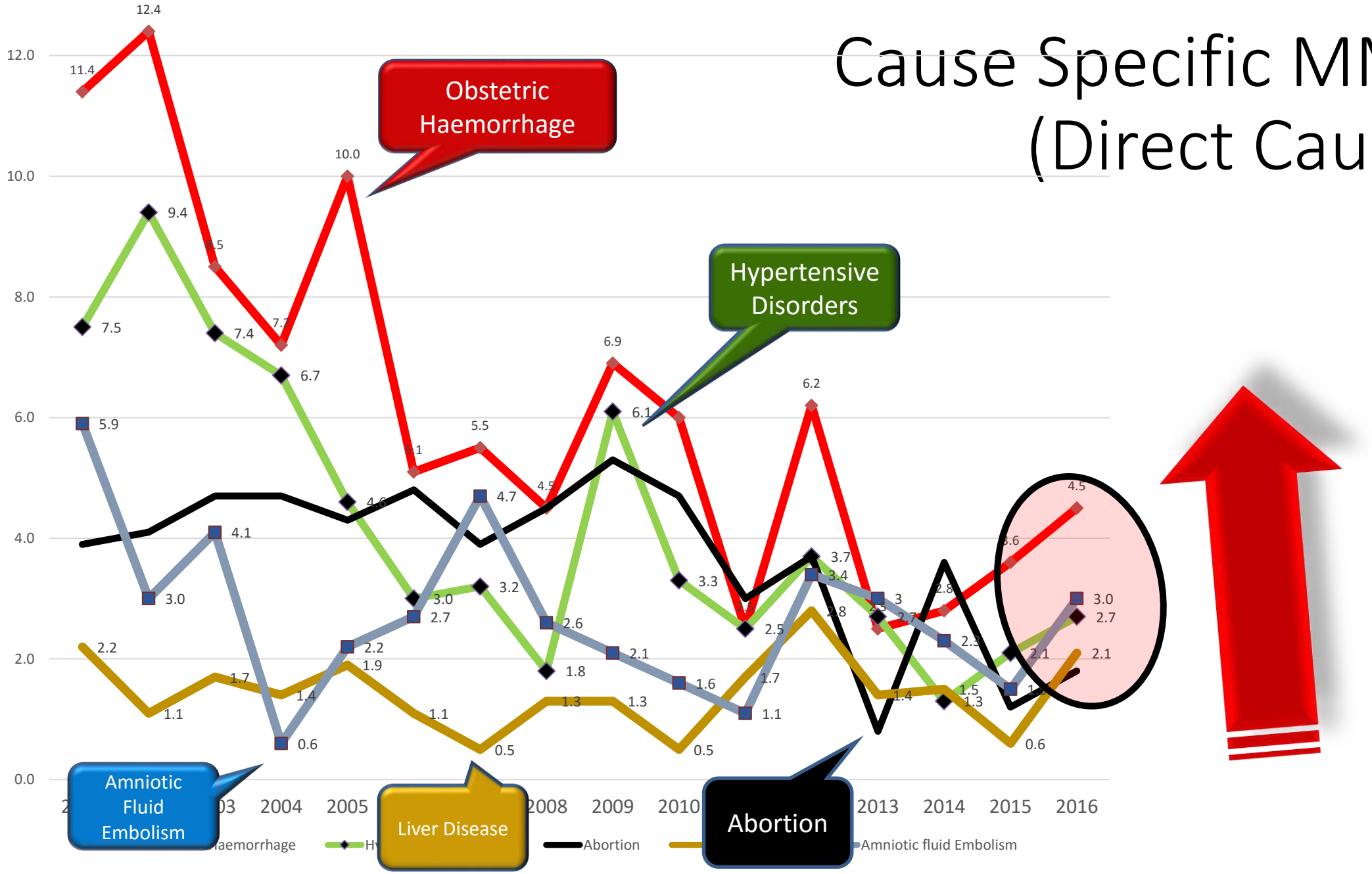
- Guillain Barre Syndrome -? Atypical
- Ruptured AV Malformation
- SAH due to ?Berry Aneurysm
- CNS -colloid cyst of brain
- Ruptured Berry aneurism
- Viral Encephalitis
- Epilepsy
- Obstructed VP shunt

- High grade T - Cell Lymphoma
- Benign Pheochromocytoma
- Lung Carcinoma
- Acute Promyelocytic Leukaemia
- Heamorrhagic brain tumor
- Brain Tumour - Astroglioma
- Choriocarcinoma
- Right Sphenoid wing meningioma
- CA tongue

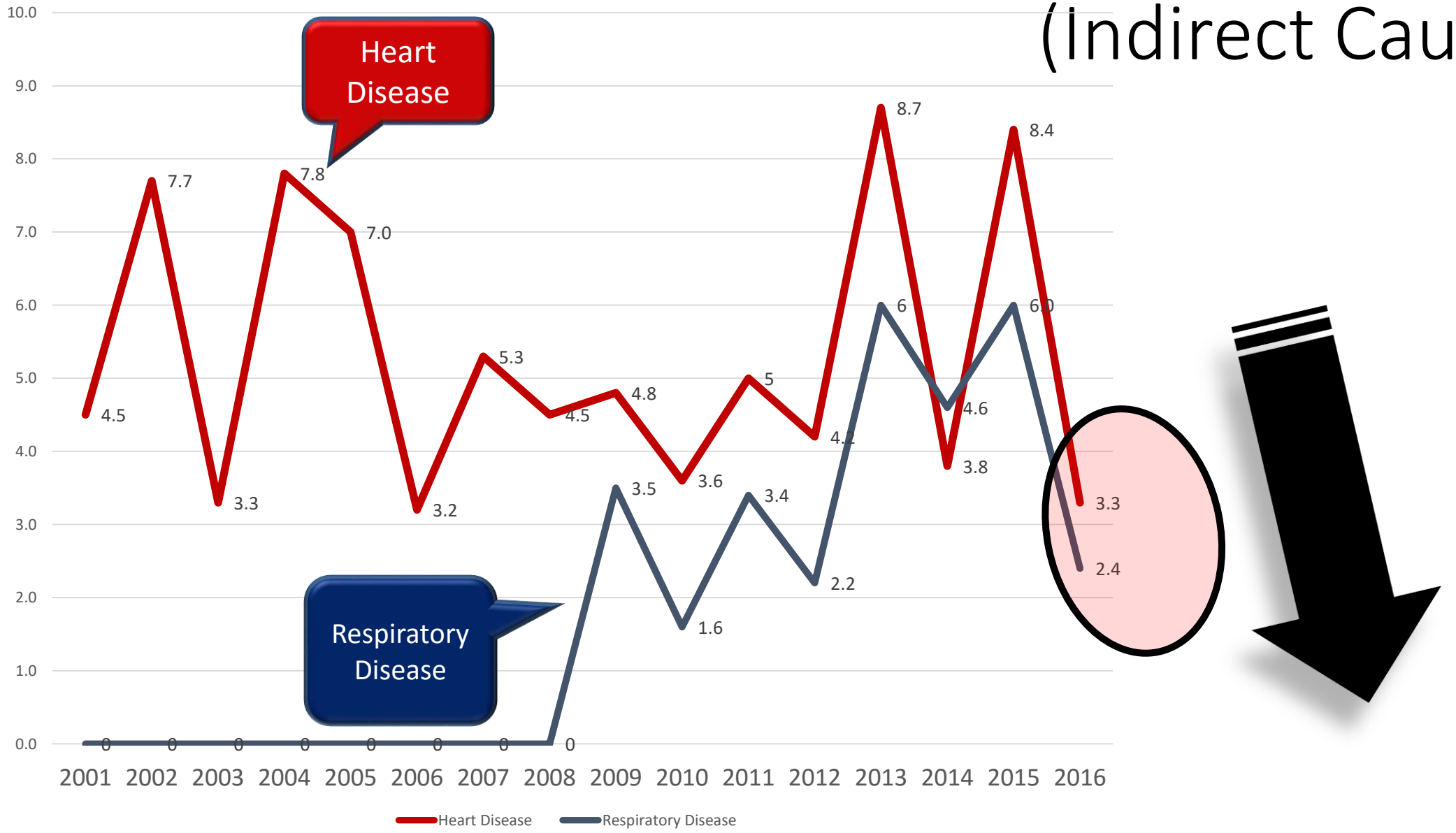
# Cause Specific MMRs (2001 – 2016)



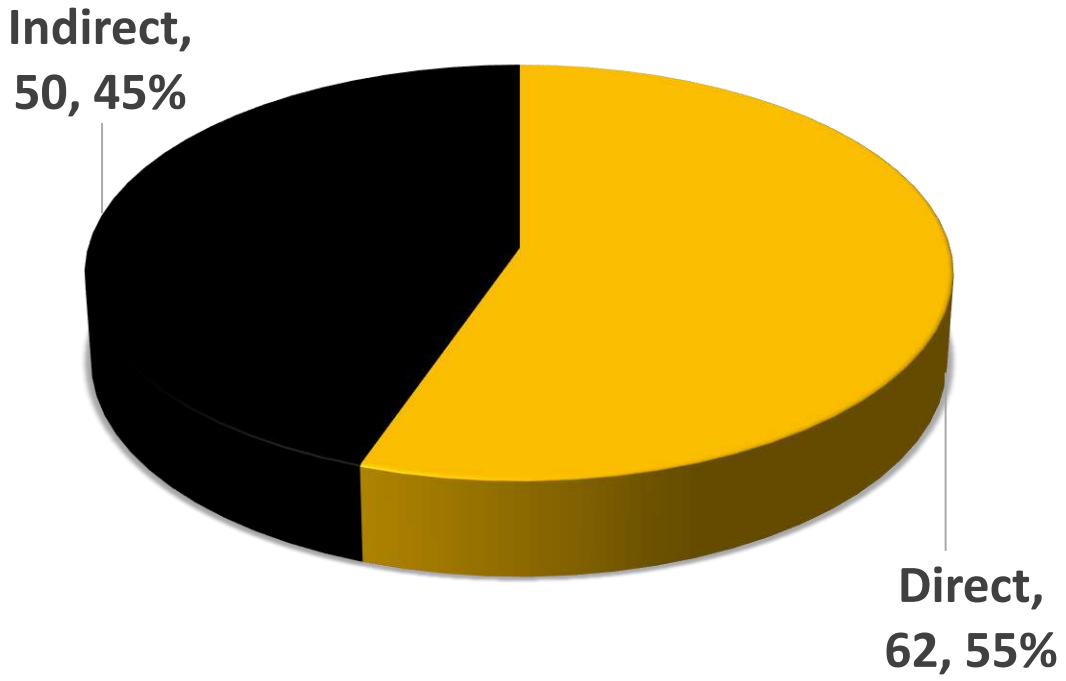
# Cause Specific MMRs (Direct Causes)



# Cause Specific MMRs (Indirect Causes)



# Category of MD

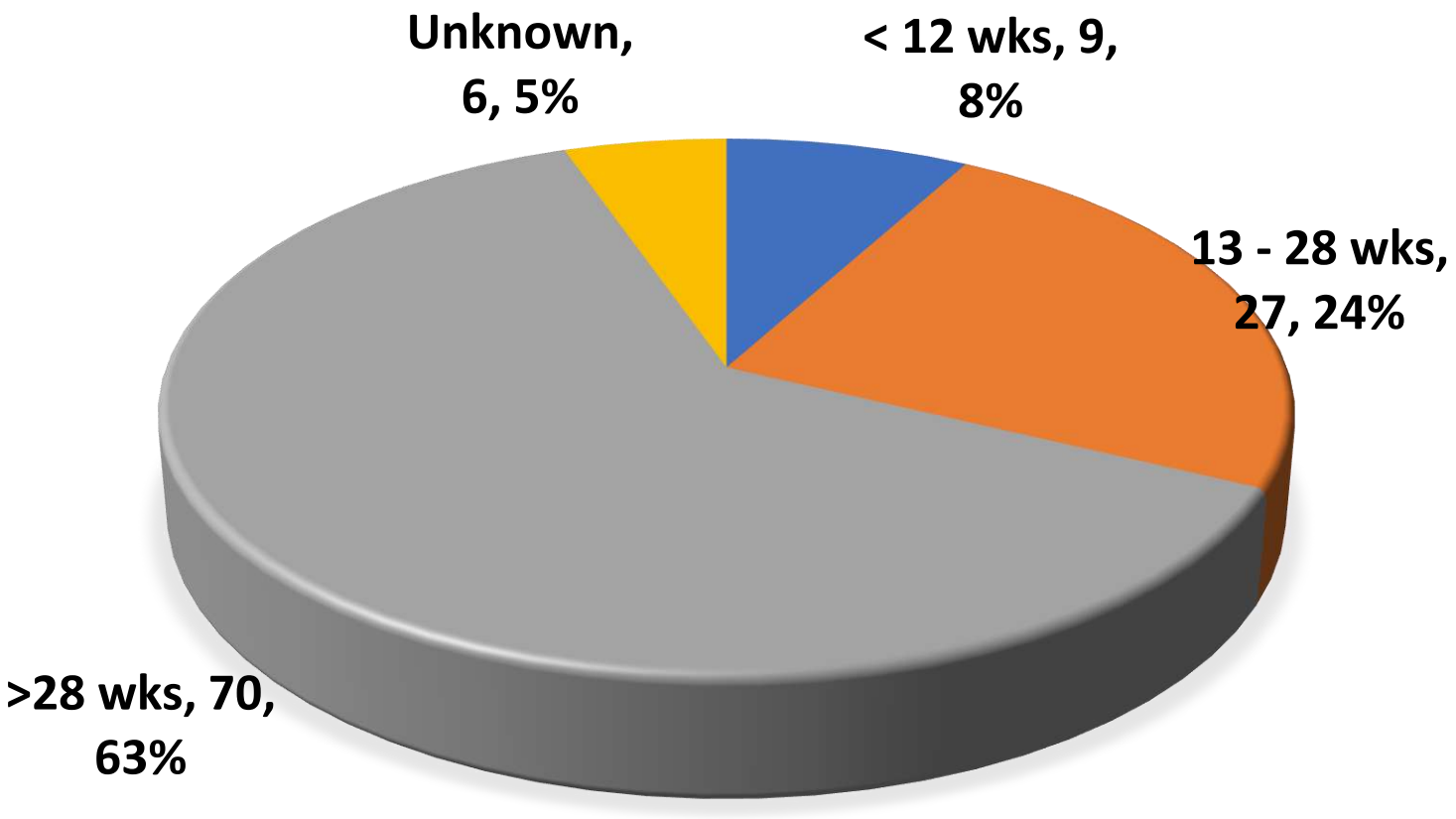



# Timing of death

| Timing | N | % |
|---|---|---|
| Antenatal | 35 | 31.3 |
| Postnatal/Post-abortion | 77 | 68.8 |
| Total | 112 | 100.0 |

| | |
|---|---|
| > 6 hrs | 9 |
| 6- 12 hrs | 3 |
| 12 - 24 hrs | 3 |
| 1 - 42 days | 59 |
| Unknown | 3 |

# POA completed before delivery or death

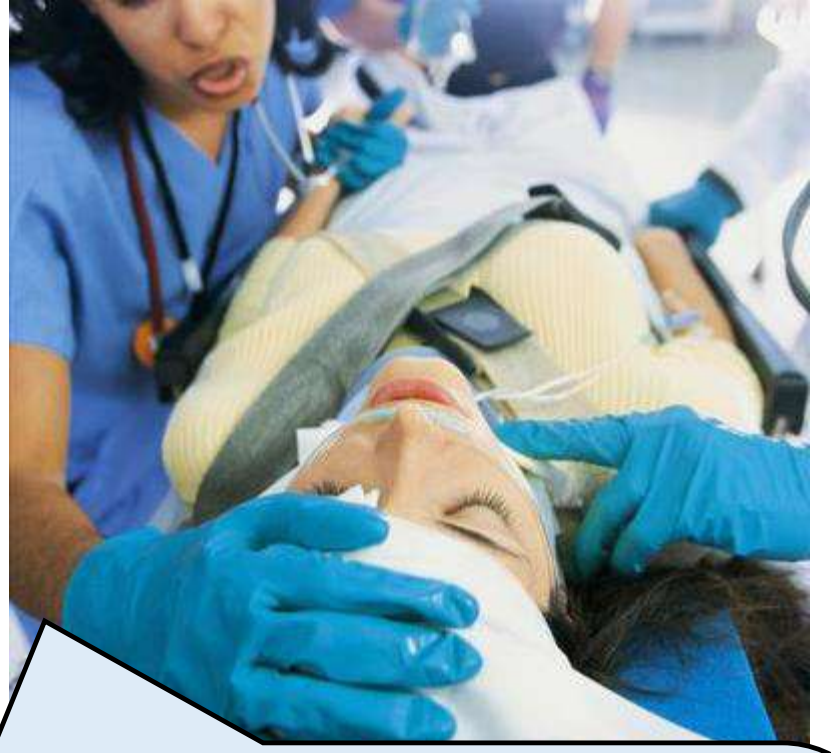



# Pregnancy outcome

| Pregnancy outcome | N | % |
|---|---|---|
| Abortion / Ectopic | 10 | 8.9 |
| Not delivered | 31 | 27.7 |
| Live baby | 54 | 48.2 |
| Stillbirth / NND | 14 | 12.5 |
| Not available | 3 | 2.7 |
| Total | 112 | 100.0 |

# Place of death

| Place of death | N | % |
|---|---|---|
| Home | 2 | 1.8 |
| In transit / On admission | 9 | 8.0 |
| Hospital | 101 | 90.2 |
| Total | 112 | 100.0 |

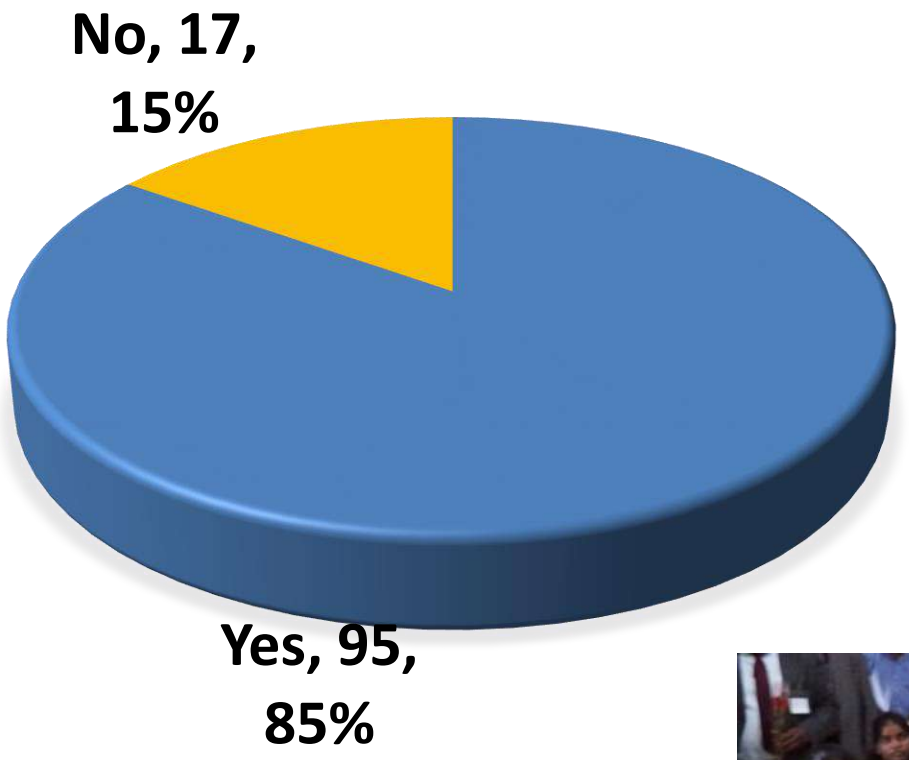


| | | |
|---|---|---|
| DH | 2 | 2.0 |
| BH / DGH | 28 | 27.7 |
| GH/ PGH | 12 | 11.9 |
| TH | 57 | 56.4 |
| Army Hospital | 2 | 2.0 |
| Total | 101 | 100.0 |

- 13 mothers were initially managed at DH/PU
- 3 at Private Hospitals

# Provision of AN care

| Cases | N |
|---|---|
| Abortion | 5 |
| Respiratory -Bronchial Asthma | 3 |
| Ectopic pregnancy | 2 |
| Obstetric heamorrhage - Placental Abrupton | 2 |
| DHF | 1 |
| DVT - Pulmonary Embolism | 1 |
| Malignancy - Choriocarcinoma | 1 |
| Sepsis - Home delivery | 1 |
| Unascertained | 1 |




**Before 12 wks - 91**

| | |
|---|---|
| Specialist care provided | 91 |
| Identification of risks in time | 73 |
| Identification of risks delayed | 4 |
| AN field care provision not satisfactory | 32 |
| AN Clinic care not satisfactory | 8 |

# Hospital Care

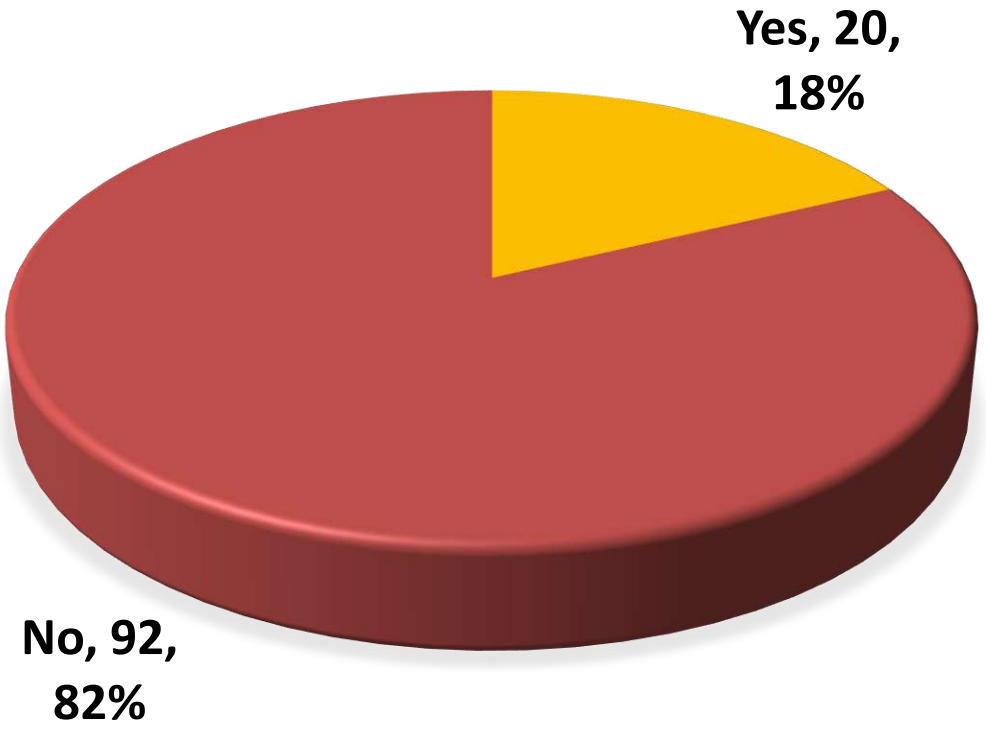
- Surgical Interventions (LSCS / Hysterotomy etc) – 48

| | |
|---|---|
| VOG | 23 |
| SR / Registrar | 7 |
| MO / SHO | 14 |

# Medically contraindicated pregnancies

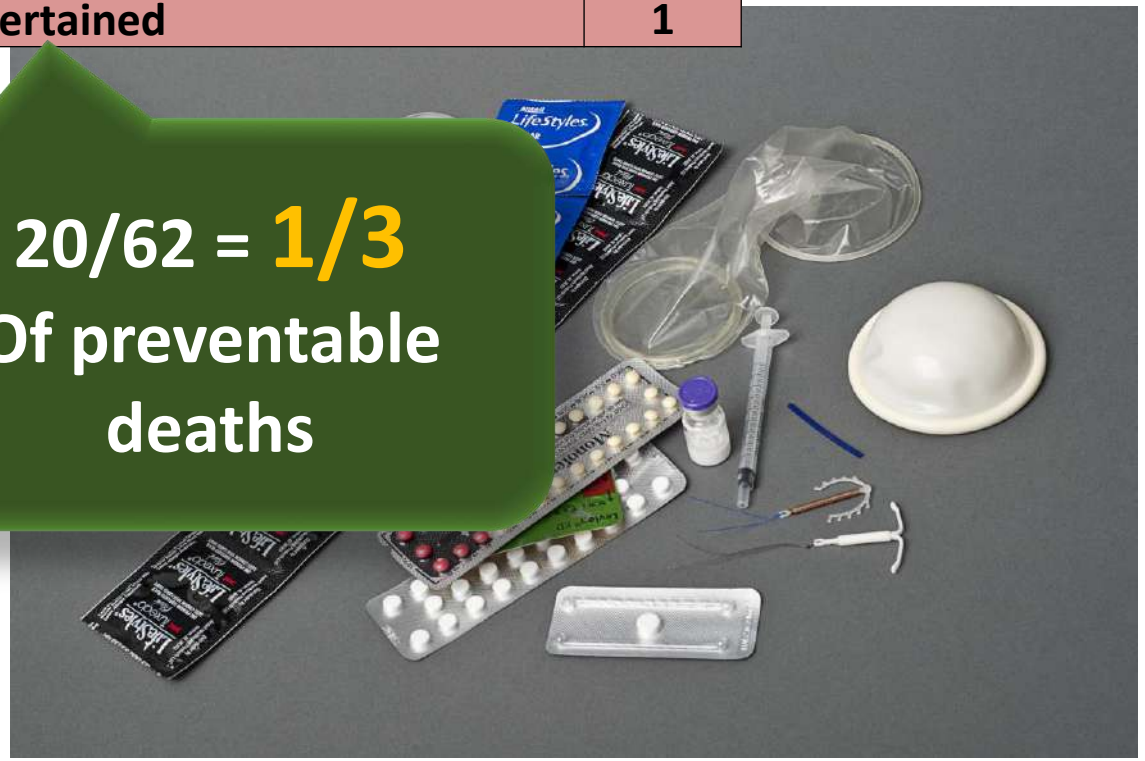
| 2011 | 2012 | 2013 | 2014 | 2015 | 2016 |
|---|---|---|---|---|---|
| 9 | 3 | 13 | 4 | 1 | 0 |

# Unmet Need of Family Planning

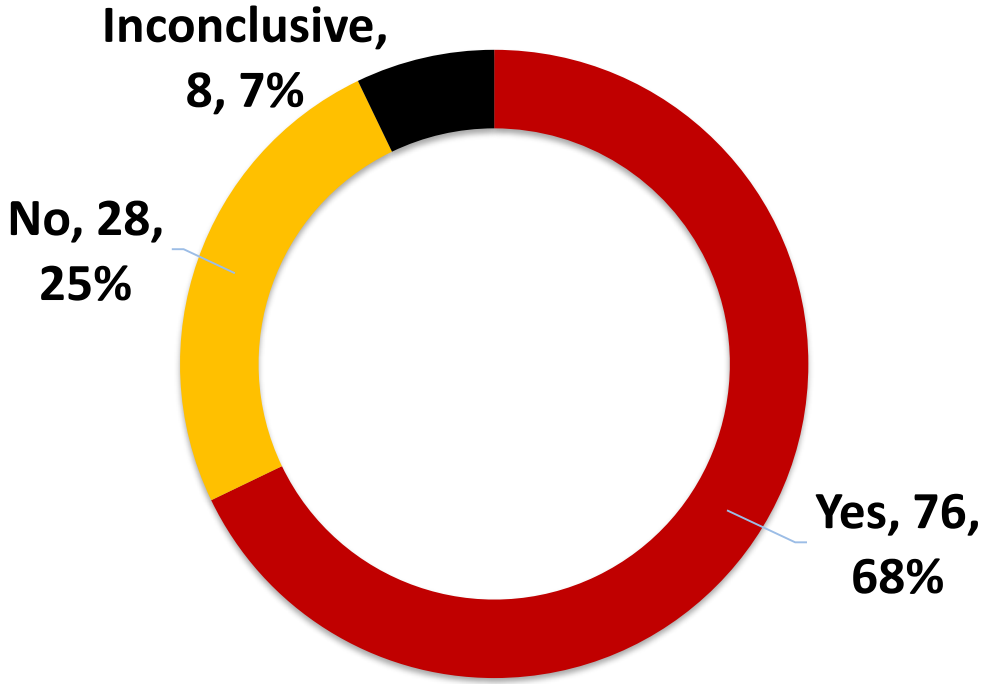



| | |
|---|---|
| Abortion | 5 |
| Obstetric heamorrhage | 4 |
| Heart Disease | 3 |
| Respiratory -Pneumonia | 2 |
| Acute Fatty Liver in Pregnancy | 1 |
| CNS -colloid cyst of brain | 1 |
| Hypertensive Disorder - Eclampsia | 1 |
| Malignancy -Choriocarcinoma | 1 |
| Sepsis - Home delivery | 1 |
| Unascertained | 1 |

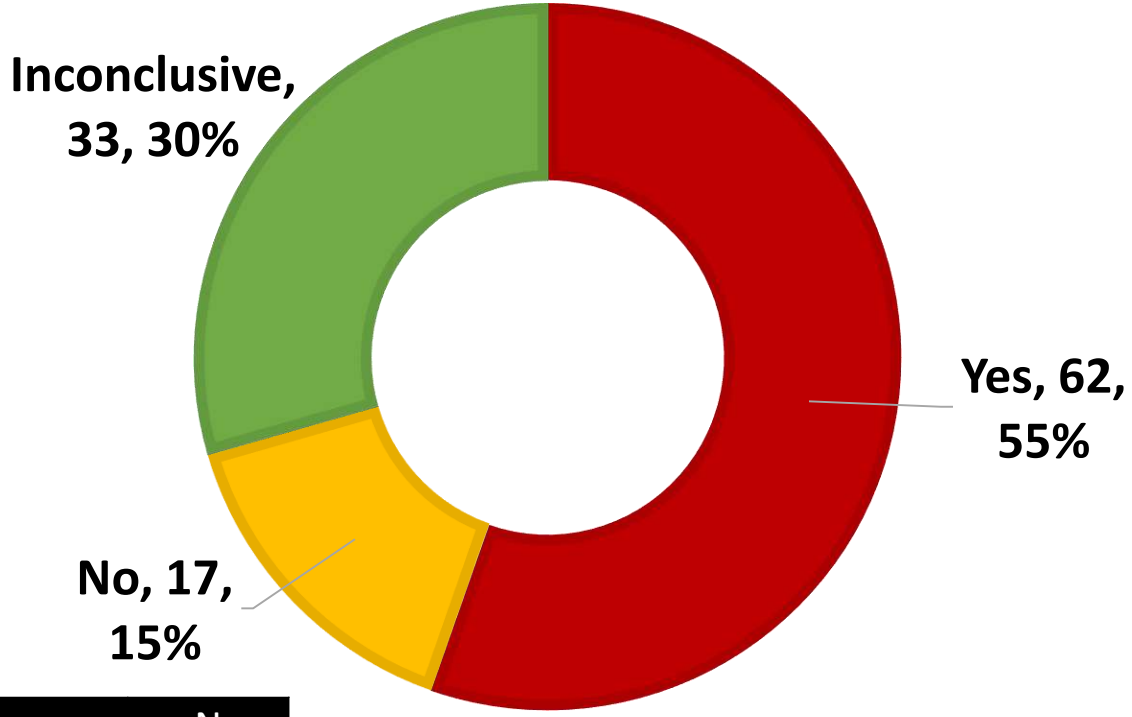
**20/62 = 1/3**
**Of preventable deaths**



# Delays


| | | |
|---|---|---|
| Delay 1 : Seeking | 48 | 42.9% |
| Delay 2 : Reaching | 1 | 0.9% |
| Delay 3 : Treating | 44 | 39.3% |




| Unpreventable | N |
|---|---|
| Malignancy | 7 |
| Amniotic Fluid Emboilsm | 2 |
| Acute Fatty Liver in Pregnancy | 1 |
| Aortic dissection | 1 |
| AV malformation of right lung | 1 |
| DHF | 1 |
| DVT - Pulmonary Embolism | 1 |
| Viral Myocarditis | 1 |
| Lobar pneumonia | 1 |
| Necrotising pancreatitis | 1 |

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| Preventable - Cause of death | N |
|---|---|
| Obstetric Haemorrhage | 11 |
| Abortion | 6 |
| Hypertensive Disorders | 6 |
| Respiratory disease | 6 |
| Heart disease | 5 |
| Sepsis | 5 |
| Amniotic Fluid Emboilsm | 4 |
| CNS -conditions | 3 |
| Ectopic pregnancy | 3 |
| Acute Fatty Liver in Pregnancy | 2 |
| DHF | 2 |
| Misoprostol overdose | 2 |
| DVT - Pulmonary Embolism | 1 |
| Hyperemesis Gravidarum | 1 |
| Intestinal Obstruction | 1 |
| Malignancy -Choriocarcinoma | 1 |
| Suicide - Postpartum Depression | 1 |
| TB Meningitis | 1 |
| Unascertained | 1 |
| | 62 |

# Preventability

# Notable Issues

- **Complex social scenarios – sexuality issues / unwanted pregnancies**
- **RED book not properly maintained**
- **Unmet need – Several issues in providing FP to needy women**
- **Substandard documentation (BHT / Field records)**
- **Guidelines not followed (Induction / PPH / PIH)**
- **Post-partum monitoring suboptimal**
- **Issues in induction (without VOG decision) / issues in use of oxytocin**
- **Lethargic approach in PPH**
- **Transfusion specialists not utilized**
- **Responsibilities entrusted to SHO**
- **Suboptimal care at peripheral hospitals**
- **24/7 Laboratory services**
- **Fast track management of obstetric emergencies**
- **Early detection of sepsis**
- **Anti-hypertensives usage in eclampsia**
- **Administrative failures / Participation at NMMRs**

# NMMR Minutes

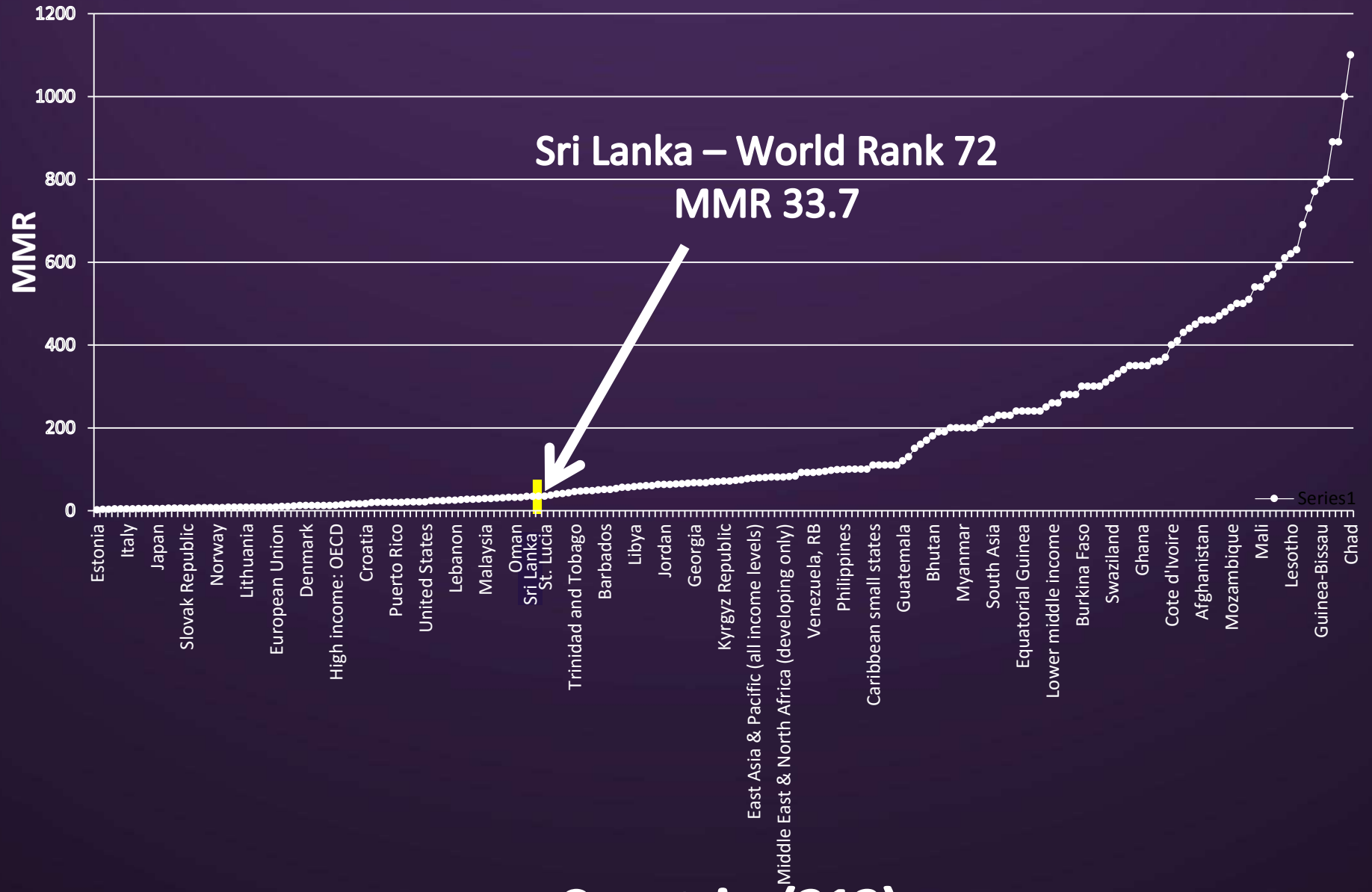
**Minutes – Kegalle 2016**

**Translating Lessons Learnt into Action** — **National Maternal Mortality Reviews**

| | |
|---|---|
| **Date** | 01st June 2017 |
| **Venue** | Auditorium – RDHS Office Kegalle |
| **Participants:** | Dr. Kapila Jayaratne (CCP, National Program Manager – FHB)<br>Prof. Deepal Weerasekara (Consultant VOG, Representative- SLCOG)<br>Dr. Vijith Gunasekara (RDHS - Kegalle)<br>Dr. R.M.K.Sarathchandra (MOMCH- Kegalle)<br>Dr. W.N.T.N.K. Wakwella (MOMCH – Kegalle)<br>Representatives from FHB<br>Representatives from Hospitals including Heads of Institutions,<br>Consultant VOGs, Consultant Physicians, Consultant Anaesthetists, Consultant JMOs, Consultant Paediatricians.<br>Health teams from curative and preventive health care services of the District of Kegalle. |

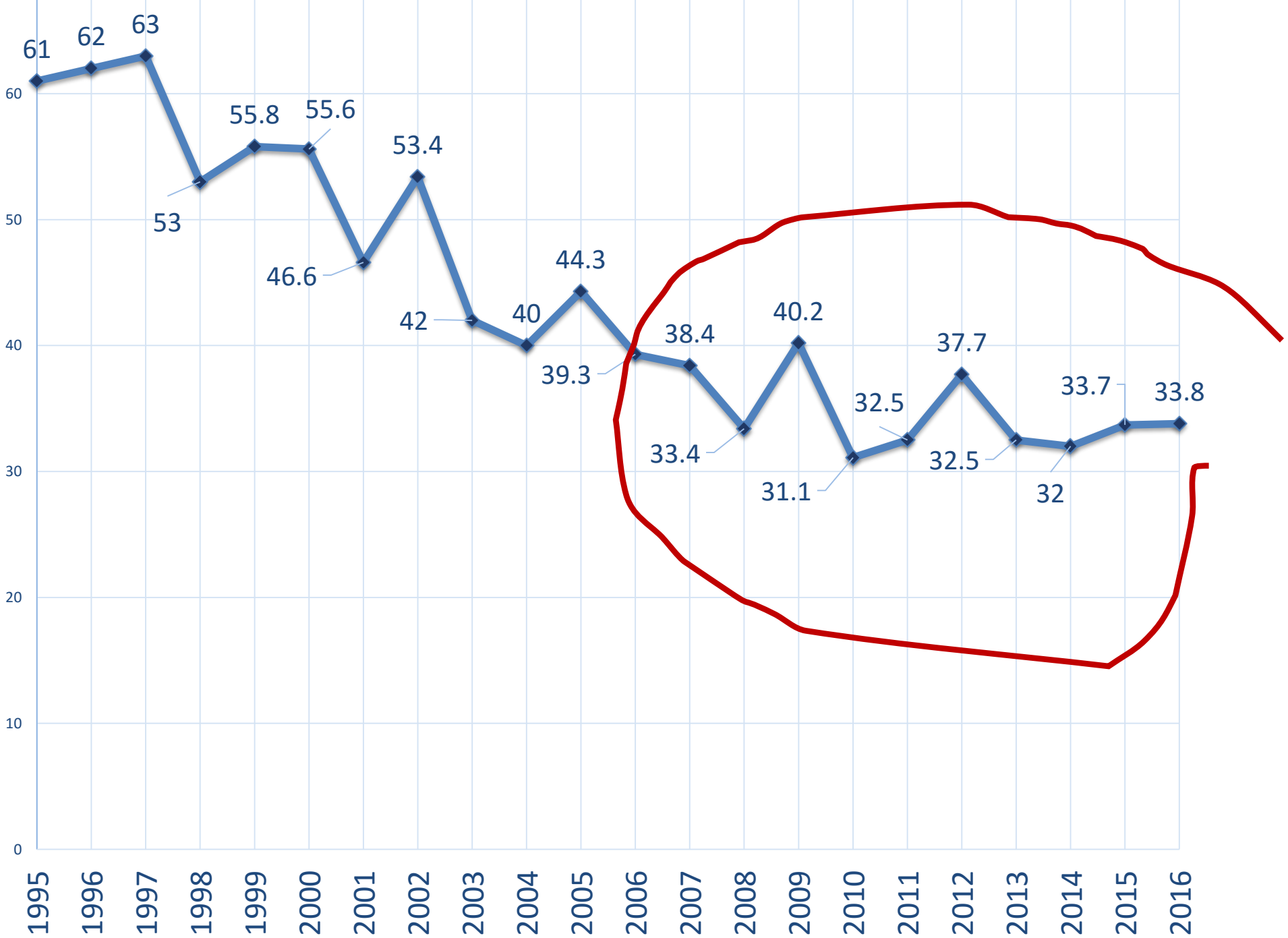
Dr. Vijith Gunasekara (RDHS - Kegalle) welcomed all participants both from district and national levels and told that this is not a fault finding process but merely a fact finding process. He said that this review helps in critically analysing deaths in a scientific manner and identify gaps in administrative, logistics, managerial, preventive and curative

# Global Ranking - 2015




**Countries(213)**

**The World bank**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**DHS 2016**

# Antenatal care

- Obtained from skilled provider 98.8 %
  - **Took iron pills or capsules 97.8 %**
  - **Blood pressure measured 98.6 %**
  - **Urine sample taken 98.6 %**
  - **Blood sample taken 91.1 %**


## Deliveries

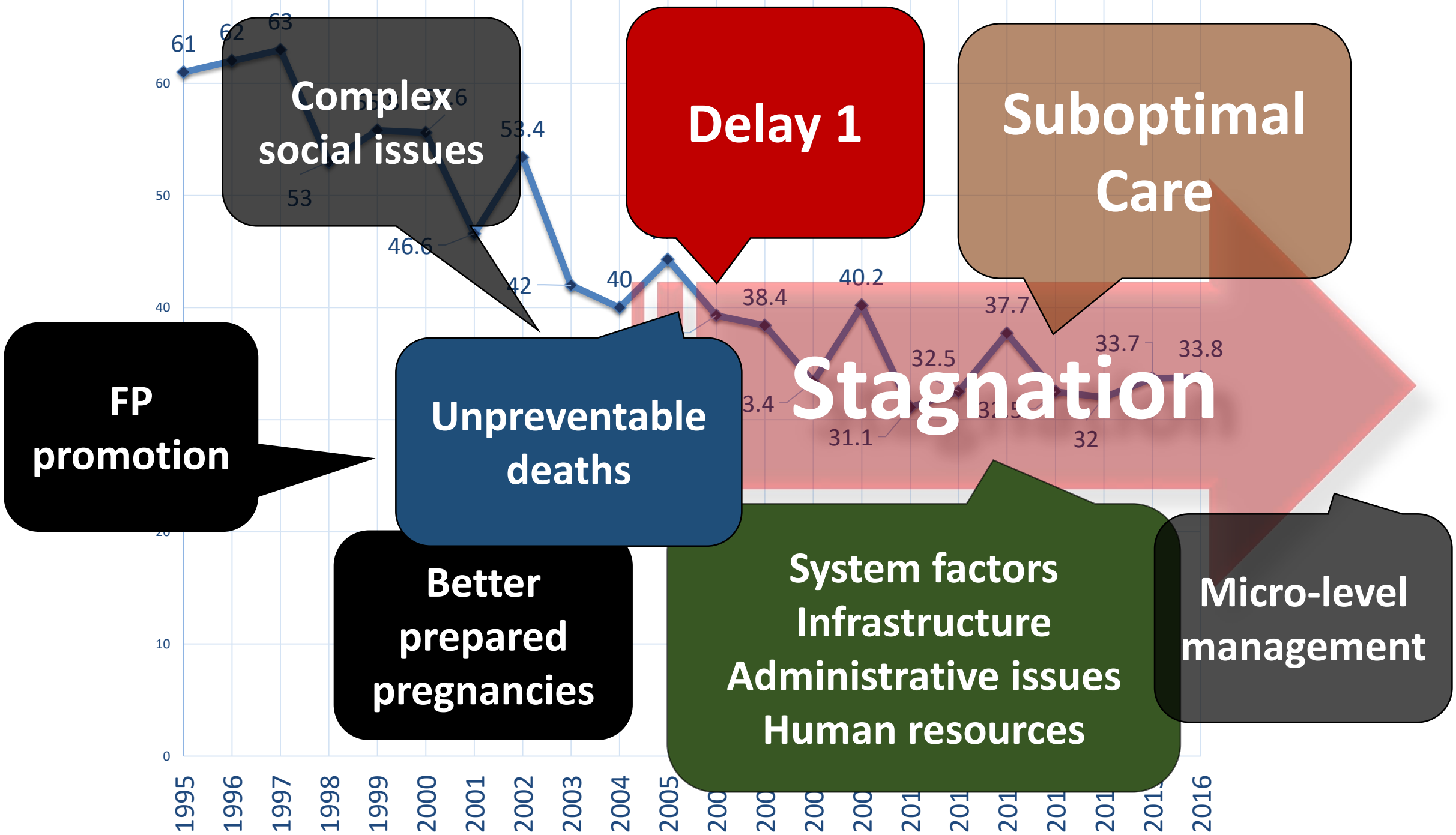
- **In public sector hospitals 94 %**
- **In private sector hospitals 5.4 %**

- **99.5 % Delivered by a skilled Provider**

- **91.5 % of mothers received postnatal checkups less than 4 hours**
- **99 % of mothers received postnatal checkups in the first 2 days after the delivery**

# Obstetric Transition

| Stage | MMR | Causes | Service Provision |
|---|---|---|---|
| Stage I | > 1 000 | • ↑↑ fertility<br>• ↑↑ direct maternal deaths<br>• ↑↑ communicable diseases | • ↑↑ do not receive professional obstetric care<br>• ↑↑ do not have access to health facilities |
| Stage II | 999 - 300 | • ↑↑ Mortality and fertility<br>Pattern of causes similar to Stage I | • ↑↑ women seek and receive care in health units |
| Stage | 299 - 50 | • Variable fertility | • Access continues to be an issue for a |
| Stage IV | < 50 | • ↓ fertility rate<br>• ↓ direct ↑ Indirect causes<br>• ↑ Chronic-degenerative diseases | • ↑↑ access to care<br>• ↑↑ medicalization as a threat to the quality and improvement of health outcomes |
| V | | • ↑↑ indirect obstetric causes<br>• ↑ chronic-degenerative disorders<br>**All avoidable maternal deaths are prevented** | of advances against structural violence<br>• Effective management of vulnerable populations<br>• Sustainability of excellence in quality of care |


Complex social issues
Delay 1
Suboptimal Care
FP promotion
Unpreventable deaths
Stagnation
Better prepared pregnancies
System factors
Infrastructure
Administrative issues
Human resources
Micro-level management
61
62
63
53
46.6
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# Acknowledgements


- MCMMS Unit team members
- Director FHB
- Dr. Ajita Wijesundere
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- SLCOG (President / Reviewers / Members)
- SLCOA – Reviewers
- CFPSL
- CCPs / MOMCH
- RDHS / Hospital Administrators
- MOOH / MO PH
- FHB staff – Accountant / Office staff / Drivers

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