



**A terme sterfte 2010-2012: Perinatale audit op koers  
(Term mortality 2010-2012: Perinatal audit on track)**

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**English summary**

## **Background**

Perinatal mortality is an important indicator of the quality of perinatal care. Suboptimum professional care contributes to a substantial proportion of stillbirths. Improving quality of care by a nationwide implementation of perinatal mortality audit addresses the quality of care. Introduction of perinatal audit is associated with a reduction in perinatal mortality.

Perinatal mortality in the Netherlands is decreasing since 2000, but is still rather high in comparison to other European countries. This outcome is an important incentive for Dutch professionals in the field of perinatal care and Dutch politics to study and implement improvements in perinatal care.

In the Netherlands, local or regional one-time studies on perinatal audit are undertaken since the eighties of the past century. A short 20 years later, the professional organizations of midwives, general practitioners, obstetricians, pediatricians, and pathologists founded the Foundation Perinatal Audit in The Netherlands (Stichting Perinatale Audit Nederland; PAN – [www.perinataleaudit.nl](http://www.perinataleaudit.nl)), with strong support from the government

The first nationwide Dutch perinatal mortality audit (in short: perinatal audit) started with the audit of term perinatal mortality. This report finalizes a three-year period. In this report, we present the findings from the audit of term perinatal mortality in 2010-2012.

### **First theme: term mortality**

The theme of the first national perinatal audit in 2010 through 2012 is 'term perinatal mortality', before during and after birth. It encompasses all stillbirths and all neonatal mortality during the first four weeks of children born between 37 to 42 weeks of gestation. In this report we include births at 42 weeks and later as well.

This theme was chosen because most children are born term and their chances of survival are very high (99.7%). About one quarter of all perinatal casualties are children born at term. The death of a term born child requires extra elucidation, and the care involved, more than with prematurely born children, is multidisciplinary.

Care for term pregnancies and children involves care by all professional groups, both independent midwives and gynecologist as well as pediatricians/neonatologists. Independent midwives play a key role as provider of obstetric care in the Netherlands. They provide about 84 % of all first antenatal visits. If complications (threaten to) occur, they will refer women to obstetric care by a medical specialist in a general hospital (secondary care) or tertiary medical center. At the start of labor about 50% of all pregnant women are under surveillance by a midwife.

### **Perinatal audit in practice**

Perinatal audit is defined as 'the systematic and critical analysis of the quality of medical care, including the procedures used for diagnosis and treatment, the use of resources, and the resulting outcome and quality of life for mother and child'.

Perinatal audit is a cyclic process, for which a systematic method is introduced. This includes different steps: the data about the provided care -including hospital discharge letters, lab results and information on the placenta and autopsy- are processed into a narrative. Based on this document, the cause of death is classified. The occurrence of substandard factors -meaning: a care management problem involving care that deviated from the safe limits of practice as laid down in guidelines, standards, protocols or normal practice- is also assessed. For every substandard factor, the audit group ascertains a possible relation with the outcome. These conclusions lead to concrete recommendations and actions to improve care. In due time, the suggested actions for improvement are evaluated.

In the Netherlands a wide range of professionals is invited to participate in the audit: general practitioners (including GP's who are obstetric care providers as well), independent and hospital-based midwives, gynecologists, pediatricians and pathologists, as well as nurses and perinatal professionals in training. Depending on the case discussed, ambulance staff, maternity nurses, clinical geneticists and/or anesthesiologists also participate. Independent chairpersons preside the audit meetings.

### **Number of meetings**

The perinatal audit started in 2010. In April of that year, the first cases of at term mortality in 2010 were discussed. Cases from 2012 were discussed up until July 1<sup>st</sup> 2013. Between April 1st 2010 and July 1st 2013, a total of 764 audit meetings took place in the perinatal cooperation units, in which 9,055 care professionals participated at least once.

### **Decreasing at term and total perinatal mortality**

Term mortality has declined with 47% between 2001 and 2012. In 2001, according to the The Netherlands Perinatal Registry (Perinatale Registratie Nederland; PRN), 651 at term children died before, during or in the first four weeks after birth (3.8 per thousand). In 2012 it were 325 children (2.0 per thousand).

The total number of children born after 22 weeks of gestation that dies around birth (before, during or in the first four weeks after birth) has declined from 2.322 children (12.2 per thousand) in 2001 to 1,491 children (8.5 per thousand) in 2012; a 30% decrease.

### **Indicators of term deaths in 2010-2012**

Health care data of 943 term born children that died around birth in 2010-2012 are registered in PRN-Audit, the registration of perinatal mortality cases to be audited. In 65% of all cases children are stillborn (55% ante partum and 10% intra partum) and 35% of the cases are neonatal deaths (in the first four weeks after birth).

Some findings:

- 19% of the women with term mortality were in primary care at the onset of labor. In 77% of the cases, they were in secondary or tertiary care. The remaining 4% are unknown.
- Autopsy was performed in 38% and pathological examination of the placenta in 77% of the term cases registered for audit. In 32% of the deceased children, the cause of death as classified by the Tulip-classification is 'unknown', partly because important information is missing in over half of these cases.

### **Reviewed cases of at term mortality in 2010-2012**

Most of the cases of term perinatal mortality were reviewed in a local audit (91%). The data from 76% of these reviewed cases was registered into the Perinatal Audit Registration System (PARS), the registration system in which the local audit groups register the audit meetings (participants, number of cases discussed) and the outcomes of the audits. After three years of audit of term perinatal mortality, the number of reviewed cases increased from 87% in 2010 to 95% in 2012. The registration of audit outcomes increased as well: 79% of all audited cases of term mortality in 2012 are available in PARS, compared to 71% of 2010.

## **Results**

### *Presence of substandard factors*

During the audit of term perinatal mortality, the audit group assesses substandard factors (SSFs). In 252 cases, (36%) out of 707 cases in 2010-2012 of which data are registered in PARS, the audit groups did not identify any SSFs. In 376 cases (53% of all audited cases) the audit groups identified one or more SSF. A total of 717 SSFs emerged.

In 10% of the 2010-2012 cases, the information is not sufficient to identify SSFs. This percentage has declined from 12% in 2010 to 9% in 2012.

### *Relation between substandard factors and mortality*

The audit groups concluded that 26% of the SSFs are not associated with the mortality. In 6% the association with mortality cannot be determined. In 8% of all reviewed 2010-2012 cases, the audit group classified a probable or highly probable association between the substandard factors and mortality, with a decrease from 10% in 2010 to 5% in 2012. They ascertained a possible association in 15%. These results are consistent with previous research with external audit panels.

### *Involvement of care professionals*

In the 376 cases with a total of 717 SSFs, 1,269 care professionals are involved in the care provided; an average of 3.4 professionals per case. Of them, 26% is a gynecologist, 20% an independent midwife and 12% a hospital-based midwife. Nurses form 11% of this group, pediatrics/neonatologists 7% and 10% is a gynecology registrar. The other 14% comprises, among others, general practitioners, midwives in training, sonographers, pathologists, maternity nurses and ambulance staff. In 30% of all SSFs, more than one professional group (i.e. group of midwives or group of gynecologists) is involved. In 54% only one group is involved.

## **Recommendations from local audit groups**

To improve the 717 identified substandard factors, the local audit groups formulated 595 recommendations. 512 SSFs have led to the formulation of one recommendation, 41 SSFs led to two and in some cases three recommendations. The audit groups did not formulate recommendations for 164 SSFs.

## **Implementation of audit recommendations**

Audit leads to a wide spectrum of recommendations, but recommendations by themselves are not enough to improve health care. Resources are needed for translation into specific enough actions for improvement and implementing such improvements in subsequent programs takes time and effort. At first the implementation of recommendations were more or less invisible. Organizations were working on them, but could not yet show results. This is changing: professional organizations, CPZ (College Perinatale Zorg; an initiative funded by the government to coordinate changes in perinatal care) and regional research consortia have elaborated a part of the recommendations, or are currently doing so. These activities strengthen each other, and the audit. Furthermore, visibility of and familiarity with the recommendations have improved because of papers and presentations about audit outcomes.

The role of the general practitioner in the perinatal care chain is also changing. Although most GP's no longer provide the main care for pregnant women, a lot of these women do visit their GP with different problems. This calls for a reinforcement of the relationship and communication between GP's and perinatal care professionals.

**On track?**

Within just a couple of years, all hospitals that provide obstetric/pediatric care with the surrounding and adherent midwifery practices in the country are running perinatal audits. The high level of participation by all professional groups and their willingness to engage in dialogue on such a delicate issue is outstanding. Audit sessions utilize narratives to enable a safe environment for the audit. Nevertheless, care professionals regularly break their anonymity and show their involvement with a case. This improves the quality of the audit.

It is unknown whether all audit meetings take place in the most optimal way. PAN therefore offered regular training sessions in the organization of audit, in making narratives, in chairing of the audit meeting and in classification of perinatal mortality.

Group dynamics can influence and affect the quality of audit. Therefore, audit outcomes are not always generalizable, neither do they render solid evidence of causal effects. That would require further research.

Parents do not play a role in the audit process. Their perspective on the provided care can offer important supplementary information to the professional's information. In some regions experiments are ongoing where the parents' written information is for instance used as a part of or supplement to the chronological report. This initiative deserves further elaboration.

This report argues in favor of a next step in the perinatal audit in the Netherlands: the introduction of essential requirements for high-quality perinatal mortality audit. Introducing these specifications will be useful in assessing facilitators and barriers to the audit process, both local and national. They will highlight what is needed to enable audits of good quality and to finalize the audit cycle. The implementation of actions for improvement and its evaluation certainly need to fit in this approach.

## **Key points**

The perinatal audit has become a regular part of perinatal care in all perinatal cooperation units.

Audit participation by care professionals is increasing. The registration of the collected data is increasing, in quality as well as quantity.

When analyzing at term mortality, in over half of the cases one or more substandard factors are present. Usually, multiple care professionals are involved with such factors.

The audit leads to a wide array of recommendations to improve care locally, regionally and nationally. Examples are the development and use of multidisciplinary guidelines, the more exact use of diagnostics for mother and child and better structured communication and documentation.

The perinatal audit is a catalyst for communication between professional groups. It brings them closer together.

The audit may have contributed to the decrease in at term mortality in the 2010-2012 period.