**Georgian Perinatal Health Report**

2015

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# summary

This report is intended for all people with a stake in improving the health and care of pregnant women and babies, including health policy makers and planners, clinicians, researchers, and users of health care systems.

*Total births and deaths in 2015*

There were 59 249 live births registered in Georgia in 2015. A total of 59 836 deaths (stillbirth -586, neonatal deaths 363, post-neonatal deaths 144) were notified to the Ministry of Labor, Health and Social Affairs and its agency, the National Centers for Diseases Control and Publics Health.

*Rates of stillbirths, neonatal deaths and infant deaths among singelton and multiple births*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Stillbirth** | **Neonatal Mortality Rate** | **Postneonatal Mortality Rate** | **Perinatal Mortality Rate** | **Infant Mortality Rate** |
| 2010 | 10.9 | 9.6 | 6.6 | 17.4 | 12.0 |
| 2011 | 9.5 | 8.5 | 6.1 | 15.6 | 11.0 |
| 2012 | 11.2 | 9.2 | 6.6 | 17.7 | 10.8 |
| 2013 | 9.4 | 8.4 | 6.7 | 16.1 | 10.5 |
| 2014 | 10.5 | 7.2 | 5.1 | 13.8 | 8.2 |
| 2015 | 9.7 | 6.1 | 2.4 | 13.4 | 8.6 |

The numbers and rates of stillbirths, neonatal deaths and infant deaths have been falling and in 2015 were the lowest ever recorded. Low birthweight and prematurity continue to be associated with the highest rates of stillbirth and neonatal mortality.

In 2015, maternal mortality was 32 per 100 000 live births. Infections and hemorrhage were the leading causes of maternal deaths followed by a combination of other direct causes of maternal deaths.

# Introduction

Maternal and child health is one of the public health priority areas related to health and economic development of the country. Infant and maternal mortality has declined in Georgia but still remains as a burden for the country. There are multiple factors influencing maternal and infant health. The key factors behind perinatal mortality and morbidity are preterm birth, fetal growth restriction, congenital anomalies and also external factors such as social, behavioral and cultural determinants of health.

Georgia is a lower middle-income country with about 3.7 million population. Healthcare system of Georgia has undergone through several waves of healthcare reforms. In 2013, in order to improve financial protection and geographical access to the basic healthcare services, the Georgian government introduced a Universal Health Care (UHC) program for the entire population. The UHC program is a government-funded healthcare program administrated by a state agency (i.e. Social Service Agency) through private healthcare providers.

Georgia made significant efforts to improve maternal and child care during the last decade. This was done through the ongoing general healthcare reforms as well as through reforms focused on maternal and child healthcare in particular [1]. Several government funded maternal and child healthcare programs have emerged as programs related to antenatal care provision; early detection of congenital anomalies; identification and management of high-risk pregnancies; screening of pregnant women for HIV, hepatitis B and C, and syphilis; free provision of folic acid and iron supplements for pregnant women; free childbirth and caesarian section services as part of UHC. The UHC program covers all health needs of children (0-18 years) [1].

Georgia achieved Millennium Development Goal 4 and reduced under-5 and infant mortality rates. However, the improvement of maternal health and the reduction of the maternal mortality ratio (MMR) still remain a crucial public health concern.

This publication presents maternal and infant mortality data of Georgia for 2015. The report includes information on rates and causes for neonatal deaths (up to 28 days of age), post-neonatal infant deaths (from 28 days to one year) and stillbirths (from 22 weeks of gestation) and maternal mortality.

While health reports have been produced in Georgia on annual basis, this is a first annual report that aimed to present comprehensive information about maternal and perinatal health and reveal the strengths and weaknesses of perinatal health information systems and to identify areas requiring further improvement for evidence-based public policy. Production of this report was managed jointly by the Health Department of the Ministry of Labor, Health and Social Affairs (MoLHSA) and the National Centers for Diseases Control and Public Health (NCDC).

# 1. Sources of maternal and infant HEALTH and mortality data

## **1.1 Public Service Development Agency**

From 1998 to 2009, the death registration in Georgia was regulated by the Georgian Law on “Registration of Acts of Civil Status” (15.10.1998 No1644-Is)and respective amendments to this Law. Since that period the data management is under the responsibility of the Public Service Development Agency at the Ministry of Justice.

The death case is registered based on the following documents: medical certificate of death issued by a medical facility, death confirmation based on clinical or forensic enquiry,court decision, civil registration act and local self-government act.

Since 2009, in order to improve the vital registration system, local governments have been obliged to notify a death case within five days (15.12.2009 No2321) and from April 2010, a death notification within the same period became mandatory for all medical facilities, regardless of the type of property (20.04.2010 No2952). In case of deadline violation, the Public Service Development Agency is entitled to impose a penalty to responsible entities in amount of 500 GEL.

The paper-based medical certificate of death, approved by the order of MoLHSA (23.03.2003 No54/N) has been used till 2011. The medical certificate of death commonly was hand-delivered by the relatives of deceased person to the territorial offices (self-government) for registration*.*

Since April 2011, according to the new regulations, medical death certificate must be issued only electronically (15.12.2010 No4051). The new electronic format of medical death certificate maintains to collect the underlying cause of death (UCOD) and reflect the chain of morbid events leading directly to death or the circumstances of the accident or violence that caused the fatal injury. It is designed according the WHO recommendations (form No106/S-4) and endorsed by the MoLHSA.

The original documents of death registration records are sent to the Public Service Development Agency whilst the second copies (paper based) are stored in the territorial office, where the death case was registered. The registered acts of civil status, including death, are compiled in the shared united electronic database of the Public Service Development Agency. The Public Service Development Agency submits the electronic database of death registration records together with the electronic database of medical notifications of death to the National Statistics Office (NSO) on a quarterly basis and on demand.

## **1.2 National Statistics Office of Georgia (Geostat)**

The National Statistics Office is an official authority exclusively responsible for production and dissemination of official statistics in accordance with international statistical standards and requirements. It was established as a legal entity of public law according to the December 11, 2009 Law of Georgia, succeeding the Department of Statistics of the Ministry of Economy and Sustainable Development. Its principal purposes are the collection, editing, processing, storage, analysis and dissemination of exhaustive, up to date, reliable and comparable statistical data. One of the main functions of GEOSTAT is the provision of official statistics to all users. Of equal importance is the fact that these data constitute the basis of the national vital statistics system, which in turn is an integral part of the country’s health information systems

## **1.3 Ministry of labor, Health and social affairs and the National Center for Disease Control and Public Health Of Georgia**

In 2013, the MoLHSA implemented the maternal, under-5 deaths and stillbirths’ urgent notification system. Every case must be notified within 24 hours for further investigation and research. According to the MoLHSA Order (07.03.2016 No01-11/n) healthcare providers are obliged to call the hot-line of the Emergency Coordination and Response Department of the MoLHSA and notify the operator about the death event. The information must be reported to the Health Department of the MoLHSA electronically on the daily basis. In 5 days facilities are obliged to submit copies of medical charts to the Health Department of MoLHSA.

One of the responsibilities of the National Center for Disease Control and Public Health of Georgia (NCDC) is maternal and child health surveillance. The Department of Medical Statistics of the NCDC collects data on maternal and child health from all healthcare facilities on monthly and annual bases since 1996. Data on antenatal, intranatal and postnatal care, as well as maternal deaths, early neonatal deaths and stillbirths are reported to the NCDC by perinatal care facilities on a monthly basis.

In 2012, the NCDC implemented the active surveillance of death of reproductive age women (15 – 49 age). Since 2015 the system also covers under -5 children mortality. The notifications are recorded by local public health offices that are responsible to collect information from local health facilities through Electronic Integrated Disease Surveillance System (EIDSS).

In January 2016, MoLHSA with NCDC launched an electronic registry “Mother’s and neonate’s health surveillance system”, so called “Georgian Birth Registry” (GBR). The system contains information on all cases of pregnancy-, delivery-, postpartum-, abortion, including maternal deaths, stillbirths and early neonatal deaths.

# **2. Stillbirth**

## **2.1 Justification**

Stillbirth is one of the public health problems worldwide. WHO estimates that 97–99% of the 3 to 4 million stillbirths that occur each year globally happen in low- and middle-income countries. The causes of stillbirths are multiple - preterm birth, congenital anomalies, maternal infections in pregnancy (malaria, syphilis and HIV), **bleeding (haemorrhage) before or during labour, placental abruption,** maternal disorders (especially hypertension, obesity and diabetes), fetal growth restriction and other medical conditions[2].

During the last decade, in Georgia, the rates of stillbirths have declined. However, they are still high compared with high-income countries of European region and the world. Currently, information on prevalence of stillbirth’s modifiable risk factors such as overweight/obesity, smoking and environmental factors are not available. Also autopsy and histopathological examinations to determine the causes of stillbirths are not performed due to religious and cultural barriers.

The WHO’s International Classification of Diseases (ICD-10) defines stillbirth as “death before the complete expulsion or extraction from its mother of a product of conception, irrespective of the duration of pregnancy, which is indicated by the fact that after such separation, the fetus does not show any evidence of life”. Georgia uses the WHO definition of stillbirth and records all stillbirths with a gestational age limit of 22 completed weeks or more in the national perinatal mortality statistics. If gestational age is missing stillbirths are recorded when the birth weight is 500g or more.

## **2.2 Data sources and availability of stillbirth indicator in Georgia**

The sources of stillbirth are National Statistics Office(GEOSTAT) that collects data from the civil registration offices,the National Centre for Diseases Control and Public Health (NCDC) collecting aggregated data from maternity units on monthly and annual bases, and the MoLHSA’s stillbirth, maternal and child death notification system.

Every case of stillbirth must be reported. Health facilities certify stillbirth by issuing medical birth certificate and submitting it to the civil registration office. The civil registration office collects data not only from health facilities but also from bureau of legal entities and sends to GEOSTAT. In addition, since 2013, every stillbirth case occurred in a healthcare facility must be reported to the MoLHSA within 24 hours and the paper copy of medical record submitted within the 5 days of fetus delivery.

The stillbirth data presented in this report is an outcome of triangulation of data collected by the MoLHSA’s notification system and NCDC.

## **2.3 Limitation of registration system and ways of improvement**

Despite significant improvement in registration of stillbirth, there are several limitations in the current reporting system. Maternity houses as well as local government entities are reporting the fact of stillbirth with limited information about gestational age and birth weight. Although MoLHSA’s notification system collects case-based information with copies of medical charts that provide information about birth weight and gestation age, absence of unique medical charts for stillbirth is a limitation of the current reporting system.

To improve maternal and infant health information system, the MoLHSA and NCDC with UNICEF technical assistance implemented the national Georgia Birth Registry (GBR). The system has become operational since 1st of January, 2016. The registry will contain comprehensive information on causes and consequences of pregnancy and birth related health problems and its analyses contribute to better management, planning and quality improvement of health services, policy and program decision-making, surveillance and compilation of statistics.

## **2.4 Termination of pregnancy**

According to the Georgian law, abortion is allowed until 12 weeks of pregnancy. Abortions after 12 weeks and till 22 weeks of gestation are permitted only due to medical or social conditions. There are very limited conditions for lawful termination of pregnancy after 22 weeks of gestation.

Since 2013, pregnancy termination after 22 weeks is allowed only in case of maternal complication or congenital anomalies and after written permission of the Maternal and Child Health Committee under the MoLHSA. In 2015, only 35 cases of pregnancy terminations after 22 weeks of gestation were registered in the separate database maintained by the MoLHSA. In 2016, the MoLHSA issued a new regulation according to which each induced termination of pregnancy after 22 weeks of gestation does not require permission of the Maternal and Child Health Committee; however, the case shall be reported to the MoLHSA within 5 days of the procedure by the person in charge of the institution where the induced termination of pregnancy is performed.

## **2.5 Results**

In 2015, stillbirths accounted for 586 deaths. Stillbirth rate at or after 22 weeks of gestation was 9.7 per 1000 total births. If stillbirth defined as the number of deaths before or during birth at or after 28 weeks of gestation, commonly used by WHO for international comparisons, the stillbirth rate drops to 6.8 per 1000 total births.

Significant improvement in stillbirth rates was observed during the last decade. The rate dropped from 16.8 (2006) to 9.7 (2015) per 1000 births.

**Figure 2.5.1: Trends of stillbirth rate per 1000 births, Georgia, 2001-2015; MoLHSA & NCDC**

The distribution of birth weight and gestational age among stillbirth in 2015 is illustrated on figure 2.5.2.

**Figure 2.5.2: Percentage of stillbirths by birth weight groups and gestation age; Georgia, 2015; MoLHSA & NCDC**

Nearly 71% of stillbirths happened before term pregnancy, 37 weeks of gestation, with highest proportion - 35% observed in extremely preterm births group (22-27 weeks), followed by very preterm birth - 24% (28-33 weeks) and moderate to late preterm - 12% (34-36 weeks). Stillbirth in full term births (at or after 37 weeks) was 26.3%. For the remaining 2.5% gestation age was not reported.

**Figure 2.5.3: Percentage of stillbirth by gestation age and time of death; Georgia, 2015; MoLHSA & NCDC**

The stillbirth registration system in Georgia has been improving; however, detection of underline causes of stillbirth has yet to be developed. Analyses of patient’s records showed that 82% of all stillbirths occurred in antenatal period and only 14% occurred during the childbirth. In remaining 4% cases timing of death was difficult to obtain.

Among 82% of antepartum stillbirth, 31% occurred at 22-27 weeks of gestation, 27% at 28-33 weeks, 13% and 29% in 34-36 and 37-41 weeks of gestation, respectively.

Among 14% intrapartum stillbirth, 64% were between 22-27 weeks of pregnancy, 16% in 28-33 weeks, 6% and 14% were observed at 34-36 and ≥37 weeks of gestation, respectively. All stillborn babies at ≥37 weeks of gestation were more than 2400 gr.

Estimated intrapartum stillbirth in developed world varies between 4-10% of all stillbirths [3]. Compared to other lower-middle income countries, low proportion of intrapartum stillbirth (14%) in Georgia need to be interpreted with caution. Absence of postmortem autopsy, which would allow more precise identification of time of death and fetal appearance, lack of some key data (e.g. admission cardiotocography) are some of the data limitations.

**Figure 2.5.4: Stillbirth rate per 1000 births by the regions; Georgia, 2015; NCDC**

Figure 2.5.4 shows that in 2015 the highest stillbirth rate was in Tbilisi, followed by Imereti and Adjara regions.

## **2.6 Comparison with other countries**

Georgia’s stillbirth show decline since 2006 and continue to fall as demonstrated by the rate observed in 2015. According to the available data the rate of stillbirth in Georgia is higher compared with European Region and CIS countries (figure 2.6.1) until recently. However, this should be interpreted with cautious and not suggesting that Georgia’s performance is worse than that of CIS countries. This is because the methods of data collection vary considerably between countries, so comparisons may not be justified: different countries define stillbirth in different ways and have different ways of collecting the data. For example, differences in legislation and practices about pregnancy termination contribute to some of the observed variation in fetal and neonatal mortality.

**Figure 2.6.1: Trends of stillbirth rate per 1000 births Georgia; CIS, and European Region, 2000-2013; WHO, HFA-DB**

 **KEY POINTS:**

1. There has been an improvement over the last years and stillbirth rate has fallen to 9.7 per 1000 total births in 2015.
2. Despite decline, the stillbirth rate in Georgia is still higher than in European countries.
3. High proportion of late fetal loss (62%) at ≥28 weeks of gestation presents a concern. Introducing and strengthening perinatal mortality audit system will be critical to investigate the causes and factors contributing to stillbirth, especially for all stillbirths occurring at ≥37 weeks.
4. Improving screening of high risk pregnancies, early detection of risk factors and emerging complications (e.g. preeclampsia and fetal growth restriction) with proper management could reduce the risk of anterpartum stillbirth.
5. Further improvement of quality and timely obstetric care will substantially reduce intrapartum stillbirths.

# 3. Neonatal mortality

## **3.1 Justification**

Neonatal mortality rate is defined as the number of deaths after live birth during the neonatal period (0-27 days) at or after 22 completed weeks of gestation per 1000 live births in the same year. It is one of the key measures of healthcare system performance and quality of care during pregnancy and delivery. Neonatal deaths are subdivided into early neonatal deaths (0-6 days after live birth) and late neonatal deaths (7-27 days after live birth). In Georgia, data on neonatal deaths are collected on annual and monthly bases by timing of death, gestational age, birth weight, and plurality.

According to the WHO data, the neonatal mortality contributes about 43% of under-5 mortality in developed countries [3]; In Georgia, neonatal mortality has the higher share in under-5 mortality than in developed countries.

While several systems of classification of perinatal and neonatal deaths exist, no single system has been adopted as a standard in the country. The Dollfus classification system was used first time in Georgia for neonatal mortality cause description in 2015. The selection of this classification system was based on the fact that it has only nine categories and has good comparability with ICD-10. It is also etiology-based with a focus on prevention.

## **3.2 Data sources and availability of neonatal mortality indicators in Georgia**

The existing sources of neonatal mortality areGEOSTAT that collects data from civil registry offices,NCDC that receives aggregated data from maternity houses (on monthly and annual basis) and local public health entities (notification in the Electronic Integrated Disease Surveillance System (EIDSS), and MoLHSA that has mandatory notification system on stillbirths, under-5 children and maternal mortality.

Each case of neonatal death must be reported. Health facilities certify neonatal death by issuing medical death certificate and submitting it to the civil registration office. The civil registration office collects data not only from the health facilities but also from bureau of legal entities and sends data to GEOSTAT. In addition, since 2013, every neonatal death case occurred in the healthcare facility must be reported to the MoLHSA within 24 hours and paper copy of medical record submitted within 5 days of fetus delivery.

The neonatal data presented in this report is an outcome of triangulation of data collected by the MoLHSA’s notification system and NCDC’s information system.

## **3.3 Limitation of registration system and ways of improvement**

Significant improvements in registration of neonatal deaths were made during the last years. Neonatal death reporting to NCDC from maternity units and public health entities is complemented by MoLHSA’s mandatory notification system with copies of medical charts providing information about birth weight, gestation age, cause of deaths and other key data points. Improving accuracy of gestational age on birth certificates will be important intervention to undertake.

GBR, a national health registry of all births in the country, introduced in January 2016 will further improve neonatal death registration and neonatal health information system in general, and will clarify the causes and consequences of pregnancy and birth related health problems. The GBR will also provide an opportunity to monitor regionalization of perinatal care by maternal and neonatal conditions.

## **3.4 Results**

In 2015, the total number of neonatal deaths was 363. Neonatal mortality rate was 6.1 per 1000 live birth. Early neonatal and late neonatal mortality rates were 3.7 and 2.5 per 1000 live births, correspondingly.

**Figure 3.4.1:** **Trends of neonatal, early and late neonatal mortality rate per 1000 live births; Georgia, 2007 -2015; MoLHSA & NCDC**

In neonatal mortality we see a steady fall, from 12.1/1000 in 2009 to 6.1/1000 live births in 2015. Notably, early neonatal death is the key contributor to the reduction of neonatal mortality rate which declined by nearly 2.7 times from 2007. Late neonatal mortality rate have changed little during the same period (Figure 3.4.1).

The share of neonatal death in under-5 mortality has downward trend and reached 60% in 2015; however, it still exceeds the global average value of 43% (WHO). The share of neonatal death in infant mortality also reduced and reached 70% in 2015.

**Figure 3.4.2: The share of neonatal mortality in under-5 and infant mortality; Georgia, 2007-2015; MoLHSA & NCDC**

Majority of neonatal deaths (75%) occurred in preterm babies. Among all neonatal deaths, 30% occurred from 22 to 27 weeks of pregnancy, 33% within 28-33 weeks; 12% and 19% occurred within 34-37 and >37 weeks of pregnancy, respectively.

7.5% of neonatal deaths occurred in babies born from multiple pregnancies in 2015; among them 67% died during early neonatal period.

The share of early neonatal mortality in all neonatal deaths reached the lowest level during the last decade in 2015, and was 57.8%.

Among the cases of early neonatal death 35% were from 22 to 27 weeks of pregnancy, 32% were within 28-33 weeks, 10% and 15% were within 34-37 and >37 weeks of pregnancy, respectively. Birth weight of 41% of neonatal death cases were within 1000-2499gr. 16% of early neonates were term neonates and their birth weight was >2500 gr.

**Figure 3.4.3: Early neonatal deaths by gestation age and birthweight; Georgia, 2015; MoLHSA & NCDC**

Same distribution pattern was observed in late neonatal mortality. Specifically, 22% of late neonats died from 22 to 27 weeks, 35% died within 28-33 weeks, 15% and 22% within 34-36 and ≥37 weeks of gestation, respectively.

**Figure 3.4.4: Late neonatal deaths by gestation age and birthweight; Georgia, 2015; MoLHSA & NCDC**

Causes of all neonatal deaths were clasified according to the Dollfus classification.

**Table 1: Dollfus Classification; MoLHSA & NCDC**

|  |  |  |
| --- | --- | --- |
|  | **Causes of death** | **%** |
| 1 | Prematurity and related conditions | 51.8 |
| 1.1 | Prematurity <28 weeks | 30.7 |
| 1.2 | Prematurity ≥28 - <37 weeks | 21.1 |
| 2 | Congenital anomaly | 20.3 |
| 3 | SIDS | 0.3 |
| 4 | Obstetric conditions | 1.4 |
| 5 | Birth asphyxia | 5.8 |
| 6 | Perinatal infections | 4.4 |
| 7 | Other infections | 5.8 |
| 8 | External causes/injuries | 0.5 |
| 9 | All other (except RDS) | 3.0 |
| 9.1 | Respiratory distress syndrome | 4.9 |
|   | NA | 1.9 |

Table 2 presents data on percentage of neonatal deaths attributed to different congenital anomalies.

**Table 2 Distribution of congenital anomalies among neonatal deaths; Georgia, 2015; MoLHSA & NCDC**

|  |  |  |
| --- | --- | --- |
|  | Congenital Anomalies associated with Neonatal death | **%** |
| 1 | Congenital malformations of the nervous system | 12 |
| 2 | Congenital malformations of the circulatory system | 51 |
| 3 | Congenital malformations of the respiratory system | 5 |
| 4 | Congenital malformations of the urinary systems | 4 |
| 5 | Congenital malformations of the digestive system | 5 |
| 6 | Congenital malformations and deformations of the musculoskeletal system | 3 |
| 7 | Congenital malformations and deformations of the unspecified system | 1 |
| 8 | Congenital malformations of the several systems | 19 |
| 8.1 | including cleft lip and cleft palate | 1 |

Cardiac and nervous system related anomalies were the most common congenital anomalies, followed by multi-system anomalies.

## **3.5 Comparison with other countries**

The figure 3.5.1 shows the comparison of neonatal mortality rates in Georgia and other neighboring countries. Georgia’s neonatal death takes sixth place among post-soviet countries. It was higher than in Baltic countries, Ukraine, Moldova, Russia, and Belarus; however, it is lesser than in neighboring countries, such as Armenia, Azerbaijan and Central Asian Republics. Neonatal death rate has declined in 2015 and reached 6.1 per 1000 live birth thus putting Georgia closer to the average observed in the European Region.

At the same time this indicator is more than two times higher compared to the European Region countries.

**Figure 3.5.1: Neonatal Mortality Rate per 1000 births; Georgia and EU region, 2000-2013; WHO, HFA-DB**

**KEY POINTS**

1. Neonatal mortality rate shows steady fall since 2012. It has reached 6.1 per 1000 live birth in 2015.
2. Prematurity is a particular risk of neonatal mortality; high proportion of premature neonates died during the neonatal period.
3. One-third of neonates died at ≥34 weeks of gestation. More targeted care for late preterm births and term babies with scale-up of high impact interventions will significantly contribute to reducing the deaths among these babies and imrove overall survival gains.
4. Improving national data system will be required to facilitate tracking the burden of preterm birth.
5. Strengthening implementation of preterm birth strategies, including high coverage of evidence-based interventions such as screening and management of pregnant women at higher risk of preterm birth, increasing public and provider education

will contribute reducing neonatal mortality.

1. Implementation of regionalization of perinatal health services throughout the country is critical to ensure that high-risk infants are delivered and cared at risk-appropriate facilities with adequate neonatal intensive care units.
2. Improving primary prevention of congenital anomalies, early detection and better management of certain anomalies, including pregnancy termination before 22 weeks of gestation can reduce neonatal mortality attributed to congenital anomalies.

# Infant mortality

## **4.1 Justification**

Infant mortality extends beyond the perinatal period, however, it was decided to include in the report. The infant mortality rate measures the longer-term consequences of perinatal morbidity. High-risk babies hospitalized in neonatal intensive care units can die after the neonatal period.

Georgia uses the WHO International Classification of Diseases (ICD-10) - “the number of infants dying under a year of age (days 0-364) in a given year per 1000 live births in the same year”. The data on annual infant deaths is collected by cause of death, gestational age, birth weight, and plurality.

According to the latest estimates of the UN Inter-agency Group for Child Mortality Estimation (IGME), under-5 mortality is steadily declining and IGME estimates are very close to the official data in Georgia. Georgia has made significant improvement in infant mortality rate; it has declined from 18.3 per 1000 live birth (2003) to 8.7 per 1000 live birth (2015).

The selection of Dollfus classification system for classification of deaths was based on the fact that it has only nine categories and has good comparability with ICD-10. It is also etiology-based with a focus on prevention.

## **4.2 Data sources and availability of indicators in Georgia**

The existing sources of infant mortality are:GEOSTAT that collects data from civil registry offices;NCDC that collects aggregated infant mortality data from maternity houses and hospitals (on monthly and annual basis) and local public health entities (notification in the Electronic Integrated Disease Surveillance System); and MoLHSA that has mandatory notification system on stillbirths, under-5 children and maternal mortality.

According to the law, each infant death is a notifiable event in Georgia. Health facilities certify infant death by issuing medical death certificate and submitting it to the civil registration office. The civil registration office collects data not only from health facilities but also from bureau of legal entities and sends data to GEOSTAT. Since 2013, every infant death occurred in the health facility must be reported to the MoLHSA within 24 hours and paper copy of medical record submitted within 5 days. In addition, since January 2015, each case of under-5 death is entered into the electronic integrated disease surveillance system (IEDSS). The infant death data presented in this report is an outcome of triangulation of data collected by the MoLHSA notification system and NCDC.

## **4.3 Limitation of registration system and ways of improvement**

Despite significant improvements in registration of infant deaths as demonstrated by close correlation of official data and IGME estimations, there are still limitations in the current reporting system. Infant death reporting to NCDC from maternity units, pediatric hospitals and public health entities is complemented by MoLHSA’s mandatory notification system with copies of medical charts providing information about birth weight, gestation age, cause of deaths and other key data points. Developing and implementing standardized medical charts for infant death will be an important intervention to strengthen the reporting system.

Recently initiated GBR will contribute to information and knowledge on infant mortality. In 2017 the birth registry will be expanded and cover under-5 children mortality and morbidity.

## **4.4 Results**

In 2015, 507 infant deaths (363 neonatal and 144 post-neonatal deaths) were registered. Infant mortality rate is 8.6 per 1000 live births.

**Figure 4.4.1: Infant mortality rate per 1000 live births; Georgia, 2003-2015, MoLHSA/NCDC, IGME, and GERHS**

Infant deaths in post-neonatal period often are associated with preventable social and environmental factors such as accidents and infections. In 2015, share of post-neonatal deaths among infants was 28%.

According to Dollfus classification prematurity and related conditions were the most common cause of post neonatal death (44.2%) followed by congenital anomalies (27.9) (Table 4.1).

**Table 4.1 Proportion of post neonatal causes of death based on Dollfus Classification; Georgia, 2015; MoLHSA & NCDC**

|  |  |  |
| --- | --- | --- |
|  | Causes of death | % |
| 1 | Prematurity and related conditions | 44.2 |
| 1.1 | Prematurity <28 weeks | 22.1 |
| 1.2 | Prematurity >28 - <37 weeks | 22.1 |
| 2 | Congenital anomaly | 27.9 |
| 3 | SIDS | 0.6 |
| 4 | Obstetric conditions | 0.6 |
| 5 | Birth asphyxia | 1.9 |
| 6 | Perinatal infections | 3.2 |
| 7 | Other infections | 13.6 |
| 9 | All other (except RDS) | 6.5 |
| 9.1 | Respiratory distress syndrome | 1.9 |
|  | NA | 1.3 |

Congenital malformations of circulatory system were the most common cause among the post-neonatal death cases.

**Table 4.2 Proportion of congenital anomalies among post neonatal causes of death based on Dollfus Classification; Georgia, 2015; MoLHSA & NCDC**

|  |  |
| --- | --- |
| **Congenital anomaly** | % |
| Congenital malformations of the nervous system | 5 |
| Congenital malformations of the circulatory system | 59 |
| Congenital malformations of the respiratory system | 9 |
| Congenital malformations of the urinary systems | 2 |
| Congenital malformations of the digestive system | 9 |
| Congenital malformations and deformations of the musculoskeletal system | 2 |
| Congenital malformations of the several systems | 14 |

More boys (51.5%) than girls (42.5%) died in 2015. Gender distribution in the total infant is illustrated in figure 4.4.2.

**Figure 4.4.3: Percentage of infant mortality by sex; Georgia, 2015; MoLHSA & NCDC**

In 2015, infant mortality rates where highest in Tbilisi (16 per 1000 live births), followed by Kakheti (9.5 per 1000 live births) and Imereti (8 per 1000 live births respectively) regions (Figure 4.4.5)

**Figure 4.4.3: Infant mortality rate per 1000 live births by regions: Georgia, 2015; MoLHSA & NCDC**

Of all infants who died in 2015, 71% were premature by gestation age and 56% by birth weight.

**Figure 4.4.4: Infant mortality rate per 1000 live births by birth weight groups and gestation age; Georgia, 2015; MoLHSA & NCDC**

In 2015 85% of under-5 mortality was represented by infant mortality; the main causes of infant death (e.g. accidents and infections) are preventable.

## **4.5 Comparison with other countries**

**Figure 4.4.5: Infant mortality rates by 1000 live births; Georgia, European Region, CIS, last available years; MoLHSA & NCDC**

Despite steady decline, infant mortality rates in Georgia higher than the rates observed in the EU region. However, the recent decline in 2015 with the rate 8.6 by 1000 live birth puts Georgia closer to the EU region average.

**KEY POINTS:**

1. Georgia reached its target for Millennium Development Goal 4. The rates of under-1 mortality steadily have declined.
2. Improving primary preventions of congenital anomalies, early detection and better management of certain anomalies, including termination before 22 weeks of gestation can reduce the number of infant deaths attributed to congenital anomalies.
3. Preventing and better management of preterm birth, including late preterm birth, through identification of opportunities for prevention, management and assessment of impact of such efforts will be important strategy to address preterm mortality.
4. Implementation of regionalization of perinatal health care services throughout the country will be critical to ensure that high-risk infants are delivered and cared at risk-appropriate facilities.
5. Increase health equity and reduce disparities by targeting social determinants of health through investments in high-risk communities and initiatives to address poverty.

MATERNAL HEALTH

# Caesarian Section

## 5.1 Justification

Rates of C-section have been increasing around the world in recent years. The increase in C-section is due to changed risk profiles both for mothers and their fetus, maternal requests, the perception that it’s a safe procedure, fear of litigation, financial incentives for doctors related to methods of payment among others [4]. When medically justified, a caesarean section can effectively prevent maternal and perinatal mortality and morbidity. However, there is no evidence showing the benefits of caesarean delivery for women or infants who do not require the procedure. As with any surgery, caesarean section is associated with short and long-term risk which can be extended many years beyond the current delivery and affect the health of the woman, her child, and future pregnancies. These risks are higher in women with limited access to comprehensive obstetric care [5].

The number of caesarean sections has been increasing in Georgia. Between 2007 and 2015 the cesarean rate rose by almost 50%. C-sections have become more popular throughout Georgia, although the trend is uneven from region to region.

Under the UHC program state is paying 800 GEL[[1]](#footnote-1) for emergency and C-section based on medical indication (elected or planned C-section). If C-section is performed on maternal request, the payment is partial, 500 GEL, as with any vaginal births covered by the government.

In 2013, MoLHSA has made an attempt to reduce the number of C-sections. C-section protocol was developed and approved. The protocol defined indications and contraindications for a caesarean section. In 2015, MoLHSA initiated regionalization of perinatal care services with clear definition of perinatal care levels and services, included C-section, performed at each level. It is hoped that perinatal regionalization will contribute to reduction of medically unjustified C-sections.

The indicator is defined as the percent of pregnant women who have a cesarean section of all births - live born and stillborn

## 5.2 Data sources and availability of indicators in Georgia

The existing national sources of data for C-section include NCDC’s aggregated C-section data from maternity houses collected on monthly and annual basis and Social Service Agency data from maternal healthcare facilities participating in the UHC Program.

## **5.3 Limitation of registration system and ways of improvement**

NCDC collects aggregated data from all maternal healthcare facilities, but Social Service Agency collects case-based data from maternal healthcare facilities participating in the UHC program. These sources elucidate trends in repeat and primary cesarean rates; however, neither source yields accurate information about indication for cesarean delivery such as cesarean for maternal request, labor arrest disorders, or fetal status.

The Robson classification system proposed as a global standard for assessing, monitoring and comparing caesarean section rates within healthcare facilities and regions over time and between facilities has not been yet implemented in Georgia. The birth registry, implemented since 2016, will contribute to better data on causes and consequences of C-section.

## **5.4 Results**

According to the NCDC data, in 2015 the rate of C-section was 409.6 per 1000 live birth and share of C-section among all childbirth was 41.3%. The data in the Figure 6.4.1show a consistent rise in cesarean deliveries. Moreover, in some medical facilities this share was significantly higher than the average value.

**Figure 5.4.1: C-section among all childbirth; Georgia, 2007-2015; MoLHSA & NCDC**

There were 57% of emergency and 43% of planned C-sections in 2015. Over half (54.8%) cesarean deliveries were primary C-sections. Data on demand or maternal request for C-sections are not registered in NCDC databases.

**Figure 5.4.2: Planned and emergency C-section; Georgia, 2007-2015; MoLHSA & NCDC**

**In 2015, out of 50 860 deliveries funded by the** UHC program, 37% (18 818 cases) were cesarean births. Among them 96% (18 058 cases) were planned (based on medical indications) and emergency, and 4% (760 cases) were performed on maternal request.

According to UHC program data, prevalence of planned and emergency C-sections was the highest in Tbilisi (43.2%) followed by Imereti (17.7%) and Adjara (14.2%).

**Figure 5.4.3 Percentage of C-section by the region; Tbilisi, 2015; MoLHSA & NCDC**

## **5.5 Comparison with other countries**

The C-section rate in Georgia is more than one and a half times higher compared to the European Region countries and 2-times higher than in CIS countries.

**Figure 5.5.1: Caesarean section rate per 1000 live births; Georgia, European Region and CIS, 2000-2013; WHO, HFA-DB**

**KEY POINTS**

1. High proportion of C-section, especially primary C-sections, needs to be addressed with proper clinical audit system. This will help to better understand the precise forces sustaining these trends in their broader context, and to develop appropriate policies and guidelines for performing and monitoring cesarean deliveries in Georgia as well as interventions that might encourage an increase in vaginal births.

# Maternal mortality associated with childbearing in Georgia

## **6.1 Justification**

Globally, approximately 830 women die every day from preventable pregnancy and childbirth related causes [6]. Maternal Mortality Ratio (MMR) is one of the key indicators of health system performance. Majority of maternal deaths globally are due to haemorrhage, infection, unsafe abortion, and eclampsia, or from health complications aggravated during pregnancy [8].

During the last 15 years, according to the Maternal Mortality Estimation Inter-Agency Group (MMEIG) Georgia has made significant progress in reducing maternal mortality ratio. According to MMEIG, in 2000, MMR was 60/100,000 live births in Georgia, which by 2015 reduced to 36/100 000 live births.

The Reproductive Age Mortality Study (RAMOS) conducted in 2014 showed significant improvement of death registration of women of reproductive age. Nearly all deaths (98%) of women of reproductive age were registered by Georgia’s vital registration system in 2012, compared with RAMOS 2008 when only 84% deaths of reproductive age women registered in 2006. According to the same studies, the level of underreporting of maternal mortality in vital statistics significantly reduced (65% in 2006 vs. 39% in 2012)[[2]](#footnote-2) and maternal mortality ratio decreased from 44.4 to 26.3/ 100,000 live births.

## **6.2 Data sources and availability of indicators in Georgia**

The existing sources of maternal mortality include: GEOSTAT, department of medical statistics of the NCDC, the MoLHSA, MMEIG and periodic surveys, specifically RAMOS.

NCDC collects data on maternal death from two sources: monthly and annual reports on maternal death from health facilities and notifications from local public health entities (notification in the Electronic Integrated Disease Surveillance System) on every case of reproductive age woman death. MoLHSA’s mandatory notification system collects data on stillbirths, under-5 children and maternal mortality. Facilities submit copies of deceased woman medical charts to the MoLHSA within 5 days.

Health facilities certify maternal death by issuing medical death certificate and submitting it to the civil registration office. The civil registration office collects data not only from health facilities but also from bureau of legal entities and sends to GEOSTAT.

The presented data on maternal mortality is an outcome of triangulated data collected by NCDC and MoLHSA.

## **6.3 Definition and presentation of indicators**

The WHO’s International Classification of Diseases (ICD-10) defines maternal mortality as “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”. ICD-10 describes late maternal death as “the death of a woman from direct or indirect obstetric causes more than 42 days but less than one year after termination of pregnancy”.

This chapter presents maternal deaths in the following groups: direct obstetric deaths, indirect obstetric deaths and pregnancy-associated death. ICD-10 defines direct obstetric deaths as “those resulting from obstetric complications of the pregnant state (pregnancy, labour and puerperium), from interventions, omissions, incorrect treatment, or from a chain of events resulting from any of the above”. ICD-10 states indirect obstetric deaths as “the result from previous existing disease or disease that developed during pregnancy and which was not due to direct obstetric causes, but which was aggravated by physiologic effects of pregnancy”.

The maternal deaths in Georgia are classified according to the WHO’s International Classification of Diseases (ICD-10).

## **6.4 Results**

In 2015, 24 pregnant women died while pregnant or within one year from the end of pregnancy. Of those 21 (87.5%) were classified as maternal (directly or indirectly caused by pregnancy) and 3 (12.5%) as deaths from co-incidental causes.

Of the 21 maternal deaths, 19 (90%) were early (occurred during pregnancy or 0-42 days after pregnancy termination) and 2 (10%) late maternal deaths (occurred during 43-365 days after pregnancy termination).

**Figure 6.4.1: Maternal mortality ratio per 100 000 live births; Georgia, 1990-2015; NCDC, MMEIG, RAMOS, MMS, MoLHSA**

According to GERAMOS there has been decrease in maternal mortality rates between 2006 and 2012. In 2012, GERAMOS MMR was 26.3, while for the same period official statistics estimated maternal mortality at 22.8/100000 live births. Such close correlation between survey and official statistics demonstrates marked improvement of maternal death registration coverage by the official statistics. Slight increase in maternal mortality rates has been observed during the last couple years; however, small numbers mean greater annual variations.

For countries with small numbers of maternal deaths, WHO reccommends to use the moving average method. A moving average is a technique to get an overall idea of the trends in a data set; it is an average of any subset of numbers. The moving average is extremely useful for long-term trends in case of very small number of maternal deaths. It represents the “middling” value of a set of numbers and is the best tool for visualization. An analysis of the moving averages of maternal mortality shows a change in the MMR’s trend, with a mild elevation of maternal death in the period studied

**Figure 6.4.2 Maternal mortality ratio per 100,000 LB 3-year moving average, Georgia, 1996-2015**

Out of a total 19 early maternal deaths, direct, indirect and unspecified causes shared 57.9%, 26.3% and 15.8 % respectively. hemorrhage (21%, 4 cases) and Infections (10.5%, 2 cases) were the leading causes of maternal deaths followed by pre-eclampsia (5.3%, 1 case) and obstetric embolism (5.3%, 1 case). Notably, a combination of other direct causes reached 15.8% (3 cases) of maternal deaths, such as aspiration pneumonitis due to anaesthesia during labour and deliveries, complication of anaesthesia during the puerperium, unspecified and rupture of uterus during labour.

**Figure 6.4.1: Percentage of maternal mortality by causes of deaths; Georgia, 2015; MoLHSA & NCDC**

Among the indirect obstetric causes (15.8%, 3 cases) respiratory system diseases contributed to two deaths and cardio-vascular system disease to one death. One late maternal death due to suicide secondary to postpartum depression was identified, the second late maternal death happened due to cerebral aneurism in 2015.

**KEY POINTS**

1. There has been marked improvement in registration of maternal deaths in Georgia.
2. Majority of maternal deaths were due to preventable causes.
3. Investigation of maternal deaths helps to understand the medical and non-medical causes of maternal deaths and to take appropriate actions.
4. To avoid preventable maternal deaths it will be important to 1) ensure pregnant women at risk receive care in facilities that are able to provide the required level of specialized care (i.e., implement a perinatal care regionalization policy nationwide); 2) improve the coordination of maternal care throughout the continuum of antenatal, intrapartum, and postpartum care; and 3) establish nationwide comprehensive quality measures and increase accountability for the quality of services.

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1. GEL- Georgian currency [↑](#footnote-ref-1)
2. [↑](#footnote-ref-2)