

Achievement of the 2015 Millennium Development Goal 5A (Maternal Mortality) by Belize in 2011

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Abstract

Objective: Millennium Development Goal 5A, to decrease the maternal mortality ratio by three quarters between 1990 and 2015, is proving difficult to achieve in many developing countries, including those in Mesoamerica. In this preliminary report from Belize we describe the major steps taken recently to improve maternal outcomes, leading to the achievement of Millennium Development Goal 5A in 2011, confounding all predictions.

Methods: In mid-2007, Belize deployed the world's first integrated countrywide health information system (BHIS), with eight embedded prevention/management domains. These included one centred on maternal health and covering best practices in prenatal, intrapartum, and postpartum care. The Ministry of Health and local maternal health care leaders used ongoing BHIS maternal data aggressively to detect health care system problems and to intervene to change outcomes. The maternal mortality ratios per 100 000 live births for 2005 to 2011 (i.e., from two years before BHIS deployment to four years after) were calculated from death and live birth data using Belize vital statistics.

Results: The maternal mortality ratio fell from 134.1 in 2005 to zero in 2011, with the major sustained drop occurring from 2008 onwards, coincident with implementation of the BHIS. The annual number of live births did not change over this time.

Conclusion: Exceeding all expectations, Belize achieved Millennium Development Goal 5A in 2011, with a reduction in the maternal mortality ratio of well over three quarters. The drop in maternal mortality ratio was temporally associated with the introduction of the BHIS and its embedded maternal health domain. BHIS data were used aggressively to monitor and continuously improve maternal health care.

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Résumé

Objectif : L'atteinte de l'objectif 5A du Millénaire pour le développement, soit celui qui prévoit une baisse du taux de mortalité maternelle de l'ordre de 75 % entre 1990 et 2015, s'avère difficile dans de nombreux pays en développement, y compris ceux de la Mésio-Amérique. Dans le cadre de ce rapport préliminaire en provenance du Belize, nous décrivons les principales mesures qui ont récemment été mises en œuvre pour améliorer les issues maternelles, ce qui a eu pour effet de mener à l'atteinte de l'objectif 5A du Millénaire pour le développement en 2011 et de défier toutes les prédictions.

Méthodes : Au milieu de l'année 2007, le Belize a été le premier pays au monde à mettre en œuvre un système d'information sur la santé intégré à l'échelle du pays (BHIS); huit domaines de prévention/gestion ont été incorporés à ce système, dont un qui est axé sur la santé maternelle et qui couvre les pratiques optimales en matière de soins prénatals, intrapartum et postpartum. Le ministère de la Santé et les chefs de file locaux en matière de santé maternelle ont utilisé de façon dynamique les données maternelles continues issues du BHIS en vue de mettre au jour les problèmes du système de santé et d'intervenir pour en modifier les issues. Les taux de mortalité maternelle par 100 000 naissances vivantes pour la période allant de 2005 à 2011 (c.-à-d. de deux ans avant la mise en œuvre du BHIS à quatre ans par la suite) ont été calculés à partir des données sur les décès et les naissances vivantes en faisant appel aux statistiques de l'état civil du Belize.

Résultats : Le taux de mortalité maternelle est passé de 134,1 en 2005 à zéro en 2011, la baisse soutenue importante ayant débuté en 2008, ce qui coïncidait avec la mise en œuvre du BHIS. Le nombre annuel de naissances vivantes est resté le même au cours de cette période.

Conclusion : Défiant toutes les attentes, le Belize a atteint l'objectif 5A du Millénaire pour le développement en 2011, et ce, grâce à une baisse du taux de mortalité maternelle de l'ordre de bien plus de 75 %. Cette chute du taux de mortalité maternelle a coïncidé avec la mise en œuvre du BHIS et du domaine sur la santé maternelle qui lui est incorporé. Les données issues du BHIS ont été utilisées de façon dynamique pour effectuer le suivi et assurer l'amélioration continue des soins de santé maternelle.

INTRODUCTION

The United Nations has estimated that over 350 000 women die annually from complications during pregnancy or childbirth, with more than 99% of these deaths occurring in developing countries.¹ This problem is so serious that maternal health was designated as the target of one of the eight Millennium Development Goals (number 5A): "Reduce by three quarters, between 1990 and 2015, the maternal mortality ratio."² Unfortunately, of the eight MDGs, the reduction in maternal mortality is proving to be the most difficult to achieve, and analysts predict that many developing countries will fall short.³⁻⁶ Among factors cited to explain the shortfall are the inability in many developing countries to measure maternal mortality ratios reliably in order to evaluate trends leading to poor accountability, and the lack of timely review of fatal cases to identify avoidable factors.³ Both lead to inertia, with no actions taken to address problems in care that contribute to maternal mortality.

Belize, like other countries in the region, has had difficulty in accurately calculating maternal mortality ratios per 100 000 live births, resulting in widely varying estimates for the same year in different reports (88, 55.6, and 72 in 1990 and 87, 76.3, and 100 in 2000⁵⁻⁷). Based upon 2008 data estimating maternal mortality ratios for Mesoamerica, Lozano and colleagues predicted that no country in the region (including Belize) would likely achieve MDG 5A by 2015.⁸ However, although it was not clear while Lozano et al. were compiling that report, Belize had not only become able to determine maternal mortality ratios more accurately but was also on its way to achieving MDG 5A, which it did in 2011, five years ahead of the 2015 target. This preliminary report describes the major steps taken by Belize to improve maternal outcomes in order to achieve this MDG.

METHODS

In mid-2007, with the deployment of the first country-wide, fully integrated patient-centred health information system in the world, Belize acquired the capacity to monitor the impact of maternal mortality intervention programs and investigate maternal deaths in a timely fashion. The second benefit of the BHIS was that it provided the platform for country-wide deployment of health promotion, disease prevention, and management protocols through artificial intelligence

prompts built in to help health care professionals provide better and safer care. One of the eight domains embedded in the BHIS is centred on maternal health, covering best practices in prenatal, intrapartum, and postpartum care. The seven other BHIS care domains cover hypertension, serious adverse drug reactions, prevention of mother-to-child HIV transmission, care of those under one year and under five years of age, and management of acute respiratory and gastrointestinal infections in those over five years of age.

Soon after the BHIS was deployed, the maternal-child health leadership for the Belize Ministry of Health began immediately to use the BHIS data to both review and improve maternity care practices. Systematic review of maternity care practice and outcomes became institutionalized at all levels within Belize because BHIS data were available at all levels. Based upon BHIS data findings, a series of targeted initiatives were undertaken, aimed at improving management of preeclampsia, evaluation and management of maternal fever, completeness of prenatal screening, and postpartum maternal support. In-service training could thus be directed where it was most needed. For example, analysis showed that management of eclampsia was not uniform across the country. Closer assessment revealed that there were three different methods of mixing magnesium sulphate for treating preeclampsia in different parts of Belize, two of which were associated with several cases of eclampsia. Targeted in-service training corrected this problem, and BHIS monitoring data showed this led to a decrease in the incidence of eclampsia.

Because of the modest financial resources in Belize, little else changed in the Belize health care system from 2007 to 2011. Additional health care personnel were not hired, the range and accessibility of health care resources did not increase, and no new programs beyond the eight BHIS embedded prevention and management guideline domains were added.

For maternal mortality ratio calculations from 2005 to 2011 (i.e., from two years before BHIS deployment to four years after), maternal mortality data were obtained from the Belize Ministry of Health Epidemiology Unit, since the Belize government requires by law that all deaths be registered. The causes of death, both primary and secondary, are assigned by the attending physician (as required by law in Belize), are consistent with Pan American Health Organization standards, and are coded using the World Health Organization's International Classification of Diseases, 10th revision (2010). The mortality data for the calculations were collected independent of the BHIS system. Population estimates (estimates of the number of pregnant women and estimates of live births) for

ABBREVIATIONS

BHIS	Belize Health Information System
MDG	Millennium Development Goal

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