

Background

The Georgia Reproductive Age Mortality Study (RAMOS) 2014 is the second national study looking at deaths of reproductive age women (15-49) in Georgia. This study was commissioned and conducted by the National Center for Disease Control and Public Health (NCDC) with technical support from USAID SUSTAIN, a USAID-funded health project implemented by John Snow, Inc. (JSI). Georgia's first RAMOS was conducted in 2008 looking at 2006 data. This second RAMOS was conducted in 2014 looking at 2012 data.

RAMOS 2014 objectives:

1. Identify the causes of mortality in women of reproductive age to determine the magnitude of maternal mortality and assess changes in maternal death since RAMOS 2008
2. Identify the causes of maternal mortality
3. Evaluate the existing vital statistics civil registration system
4. Assess health facility-based standards of care for women experiencing complications during pregnancy, abortion, labor and delivery, and the postpartum period
5. Provide evidence-based recommendations to health care policy makers.

RAMOS 2014 marks the first time the NCDC has designed and implemented such a large, population-based study. Their ability to do so is a direct result of capacity building provided during the first RAMOS, which was also funded by USAID through JSI.

Methods

The RAMOS 2014 methodology involved first identifying all deaths among women of reproductive age (15-49) with permanent residence in Georgia. RAMOS 2014 used multiple sources of data to identify deaths, including the vital registry electronic database, hospital databases, and community informants contacted during the field investigation. Overall 913 deaths between January 1 and December 31, 2012 were identified as meeting the eligibility criteria through these data sources. Of the 913 eligible cases, 881 deaths were investigated by performing household visits and completing detailed verbal autopsies with relatives of the deceased women, which yielded a response rate of 97%.

Deaths among women during pregnancy or one year after pregnancy were further investigated by conducting key informant interviews and reviewing medical records at the last medical facility that had provided care for the fatal illness or condition. A specialist panel reviewed the cases of all deceased women, assigned underlying causes of deaths, and coded the deaths using ICD-10 codes. The data was analyzed using SPSS statistical software.

Key Findings

RAMOS 2014 found that nearly all deaths (98%) of women of reproductive age (WRA) were registered by Georgia's vital registration system. This is a significant improvement over the death registration results from RAMOS 2008, which found that only 84% of all deaths among WRA were registered.

RAMOS 2014 found that cancer caused the death of 399 (45.3%) WRA. More women died from cancer than from any other category of mortality cause. The other leading categories of mortality causes were external causes with 163 (18.5%) death cases and circulatory system diseases with 116 (13.2%) death cases. These findings not much differ from RAMOS 2008, when cancer (45.4%) was the leading cause of death, followed by external causes (15.9%) and circulatory system diseases (11.6%).

Breast and Reproductive Tract Cancers

Breast cancer caused 111 (12.6%) deaths, making it the single leading cause of death among WRA. Reproductive system cancers were responsible for 107 (12.2%) deaths. Cervical cancer killed 57 (6.5%) women and was the leading reproductive system cancer, followed by uterine cancer with 36 (4.1%) and ovarian cancer with 14 (1.6%) deaths.

Stage of Cancer at Diagnosis

Over two-thirds (72.1%) of breast cancer patients were diagnosed at a late stage. Similarly 75.4% of cervical cancer, 77.1% of uterine cancer, and 64.3% of ovarian cancer patients were diagnosed at late stages. Late stage diagnosis of cancer, particularly for breast and cervical cancers, which can be successfully treated if diagnosed early, is a major public health concern in Georgia. There has been no improvement in downstaging cancer since RAMOS 2008.

Time from First Symptoms to Cancer Diagnosis

Long patient delay, which is defined as time from onset of first symptoms to diagnosis, is a major issue. The average wait time from first symptoms to diagnosis for breast cancer patients was 6.8 months, for cervical cancer patients - 5.7 months, for uterine and ovarian cancer patients - 5.3 and 2 months respectively, and with other cancers - 5 months.

Survival time and rates

The median survival time for 111 breast cancer patients was 24 months, for patients with reproductive system cancers (107) – 12 months, and for other cancer patients (181) – 14 months. The five-year survival rate for breast cancer patients with early stage diagnosis was 33.3% and with late stage diagnosis – 13.8%.

External Causes of Death

Among external causes, transport accidents took the lead with 47.9% deaths. Overall, transport accidents caused 81 (9.3%) of deaths among WRA. Suicide was the cause of 28 (3.2%) deaths and homicide- the cause of 11 (1.3%) deaths. Other external causes killed 36 (4.1%) women.

Circulatory System

Circulatory system diseases accounted for 116 (13.2%) deaths. In this category, cerebrovascular diseases took the lead with 46 (39.7%) deaths.

Maternal Mortality

RAMOS 2014 found that maternal mortality ratio¹ declined from 44.4/100 000 live births in 2006 to 26.3/100 000 in 2012. This is almost a 40% reduction in maternal deaths over six years. For the same period of 2012, Georgia official statistics estimated maternal mortality at 22.8/ 100 000 live births.

RAMOS 2014 revealed that about 39% of all maternal deaths went unreported in the official statistics in 2012, compared with 65% in 2006. This is a marked improvement since RAMOS 2008.

The overall maternal mortality (early and late maternal deaths) ratio for 2012 was 40.3/100 000 live births compared with 65.6/100 000 live births in 2006.

RAMOS 2014 identified 36 pregnant women who died while pregnant or within one year from the end of pregnancy. Of those, 23 (63.8 %) deaths were classified as maternal, directly or indirectly caused by pregnancy and 13 (36.1%) as deaths from co-incidental causes. Of the 23 maternal deaths, 15 (65.2%) were early (occurred during pregnancy or between 0–42 days after pregnancy termination) and 8 (34.8%) were late (occurred between 43–365 days). Direct maternal causes accounted for 73.9% (17 cases) of maternal deaths and indirect 26.1% (6 cases).

The leading cause of direct maternal deaths was infection at 21.7%, followed by hemorrhage at 17.4%, and embolism at 13.0%. Pregnancy induced hypertension was the cause of death in 8.7% of cases. This is a decrease of 40% from RAMOS 2008. There was also a decrease in obstetric hemorrhage from RAMOS 2008. Among the indirect maternal causes (26.1%), the largest group was cancer resulting in three deaths, followed by deaths from tuberculosis (1), bacterial meningitis (1), and suicide (1).

Not all deaths included in the RAMOS 2014 investigation were officially reported. Of the 23 maternal deaths included in the RAMOS 2014, official statistics reported 13 early and 1 late maternal deaths. RAMOS 2014 identified an additional two early and seven late maternal deaths, which went unrecognized as maternal deaths by the official statistics. While 70.6% (12 cases) of direct maternal deaths were correctly identified in the official statistics, only 16.7% (one case) of the indirect maternal deaths were officially reported. Similarly, most late maternal deaths (87.5%) were not identified as maternal in the official statistics.

Conclusions and Recommendations

Between RAMOS 2008 and RAMOS 2014, several successful initiatives were introduced to improve the registration of deaths. First, civil registration reform introduced regulations and interventions, e.g. a monetary penalty imposed on all responsible bodies for failing to report death events, creation of electronic medical death certificates (as opposed to paper), which resulted in improved death registration coverage.

Second, Georgia Statistics Office began to match maternal death records against birth and fetal death records. The NCDC&PH began active surveillance of maternal mortality by incorporating WRA deaths into an already existing, integrated electronic disease surveillance system (IEDSS) and implementing the verbal autopsy methodology. These initiatives had profound implications for correctly identifying maternal deaths.

While remarkable progress has been made in death registration coverage in the vital registration system, correctly identifying all causes of death has been overlooked. This resulted in a deteriorated mortality structure (47% of ill-defined causes).

The NCDC is working to improve the process of mortality registration (including maternal deaths) to improve the quality of data by implementing or planning the following activities:

1. Assessing death certification quality to reveal reasons behind poor data quality and developing recommendations (BCA 2012 – 2013)
2. Developing new software for birth and death registration with different control clauses and internal data checks in order to meet international standards (ICD-10 volume 2)
3. Strengthening Active Maternal Death Surveillance and Response System
4. Using links and matching with all possible databases (through ID number) or data sources to improve death certification
5. Conducting trainings on identifying and coding underlying causes of death according to WHO recommendations
6. Promoting the ICD-10 web-based training tool.

RAMOS 2014 reveals cancer as the leading cause of death among WRA, with breast cancer dominating. Delays in seeking medical consultation for diagnosis and treatment and late stage diagnosis are major challenges. Stakeholders and policy makers must consider the burden of reproductive cancers, especially preventable cancers, and strengthen the national cancer screening program. Georgia's new universal health coverage program makes many cancer treatments more widely available.

The following will be required to increase screening rates, improve early treatment, and reduce fatalities:

1. Emphasize health education and awareness raising
2. Research factors associated with under use of screening services and late presentation
3. Implement public health policies to overcome these factors, particularly among underrepresented groups.

Georgia's maternal mortality ratio compares well with other countries in transition. However, the distribution pattern of the causes of maternal deaths is more complex. In cases of infection and severe obstetric hemorrhage, Georgia resembles less developed countries.

Sub-standard care by health providers remains the most important avoidable factor. Better medical care or better organization of health services might have helped prevent 57% of maternal deaths. Delays associated with initial care from first care providers, who were unable to recognize and manage obstetric emergencies in a timely manner or delayed referral to higher-level hospitals, was the leading factor. Delays in seeking care, mainly due to failures in recognizing danger signs during pregnancy or postpartum, was the most frequent patient and family factor, contributing to 30.4% of maternal deaths.

Further reduction in maternal mortality is likely to be contingent on the continued strengthening of Georgia's health system including:

1. Ensuring pregnant women at risk receive care in facilities able to provide the required level of specialized care (i.e., implement a perinatal care regionalization policy)
2. Improving the coordination of maternal care throughout the continuum of antenatal, intrapartum, and postpartum care
3. Establishing nationwide comprehensive quality measures to increase accountability and develop targeted solutions.

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