



Case Study on Maternal Death Surveillance and Response

COUNTRY: BRAZIL



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ACRONYMS AND ABBREVIATIONS

CDC	Centers for Disease Control and Prevention
CLAP-SMR	Latin American Center for Perinatology, Women's and Reproductive Health
CGIAE	General Coordination of Epidemiologic Information and Analysis
DASIS	Department of Health Situation Analysis
MMR	Maternal Mortality Ratio
PAHO	Pan-American Health Organization
PNDS	National Health and Demographic Survey of Women and Children
SIM	Mortality Information System
SVS	Secretariat of Health Surveillance
WHO	World Health Organization

SUMMARY

Reducing maternal mortality remains a challenge for Brazil's health services and for the country as a whole. The high maternal mortality ratio (MMR) that prevails in the country (57 per 100,000 live births in the Southern Region and 93 per 100,000 live births in the Northeast Region) is considered to be a serious public health problem that affects Brazilians in unequal ways, since there is a higher prevalence seen among women from lower socio-economic strata, lower educational attainment, and less access to social benefits.

As a result of Brazil's concerted efforts to reduce maternal mortality, maternal mortality dropped 52% between 1990 and 2010. In 1990, the amended MMR was 140 deaths per 100,000 live births, then dropping to 68 in 2010 (SVS/MS. Bol. Epi, 2012).¹ In recent years, however, the MMR's rate of decline has slowed, especially since 2001. This may be the result of efforts that have been undertaken to improve information, including a strategy to reduce the number of deaths classified as ill-defined causes; the use of verbal autopsies; the active search of deaths and births in the North and Northeast states; and the surveillance of fetal, infant, and maternal deaths due to ill-defined causes. Recent international publications such as the *Trends in Maternal Mortality: 1990 to 2010*, published by the World Health Organization, the United Nations Children's Fund, the United Nations Population Fund, and the World Bank (WHO, 2010)² and "Maternal mortality for 181 countries, 1980–2008: a systematic analysis of progress towards Millennium Development Goal 5" (HOGAN et al., 2010)³ show that Brazil's MMR values should be lower than 68 deaths per 100,000 live births. Brazil's target, in terms of the MDG5, is to reduce by three-quarters its maternal mortality ratio by 2015, compared to the estimated 1990 level—for a figure of 35 deaths per 100,000 live births or less.



1. STRUCTURE OF CAUSES OF MATERNAL MORTALITY

The decrease in Brazil's maternal mortality between 1990 and 2007 was mainly due to a reduction in deaths from direct obstetric causes, which decreased by 56% during this period. Nevertheless, mortality due to direct obstetric causes was very distinct, since it increased by 33% between 1990 and 2000 and then remained stable between 2000 and 2007. The reduction in mortality due to direct obstetric causes was not uniform during this period; given that a high concentration of maternal deaths between 1990 and 2000 decreased by 7.13% annually compared to a 1.7% annual decrease between 2000 and 2007. However, the situation regarding indirect obstetric causes was very different, as these deaths increased 33% between 1990 and 2000, and then remained stable between 2000 and 2007. The growth of deaths from indirect obstetric causes between 1990 and 2000 probably reflects improvements in the quality of information on suspected maternal deaths (Saude Brasil, 2009).⁴

An analysis of the maternal mortality ratio by direct and indirect causes shows that there were sustained changes in the pattern of maternal deaths in Brazil. In 1990, mortality from direct obstetric causes was 9.4 times higher than mortality from indirect obstetric causes. This ratio decreased to 3.5 times higher in 2000 and to 2.4 in 2010. The change in the distribution of maternal deaths also points to a maternal-death reduction (Bol. Epi, 2012).¹ Observed changes due to direct obstetric causes between 1990 and 2010 included a reduction of 66.0% in maternal deaths due to hypertension, 69.3% of deaths due to hemorrhage, 60.4% of deaths due to puerperal infections, 81.9% of deaths due to abortion and 42.5%

of deaths due to diseases of the circulatory system; which can lead to pregnancy, childbirth or postpartum complications. It is worth noting that in 1990, abortion was the third leading direct obstetric cause of maternal death, decreasing to fourth place in 2010 (Bol. Epi, 2012).¹

The proportion of adolescents and young women who die from obstetric causes is a matter of grave concern. According to the Secretariat for Health Surveillance (SVS), between 1990 and 2007, maternal mortality among adolescent mothers (10–19 years old) ranged from 13% and 16% of all maternal deaths (Saude Brazil, 2009).⁴ Among teenagers, the two main causes of maternal death were hypertension and puerperal infection, causes that also were leading causes in the previous decade. Teenage pregnancy is a major challenge for policy makers and health managers in the country. In 2010, 15.9% of maternal deaths occurred among women 10–19 years of age; 76.2% in women 20–39 years old, and 7.9% in those 40 years old or older or more years of age (Bol. Epi, 2012).¹

1.1 Other Indicators Associated with the Reduction of Maternal Mortality

1.1.1 Prenatal Care

From 1996 to 2007, the percentage of pregnant women who had had no prenatal care decreased considerably, from 9.8% to 1.9%. In that same period, the percentage of pregnant women who had had at least four prenatal visits increased from under 60% to 89% (Saude Brazil, 2009).⁴ According to the National Demographic and Health Survey (PNDS, 2009),⁵ 83.6% of pregnant women had their first prenatal consultation in their third trimester in the country as a whole. This proportion was 87.1% in the Midwest, 85.5% in the Southeast, 80.2% in the Northeast and 76.9% in the North. Yet, despite these advances in the coverage of and early uptake of antenatal care for pregnant women, there is evidence that the quality of care needs to be improved, as evidenced by the incidence of congenital syphilis, the fact that hypertensive disorders remain as the leading cause of maternal mortality, and the presence of perinatal causes as the most significant component of the deaths in the first year of life.

1.1.2 Hospital Births

Data from the PNDS (PNDS, 2009)⁵ indicates that between 1996 and 2006, the percentage of hospital births rose from 96% to 98%, with regional variations (92% in the North and 99.5 % in the Southeast). Of the total births, 76% were attended in the public health system. Most deliveries were assisted by formally qualified professionals—89% by a doctor and 8.3% by a nurse. Access to care during delivery

also has improved. The same survey also shows that 90% of births occurred in the first service sought by the women, especially in the South (96%), followed by the North (90.6%), Southeast (88.7%), Northeast (88.3%), and Midwest (86.8%).

However, despite the fact that there are laws and regulations on prenatal care (BRAZIL, 2007)⁶, there still lacks a universally defined practice of local hospital births and referrals with linkages to the maternity ward where the woman would receive assistance in the public health system prior to her due date.

The PNDS (BRAZIL, 2009)⁵ also showed that 16.3% of pregnant women had access to a companion during the time of delivery. This percentage was 19.3% in the South, 18.5% in the Southeast, 15.4% in North, 15.4% in the Midwest, and 12.1% in the Northeast. Another measure of better care during normal childbirth procedures was the increase in access to pharmacological or non-pharmacological measures for pain relief, which were accessible to 30.4% of pregnant women, throughout the country, especially the Southeast (46.7%) and South (37.4%).

1.1.3 Leading municipalities that track maternal mortality

There are 90 municipalities across the country that have been identified as focal points, that are responsible for reporting 50% of all maternal deaths—13 in the North region, 19 in the Northeast region, 25 in the Southeast region, 25 in the Southern region, and eight in the Midwest region. These municipalities have focal points in every capital and in other major cities where a high percentage of the state's population lives. They also are the best performers in maternal-death surveillance in their state, and are responsible for a higher percentage of maternal death notifications⁴.

In 2010, 74% of all maternal deaths were investigated. The analyses found that 17% of them had occurred during pregnancy, 9% during childbirth, and 56% in the postpartum period (up to 42 days after delivery). That same year, 92% of maternal deaths occurred in a hospital. Since 2008, the Secretary for Health Surveillance (SVS), along with state and municipal health secretariats, have implemented a maternal-death surveillance system, with one of the main strategies being the surveillance of deaths among women of childbearing age. The system notifies deaths from every state on a monthly basis. The rate of surveillance of these deaths increased from 55% in 2009 to 76% in 2010 (Bol. Epi, 2012).¹

The system is now the main tool for the notification of maternal deaths. The notification is made by the surveillance team in every municipality, and state health secretariats and the Secretariat for Health Surveillance can monitor the number of cases that are notified and investigated. In addition, the Secretariat for Health Surveillance is training professionals throughout the country on how to use the system.

The Ministry of Health is financing a course for certifying those who investigate maternal, infant, and fetal deaths and who participate in mortality committees. This distance-education course will provide training to 4,500 students throughout Brazil.

1.2 Conclusions

Brazil has attained near universal coverage of obstetric care and a high prevalence of contraceptive-method use. These gains have occurred alongside profound changes in contraceptive-use, with a significant reduction in the percentage of sterilized women and an increase in the use of modern methods available, notably those used by men. In 1997, 2002, and 2007, the Ministry of Health's Technical Department of Women's Health has sought information from the coordination of women's health, the health sector's epidemiological surveillance units, and maternal mortality committees in every state regarding the quality of the investigation of deaths of women of childbearing age. This research showed that between 1989 and 1990, the investigation of deaths of women of childbearing age was limited to six municipalities; by 2007, more than 2,400 municipalities nationwide were conducting such investigations.^{4, page 220.}

The main reasons for the increase in the number of investigations included: the formation of maternal mortality committees in all states and municipalities; the enactment of legislation on the mandatory reporting of maternal mortality; the setting of goals for states and municipalities to investigate the deaths of women of childbearing age; and, more recently, the monitoring of data reporting through an online information system.

The maternal mortality ratio (MMR) for the period between 1990 to 2010 dropped by 52%. The simultaneous implementation of public policies to improve care and the quality of information on the occurrence of deaths may be a factor for MMR stability. Now, the figure includes both the number of maternal deaths not previously reported and those identified through the investigation of deaths from ill-defined causes.

The main reasons for the reduction in maternal mortality are associated with health policies designed to improve living conditions, such as sanitation policies. Some of these health policies include a greater access to contraceptive methods, prenatal care, and hospital delivery; the certification of skilled birth attendants (including courses in advanced life support in obstetrics); investments in the increase of transportation for at-risk patients; greater access to blood and blood products; and the availability of more intensive care units.

The most recent national studies show progress, but at the same time point to the need to improve the quality of services (for example, reducing the number of unnecessary cesarean sections and the number of interventions during childbirth). Additionally, studies show the consolidation of progress made in the organization of health care services to women and an intensification of strategies that strengthen the epidemiological surveillance of maternal deaths and allow real-time monitoring of their occurrence.



2. CHARACTERISTICS OF THE MATERNAL MORTALITY SURVEILLANCE SYSTEM

2.1 The System's Organization

2.1.1 Brazil's Ministry of Health

The Ministry of Health is the executive branch's agency that is responsible for the development and organization of plans and policies aimed at promoting health and preventing disease for all Brazilians.

The Ministry is charged with establishing conditions that will protect and recover the population's health by reducing illness, controlling endemic and parasitic diseases, and improving health surveillance. Its mission is to "Promote the health of the population by integrating and constructing partnerships with federal agencies, federal units, municipalities, the private sector and civil society in order to contribute toward the improvement of the quality of life and the exercise of citizenship."

The following matters fall under the Ministry of Health's jurisdiction:

- National health policy

- The coordination and supervision of the health system
- Environmental health and health promotion, protection, and the recovery of individual and collective health, including of workers and indigenous population
- Health information
- Critical inputs for health
- Overall preventive action, health monitoring, and the surveillance of borders, ports, rivers, and air
- Surveillance of health care, especially drugs, medicines, and food
- Scientific research and technology in health care

The Ministry of Health's core structure includes six agencies responsible for developing, proposing, and implementing health policies in their role as the executors of the Ministry's ultimate activities. In addition, units such as the executive secretary, the minister's office, and legal counsel also are part of the Ministry and are responsible for advisory activities and direct assistance to the minister's actions. The Ministry of Health works in unison with the National Health Council and the Board of Supplementary Health (which covers the private health system). These committees are permanent and deliberative collegiate agencies that deal with issues related to health and bring together representatives from the government, health service providers, health professionals, and public-health-system users. Finally, there are some organizations that, although not an integral part of the Ministry's central structure, work in partnership with it—these are public foundations, autonomous organizations, public enterprises, and joint venture companies. These entities have specific functions and activities that must align with the major health and government priorities (see the Ministry of Health's basic organizational chart, page 7).⁷

The public health structure in Brazil also includes actions from state and municipal health departments. The 1998 Federal Constitution guarantees the right to health through the creation of a Unified Health System. The system's principles address the democratization in health services by providing universal care. On the other hand, health work is no longer centralized, and the states and municipalities assume their own responsibilities and prerogatives within the Unified Health System, and have developed actions that give priority to prevention of illnesses and health promotion.

2.1.2. The Secretariat for Health Surveillance (SVS)

The Secretariat for Health Surveillance is one of the six agencies that are part of the Ministry of Health's core structure (see the Ministry of Health's basic organizational chart, page 297).⁷ Among its functions is the coordination of programs for the prevention and control of communicable diseases of national importance, such as AIDS, dengue, malaria, viral hepatitis, leishmaniasis, leprosy, and tuberculosis and vaccine preventable diseases. In addition, the Secretariat is responsible for coordinating the National Program of Immunization, investigating disease outbreaks; coordinating the national network of public

health laboratories; managing the information systems of mortality, childbirth and, reportable diseases; coordinating the management and control of non-communicable diseases and disorders; and analyzing the country's health situation, which includes conducting investigations and surveys on risk factors of non-communicable diseases, among other actions.

The Department of Health Situation Analysis (DASIS) is a department within the Secretariat for Health Surveillance (see the Ministry of Health's basic organizational chart, page 310).⁷ DASIS is responsible for:

- Conducting studies and analyses to monitor the country's epidemiologic situation and to evaluate the impact of health policies and programs;
- Monitoring the epidemiologic non-communicable disease trends and other health problems;
- Standardizing and coordinating the implementation of vital statistics systems;
- Promoting and publishing analyses of the information generated by the health sector's information systems;
- Developing methodologies for conducting health-situation analyses;
- Participating in the formulation and supervising the execution of actions on health surveillance and the "Alliance for Health"¹ (Portaria/GM 399 de 22/02/2006);⁸
- Providing technical advice and establishing cooperation with states, municipalities, and the Federal District to organize actions for analyzing the health situation.

The Department of Health Situation Analysis is divided into two coordination offices; maternal mortality surveillance falls under the General Coordination for Information and Epidemiologic Analysis (CGIAE).

The General Coordination for Information and Epidemiologic Analysis (CGIAE) is responsible for:

- Stimulating and coordinating studies, research, and analysis on the health situation, health inequalities and evaluation of actions, and programs and health policies;
- Coordinating, supervising, maintaining, and updating the registration system for live births and the registration system for information on mortality;
- Supporting the development and supervising the implementation of actions regarding the functionality of the registration systems for live births and for mortality, and the use of epidemiology to support decision-making in the public health system for the goals agreed to in the contracts of control and evaluation between the federal government, states, and municipalities.
- Providing technical assistance to states, municipalities, and the Federal District for maintaining the registration systems for live births and mortality and for the use of epidemiology to support decision-making in the public health system;
- Coordinating mortality surveillance in conjunction with other relevant units (states and municipalities);

¹ In 2006, health policy makers and managers signed a commitment to build an "Alliance for Health." The Alliance includes a set of health indicators that should be established as priorities; one of them is the reduction of the maternal mortality rate.

- Training professionals in health surveillance, in partnership and coordination with other relevant units (states and municipalities);
- Promoting the communication and dissemination of information and epidemiological analysis, in conjunction with other relevant units.

2.1.3. Legal and Regulatory Framework for the Mortality Surveillance System

In 2009, the Department of Health Situation Analysis published a compilation of the main legal texts concerning the mortality information systems under the responsibility of the Ministry of General Coordination of Information and Epidemiologic Analysis. The goal was to enable users of these systems to understand the relevant legislation and determine better ways of solving certain issues (Legislação Relativa aos Sistemas de Informação).⁹

- *Federal Law 6.015 – 31/12/1973*: establishes the mandatory of civil registration of births and deaths; no burial can happen without this official registration.
- *Federal Law 6.216 – 30/06/1975*: changes some aspects of the previous law and establishes that children under one cannot be buried without a birth certificate
- *1988 Federal Constitution*: establishes the free registration of births and deaths for the poor.
- *Federal Law 7.844 – 18/10/1989*: sets forth who can be classified as poor and, therefore, have the right to free birth and death registration.
- *Federal law 8.069–13/07/1990 – Statute of Children and Adolescents*: establishes the mandatory requirement for hospitals and other health facilities to keep the register of mothers' health care and their medical charts for 18 years.
- *Federal law 8.080 – 19/09/1990 – The Organic Health Law*: establishes health as a fundamental human right and a duty of the State. This duty includes the mandatory of formulation and execution of economic and social policies that aim to reduce diseases and guarantee the universal and equitable access to health services. The Ministry of Health, in conjunction with states and municipalities, is given two years to organize a national health information system.
- *Federal law 8.935 – 18/11/1994*: establishes that birth and death registration and certification are free or the poor.
- *Federal law 9.534 – 10/12/1997*: amendments regarding free of birth and death registration and certification.
- *Ministry of Health Ordinance No. 3.947 – 25/11/1998*: sets forth the minimum requirements to be adopted by all Ministry of Health systems and databases.
- *Ministry of Health Ordinance No 1.929 – 09/10/2003*: designates the Secretariat for Health Surveillance as the national administrator of the mortality information system and the live-births information system. Establishes that the Secretariat for Health Surveillance is responsible for giving technical support to state secretariats of health, as needed.
- *Ministry of Health Ordinance No. 1.172 – 15/06/2005*:

- Establishes the areas of responsibility for the three levels of government regarding the management of the Mortality and Live Births Information System a) technical norms, defining instruments, and flows of information; b) consolidation of data from the states; and c) data feedback.
- Sets forth the rules for epidemiological analysis and the dissemination of information; the coordination and implementation of activities of information, education, and communication; the promotion, coordination, and implementation of epidemiological and operational research in specific situations; the establishment of reference centers for national health surveillance; the technical coordination of international cooperation in the area of health surveillance; and the development and implementation of training programs for human resources.
- Establishes health surveillance programming and monitoring parameters for the three levels of government. Activities and goals agreed upon will be monitored through performance indicators that consider epidemiological and operational aspects established by the Secretariat for Health Surveillance.
- Establishes that the Secretariat for Health Surveillance may suspend the transfer of funds to states and municipalities in some cases, including: a lack of proven consistency in submitting and providing feedback of information for the epidemiological systems.
- *Resolution of the Federal Council of Medicine No. 1.779 – 11/11/2005*: regulates medical responsibility in providing death certificates.
- *Ministry of Health Ordinance No. 1.405 – 29/06/2006*: Establishes the National Network for the Surveillance of Deaths and the Clarification of Cause of Death.
- *Ministry of Health Ordinance No. 204 – 29/01/2007*: Regulates the financing of and transfer of federal resources to activities and health services in the form of financial blocs, along with their monitoring and control.
- *Ministry of Health Ordinance No. 399 – 22/02/2006*: Explains the 2006 Health Alliance and the consolidation of the Unified Health System and approves the Operational Guidelines of the Health Alliance. One of the Alliance's priorities is the "Alliance for Life," which is constituted by a group of health priorities defined by the federal, state, and municipal governments—among them, the reduction of maternal mortality. Objectives and targets for the reduction of maternal mortality were to reduce by 5% the maternal mortality ratio in 2006; ensure that supplies and medicines for the treatment of hypertensive disorders in childbirth are available; and certify the blood distribution points to meet the needs of hospitals and other sites where childbirth occurs.
- *Department of Health Surveillance Ordinance No. 1119 – 05/06/2008*: Regulates the surveillance of maternal deaths and is the most important legal regulation. This ordinance establishes that:
 - The surveillance of maternal deaths for all events, confirmed or not, and regardless of where they occurred, should be carried out by health professionals assigned by the federal, state, or municipal health surveillance units or from the Federal District government.
 - Maternal deaths and deaths among women of childbearing age, regardless of the cause stated, are considered events of mandatory surveillance, with the goal of finding determining factors, their possible causes, and to support the adoption of measures that could prevent similar deaths in the future.

- The mechanism that triggers the research process is the death certificate, which should be completely and properly filled out, with special emphasis on the basic cause of death, more than the age of death.
 - The flow and timeframe that death certificates must follow until this information is registered in the mortality surveillance system, and
 - Annexes of the ordinance contain information for the completion of death certificate and the standard form for maternal death surveillance.
- *Department of Health Surveillance Ordinance No. 116 – 11/02/2009*: Regulates data collection, flow and frequency of transmitting births and death information to the health information systems under the responsibility of the Secretariat for Health Surveillance. Table 1 details the areas of responsibility, by level of government that this ordinance established.

Table 1. Areas of Responsibility as Determined by the Health Surveillance Ordinance No. 116 – 11/02/2009, by Government Level

Government Level	Responsible Agency	Areas of Responsibility
FEDERAL	Secretariat for Health Surveillance, Department of Health Situation Analysis, General Coordination of Information and Epidemiologic Analysis	<ul style="list-style-type: none"> - Develop and publish guidelines, standards, technical standards, routines, and procedures for administering the system; - Issue and distribute numbered death certificates for state health secretariats; - Consolidate and evaluate the data processed and transferred by the states; - Establish deadlines for sending data at the state level; - Develop initiatives aimed at improving the quality of information; - Provide feedback data to the system's members; - Disseminate information and epidemiological analysis; - Manage and maintain the register of state managers.
STATE	State health secretariats, mortality system managers	<ul style="list-style-type: none"> - Create and maintain the necessary conditions for decentralizing the system to the municipal level; - Distribute death certificates to municipal health secretariats and to the indigenous special health districts; - Consolidate and evaluate data from the units notifying within their jurisdictional territory; - Establish flows and deadlines for submission of data by the municipal level and/or regional level; - Submit data regularly to the national system in the timeframe set forth in the Ordinance; - Develop initiatives aimed at improving the quality of information; - Provide feedback data to municipal health secretaries; - Disseminate information and epidemiological analysis; - Establish and publish guidelines, technical standards,

		routines and procedures for the management of the system, complementing this task at the federal level; <ul style="list-style-type: none"> - Manage and maintain the register of municipal managers.
MUNICIPALITY	Municipal health secretariats, mortality system managers	<ul style="list-style-type: none"> - Control the distribution of death certificates among health facilities, civil registry notary, medical professionals and institutions that use them; - Collect, process, consolidate, and evaluate data from the reporting units; - Transfer data in accordance with flows and deadlines established at the state level; - Develop initiatives to improve the quality of information; - Provide feedback data to the reporting units; - Disseminate information and epidemiological analysis; - Establish and publish guidelines, technical standards, routines and procedures for the management of the mortality system, complementing this task at the federal and state levels.

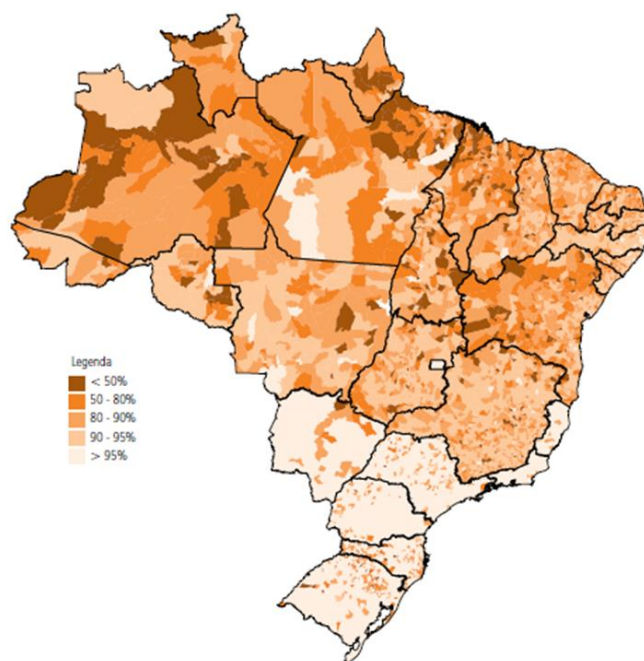
2.1.4. Mortality Information System Coverage

The Mortality Information System (SIM) was developed by the Ministry of Health in 1975; it consolidated more than 40 different instruments of that time to collect data on mortality in Brazil. The system takes into account variables that make it possible to develop indicators and conduct epidemiologic analyses that contribute to improving the health of Brazilians. . The Mortality Information System includes all data and provides access to complete coverage on the deceased persons nationwide.

In 2003, the Ministry of Health financed a study on maternal mortality in the country's state capitals. As a result of the study, the Ministry of Health established a correction factor of 1.4 on Brazil's maternal mortality rate in the mortality system. After this study, actions were taken to certify the information system and the notification of deaths. The quality of the information in the South, Southeast, and Middle-West regions was better than in the North and Northeast regions. To evaluate the quality of death notification in the North and Northeast regions, a second study was conducted in 2010.

In order to quantify the number of deaths in the country that were not registered in Mortality Information System, a special search was conducted in 2010, using the active search method (Szwarcwald, 2011).¹⁰ Although the Mortality Information System coverage in Brazil as a whole reached 93%, inequalities in information on mortality persist within the country, with 30% of municipalities still having coverage of deaths under 80%, mostly in the North and Northeast regions (Saude Brasil, 2009).⁴ See Table 1.

Figure 1. Data coverage on deaths by municipality, Brazil, 2008



Source: Saude Brazil, 2009

According to the General Coordination of Information and Epidemiologic Analysis, the rate of investigation of deaths in women of childbearing age was 55% in 2009 (37.023/67.168), 77% in 2010 (50.855/66.497), and 76% in 2011 (50.500/66.381, preliminary data for this year 2011).¹¹

Since March 2012, the Minister of Health has held a monthly video-conference with state health secretariats to monitor the investigation of maternal deaths and keep track of the evolution of the rates.

The Mortality Information System was computerized in 1979, and in 2001 it was decentralized, with data collection placed under the responsibility of state and municipal health secretariats. The World Health Organization (WHO) already uses data from Brazil's Mortality Information System without applying any correction factor, which attests to the country's credibility in the surveillance and investigation of deaths in women of reproductive age.

There are persistent problems in the absence of registration of deaths in the Mortality Information System, such death certificates that are not filled out; problems in the flow of death certificates, for example, a lack of supervision and control in the transfer of data; and high turnover among the technicians that manage the system.

2.1.5. Maternal Death Surveillance Resources

Physical Resources:

The Secretariat for Health Surveillance's central office is located in Brasília, in the Ministry of Health building. The office has adequate space for the development of actions related to maternal mortality surveillance, and all communications resources are available to technicians. Since 2011, the Secretariat for Health Surveillance's General Coordination of Information and Epidemiologic Analysis maintains on-line information about maternal mortality, which includes information from 1996 to 2012. The data can be searched by municipality, state, and federal level.

<http://svs.aids.gov.br/dashboard/mortalidade/materna.show.mtw>¹²

A map showing mortality data also can be consulted:

<http://svs.aids.gov.br/svs/materna/atlas.htm?fe4aacd50e13e28043958e39d54953d4>¹³

Human Resources:

The Secretariat for Health Surveillance has a technical team that supports the various actions undertaken by the General Coordination of Information and Epidemiologic Analysis. Among other initiatives this year, the technical team conducted several macro regional training courses on mortality surveillance and information systems that covered all states health secretariats and many municipal health secretariats.

2.1.6 The Mortality Information System's Data Collection Process

Death Certificate:

The basic, essential document for collecting data on mortality in Brazil is the death certificate, which subsequently feeds into the Mortality Information System (A declaração de óbito, 2009).¹⁴ According to the federal Council of Medicine, the person responsible for issuing the death certificate is the physician according. The death certificate must be sent to the Civil Registry Offices so the burial can be authorized, and so all legal steps related to that death can be followed.

Three sequentially numbered copies of the death certificate are generated. The Ministry of Health is solely responsible for the certificate's issuance and transmission to the states; its distribution to municipalities falls under the responsibility of the state's health departments. The municipal health secretariats are responsible for the control and distribution of death certificates among health-care establishments, forensic services, death certification services, civil registry notaries, medical

professionals, and any other institutions that are entitled to it. Health departments (state- and municipal-level), along with health establishments and civil registration offices, are responsible for collecting original copies of the death certificate.

Death certificates are filled out by the notifying institution (usually where the death occurred) and are regularly collected by the municipal health secretariat, where they are typed, processed, and evaluated; the information is then consolidated into the local mortality system. Mortality data reported by the municipalities at the local level are transferred to the state-level database, which aggregates and sends them to the federal level.

Data transmission is done via the Internet, and occurs simultaneously at the three management levels. At the federal level, the Health Secretariat for Health Surveillance includes in its structure the General Coordination of Information and Epidemiological Analysis (CGIAE) that responds to Department of Health Situation Analysis (DASIS). The General Coordination of Information and Epidemiologic Analysis analyses the data; evaluates the distribution of information in the Mortality Information System; aggregates the data by state; and elaborates technical reports, indicators panels, and other statistical information mechanisms about mortality that are disseminated nationwide.

The Ministry of Health, through the Secretariat for Health Surveillance/Department of Health Situation Analysis/General Coordination of Information and Epidemiologic Analysis, has encouraged state and local managers to make use of the data contained in the Mortality Information System to formulate epidemiological indicators as strategic tools to support the planning of actions, activities, and programs related to health management.

The Ministry of Health, working through the Secretariat for Health Surveillances technical areas, has worked to provide technical training to health professionals in both state and municipal health secretariats, as well as to disseminate mortality indicators developed from the Mortality Information System to generate baselines that can provide parameters for the guidelines used by collegiate agents of the public health system.

The Mortality Information System works as source for information that can support decision-making in many health-care areas. The system alone, or associated with other sources such as the hospital information system, is reliable and enables the development of indicators on overall mortality or specific indicators, such as those defined by the Inter-Agency Network for Health Information (RIPSA).¹⁷

The information in the Mortality Information System may be accessed through various means:

1 – Through the internet: <http://tabnet.datasus.gov.br>

<http://www2.datasus.gov.br/DATASUS/index.php?area=0205&VObj=http://tabnet.datasus.gov.br/cgi/deftohtm.exe?sim/cnv/mat10>

<http://svs.aids.gov.br/dashboard/mortalidade/materna.show.mtw>

2 – Through a program, TABNET, that allows for an easy way to search data:¹⁵

<http://tabnet.datasus.gov.br/tabdata/>

Allow download of data revised from 29/07/2009¹⁶.

3 – In a CD-ROM database that covers information from 1979 forward and is distributed by the Ministry of Health to state health secretariats, universities, and other users each year.



3. THE ORGANIZATION OF MATERNAL DEATH SURVEILLANCE WITHIN THE UNIFIED HEALTH SYSTEM

The main documents that structure the maternal-death surveillance within the Unified Health System are the Department of Health Surveillance Ordinance No. 1119 (05/06/2008) (Portaria GM n. 1119, de 05/06/2008)¹⁸ and the Guidelines for the Epidemiologic Surveillance of Maternal Deaths (Guia de Vigilância Epidemiológica do Óbito Materno).¹⁹ Maternal death surveillance is a responsibility of all three government levels (federal, state and municipality). At the municipal level it involves an active search for death certificates in health units, civil registry offices, and cemeteries. All three levels are involved in the management of the Mortality Information System, including the monitoring and epidemiological surveillance of maternal deaths.

The Secretariat for Health Surveillance recommends the following steps for conducting maternal-death surveillance at the municipal level: identification of deaths; selection of deaths for surveillance; data collection; home visits with verbal autopsy as needed, and health-institution investigation.

3.1 Identification of Deaths

After the death, the physician or the health institution has 48 hours to send the first copy of the death certificate to the Mortality Information System in the municipality. The manager then has a further 48 hours to send the first copy of the death certificate to the Death Surveillance Team, to initiate the investigation. The municipal health secretariats should conduct active searches for death certificates in hospitals, death verification services, the Forensic Medicine Institute, notary offices, funeral homes, and official or unofficial cemeteries. The active search may include community health agents, the police, lay midwives, and others key informants. The search can also be extended to other health-information systems, such as the Hospital Information System²⁰ and the Ambulatory-care Information System.²¹

According to key informants (unpublished data), the health unit has 24 hours to report the maternal death by phone, fax, or email. In the city of Rio de Janeiro, the death notification is made directly to the regional area, whereas in the city of Belo Horizonte, the notification is made to the central level, which contacts the regional areas, and then sends the copy of the death certificate. Coverage in Belo Horizonte is 100%, but in Rio de Janeiro it's only a bit higher than 80%. In Rio de Janeiro State, the coverage of investigations in women of childbearing age was 78.52% in 2011.

3.2 Selection of Deaths

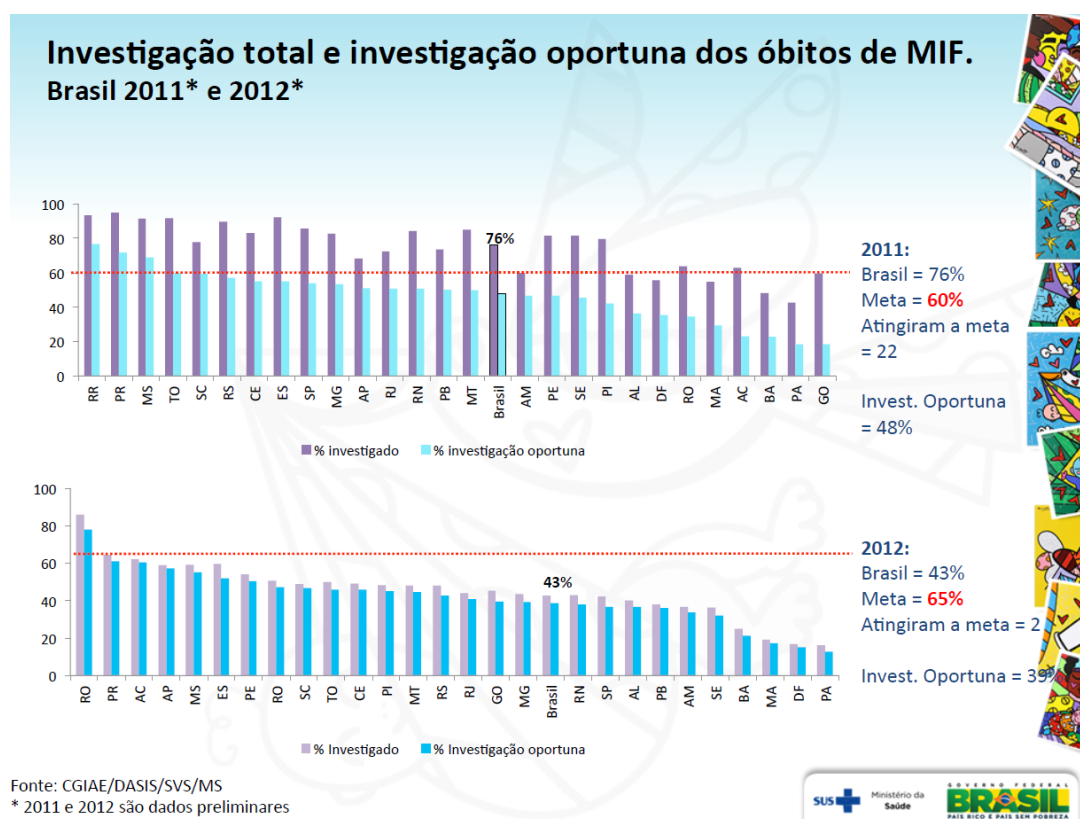
All maternal deaths and deaths in women of childbearing age are investigated, regardless of the cause stated in the certificate. The investigation must seek to find out if the woman was pregnant in the 12-month prior to her death. If confirmed, the investigation must continue.

After the selection of death certificates for investigation, a spreadsheet should be filled with a list of all cases, allowing each investigation to be followed-up.

All informants report that all deaths of women of childbearing age are subject to investigation. Investigation targets are agreed upon with the federal government, and failure to reach such targets may result in penalties to the municipality.

Figure 2 shows the percentage of total deaths in women of childbearing age that were investigated, and the percentage of those investigations that were conducted in the established timeframe. In 2011, Brazil's target was to investigate 60% of all cases and achieved 76%; however, only 48% were conducted in a timely manner.

Figure 2. Percentage of total deaths in women of childbearing age investigated and percentage of deaths investigated in a timely manner, nationwide and by federal unit, Brazil, 2011 and 2012^a



Source: General Coordination for Information and Epidemiologic Analysis/Department of Health Situation Analysis/Secretariat for Health Surveillance/Ministry of Health.

^a Numbers for both these years are preliminary figures.

3.3. Data Collection

Any relevant information must be investigated to make it possible to understand the conditions that contributed to woman's death. To help the professionals involved in the investigation, the Ministry of Health has developed a set of instruments. They are confidential and help the professional to reconstruct the conditions that led to death. These instruments are:

- The maternal death investigation form – Ambulatory Health Service,²²

- The maternal death investigation form – Hospital Health Service,²³
- The maternal death investigation form – home interview,²⁴
- The maternal death investigation form – verbal autopsy,²⁵
- The maternal death investigation form – autopsy report data,²⁶ and
- The maternal death investigation form – synthesis, conclusions, and recommendations.²⁷

If the information obtained from the investigation in health services and through the home interview is insufficient to determine the cause of death, a verbal-autopsy form is available for conducting a supplementary interview. A verbal autopsy is also recommended if the death was not reported to the Mortality Information System, if there is no death certificate, if the death certificate wasn't signed by a physician, or if the death certificate shows an undetermined cause of death.

To be considered timely, the investigation must occur in fewer than 120 days after the maternal death. The timeliness of the investigation is one of the indicators that are used to evaluate the quality of the surveillance conducted by the municipalities.

Whenever possible, the professionals of the Basic Health Assistance, that work in the regional area where the woman resided, should be involved in the investigation at ambulatory services and at the deceased' home. In areas that have no Basic Health Assistance professionals available, the local manager should designate the professionals who should perform the investigation. Data collection in hospital charts should be done by the Hospital Epidemiologic Center (Nucleo Hospitalar de Epidemiologia-NHE),²⁸ if there is one. In its absence, the investigation should be conducted by the Hospital Death Analysis Commission, the Hospital Infectious-disease Control Commission, or by any other designated professional. Whenever possible, professionals who were involved in the care of the deceased should not participate in the investigation.

3.4. Death Analysis

An analysis of the death occurs after the investigation has concluded. In this phase, one evaluates the quality of information entered into the various forms detailing the woman's health care and death; economic and social condition; prenatal, delivery, and post-partum care received; and any emergency care she may have accessed.

The analysis is conducted by a surveillance team, whose composition varies depending on the local setting. Whenever possible, this process should involve health professionals from the Maternal Death Committee,²⁹ and from the Hospital Epidemiologic Center.

When the death occurs in a different municipality from where the woman lived, the hospital investigation should be conducted by the Hospital Epidemiologic Center where the death occurred. Upon filling the forms, copies must be sent to the respective municipal health secretariat and to the state health secretariats, that then sends it to the municipal health secretariat where the woman lived.

Ambulatory and home investigations are competencies of the municipal health secretariat where the woman lived.

Informants report that recommendations for the analysis of maternal death cases include an evaluation of problems encountered in the course of the woman's care and the identification of factors that could have been avoided. In the city of Belo Horizonte there is a recommendation that the process take up to 15 days, so it can return to the central level to be debated by the Municipal Central Committee. Informants stress the importance of the quality of the data collected during the investigation process, and point out that the classification of death is sometimes subject to debate. The state secretariats for health surveillance only conduct the analysis of maternal death if the municipalities can't do it.

Table 2 presents the number of deaths among women of childbearing age between January and September in 2012. This information is available at:

<http://svs.aids.gov.br/dashboard/mortalidade/materna.show.mtw.>

Localities	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Year
● Brazil	3 955	3 602	3 569	3 296	2 969	2 439	1 720	613	16	22 179
● North Region	228	207	207	190	148	156	90	21	0	1 247
● Rondônia	36	24	26	37	14	19	10	1	0	167
● Acre	7	21	22	20	10	14	5	7	0	106
● Amazonas	46	40	51	47	55	42	29	3	0	313
● Roraima	9	10	10	5	11	16	10	4	0	75
● Pará	92	65	55	42	34	36	20	2	0	346
● Amapá	6	8	9	16	4	12	6	0	0	61
● Tocantins	32	39	34	23	20	17	10	4	0	179
● Northeast Region	950	869	891	831	705	548	384	119	1	5 298
● Maranhão	89	59	90	70	41	27	20	2	0	398
● Piauí	57	57	54	53	38	45	21	15	0	340
● Ceará	151	162	153	153	125	108	70	23	0	945
● Rio Grande do Norte	51	56	49	48	32	23	17	2	0	278
● Paraíba	64	78	60	76	59	56	33	13	0	439
● Pernambuco	218	186	198	174	170	124	99	34	1	1 204
● Alagoas	72	72	72	56	55	33	21	4	0	385
● Sergipe	56	47	49	62	38	26	23	9	0	310
● Bahia	192	152	166	139	147	106	80	17	0	999
● Southeast Region	1 846	1 664	1 566	1 469	1 313	1 067	791	309	8	10 033
● Minas Gerais	475	410	403	410	381	271	205	63	0	2 618
● Espírito Santo	113	94	89	91	71	54	38	3	0	553

Table 2. Number of deaths among women of childbearing age; nationwide and by locality, as well as by month, January to September 2012, Brazil

Localities	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Year
● Rio de Janeiro	390	354	376	345	301	287	223	124	4	2 404
● São Paulo	868	806	698	623	560	455	325	119	4	4 458
● South Region	629	599	604	539	531	454	308	114	4	3 782
● Paraná	265	252	269	225	210	195	168	89	4	1 677
● Santa Catarina	117	114	111	103	113	76	52	7	0	693
● Rio Grande do Sul	247	233	224	211	208	183	88	18	0	1 412
● Midwest Region	302	263	301	267	272	214	147	50	3	1 819
● Mato Grosso do Sul	66	55	77	58	62	45	36	11	0	410
● Mato Grosso	63	62	71	73	64	51	46	12	0	442
● Goiás	117	99	114	90	100	73	50	12	2	657
● Distrito Federal	56	47	39	46	46	45	15	15	1	310

● Country ● Region ● Federal Unit

Source: Maternal Mortality Information System, Brazil, October 2014. Available from:

<http://svs.aids.gov.br/dashboard/mortalidade/materna.show.mtw> [last accessed on 19 November 2014].

3.5. Identifying the Problems Related to Maternal Deaths

There are many different problems that are associated with a maternal death. The Guidelines for the Epidemiologic Surveillance of Maternal Deaths¹⁹ lists two broad groups of problems. The first deal with family planning and prenatal care (poor access to contraceptive methods, poor information, scarce human resources, etc.); the second deal with childbirth, the postpartum, and other associated obstacles (poor access to services, absence of protocols, a lack of blood, and insufficient intensive care units). The identification of problems is intended to critically evaluate the problems that may occur at different stages of health care the woman received and to define effective prevention measures. The purpose of the investigation of maternal death is not to blame any individual or services, but rather, to prevent future deaths from similar causes.

The informants relate that a series of recommendations are made for every case that is analyzed. In the city of Belo Horizonte city, for example, the recommendation is to guarantee that a woman in labor will have a maternity bed available when she arrives at the health service. This measure put an end to the problem of having women in labor go to several maternities before they could find a vacancy. Respondents also report that the analyses of cases consider current public policies so that the measures proposed can avoid new deaths. One informant told of a maternal-death case that occurred in an urban

illegal-occupancy area that had no basic health assistance. After the analysis of the case concluded, a family health unit was assigned to that population. In the city of Rio de Janeiro, regional managers have the autonomy to implement local policies to solve local health problems.

3.6. Criteria for Defining Avoidable Maternal Mortalities

The Guidelines for the Epidemiologic Surveillance of Maternal Deaths¹⁹ suggest in a death analysis applying criteria to determine if the death in question was in fact avoidable. This criteria should not be limited to therapeutic measures administered during the woman health care, but also should take into account various other factors, such as those related to social condition, religion, work, and institutional and inter-sectorial characteristics.

3.7. Identification and Proposal of Preventive and Corrective Measures Related to Care and Vital Statistics

This part of the analysis aims at proposing and adopting measures that can improve the quality of assistance and reduce the number of maternal deaths. It also is intended to help improve the quality of the health-care registers in health units. In the cases where the municipality where the woman lived doesn't have a health professional, the analysis of the death and the determination of preventive measures are made by the state secretariat for health surveillance or by the state maternal mortality committee.

Enhancing vital statistics is designed to expand coverage and improve the quality of the data in the mortality system. The improvement of the quality of the data, in turn improves the analysis process and makes it possible to plan actions that will have more of an impact in the reduction of maternal mortality.

After the conclusion of the maternal death investigation and analysis process, this information and any recommendations must be returned to the health units and health professionals without delay.

3.8. Coverage

When an active search identifies a maternal death that has not been registered in the Mortality Information System, which means that no death certificate was generated for that death, it is suggested that the municipality surveillance team issue an "epidemiological death certificate" to be processed in

the system. If the death certificate was filled out but not registered in the system, it must be entered by the municipality surveillance team.

3.9. Quality of Data and Ill-Defined Causes of Death

The data identified during the investigation of the death process that are not registered in the death certificates, also should be included in the Mortality Information System. This is also a time when the basic cause of death stated in the death certificate may be corrected; corrections are done just in the Mortality Information System, and it is not necessary to correct the civil registration.

3.10. Drawing up the Report

This part of the analysis aims at presenting the process of investigation, the death analysis, the identification of avoidability criteria, and the identification of measures that can be taken to prevent more maternal deaths. The preparation of the report is the responsibility of the Secretariat for Health Surveillance's team. The report also can be elaborated with the collaboration of health professionals and with members of the maternal mortality committee. The Maternal Death Investigation Form – Synthesis, conclusions and recommendations²⁷ and the Maternal Death Surveillance Municipal Spreadsheet should be used to elaborate the report. The spreadsheet shows the number of deaths in woman of childbearing age, the number and the proportion of investigations, the four leading causes of death, the most frequently found problems identified, and the most important recommendations issued.

3.11. Information Disclosure

The objective of the disclosure of information is to disseminate the report's content at every level of health management through appropriate means and communication channels. The dissemination of the report is important to the social control of the health system – community and health professionals.

The monitoring of maternal deaths is made by the Central Committee of Death Surveillance both in Rio de Janeiro and in Belo Horizonte, in partnership with regional committees. The return of the information to the health services is ongoing. The reports are debated at different forums, usually made up of various participants, such as members of the medical council, the nurse council, public prosecutor office, nongovernmental organizations (NGOs), health professionals and others.

Best practices include the creation of forums for debating the quality of maternal health care and setting timeframes for the investigation process, which makes the process more dynamic. Greater coordination between regional areas and health units streamlines the investigation process. They also reinforce the benefit of having easily filled forms that organizes the collected data.

The main weaknesses lie in the difficulty in carrying out the home investigation, a lack of human resource training in women's health care, and resistance to changing the model of health care. Resistance to make a critical analysis of health care persists in many services and reports don't include a quality analysis of the way in which forms were filled out and completed.



4. CONCLUSION

The reduction in Brazil's maternal mortality in recent decades has been the result of the interaction of various factors, including poverty reduction measures, increased access to health services, and improvements in the research and analysis of maternal deaths. As of this writing, all municipalities in the country can notify the Mortality Information System online. The process of investigation and analysis of maternal deaths have a solid legal framework, and the federal government supports states and municipalities in providing training for professionals. The large investment made in the computerization of information about maternal mortality and its disclosure in Brazil are a reflection of the political decision to reduce this indicator to acceptable levels, levels that are closer to those set by the Millennium Development Goals.

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5.2. Address and Contacts at the Secretariat for Health Surveillance and Informants

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- **Departamento de Análisis de la Situación de Salud (DASIS):** SAF Sul, Trecho 2, Lote 5/6, Bloco F, Torre 1, Edifício Premium, Térreo, Sala 16, Brasília/DF. CEP: 70.070-600 - Directora: Deborah Carvalho Malta - E-mail: deborah.malta@saude.gov.br
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- **Coordinación General de Información y Análisis Epidemiológico (CGIAE):** SAF Sul, Trecho 2, Lote 5/6, Bloco F, Torre 1, Edifício Premium, Térreo, Sala 15, Brasília/DF. CEP: 70.070-600 - Coordinacion: Juan José Cortez Escalante - E-mail: juan.cortez@saude.gov.br
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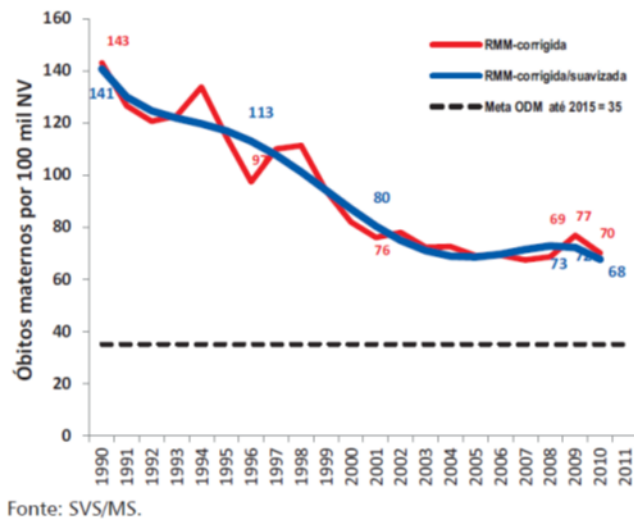
Informants

- Sonia Lansky, pediatra. Responsable del Comité Perinatal de la ciudad de Belo Horizonte. Consultora del Área Técnica de Salud de la Mujer y de la Coordinación General de Información y Análisis Epidemiológico.
- Angela Cascão. Responsable del Departamento de Estadísticas Vitales del estado de Rio de Janeiro.
- Penha Maria Rocha - Responsable del Departamento de Estadísticas Vitales de la ciudad de Rio de Janeiro.
- Rosangela Perillo. Gerente de Vigilancia de la Salud e Información de Belo Horizonte.

6. Annex

Annex 1. Graphic 1- Corrected Maternal Mortality Ratio: Brazil 1990-2010

Gráfico 1 – Razão de mortalidade materna corrigida – Brasil, 1990 a 2010

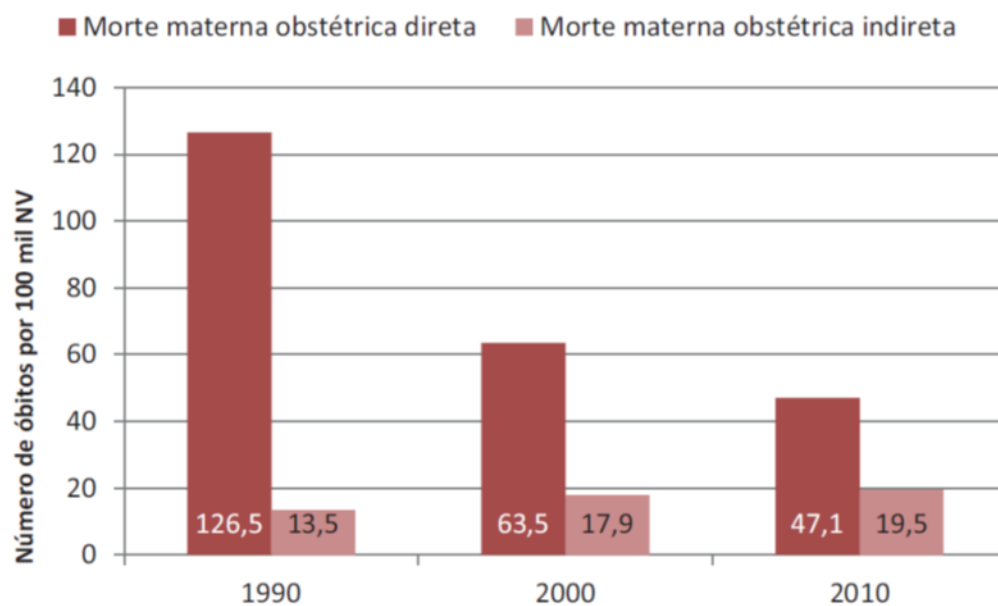


A mortalidade materna em todo o Brasil decresceu aproximadamente pela metade em 20 anos.

Source: Secretariat for Health Surveillance/Ministry of Health.

Annex 2. Graphic 3- Maternal Mortality Ratio (per 100,000 live births) from Direct and Indirect Causes: Brazil 1990, 2000 and 2010

Gráfico 3 – Razão de mortalidade materna (RMM) por causas obstétricas diretas e indiretas (por 100 mil nascidos vivos) – Brasil, 1990, 2000 e 2010

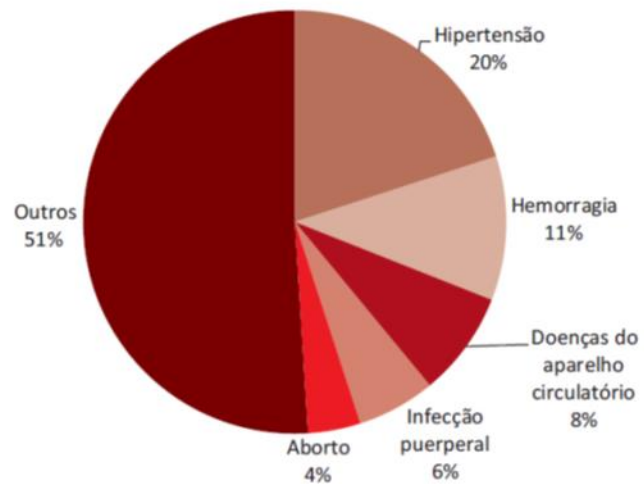


Fonte: SVS/MS.

Source: Secretariat for Health Surveillance/Ministry of Health.

Annex 3. Graphic 4-Percentage (%) of maternal death by cause: Brazil 2010

Gráfico 4 – Proporção (%) dos óbitos maternos, segundo tipo de causa – Brasil, 2010

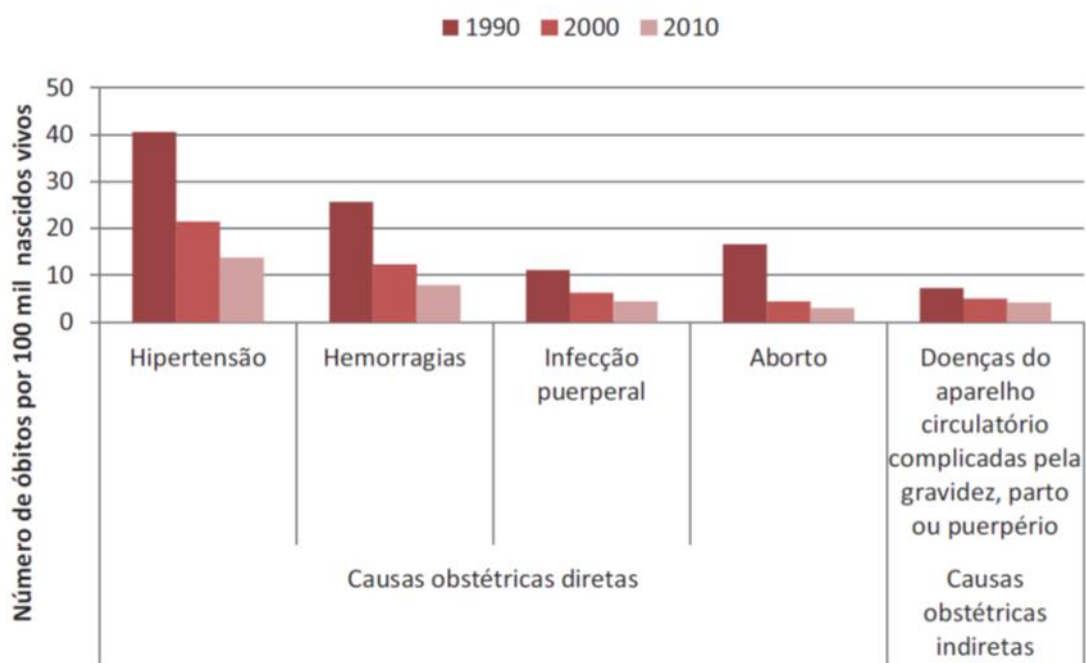


Fonte: SVS/MS.

Source: Secretariat for Health Surveillance/Ministry of Health.

Annex 4. Graphic 5- Maternal Mortality Ratio (per 100,000 live births), by Specific Cause of Death: Brazil 1990, 2000 and 2010

Gráfico 5 – Razão de mortalidade materna (RMM) por causas específicas de morte (por 100 mil nascidos vivos) – Brasil, 1990, 2000 e 2010

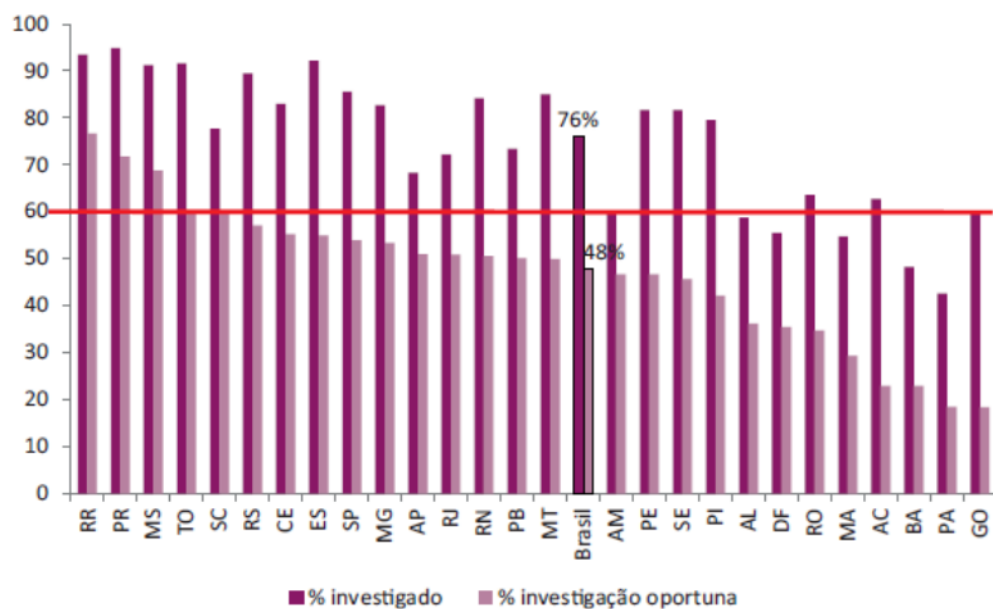


Fonte: SVS/MS.

Source: Secretariat for Health Information/Ministry of Health.

Annex 5. Graphic 1- Percentage of Deaths in Women of Childbearing Age- Investigated and Percentage Investigated in a Timely Manner, Nationwide and By Federal Unit: Brazil 2011

Gráfico 1 – Proporção de óbitos de mulheres em idade fértil (MIF) – investigados e com investigação oportuna – Brasil e UF 2011*



Fonte: SIM – CGIAE/DASIS/SVS/MS.

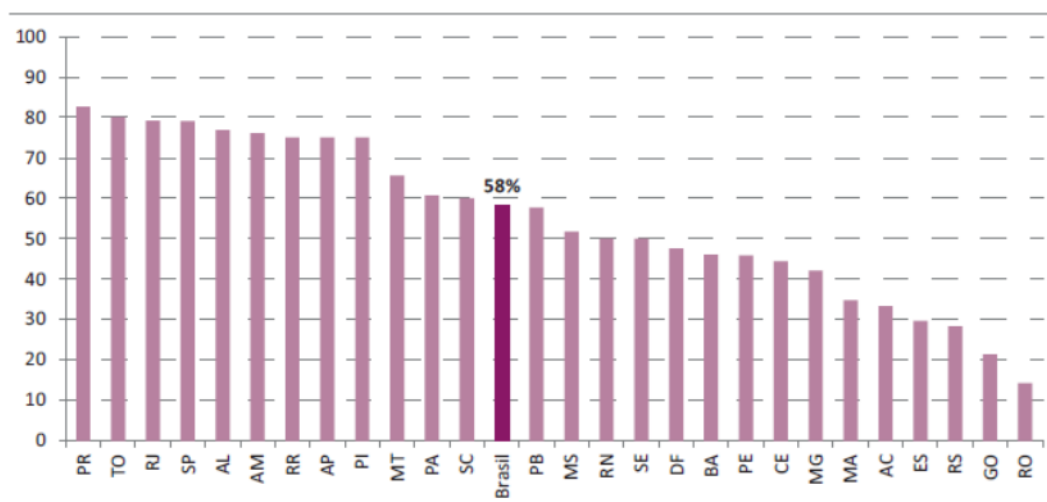
* Dados preliminares para 2011

Source: Mortality Information System – General Coordination for Information and Epidemiologic Analysis/Department of Health Situation Analysis/Sekretariat for Health Surveillance/Ministry of Health.

^a Data for 2011 is preliminary.

Annex 6. Graphic 2- Percentage of Maternal Deaths that were Notified in a Timely Manner, Nationwide and by Federal Unit: Brazil 2011

Gráfico 2 – Proporção de óbitos maternos com notificação oportuna – Brasil e UF 2011*



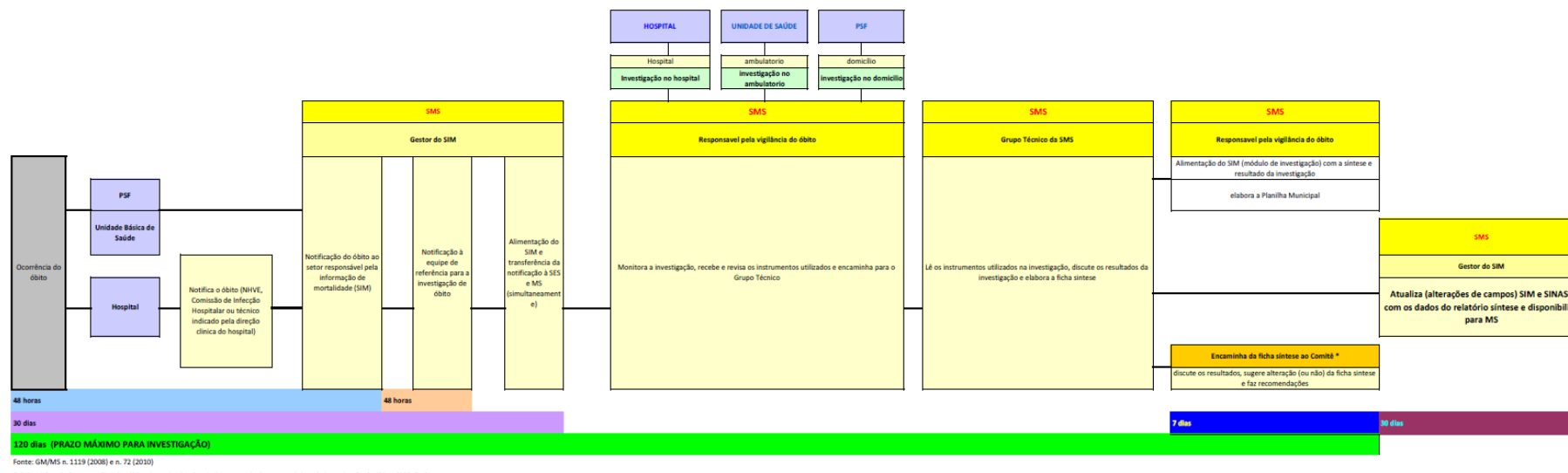
Fonte: SIM – CGIAE/DASIS/SVS/MS.

*Dados preliminares para 2011.

Source: Mortality Information System – General Coordination for Information and Epidemiologic Analysis/Department of Health Situation Analysis/Secretariat for Health Surveillance/Ministry of Health.

^a Data for 2011 is preliminary.

Annex 7. Fluid Diagram of the Research Process on Maternal Mortality



Annex 8. Report on Maternal Health by the Ministry of Health-SUS



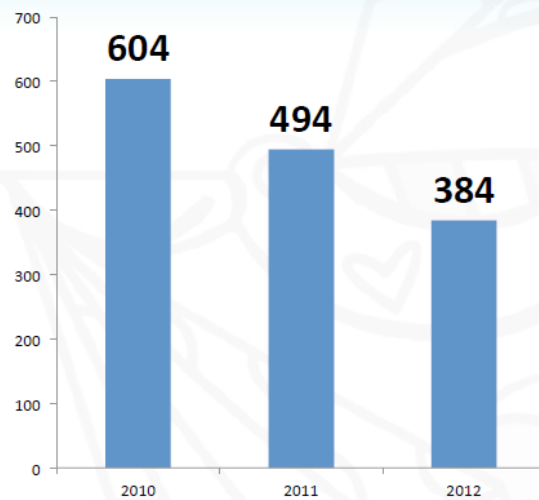
Investigação de óbitos

2010 - 2012



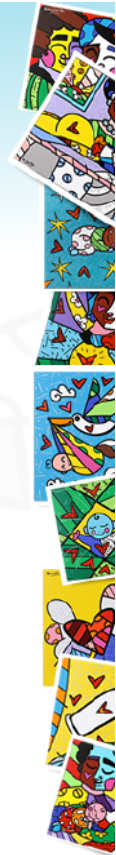
Óbitos maternos notificados ao SIM

Brasil, jan-abr, 2010-2012



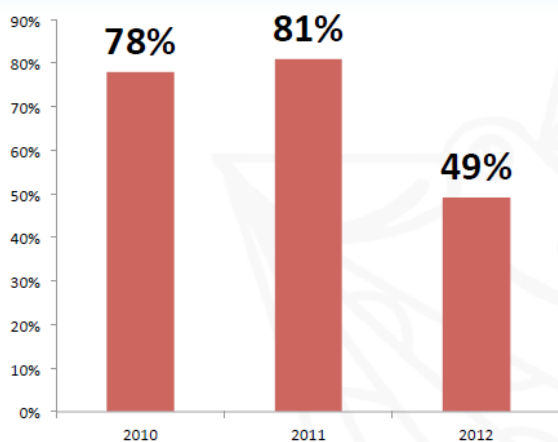
As notificação de óbitos maternos em 2011 e 2012 são preliminares

Fonte: CGIAE/DASIS/SVS/MS



Investigação (%) de óbitos de MIF

Brasil, jan-abr, 2010-2012



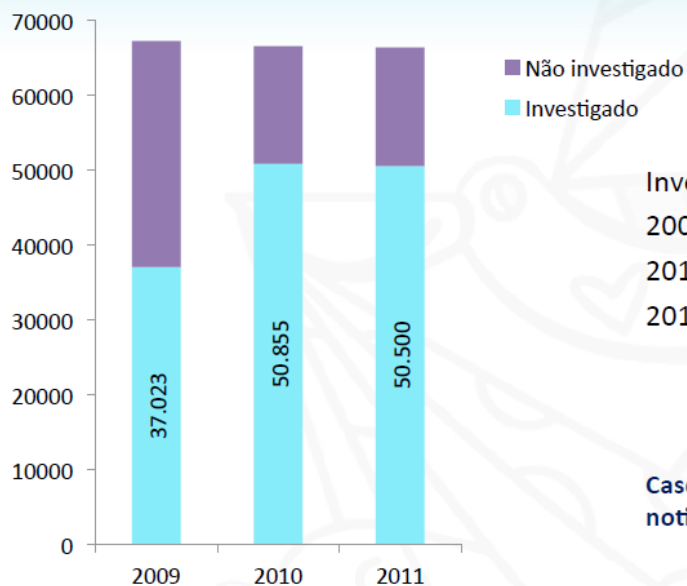
As notificação de óbitos maternos em 2011 e 2012 são preliminares.

O percentual de investigação de MIF em 2012 ainda está baixo (49 %).

A tendência é que, quando consolidados os dados de 2012, a investigação de óbitos de MIF seja superior a 80%.

Fonte: CGIAE/DASIS/SVS/MS

Investigação de óbitos nas MIF. Brasil, 2009 a 2011*



Investigação da mortalidade MIF:

2009: 37.023 / 67.168 (55%)

2010: 50.855 / 66.497 (77%)

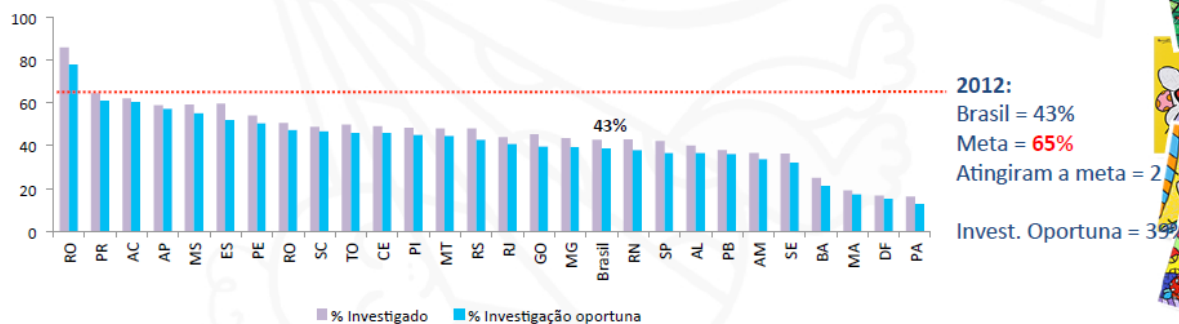
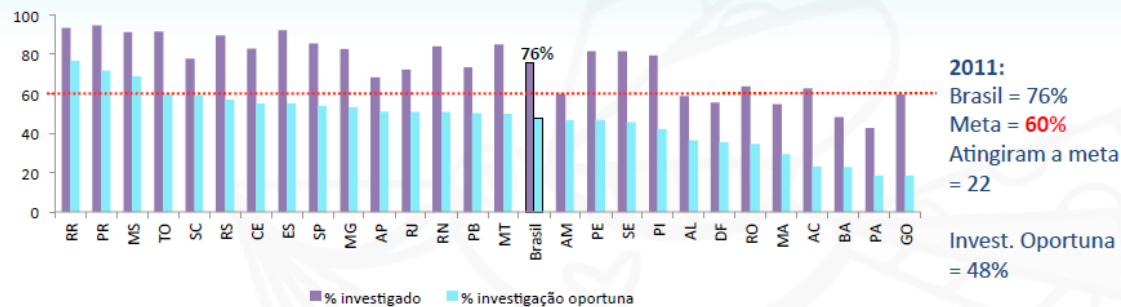
2011*: 50.500 / 66.381 (76%)

**Casos de 2011 estão em finalização de
notificação e investigação**

Fonte: CGIAE/DASIS/SVS/MS

* 2011 são dados preliminares

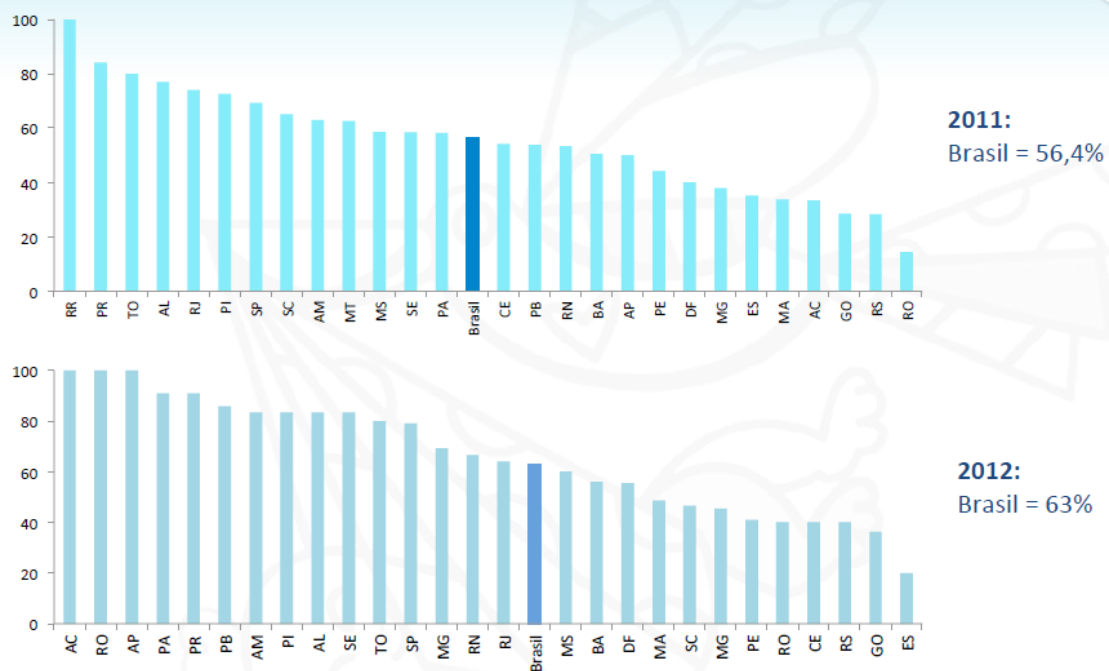
Investigação total e investigação oportuna dos óbitos de MIF. Brasil 2011* e 2012*



Fonte: CGIAE/DASIS/SVS/MS

* 2011 e 2012 são dados preliminares

Notificação oportuna de óbitos maternos (≤ 30 dias). Brasil e UF, 2011* e 2012*

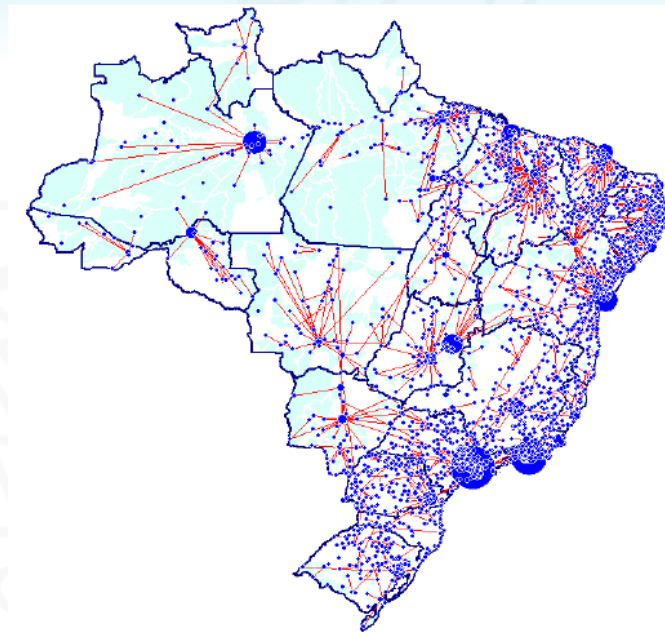


Fonte: CGIAE/DASIS/SVS/MS

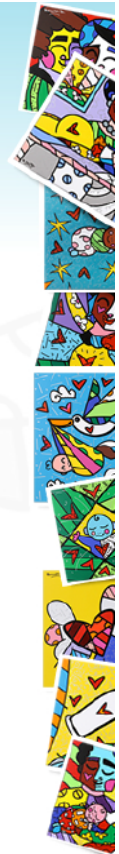
* 2011 e 2012 são dados preliminares

Ocorrência de Óbitos Maternos e diagrama de fluxo (do município de residência para o de ocorrência do óbito). Brasil, 2008 a 2011*

Aproximadamente
42% dos óbitos
maternos ocorreu
**fora do
município** de
residência da
gestante

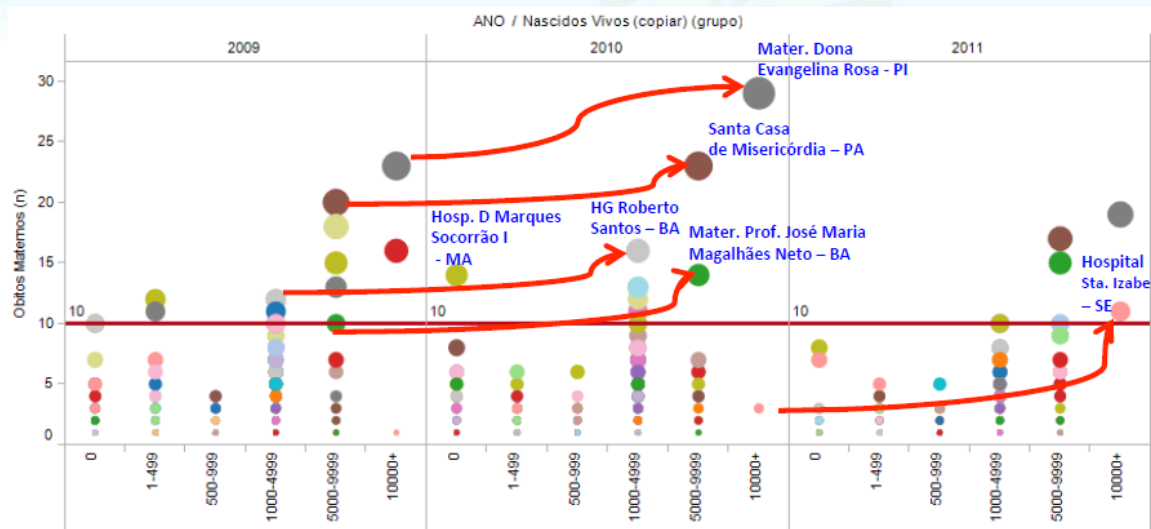


* Para 2011 são dados preliminares
Fonte: CGIAE/DASIS/SVS/MS
Data: 11 de julho de 2012



Estabelecimentos de saúde segundo frequência de óbitos maternos e partos atendidos.

Brasil, 2009 a 2011 (preliminar)*

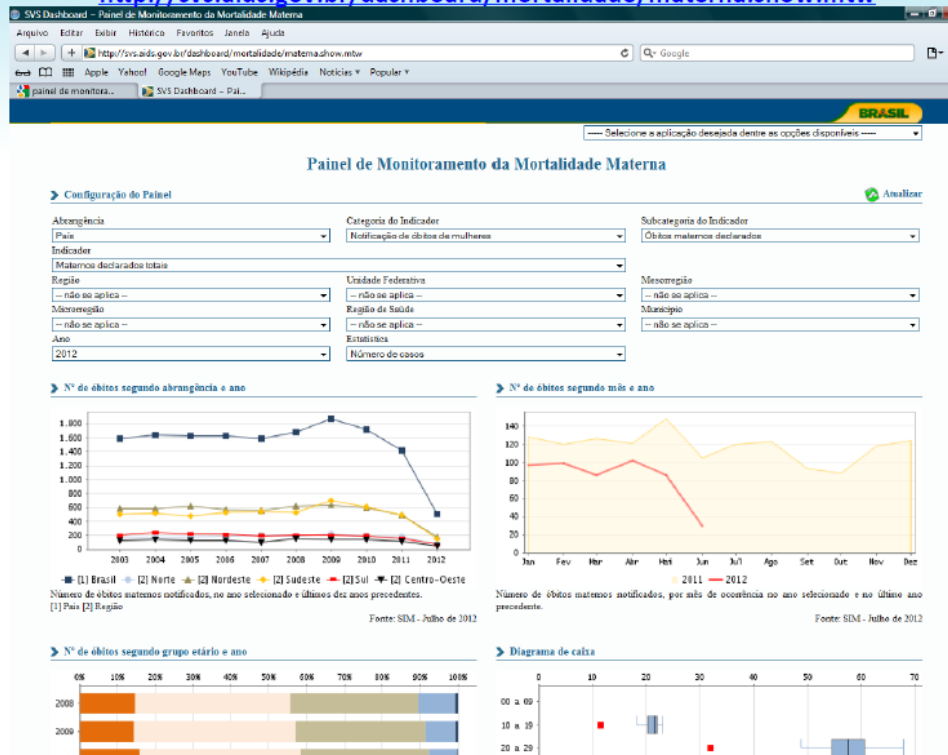


* É dado preliminar
Fonte: CGIAE/DASIS/SVS/MS
Data: 11 de julho de 2012

A vigilância do óbito materno está avançando em todos os estados desde 2009. É possível que o aumento observado se deva a maior identificação de óbitos maternos em todo o país.

Painel de Monitoramento da Mortalidade Materna

<http://svs.aids.gov.br/dashboard/mortalidade/materna.show.mtw>



Fonte: CGIAE/DASIS/SVS/MS

