CHAPTER 15

Recommendations
Lessons can be learned from every case of maternal death. Some cases were examples of good care, although followed by maternal death. Maternal mortality is not always a result from substandard care.

1. Individual preconception care should be offered to all women who consider to become pregnant. Specialized individual preconception care should be offered to women of childbearing age with pre-existing serious medical or mental health conditions. An important opportunity which should not be missed is prior to receiving any form of assisted reproduction technologies. Women who are obese should also be advised and helped to change lifestyle and loose weight prior to conception.

2. This report identified several groups with increased risk, being women of high maternal age, obese women (with registration of BMI in early pregnancy), women of high parity, women with impaired general health and immigrant women. These groups should be monitored more closely. Danger signs should be explained to all pregnant women, but more specifically to these groups.
   a. More focus on care for immigrant women. It might be difficult for migrant women to find access to maternity service. Also, on arrival to the Netherlands, they might not be in good health. Especially women originating from the Dutch Antilles and Surinam, sub-Saharan Africa and Asia have high risks and more research should be performed to detect why these groups have such high MMRs. Obstetric health workers should be aware that many women from these countries suffer from impaired health. These women should have a general health check, preferably before becoming pregnant. They should be educated on the risks of pregnancy combined with impaired health. If there is a language-based communication problem, an interpreter should be arranged to improve communication and understanding in both directions, to find out what the expectations are, to explain how access can be find to obstetric care and which danger signs are relevant in pregnancy. All literature in use for the indigenous population should be available in other languages and easily accessible to these groups.
   b. High risk groups for hypertension in pregnancy, such as women with diabetes mellitus, older women, women with a family history positive for pre-eclampsia, with pre-existing hypertension, complicated obstetric history with pre-eclampsia or other symptoms of utero-placental
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dysfunction, or with such signs in the current pregnancy should have more frequent antenatal checks.

c. Groups at high risk for thromboembolism should be better identified. The need for thromboprophylaxis should be assessed, with the help of a haematologist if necessary. If a woman is admitted to hospital care, a reevaluation of risk factors should take place. Adjustment of dosage of thromboprophylaxis in obese women should be included in the guidelines.

d. Jehovah’s witnesses are at increased risk and a plan should be made how to act if haemorrhage occurs in such patients. Also, small women and women with pre-eclampsia have smaller circulating volumes. A lower amount of bloodloss has already more implications for these groups than for healthy, taller women.

e. Psychiatrists, obstetricians, midwives and general practitioners should be trained to identify groups at risk for psychiatric disorders. All pregnant women should be taken a psychiatric history at their first antenatal visit.

f. Women with higher risks for cardiac disease (obese women, women older than 35 years, women with pre-existing hypertension or diabetes, or with a positive family history for cardiac diseases) should receive more frequent antenatal visits and be informed about danger signs. If a woman has had surgical correction of congenital heart disease, she is still at risk.

3. Better treatment of hypertension. Especially the treatment of systolic hypertension should improve. Most obstetric care givers are aware of the dangers of a high diastolic blood pressure, with a threshold of 95 mmHg, but the dangers of systolic blood pressure are often neglected. Anti-hypertensive treatment should be started in women with a systolic blood pressure of 160 mmHg or higher. If the woman has complaints such as headache, or if a rapid worsening of the clinical picture is suspected, a lower threshold for treatment is indicated.

When women suffer from severe pre-eclampsia with complaints and/or HELLP syndrome, magnesium sulphate should be started with a low threshold to prevent eclampsia. If the woman is complaining of severe headache, or has renal, hepatic, haematologic or neurologic signs, magnesium sulphate (MgSO₄) is the treatment of choice, whether or not she has hyperreflexia.
Women who are severely ill, even with a gestational age at term or after delivery, should be referred to a tertiary care center. If in early third trimester pregnancy temporisation is wanted, this should occur in a tertiary care center. But in severely ill women there is no room for temporisation of pregnancy for fetal reasons, especially not after a gestational age of 32-34 weeks. If the woman has pre-eclampsia but is not very ill (yet), there may be room to induce vaginal delivery, for this has lower risks for this and future pregnancy. Before delivery or referral to more specialised care the woman should be stabilized: blood pressure lowered when needed and eclampsia treated or prevented with MgSO$_4$.

One should be aware that many complications of pre-eclampsia occur post partum, which should lead to strict surveillance after delivery.

4. In cases of death due to thromboembolism, obstetric sepsis, haemorrhage or cardiac, cerebral or mental disease, often a delay of diagnosis and treatment leads to a cascade resulting in maternal death. Obstetric care givers should be aware of the risks of postpartum bleeding and fever, and should be trained to identify danger signs of other conditions. Introduction of an early warning scoring system will help to identify women who develop critical illness.

   a. Complaints of thromboembolism can be very mild in the beginning, and must be reevaluated if complaints become worse. If the clinical picture is suggestive for thromboembolism, anticoagulant therapy should be started before further testing is arranged.

   b. Mortality from obstetric haemorrhage is in most cases due to a delay in diagnosis and management. Active management of the third stage of labour has proven to reduce the amount of blood loss. When excessive blood loss occurs, the first action is to stop the bleeding and replace volume loss with at least two peripheral infusion lines. A commonly used rule is to replace every ml of blood with 2 ml of fluids and blood products. Also oxygen should be given.

   c. In most cases of genital tract infection, the course of events was dramatically short. Early diagnosis is essential, as is the immediate initiation of treatment with antibiotics.

   d. Women suffering from a known cardiac disease or structural congenital heart defects should be monitored closely during pregnancy. Many women in the Netherlands died due to dissection of the aorta or one of its branches: obstetric health workers should be aware of this and keep
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- this diagnosis in mind if a woman presents with complaints suggestive for vascular dissection. Appropriate investigations should take place by someone who is trained to interpret the results.

  e. The high prevalence of psychiatric disorders during pregnancy and puerperium calls for a multidisciplinary approach of women at increased risk. A guideline should be introduced and implemented.

5. The percentage of caesarean section is increasing. We should be aware of the higher maternal risks of caesarean section compared to vaginal delivery, and only perform caesarean section for valid indications. A periodic audit on a local basis regarding indications for obstetric interventions and the effect on obstetric outcome will be helpful in achieving this goal. Women who have had a previous caesarean section must have placental localisation in their index pregnancy to exclude placenta praevia and accreta to anticipate possible complications.

6. All care givers working in the obstetric field should be trained on a regular basis to recognize and manage serious medical or mental health conditions. Live support skills and the management of obstetric emergencies should be trained with all people working in the labour ward. Especially in maternal collapse every second counts. So local protocols should be memorized and updated regularly and be available in every obstetrical unit to avoid delays in diagnosis and management.

7. Better reporting of cases of maternal mortality to the maternal mortality committee. It is only possible to have a clear insight into maternal mortality and the quality of obstetric care if all maternal deaths are available in detail, to classify and assess all cases based on more information. Only then lessons can be learned from every case of maternal death.

8. Routine local and regional audits of all maternal deaths, combined with cases of severe maternal morbidity, could improve the level of obstetric care next to the ongoing national maternal mortality audit by the maternal mortality committee. In local or regional audits, more specific details should be obtained, such as the performance of the team and communication, to perform a proper root-cause analysis which should lead to specific recommendations to improve the quality of care on a local level.

9. In order to make international comparisons possible between high income countries, the introduction of pregnancy related mortality could lead to smaller differences between countries due to classification bias.
10. Substandard care should be divided in subclasses: major and minor substandard care. This in order to make a more correct interpretation of substandard care possible, as not all substandard care factors have the same impact on the death of the woman.

11. In the assessment of cases where other specialists were involved in the care provided, these specialists should be added to the maternal mortality committee to provide expertise on this care given.