

# Mid-Term Assessment of Maternal Care Assistance Program Implementation in Leyte Province, 2014-2017, in Terms of Facility-Based Delivery, Maternal Mortality Ratio, and Infant Mortality Rate

**Running Title:** Mid-Term Assessment of Maternal Care Assistance Program

Adelaida Dagaño Gaytos Rosaldo, Charlie Cotoner Falguera, Ira Dotollo Aboy, Daisybel Alicay Calgo, Gina Lou Guias Obani, Ellen Aberte Vega, University of the Philippines Manila, School of Health Sciences, Philippines

**Corresponding Author:** Adelaida Dagaño Gaytos Rosaldo

Email: [agrosaldo@up.edu.ph](mailto:agrosaldo@up.edu.ph)

## Abstract

*Background:* High maternal- and child-mortality rates continue to affect many nations around the world. This includes the Philippines, where these deaths are exacerbated by a low rate of facility-based deliveries. Hence, a financial incentive scheme (the Maternal Care Assistance Program) has been implemented to address the issues. *Objectives:* This study examined the status of the Maternal Care Assistance Program (MCAP), maternal and child health over a four-year period, and the relationship between them. *Methodology:* A cross-sectional design was employed, using secondary data from records in the Rural Health Units (RHUs) of 37 municipalities of the Leyte province in the Philippines. Data were analyzed using Kruskal-Wallis test and Spearman rank correlation. *Findings:* We found a pattern of decrease in the Maternal Mortality Ratio (MMR) and Infant Mortality Rate (IMR). Facility-based deliveries (FBDs) increased significantly over the four-year period. Cash incentives given to health worker volunteers showed a significant indirect relationship with MMR and IMR. *Conclusion:* We found positive improvement in the rate of facility-based deliveries. Moreover, our findings showed reduced maternal and infant deaths over the four-year period, during use of the financial assistance scheme. The financial assistance scheme partly influenced the reduction of MMR and IMR. *Recommendations:* To sustain the gains made and further improve maternal and child health, it is essential to increase maternal health services coverage. Likewise, improving the financial assistance scheme is essential to better achieve its objectives. Accordingly, policymakers and government may need to modify existing laws and budgetary requirements for the program to maintain its momentum and continue to improve.

**Keywords:** Maternal Care Assistance Program, Facility-Based Delivery, Maternal Mortality Ratio, Infant Mortality Rate

## Introduction

Maternal and child health issues affect not only the Philippines, but many countries around the world. The formation of the United Nations (UN) Millennium Development Goals (MDGs) has been a key in addressing these pressing problems. The MDGs aim to substantially reduce maternal- and child-mortality rates and broaden general access to reproductive health care, especially in developing countries like the Philippines [1].

The Philippines has made significant progress toward achievement of the MDGs. However, previous data has shown a low chance of meeting the targets for reducing both the maternal mortality ratio and neonatal mortality [2]. This may be affected by the low rate of facility-based delivery. In fact, even before the MDGs culminated, it was predicted that the Philippines would most likely fail to achieve improved maternal health [3]. To counteract maternal health problems, it is imperative to sufficiently fund maternal care services. However, financial cost remains a major obstacle to the proper implementation of these services [4]. Thus, it is also essential to continually explore ways to minimize cost obstacles. The Maternal Care Assistance Program (MCAP) was formulated to improve maternal health in the Philippines by providing integral health services throughout the entire period of pregnancy (antenatal care, labor and delivery services, postpartum care, and follow-up care) [5], as well as giving cash assistance to pregnant women and to health worker volunteers.

Several foreign studies have been conducted on financing schemes to improve maternal and child health care. These financing schemes are known as demand-side financing (DSF), and many countries have their own specific versions. Conditional cash transfers in India have increased the utilization of antenatal care

services, facility-based deliveries, postpartum care services, and immunizations [6]. This is also true in Kenya, where DSF has been highly effective in increasing facility delivery rates, suggesting that removing financial barriers increases the use of maternal health services [7]. Other African and Asian countries such as Bangladesh [8-9], Cambodia [10-11], China [12], Tanzania [13], Afghanistan [14], and Nepal [15] have respectively adopted their own cash assistance and funding scheme programs which show promising effects on maternal and child health. In South Asia, empirical evidence demonstrates increased utilization of maternity services, with modest improvements in maternal mortality and skilled attendance at birth [16].

It seemed likely that this novel utilization of cash assistance would have positive effects on maternal and child health in the Philippines. However, to the authors' knowledge, this study is the first to assess the relationship between MCAP and facility-based delivery rates, maternal mortality rates, and infant mortality rates in the locality. We hope this study will serve as an urgent call for policymakers, health and social welfare agencies, and health care organizations to work to sustain and advance the program in order to continue improving maternal health care, especially in low- and middle-income settings.

## Aims

This study aims to assess the status of the Maternal Care Assistance Program (MCAP) and of, maternal and child health in the province of Leyte over a four-year period, as well as to analyze the relationship between them. Specifically, this study answered the following questions:

Is there a significant difference across the four-year period in terms of facility-based

deliveries (FBDs), maternal mortality ratio (MMR), and infant mortality rate (IMR)?

Is there a significant relationship between the components of MCAP and MMR, IMR, and FBD?

## Methodology

### Research Design

This study analyzed secondary data from a province-wide population-based survey. A descriptive correlational design was employed to analyze the effect of MCAP on FBD, MMR, and IMR for the four-year period from 2014 to 2017. This design examined whether the characteristics of the independent variable changed or influenced the characteristics of the dependent variables [17].

### Research Locale

The province of Leyte comprises 40 municipalities and is composed of 10 Inter-Local Health Zones (ILHZ): Calesan, Golden Harvest, Goodwill, Kammao, Leyte Gulf, Leyte Plains, Leyte West Coast, Mabahinhil, Maharlika, and Mainbay. Three municipalities were excluded from this study. Two of the municipalities provided incomplete data, and the third did not implement MCAP. Thus, thirty-seven (37) municipalities with a total population of 1,341,980 were included in this study.

Each municipality is managed by a Local Government Unit (LGU), under the jurisdiction of which are Rural Health Units (RHUs) equipped with birthing centers accredited by the Philippine Health Insurance Corporation (PhilHealth), the sole government-owned health insurance provider of the country, managed by the Department of Health (DOH). In addition to these main health centers, there are 189 Barangay Health Stations (BHS) (community health centers) distributed into catchment areas. Five of these BHSs have also PhilHealth-accredited birthing centers.

## Data

Data for this study included the figures for maternal deaths, infant deaths, and facility-based deliveries for the years 2014 to 2017. However, only 37 RHUs met the following inclusion criteria: a) Municipality with a PhilHealth-accredited birthing facility; b) MCAP currently implemented; and c) available and complete records. Excluded were RHUs that met at least one of the following exclusion criteria: a) Cities, regardless of whether or not they were implementing MCAP; b) private birthing facilities, whether or not they had been accredited by PhilHealth; c) LGU birthing facilities with incomplete data; or d) municipal LGUs that were not implementing the MCAP.

### Instrumentation

This study used a researcher-designed records review tool to guide the collection and recording of data. The tool combines a checklist with quantitative data entries. It has two parts: Part I: Status of Maternal Deaths, Infant Deaths and FBD; and Part II: Maternal Care Assistance Program implementation status, in terms of executive orders or LGU ordinances, duration of MCAP implementation, amount of cash assistance given to beneficiaries, and timing of cash assistance paid to beneficiaries. All data were collected by the researcher.

### Data collection procedure

Pilot testing was performed in one of the ten (10) ILHZs (Leyte Plains), and necessary improvements to the tool were made prior to the full data collection. Minor revisions were made to the ways certain questions and lead statements were phrased. Data on total livebirths from 2014 to 2017 were included, with the records review tool applied for better understanding, analysis, and interpretation. The Field Health System Information System (FHSIS) – a network information system developed by the DOH – and

MCAP reports from the RHUs were utilized to facilitate correctness of data. Copies of MCAP ordinances in all 37 LGUs were obtained for validation purposes. Further validation was conducted in coordination with the Municipal Health Officer (MHO). The data collection took place during November 2018.

### Data analysis and statistical treatment

Analysis of data was performed both manually and electronically, in accordance with the nature of the responses required. Some of the data were entered into IBM-SPSS Version 23 for analysis. The descriptive statistics used included weighted mean, percentage, and frequency counts. To answer the specific research questions, Kruskal-Wallis test and Spearman rank correlation were utilized. The significance level was set at  $<0.05$ .

### Findings

Figure 1 shows an increased FBD trend from 2014 to 2017 in Leyte province. However, the FBD rate was still below the DOH target of 100%. The highest percentage increase can be seen from 2014 to 2015 (17.25%), just after the first year of MCAP implementation. Meanwhile, Figure 2 depicts a decrease in MMR from 2014 to 2015 and from 2016 to 2017. There was an increase in MMR from 2015 to 2016. The largest percentage change was between 2014 and 2015 (-35.96%) with the second-year implementation of MCAP. However, all MMR numbers were higher than the national target – 52 per 100,000 live births (LB). In addition, Figure 3 shows an increasing trend from in IMR from 2014 to 2015, but a sudden decrease in the year 2017. Nevertheless, the IMR rate in all years fell below the national target of 17 per 1,000 LB.

All LGUs and RHUs in Leyte included in this study implemented the MCAP. They had all been subject to imposed ordinances (N=37), as an LGU ordinance was one of

the requirements for the implementation of the MCAP scheme. More than half (N=20) implemented the MCAP for at least two to three years. The majority (N=32) provided cash incentives worth P1,500 to P2,000 to pregnant mothers, as well as to health worker volunteers amounting to more than five hundred pesos (P500) (N=28). Payment of the cash assistance given to mothers (N=36) and health worker volunteers (N=36) was within the post-partum period. Table 1 summarizes the descriptive statistics of MCAP implemented in the various RHUs of Leyte.

To answer research question 1, the Kruskal-Wallis analysis was used. Facility-based deliveries (FBD), maternal mortality ratio (MMR), and infant mortality rate (IMR) were identified as independent variables and the years within the four-year period (2014-2017) were the dependent variables. There was a statistically significant difference across the four-year period of FBD (H-value = 9.021,  $p = 0.029$ ) with a mean rank of 58.58 for year 2014, 71.92 for year 2015, 81.31 for year 2016, and 86.19 for year 2017. Table 2 shows the summary of the results of the Kruskal-Wallis H-test.

In answering research question 2, Spearman's rank correlation was used. Table 3 shows that the P-value was observed to be significant in associating MMR and IMR to cash incentives given to health worker volunteers ( $r_s = -0.372$ ;  $p = 0.024$  and  $r_s = -0.362$ ;  $p = 0.028$ , respectively), signifying an indirect relationship to MMR and IMR.

### Discussion

The purpose of this study is to examine the status of the Maternal Care Assistance Program (MCAP) and determine its relationship to maternal and child health status in the province of Leyte from the years 2014 to 2017. Evidence displays a consistent rise in facility-based deliveries from 2014 to 2017. This may indicate a

development of a broader health system, which may help to address problems in maternal and child mortality[18]. Mothers may increasingly be opting to deliver at birth facilities because of the availability of medicines and medical supplies, the idea of having positive health outcomes[19]. Data from the years 2008 and 2013 revealed a developing but still alarming delivery rate in health facilities both in the national and regional scenarios [20-21]. Few studies have been conducted in the Philippines in understanding why mothers choose to give birth at home than health facilities. Possible reasons for these include experiences of imminent birth, distant residential place and transportation issues to the health facilities, accessibility of nearby traditional birth attendants and midwives, availability of delivery equipment and materials, affordability, presence of support families, and fear of delivery in the health facilities [22]. Other socio-demographic and psychosocial factors may also affect the preference of women for home birth such as younger age group, low monthly family income, educational attainment, and poor knowledge and attitude on FBD [23]. The data on IMR and MMR showed a faltering pattern despite ongoing MCAP implementation.

One of the goals of this program is to help reduce maternal deaths and eventually infant deaths by encouraging mothers to deliver in health facilities. Previous claims indicated that FBD attended by skilled birth attendants is an essential means in decreasing maternal mortality [24-25]. A myriad of births at home predispose to increased level of maternal deaths [22-26]. However, our study failed to show significant relationship of the MCAP to FBD. On the contrary, previous studies have shown consistent increase in FBDs, as well as improved health care measures for mothers and babies as affected by financial incentive scheme [27-29]. The interplay of aforementioned vast factors and reasons might suggest why our

findings did not present direct significant influence of the financial incentive scheme to the place of delivery. Nevertheless, this study which covers mid-term assessment and the sustainability of this program is essential, and it must undergo rigorous evaluation to determine its relevance and efficacy. There was a consistent and relevant implementation of the MCAP in almost all municipalities in the province of Leyte. Municipal ordinance imposition has strengthened this program throughout the municipalities. The incentives given to pregnant mothers and health worker volunteers aimed to increase positive health outcomes.

Overall, our study showed that the financial assistance scheme partially influenced in increasing facility-based deliveries and reducing both MMR and IMR in four-year period. It partially supported an affirmative answer of the first research question where it revealed a significant difference in the changing and increasing number of FBDs across the four-year period, an indication of the improving quality of maternal and neonatal services overall. However, the period of implementation may have been a significant factor in this result, as the program has only recently been implemented and this study was limited to mid-term assessment. An evaluative study after full implementation of the program might have clearer findings and implications which we hope could have better effects on FBD rates, MMR, and IMR. Previous studies have claimed that other factors may obstruct the financial incentive scheme from achieving its objectives, in general [30]. Geographical conditions – such as the location of birthing facilities and community areas, transportation, and accessibility may affect the availability and provision of services. Political and economic factors may also affect the sustainability of programs and health services.

In the present study, one of the components of the MCAP (i.e., the cash incentive given to health worker volunteers) was found to be negatively associated with the MMR and IMR. The cash incentive was given to health worker volunteers who monitored and provided care to expectant mothers during pregnancy, throughout labor and delivery in the birth centers, and until the immediate postpartum period after successful delivery without problems or complications for the mother or baby. These health worker volunteers were the “barangay” or community health workers and trained “hilots” or skilled birth attendants in the communities who had first contact with the mothers. This study was congruent with previous studies in finding that the financial incentive scheme increased access to social services, which specifically promote positive utilization of health services, thereby reducing maternal and infant death [31-32].

This study substantially contributes to the existing literature examining the effects and relationships of financial incentive programs to FBDs, MMR, and IMR. Additionally, this study examines the MCAP’s distinct feature of providing incentives to health worker volunteers. These volunteers were among the first contacts of pregnant mothers, and previously known to assist deliveries of babies at home. Previous studies have shown the risks of home deliveries to mothers and babies [33-34]. Hence, to promote FBD, the program also targeted health worker volunteers by providing them financial incentive for every expectant mother, to convince and have antenatal care, delivery of baby, until immediate post-partum care at birthing facilities.

### **Limitations of the Study**

This study acknowledges some limitations that could be surmounted through future research. First, while we had access to

population-based data, this information was limited to the province of Leyte. This study could be replicated using larger samples to achieve a more generalized result. Second, this study used a cross-sectional design, which inhibited the results from showing causal relationships between the variables. Third, this was a mid-term assessment and hence only covered short-term effects on the variables of interest. Thus, a full evaluative study remains necessary. Fourth, a time series analysis is best suited to determine if there are actual changes and improvement between certain years prior and during or after implementation of the program in relation to FBD, MMR, and IMR. However, this seems elusive because most of the data from year 2013 and earlier from various municipalities in Leyte have been washed away by the super typhoon Haiyan that hit last November 2013. Nevertheless, the findings significantly contribute to current literature.

### **Implications of the Study**

This study showed positive developments in FBD rates, as well as in the reduction of maternal and infant deaths, over the four-year period which the financial assistance scheme was implemented. However, it also showed a failure to achieve the national targets for these numbers and the MDGs. To maintain the advances that have been made and further improve health outcomes, it is essential to increase maternal healthcare coverage. Likewise, improving the financial assistance scheme through rigorous evaluation of the program, intensifying the coverage, and acquiring sufficient funds, is essential to more closely approximating its objectives. On a positive note, minimizing financial barriers to maternal health services has led to a higher rate of FBDs and reduced maternal and infant deaths. The government and policymakers may need to adjust existing laws and funds to sustain the financial assistance program and may involve (or continue to involve) non-

government organizations and agencies to outsource funding and continue to grow the program.

### Ethical Approval

This paper was approved by the Local Ethical Committee of the University of the Philippines Manila School of Health Sciences. Moreover, this study is limited to the analysis of secondary data, with no human beings directly involved. Thus, both the ethical risk and the risk of harm of this study are low.

### Conflict of Interest

The authors declare that there is no conflict of interest.

### Acknowledgements

The authors would like to express their deep appreciation to the following agencies and individuals, who have helped provide the large amounts of information that made this study possible: the Philippine Health Insurance Corporation, Regional Office 8; the Department of Health, Region 8; the Leyte Provincial Health Office; the Local Government of Leyte Province; and Profs. Rolando Borrinaga and Dr. Filedito D. Tandinco.

### References

1. United Nations. The millennium development goals report. New York: United Nations. 2015.
2. National Economic and Development Authority (NEDA) & United Nations (UN) Development Programme. The Philippines – Fifth progress report: Millennium development goals. Pasig City, Philippines: National Economic and Development Authority. 2014.
3. Concepcion MB. Philippine Progress on MDGS: An Update. National Academy of Science and Technology; 2012.
4. Bernardino JD, Burog HL. Awareness on and availment of Philhealth's maternity care benefits among the selected patients of a tertiary hospital in Southern Luzon from February 2015 to February 2016.
5. Philippine Health Insurance Corporation. PhilHealth Circular No. 22 Series of 2014. 2014.
6. Rahman MM, Pallikadavath S. How much do conditional cash transfers increase the utilization of maternal and child health care services? New evidence from Janani Suraksha Yojana in India. *Economics & Human Biology*. 2018 Sep 1;31:164-83.
7. Grépin KA, Habyarimana J, Jack W. Cash on delivery: Results of a randomized experiment to promote maternal health care in Kenya. *Journal of health economics*. 2019 May 1;65:15-30.
8. Schmidt JO, Ensor T, Hossain A, Khan S. Vouchers as demand side financing instruments for health care: a review of the Bangladesh maternal voucher scheme. *Health policy*. 2010 Jul 1;96(2):98-107.
9. Nguyen HT, Hatt L, Islam M, Sloan NL, Chowdhury J, Schmidt JO, Hossain A, Wang H. Encouraging maternal health service utilization: an evaluation of the Bangladesh voucher program. *Social science & medicine*. 2012 Apr 1;74(7):989-96.
10. Van de Poel E, Flores G, Ir P, Van Doorslaer E. Can vouchers deliver? An evaluation of subsidies for maternal health care in Cambodia. *Bulletin of the World Health Organization*. 2014 Mar 17;92:331-9.
11. Ensor T, Chhun C, Kimsun T, McPake B, Edoke I. Impact of health financing policies in Cambodia: A 20 year experience. *Social Science & Medicine*. 2017 Mar 1;177:118-26.
12. Yang L, Sun L, Wen L, Zhang H, Li C, Hanson K, Fang H. Financing strategies to improve essential public health equalization and its effects in China. *International journal for equity in health*. 2016 Dec 1;15(1):194.

13. Kuwawenaruwa A, Mtei G, Baraka J, Tani K. Implementing demand side targeting mechanisms for maternal and child health-experiences from national health insurance fund program in Rungwe District, Tanzania. *Globalization and health*. 2016 Dec;12(1):41.
14. Engineer CY, Dale E, Agarwal A, Agarwal A, Alonge O, Edward A, Gupta S, Schuh HB, Burnham G, Peters DH. Effectiveness of a pay-for-performance intervention to improve maternal and child health services in Afghanistan: a cluster-randomized trial. *International journal of epidemiology*. 2016 Apr 1;45(2):451-9.
15. Pandey S. Women's knowledge about the conditional cash incentive program and its association with institutional delivery in Nepal. *PloS one*. 2018;13(6).
16. Jehan K, Sidney K, Smith H, De Costa A. Improving access to maternity services: an overview of cash transfer and voucher schemes in South Asia. *Reproductive health matters*. 2012 Jan 1;20(39):142-54.
17. Sousa VD, Driessnack M, Mendes IA. An overview of research designs relevant to nursing: Part 1: quantitative research designs. *Revista latino-americana de enfermagem*. 2007 Jun;15(3):502-7.
18. Acuin CS, Khor GL, Liabsuetrakul T, Achadi EL, Htay TT, Firestone R, Bhutta ZA. Maternal, neonatal, and child health in southeast Asia: towards greater regional collaboration. *The Lancet*. 2011 Feb 5;377(9764):516-25.
19. Bhattacharyya S, Srivastava A, Roy R, Avan BI. Factors influencing women's preference for health facility deliveries in Jharkhand state, India: a cross sectional analysis. *BMC Pregnancy and childbirth*. 2016 Dec;16(1):50.
20. National Statistics Office (NSO) (Philippines). *Philippines National Demographic and Health Survey 2008*. Calverton, Maryland, USA: National Statistics Office and ICF Macro. 2009
21. Philippine Statistics Authority (PSA) (Philippines) all. *Philippines National Demographic and Health Survey 2013*. Manila, Philippines and Rockville, Maryland, USA: Philippine Statistics Authority and ICF International. 2014
22. Andrino MA, Balasoto IH, Kathrine M, Bono ZG, Canindo KR, Casa JL, Oducado RM. Reasons why women choose home birth. *Asia Pacific Journal of Multidisciplinary Research*. 2016 Nov;4(4).
23. Calpito KJ, Cañizares CM, Celis VA, Duarte NE, Gaela MA, Medina JR, Guevarra JP, Gregorio Jr ER. Selected sociodemographic and psychosocial variables related to mothers' preference for childbirth setting in a barangay in Rosario, Cavite. *Acta Medica Philippina*. 2015 Sep 30;49(3).
24. Campbell OM, Graham WJ. group Lancet Maternal Survival Series steering. Strategies for reducing maternal mortality: getting on with what works. *Lancet*. 2006;368:1284-99.
25. Takayoshi F, Yamaguchi S, Pangilinan AM, Tobe M, Kanamori S. Revisiting the Facility-Based Delivery Rate Formula in the Philippines for Better Local Health Governance and Services. *Global Health: Science and Practice*. 2018 Dec 27;6(4):754-7.
26. Philippine Department of Health. *Manual of operations implementing health reforms towards rapid reduction in maternal and neonatal mortality*. Manila: DOH. 2009
27. Peabody JW, Shimkhada R, Quimbo S, Solon O, Javier X, McCulloch C. The impact of performance incentives on child health outcomes: results from



- a cluster randomized controlled trial in the Philippines. *Health Policy and Planning*. 2014 Aug 1;29(5):615-21.
28. Randive B, Diwan V, De Costa A. India's conditional cash transfer programme (the JSY) to promote institutional birth: is there an association between institutional birth proportion and maternal mortality?. *PloS one*. 2013;8(6).
  29. Basinga P, Gertler PJ, Binagwaho A, Soucat AL, Sturdy J, Vermeersch CM. Effect on maternal and child health services in Rwanda of payment to primary health-care providers for performance: an impact evaluation. *The Lancet*. 2011 Apr 23;377(9775):1421-8.
  30. Morgan L, Stanton ME, Higgs ES, Balster RL, Bellows BW, Brandes N, Comfort AB, Eichler R, Glassman A, Hatt LE, Conlon CM. Financial incentives and maternal health: where do we go from here?. *Journal of health, population, and nutrition*. 2013 Dec;31(4 Suppl 2):S8.
  31. Rowe-Gaddis GE. Rural Brazil and Programa Bolsa Família: Do conditional cash transfers differentially Impact Rural Mortality Rates?. 2017
  32. Varghese M. Impact of janani suraksha yojana on maternal mortality rate in India. *International Journal of Multidisciplinary Educational Research*. 2017 Jul;6(7):201.
  33. Yanagisawa S. Crossing the river: health of mothers and children in rural Cambodia. In *International congress series 2004 Apr 1 (Vol. 1267, pp. 113-126)*. Elsevier.
  34. Abdella A. Maternal mortality trend in Ethiopia. *Ethiopian Journal of Health Development*. 2010;24(1).

-----\*-----