



NOIS

National Obstetric Information System

Annual Report 2018

DIRECTORATE FOR HEALTH INFORMATION AND RESEARCH

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The accuracy of information contained in this document may be limited by factors beyond the authors' control. Some data in this document may be subject to interpretation.

Data presented in this report is based on data which has been made available to the Department of Health Information and Research from the collaborating hospitals. Accuracy and completeness of data is the responsibility of the hospital providing data.

Users should always acknowledge the source in all works based on information supplied in this document.

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General Information

4434 deliveries

4516 total births

4491 live birth

25 still births

76 twin and **3** triplet deliveries

99.7% of deliveries occurred in hospital

158 Mothers registered as having made use of assisted reproduction

Mothers

Maternal Age

Commonest Age group: **30 to 34 years (36.8%)**

Range: **14 - 47 years**

Mode: **30 years**

Mean (Average): **30.5 years**

Mean age in primiparae: **29.2 years**

Nationality

75.4% mothers reported to be of **Maltese** Nationality

24.6% mothers reported to be of **non-Maltese** Nationality

Education

39.4% of mothers reported having **Tertiary Level of Education**

Infants

Gender Distribution

51.3% - Male, **48.7%** - Female

Birth weight

9 (0.2%) babies born weighing <500g but 22 weeks gestation

53 (1.2%) babies born in very low birth weight range 500-1499g

274(6.1%) babies born in low birth weight range of 1500-2499g

18 (0.4%) babies born weighing 4500g and over

Commonest birth weight range: 3000 to 3499g – 1927 (42.7%)

Mean birth weight: **3190.6g**

Maturity

307 babies (6.8%) born preterm: <37 weeks gestational age

63 babies (1.4%) born very or extremely preterm: < 32 weeks gestational age

Mortality (500g and over)

Fetal Mortality: 3.8/1,000 total births

Neonatal Mortality: 4.5/1,000 live births

Early Neonatal Mortality: 3.1/1,000 live births

Late Neonatal Mortality: 1.3/1,000 live births

Perinatal Mortality Rate: 8.2/1,000 total births

COMMENTARY

For the past 20 years, the National Obstetric Information System (NOIS) has systematically gathered and analysed data related to all births that occur in both public and private hospitals in Malta and Gozo. This obstetric and perinatal data is compiled using a case-based approach whereby a comprehensive questionnaire with relevant medical information is filled in by the particular hospital for every birth that occurs. Data is then coded and analysed at the Directorate for Health Information and Research (DHIR) with the aim of describing the epidemiology and trends in maternal and infant health.

The aim of the commentary is to bring to light some salient and relevant findings from the data reported.

Key facts

In 2018 there were a total of 4434 deliveries in the Maltese Islands with a total of 4516 births (Figure 1), of which 4491 were live births and 25 stillbirths. There was an increase of 118 births in 2018 as compared to 2017.

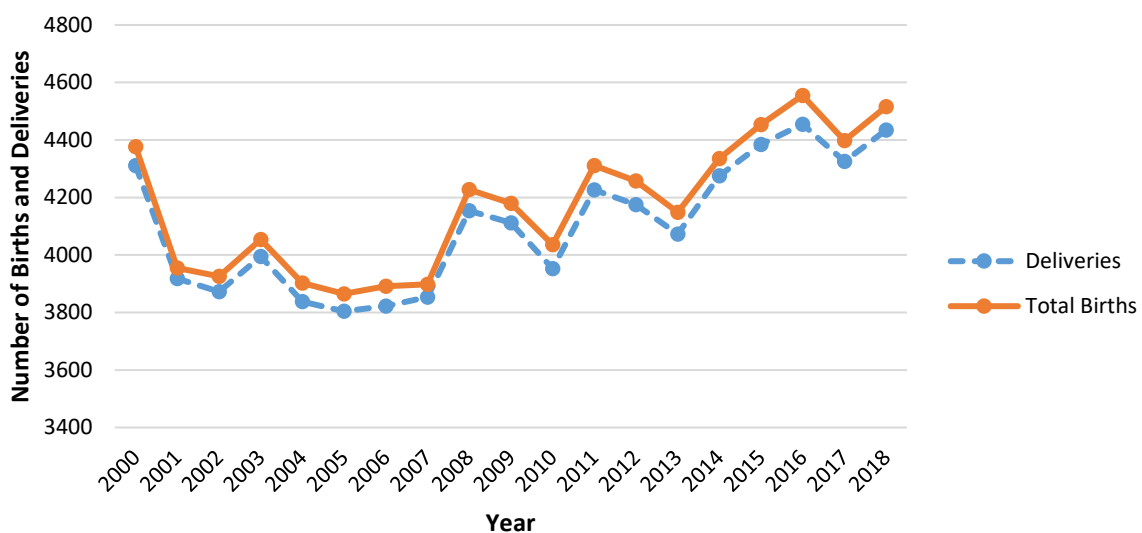


Figure 1: Trends in deliveries and total births of the Maltese Islands between the years 2000 and 2018

In 2018 there were a total of 4355 singleton deliveries (98.2% of all deliveries), 76 (1.7%) twin deliveries, and 3 (0.07%) triplet deliveries. A total of 158 mothers were registered as having utilised assisted reproduction (ART), of these 51% were reported to have had IVF / ICSI.

The vast majority of births occurred in hospital (99.7%), while 5 deliveries occurred at another site and were later transferred to hospital and 9 were home deliveries who were then transferred to hospital.

Maternal Characteristics

The majority of deliveries (36.8%) were in the maternal age-group of 30-34 years (Figure 2). This was consistent with the trends reported in the past few years, with a steady significant

decrease in the proportion of mothers younger than 30 years and a shift towards older maternal age. This is of public health importance due to the association between older maternal age and adverse outcomes during pregnancy and delivery. Most of the mothers were primiparas (51.4%) and 66.8% of all mothers were reported as married.

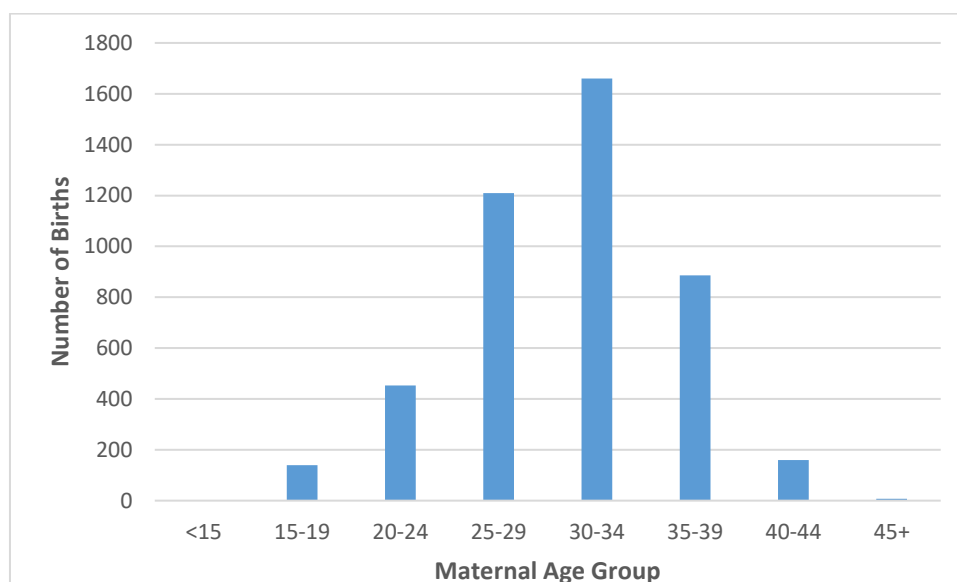


Figure 2: Births according to Maternal Age-Group

A steady increase in the proportion of non-Maltese mothers when compared to previous years was noted, with nearly a quarter of all mothers (24.5%) having a non-Maltese nationality. The majority of non-Maltese mothers were Europeans (15.5%), with Italians (2.1%) and British (1.9%) topping the list. On the other hand, the majority of non-European mothers were from Syria (2.3%), Sub-Saharan Africa (1.5%), Libya (1.4%) and the Philippines (1.3%).

The proportion of mothers who had completed compulsory education up to primary (2.4%) or secondary (19.7%) levels of education was dwarfed by those who continued with post-secondary or vocational non-tertiary education (23.2%) and tertiary education (39.4%). This is notable as maternal education has been shown to affect outcomes on pregnancy and infant health, with higher educational levels associated with more favourable outcomes.

During 2018 there were 874 mothers (19.7%) who reported smoking one or more cigarettes during their pregnancy, while 43 mothers (10%) reported drinking some alcohol. 21 mothers (0.5%) were reported to be using illicit drugs at some point during their pregnancy. The links between these maternal lifestyles and adverse perinatal outcomes have been well established and it is likely that these negative lifestyle choices are under-reported by the mothers.

Maternal Pathology during Pregnancy and Delivery

Gestational hypertension (7.5%) and suspected intrauterine growth retardation (4.9%) were the commonest maternal pathologies reported during pregnancy. 249 mothers were reported with impaired glucose tolerance, 28 mothers with Insulin-Dependent Diabetes Mellitus and 11 mothers with Non-Insulin Dependent Diabetes Mellitus.

The majority of women (68.4%) delivered by normal or assisted vaginal delivery, while elective and emergency Caesarean Sections (CS) totalled 1400 (31.6%) of all deliveries (Figure 3).

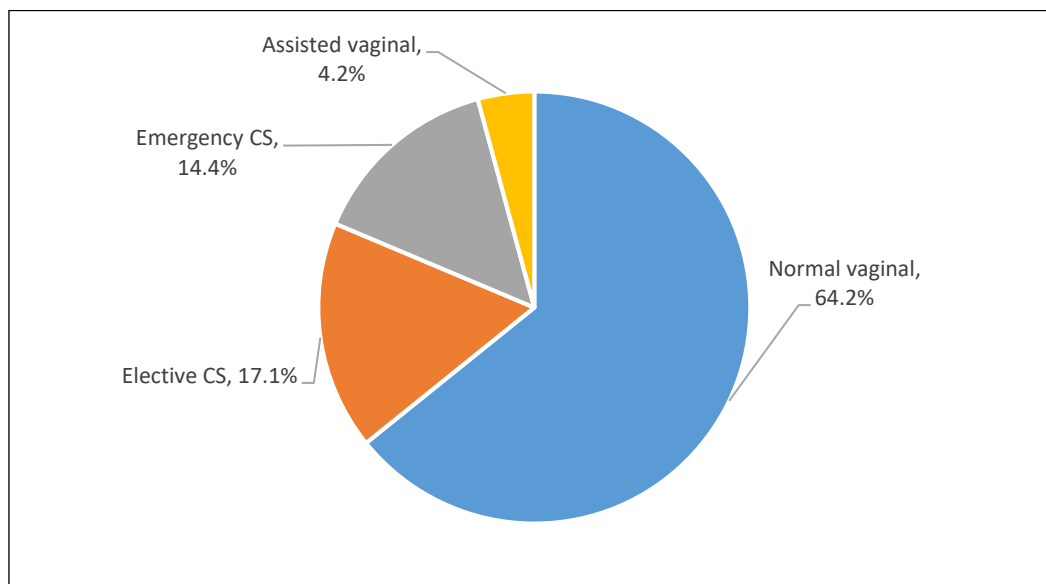


Figure 3: Frequency of the Different Types of Deliveries

63.2% of women having a vaginal delivery were reported to have sustained some damage to the perineum, including episiotomy or perineal tear, or both.

Over half of all deliveries (53.9%) had spontaneous onset of contractions, while 28% of all deliveries were induced artificially by drugs or rupture of membranes. 16.2% were carried out as planned elective CS and the remaining 1.9% were carried out as an emergency section for a pathological condition.

Infant Characteristics

The majority of infants delivered were male 2318 (51.3%), with female births totalling 2198 (48.7%). 91.8% of infants were born within the normal birth weight range of 2500g to 4499g, while 0.4% weighed 4500g or more. Low birth weight infants of less than 2500g totalled 336 (7.4%), with 9 of these having a birth weight below 500g.

In 2018 there were a total of 307 (6.8%) preterm births with a gestational age of less than 37 weeks, with the number of very or extremely preterm births of less than 32 weeks totalling 63 (1.4%) births.

Just over half of live births (52.5%) were exclusively breast fed at the time of discharge from hospital, while 28.1% were exclusively bottle fed. A total of 833 (18.5%) of live births had mixed feeding routines at the time of discharge.

Maternal and Neonatal Mortality

No maternal deaths were reported in Malta for the 8th consecutive year since 2010. For infants, there was a total of 25 stillbirths reported for 2018, while 15 cases from the 4491 live births reported were early neonatal deaths. Late neonatal deaths totalled 6 in 2018. The perinatal mortality rate for babies over 500g of weight was 8.2 per 1000 total births.

NATIONAL OBSTETRIC INFORMATION SYSTEM (NOIS) ANNUAL REPORT - 2018

A National Obstetric Information System (NOIS) was launched at the beginning of 1999 and now covers all deliveries, to residents and non-residents, taking place on the islands of Malta and Gozo.

Data collection and Sources of Information

Systematic data collection for NOIS commences once the mother delivers her baby. Information regarding the course and outcome of each pregnancy is recorded by the relevant staff at each centre on a standard NOIS data sheet. Once the data are recorded, the sheets are forwarded to the Directorate for Health Information and Research (DHIR). At the DHIR the relevant sheets are processed and entered into the NOIS database. The system registers all infants/fetuses delivered at 22 completed weeks gestation and more.

The maternity centres actively participating in this information system in 2018 were: Mater Dei Hospital, Gozo General Hospital, St James Hospital Sliema and Zabbar. Home deliveries, which are not subsequently referred to a hospital, may not be captured by this system.

The NOIS Data Collection Sheet is used to collect extensive and comprehensive maternal, pregnancy, delivery and infant outcome data for all deliveries and births.

Data at the DHIR is kept in accordance with existent Data Protection legislation and confidentiality is protected at all times.

Report

This report analyses all deliveries and infant/fetal births occurring on the Maltese Islands and reported to the Registry and compares figures to those reported for previous years where appropriate. The data in this report includes all births occurring irrespective of residency of the parents.

Data is sent to the Registry from all hospitals on the Maltese Islands. Accuracy and completeness of data provided to DHIR is the responsibility of the hospital providing data. This report includes the latest updated data as at time of release of report.

Further information and detailed maternal and perinatal health statistics and indicators may be found at: <https://deputyprimeminister.gov.mt/en/dhir/Pages/Registries/births.aspx>.

ANALYSIS OF REPORTED DATA

There were a total of 4434 deliveries reported and registered for the Maltese Islands in 2018. These resulted in a total of 4516 infant/fetal births; this is an increase of 118 births when compared to 2017 and is the largest number of births recorded since 2000.

The table below gives the number of deliveries and births in Malta and Gozo and registered in NOIS since 2000.

| Year | Deliveries* | Total Births** | Livebirths |
|------|-------------|----------------|------------|
| 2000 | 4311 | 4377 | 4361 |
| 2001 | 3918 | 3955 | 3935 |
| 2002 | 3872 | 3926 | 3905 |
| 2003 | 3995 | 4054 | 4036 |
| 2004 | 3838 | 3902 | 3887 |
| 2005 | 3804 | 3865 | 3857 |
| 2006 | 3822 | 3891 | 3880 |
| 2007 | 3853 | 3898 | 3886 |
| 2008 | 4154 | 4228 | 4199 |
| 2009 | 4112 | 4180 | 4152 |
| 2010 | 3952 | 4036 | 4018 |
| 2011 | 4226 | 4311 | 4283 |
| 2012 | 4175 | 4258 | 4239 |
| 2013 | 4073 | 4149 | 4127 |
| 2014 | 4275 | 4335 | 4308 |
| 2015 | 4385 | 4453 | 4435 |
| 2016 | 4455 | 4555 | 4532 |
| 2017 | 4325 | 4398 | 4379 |
| 2018 | 4434 | 4516 | 4491 |

* Deliveries refer to maternal confinements irrespective of number of infants delivered.

** Total births include all reported live and still births

Table 1. Total births and deliveries 2000-2018

Of the registered 4434 deliveries (4516 births) in 2018, 4159 deliveries (4237 births) occurred in Malta and 275 deliveries (279 births) occurred in Gozo.

DELIVERIES

DEMOGRAPHY

Maternal Age

The maternities have been grouped into 5-year age groups and the frequency distribution of deliveries according to maternal age group is given below. A decrease in deliveries is seen in the younger age groups <30 years with a corresponding increase in deliveries in the older age groups ≥30 years. In 2018, the greatest number of deliveries 1632 (36.8%), occurred in the age group 30 to 34 years while there was only one delivery occurring in the youngest age group of less than 15 years. The minimum age at delivery of the mothers was 14 years (1 mother) while the maximum age was 47 years (2 mothers). The most frequent maternal age at delivery was 30 years and average maternal age was 30.5 years. The average age of first-time mothers was 29.2 years.

The frequency distribution of deliveries in 2018 according to maternal age group is given in the following table.

| Age group (years) | 2018 | | 2017 | |
|-------------------|-----------|------|-----------|------|
| | Frequency | % | Frequency | % |
| <15 | 1 | 0.02 | 3 | 0.1 |
| 15-19 | 140 | 3.1 | 141 | 3.3 |
| 20-24 | 446 | 10.0 | 475 | 11.0 |
| 25-29 | 1200 | 27.0 | 1256 | 29.0 |
| 30-34 | 1632 | 36.8 | 1549 | 35.8 |
| 35-39 | 853 | 19.4 | 756 | 17.5 |
| 40-44 | 155 | 3.5 | 140 | 3.2 |
| 45+ | 7 | 0.2 | 5 | 0.1 |
| Unspecified | 0 | 0 | 0 | 0 |

Table 2. Deliveries according to maternal age group

Marital Status

In 2018, 1330 (30.0%) of all deliveries occurred to mothers who were reported as never married (single); while 2961 (66.8%) of all deliveries occurred to mothers reported as married, and 125 (2.8%) were reported as being separated, divorced or widowed. 18 mothers had their marital status unspecified.

Maternal Nationality

75.4% (3345) of all deliveries this year occurred to women of Maltese nationality while 24.5% (1087) were Non-Maltese. The remaining 2 mothers did not have a nationality specified. The table below gives the number of mothers of Maltese and non-Maltese Nationality delivering on the Maltese Islands since 2000.

| Nationality | Maltese | | Non-Maltese | | Unknown | |
|-------------|---------|------|-------------|------|---------|-----|
| | Number | % | Number | % | Number | % |
| 2000 | 4096 | 95.0 | 211 | 4.9 | 4 | 0.1 |
| 2001 | 3737 | 95.4 | 178 | 4.5 | 3 | 0.1 |
| 2002 | 3662 | 94.6 | 170 | 4.4 | 41 | 1.1 |
| 2003 | 3687 | 92.3 | 220 | 5.5 | 88 | 2.2 |
| 2004 | 3558 | 92.7 | 168 | 4.4 | 112 | 2.9 |
| 2005 | 3512 | 92.3 | 237 | 6.2 | 55 | 1.4 |
| 2006 | 3491 | 91.3 | 288 | 7.5 | 43 | 1.1 |
| 2007 | 3511 | 91.1 | 308 | 8.0 | 34 | 0.9 |
| 2008 | 3729 | 89.8 | 402 | 9.7 | 23 | 0.6 |
| 2009 | 3711 | 90.2 | 376 | 9.1 | 25 | 0.6 |
| 2010 | 3581 | 90.6 | 365 | 9.2 | 6 | 0.2 |
| 2011 | 3740 | 88.5 | 479 | 11.3 | 7 | 0.2 |
| 2012 | 3668 | 87.9 | 501 | 12.0 | 6 | 0.1 |
| 2013 | 3501 | 86.0 | 564 | 13.8 | 8 | 0.2 |
| 2014 | 3533 | 82.6 | 733 | 17.1 | 9 | 0.2 |
| 2015 | 3544 | 80.8 | 838 | 19.1 | 3 | 0.1 |
| 2016 | 3565 | 80.0 | 889 | 19.9 | 1 | 0.1 |
| 2017 | 3364 | 77.8 | 958 | 22.2 | 3 | 0.1 |
| 2018 | 3345 | 75.4 | 1087 | 24.5 | 2 | 0.1 |

Table 3. Deliveries by reported Nationality of Mother for all deliveries on the Maltese Islands

Parity

There were 51.4% (2280) of mothers who were primiparas in 2018. The following table gives a breakdown of mothers by age and previous parity (includes all previous live and still births). Parity and maternal age were specified for all mothers.

| Mother's Age Group | Maternal Parity (previous livebirths and still births are included) | | | | | | | Total |
|--------------------|--|-------------|------------|------------|-----------|------------------|----------|-------------|
| | Primipara | 1 | 2 | 3 | 4 | >4 th | Unknown | |
| Under 20 | 123 | 17 | 1 | 0 | 0 | 0 | 0 | 141 |
| 20-24 | 281 | 122 | 30 | 11 | 2 | 0 | 0 | 446 |
| 25-29 | 757 | 339 | 76 | 18 | 5 | 4 | 1 | 1200 |
| 30-34 | 779 | 625 | 163 | 40 | 15 | 10 | 0 | 1632 |
| 35-39 | 280 | 365 | 148 | 38 | 8 | 14 | 0 | 853 |
| 40-44 | 57 | 44 | 30 | 16 | 6 | 2 | 0 | 155 |
| 45+ | 3 | 2 | 1 | 0 | 1 | 0 | 0 | 7 |
| Unknown | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total | 2280 | 1514 | 449 | 123 | 37 | 30 | 1 | 4434 |

Table 4. Parity of Mothers by age group for 2018

Educational Level reached

It is documented that maternal educational level has a bearing on outcomes of pregnancy. In 2018, 95% of mothers had their completed level of education reported.

Distribution of maternal educational level is presented in Table 5. 39.4% of mothers were reported as having a tertiary education.

| Level of Education reached | 2018 | |
|--|--------|------|
| | Number | % |
| Primary or no education | 107 | 2.4 |
| Secondary | 1315 | 29.7 |
| Post-Secondary/Vocational non-tertiary | 1029 | 23.2 |
| Tertiary | 1746 | 39.4 |
| Unspecified | 237 | 5.3 |

Table 5. Maternal Education distribution

MATERNAL LIFESTYLES

There were 874 (19.7%) of the mothers who were reported to smoke one or more cigarettes during their pregnancy this year. 43 mothers were reported to drink some alcohol during their pregnancy, while 21 mothers were reported as being illicit drug abusers. It is conceivable that mothers may under-report these known harmful lifestyles.

| Maternal Lifestyles | 2018 | |
|--|--------|------|
| | Number | % |
| Cigarette smoking during pregnancy: | | |
| 1 to 3/day | 522 | 11.8 |
| > than 3/day | 352 | 7.9 |
| Do not smoke | 3518 | 79.3 |
| Unspecified | 42 | 0.9 |
| Alcohol consumption during pregnancy: | | |
| Up to 1 unit/day | 40 | 0.9 |
| > than 1 unit/day | 3 | 0.1 |
| None | 4324 | 97.5 |
| Unspecified | 67 | 1.5 |
| Drug Abuse during pregnancy | | |
| Yes | 21 | 0.5 |
| No | 4353 | 98.2 |
| Unspecified | 60 | 1.4 |

Table 6. Reported smoking, alcohol and drug habits of mothers

Maternal smoking is a well-established risk factor for adverse perinatal outcomes including low birth weight (EuroPeristat, 2018). In 2018, the overall average birth weight of all infants born was 3190g, with 7.4% (336) of these babies being less than 2500g.

The average birth weight of babies born to mothers reported to have smoked at some time during their pregnancy (889 babies) was 3165g, with 8.9% (79) of these babies being less than 2500g.

MATERNAL PATHOLOGY DURING PREGNANCY

In 2018 there were 158 mothers registered as having made use of assisted reproduction (ART), this includes all forms of ART namely ovulation stimulation, IVF and ICSI.

The table below gives the number of mothers reported with specific obstetric pathology during pregnancy. 7.5% of mothers were registered as having gestational hypertension.

| Pathology during pregnancy | 2018 | | 2017 | |
|----------------------------|--------|-----|--------|------|
| | Number | % | Number | % |
| Antepartum Haemorrhage | 65 | 1.5 | 71 | 1.6 |
| Gestational hypertension | 331 | 7.5 | 216 | 5.0 |
| Pre-eclampsia | 24 | 0.5 | 23 | 0.5 |
| Eclampsia | 0 | 0 | 1 | 0.02 |
| Placenta praevia | 35 | 0.8 | 28 | 0.6 |
| Abruption of placenta | 12 | 0.3 | 11 | 0.3 |
| Suspected IUGR* | 217 | 4.9 | 230 | 5.3 |
| Cardiovascular disease | 3 | 0.1 | 20 | 0.5 |

*IUGR – intrauterine growth retardation

Table 7. Pathology during pregnancy

Diabetes in Pregnancy

In 2018 there were 28 mothers who were reported as having pre-existing Insulin Dependent Diabetics before this pregnancy while there were 11 mothers reported with pre-existing Non-Insulin Dependent diabetes prior to pregnancy. There was a total of 249 mothers registered with impaired glucose tolerance or gestational diabetes.

SINGLETON AND MULTIPLE DELIVERIES

For this year, there were a total of 4355 (98.2%) singleton, 76 (1.7%) twin deliveries and 3 triplet deliveries.

| Multiplicity | 2018 | 2017 |
|--------------|------|------|
| Singleton | 4355 | 4253 |
| Twin | 76 | 71 |
| Triplet | 3 | 1 |
| Quadruplet | 0 | 0 |

Table 8. Deliveries by multiplicity

SITE OF DELIVERY

In 2018 of the total 4434 deliveries registered by the National Obstetric Information System, 4420 (99.7%) occurred in a hospital, 9 deliveries occurred at home and 5 deliveries occurred at another site but were later transferred to hospital.

ONSET OF DELIVERY

Of the total 4434 deliveries, 53.9% (2392) were reported as spontaneous onset of contractions, 28.0% (1240) were induced by drugs or artificial rupture of membranes and 16.2% (716) were carried out as elective caesarean sections, while 1.9% (86) were carried out as emergency caesarian sections for pathological conditions including antepartum haemorrhage, pre-eclampsia, fetal distress etc.

DAMAGE TO THE PERINEUM

A total of 3034 women were delivered by normal or assisted vaginal delivery. 2847 (93.8%) of these women were reported to have a normal vertex vaginal delivery, while 187 (6.2%) had assisted vaginal delivery (including ventouse, forceps and breech). A total of 1049 (34.6%) of these normal or assisted vaginal deliveries were reported to have sustained no episiotomy or damage to the perineum, while 1979 (63.2%) were reported to have had an episiotomy, perineal tear/laceration, or both. For 7 women perineal damage was unspecified.

| Damage to perineum | Normal Vaginal Delivery (n= 2847) | | Assisted Vaginal Delivery** (n= 187) | |
|---------------------|--------------------------------------|------|---|------|
| | Number | % | Number | % |
| No Damage | 1036 | 36.4 | 13 | 7.0 |
| Episiotomy* only | 319 | 11.2 | 82 | 43.9 |
| Perineal tear only | 1396 | 49.0 | 63 | 33.7 |
| Episiotomy and tear | 90 | 3.2 | 28 | 15.0 |
| Unknown | 6 | 0.2 | 1 | 0.5 |

* Episiotomy is defined as a surgical incision through the perineum to enlarge the vagina to assist delivery

**These include ventouse, forceps and breech extraction

Table 9. Damage to perineum in vaginal deliveries

INFANT / FETAL BIRTHS

METHOD OF BIRTH

In 2018 there were a total of 4516 infant/fetal births. Of these 2847 (63.0%) were delivered as a normal vertex delivery, 1482 (32.8%) by emergency or elective Caesarean Section and 187 (4.1%) by assisted vaginal delivery (includes forceps, ventouse and breech).

| Mode of Delivery* | 2018 | 2017 |
|--------------------------------------|------|------|
| Vertex delivery | 2847 | 2800 |
| Elective/emergency Caesarean Section | 1482 | 1408 |
| Forceps | 5 | 6 |
| Ventouse | 179 | 182 |
| Breech deliveries | 3 | 2 |

*Data analysed according to total infant/ fetal births

Table 10. Mode of delivery

For 2018 there were 1482 infants/fetuses delivered by caesarean section but 1400 caesarean operations performed, this due to the fact that a number of caesareans are done in multiple birth deliveries. The Caesarean section operation rate in 2018 was 31.6% of the total 4434 maternal deliveries.

| Year | Deliveries by Caesarean section | Caesarean section operation rate (% of all deliveries) |
|------|---------------------------------|---|
| 2000 | 994 | 23.1 |
| 2001 | 926 | 23.6 |
| 2002 | 914 | 23.6 |
| 2003 | 1039 | 26.0 |
| 2004 | 1048 | 27.3 |
| 2005 | 1165 | 30.6 |
| 2006 | 1329 | 34.8 |
| 2007 | 1243 | 32.3 |
| 2008 | 1263 | 30.4 |
| 2009 | 1194 | 29.0 |
| 2010 | 1252 | 31.7 |
| 2011 | 1435 | 34.0 |
| 2012 | 1409 | 33.7 |
| 2013 | 1270 | 31.2 |
| 2014 | 1368 | 32.0 |
| 2015 | 1359 | 31.0 |
| 2016 | 1366 | 30.7 |
| 2017 | 1338 | 30.9 |
| 2018 | 1400 | 31.6 |

Table 11. Caesarean Section rates 2000-2018

GENDER DISTRIBUTION OF BIRTHS

The gender distribution of births is given in the table below. As usually seen, there were more male infants/fetuses delivered than female.

| Gender | 2018 | | 2017 | |
|---------|--------|------|--------|------|
| | Number | % | Number | % |
| Male | 2318 | 51.3 | 2263 | 51.5 |
| Female | 2198 | 48.7 | 2135 | 48.5 |
| Unknown | 0 | 0 | 0 | 0 |

Table 12. Gender distribution of infants delivered

BIRTHWEIGHT OF INFANTS/FETUSES

In 2018, there were 4149 (91.8%) of the total births that occurred in the birth weight range of 2500g to 4499g. 274 (6.1%) of the total births were in the low birth weight range of 1500g to 2499g, while 53 (1.2%) of births were of very low birth weight 500g to 1499g. This year there were 9 babies of birth weight less than 500g but 22 completed weeks gestation, while another 18 babies were of birth weight 4500g and over. Birth weight was not recorded for 13 births.

The lowest birth weight recorded this year was 250g in a 23-week antepartum intrauterine death. The highest birth weight recorded was 5300g in a mother with gestational diabetes mellitus. The average birth weight was 3190.6g. All infants / fetuses delivered at 22 weeks gestation and over are registered into the system.

| Birth weight | 2018 | | 2017 | |
|--------------|--------|------|--------|------|
| | Number | % | Number | % |
| <500g | 9 | 0.2 | 6 | 0.1 |
| 500-999g | 24 | 0.5 | 19 | 0.4 |
| 1000-1499g | 29 | 0.6 | 29 | 0.7 |
| 1500-1999g | 64 | 1.4 | 65 | 1.5 |
| 2000-2499g | 210 | 4.7 | 220 | 5.0 |
| 2500-2999g | 1001 | 22.2 | 983 | 22.4 |
| 3000-3499g | 1927 | 42.7 | 1853 | 42.1 |
| 3500-3999g | 1047 | 23.2 | 1035 | 23.5 |
| 4000-4499g | 174 | 3.9 | 172 | 3.9 |
| 4500-4999g | 14 | 0.3 | 13 | 0.3 |
| 5000+ | 4 | 0.09 | 1 | 0.02 |
| Unspecified | 13 | 0.3 | 2 | 0.05 |

Table 13. Birth weight distribution of infants/fetuses

GESTATIONAL AGE AT DELIVERY

Preterm births are associated with adverse obstetric outcomes and long-term health problems. In 2018, 307 (6.8%) of babies born were preterm, having a gestational age of <37 weeks. 63 (1.4%) were born very or extremely preterm (<32 weeks).

| Gestational age | 2018 | | 2017 | |
|--|--------|------|--------|------|
| | Number | % | Number | % |
| Extremely preterm 22-27 weeks | 30 | 0.7 | 21 | 0.5 |
| Very preterm 28-31 weeks | 33 | 0.7 | 35 | 0.8 |
| Moderately preterm 32-36 weeks | 244 | 5.4 | 306 | 7.0 |
| Term 37 – 41 weeks | 4208 | 93.2 | 4029 | 91.6 |
| Post term 42+ weeks | 0 | 0 | 7 | 0.2 |
| Unspecified | 1 | 0.02 | 0 | 0 |

Table 14. Gestational age at delivery

OUTCOME OF BIRTH

The number of live births registered in 2018 was 4491, which accounted for 99.4% of the total births at a national level. The remaining 25 births were reported as stillbirths. Of the live births, there were 15 cases of early neonatal deaths and 6 cases of late neonatal deaths (see table below). All births delivered at 22 weeks and over, irrespective of birth weight, are registered into the system.

| Outcome of Birth | 2018 | 2017 |
|------------------|------|------|
| Livebirths | 4491 | 4379 |
| Stillbirths | 25 | 19 |

| Neonatal deaths | 2018 | 2017 |
|-----------------------|------|------|
| Early Neonatal deaths | 15 | 14 |
| Late Neonatal deaths | 6 | 6 |

Table 15. Birth outcomes – livebirths, fetal, early and late neonatal deaths (22+ weeks gestation)

INFANT FEEDING METHODS AT DISCHARGE

Infant feeding habits are recorded by hospital staff at the time of discharge from hospital, which is usually 2-5 days after delivery. Little can be said on the longer-term infant feeding habits as these may change soon after discharge from the birthing facilities.

| Infant feeding methods at time of discharge | 2018 | 2017 |
|--|-------------|-------------|
| Breast only | 2359 | 2433 |
| Bottle only | 1263 | 1180 |
| Mixed (Breast & Bottle) | 833 | 747 |
| Other* | 50 | 37 |
| Unspecified | 11 | 1 |

* 'Other' - include babies who are still at hospital after 28 days and those who die before discharge

Table 16. Infant feeding methods at time of discharge

MATERNAL AND PERINATAL MORTALITY INDICATORS

Maternal, fetal, perinatal and neonatal mortality statistics are indicators of quality of health care. Definitions of the rates presented are given below and follow those of WHO ICD-10 (International Statistical Classification of Diseases & Related Health Problems – 10th Revision). Indicators given in the tables below refer to births with birth weight 500g and over.

| Year | Maternal Deaths |
|------|-----------------|
| 2000 | 0 |
| 2001 | 2 |
| 2002 | 0 |
| 2003 | 0 |
| 2004 | 0 |
| 2005 | 0 |
| 2006 | 0 |
| 2007 | 0 |
| 2008 | 1 |
| 2009 | 0 |
| 2010 | 1 |
| 2011 | 0 |
| 2012 | 0 |
| 2013 | 0 |
| 2014 | 0 |
| 2015 | 0 |
| 2016 | 0 |
| 2017 | 0 |
| 2018 | 0 |

Table 17. Maternal Deaths 2000-2018

| Year | Fetal death rate 500g and over | |
|------|--------------------------------|------------------------|
| | Number | Rate/1000 total births |
| 2000 | 16 | 3.6 |
| 2001 | 20 | 5.1 |
| 2002 | 20 | 5.1 |
| 2003 | 16 | 3.9 |
| 2004 | 15 | 3.8 |
| 2005 | 8 | 2.1 |
| 2006 | 10 | 2.6 |
| 2007 | 11 | 2.8 |
| 2008 | 26 | 6.2 |
| 2009 | 21 | 5.0 |
| 2010 | 16 | 4.0 |
| 2011 | 23 | 5.3 |
| 2012 | 14 | 3.3 |
| 2013 | 18 | 4.3 |
| 2014 | 26 | 6.0 |
| 2015 | 14 | 3.1 |
| 2016 | 17 | 3.7 |
| 2017 | 15 | 3.4 |
| 2018 | 17 | 3.8 |

Table 18. Fetal Death Rates 2000-2018

| Year | Neonatal mortality rate (500g and over) | |
|------|---|-----------------------|
| | Number | Rate/1000 live births |
| 2000 | 23 | 5.3 |
| 2001 | 12 | 3.0 |
| 2002 | 20 | 5.1 |
| 2003 | 20 | 5.0 |
| 2004 | 17 | 4.4 |
| 2005 | 17 | 4.4 |
| 2006 | 9 | 2.3 |
| 2007 | 17 | 4.4 |
| 2008 | 24 | 5.7 |
| 2009 | 17 | 4.1 |
| 2010 | 18 | 4.5 |
| 2011 | 22 | 5.1 |
| 2012 | 14 | 3.3 |
| 2013 | 16 | 3.9 |
| 2014 | 11 | 2.6 |
| 2015 | 15 | 3.4 |
| 2016 | 22 | 4.9 |
| 2017 | 18 | 4.1 |
| 2018 | 20 | 4.5 |

Table 19. Neonatal Mortality rates 2000-2018

| Year | Early neonatal mortality rate (500g and over) | |
|------|---|-----------------------|
| | Number | Rate/1000 live births |
| 2000 | 16 | 3.6 |
| 2001 | 10 | 2.5 |
| 2002 | 16 | 4.1 |
| 2003 | 18 | 4.5 |
| 2004 | 12 | 3.1 |
| 2005 | 13 | 3.4 |
| 2006 | 4 | 1.0 |
| 2007 | 14 | 3.6 |
| 2008 | 21 | 5.0 |
| 2009 | 13 | 3.1 |
| 2010 | 16 | 4.0 |
| 2011 | 18 | 4.2 |
| 2012 | 12 | 2.8 |
| 2013 | 13 | 3.2 |
| 2014 | 10 | 2.3 |
| 2015 | 11 | 2.5 |
| 2016 | 17 | 3.7 |
| 2017 | 12 | 2.7 |
| 2018 | 14 | 3.1 |

Table 20. Early Neonatal Mortality rates 2000-2018

| Year | Late neonatal mortality rate (500g and over) | |
|------|--|-----------------------|
| | Number | Rate/1000 live births |
| 2000 | 7 | 1.6 |
| 2001 | 2 | 0.5 |
| 2002 | 4 | 1.0 |
| 2003 | 2 | 0.5 |
| 2004 | 5 | 1.3 |
| 2005 | 4 | 1.0 |
| 2006 | 5 | 1.3 |
| 2007 | 3 | 0.8 |
| 2008 | 3 | 0.7 |
| 2009 | 4 | 1.0 |
| 2010 | 2 | 0.5 |
| 2011 | 4 | 0.9 |
| 2012 | 2 | 0.5 |
| 2013 | 3 | 0.7 |
| 2014 | 1 | 0.2 |
| 2015 | 4 | 0.9 |
| 2016 | 5 | 1.1 |
| 2017 | 6 | 1.4 |
| 2018 | 6 | 1.3 |

Table 21. Late Neonatal Mortality Rates 2000-2018

| Year | Perinatal mortality rate (500g and over) | |
|------|--|------------------------|
| | Number | Rate/1000 total births |
| 2000 | 32 | 7.3 |
| 2001 | 30 | 7.6 |
| 2002 | 36 | 9.2 |
| 2003 | 34 | 8.4 |
| 2004 | 27 | 6.9 |
| 2005 | 21 | 5.4 |
| 2006 | 14 | 3.6 |
| 2007 | 25 | 6.4 |
| 2008 | 47 | 11.1 |
| 2009 | 34 | 8.1 |
| 2010 | 32 | 7.9 |
| 2011 | 45 | 10.5 |
| 2012 | 28 | 6.6 |
| 2013 | 34 | 8.2 |
| 2014 | 36 | 8.3 |
| 2015 | 29 | 6.5 |
| 2016 | 34 | 7.5 |
| 2017 | 27 | 6.2 |
| 2018 | 37 | 8.2 |

Table 22. Perinatal Mortality Rates 2000-2018

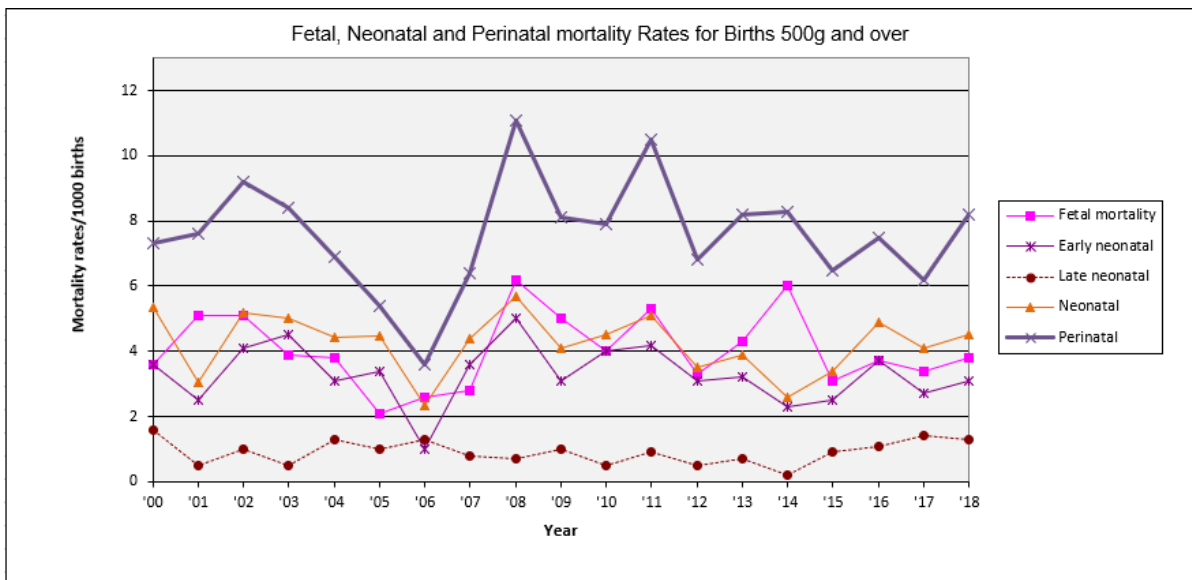


Figure 4. Fetal, neonatal and perinatal mortality rates 2000-2018
 (fetal deaths include only fetuses of birth weight 500g and over)

Varying data collection systems and reporting of smaller babies (namely 22-24 weeks gestation) over time may account for some of the changes in mortality rates.

Annex I gives some selected comparative birth and mortality statistics for Malta and the EU.

ANNEX 1

Selected comparative statistics for Malta and EU – data reproduced from the WHO – European Health for All Database (HFA-DB): <https://gateway.euro.who.int/en/hfa-explorer/> as available at November 2019. To date, only data until 2016 is fully completed for both Malta and EU members, data in the HFA database is continually updated as necessary.

| Year | Malta | EU members before May 2004 | EU members after May 2004 |
|------|-------|----------------------------|---------------------------|
| 2001 | 10.01 | 10.58 | 9.44 |
| 2002 | 9.86 | 10.52 | 9.26 |
| 2003 | 10.12 | 10.57 | 9.31 |
| 2004 | 9.69 | 10.63 | 9.49 |
| 2005 | 9.55 | 10.59 | 9.74 |
| 2006 | 9.32 | 10.70 | 9.92 |
| 2007 | 9.26 | 10.75 | 10.13 |
| 2008 | 9.80 | 10.90 | 10.61 |
| 2009 | 9.77 | 10.70 | 10.67 |
| 2010 | 9.40 | 10.75 | 10.39 |
| 2011 | 10.00 | 10.52 | 9.87 |
| 2012 | 9.84 | 10.37 | 9.89 |
| 2013 | 9.52 | 10.08 | 9.44 |
| 2014 | 10.03 | 10.14 | 9.87 |
| 2015 | 10.33 | 10.03 | 9.84 |
| 2016 | 10.67 | 10.07 | 10.05 |

Table 23. Live births per 1000 population (HFA Indicator 16)

| Year | Malta | EU members before May 2004 | EU members after May 2004 |
|------|-------|----------------------------|---------------------------|
| 2001 | 1.50 | 1.50 | 1.25 |
| 2002 | 1.40 | 1.50 | 1.25 |
| 2003 | 1.50 | 1.52 | 1.25 |
| 2004 | 1.37 | 1.55 | 1.26 |
| 2005 | 1.37 | 1.56 | 1.29 |
| 2006 | 1.41 | 1.58 | 1.31 |
| 2007 | 1.37 | 1.59 | 1.34 |
| 2008 | 1.40 | 1.62 | 1.40 |
| 2009 | 1.40 | 1.61 | 1.43 |
| 2010 | 1.40 | 1.62 | 1.39 |
| 2011 | 1.50 | 1.60 | 1.35 |
| 2012 | 1.36 | 1.60 | 1.35 |
| 2013 | 1.36 | 1.58 | 1.33 |
| 2014 | 1.38 | 1.60 | 1.36 |
| 2015 | 1.37 | 1.59 | 1.37 |
| 2016 | 1.37 | 1.61 | 1.38 |

Table 24. Total Fertility Rate (HFA indicator 25)

| Year | Malta | EU members before May 2004 | EU members after May 2004 |
|------|--------|----------------------------|---------------------------|
| 2001 | 50.83* | 5.43 | 16.94 |
| 2002 | 0 | 5.28 | 13.93 |
| 2003 | 0 | 5.42 | 15.13 |
| 2004 | 0 | 5.54 | 13.54 |
| 2005 | 0 | 4.86 | 10.11 |
| 2006 | 0 | 5.42 | 9.27 |
| 2007 | 0 | 4.85 | 8.45 |
| 2008 | 24.92* | 5.08 | 10.17 |
| 2009 | 0 | 6.20 | 9.68 |
| 2010 | 25.65* | 5.12 | 9.24 |
| 2011 | 0 | 4.65 | 9.21 |
| 2012 | 0 | 4.49 | 5.98 |
| 2013 | 0 | 4.41 | 6.78 |
| 2014 | 0 | 4.64 | 6.10 |
| 2015 | 0 | N/A | 7.56 |

*There were 2 maternal deaths in 2001, and 1 maternal death in each of 2008 and 2010.

Table 25. Maternal Deaths per 100 000 live births (HFA Indicator 90)

| Year | Malta | EU members before May 2004 | EU members after May 2004 |
|------|-------|----------------------------|---------------------------|
| 2001 | 5.06 | 4.46 | 5.38 |
| 2002 | 5.09 | 5.01 | 5.32 |
| 2003 | 3.95 | 5.05 | 5.19 |
| 2004 | 3.84 | 5.02 | 5.09 |
| 2005 | 2.07 | 4.93 | 4.96 |
| 2006 | 2.64 | 4.98 | 4.76 |
| 2007 | 3.18 | 4.88 | 4.63 |
| 2008 | 7.17 | 5.08 | 4.49 |
| 2009 | 6.90 | 5.44 | 4.44 |
| 2010 | 4.09 | 5.08 | 4.20 |
| 2011 | 5.49 | 5.00 | 4.30 |
| 2012 | 3.38 | 5.06 | 4.18 |
| 2013 | 3.95 | 5.00 | 4.03 |
| 2014 | 6.17 | 5.02 | 4.06 |
| 2015 | 3.80 | 4.93 | 3.71 |

Table 26. Fetal Deaths per 1000 births (HFA Indicator 82)

| Year | Malta | EU members before May 2004 | EU members after May 2004 |
|------|-------|----------------------------|---------------------------|
| 2001 | 3.05 | 3.11 | 5.98 |
| 2002 | 5.38 | 3.01 | 5.70 |
| 2003 | 5.20 | 2.92 | 5.52 |
| 2004 | 4.37 | 2.86 | 5.57 |
| 2005 | 4.41 | 2.74 | 5.09 |
| 2006 | 2.38 | 2.68 | 4.71 |
| 2007 | 5.31 | 2.62 | 4.45 |
| 2008 | 5.98 | 2.53 | 4.09 |
| 2009 | 4.47 | 2.50 | 4.01 |
| 2010 | 4.62 | 2.45 | 3.71 |
| 2011 | 5.76 | 2.41 | 3.57 |
| 2012 | 4.84 | 2.35 | 3.38 |
| 2013 | 4.46 | 2.33 | 3.26 |
| 2014 | 3.82 | 2.35 | 3.22 |

Table 27. Neonatal Deaths per 1000 live births (HFA Indicator 77)

DEFINITIONS

(Following the International Statistical Classification of Diseases and Related Health Problems – Tenth Revision, Volume II ICD-10, WHO, Geneva)

Maternal Death

A maternal death is the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and the site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management, but not from accidental or incidental causes.

Birth Weight

The first weight of the fetus or newborn obtained after birth.

Low birth weight is less than 2500g (up to and including 2499g).

Very low birth weight is less than 1500g (up to and including 1499g).

Extremely low birth weight is less than 1000g (up to and including 999g)

Gestational Age

The duration of gestation is measured from the first day of the last menstrual period. Gestational age is expressed in complete days or completed weeks.

For the purposes of calculation of gestational age from the date of the first day of the last normal menstrual period to the date of delivery, it should be borne in mind that the first day is day zero and not day one; days 0-6 therefore correspond to completed week zero;

Fetal Death

Fetal death is the death prior to the complete expulsion or extraction from its mother of a product of conception, irrespective of the duration of the pregnancy; the death is indicated by the fact that after such separation, the fetus does not breathe or show any other evidence of life, such as beating of the heart, pulsation of the umbilical cord, or definite movement of voluntary muscles.

Fetal Death Rate

The number of fetal deaths in a year expressed as a proportion of the total number of births (live births plus fetal deaths) in the same year. Rates are usually expressed per 1000 total births.

$$\text{Fetal death rate} = \frac{\text{no. of fetal deaths in a year}}{\text{no. of live births plus fetal deaths in that year}} * 1000$$

Live Birth

Live birth is the complete expulsion or extraction from its mother of a product of conception, irrespective of the duration of pregnancy, which, after separation, breathes or shows any evidence of life, such as beating of the heart, pulsation of the umbilical cord, or definite movement of the voluntary muscles, whether or not the umbilical cord has been cut or the placenta is attached; each product of such a birth is considered live born.

Neonatal Period

The neonatal period commences at birth and ends 28 completed days after birth. Neonatal deaths (deaths among live births during the first 28 completed days of life) may be subdivided into early neonatal deaths, occurring during the first seven days of life, and late neonatal deaths, occurring after the seventh day but before 28 completed days of life.

Age at death during the first day of life (day 0) should be recorded in units of completed minutes or hours of life. For the second (day 1), third (day 2) and through 27 completed days of life, age at death should be recorded in days.

Neonatal Mortality Rate

The number of deaths during the neonatal period in that year expressed as a proportion of the total number of live births in the same year. Rates are expressed per 1000 live births.

$$\text{Neonatal mortality rate} = \frac{\text{no. of neonatal deaths in a year} * 1000}{\text{no. of live births in that year}}$$

Early Neonatal Mortality Rate

The number of deaths during the early neonatal period (during first 7 days of life) in that year expressed as a proportion of the total number of live births in the same year. Rates are expressed per 1000 live births.

$$\text{Early Neonatal mortality rate} = \frac{\text{no. early neonatal deaths in a year} * 1000}{\text{no. of live births in that year}}$$

Late Neonatal Mortality Rate

The number of deaths during the late neonatal period (ie occurring after the seventh day but before 28 completed days of life) in that year, expressed as a proportion of the total number of live births in the same year. Rates are expressed per 1000 live births.

$$\text{Late Neonatal mortality rate} = \frac{\text{no. of early neonatal deaths in a year} * 1000}{\text{no. of live births in that year}}$$

Perinatal Period

The perinatal period commences at 22 completed weeks (154 days) of gestation (the time when birth weight is normally 500g) and ends at seven completed days after birth.

Perinatal Mortality Rate

The number of deaths during the perinatal period in a year expressed as a proportion of the total number of births (live births plus fetal deaths) in the same year.

$$\text{Perinatal mortality rate} = \frac{\text{no. of perinatal deaths in a year} * 1000}{\text{no. of live births plus fetal deaths in that year}}$$

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