

Exploring Possible Open Data Opportunities in Maternal Health and Child Care in the Philippines

Michelle Renee D. Ching and Sherwin E. Ona

Abstract—Maternal Health and Child Care (MHCC) concerns have figured prominently in both international and local health initiatives. However, there are numerous challenges that beset MHCC, one of which is the apparent mismatch between the services being implemented and community needs.

In the Philippines, despite the increase in public health allocations, indicators have shown an increase in maternal deaths and teenage pregnancies. These have also resulted in the Philippines missing its Millennium Development Goals (MDG) on MHCC. These realities point to the need to rethink the current approaches with the intention of addressing the mismatch and increase the efficacy of MHCC programs.

This paper explores the existing literature on MHCC practices and Open Data (OD) techniques. In particular, the paper will present results collected from City of Sta. Rosa Province of Laguna on maternal practices and possible causes which hinders the fulfillment of Philippines MDG targets and implications of open data to the local community health practices.

Index Terms—Information and communications technology, local government units, maternal health and child care, open data.

I. INTRODUCTION

Philippines has been addressing its Maternal Health and Child Care (MHCC) challenges for the past decade and 2 of its Millennium Development Goals (MDG) are targeting it [1], [2]. It has been continuously increasing its public health allocation [3] and devolving the public health programs to the local communities [4], [5]. However, the maternal and child mortality rates are still increasing [6]-[9]. Then, why does the Philippines still far from achieving its MDG on MHCC?

A. Background of the Study

According to a study by the Philippine Health Information Network, this is due to the inefficient and ineffective health and management information system that points to the informatics-related problems of Pons and Schwefel, Jayasuriya, and Marcelo [4], [10]. Hence, based on World Health Organization (WHO), the informatics-related problems and participatory factors are vital in understanding the MHCC challenges [11].

In addressing the continuous increase of maternal and child mortality rates, the Philippine government provides various public health programs [12] and devised a comprehensive

reform program in health, which are the Universal Health Care of the Aquino Health Agenda: National Health Plan (AHA) [13], Fourmula One for Health (F1), and the Health Sector Reform Agenda [7]. These were formulated to achieve the 8 MDG targets.

Our paper presents the potentials of Open Data (OD), participation, and the possible avenues for ICT use to overcome the informatics-related problems [11], [14]. By examining the MHCC practices of City of Sta. Rosa Province of Laguna, our paper highlights the existence of datasets and its current use.

B. Overview of Related Literatures

What is OD and how will it be a tool to increase citizen participation and government transparency to be able for developing countries, such as the Philippines, improve its public services, especially on MHCC?

OD is a concept of making data available for public use, reuse, and redistribution without any restrictions [11], [15] and the data to be published should be raw [11]. Open Government Data (OGD) is under this concept, where the data comes from the government-produced information that is in a standard and reusable format [11], [16]. This entails citizens to manipulate the data available and come up with newer information that can help them and the government on delivering and formulating public services more efficiently and effectively. Hence, discussion / concept of OD is often linked to good governance especially in increasing citizen participation, and encouraging the government to be more transparent and be accountable [11], [15].

Examples of OD in health are vest in developed countries, such as the UK, which started to adopt the idea of openness since 2007 [3] and had joined the Open Government Partnership (OGP) on September 2011 [17], where one of their plans is to publish the Success Rates of Hearth Surgeries from their hospitals [1] despite the myth that surgeons will be more likely to refuse risky cases [18]. The Society of Cardiothoracic Surgery published the 400,000 operations data and citizens were able to compare the factors on the skills of the surgeons and his unit as well as the health of his previous patients and the death rate of Coronary Heart Surgery and Aortic Valve Replacement had improved even though the patients' conditions are becoming more complex [18]. Furthermore, in China, a study conducted by Min He, they've given an open-access about their doctors and nurses data. Their findings generated new information that there are few health policies for doctors and nurses concluding that there are more of them have poor health stressing the need for the attention of the policy-makers [19].

There are provisions for government transparency, citizen

Manuscript received July 26, 2014; revised December 6, 2014.

The authors are with De La Salle University (DLSU), 1004 Manila, Philippines. They are also with the ODDC Initiative of the IDRC and the World Wide Web Foundation (e-mail: michelle.ching@dlsu.edu.ph, sherwin.ona@delasalle.ph).

participation, and ICT innovation that can be intertwined in these initiatives. Because of this, exploring OD opportunities in addressing the informatics-related problems of the Philippine government should be done.

C. Objectives and Scope of the Study

The objective of this study is to uncover OD opportunities in MHCC. Our study examined the existing MHCC practices in City of Sta. Rosa Province of Laguna and focused on how datasets are used to support these practices. In line with the concept of OD, these datasets were studied in relation to their format / type, accessibility, and its storage.

II. METHODOLOGY

As part of the research study of the Center of ICT for Development (CITe4D) of De La Salle University on OD in MHCC, the area of City of Sta. Rosa Province of Laguna has been selected as part of the 4 areas to be studied, which are Bacolod, Iligan, and Ilo-ilo.

This research is an ongoing process and focused on the community-based health center, locally known as the barangay health center. Key informant interview sessions were done with center’s midwife. Direct observations on women availing the pre-natal check-ups were conducted together with the collection of forms and other related documents. Documentation of the interviews and direct observations were made through photos, videos, and audio records.

III. FINDINGS

The tables (Table I and Table II) below summarize how public health programs are being dispensed to local citizens.

TABLE I: BARANGAY HEALTH STATIONS HEALTH PROGRAMS

Day(s)	Health Program	Notes
Mondays, Tuesdays, and Fridays	Morbid	A doctor is stationed every Tuesday.
Wednesdays	Well Baby - Child Immunization	Sick patients are accommodated in the afternoon.
Thursdays	Pre-Natal	

Although, not all of the Barangay Health Stations (BHS) have doctors on duty every Monday, Tuesday, and Friday.

TABLE II: HEALTH DISSEMINATION PHASES

Phases	Activity	Form
Targeting and Service Delivery	Spot Mapping and Service Delivery	Diagrams and Boards
Monitoring	Catchment Area Visitation, Information	Pre-Natal Record, Monthly Monitoring for Child Care, Immunization
	Gathering through Social Networks, and creation of Case Records	Record for Child Care, and TCL
Service Delivery	Validation, and Consolidation	To be explored

The schedule of centers is followed nationwide. However, some sick health seekers go to the BHS even if it’s not the schedule. The midwives accommodate them after they have accomplished their scheduled task.

On health dissemination phases, health workers do a spot mapping wherein they visit the different areas of their barangay to look for patients such as pregnant women and children. Fig. 1 is an example of a spot map.



Fig. 1. Barangay Sto. Domingo spot map as of 2013.

Once they identified their patients they inform them to come by the center so that they can receive the necessary health services. Monitoring happens when patients had been distinguished and house-to-house visits are done if they are not availing of their follow-up check-ups and their cases are being recorded for compliance of submitting the Filed Health Service Information System (FHSIS) Annual Report to the Department of Health (DOH). These patients carry with them their public health program record, as shown in Fig. 2 and Fig. 3 that is presented to the midwife upon check-up. In addition to this, social networks play a large role for getting information from local citizens.

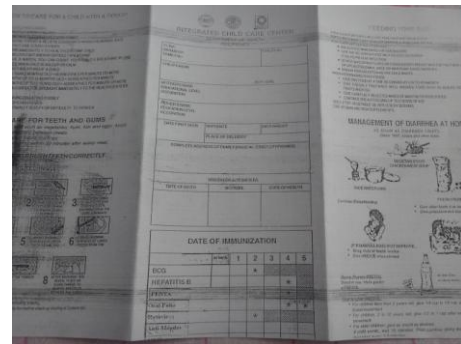


Fig. 2. Child Immunization record.

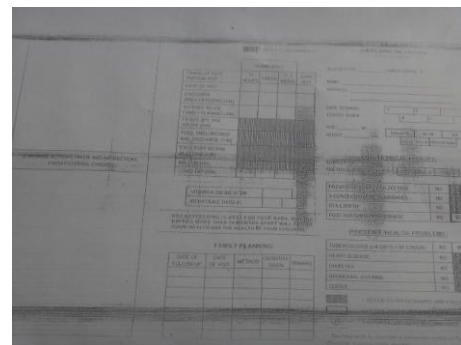


Fig. 3. Pre-Natal record.

Furthermore, service evaluation is conducted through

meetings, spot visits, and special programs such as medical missions and feeding programs. Validation occurs through Random Coverage Assessment and Target Client List (TCL) that are used in the center for record keeping, as shown in Fig. 4 and Fig. 5. Moreover, consolidation is done through center reports and supply inventory.

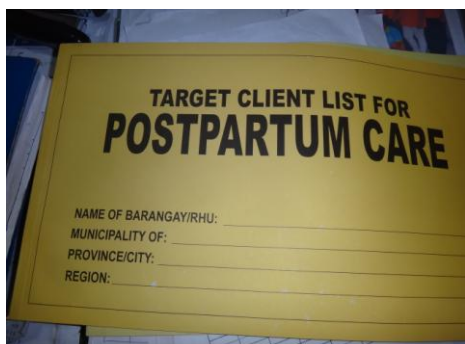


Fig. 4. TCL for postpartum care.

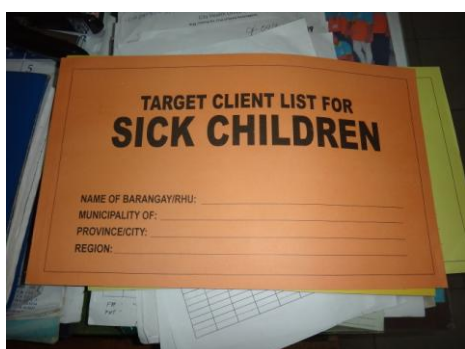


Fig. 5. TCL for sick children.

Issues raised during the interviews and direct observations were inadequacy of medicines such as vitamins and supplements for pregnant women, pregnant women still avail *hilot* or home birthing as an alternative for getting health services, automating the record keeping is a challenge due to limited computer skills of the Barangay Health Workers (BHWs), transients or transfers to barangays are sometimes neglected of their right to avail the public health programs due to the reason that they were not counted as residents of the barangay, which means they were not considered on the distribution of medical supplies, transportation is also a problem because it's expensive, especially to those who resides in the relocation, and lastly, health seekers are intimidated of the midwife when they are being lectured on the do's and don'ts.

Aside from these, there is an existing process being done in the centers on collecting information, thus leading to the creation of datasets. Such datasets are used for the purpose of FHSIS Annual Report for DOH, which is generated from the TCL that is for statistical purposes only and the method of collecting and storing of these information varies depending on the strategy of the midwife but are all in physical form, as shown in Fig. 6 and Fig. 7. There are cases in which they encounter problems on retrieving information of the health seekers, which are caused by inadequate skills on data and information management [20]. Furthermore, once the FHSIS Annual Report had been submitted to DOH, the data used were no longer pulled out and reused.



Fig. 6. Daily health cases record.

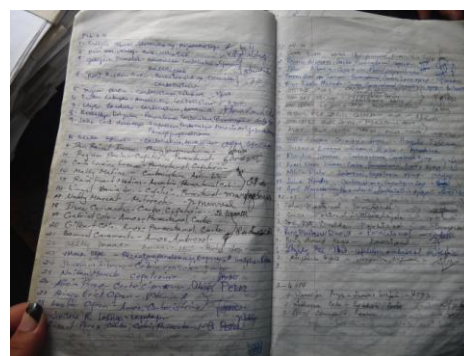


Fig. 7. Medicine distribution record.

Based on the literatures and findings, there are existing information gaps [10], where health seekers have limited knowledge on the public health programs [21], limited participation of the Civil Societies in local planning due to the information are not updated and late submission of reports [22], there is inadequate skills on data and information management [20], and government focusing only on the supply side [20], causing underutilization of data [10] and poorly integrated health information system [4].

TABLE III: OPEN DATA OPPORTUNITIES

Datasets	Contents	Nature	Open Data Potential
Patient Record Booklet	<ul style="list-style-type: none"> • Patient's Personal Information • Patient Status 	Physical	<ul style="list-style-type: none"> • Machine-Readable Format / Open Format • License Free • Accessible • Machine-Readable Format / Open Format
Log Sheet / Record Book	<ul style="list-style-type: none"> • Patient's Personal Information • Patient Cases 	Physical	<ul style="list-style-type: none"> • License Free • Accessible • Machine-Readable Format / Open Format
TCL	<ul style="list-style-type: none"> • Patient's Personal Information • Patient Status • Patient Cases 	Physical	<ul style="list-style-type: none"> • Machine-Readable Format / Open Format • License Free • Accessible

As shown from the Table III above, there is a high potential of opportunity for OD in public health for better provision of services through ICT wherein it can collate all the datasets produced by the health workers, monitor demands and supplies [20], and make it available for everyone to come up with new information and help in decision-making processes provided that the datasets are in a machine-readable format such as CSV and that it can be accessed for free by anyone.

IV. RECOMMENDATIONS

Future study on the validation of the initial findings in City of Sta. Rosa Province of Laguna and replication of the research study on different areas in the Philippines to be able to find out patterns for OD opportunities, explore possible ICT tools that can be used to harness datasets, and explore possible Capacity Building for rural health.

ACKNOWLEDGMENT

Author M.R.D. Ching would like to express her gratitude to Dr. Sherwin E. Ona, thesis adviser and co-author of this paper, for the knowledge he imparted. For the connections of Ma'am Noralyn T. Pangcatan of Padilla Polyclinic and Ma'am Mariza Garing of City Health Office (CHO) 1 in CHOs and BHSs, midwives Ma'am Edna Lozano and Ma'am Virginia Ulat of Sto. Domingo and Pulong Sta. Cruz, respectively, and Ms. Jenny Pedarce for her assistance during the data gathering.

REFERENCES

- [1] (September 26, 2012). One year on: From commitment to action. *Open Government Partnership*. [Online]. Available: <http://www.youtube.com/watch?v=QvOXMrYs6BY>.
- [2] A. N. Sabordino. (April 2, 2013). Health sector budget: An analysis. Senate of the Philippines. [Online]. Available: <http://senate.gov.ph/publications/LBRMO%202013-02%20Budget%20Facts.pdf>.
- [3] About the task force. Wordpress – Power of Information Task Force. [Online]. Available: <http://powerofinformation.wordpress.com/about/>.
- [4] *Organization and Governance*, Asia Pacific Observatory on Health Systems and Policies, 2013.
- [5] Health service delivery profile: Philippines. World Health Organization and Department of Health of the Philippines, 2012.
- [6] K. L. Alave. (June 18, 2012). Maternal mortality rate rose in 2011, says DOH. *Inquirer News*. [Online]. Available: <http://newsinfo.inquirer.net/214829/maternal-mortality-rate-rose-in-2011-says-doh>.
- [7] A. A. Padilla. (October 27, 2010). Aquino health agenda: Universal health care. *Meta Philippines*. [Online]. Available: <http://metaphilippines.org.ph/MeTA-Philippines-Downloads/UHCPresentations-2-2010Oct%5BAnnex-17%5D%20AAPadilla.pdf>.
- [8] (September 2011). In the Philippines, giving birth kills: Maternal mortality in the Philippines. Third World Studies Center. [Online]. Available: http://www.youtube.com/watch?v=5N_CMEbrG3s.
- [9] (2013). Maternal mortality country profiles. World Health Organization. [Online]. Available: http://www.who.int/gho/maternal_health/countries/en/.
- [10] Philippine health information system: Review and assessment, The Philippine Health Information Network, February – July 2007.
- [11] *Open Government Data for Citizen Engagement in Managing Development: Guidance Toolkit*, United Nations, 2013.
- [12] (October 2011). *Programs A-Z. Department of Health*. [Online]. Available: http://www.doh.gov.ph/health_programs_glossary.html.
- [13] W. T. Ong. (March 13, 2012). Top 10 health agendas of the Philippines. *The Philippine Star*. [Online]. Available: <http://www.philstar.com/health-and-family/786108/top-10-agendas-philippines>.
- [14] *Principles of Open Government: Transparency, Participation, and Collaboration*, California: California Research Bureau Short Subject: Open Government Series, 2012.
- [15] A. C. Neuron, R. Riedl, and J. Brugger, “Swiss executive authorities on open government data – Policy making beyond transparency and participation,” *Hawaii International Conference on System Sciences*, pp. 1911–1920, 2013.
- [16] T. Davies, “Open data, democracy, and public sector reform: A look at open government data use from data,” August 2010.
- [17] United Kingdom, Open Government Partnership, 2013.
- [18] S. Boseley. (July 29, 2009). UK heart operation death rates fall after data published. *The Guardian*. [Online]. Available: <http://www.theguardian.com/lifeandstyle/2009/jul/30/heart-surgery-death-rates-fall>.
- [19] M. He, Q. Wang, S. Zhu, A. Tan, Q. He, T. Che, and G. Hu, “Health related quality of life of doctors and nurses in China: Findings based on the latest open-access data,” *Qual Life Res.*, November 30, 2011.
- [20] S. La Vicente, B. Aldaba, S. Firth, A. Kraft, E. Jimenez-Soto, and A. Clark, “Supporting local planning and budgeting for maternal, neonatal, and child health in the Philippines,” *Health Research Policy and Systems*, 2013.
- [21] (March 26, 2013). Philippine teenage pregnancy up 65% in the last decade. *Manila Standard Today: Lifestyle*. [Online]. Available: <http://manilastandardtoday.com/2013/03/26/philippine-teenage-pregnancy-up-65-in-the-last-decade/>.
- [22] V. A. Bautista, “Challenges to sustain primary health care in the Philippines,” National College of Public Administration and Governance: University of the Philippines, 2001.



Michelle Renee D. Ching is currently taking her master's degree in information technology at De La Salle University (DLSU). She received her bachelor's degree of information management in De La Salle University – Science and Technology Complex (DLSU – STC) in 2009 with honors.

She took her on-the-job training in accenture under the Accenture Education Program in 2008 and had worked in Megaworld Corporation as a junior management information associate (2009) and in Manila Cordage Company as a software quality tester (2010 – 2011). Currently, she is a part-time lecturer in DLSU and DLSU – STC (2010 – present).

Ms. Ching works in a part of the Center of ICT for Development (CITe4D) research center in DLSU and is a junior research assistant in the project headed by Dr. Sherwin E. Ona entitled “Exploring the Avenues for Open Data in Health and SMEs” under the ODDC initiative of the IDRC and the World Wide Web Foundation.



Sherwin E. Ona is a faculty member of the College of Computer Studies, De La Salle University (CCS – DLSU). He was a former research and advance studies director of CCS – DLSU (2011 – 2013) and the former head of the Center of ICT for Development (2009 – 2013).

He also served as consultant to various government agencies namely, the Department of Agriculture (2000), the Commission of Information and Communications Technology (CICT), Office of the President, Republic of the Philippines (2005 – 2007), Career Executive Service Board (CESB), Civil Service Commission (2010 – present) and the ICT Office, Department of Science and Technology (2012 – present).

At present, Dr. Ona heads the project entitled “Exploring the Avenues for Open Data in Health and SMEs” under the ODDC initiative of the IDRC and the World Wide Web Foundation.