

Determination of Public and Private Primary Birthing Centers Service Delivery Network Functionality in Albay, Philippines

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ABSTRACT

Background. One of the strategies adopted by the Department of Health (DOH) to improve maternal outcomes is the systems approach which means understanding extensively how the system operates to determine factors affecting the delivery of services. In 2014, Albay province responded by adapting and implementing the Maternal, Newborn and Child Health, and Nutrition (MNCHN) Service Delivery Network Guidelines. However, no external monitoring and evaluation have been done to assess the compliance of birthing facilities to these guidelines.

Objectives. To determine Legazpi City's obstetric service delivery network functionality and to compare government and private primary level birthing facilities in terms of 1) governance; 2) human resources; 3) protocols; 4) transportation and communication, and 5) emergency drugs and equipment.

Materials and Methods. A cross-sectional study using the referral system assessment (RSA) questionnaire translated into a scorecard with a review of secondary data on high-risk pregnancies, referral rates, and maternal mortalities was done on eight facilities in Legazpi City.

Results. Overall, none of the health facilities assessed were fully-functional. Privately owned facilities scored highest in emergency drugs and equipment (83.3%) and lowest in human resources (38.9%). Government facilities scored highest in emergency drugs and equipment (88.9%) but lowest in transportation and communication (44.4%). Statistically significant differences were observed for human resources (p -value=0.0180), wherein public facilities garnered higher scores, and in transportation and communication (p -value=0.0294), private facilities showed better scores. Only one maternal death in 418 referrals was reported.

Conclusion. Overall, the health facilities varied in the level of functionality in terms of SDN guidelines.

Keywords: Service Delivery Network, maternal mortality, monitoring and evaluation

INTRODUCTION

Obstetric care in developing countries continues to be challenging as maternal mortality rates (MMR) remain high. In the case of the Philippines, 108 maternal deaths per 100,000 live births were registered in 2020.¹ This is very far from the Sustainable Development Goal target of 70 maternal deaths per 100,000 live births.² The National Objectives of Health (NOH) 2011-2016 reported that the underlying causes of maternal deaths in the Philippines are: delay in taking critical actions, delay in seeking critical care, delay in making referrals, and delay in providing appropriate medical management. Other factors contributing to high MMR are unplanned pregnancies, poor recognition and management of high-risk pregnancies, poor access to health

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facilities, and lack of competent human resources to handle emergencies.³⁻⁶

The poor quality of healthcare and the health system's inadequate continuity of care are among the key contributors that affect maternal mortality in the country.⁷ The variations in the quality of maternal healthcare delivery in other parts of the world, such as Africa, were also affected by social, political, and economic factors.⁸

To address these challenges, one of the concepts adopted by the Department of Health (DOH) is the systems approach which means understanding how the health system operates to reveal essential relationships and synergies that affect the delivery of services. A health system is an efficient way of organizing the efforts of the people, organizations, etc., to promote, restore, and maintain health whenever, wherever, and however the intended recipients may need them. Six building blocks compose an efficient and effective health system, which include (leadership/governance, health care financing, health workforce, medical products/technologies, information/research, and service delivery). These building blocks are not mutually exclusive – they must exist for the health system to work effectively. As they work together, problems may be identified and addressed – realizing which element must be enhanced for the entire system to work.⁹

Consistent with the health systems approach is the DOH's Maternal, Newborn, Child Health & Nutrition (MNCHN) strategy of strengthening service delivery networks (SDN) and referral systems. The SDN is a province- or city-wide network of health care professionals, health units, and referral centers, both public and private capable of providing MNCHN services. A province with a functional SDN can achieve better health outcomes than one that manages its health facilities on its own.¹⁰ An organized SDN capitalizes on the strengths of public and private health facilities in its catchment area such that pregnant women will be referred and treated appropriately regardless of their point of entry in the system.

The SDN communicates with its stakeholders in the Philippines through a two-way referral system. It has been widely accepted that significant reductions in maternal mortality cannot be achieved without an effective referral system. Some elements of an effective referral system include adequate resources in the referral center, communications, and feedback system, designated means of transport, presence of protocols, adequately trained personnel, a unified records system, and means to ensure patients do not bypass a level in the referral system. In the Philippines' two-way referral system, level I facilities refer to level II facilities if the case cannot be managed in level I. Level II, after that, informs level I on the management provided to the client. Both levels keep a record of what transpired during the whole transaction. This system can also happen between level II and level III facilities and between level I and III facilities if the need arises. Ideally, the client enters a level I facility first. While this system was envisioned to connect the health facilities

and rationalize their use, this did not materialize. The reality is that adequate referral mechanisms were not implemented, and the level I facilities were bypassed by patients. It is a common practice for patients to go straight ahead to level II or level III health facilities for primary health concerns, causing heavy traffic at these higher-level facilities and depletion of resources. Hospital admissions demonstrated that highly specialized health facilities treat simple cases for level I facilities. This is aggravated by inadequate gatekeeping mechanisms, which enable easy access to specialists even when unnecessary.¹¹⁻¹³ Another problem is the reluctance of private clinics and practitioners to refer high-risk patients to appropriate health facilities to avoid losing their PhilHealth financial incentives. However, the local government health officers cannot penalize these private clinics since they are not within their mandate.¹⁴ These are gaps in the referral system that needs to be addressed in setting the guidelines for implementing an SDN. What further complicates these gaps is the lack of a monitoring and evaluation system that could assess the compliance of public and private clinics with the SDN guidelines. Monitoring and evaluating the SDN are essential as these are ways to measure and assess the progress of implementation and results systematically.¹⁵⁻¹⁷ Findings from the monitoring and evaluation can help determine when changes in the health system are needed and identify which elements are being implemented effectively.

In the Bicol Region, Albay province established its Interlocal Health Zone SDN guidelines as early as 2014 and had the lowest MMR compared to its neighboring provinces.¹⁸ Region V registered 141 maternal deaths in 2015, with a maternal mortality ratio of 123 per 100,000 live births. Masbate (27.15) reported the highest MMR followed by Albay (24.52) and then Camarines Sur (21.89). Overall, Albay reported 28 maternal deaths in 2015 and 26 in 2016. However, Legazpi City, the capital of Albay, reported only one death in 2016. The leading cause of maternal death in 2015 was hypertensive disorders in pregnancy, childbirth, and puerperium, at a rate of 46.41 per 100,000 live births. This is 113.47% higher than the average for the past five years, 21.74% per 100,000 live births. The majority of deaths occurred at tertiary hospitals.¹⁹ The Administrative Order (AO) 2014-0046 improved the referral systems already established in those health districts, namely: FIRST AID FOR HEALTH (Sto. Domingo, Malilipot, Bacacay, Tabaco City, Malinao, Tiwi); LEDACAMARA (Legazpi City, Daraga, Camalig, Manito, and Rapu-Rapu) and JOLLIPOGUI (Jovellar, Ligao City, Libon, Pio Duran, Oas, Polangui, Guinobatan). This study assessed, in particular, the LEDACAMARA MNCHN SDN implementation in Legazpi City and is the first to compare the functionality of public and private primary birthing centers within the same locality. This study also aimed to determine the level of functionality of Legazpi City's obstetric SDN by determining the maternal health outcomes of referrals made in each of the selected primary level birthing facilities and looking at the functionality

of public and private primary level birthing facilities in terms of 1) governance, leadership and accountability; 2) human resources; 3) protocols; 4) transportation and communication; 5) emergency drugs and equipment.

METHODS

This cross-sectional study used key informant interviews using the referral system assessment (RSA) questionnaire, facility visit, and document review.

Setting and Population

Legazpi City was selected as the study site. The city has a population of 199,166, and an area of 204.20 km² is a component city and the capital of the province of Albay. It is composed of two districts: Legazpi Port and Old Albay District. It has 70 barangays, 45 urban and 25 rural. It has four public birthing stations – Banquerohan BHS, Buyoan BHS, Taysan BHS, and Dapdap BHS, all with birthing facilities and 12 private lying-in clinics. Secondary and tertiary hospitals that cater to the maternal and child health needs of its people are the Bicol Regional Training and Teaching Hospital, Albay Doctors Hospital, Aquinas Hospital Inc, Tanchuling Medical Hospital, and AGO General Hospital.²⁰

Legazpi City represents a relatively rural area with a good mix of public and private facilities that can be evaluated even though it has reported low maternal mortality. The apex hospital designated for the whole region has reported a high MMR compared to the rest of the country and is also located in the city's center. There is a documented presence of an established interlocal health zone referral system in the city, good road networks, easy accessibility to referral services, and available staff to provide obstetric services. The regional DOH and other stakeholders in the locality expressed extreme enthusiasm and cooperation in participating in the study, which is a good driving factor.

All four public birthing facilities were included in the study. A similar number of private lying-in centers were randomly chosen via the fishbowl method (simple random sampling). Facilities A, C, F, and G were private facilities, while B, D, E, and H were public facilities.

In this study, the RSA questionnaires were accomplished by representative midwives or nurses from each selected facility. The PI visited the selected health facilities and conducted a document review to validate the responses to the RSA questionnaire from June to November 2018. The RSA questionnaire also included a document checklist used to assess the content of the available referral tools in the facilities, such as the referral forms, referral guidelines, and referral directories obtained during the RSA questionnaire interview.

Secondary data were collected on high-risk pregnancies, referral rates, and maternal mortalities per facility. These data were used to describe maternal health outcomes from each facility's functionality based on the SDN guidelines.

Evaluation Tools

A referral system assessment (RSA) questionnaire and scorecard were used to determine the level of health facility functionality based on the established FP-MNCHN Referral Guidelines for LEDACAMARA (Legazpi City, Daraga, Camalig, Manito, Rapu-Rapu) SDN. The RSA questionnaire was developed based on the LEDACAMARA SDN guidelines and adopted the DOH's Manual of Operations recommendations for MNCHN and USAID-MEASURE Evaluation's Referral Systems Assessment and Monitoring (RSAM) Toolkit. To ensure content validity of the RSA questionnaire, the MNCHN and SDN program coordinators of DOH Region 5 and Albay Provincial Health Office were asked to review the tool as subject-matter experts. The tool was also pilot tested and showed an excellent internal consistency (Chronbach alpha= 0.71).

The RSA questionnaire determined the presence of some aspects within the referral system using questions divided into five main themes:

1. governance, leadership and accountability - refers to creating and implementing policies ensuring adequate resources, i.e., network and organizational structure and finances are assured and readily available for SDNs to function;
2. human resources - refers to the availability of skilled and professional personnel that are knowledgeable in their roles and responsibilities within the SDN;
3. protocols - these are the established rules, guidelines, and processes, including a unified records system and data management and standard operating procedures for the effective utilization of SDNs;
4. transportation and communication - defined as the availability of modes of transportation and communication for the efficient mobility of patients and coordination of health facilities among networks;
5. emergency drugs and equipment - these refer to the availability of proper medicines and tools to ensure effective quality care for patients.

Some of the information collected using the RSA questionnaire included data on facility catchment population, availability of human resources, availability of health services, referral processes and procedures, referral data collection and use, and the challenges to the referral system in the selected facilities.²¹

The results gathered from the RSA questionnaire were then translated into a scorecard which determined the level of functionality per question in each of the five main themes using a 4-point scale: (0) non-functional, (1) partially functional, (2) substantially functional, and (3) fully functional. The scores were then totaled per theme and divided by the perfect score in each theme. The corresponding percentages were interpreted as non-functional (<40%), partially functional (41-60%), substantially functional (61-80%), and fully functional (81-100%). The scores on all themes were also

totalled and divided by the perfect score to assess each health facility's level of functionality. The corresponding overall percentages were also interpreted as non-functional (<40%), partially functional (41-60%), substantially functional (61-80%), and fully functional (81-100%).

The scorecard approach was adopted in this study because this approach is widely used in the Philippine local government units and the DOH as a monitoring and evaluation tool to gauge performance. Each interpretation in the RSA scorecard was also color coded; red for non-functional, orange for partially functional, yellow for substantially functional, and green for fully functional. This served as a visual tool to help decision-makers and facility owners identify weaknesses and gaps in their referral system.

Data Analysis

Data collected from the RSA questionnaire and its corresponding document review checklist were entered into Excel worksheets. Descriptive statistics on all relevant parameters were generated per health facility to summarize scores on the level of functionality based on SDN guidelines. The corresponding scores per theme and overall functionality based on the RSA scorecard of each facility were also presented as charts and figures. Significant differences in mean scores per theme and overall functionality between private and public health facilities were also determined using Wilcoxon Rank Sum Test. In terms of maternal health outcomes, the socio-demographic profile and clinical characteristics of high-risk mothers were presented using mean, frequencies, and proportion. The frequency of deliveries and referrals for each quarter (January to March, April to June, July -September, and October to December) from 2016 to 2018 were summarized using graphs and tables. Data on the most common method of transporting referred patients and the most common destination of referrals were tabulated, and row percentages were obtained. The ten leading causes of maternal referrals were also identified. This data was stratified according to public and private facilities to see the leading causes of referrals for each type of facility. Trends in maternal referrals were also shown graphically. Finally, the outcomes of these referrals and maternal mortality were also described.

Ethical Considerations

Before the execution of the study, the protocol has been reviewed and approved by the UP Manila Institutional Review Board and the Research Ethics Board. The study has also been registered with the Philippine Health Research Registry upon review. It was funded in part by the NIH-UP Manila Research Grant.

RESULTS

There were eight participating primary birthing facilities in the study. Facilities A, C, F, and G are private facilities,

Table 1. Characteristics of High-Risk Patients (n=418)

Characteristics	Frequency	Percentage
Age		
<20 years	64	15.3%
20-34	281	67.2%
>34	73	17.5%
Gravidity		
1	149	14.9%
2-4	228	60.7%
>4	41	24.4%
AOG		
<12 weeks	2	0.1%
12-28 weeks	15	2.1%
>28 weeks	400	97.7%

while B, D, E, and H are public facilities. From January 2016 to June 2018, the facilities in the study had 3,406 deliveries. Out of this, private facilities had 2,300 (67.5%) deliveries, and public facilities had 1,106 (32.5%) deliveries (Figure 1.).

For the same period, there were a total of 418 referrals. Private facilities had a total of 143 referrals, while public facilities had 255 referrals (Figure 2).

Table 1 summarizes the demographic profile of the 418 high-risk pregnant women referred to higher centers. The patients' ages range from 16-46 years, gravidity of 1-9, and AOG of 10-43 weeks.

The leading indications for referrals are shown in Figure 3. This figure may not add up to 100% as some mothers have more than one indication for referral. Included in the "Other" are those with five or less cases: abortion, post-term, previous scar, multigravida, elderly, big baby, maternal exhaustion, fetal distress, difficulty of breathing, fetal death and stillbirth, ectopic pregnancy, twins, varicosities, edema, low amniotic fluid, scarred uterus, multiple gestations, hysteria, weakness, and history of atony.

The ten leading indications for referrals to public facilities, in descending order, are hypertension (74 cases); primigravida (35); pre-term labor (28); malpresentation (19); prolonged labor (15); postpartum hemorrhage and premature rupture of membranes (6 each); meconium staining and grand multipara (4 each); and retained placenta and placenta previa (3 each). For private facilities, the ten leading indications for maternal referrals, in descending order, are hypertension (68 cases); prolonged labor (31); primigravida (23); malpresentation (12); pre-term labor (9); postpartum hemorrhage, meconium staining, and retained placenta (4 each); placenta previa (3); premature rupture of membranes and grand multipara (2 each).

None of the private facilities used an ambulance in transporting their referred patients; all of their referred patients have to take either public via jeepneys and tricycles (83%) or private transportation via car (18%) to the destination facility. On the contrary, almost all those referred from public facilities were transported via ambulance (91%).

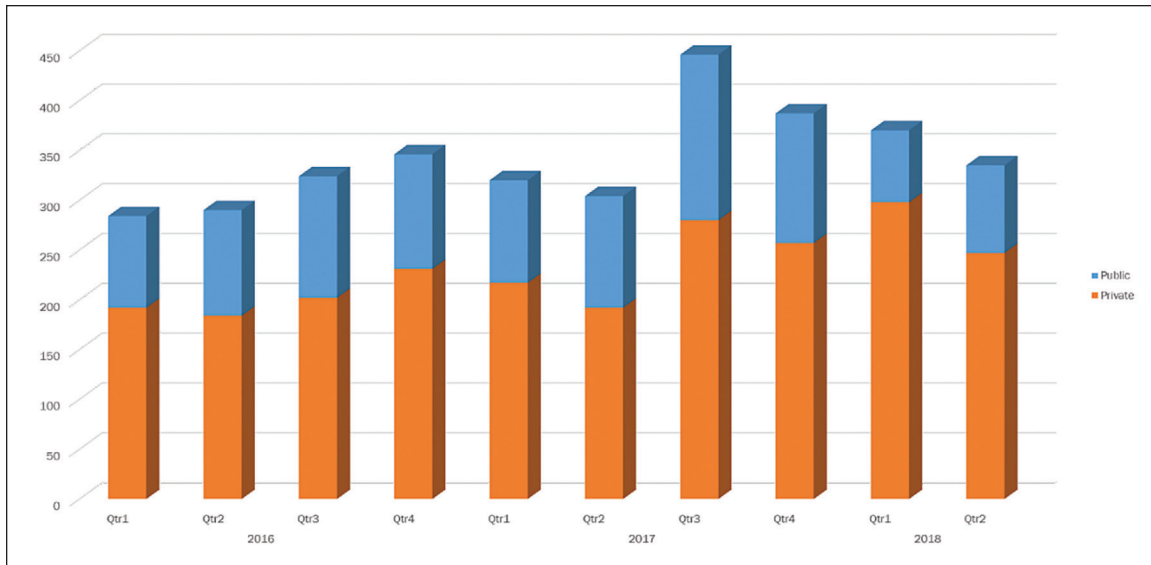


Figure 1. Comparison of Quarterly Deliveries between Public and Private Facilities from Jan 2016-June 2018.

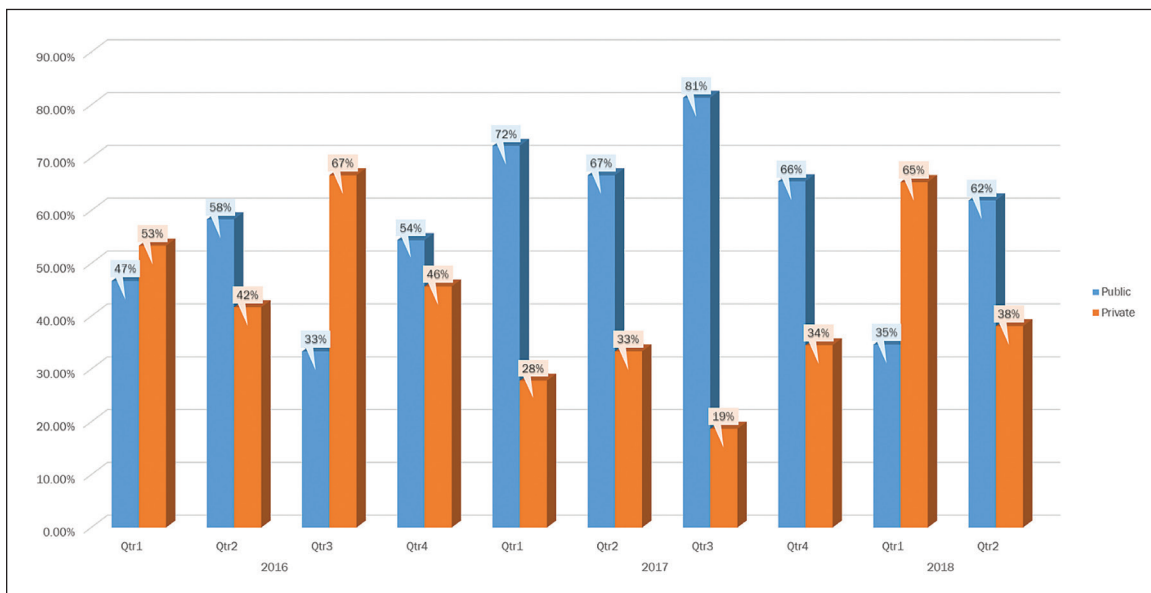


Figure 2. Comparison of Quarterly Referrals between Public and Private Facilities from Jan 2016-June 2018.

There were two possible referral destinations: AGO General Hospital (AGH), a private hospital, and Bicol Regional Training and Teaching Hospital (BRTTH), a public hospital. However, 93% of referrals were brought to BRTTH.

Among the participating facilities in the study, only one maternal death occurred during the entire observation period (April 2018). It was a case of a 34 y/o G3P2 (2002) teacher with no apparent co-morbid condition. Her previous two pregnancies were delivered vaginally at the same lying-in facility where she was referred from. After several hours of labor, the patient allegedly requested to be transferred to a private hospital, where she underwent a cesarean section.

She died in the hospital after two weeks due to respiratory and cardiac complications. Also, all patients had completed the required minimum antenatal visits.

For this part, a signed SDN guideline between both government and private facilities has been in place in Albay since 2016. This agreement includes 16 private lying-in facilities, one private district hospital, five city/municipality health offices, and one regional hospital. All eight birthing facilities included in this study are signatories to the guideline.

The LEDACAMARA SDN agreement has specified six (6) stages in its referral process: (1) *pre-referral* from the time the client/patient is seen to the point where the

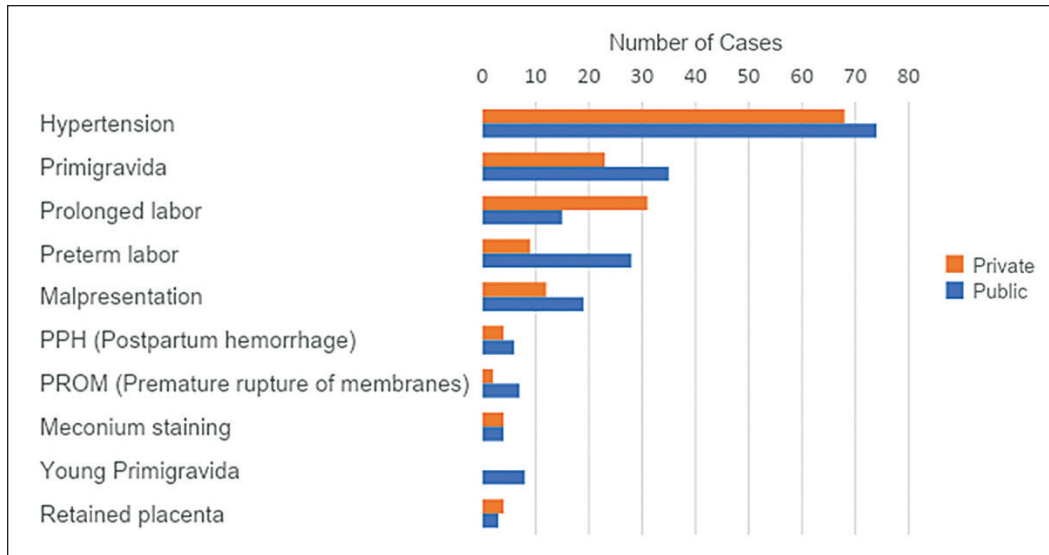


Figure 3. Comparison between Private and Public Facility of Leading Indications of Maternal Referrals.

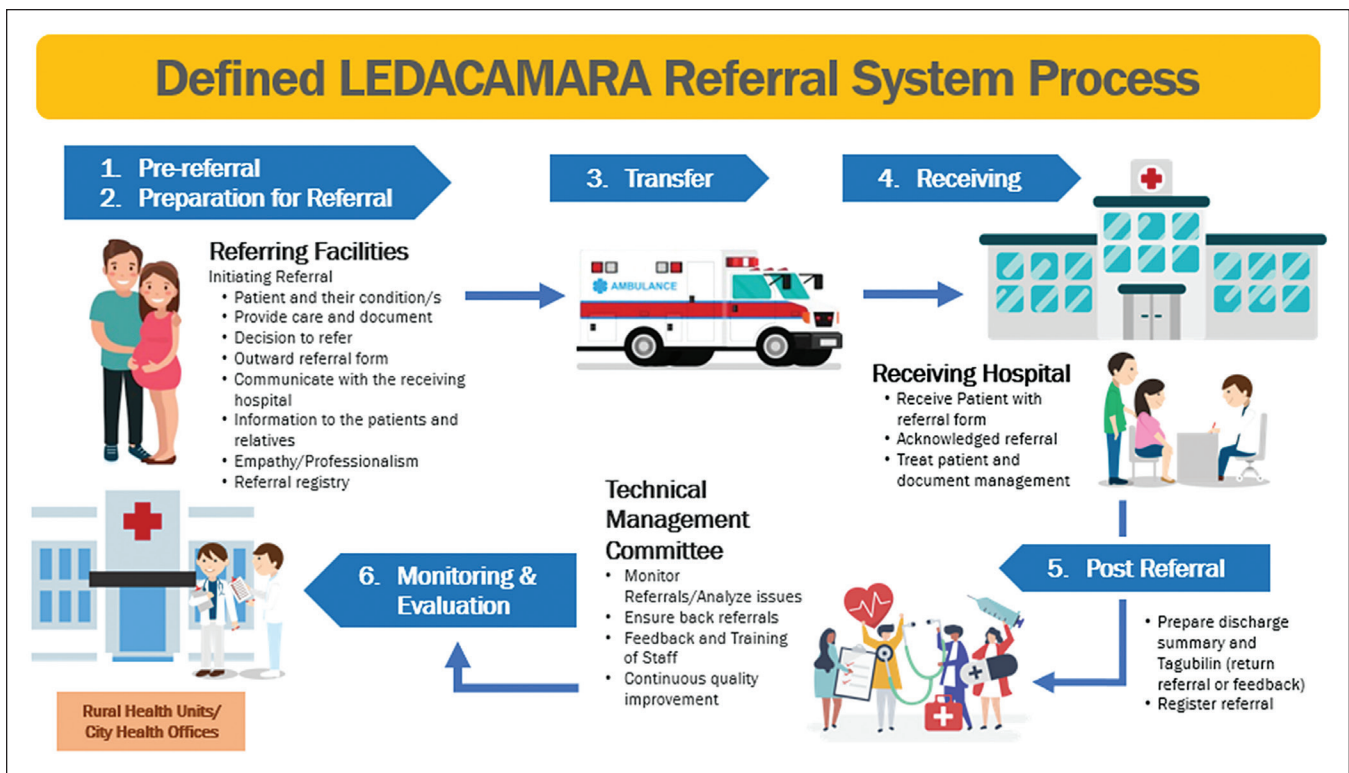


Figure 4. SDN Referral Flow.

decision to refer is made; (2) *preparation for a referral* from when the decision to refer is made to the completion of all the requirements for the referral is done; (3) *transfer* where the time the preparations for referral are completed to the arrival of the patient at the receiving facility; (4) *receiving* as soon as the receiving facility is informed of the patient's arrival and the higher level facility accepts the referral and

provides the initial treatment/management; (5) *post-referral* where once the completion of service is done and the patient/client is discharged from the receiving facility; and (6) *monitoring and evaluation* to determine the referral system's functionality, performance, and areas for improvement. The protocol specifies and emphasizes respectful and patient-centered maternity care in all these steps (Figure 4).

Table 2. Comparison of functionality scores between government and private health facilities

Characteristic	Privately-owned Health Facilities					Government-owned Health Facilities					P-value
	A	C	F	G	Pooled	B	D	E	H	Pooled	
<i>I. Governance, Leadership and Accountability</i>	14/18 77.8%	14/18 77.8%	12/18 66.7%	12/18 66.7%	13/18 72.2%	16/18 88.9%	14/18 77.8%	16/18 88.9%	14/18 77.8%	15/18 83.3%	0.0614
<i>II. Human Resources</i>	7/18 38.9%	7/18 38.9%	7/18 38.9%	6/18 33.3%	7/18 38.9%	10/18 55.6%	11/18 61.1%	16/18 88.9%	14/18 77.8%	13/18 72.2%	*0.0180
<i>III. Protocols</i>	14/36 38.9%	23/36 63.9%	20/36 55.6%	17/36 47.2%	19/36 52.8%	19/36 52.8%	21/36 58.3%	20/36 55.6%	22/36 61.1%	21/36 58.3%	0.4678
<i>IV. Transportation and Communication</i>	10/18 55.6%	13/18 72.2%	14/18 77.8%	11/18 61.1%	12/18 66.7%	8/18 44.4%	10/18 55.6%	6/18 33.3%	7/18 38.9%	8/18 44.4%	*0.0294
<i>V. Emergency Drugs and Equipment</i>	13/18 72.2%	18/18 100%	15/18 83.3%	14/18 77.8%	15/18 83.3%	18/18 100%	14/18 77.8%	16/18 88.9%	15/18 83.3%	16/18 88.9%	0.4624
Total	58/108 53.7%	75/108 69.4%	68/108 63%	60/108 55.6%	66/108 61.1%	71/108 65.7%	70/108 64.8%	74/108 68.5%	72/108 66.7%	73/108 67.59%	0.2482

81-100	Fully functional	61-80	Substantially Functional	41-60	Partially Functional	<40	Non-Functional
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Results of the baseline assessment of the facilities' compliance with SDN guidelines are shown in Table 2. SDN indicator of governance, leadership, and accountability is one of the strengths of the health facilities in Legazpi City. The city's healthcare network comprises 26 barangay health stations, 13 community health level facilities, four public (3 BEmONC) birthing centers, eleven (1 BEmONC) private lying-in centers, and three CEmONC private tertiary hospitals and one CEmONC government hospital. All birthing facilities in Legazpi City are within a 15-kilometer radius of the apex hospital (the CEmONC government hospital) which can be reached within 30-60 minutes. In 2014, the city had Ordinance No. 0011-2014, which established and adopted the Commodity Self-Reliance (CSR) Maternal, Newborn, Child Health, and Nutrition (MNCHN) strategy for the effective and efficient implementation in Legazpi City. As seen in Table 2, all privately owned facilities were substantially functional, ranging from 66.7% to 77.8%.

On the other hand, two government-owned facilities were already fully-functional, and the other two were substantially functional, ranging from 77.8% to 88.9%. This effective SDN has its core in the functional referral system of the city. All facilities reported that LGU ordinances to support MNCHN programs and the SDN's budgeting were available. An ILHZ SDN board regularly holds consultative meetings. Visits by provincial SDN and MNCHN managers occur at the facility level, but provincial M and E table monitoring has been conducted only 3x from 2016 to 2018. An NGO -USAID's LuzonHealth, supports Albay's MNCHN SDN program implementation.

In Legazpi, there are four permanent MDs, one contractual MD, three permanent nurses, 4 OIC nurse designate, seven contractual nurses, 19 permanent midwives, 15 contractual midwives, 27 NDP, and 7 RHMP. Two hundred sixty-two (262) registered barangay health workers (BHWs) manage the communities. The number of health professionals available to provide maternal care is more than

enough if we base this on a 2.7% PSA projection of a city population of 199,166. Not considering the BHWs, the birth attendant to patient ratio is 87/5377 patients or 17.4 health workers/1,075 pregnant women. In the 2016 census, Legazpi City's projected eligible pregnant women are 5,377.

There was a considerable gap in terms of human resources, particularly in privately owned health facilities. All privately owned facilities were non-functional, ranging from 33.3% to 38.9%. All privately owned facilities were non-functional in 5 of the six elements needed for human resources. The number of midwives on duty at one time is usually 1-2 per 8-hour shift, depending on availability. Other midwives are outsourced or are called in as needed.

On the other hand, government-owned health facilities had better scores ranging from 55.6% to 88.9%. One government-owned facility was already fully-functional in terms of human resources, two were substantially functional, and one was partially functional. Human resource training and orientation and regular monitoring, supervision, and mentoring from DOH were the most lacking across all facilities. Midwives and nurses carried out all deliveries during observation. Doctors only come in to sign paperwork but do not stay to supervise the midwives.

The majority (6 out of 8) of the health facilities were only partially-functional in SDN protocols, with scores varying between 38.9% to 63.9%. While referral protocols were present in all facilities, there was a gap in management and proper completion of data on referrals. No standardized form was seen for private facilities. Although forms are standardized for public facilities, referral logbooks contain different headings. There were considerable gaps in all facilities regarding data quality and availability of staff designated for follow-up referrals, updated directory for available services, and clinical algorithms in the facility.

For transportation and communication, all privately owned facilities were substantially functional, ranging from 61.1% to 77.8%. However, private facilities have no access to

an ambulance and transport patients via their vehicles. On the other hand, government-owned facilities were less functional, with scores ranging from 33.3% to 55.6%. Two government facilities were non-functional, and the other two were partially functional only. A common gap observed for government-owned facilities was the unavailability of dedicated landlines, mobile numbers, and internet access. Only one ambulance was servicing all facilities.

Another strength identified across all health facilities was emergency drugs and equipment availability. Five facilities were fully functional, and three were substantially functional, with scores between 72.2% and 100.0%. Except for one public facility with expired MgSO₄, all the rest were noted to have uterotonics, antibiotics, and drugs for hypertension. The equipment used was well maintained and working.

None of the health facilities assessed were fully functional in terms of SDN guidelines during the initial visit. All government-owned facilities were substantially functional, while half of the private facilities were either substantially or partially functional. Privately owned facilities scored highest in emergency drugs and equipment (83.3%) and lowest in human resources (38.9%). On the other hand, government facilities scored highest in emergency drugs and equipment (88.9%) but lowest in transportation and communication (44.4%). Statistically significant differences were observed between the two types of facilities in terms of functionality in human resources (p -value=0.0180), wherein public facilities garnered higher scores, and in transportation and communication (p -value=0.0294), where private facilities showed better scores.

DISCUSSION

In 1991, the Philippine government underwent a significant decentralization of health governance through the Local Government Code of 1991.²² Through this law, the responsibility for prioritization, financing, and delivery of government health programs fell to the LGU. Consequently, inequities between various local health systems became more apparent. For some LGUs, health programs were not funded because local chief executives lacked financial and political commitment. Substandard and improperly implemented guidelines are significant barriers to obstetric care access, unnecessary diagnostic exams, and suboptimal treatment.^{23,24} Guideline-related barriers include the protocol's complexity, layout, accessibility, and applicability.

The DOH established the guideline for developing SDN through AO 2014-0046. The SDN aims to improve service provision on various health programs across different life stages through equitable access to health services, efficient provision of continuity of care, and service provision that is responsive to the needs of the patients. The development of these SDN guidelines was an offshoot of the referral systems and service networks designed to rapidly reduce maternal and neonatal outcomes in the MNCHN strategy.

In Albay, this concept of SDN was adopted through the LEDACAMARA SDN. The SDN guideline for the whole country was then redefined in 2016 through AO 2017-0014. Notably, the redefined SDN approach will lead to patient access to adequate and appropriate service from any facility, continuity of patient's medical information from medical history to laboratory examination data, and access to comprehensive care from preventive to rehabilitative.²⁵ In addition to this, the Universal Health Care Act signed in 2019 will help mitigate fragmentation of services through integration at the province-level for continuity of care and improved access to services, incentivizing public and private linkages; and rationalizing multiple payers for health at the province-level by the establishment of a Special Health Fund.²⁶ The need for an established SDN was further reiterated in the performance assessment of the National Objectives for Health 2011-2016, wherein SDN was considered a strategy to integrate and sustain MNCHN services.¹⁴

Given that these initiatives were fairly recent, it was expected that the SDN in the province of Albay is not yet fully functional. However, it can be noted that in terms of leadership and governance, the sampled government facilities were already substantially or fully functional. Indicators in leadership and governance on the presence of ordinances that support the SDN and whether local leaders demonstrate support for the SDN through the provision of resources. Also, private and government facilities were already substantially or fully functional in emergency drugs and equipment. The drugs and equipment assessed included uterotonics, antihypertensive and anti-seizure medications, antibiotics, intravenous fluids, and oxygen tanks. On the other hand, major gaps identified are the lack of adequately trained human resources in private facilities, unavailability of reliable transport and communication system in government facilities, and lack of standard protocols in both types of facilities. Despite these gaps, however, the referral system in the sampled facilities seems to be working since 100% of high-risk pregnancies have been referred successfully during the study period.

Only one maternal mortality was reported, which occurred in a referral hospital from a private facility. Certain studies show that having obstetric complications while in private birthing clinics encourages the shift of patients from private to public birthing facilities.²⁷ Therefore, efforts to capacitate the health care workers in private birthing facilities should be a priority.

Collaboration between facilities that are known to be effective has been proven to improve patient outcomes in terms of safety (in both low- and high-risk pregnancies), efficiency, and patient satisfaction.^{28,29} The primary reason for coordination issues in the referral network is the lack of a pre-referral and feedback mechanism between referring and receiving facilities.³⁰ In an ideal setup, the referring facility gives adequate patient information to the receiving facility for continuity of care. The same is true for the receiving facilities;

they should record the outcome of the visit and treatment of all referred patients in a standard form and report the follow-up treatment recommendations to the center of origin.³¹

In 2015, USAID's LuzonHealth Project of SDN assessment found that the lack of standard protocols is a consistent finding within its 21 partner provinces. Their baseline assessment showed that only 20% (4/21) of provinces had written referral arrangements or service agreements, while 80% (18/21) of the LGUs had none. Regarding the assessment of the referral system, significant observations included the lack of guidelines between referring and receiving facilities, the absence of advance arrangements during emergency referrals, unavailability of specialist services in common referral locations, and low referral acceptance.³²

Many preferred birthing in private maternity clinics in the City of Legazpi, Albay. One of the reasons for this is there are more private maternity clinics compared to public birthing sites; the same case is also observed in the study of Vergara in 2020, where it was noted that there was a flourishing midwife-led private maternity-care sector in the country.³³ Other factors that affect the patient or client preference are their economic and physical accessibility to the facility since those households with a greater capacity to finance these needs are more likely to obtain delivery services outside their area of residence.²⁷

Several studies were conducted to assess the functionality of the MNCHN referral system. In Dammam, Saudi, an evaluation of the antenatal referral rates from different Primary Health Care centers and Maternity and Children's hospitals was done.³⁴ From the questionnaires distributed, it was observed that there was a variation of referral rates (11.5 – 21.2 for every 100 antenatal consultations) among the general practitioners; specific characteristics of the physician influenced their said rates. The authors then concluded that there was indeed variation in referral rates in Dammam. Also, there was no need to monitor and improve the area's antenatal care and referral process. However, better training of the general practitioners and practicing shared obstetrics was recommended.

On the other hand, in 2010 in Tanzania, a study was conducted to evaluate the effectiveness of the maternal referral system.³⁵ Those who reached the hospitals (n= 1538) were interviewed, and those who did not reach the hospital were traced and interviewed. It was found that the following were the reasons why women were referred: demographic risks (70%), obstetric historical risks (12%), prenatal complications (12%), and natal and immediate postnatal complications (5.5%). Also, more than four pregnancies and maternal age <20 years were the most common referral indications. As for their compliance, 37% of those referred due to demographic risk were compliant. Financial constraints were identified as the major factor for those who did not comply. Luckily, noncompliance with the referral did not significantly increase the risk of perinatal death. The authors concluded that there was a need to review the referral indications and strengthen

counseling on birth preparedness and complication readiness to increase compliance to maternal referrals.

In a more recent meta-analysis (n = 19 studies), the effectiveness of referral interventions that enable pregnant women to attend health facilities was assessed.¹⁴ In the four studies in South Asian regions, organizational interventions that generated funds for transport reduced neonatal deaths, which was seen largest in India (OR= 0.48, 95% CI 0.34–0.68). On the other hand, decreasing stillbirths with maternity waiting for home interventions were seen in three quasi-experimental studies from sub-Saharan Africa (OR= 0.56, 95% CI 0.32–0.96). It was emphasized that referral interventions both improve and reduce the use of health services. The authors concluded that community mobilization interventions could reduce neonatal mortality. However, the effectiveness of the referral system in neonatal mortality reduction cannot be identified. In addition, the decrease in stillbirth rates from maternity waiting homes needed more study. It was recommended that better monitoring and evaluation practices be done to improve an effective referral system. Further studies on how intervention works should also be done.

In 2019, a study was created that assessed the relationship between the referral system and the facilities' readiness to treat complications at each health system level in Ghana.³⁶ Information on 977 health facilities was provided by the National Emergency Obstetric and Newborn Care Assessment 2010. It was seen that most of the number of referrals were from lower-level facilities, where they refer nearly all women with complications. On the other hand, district hospitals refer approximately 9% of their complicated cases. Prolonged and obstructed labor and antepartum hemorrhage were the most common complications referred. In the study, the readiness to treat a complication was correlated with a decrease in the number of referrals for all complications except uterine rupture. Also seen was inadequate facilities' readiness, with 40% of hospitals and 10% of lower-level facilities meeting the readiness threshold. Facilities with higher caseloads, more midwives, better infrastructure, and communication and transport systems referred to lesser women. The authors said that increasing communication and transport access and increasing the readiness for complication management will improve the quality of obstetric care and referral system.³⁶

Limitations

This study reviewed secondary data only, which was validated through observations and key informant interviews. The accuracy of results depends on how complete and precise information was recorded in the referral system documents. There is also a small number of facilities included in the study, which could have limited the statistical power of the tests to detect significant differences. Due to the study's cross-sectional nature, the indicators used for measuring functionality did not include those that will need follow-up, such as neonatal outcomes.

CONCLUSION AND RECOMMENDATION

Overall, the health facilities varied in the level of functionality in terms of SDN guidelines. All government-owned facilities were substantially functional, while half of the private facilities were either substantially or partially functional. Privately owned facilities scored highest in emergency drugs and equipment (83.3%) and lowest in human resources (38.9%). On the other hand, government facilities scored highest in emergency drugs and equipment (88.9%) but lowest in transportation and communication (44.4%). Better functionality scores were observed in human resources for government-owned, while better transportation and communication scores were seen in private facilities. Despite the SDN not being fully-functional, only one maternal death in 418 referrals was reported, and all pregnant women completed their antenatal check-ups.

Further validation of the referral system assessment tool and the scorecard for facility functionality is recommended in a setting with a larger number of primary-level facilities. SDN functionality assessment should also involve the secondary referral facilities. The functionality of the included facilities in this study should be further improved, especially in public and private facility protocols. Private facilities should prioritize human resource development opportunities, while public facilities should receive more funding to improve transportation and communication. Reliable and timely monitoring and evaluation of SDN functionality is relevant for Legazpi City to further strengthen its strategies for reducing maternal mortality.

Statement of Authorship

Both authors contributed in the conceptualization of work, acquisition and analysis of data, drafting and revising, and approved the final version submitted.

Author Disclosure

Both authors declared no conflicts of interest.

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