Strategy for the reduction of maternal, perinatal and infant morbidity and mortality

Trevo de Quatro Folhas
Brazil

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Trebol Programme/Brazil/2010

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Trevo de Quatro Folhas

Sobral, Ceara, Brazil

First Place
Experiences in Social Innovation in Latin America and the Caribbean

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1. Health in the Millennium Development Goals

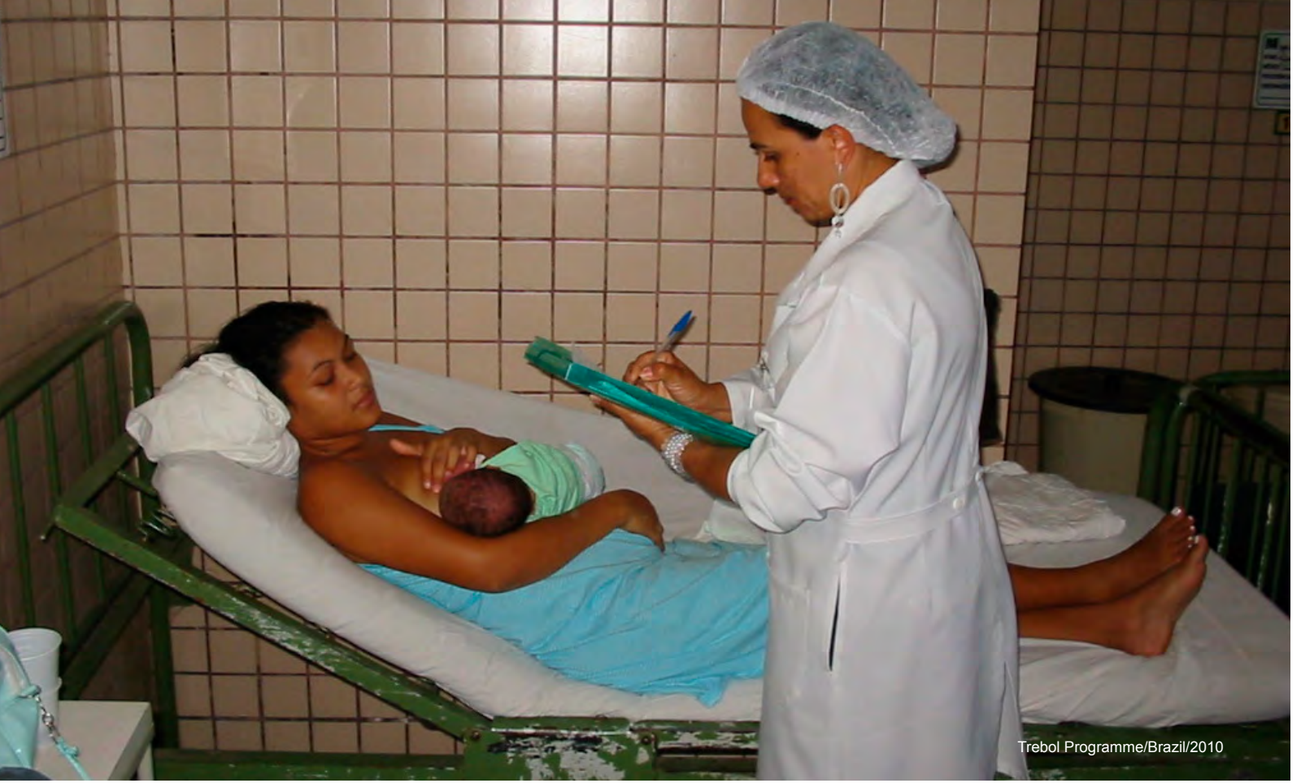
Toward a more equitable world free of poverty by 2015, in September 2000, Heads of State and Governments of 189 countries signed the Millennium Declaration. Eight Millennium Development Goals (MDG) were developed, three directly related to health: MDG 3, which aims to reduce mortality amongst under fives by two thirds; MDG 4, which aims to improve maternal health by reducing maternal mortality and ensuring universal access to reproductive health; and MDG 5, which aims to reduce the spread of HIV, malaria and other serious illnesses that afflict humanity. The MDGs combined recognise that economic growth, income distribution, and investment in human capital have an immense impact on the quality of life and health of people.

Latin America and the Caribbean (LAC) is one of the regions in the world that has advanced the most in meeting the millennium goals for health, especially those related to children (UNICEF 2010). In 2009, the region's infant mortality rate was the lowest of the developing world and was declining faster than in any other region.[1] However, this regional rate obscures great variance across and within countries. At one extreme, five LAC countries have rates of less than 9 deaths per 1,000 live births, placing them on par with European countries. On another extreme, 11 countries have rates that exceed the regional average and two[2] have rates higher than the world average[3] (See graph 1). There are also large discrepancies between urban and rural areas and different ethnic groups within countries.

There are various factors that affect maternal and infant mortality. Some include the families' income and their educational level, the nutritional status of women, access to basic services such as potable water and basic sanitation or the sexual and reproductive health of mothers and their age.[4] There is no doubt that health legislation that ensures women's equal rights is also a factor that affects it. Additionally, improving access to health services and progress in the institutionalisation of labour would, as has been achieved in several countries in the region, lower the mortality rate. However, access to these services is conditioned by economic, social and geographical reasons, such as the lack of financial independence and autonomy for women and the distance between their home and the centre or service.

For its part, perinatal mortality, which is a direct indicator of prenatal, birth and neonatal care and an indirect indicator of maternal health – was 34.6 per 1,000 live births in 2003 for the region; ranging from 53 in the Caribbean to 21.4 in South America and Mexico (PAHO/WHO/CLAP 2003). Between 1997 and 2005, both the world and regional Maternal Mortality Rate (MMR) declined; however, it is important to consider the extensive problems of under-reporting of deaths, especially in remote and rural areas[5] (PAHO/UNICEF/UNFPA/World Bank 2008).

1. The world average has been reduced by 27.2% in comparison with 51.7% as a regional average.
2. Haiti and the Plurinational State of Bolivia.
3. 49.9 per 1,000 live births.
4. Children of mothers aged less than 18 years old or women of more than 40 years with close birth spacing have a far higher mortality rate.
5. In Latin America and the Caribbean, the figure has fallen from 130 to 99 per 100,000 live births, while the world rate has declined from 430 to 400 per 100,000 live births.



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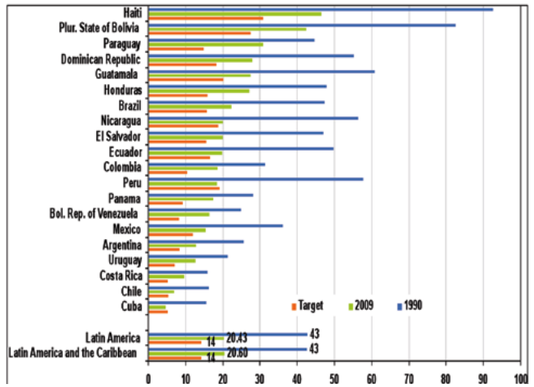
2. Brazil in the Regional Context

Brazil has achieved large reductions in maternal and infant mortality indices, but greater progress is needed before the targets will be reached (Graph 1). Furthermore, there are large disparities between the various socio-economic strata and populations of different ethnic origins. While the richest quintile has an infant mortality rate of 15.8 per 1,000 live births, the rate is 34.9 per 1,000 live births for the poorest quintile. For indigenous mothers, the figure is 94 per 1,000, for those of African descent it is 39 per 1,000 while for white mothers it is only 22.9 per 1,000 live births (UNICEF 2007).

Graph 1

Latin America (20 countries): Infant Mortality Rate (Indicator 4.2), 1990, 2009 and Target for 2015a (Per 1,000 live births)



Source: Latin American Demographic Centre (CELADE) – ECLAC Population Division, on the basis of data obtained by linear interpolation of estimates of the probability of death before 1 year of age for the five year periods of 1985-1990 and 1990-1995 (1990 data), 2000-2005 and 2005-2010 (2009 data). The figure given for the 2015 target is one third of the 1990 infant mortality rate.

In 2005, Brazil's MMR was 75 per 100,000 live births (UNICEF 2010) - a rate higher than the regional average. The main causes were obstetric complications (61.4%) with most of the fatalities attributable to eclampsia and pre-partum haemorrhage. The indirect causes included pre-existing conditions aggravated by pregnancy, especially diabetes, anaemia and cardiovascular problems (PAHO 2007).

HIV/AIDS is a serious health problem in Brazil. According to the most recent report from UNAIDS/WHO (2007), a third of all people living with the human immunodeficiency virus (HIV) in the region are found in Brazil - although the epidemic is now stable due to prevention and treatment services. Prevalence of the disease amongst adults has remained at approximately 0.5% since 2000 and vertical transmission was reduced from 16% in 1997 to 4% in 2002. However, these rates vary according to the socioeconomic level of the individual with infection three times more common in lower income groups.

a. Health system of the municipality of Sobral

From 1998, the health system of the municipality of Sobral, Ceará state, Brazil has operated fully within the framework of the Brazilian Single Health System (SUS). The local government office, through the Ministry of Health and Social Action, is therefore wholly responsible for integrated health promotion for the population, coordinating all care and prevention actions and handling federal resources allocated for the health care of all levels of the population.

The care model is organised on the basis of the principles and directives of the SUS and is based on the Family Health Programme (PSF). The objective of the PSF is to redirect the health care model by substituting the traditional system of assistance with one focused on health promotion, which is based on a health situation diagnosis that analyses the determining factors affecting the health of the population's neighbourhood, district or municipality.

b. Status of Sobral's infant mortality rate
Infant mortality rate (IMR) in Sobral has been falling since 1997 due to a series of investments in specific programmes by the municipal government. Initially, a significant reduction in deaths from diarrhoea was achieved as a result of improvements in the basic sanitation system. The implementation of the PSF in 1997 provided universal access to health services and Community Health Agents (CHAs) implemented early interventions in complex diseases and reduced the general mortality in one municipality (Svitone et al. 2000). According to statistics from the Brazilian Institute of Geography and Statistics, IMR in Sobral fell from 43 per 1,000 live births in 1999 to less than 20 per 1,000 in 2005 - a level below both state and national averages.

A series of concrete actions broadly identified as necessary were implemented to decrease rates of maternal and infant morbidity and mortality. These included: access to good-quality health services and qualified care in the prenatal, birth, postpartum and neonatal periods; monitoring child development and providing vaccinations; access to sexual and reproductive health care; implementing integrated care models linking public and community health; and recognising and addressing the socioeconomic factors that underlie disease and mortality. This is precisely the perspective behind the actions of the Trevo de Quatro Folhas programme.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3. Trevo de Quatro Folhas (four-leafed clover) Programme

a. Objective
The "Trevo de Quatro Folhas" (TQF) strategy was developed by Sobral's Ministry of Health and Social Action to reduce maternal and infant morbidity and mortality through the reorganisation of health care for mothers and children during the prenatal, delivery, postpartum and neonatal periods through two years of age. Each period constitutes one of the four leaves of the clover.

b. Origin
The health authorities of Sobral were concerned by the high rates of maternal and infant mortality in the municipality. In response, authorities sought to document deaths through 'verbal autopsies[6]', where families who had recently experienced a maternal, foetal or infant death were asked to provide their version or understanding of the events leading up to the death. This process facilitated the identification of shortcomings in the prenatal, birth, postpartum and neonatal care systems, as well as underlying socioeconomic causes. The process led to the detection of the following issues regarding pregnant women:

In the identification:
a. shortcomings in the capacity to detect and attend to high risk pregnancies;
b. some women never received care from the health unit, while others received less than six prenatal consultations;
c. some women did not receive the required laboratory analyses;
d. some women lacked the required amount of rest due to the lack of family and social support;

In the coordination:
a. a lack of links between the healthcare teams and pregnant women which led to a noted absence of monitoring protocols for women and children and delays in identifying pregnant women to initiate prenatal controls;
b. difficulties in coordination among the three different levels of care for women and children;
c. difficulties in the accompaniment of pregnant women during consultations;
d. problems in the system of referral and counter-referral between prenatal care and maternity units as well as between delivery and postnatal care.

Meanwhile, infant deaths were associated with:
a. shortcomings in care for the mother and child and insufficient identification and monitoring of high-risk newborns;
b. a lack of home visits to the mother and child within the first few days of life;
c. high rates of neonatal infection;
d. insufficient guidance to mothers on continued/exclusive breast-feeding, which was frequently suspended due to the heavy domestic workload and/or a mother's need to accompany other children admitted to the hospital.

Consequently, many women were experiencing complications that put their lives and those of their children at risk. This situation was far more common in the less well-off population, where the lack of family and social support was accentuated and access to services more limited due to distance or a woman's autonomy.

c. Strategies
The municipal TQF project included the following strategies:
1. establish actions to guarantee quality of care in the four[7] phases of maternal and child care;
2. define the criteria for defining clinical and social risk related to the level of care for women and children from the prenatal to childcare periods;
3. develop various strategies with civil society organisations to secure resources and achieve social mobilisation;
4. produce a 'pregnancy kit'[8] for expectant mothers and develop thematic proposals for educational activities with groups of pregnant women;
5. implement a daily monitoring system with the ongoing evaluation of indicators for the process and the outcomes of maternal and infant care;
6. provide technical support to the Municipal Committee for the Prevention of Maternal, Perinatal and Infant Mortality.

d. Characteristic of the population and care criteria
TQF is a care strategy with a family health perspective. It attends to families where there is a woman who is pregnant, in the postnatal period or breast-feeding, or where there are children under the age of two years, particularly families in which there is social or clinical risk. TQF's strategy primarily works by providing accompaniment support and encouraging self-care.

Most of the families supported by TQF live in poverty and social exclusion. They are residents of rural or urban areas where there is a social and housing risk, defined by the municipal health teams' risk classification system including social and clinical factors developed and validated by TQF (Box 1). This classification system is used to select families to join the project and the specific care actions to be undertaken. Most of the women in the project are teenage or young mothers with low levels of education and with children less than two years old.

Box 1
TQF Risk criteria:
Sobral, Ceará, Brazil

Criteria

SOCIAL Risks	CLINICAL Risks
• Illiteracy • Place of residence (area of risk) • Absolute poverty • Vulnerable families with children less than five years old • Lack of nutritional support and family support • Drug dependency • Incapacity or difficulty in self-care • Unplanned pregnancy • Adolescent mother • Domestic violence	• Pregnant or postpartum women with pre-existing diseases, infectious diseases, gynaecological and obstetric pathologies • Personal characteristics[9] and previous reproductive history of pregnant, postpartum and breast-feeding women • Children with referrals for consultations given at birth, pre-existing diseases, low birth weight or premature delivery. • Children classified as an 'at-risk' newborn or with later acquired risk

Source: Programme leaders, 2010.

Families that are unable to satisfy basic needs are provided with emergency benefits from civil society's contributions, such as: basic documentation[10], food, clothing, footwear, and medicine. This same perspective pervades the *Madrinhas* and *Padrinhos Sociales* (Social Co-Parents) scheme, where repeat donors contribute a fixed amount of money each month to TQF. There is also a group of Social Promoters who are volunteers from within the municipality who make a long-term commitment to disseminate the programme, organise social events and raise financial resources.

6. 'Verbal autopsy' is a methodology used to collect a full history of all the facts relating to the death of a mother or child by conducting interviews with the immediate family.
7. Pregnancy, delivery, postpartum and childcare to two years of age
8. Pregnancy kit, delivered to the pregnant mother to encourage responsible maternity. This contains blankets, clothes and socks for the newborn.
9. Such as family health history (diabetes, high blood pressure, etc)
10. Birth registration for the child and identification documents for the mother

Meanwhile, the families are also encouraged and supported in seeking help from various programmes and social projects run by national and state governments for which they may be eligible, such as: permanent incapacity benefit for sickness and disability, Bolsa Familia programme benefits, home vegetable garden subsidies, and training courses. Sometimes, help can also be provided with transport to nurseries or schools; inclusion in employment or income generation projects; and home improvements.

e. Basic lines of action

The three basic lines of action of the programme are: care management during four maternal and infant phases; monitoring of maternal and infant morbidity and mortality; and provision of social support.

Line 1: Care and management during the four phases of maternal and infant care

PHASE 1: Management of prenatal care

Phase 1 includes the selection and training of Social Mothers[11] to care for at-risk pregnant mothers and the organisation of an ongoing calendar of education activities in gynaecology and obstetrics for professionals in the Family Health Centres (FHC). Monitoring of quality indicators of prenatal check-ups, through ongoing data entry in the TQF database and cross-referencing with official systems in the Ministry of Health, is carried out. This information is consolidated in monthly reports, providing prenatal monthly indicators for the municipality in each area of family health. Monthly reports from FHC are used to detect pregnancies, according to clinical and social risk criteria. These expectant mothers receive home visits by the Family Health Team, especially those lacking prenatal monitoring and requiring food support or a Social Mother's care. This procedure is evaluated according to clinical and socio-family profile, and one of the key issues is the evaluation of the medical recommendations' fulfilment.

To promote participation in the Programme, each mother receives prenatal care and a Pregnancy Kit. On the other hand, the team visits the hospitalised high-risk pregnant mothers to register the details needed for accompaniment and prepares a daily report to FHC on their condition and progress in the hospital. To ensure the ongoing support by the Social Mothers, the pregnant mother's needs are constantly evaluated and analysed in the high-risk maternity unit. One important issue is the care protocols for expectant mothers with mental health problems.

PHASE II: Management of birth and postpartum care

The actions undertaken in this phase are complementary to those taken in the previous phase—identification of risk factors for labour and the development of a care guideline or plan, the preparation of a protocol to ensure care for pregnant women in delivery units to avoid a 'pilgrimage' through various services (health centres, emergency rooms) prior to delivery. At the same time, there are visits and interviews with postpartum mothers in the maternity unit to evaluate delivery care, the use of the Mother and Child Health Card, especially in relation to registering prenatal monitoring and the identification of risk factors in the postpartum period and production of care plans, as well as the need for Social Mothers to accompany women with mental health issues and no family support during delivery. The programme reports daily to FHC on live births, stillbirths, complications and conditions of deliveries and defines the protocols for visits by nursing staff and CHAs to FHC during the early postpartum period. Based on the process and outcome indicators, monthly reporting forms for the Centres are created, data are consolidated and cross-checked with the TQF database programme and official information systems, and record the actions of the Centres and TQF[12]. Additionally, the Social Mothers conduct home visits to postpartum women to evaluate and support their needs.

Model Health Card

Provides a record of progress throughout pregnancy and delivery and then records the vaccination, growth and hospital admissions of the child. It also contains useful information for parents on normal child growth and development up to five years, breast-feeding and related issues.

11. More explanation on the role and selection of Social Mothers is provided under the subsection "Provision of Social Support".

12. System of Primary Care Information, System of Live Births Information, System of Prenatal Information, and System of Mortality Information

PHASE III: Management of delivery care and neonatal period

The activities undertaken in this phase occur from birth to 28 days of life. In this phase, the newborns hospitalised in maternity units are visited daily to identify the risk factors in the neonatal period and their progress until discharge from the hospital. There are home visits to provide guidance for mothers with difficulties in breast-feeding. There is consistent communication between the Manager of the FHC and the Head of Paediatrics to request special care for any at-risk newborn. Within the framework of the "Responsible Maternity" project, the early administration of the Pezinho Test (Neonatal Screening)[13], the official registration of the birth and neonatology consultations[14] (delivery of photo of the newborn citizen of Sobral) are encouraged.

PHASE IV: Management for the child in the first two years of life

Activities in this phase correspond to care for the child from birth until the second birthday— identify the at-risk infants/children, classify them according to their condition of 'acquired risk' in the first two years of life and prepare the care plan, and define the accompaniment routines for the healthy child. There are home visits to evaluate the need for nutritional and/or home support or hospital accompaniment by a Social Mother[15]. For those hospitalised, there are daily visits to paediatric wards to accompany children less than two years old and observe their progress until discharge. A report is prepared daily for the FHC on the admission, progress and discharge of children less than two years old, and there are interdisciplinary and interagency meetings to discuss more complex cases.

It is important to highlight that each plan of care in the four phases is designed in conjunction with the beneficiary family, who in turn commits to a series of specific actions. This promotes the idea of co-responsibility in which the health system is not solely responsible for ensuring the health of the individual or the family. For example, pregnant women commit to attend prenatal visits and do the required tests, and to participate in groups with other pregnant women where there is continuing education on self-care, clinical treatment, and early detection of signs and symptoms of complications. For families with infants under 6 months, the agreement is to take the baby to a childcare consultation (support growth and development), have current vaccinations, maintain exclusive breast-feeding, ensure birth registration, and receive guidance on basic care, early stimulation, bonding between mother/family-child. Finally, for families with children between 6 and 24 months of age, the recommendations focus on appropriate care, compliance with a schedule of child care and vaccinations, healthy eating, and receiving paediatric check-ups and clinical treatments. The accompaniment that TCH offers to beneficiary families is maintained until the identified risk is resolved.

Line 2: Monitoring of maternal, perinatal and infant morbidity and mortality

Mother and infant care operates through ongoing monitoring and evaluation of indicators on the quality of care for pregnant women and children, and analysis and classification of maternal, foetal and infant deaths, according to the process described in the phases of the programme.

A Maternal, Perinatal and Infant Mortality Prevention Committee is responsible for monitoring maternal and infant care. This is an interagency entity with representatives from all three levels of health care in the municipality and the various ombudsman offices[16] coordinated by the TQF team. The Committee meets once a month to discuss and classify all the maternal, foetal and infant deaths of the previous month in Sobral municipality to identify the determining factors in each death and to determine responses for addressing similar cases in the future. Obstetrics and paediatrics experts are responsible for analysing the deaths using the prenatal monitoring records and registration of admissions to maternity units or other hospitals in the case of child admissions. The TQF team undertakes a 'verbal autopsy' with the family and health professionals to obtain more details of the case. This source of information is the most valid as it allows full exploration of all the events from the appearance of the first sign of illness until death.

The Committee also has an educational and constructive role. From the analysis of the deaths, the Committee seeks to identify any potential failings in the care provided to the pregnant woman and/or the child and to propose actions to avoid any further deaths of this nature. The deaths are classified according to the 'avoidability' criteria proposed by the SEADE Foundation[17] (Box 2).

Box 2

Criteria of 'avoidability' and causes of death* SEADE Foundation - State Data Analysis System - Sao Paulo
I- Avoidable/preventable by: 1. Immuno-prevention 2. Adequate prenatal monitoring 3. Adequate birth care 4. Prevention, diagnosis and early treatment actions 5. Work with other sectors
II- Unavoidable Refers to highly lethal diseases where there are no interventions possible such as serious congenital abnormalities.
III- Poorly defined This refers to non-specific and poorly defined situations. The presence of poorly defined deaths indicates the degree of population access to health services and the diagnostic capacity of these services, including the presence or absence of death verification services.

For more details, see Ortiz 2001.

In addition to these tasks in the clinic and home environments, other projects are undertaken to reorganise maternal and child care, such as the Gincana Parceiros da Crianças (childhood partners games); promotion of maternal nutrition and responsible maternity; ongoing actions for the treatment of diarrhoea and severe respiratory infections; Gincana amor à vida prevenir é sempre melhor (prevention is always best, love of life games) for the provision of differentiated health care for adolescents and the prevention of early pregnancy.

Line 3: Provision of social support

Social support is guaranteed by collaboration among local, state and federal public systems in association with civil society, through the Social Mothers and Social Co-Parents scheme, and by donations from individual donors and companies who support the project.

- **The Social Mother**

A Social Mother is a person from the same community who aims to support the at-risk family, either in hospital or at home. They take care of expectant mothers and women who have given birth and require special care for themselves or their child. The Social Mothers are paid for their work proportional to the current minimum salary (BRL 14.75 per day, BRL 20.65 per day on the weekend[18]) and work an eight-hour day. The scope of their work depends on the needs identified for each of the beneficiary women, children and families in the programme. Besides homecare, they may accompany pregnant women, postpartum mothers and children when they need to be hospitalised and have no family support.

13. This test is used to detect three congenital metabolic diseases in the newborn: phenylketonuria, hypothyroidism and suprarenal hyperplasia.
14. Neonatology is the study of the health and care to be provided to children during the first years of life.
15. Families that require nutritional support receive a basket of basic foodstuffs monthly.
16. Municipal Health Council, Municipal Council for the Rights of the Child and Adolescents and the Municipal Council on the Rights of Women.
17. State Data Analysis System - Sao Paulo
18. At 2010 rates.

The first Social Mothers were selected in 2001 as the TQF programme was being created. Candidates were chosen by CHAs in the Family Health Teams. The TQF technical team selected individuals through a group session, individual interview and analysis of their profile, especially in relation to their attitude to work with children, provide domestic support, having had a positive personal experience of breast-feeding and previous participation in community work. Currently, there are 74 Social Mothers registered with the programme in urban and rural areas of Sobral. Most are between 30 and 50 years of age, married, and have an average of four children - most of whom are now adolescents or adults.

Social Mother training is based on health promotion paradigms that place emphasis on community culture with a gender perspective, using a participatory constructivist methodology.[19] The training includes: gender and families; social support and empowerment; carer ethics; signs and symptoms of risk during pregnancy, birth and the postpartum period; advantages and difficulties in maternal nutrition; and child growth and development. This training helps to guarantee the success of the initiative. Furthermore, Social Mothers develop practical knowledge and skills in: caring for the domestic environment; tending to the expectant mother, postpartum mother and newborn; supporting the clinically or socially at-risk child; and knowing techniques to support maternal nutrition. They work to achieve an attitude that values and defends human life; ethical behaviour with the accompanied family; respect for the woman and child as citizens; and a commitment to improve the quality of life of the families.

- **The Social Co-Parents**

Social Co-Parents are individuals or legal entities in civil society that support the programme by making a regular monthly contribution, an amount which they determine themselves. These contributions are deposited in the municipal fund for the rights of children and adolescents in a manner that ensures transparency and social control of the investment. These contributions are tax-deductible. In addition to monetary contributions, in-kind contributions are also accepted.

Social Co-Parents meet every three months with the TQF team to discuss advances and challenges, contribute to the planning of fundraising campaigns, the recruitment of Social Co-Parents, and the organisation of events. There is a yearly support meeting of Social Mothers and Co-Parents, expectant mothers and beneficiary mothers of the project. Several events take place during these meetings, such as the Desfile por la vida (Parade for life) that involves health professionals, Social Mothers, Social Co-Parents, members and local artists holding a demonstration to increase awareness of the strategy, capture more resources and strengthen overall commitment to the project. The Día de la Princesa (Princess Day) is another event held annually, to pay homage and strengthen the self-esteem of women who have persevered with breastfeeding, using the event to promote breastfeeding together with the community. Furthermore, they take advantage of these events to present stories, monthly results, and reinforce the purpose of TQF.

Other actions undertaken by the TQF team include the participation in a monitoring group for congenital syphilis; the Municipal Council for the Rights of the Child and Adolescent; the inter-sector agreement of the Barrios Vila União, Terrenos Novos and Junco neighbourhoods; the Committee for the Prevention of Violence against Children and Adolescents as well as the production of scientific texts on maternal and child care.

19. This method values popular knowledge and operates on the basis of the formation of independent and critical subjects.

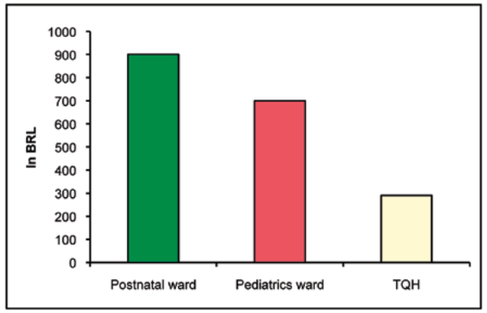
f. Costs and funding

The project is managed and implemented by the Municipal Health Office and forms an integral part of the municipal public health policy. A significant portion of the funding comes from the municipal health fund - as established in the Brazilian constitution.

In 2009, the total cost of TQF actions was BRL 675,286.35 (approximately USD 338,000) of which nearly 85% was spent on maintaining the head office, transporting employees to hospital visits and staff salaries and remuneration, including those of the Social Mothers.

In 2004, a comparative study was made of the monthly cost of attending a child in various health sectors. The study showed the admission of a baby to a postnatal ward (joint lodging) in a maternity unit cost an average of BRL 907.95 (approximately USD 338). In a paediatric nursing ward, the rate was slightly lower at BRL 704.37 (approximately USD 263), while an at-risk child accompanied at home by a TQF Social Mother (hospitalised child) cost a mere BRL 288 (approximately USD 107) (Graph 2).

Graph 2
Monthly cost of child care by sector of care, 2004.
Sobral, Ceará, Brazil
(in BRL)

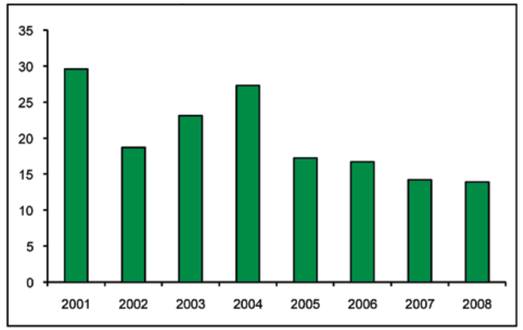


Source: Field visit forms. September, 2007.

g. Impact and Outcomes of Programme

Since implementation in 2001, the programme has significantly reduced the rate of infant mortality from 29.6 per 1,000 live births in 2001 to 13.8 per 1,000 in 2008 (Graph 3); however, early neonatal mortality is still higher than the desired rate and continues to present large fluctuations (Box 3). A study undertaken by the health service showed how this indicator is mainly related to premature birth due to urinary tract infections in pregnant women. In response to these findings, in 2007 a new proposal was made to change the way such infections are treated.

Graph 3
Infant Mortality Rate (IMR) in the municipality of Sobral, 2001-2008
Ceará, Brazil
(per 1,000 live births)



Source: SSAS/Committee for the Prevention of Maternal, Perinatal and Infant Mortality of Sobral.

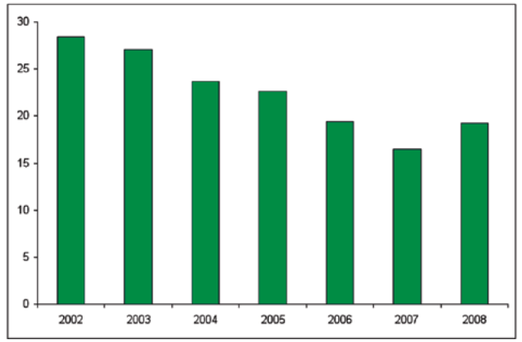
Box 3
Infant Mortality Rate by components[20], Sobral, 2002-2006.
Ceará, Brazil
(per 1,000 live births)

Year	Neonatal Mortality		Post-neonatal Mortality	Infant Mortality
	Early	Late		
2002	68.7	14.1	17.2	18.7
2003	57.3	20.0	22.7	23.1
2004	48.8	25.6	25.6	27.3
2005	62.9	14.8	22.2	17.2
2006	61.5	21.2	17.3	16.7
2007	46.7	24.4	28.9	14.2
2008	65.9	18.2	15.9	13.9

Source: SSAS/Committee for the Prevention of Maternal, Perinatal and Infant Mortality of Sobral.

Perinatal mortality rate[21] PMR has seen a constant decrease since 2002, going from 28.4 to 16.5 per 1,000 live births by 2007 (Graph 4), although the subsequent increase in 2008 shows there is still a great challenge to be confronted.

Graph 4
Perinatal Mortality Rate, Sobral, 2002-2008.
Ceará, Brazil
(per 1,000 live births)

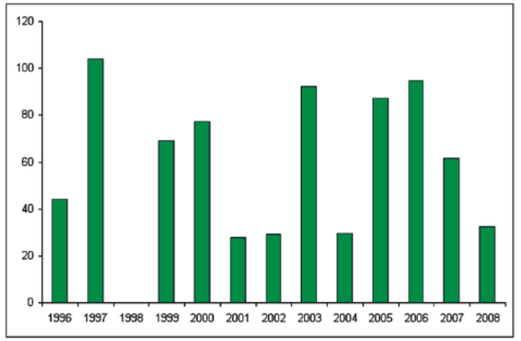


Source: SSAS/Committee for the Prevention of Maternal, Perinatal and Infant Mortality of Sobral.

Although the Maternal Mortality Rate[22] has declined by almost 70 points (Graph 5), levels are not yet stable and are highly sensitive to aspects that are not yet totally under control, such as pre-existing infections or diseases. This will undoubtedly continue to be a great challenge to the TQF strategy. These outcomes have led the TQF team to revise indicators of quality of care during pregnancy.

20. The IMR is divided according to the time of infant death (less than one year): neonatal (zero to 27 days), subdivided into early neonatal (from birth to the sixth day of life) and late neonatal (7 to 27 days of life), and post-neonatal (between 28 and 365 days of life).
21. The Perinatal Mortality Rate (PMR) is calculated on the basis of the number of foetal deaths (with a weight greater than or equal to 500 g or greater or equal to 22 weeks of gestation) and of live births until six days of life.
22. Number of maternal deaths per 100,000 women of reproductive age defined as 15 to 44, 10 to 44 or 15 to 49 years of age. A maternal death occurs with the death of a pregnant woman or one who has been pregnant in the last six weeks.

Graph 5
Maternal Mortality Rate (deaths per 100,000 live births), from 1996-2009.
Sobral, Ceará, Brazil



Source: Project leaders, April 2009.

Another very important outcome of the strategy has been its capacity to significantly increase the number of families covered from 250 in 2002 to 2,265 in 2010, with the average annual costs lower than those of traditional models.

h. Challenges and Solutions
The first challenge is linked to the budgetary constraints because it is a local initiative that can only draw from the municipal budget. The mechanism of the Social Co-Parent was created to help overcome this restriction by providing fixed amounts of funds monthly and the Co-Promoters are volunteers from the same town who are permanently involved in the dissemination of the program, the organisation of social events and fundraising.

The creation of the Social Mothers concept was seen as a major initial challenge. Could they get the number of women in the community needed to do this work? Would the community and the families accept them? Would they have the ability to carry out the work properly? Using Community Health Agents to identify them was a key factor in meeting these challenges. They know them, know their family background and ability; they are recognised and respected women in the community. In addition, to ensure their capacity for effective action, they receive the training necessary to perform the assigned functions. The Community Health Agents and Social Mothers also play an important role in the identification of at-risk families. To be part of the community that they serve, they know the friends and neighbours of the pregnant women, the conditions in which they live, and thus, the positive or negative factors they face.

Lastly, another limitation is the lack of an intensive care unit in the municipality, but the system of referral of such cases to the capital has been improved.

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4. Innovative Aspects

TQF has many strengths and innovative aspects that have led to the results cited above:

Governmental level:

- The strategy is linked with national social policies and is funded by a combination of the municipal government budget and civil society.
- Coordinated care across the three levels of services through a system of referral and cross-referrals.
- Care protocols for the four phases of maternal and infant care and inter-agency care plans that incorporate clinical and social elements developed.
- An inter-sectoral plan of care under a holistic vision that incorporates clinical and social elements.
- Data, updated daily, that is available and used for implementation, course correction, and evaluation of the project.
- Production and systemisation of documents (clinical protocols, health card, forms, etc.) contextualised to the local reality.

Community and family level:

- Shared responsibility in health: responsibility shared between the health system and beneficiary families with the commitment and participation of many actors - from various municipal health sectors - in management of the project.
- Wider recognition and deeper understanding of the socioeconomic causes of maternal and infant mortality and development of creative alternatives for addressing them, such as the Social Mothers.
- The family perspective - the strategy views the woman and child as part of a family - based on the principles of health promotion.
- Assistance provided to at-risk families always seeks to promote self-care and autonomy.
- Strong interaction with the university, especially with the nursing, medicine and social services faculties.

An important aspect of this model is a collective conceptual change moving away from the trivialisation of maternal and child death to a vision that aims to guarantee the rights consecrated in the Universal Declaration of Human Rights and other related pacts and conventions.

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5. Conditions and Recommendations for Replication

TQF constitutes an effective strategy for the reduction of maternal and infant mortality. It is readily replicable in any municipality with adaptation to the local situation. The quality and clarity of systemisation of the project facilitates replication. The defining characteristic of TQF is collaboration between the municipal government, civil society, the community and the private sector. Ongoing challenges must be dealt with to ensure the continuity of the project as a public policy, guarantee sufficient financial sustainability, disseminate, and extend actions currently undertaken.

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