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Readiness of Health Facilities to Provide Emergency Obstetric Care in Papua New Guinea

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Abstract

Objective

To understand and measure the readiness of health facilities in Papua New Guinea to provide emergency obstetric care.

Methods

Data were collected via a national, cross-sectional health facility survey including all upper-level facilities (levels 5-7) and sixty lower-level (levels 3-4) facilities operational in Papua New Guinea at the time of survey. We defined four categories of readiness to provide obstetric care services: (1) facility readiness to provide clinical services; (2) availability of family planning items; (3) availability of maternal and neonatal equipment and materials; and (4) the ability of the facility to provide emergency obstetric care services.

Results

40% of level 3 and 4 facilities were not able to provide Basic Emergency Obstetric Care (BEmOC). Even among higher level facilities (levels 5, 6 and 7), 10% of facilities were not able to perform one or more of the necessary functions required to be considered a BEmOC provider. 11% of level 3 and 4 health facilities were able to provide comprehensive emergency obstetric care (CEmOC) as compared to 83% of higher level facilities.

Conclusion

Given the high fertility rate in PNG, lack of obstetric first aid and basic EmOC at level 3 and 4 facilities, the first level inpatient service providers, is a major concern. To improve access to emergency obstetric care, most of the level 3 and 4 facilities should be upgraded to provide at least BEmOC services.

Strengths and limitations of this study

- All the hospitals and randomly selected health centers in Papua New Guinea were surveyed;
- The quality of care evaluation method follows the Donabedian approach**.**
- The readiness and quality of providing obstetric care were assessed by constructing relevant indicators;
- The study did not try to connect the services availability and readiness measures with health outcomes of the population at the subnational level

Introduction

Emergency Obstetric Care(EmOC) is a cost-effective intervention vital to avert common adverse pregnancy and/or birth outcomes, which significantly contribute to maternal mortality in poor resource settings [1-4]. Basic Emergency Obstetric Care(BEmOC) alone can avert a significant proportion of maternal deaths and up to 40% of neonatal deaths [5]. A global assessment found that BEmOC facilities are consistently not available in sufficient numbers, both in countries with high and moderate levels of maternal mortality [6]. Comprehensive Emergency Obstetric Care (CEmOC) availability, which includes the provision of caesarean and blood transfusion services in addition to the key functions included in BEmOC, is also low in many low and middle income countries [7].

Maternal and child health remains a key priority area in Papua New Guinea (PNG) [8]; however, persistent maternal and neonatal deaths reflect numerous deficiencies. Maternal mortality in PNG is approximately 500 per 100 000 live births [9, 10], while neonatal mortality is 28 per 1000 live births [11]. Further, the World Health Organization model ranks PNG 130th in the world in terms of maternal mortality rate (MMR), which indicates a relatively high-risk of adverse outcomes in terms of maternal and child health[12]. The 2016-2018 PNG Demographic and Health Survey (DHS) report indicates that only 17% of pregnancies received a prenatal visit in the first trimester and 49% had four or more prenatal visits over the whole pregnancy[13]. On average 55% of deliveries were supervised by a trained health worker at a health facility between 2012-2017 [14].

Given the high MMR and low access to delivery services, it is important to assess the readiness of health facilities in the provision of emergency obstetric care in PNG. PNG has a relatively high total fertility rate [13], which implies that the demand for maternal health services will continue to increase rapidly, emphasizing the urgent need to strengthen maternal healthcare service delivery.

The purpose of this study is to measure health facility readiness to provide obstetric care and the quality of such services provided in PNG, through conducting a national health facility survey and deriving relevant indicators. These measures will inform specific approaches policy makers can adopt for improving the access and quality of obstetric care services.

Methods

Conceptual Framework

We use the Donabedian's approach to analyze the quality of obstetric care services offered through health care facilities in PNG. The Donabedian's approach is widely adopted to evaluate quality of care. It defines three broad components to understand quality differences across health care facilities [15]. These components are structure, process, and outcomes. The components are linearly linked. Structure measures affect processes and then processes affect outcomes, as shown in figure 1. This study will evaluate 'structure' and 'process' related to obstetric care services. The structure and process variables considered focus on the quality and quantity of the service-type produced. The health outcome of obstetric care services is demonstrated by maternal mortality and morbidity, which are both high in PNG.

To evaluate the provision of quality of obstetric care services, health facilities should have specific infrastructural characteristics and resources conducive for the provision of obstetric services. Some of the structural measures are quite general, related to provision of any clinical services, such as maternal services. In addition, specific personnel, supplies and drugs must be available at the facility level to be

able to offer the right type of services based on the clinical needs of patients. Availability of structural variables defines the "readiness" of the facility to provide effective health care services. Readiness alone does not necessarily imply actual provision of services. The infrastructural aspects act as the foundation for the provision of services, but relevant health care resources must be combined in the right proportions to be able to offer services to patients whenever needed. The process variables, therefore, reflect ability to offer different types of obstetric care services and functions.

Study Setting

PNG is remarkably diverse with respect to geography, language, and infrastructure. The country is divided into 22 provinces across four regions (Highlands, Momase and Southern, and the New Guinea Islands). Most of the country's 8 million people live in rural or peri-urban communities and are faced with significant challenges with regard to accessing equitable health, education and economic opportunities.

PNG has a government-funded health system throughout much of the country. It is supplemented by government-subsidized health services provided by various Christian missions. Overall, it is estimated that churches provide 47 percent of primary health services, particularly in rural areas [16].

Health facilities are categorized by the number and cadre of health workers employed and the services they provide; and are detailed in the National Health Services Standard (NHSS) of the Government of PNG (GoPNG) [17]. The levels of health facilities in PNG are numbered 1 through 7, where levels 1 and 2 provide basic primary health care, specifically outpatient services only. Level 3 health facilities, or health centers, also provide basic inpatient services for deliveries and minor ailments requiring observation. Level 4 health facilities, district and rural hospitals, provide general admissions, limited clinical support services including basic pharmacy and laboratory services, and depending on the employment of a medical officer, may provide obstetric and surgical intervention services. Level 5 to 7 health facilities provide secondary and tertiary health services as well as clinical support services, including pharmacy, laboratory, and radiology. The single level 7 health facility, the Port Moresby General Hospital, is the largest and most advanced health care facility of PNG, it employs the largest concentration of health care workers and provides comprehensive health care services.

Survey Design

We conducted a health sector efficiency survey at 73 health facilities in 2015. All operational level 5 to 7 health facilities nationwide, at the time of data collection (N=19) were surveyed, including the national referral hospital (Port Moresby General Hospital), the three regional hospitals, and 15 provincial hospitals. Sampling for level 3 and level 4 health facilities followed a two-step selection process to capture an equal amount of public- and church-run facilities. In step one, between six (New Guinea Islands) and eight (Southern, Highlands, and Momase) districts were randomly selected per region. In step two, the largest government- and church-administered health facilities (one of each type based on outpatient numbers per annum as reported by the National Health Information System) were purposely selected per district. This sampling procedure allowed selection of 30 publicly run and 30 church-run facilities from the selected districts; however, in reality not all selected facilities were operational. Where possible, closed health facilities were replaced by open ones within the same district. In some selected districts there were no functional level 3 or 4 facilities, resulting in less than 60 facilities surveyed (N=54). Figure 2 shows the location of the health facilities surveyed. The provinces shaded in green indicate where the survey was

carried out. The red squares represent level 5 to 7 health facilities, while the blue squares represent levels 3 and 4.

Survey Procedure

The survey comprised of a health facility assessment and costing instrument as well as interviews with healthcare providers, inpatients, and outpatients. Each instrument is detailed in the survey report [18]. Briefly, the health facility assessment collected information on various operational aspects of each health facility, while the costing instrument detailed expenditure on human resources, equipment, and consumables utilized for the provision of healthcare services. Both of which were completed with health facility managers and administrators. For the interviews with healthcare providers and patients (both inpatients and outpatients) written informed consent was obtained prior to interviewing. The healthcare provider interview included information on education, experience, services provided and general knowledge questions. The patient interviews covered socio-demographic information as well as patient experience and satisfaction. We conducted between one and five healthcare provider interviews, and between five and ten patient interviews per health facility. All instruments were completed by a team of 5 trained enumerators, who spent three to five days surveying each health facility. In total, 73 health facility assessments were completed, 72 costing instruments, 385 healthcare provider interviews, 385 inpatient interviews and 514 outpatient interviews.

Public Involvement

Stakeholder consultation were involved in the design and early dissemination of this research. During the feasibility stage, priority of research questions, choice of outcome measures, and methods were informed by discussions with stakeholders involving representatives from the National Department of Health, UN agencies, academics and other development partners in PNGs. The preliminary findings were also discussed with representatives from the National Department of Health, Provincial Health Authorities, hospitals and development partners in a stakeholder consultation workshop held in Port Moresby, PNG.

Ethics approval

The study was approved by the PNG Institute of Medical Research (IMR) Institutional Review Board (IRB) and the PNG Medical Research Advisory Committee (MRAC). The following approval numbers were allocated to the study: IRB No. 1414, 7 August 2014; MRAC No 14.26, 10 November 2014.

Assessing readiness to provide maternal health services

We first examine the overall readiness of health facilities (structure variables) in the provision of clinical services and then examined three aspects related to obstetric services (process variables). Four categories of readiness are defined (1) facility readiness to provide clinical services; (2) availability of family planning items; (3) availability of maternal and neonatal equipment and materials; and for process measure, we evaluated the ability of the facility to provide emergency obstetric care services. If a functional equipment or instrument is present in the facility, we consider that the equipment or instrument is available for use. Availability of drugs and supplies is defined as having the item in stock at the time of the survey. Although the facility assessment asked about stockouts in the previous one month, the definition of availability considered current availability.

Structure variable type 1: facility readiness to provide clinical services

General facility-specific conditions and resources required to ensure the provision of quality services in a safe and effective manner as listed in Table 1.

Structure variable type 2: family planning items

Three supply categories were examined, oral pills, family planning injections and condoms, as listed in Table2. For each supply category, an index was constructed to show the average availability of the items.

Structure variable type 3: maternal and neonatal equipment and materials

Essential items required to provide pregnancy termination and other maternal health services as listed in Table 3. The items can be grouped into two subcategories: items and supplies related to antenatal care (ANC) and items and supplies related to maternal or neonatal service.

Process variables: Ability to provide emergency obstetric care services

Health care facilities that offer delivery of babies and other pregnancy-related services can be categorized into three groups depending upon the "signal functions" they are able to perform [19]. Signal functions have been defined to understand the ability of health facilities to offer routine to more complex obstetric services. If a facility has the capacity to administer antibiotic injections, oxytocics, and anticonvulsants (availability of the required injections and presence of relevant personnel to administer the injections), the facility is considered an "Obstetric First Aid" facility. A BEmOC facility is able to do all the functions required in an Obstetric First Aid facility plus the capacity to do assisted vaginal delivery, and the ability for manual removal of placenta. Comprehensive Emergency Obstetric Care (CEmOC) facilities are able to perform all the functions of a BEmOC plus ability to conduct caesarean section, and capacity to do safe blood transfusion. Note that all these signal functions are narrowly focused on the ability to perform specific functions pregnant women need at the time of delivery. Ability to perform the functions are defined by the availability and functionality of equipment needed, drugs, and personnel.

Data Analysis

The analysis has used the facility level data to derive the readiness indicators and ability to perform signal functions for each facility in the survey using stata version 12. The results are presented as descriptive tables (Tables 1-4) to indicate the proportion of facilities having the instruments or able to perform the specific functions.

An equally weighted index was constructed based on the availability of the items included in each of the categories of service delivery. It reflects the percent of all readiness aspects or variables satisfied by the health facilities in a specific category. For example, if a facility reports having an instrument, a value of 1.0 was assigned for the facility for that equipment. The availability index was constructed to show the percent of listed equipment and items available in each of the facility categories. For example, if the antenatal care (ANC) items availability index is 65 for level 3 and 4 facilities, it means that the facilities on the average had 65 percent of all the ANC equipment and items considered in the analysis.

Results

Facility readiness to provide clinical services

Table 1 reports facility readiness in the provision of services. As shown, 95% of level 5 to 7 facilities were connected to the main electric supply grid but only about a third of level 3 and 4 facilities. However, more than 80% of all facilities connected to the electric supply experienced blackout at least for some time in the week before the survey. All level 5 to 7 facilities had functional backup generators, while the percentage of level 3 and 4 facilities with backup generators was 76% for church-run facilities and 48% for public facilities. Half of the level 3 and 4 facilities with backup generators reported problems in operating the generator in the previous month.

If supply line and water tanks are considered, all level 5 to 7 facilities and 83% of level 3 and level 4 public health facilities and 84% of level 3 and level 4 church health facilities reported having access to water on the day of the survey. However, less than 10% of level 3 and 4 facilities were connected with a supply line. Only 45% of level 3 and 4 public facilities had water connection to the delivery room (and water availability on the day of the survey) compared to 72% at church-run facilities.

A significant share of health facilities, 62%, 44% and 38% of level 3 and 4 public, level 3 and 4 church, and level 5 and 6 facilities, respectively, experienced water shortages in 2014. The survey asked facility respondents whether the facility was responsible for maintaining the water supply system and it was observed that about 45% of public level 3-4 facilities were responsible for maintaining the water supply system. The proportions were 64% for church-run level 3 and 4 facilities and 68% for level 5 to 7 facilities.

Both level 3 and 4 public and church-run health facilities show low readiness score for service delivery (Table 1). Readiness indexes were 40.3 for level 3 and 4 public sector facilities, 48.6 for level 3 and 4 church-run facilities, 84.6 for level 5 and 6 facilities, and 100 for the level 7 facility.

Family Planning Items

Table 2 presents the availability of family planning products and supplies in surveyed health facilities. The availability index of family planning items was 81.6 for level 3 and 4 public sector health facilities, 84.0 for level 3 and 4 church-run facilities, and 88.9 for level 5 and 6 facilities. Non-availability of family planning injections in the level 7 facility reduced the overall index of family planning item availability for the facility to 66.7. Since there is only one facility at level 7, non-availability of even a single item significantly reduces the overall index.

Maternal and Neonatal Equipment and Materials

A significant number of health facilities lacked very basic maternal and neonatal equipment as shown in Table 3. The index values for the availability of ANC-related equipment and supplies were 71.4 and 81.6 for level 3 and 4 public- and church-run facilities, respectively. The index was 81.1 for level 5 and 6 facilities and 100 for level 7 facility. The indexes of availability of delivery and neonatal equipment and supplies (excluding ANC-related equipment) were worse in level 3 and level 4 facilities, 64.7 and 76.0 respectively. The indexes were 89.9 for level 5 and 6 facilities.

Ability to provide emergency obstetric care services

Table 4 indicates that 18.6% of level 3 and 4 public health facilities and 20% of church health facilities providing maternal health services were not able to offer basic obstetric first aid. 40% of level 3 and 4 facilities were not able to perform the functions necessary under the Basic Emergency Obstetric Care

category (BEmOC). Even among higher level facilities (levels 5, 6 and 7), 10% of facilities were not able to perform one or more of the necessary functions required to be considered a BEmOC provider.

If the signal functions for comprehensive emergency obstetric care are considered, only about 11% of level 3 and 4 health facilities were found to be CEmOC units. Only 15% of level 3 and 4 facilities had the capacity to manage a caesarean section or do blood transfusion. The majority of facilities at all levels reported the capacity to remove a placenta manually (78% for level 3 and 4 public health facilities, 88% for level 3 and 4 church-run facilities, and 100% of level 5 to 7 facilities).

Discussion

The overall health facility infrastructure condition in PNG is poor. Most facilities reported the need for major building repairs and emphasized the lack of adequate toilets, stable electrical supply, and consistent water supply. Most of the level 3 and 4 health facilities require better connectivity to electricity and clean water supply. One significant concern is the number of health facilities that did not have running water in the facility's delivery room. The quantity and quality of different types of service provision crucially depends on the facility's readiness to provide the clinical services. Overall, level 3 and 4 facilities, both public and church-run, scored quite low on the readiness index, which describes the extent to which facilities are capable of providing services. The survey also revealed the need for improving the supply of basic medical items to level 3 and 4 public health facilities. Level 3 and 4 public facilities show lower availability of different medical items compared to availability in church-run facilities.

PNG shows comparatively low values in terms of readiness in the provision of health services. Comparison of health facility readiness across countries is often tricky because of differences in the level and comprehensiveness of facilities in different countries of the world. A World Bank report [20] indicates that 98 percent of public hospitals in Indonesia had electricity; in Laos, the index of basic amenities was reported as 64 percent [21] compared to 58 percent for PNG (weighted mean of the values in table 1).

Access to family planning services are still limited in PNG. The results from the survey are consistent with the most recent findings from the PNG DHS. One quarter of currently married women (26%) have an unmet need for family planning, and only 59% of currently married women are satisfied with the demand of family planning. Among those who have received family planning, about 9 in 10 users obtained their modern family planning supplies from a public (government) source. Therefore, there is an urgent need to strengthen the government health facilities, especially at lower levels, in the provision of family planning items and services.

While 83% of level 5 to 7 facilities were found to be CEmOC providers, the fact that about a fifth were not able to provide comprehensive emergency obstetric care is a major concern given these are higher level referral facilities. The number of level 3 and 4 facilities surveyed was high enough to provide some national level estimates. Using the proportions of CEmOC facilities at different levels, the number of facilities providing comprehensive obstetric care in the country would be about 50. Even if we assume balanced geographic distribution of the facilities, an emergency obstetric case will have to travel 53 km each way, on average, to reach a CEmOC facility. The distance to the nearest CEmOC is so large that for many emergency cases this is virtually synonymous of not having access to comprehensive emergency obstetric care. In order to reduce maternal mortality and morbidity significantly, it is essential to reduce the average distance to the nearest CEmOC facility[22] implying that PNG will have to upgrade a significant number of levels 4 and 5 facilities to be able to provide comprehensive emergency obstetric care. Using geographical

information systems and geographical modelling tools to optimize the location and referral can help improve timely access[23].

All facilities at level 3 or above should be able to provide obstetric first aid and BEmOC. To improve access to emergency obstetric care, most of the level 3 and 4 facilities should be upgraded to BEmOC facilities or better. The survey of facilities indicated that 20% of facilities at levels 3 and 4 were not prepared to provide even obstetric first aid and 40 percent were not ready to provide BEmOC. Despite this low readiness, equipping some targeted facilities at these levels to perform blood transfusions and cesarean section deliveries should be able to increase availability of CEmOC from 10% to 60%. Although maternal and child health is a priority area, PNG has not allocated enough resources to achieve improved access to MCH services. PNG spends more than 4.3% of its GDP on health (about $109 per capita in PPP dollars). Total health expenditure is not low compared to other countries with similar level of income[24]. However, a significant part of health resources, including human resources, particularly doctors, are concentrated in a few major hospitals. Therefore, the resource allocation at the lower level health facilities, including level 3 and level 4 health facilities, are not sufficient. Reallocation of public sector resources to lower level health care facilities are needed to improve the access of obstetric care and other preventive services.

Public financial management is another challenge in PNG with subnational facilities constantly facing cash shortages[25]. Government of Papua New Guinea may consider allocating funds to facilities, both public and church facilities, based on quantities of priority health services delivered rather than paying them based on their personnel and administrative expenses [26]. While such output or performance based financing outcomes highly depend on how the schemes are implemented, evidence in low and middle income countries shows that the performance can be improved through links to financial incentives and other sources of motivation [27]. From the demand side, past research has found that providing pregnant women with health vouchers to ensure that they have financial protection for accessing services has increased utilization of health services [28]. The payments received through the vouchers will also encourage facilities to become more sensitive to the needs of pregnant women and would have incentives to invest to become fully functional EmOC providers.

Study Limitations

Several limitations of the study should be mentioned here. First, it is not possible to indicate overall geographic access to primary health care services in PNG using the survey data because the study did not collect information from level 1 and 2 health facilities. However, these facilities do not provide maternal health services although some basic services like family planning and ANC can potentially be organized at these levels. Second, the survey is not a nationally representative survey of level 3 and 4 facilities. The survey design selected fully functional level 3 and 4 facilities in target provinces and the definition of fully functional led to the choice of facilities that showed relatively high level of utilization. Therefore, if anything, the results are likely to be a significant overestimation of degree of readiness of the facilities in the provision of maternal and obstetric care services. Even with this favorable selection of facilities, the percent of facilities able to perform BEmOC and CEmOC was quite low at levels 3 and 4 implying that the availability of obstetric care services could be significantly worse than what has been reported here. Third, the study did not try to connect the services availability and readiness measures with health outcomes of the population at the subnational level. In PNG, even the national level estimates of mortality and morbidity are considered unreliable and subnational level estimates would suffer from even higher degree of error in estimation. In any case, facility level information clearly indicates that many of the functional

facilities are not ready to provide obstetric health services and a significant proportion of facilities lack medical equipment, instruments and supplies for the provision of maternal health related essential services.

Conclusions

Inability of a health facility, irrespective of whether it is a primary, secondary and tertiary care facility, to provide obstetric care is an important concern for any health care system. It is especially true for a country like PNG where maternal and infant mortality rates are still high alongside a high fertility rate. Improving and equipping targeted health facilities to improve the readiness of delivering the BEmOC and CEmOC are required to reduce the maternal mortality rate in PNG.

Table1. Service Provision Readiness Index, by Facility Level

Readiness indicators	Level 3 and 4				Level 5 and 6		Level 7	
	Public	%	Church	%	*N*	%	*N*	%
Electricity connected to supply grid	10	34%	7	28%	17	94%	1	100%
Backup generator	14	48%	19	76%	18	100%	1	100%
Electricity availability (supply or generator)	20	69%	21	84%	18	100%	1	100%
Blackout last week	8	28%	6	24%	15	83%	0	0
Problem last month running generator due to fuel shortage	8	28%	10	40%	3	17%	0	0
Water from main line	2	7%	3	12%	15	83%	1	100%
Water shortage last year	18	62%	11	44%	7	39%	0	0
Water available for use by health care providers	24	83%	21	84%	18	100%	1	100%
Water available in delivery room	13	45%	18	72%	18	100%	1	100%
Facility does direct blood transfusion	3	10%	3	12%	16	89%	1	100%
Blood transfusions done last month	3	10%	3	12%	18	100%	1	100%
Facility has designated space for clinicians to provide service	20	69%	20	80%	18	100%	1	100%
Facility has on-call room or space for health care providers to take rest	3	10%	11	44%	10	56%	1	100%
Facility has telephone or shortwave radio	14	48%	14	56%	15	83%	1	100%
Facility has ambulance	26	90%	24	96%	17	94%	1	100%
Ambulance out of service last year	11	38%	10	40%	6	33%	0	0
Facility has other vehicles	8	28%	5	20%	18	100%	1	100%
Facility has operation theater	8	28%	9	36%	18	100%	1	100%
Index of readiness	**40.3**		**48.5**		**84.6**		**100**	

Table 2. Availability of Family Planning by Facility Category

Family planning, vaccine and other items	Level 3 and 4				Level 5 and 6		Level 7	
	Public	% of Public	Church	% of Church	Public	% of Level 5 and 6	Public	% of Level 7
Family planning items								
Oral pills	26	90%	21	84%	17	94%	1	100%
FP injections	22	76%	22	88%	15	83%	0	0%
Condoms	23	79%	20	80%	16	89%	1	100%
Index of FP items	**81.6**		**84.0**		**88.9**		**66.7**	

Note: FP = family planning;

Table 3. Availability of Maternal Health-Related Equipment and Supplies

ANC, delivery and neonatal equipment and supplies	Level 3 and 4				Level 5 and 6		Level 7	
	Public	% of Public	Church	% of Church	Public	%	Public	%
Foetal stethoscope (or monitor)	27	93%	25	100%	14	78%	1	100%
Stethoscope and blood pressure cuff	22	76%	25	100%	16	89%	1	100%
Tape measure	23	79%	22	88%	16	89%	1	100%
Scale	28	97%	25	100%	16	89%	1	100%
Ultrasound machine (and gel)	28	97%	25	100%	17	94%	1	100%
Facility has at least two skilled birth attendants covering 24 hours a day	21	72%	19	76%	18	100 %	1	100%
Delivery kit (instruments, supplies)	25	86%	25	100%	18	100 %	1	100%
Stethoscope	10	34%	11	44%	15	83%	1	100%
Partograph	11	38%	13	52%	14	78%	1	100%
Pelvic procedure instruments such as speculum	18	62%	22	88%	16	89%	1	100%
Delivery light	24	83%	24	96%	18	100 %	1	100%
Sterilizer	15	52%	16	64%	13	72%	1	100%
Vacuum extractor	14	48%	21	84%	18	100 %	1	100%
Forceps	25	86%	25	100%	18	100 %	1	100%
Manual vacuum aspirator/suction bulb	27	93%	25	100%	17	94%	1	100%
Resuscitation bag, newborn	4	14%	4	16%	15	83%	1	100%
Eye drops or ointment for newborn	27	93%	25	100%	18	100 %	1	100%
Needles and syringes	28	97%	25	100%	18	100 %	1	100%
Sterile C-section instrument kits	28	97%	25	100%	18	100 %	1	100%
Cord supplies for newborn: clamps, ties, scissors	2	7%	5	20%	12	67%	1	100%
IV sets, including sterilized needle and tube	27	93%	25	100%	17	94%	1	100%
IV fluids, including normal saline and ringer lactate	29	100%	25	100%	18	100 %	1	100%
Index ANC item availability	**71.41**		**81.60**		**81.11**		**100.00**	
Index maternal and neonatal items availability (excluding ANC)	**64.66**		**76.00**		**89.93**		**100.00**	

Table 4. Percentage of Health Facilities Providing Obstetric First Aid, Basic Emergency Obstetric Care, and Comprehensive Emergency Obstetric Care

Level of EmOC services provided by facilities	Level 3 and 4 public % (n)	Level 3 and 4 church % (n)	Level 5 to 7 % (n)	Total % (n)
Obstetric first aid				
Have the capacity to administer antibiotics, Oxytocics, and anticonvulsants	81% (22)	80% (20)	94% (17)	84% (59)
BEmOC				
Have the capacity to do assisted vaginal delivery	63% (17)	72% (18)	94% (17)	74% (52)
Have the ability to use three drugs plus do vacuum and forceps delivery	63% (17)	60% (15)	89% (16)	69% (48)
Have the ability for manual removal of placenta	78% (21)	88% (22)	100% (18)	87% (61)
CEmOC				
Have the ability to manage caesarean section	15% (4)	16% (4)	100% (18)	37% (26)
Have the capacity to do safe blood transfusion	15% (4)	20% (5)	94% (17)	37% (26)
Have the capacity to use all drugs plus services listed above	11% (3)	12% (3)	83% (15)	30% (21)

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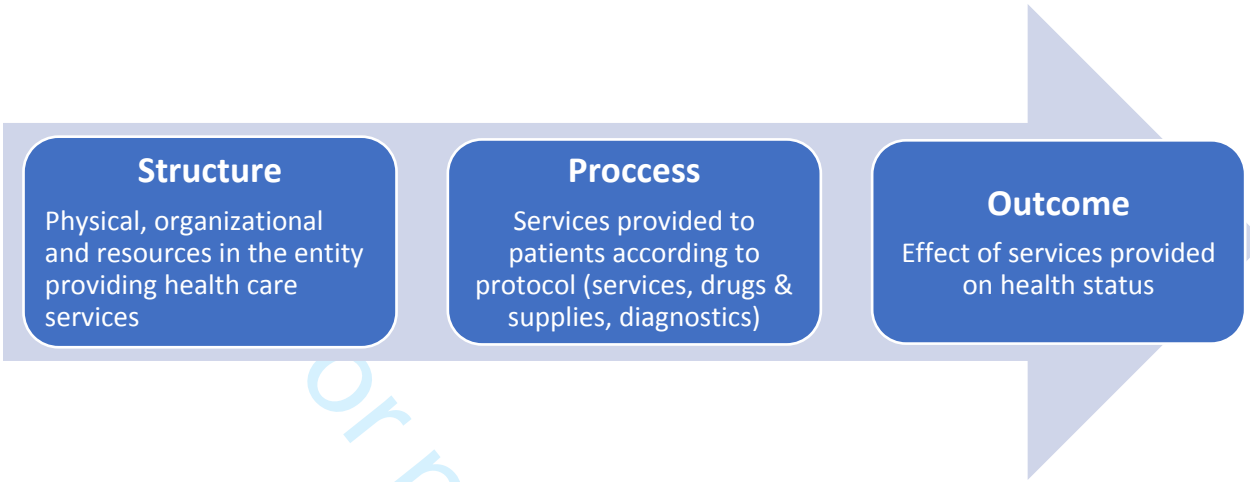
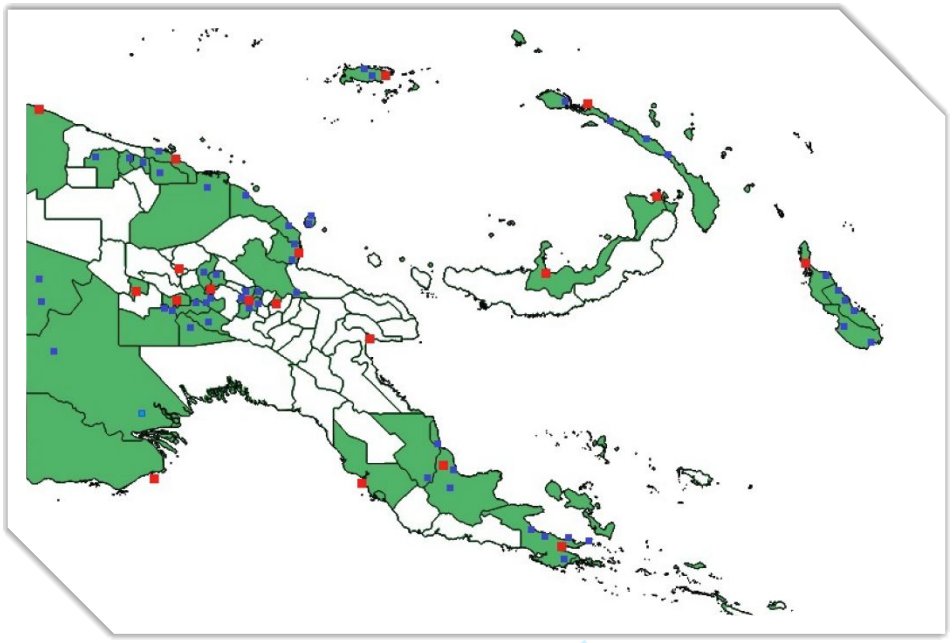
Figure 1. The three components of the Donabedian approach to evaluating quality of care



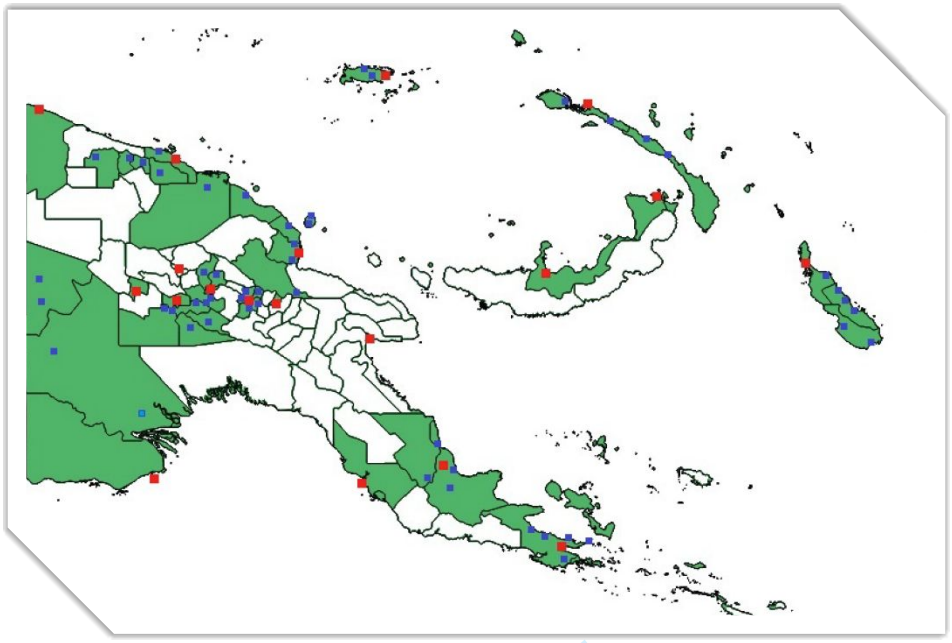
Source: Donabedian (2005)

Figure 2. Map of PNG with Districts Visited (green) and Location of Surveyed Facilities



Note: Red squares represent the level 5 to 7 facilities surveyed, while the blue squares represent the level 3 to 4 facilities.

Figure 2. Map of PNG with Districts Visited (green) and Location of Surveyed Facilities



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Readiness of Health Facilities to Provide Emergency Obstetric Care and Other Related Services in Papua New Guinea

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Xiaohui Hou: Conceptualization, Methodology, Supervision, Project Administration, Resources, Writing-Original Draft, Writing – review & editing
M. Mahmud Khan: Conceptualization, Methodology, Supervision, Formal Analysis, Writing-Original Draft, Writing – review & editing
Justin Pulford: Conceptualization, Methodology, Data Curation, Data Validation, Writing-Review & Editing.
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Data availability statement

No additional data is available. Researchers interested in 2015 PNG Facility Assessment Survey data can contact the PI of the project, Dr. M. Mahmud Khan, at the email address Mahmud.Khan@uga.edu with a statement on the reasons for requesting the dataset and types of analyses to be conducted.

Abstract

Objective

To measure readiness of health facilities in Papua New Guinea (PNG) to provide obstetric care and other related services.

Design

Cross-sectional study involving random sample of levels 3 and 4 health facilities and census of all upper level facilities that were operational at the time of survey. Structured questionnaires were used to collect data from health facilities.

Setting

Health facilities in PNG. Facility administrators and other facility personnel were interviewed during the survey.

Participants

19 upper-level facilities (levels 5-7) and 60 lower-level (levels 3-4) facilities.

Outcome measures

Four service-types were used to understand readiness of surveyed health facilities in the provision of maternity care including obstetric care services: (1) facility readiness to provide clinical services; (2) availability of family planning items; (3) availability of maternal and neonatal equipment and materials; and (4) ability to provide emergency obstetric care.

Results

56% of level 3 and 4 facilities were not able to provide Basic Emergency Obstetric Care (BEmOC). Even among higher level facilities (levels 5, 6 and 7), 16% were not able to perform one or more of the functions required to be considered a BEmOC provider. 11% of level 3 and 4 health facilities were able to provide comprehensive emergency obstetric care (CEmOC) as compared to 83% of higher level facilities.

Conclusion

Given the high fertility rate in PNG and high maternal mortality ratio (MMR), lack of BEmOC at level 3 and 4 facilities, the first level inpatient service providers, is a major concern. To improve access to EmOC, each of the level 3 and 4 facilities should immediately be upgraded to at least a BEmOC provider. Significant reduction in MMR will require improved access to CEmOC and optimal geographic location approach can identify facilities to be upgraded. Strengthening of family planning services will also help improve access to EmOC.

Strengths and limitations of this study

- This is the first empirical study that systematically examined availability of maternity care in health facilities in Papua New Guinea (PNG).
- All level 5-7 hospitals and randomly selected functional health centers in PNG were surveyed using structured questionnaires.
- The readiness of facilities in the provision of obstetric care and actual provision of services were assessed by relevant indicators and signal functions.
- Service availability and readiness of facilities could not be linked with community level health outcomes.
- The sampling design selected level of 3 and 4 facilities that were fully functional in each of the surveyed districts implying that the results overestimate the readiness and availability of obstetric care and other related services.

Introduction

Effective antenatal, neonatal and Emergency Obstetric Care (EmOC) are highly cost-effective interventions vital to avert common adverse pregnancy and/or birth outcomes, which significantly contribute to maternal mortality in poor resource settings.[1-4] Basic Emergency Obstetric Care (BEmOC) alone can avert a significant proportion of maternal deaths and up to 40% of neonatal deaths.[5] A global assessment found that BEmOC facilities are consistently not available in sufficient numbers in countries with high and moderate levels of maternal mortality.[6] Comprehensive Emergency Obstetric Care (CEmOC) availability, which includes the provision of caesarean and blood transfusion services in addition to the key functions included in BEmOC, is also quite poor in many low and middle income countries.[7]

Maternal and child health remains a key priority area in Papua New Guinea (PNG);[8] however, persistently high maternal and neonatal deaths reflect numerous deficiencies. The estimates of Maternal Mortality Ratio (MMR) in PNG vary considerably and one study by Mola and Kirby estimated the MMR for 2009 using facility-based national health information system records and survey data on maternal mortality among unsupervised births from one province. The estimates imply that the average MMR in PNG should be approximately 500 per 100 000 live births.[9 10] The neonatal mortality in PNG is also high, around 28 per 1000 live births.[11] The World Health Organization model ranks PNG 130th in the world in terms of MMR.[12] The 2016-2018 PNG Demographic and Health Survey (DHS), using the sisterhood method, found that the MMR was about 205 per 100,000 live births.[13] Even though new DHS estimate represents a significant improvement from the previous estimate of 733 per 100,000 live births in 2006, the maternal mortality in PNG remains about 24 times the MMR in neighboring Australia.[12] The DHS report also indicates that only 17% of pregnancies received a prenatal visit in the first trimester and 49% had four or more prenatal visits over the whole pregnancy. During 2012-2017, about 55% of deliveries in PNG were supervised by trained health workers at health facilities[13] indicating limited access to modern maternal health care services.

To reduce the MMR in any country, it is important to understand the causes of death so that appropriate interventions can be designed and adopted. In PNG, the maternal mortality registry often does not report causes of death. Reviewing the causes of deaths mentioned in the general death registry and in maternal mortality registry, one study in early 1980s found that the main causes were puerperal sepsis, postpartum hemorrhage, medical and surgical complications, prolonged or obstructed labor, ruptured uterus, deaths associated with caesarean section.[14] It is likely that many of these causes of deaths have remained important even today. Clearly, deaths due to the causes indicated above cannot be avoided without timely access to health facilities that are equipped to provide a range of obstetric care services. A recent article mentioned geographically dispersed population, shortage of health care providers, poverty, gender inequality and low level of education as important determinants of maternal deaths.[15] These aspects are, however, directly related to access to care and readiness of health facilities in the provision of maternity care.

Lifetime risk of maternal death depends on the probability of maternal death per pregnancy and the average number of pregnancies per woman over the reproductive age. The 2016-2018 PNG DHS estimated that total fertility rate (TFR) was about 4.2 per woman, which is slightly lower than the TFR of 4.4 in 2006. Access to obstetric care and lifetime risk of maternal death can be improved by lowering the TFR as well.

Given the critical importance of timely access to appropriate obstetric care, it is essential to assess the ability and readiness of health facilities in the provision of emergency obstetric care in PNG. Due to high TFR of PNG, the demand for maternal health services will continue to increase rapidly, underscoring the urgent need for improving access to care and strengthening maternal healthcare service delivery.

Despite the high social value of maternal and newborn health care services in PNG, no macro-level information is available on the ability or readiness of health facilities in the provision of the services. One recent study assessed the capacity of 21 health facilities in the provision of essential surgery and anesthesia services.[16] No study on PNG, to date, has examined the readiness and ability of health facilities at the national level in the provision of obstetric care services. This study is the first attempt to understand the state of obstetric care availability in PNG.

The principal objective of this study is to measure health facility readiness to provide obstetric care and other related services. Some of the measures reflect not only the readiness of the facilities in the provision of target services but also the quality of services offered. The nationally representative health facility survey allows measurement of various indicators of obstetric care related services. These measures will be useful for policy makers to reform the health care delivery system to strengthen the provision of obstetric care and general clinical services.

Methods

Conceptual Framework

We use the Donabedian's framework to analyze the readiness of obstetric care and other related services offered through the health facilities in PNG. In general, the Donabedian's approach is used to evaluate quality of care by analyzing relevant structures, processes and outcomes.[17] The structure measures affect processes and then processes affect outcomes, as shown in figure 1. In this study, our focus is on the evaluation of 'structure' and 'process' related measures relevant for maternity care. The structure and process variables help to better understand the ability of health facilities in the provision of different service-types. Although, the impact of service provision cannot be directly measured from the facility survey data, country-level estimates of maternal mortality and morbidity imply relatively poor outcomes indicating the need for improving infrastructure and processes associated with obstetric and other related services.

To evaluate the ability and readiness to provide general medical care services including obstetric care, health facilities should have several infrastructural characteristics and resources. Some of the structural measures are quite general, related to the provision of any clinical service, such as

general inpatient services. In addition, specific personnel, supplies and drugs must be available at the facility to be able to offer the right type of services at the right time based on the clinical needs of patients. The structural characteristics, although not directly related to maternity care, are the necessary aspects defining the "readiness" of the facility in the provision of effective health care services. Readiness, however, does not necessarily imply actual provision of services. The infrastructural aspects act as the foundation for the provision of services, and relevant health care resources must be combined with the infrastructure to offer services to patients whenever needed. The process variables reflect ability to offer different types of obstetric care services and functions. The process variables for monitoring obstetric care service provision, the signal functions, are well defined and we will use the facility-level signal functions for understanding the readiness of facilities in PNG.[18]

Study Setting

PNG is remarkably diverse with respect to geography, language, and infrastructure. The country is divided into 22 provinces across four regions (Highlands, Momase and Southern, and the New Guinea Islands). Most of the country's 8 million people live in rural or peri-urban communities and are faced with significant challenges with regard to equitable access to health, education and economic opportunities.

PNG has a government-funded health system throughout much of the country. It is supplemented by government-subsidized health services provided by various Christian missions. Overall, it is estimated that churches provide 47 percent of primary health services, particularly in rural areas.[19]

Health facilities are categorized by the number and cadre of health workers employed and the services they provide and are detailed in the National Health Services Standard (NHSS) of the Government of PNG (GoPNG).[20] The levels of health facilities in PNG are numbered 1 through 7, where levels 1 and 2 provide basic primary health care, specifically outpatient services only. Level 3 health facilities, or health centers, provide outpatient and basic inpatient services for deliveries and minor ailments requiring observation. Level 4 health facilities, district and rural hospitals, provide general admissions, limited clinical support services including basic pharmacy and laboratory services, and depending on the employment of a medical officer, may provide surgical intervention services. Levels 5 to 7 health facilities provide secondary and tertiary health services as well as clinical support services, including pharmacy, laboratory, and radiology. The only level 7 health facility, the Port Moresby General Hospital, is the largest and most advanced health care facility of PNG, employs the largest concentration of health care workers and provides comprehensive health care services.

Survey Design

We conducted a health facility survey of 73 health facilities in PNG in 2015. All operational upper level health facilities (levels 5 to 7) were selected for the survey. At the time of data collection,

PNG had 19 upper-level health facilities and all these 19 facilities were surveyed (although one of the facilities was not fully operational). The upper-level health facilities in the survey included the national referral hospital (Port Moresby General Hospital), three regional hospitals, and 15 provincial hospitals. At the national level, since about half of levels 3 and 4 were Church-run, the survey design intended to sample equal number of publicly-run and Church-run facilities. For selecting facilities at these two levels, between six (New Guinea Islands) and eight (Southern, Highlands, and Momase) districts were randomly selected per region. The largest government- and Church-administered health facilities (one of each type based on outpatient numbers per annum as reported by the National Health Information System) were purposely selected per district. This sampling procedure allowed selection of 30 publicly run and 30 church-run facilities from the selected districts; however, during field visits, not all selected facilities were found to be operational. Where possible, closed health facilities were replaced by functional ones within the same district. In some districts there were no functional level 3 or 4 facilities, resulting in less than 60 facilities surveyed (N=54). Figure 2 shows the location of the health facilities surveyed for this study. The provinces shaded in green indicate where the survey was carried out. The red squares represent level 5 to 7 health facilities, while the blue squares represent levels 3 and 4.

Survey Procedure

The survey comprised of a health facility assessment and costing instrument as well as interviews with healthcare providers, inpatients, and outpatients. Each instrument is detailed in the survey report.[21] Briefly, the health facility assessment collected information on various operational aspects of each health facility, while the costing instrument detailed expenditure on human resources, equipment, and consumables utilized for the provision of healthcare services. Both these instruments were completed with health facility managers and administrators. The data collection was done by a team of 5 trained enumerators, who spent three to five days surveying each health facility. In total, 73 health facilities were surveyed.

Public Involvement

Stakeholder consultations were involved in the design and early dissemination of this research. During the feasibility stage, priority of research questions, choice of outcome measures, and methods were informed by discussions with stakeholders involving representatives from the National Department of Health, UN agencies, academics and other development partners in PNGs. The preliminary findings were also discussed with representatives from the National Department of Health, Provincial Health Authorities, hospitals and development partners in a stakeholder consultation workshop held in Port Moresby, PNG.

Ethics approval

The study was approved by the PNG Institute of Medical Research (IMR) Institutional Review Board (IRB) and the PNG Medical Research Advisory Committee (MRAC). The following approval numbers were allocated to the study: IRB No. 1414, 7 August 2014; MRAC No 14.26, 10 November 2014.

Outcome measures

The handbook on monitoring emergency obstetric care[18] identified a set of indicators to measure availability, access and provision of EmOC in a country or a region. Two types of measures were defined -the first type focuses on availability, adequate coverage and utilization of services at national or sub-national levels and the second type measures obstetric care related functions performed by health facilities. The functions identified to define the level of EmOC services offered from a health facility are: (1) Administer parenteral antibiotics, (2) Administer uterotonic drugs, (3) Administer parenteral anticonvulsants, (4) Manually remove the placenta, (5) Remove retained products, (6) Perform assisted vaginal delivery, (7) Perform basic neonatal resuscitation, (8) Perform surgery (e.g., caesarean section), and (9) Perform blood transfusion. When a facility can perform all the functions listed under 1-7, it is considered a Basic EmOC (BEmOC) provider while ability to perform all the nine functions defines the comprehensive EmOC (CEmOC) provider. This study will use these nine measures to categorize health facilities as either a BEmOC or a CEmOC. Note that all these signal functions are defined by the ability to perform specific functions pregnant women need at the time of delivery. Ability to perform the functions does not necessarily imply that the facilities actually provided the services in the recent past.

Since this study is based on facility-level survey data, community or patient related health outcome measures are not directly observable. To compensate for this, we have used additional measures to understand readiness of health facilities in the provision of general inpatient care. Availability of basic medical equipment and supplies and physical condition of the facility (infrastructural variables) may affect willingness of clients to utilize services from the facilities. Another important intervention that improves access to obstetric care is through effective provision of family planning services, which reduce the demand for EmOC. Therefore, in addition to nine EmOC functions listed above, other outcome variables considered in this analysis are: (a) readiness of facilities to provide clinical services; (b) availability of family planning items; and (c) availability of maternity care related equipment and materials. Availability of drugs and supplies is defined as having the item in stock at the time of the survey.

For the availability of equipment, instruments and supplies, several indexes were calculated to indicate degree of availability of the items. The index values range from 0 to 100, 100 implying that all the items used for the construction of the index were available in all the facilities surveyed.

Calculating readiness or availability index

The analysis has used facility level data to derive the readiness indicators and ability to perform signal functions for each facility in the survey (Stata version 12 was used). The results are presented as descriptive tables (Tables 1-4) to indicate the proportion of facilities having the instruments or able to perform the specific functions.

An equally weighted index was constructed based on the availability of the items included in each of the categories of service delivery. It reflects the percent of all readiness aspects or variables satisfied by the health facilities in a specific category. For example, if a facility reports having an

instrument, a value of 1.0 was assigned for the facility for that equipment. The availability index was constructed to show the percent of listed equipment and items available in each of the facility categories. For example, if the family planning items availability index is 65 for level 3 and 4 facilities, it means that the facilities on the average had 65 percent of all the family planning equipment and items considered in the analysis.

Results

Facility readiness to provide clinical services

Table 1 reports facility readiness in the provision of services. As shown, 95% of level 5 to 7 facilities were connected to the main electric supply grid but only about a third of level 3 and 4 facilities. However, more than 80% of all facilities connected to the electric supply experienced blackout at least for some time in the week before the survey. All level 5 to 7 facilities had functional backup generators, while the percentage of level 3 and 4 facilities with backup generators was 76% for church-run facilities and 48% for public facilities. Half of the level 3 and 4 facilities with backup generators reported problems in operating the generator in the previous month.

If supply line and water tanks are considered, all level 5 to 7 facilities and 83% of level 3 and level 4 public health facilities and 84% of level 3 and level 4 church health facilities reported having access to water on the day of the survey. However, less than 10% of level 3 and 4 facilities were connected with water supply lines. Only 45% of level 3 and 4 public facilities had water connection to the delivery room (and water availability on the day of the survey) compared to 72% at church-run facilities.

A significant share of health facilities, 62%, 44% and 38% of level 3 and 4 public, level 3 and 4 church, and level 5 and 6 facilities, respectively, experienced water shortages in 2014. The survey asked facility respondents whether the facility was responsible for maintaining the water supply system and it was observed that about 45% of public level 3-4 facilities were responsible for maintaining the water supply system. The proportions were 64% for church-run level 3 and 4 facilities and 68% for level 5 to 7 facilities.

Both level 3 and 4 public and church-run health facilities show low readiness score for service delivery (Table 1). Readiness indexes were 40.3 for level 3 and 4 public sector facilities, 48.6 for level 3 and 4 church-run facilities, 84.6 for level 5 and 6 facilities, and 100 for the level 7 facility.

Availability of Family Planning Items

Table 2 presents the availability of family planning products and supplies in surveyed health facilities. The availability index of family planning items was 81.6 for level 3 and 4 public sector health facilities, 84.0 for level 3 and 4 church-run facilities, and 88.9 for level 5 and 6 facilities. Non-availability of family planning injections in the level 7 facility reduced the overall index of family planning item availability for the facility to 66.7. Since there is only one facility at level 7, non-availability of even a single item significantly reduces the overall index.

Availability of supplies and equipment for maternity care

A relatively large proportion of health facilities lacked very basic pregnancy and antenatal care related supplies and equipment as shown in Table 3. The index values for the availability of antenatal and pregnancy care items were 71.4 and 81.6 for level 3 and 4 public- and Church-run facilities, respectively. The index was 81.1 for level 5 and 6 facilities and 100 for level 7 facility. The index of availability of obstetric and post-natal care items were worse in level 3 and level 4 facilities, 64.7 and 76.0 respectively for public and church facilities. The index was 89.9 for level 5 and 6 facilities. Although many facilities stated having forceps when asked about availability of instruments for deliveries, it appears that non-obstetric forceps were reported. Health facilities in PNG, in general, do not use forceps for deliveries.

Ability to provide emergency obstetric care services

Table 4 indicates the percent of facilities able to perform different obstetric functions. As mentioned earlier, WHO has defined nine functions to understand the level of obstetric services provided from the facilities. The survey questionnaire combined first three signal functions (capacity to administer parenteral antibiotics, uterotonic drugs, parenteral anticonvulsants) into one and asked the respondents to report if the facility was able to perform all the three functions, two of the three or one of the three functions. Most level 3-4 facilities (about 80%) reported the ability to perform all these three functions. Two facilities at upper levels (levels 5-7) were not able to perform these three basic obstetric functions. One of the upper level facilities in the sample was not fully functional at the time of the survey. Ability to perform the signal functions 1 to 7 defines the "Basic EmOC" provider and table 4 shows that 38% of Church-run level 3-4 facilities and 52% of government-run level 3-4 facilities were BEmOC providers. Even among higher level facilities (levels 5, 6 and 7), 16% of facilities were not able to perform one or more of the necessary functions required to be considered a BEmOC provider.

If the signal functions for comprehensive emergency obstetric care are considered (all nine signal functions), only about 11% of level 3 and 4 health facilities were found to be CEmOC units. About 15% of level 3 and 4 facilities had the capacity to manage a caesarean section or do blood transfusion. Not all level 5 to 7 facilities were CEmOC providers – four of the 19 upper level facilities were not able to perform at least one of the nine signal functions.

Discussion

The overall health facility infrastructural condition in PNG is quite poor. Most facilities reported the need for major building repairs and emphasized the lack of adequate toilets, stable electrical supply, and consistent water supply. Many level 3 and 4 health facilities required better connectivity to electricity and clean water supply. One significant concern is the number of health facilities that did not have running water in the facility's delivery room. The quantity and quality of different types of clinical services provided crucially depends on the facility's readiness to offer services in general. Overall, level 3 and 4 facilities, both public and Church-run, scored low on the

readiness index, implying that these facilities were not very reliable providers of services and patient-confidence in these facilities are likely to be low. The survey also revealed the need for improving the supply of basic medical items at level 3 and 4 public health facilities. Level 3 and 4 public facilities show lower availability of different medical items compared to those in Church-run facilities.

Comparison of health facility readiness across countries is often tricky because of differences in the level and comprehensiveness of facilities in different countries of the world. A World Bank report[22] indicates that 98 percent of public hospitals in Indonesia had electricity; in Laos, the index of basic amenities was reported as 64 percent[23] compared to 58 percent for PNG (weighted mean of the values in table 1).

Access to family planning services is still limited in PNG. The results from the survey are consistent with the most recent findings from the PNG DHS. One quarter of currently married women (26%) have an unmet need for family planning, and only 59% of currently married women are satisfied with family planning services. Among those who have received family planning, about 9 in 10 users obtained their modern family planning supplies from a public (government) source. Therefore, there is an urgent need to strengthen the government health facilities, especially at lower levels, in the provision of family planning items and services to reduce maternal mortality and to improve access to obstetric care services. Several studies found strong positive effect of increased use of family planning on maternal and child mortality.[24-26]

While 79% of level 5 to 7 facilities were found to be CEmOC providers, the fact that about a fifth were not able to provide comprehensive emergency obstetric care is a major concern, given that these are the higher level referral hospitals in PNG. Consistent with the findings of this study, another study using a much smaller sample of facilities, concluded that the "Capacity for essential surgery and anaesthesia services is severely limited in PNG due to shortfalls in physical infrastructure, human resources, and basic equipment and supplies."[16]

The number of level 3 and 4 facilities surveyed for this study was high enough to provide national level estimates on obstetric care availability. Using the proportions of CEmOC facilities at different levels and the total number of facilities in the country at these levels, we have derived the number of facilities providing comprehensive obstetric care in PNG at the time of the survey. The number turns out to be only 50 for the country. Even if we arbitrarily assume balanced geographic distribution of these facilities, an emergency obstetric case will have to travel 53 km each way, on average, to reach a CEmOC facility. The distance to the nearest CEmOC facility is so large that for many emergency cases this is virtually synonymous of not having access to CEmOC. To reduce maternal mortality and morbidity significantly, it is essential to lower the average distance to the nearest CEmOC facility[27] implying that PNG will have to upgrade a significant number of levels 3, 4 and 5 facilities. Using geographic information systems and geographical modelling tools to optimize the location of CEmOC facilities, PNG can identify specific existing facilities to be upgraded.[28]

All facilities at level 3 or above should be able to provide basic EmOC. To improve access to emergency obstetric care, most level 3 and 4 facilities should be considered for immediate upgrading to BEmOC provider or better. The survey of facilities indicated that about 45 percent of levels 3 and 4 facilities were not ready to provide BEmOC. Despite this low readiness, equipping about 15 to 20% of these facilities to perform signal functions 5 and 6 can improve BEmOC availability from 55% of the facilities to about 80%. Although maternal and child health is a priority area, PNG has not allocated enough resources to achieve improved access to maternity and neonatal services. PNG spends more than 4.3% of its GDP on health (about $109 per capita in PPP dollars). Total health expenditure is not low compared to other countries with similar level of per capita income.[29] However, a significant part of health resources, including human resources, particularly doctors, are concentrated in a few major hospitals. Therefore, the resource allocation at the lower level health facilities (level 3 and level 4 facilities) are not sufficient. Reallocation of public sector resources to lower level health facilities are needed to expand access to obstetric care and other preventive services.

To improve availability and access to quality maternity services in PNG, especially in remote rural areas, a program of training and upskilling of Community Health Workers was adopted.[30] Although the upskilling has increased utilization of basic maternity services, significant reductions in maternal mortality will require access to hospital-based obstetric care. Government of PNG may consider allocating funds to facilities, both public and church facilities, based on quantities of priority health services delivered rather than on number and mix of human resources and other administrative needs.[31] While the effectiveness of such performance based financing depend on how the schemes are implemented, evidence in low and middle income countries shows that the performance can be improved through financial incentives.[32] From the demand side, past research has found that providing pregnant women with health vouchers to ensure financial protection for accessing medical care has increased utilization of health services.[33] The payments received through the vouchers will also encourage facilities to become more sensitive to the needs of pregnant women and would have incentives to invest to become fully functional EmOC providers. An initiative in two provinces in PNG that provided incentive packages to pregnant women increased facility-based supervised birth rates by 80%[34] indicating that enhancing facility readiness combined with incentivizing pregnant women to utilize health facilities will be very effective in improving maternal and neonatal health.

Study Limitations

Several limitations of the study should be mentioned here. First, it is not possible to indicate overall geographic access to primary health care services in PNG using the survey data because the study did not collect information from level 1 and 2 health facilities. However, these facilities do not provide obstetric care services although some basic services like family planning and antenatal care can potentially be organized at these levels. Second, the survey, strictly speaking, is not a representative survey of level 3 and 4 facilities. The survey design selected high-demand fully functional level 3 and 4 facilities in target districts and the definition of fully functional led

to the choice of facilities that showed relatively high level of utilization. Therefore, if anything, the results are likely to be significant overestimations of degree of readiness of the facilities in the provision of obstetric care and other related services in PNG. Even with this favorable selection of facilities, the percent of facilities able to perform BEmOC and CEmOC was quite low at levels 3 and 4 implying that the availability of obstetric care services could be significantly worse than what has been reported in this study. Third, the study did not try to connect the service availability and readiness with health outcomes of the population at the subnational level. In PNG, even the national level estimates of mortality and morbidity are considered unreliable and subnational level estimates would suffer from even higher degree of error in estimation. In any case, facility level information clearly indicates that many of the functional facilities are not ready to provide obstetric health services and a significant proportion of facilities lack medical equipment, instruments and supplies for the provision of quality maternity and neonatal services.

Conclusions

Inability of a health facility, irrespective of whether it is a primary, secondary and tertiary care facility, to provide obstetric care and other related services is an important concern for any health care system. It is especially true for a country like PNG where maternal and infant mortalities are high alongside a high fertility rate. Better access and utilization of family planning services can help reduce the demand for EmOC, lower maternal and neonatal mortality/morbidity and improve access to maternity services. Lowering the need for maternity services through interventions like family planning, however, is unlikely to improve access to maternity care significantly in the short-run. Supply-side interventions are necessary to ensure that the services are available in strategically located health facilities. Improving facility infrastructure, equipping the facilities with essential medical equipment and supplies and ensuring the presence of trained personnel in health facilities are needed to make the facilities BEmOC or CEmOC providers. Since the number of facilities in PNG offering EmOC is quite low compared to the needs, all level 3 and 4 facilities should be upgraded to at least the BEmOC level. Survey-based estimates suggest that only 50 facilities in PNG can be considered CEmOC providers and this number is inadequate to ensure equitable access to emergency obstetric cases. Increasing the number of CEmOC providers is urgently needed.

Figure caption

Figure 1. Three components of Donabedian approach of evaluating quality of care

Figure 2. Map of PNG with Districts Visited (green) and Location of Surveyed Facilities

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Table 1. Readiness Index for provision of general clinical services by Facility Level in Papua New Guinea

Readiness indicators	Level 3 and 4				Level 5 and 6		Level 7	
	Public	%	Church	%	*N*	%	*N*	%
Electricity connected to supply grid	10	34%	7	28%	17	94%	1	100%
Backup generator	14	48%	19	76%	18	100%	1	100%
Electricity availability (supply or generator)	20	69%	21	84%	18	100%	1	100%
Blackout last week	8	28%	6	24%	15	83%	0	0
Problem last month running generator due to fuel shortage	8	28%	10	40%	3	17%	0	0
Water from main line	2	7%	3	12%	15	83%	1	100%
Water shortage last year	18	62%	11	44%	7	39%	0	0
Water available for use by health care providers	24	83%	21	84%	18	100%	1	100%
Water available in delivery room	13	45%	18	72%	18	100%	1	100%
Facility does direct blood transfusion	3	10%	3	12%	16	89%	1	100%
Blood transfusions done last month	3	10%	3	12%	18	100%	1	100%
Facility has designated space for clinicians to provide service	20	69%	20	80%	18	100%	1	100%
Facility has on-call room or space for health care providers to take rest	3	10%	11	44%	10	56%	1	100%
Facility has telephone or shortwave radio	14	48%	14	56%	15	83%	1	100%
Facility has ambulance	26	90%	24	96%	17	94%	1	100%
Ambulance out of service last year	11	38%	10	40%	6	33%	0	0
Facility has other vehicles	8	28%	5	20%	18	100%	1	100%
Facility has operation theatre	8	28%	9	36%	18	100%	1	100%
Index of readiness	**40.3**		**48.5**		**84.6**		**100**	

Source: 2015 Survey of health facilities in PNG (survey conducted by this study)

Table 2. Availability of Family Planning Items by Facility Level in Papua New Guinea

Family planning (FP) items	Level 3 and 4 facilities				Level 5 and 6 facilities		Level 7 facilities	
	Public	% of Public	Church	% of Church	Public	% of Level 5 and 6	Public	% of Level 7
Oral pills	26	90%	21	84%	17	94%	1	100%
FP injections	22	76%	22	88%	15	83%	0	0%
Condoms	23	79%	20	80%	16	89%	1	100%
Index of FP items	**81.6**		**84.0**		**88.9**		**66.7**	

Source: 2015 Survey of health facilities in PNG (survey conducted by this study)

Table 3. Availability of Supplies and Equipment for Maternity Care in PNG by Health Facility Level

Antenatal, pregnancy, obstetric and neonatal care related equipment and supplies	Level 3 and 4				Level 5 and 6		Level 7	
	Public	% of Public	Church	% of Church	Public	%	Public	%
Foetal stethoscope (or monitor)	27	93%	25	100%	14	78%	1	100%
Stethoscope and blood pressure cuff	22	76%	25	100%	16	89%	1	100%
Tape measure	23	79%	22	88%	16	89%	1	100%
Scale	28	97%	25	100%	16	89%	1	100%
Ultrasound machine (and gel)	28	97%	25	100%	17	94%	1	100%
Facility has at least two skilled birth attendants covering 24 hours a day	21	72%	19	76%	18	100%	1	100%
Delivery kit (instruments, supplies)	25	86%	25	100%	18	100%	1	100%
Stethoscope	10	34%	11	44%	15	83%	1	100%
Partograph	11	38%	13	52%	14	78%	1	100%
Pelvic procedure instruments such as speculum	18	62%	22	88%	16	89%	1	100%
Delivery light	24	83%	24	96%	18	100%	1	100%
Sterilizer	15	52%	16	64%	13	72%	1	100%
Vacuum extractor	14	48%	21	84%	18	100%	1	100%
Forceps	25	86%	25	100%	18	100%	1	100%
Manual vacuum aspirator/suction bulb	27	93%	25	100%	17	94%	1	100%
Resuscitation bag, newborn	4	14%	4	16%	15	83%	1	100%
Eye drops or ointment for newborn	27	93%	25	100%	18	100%	1	100%
Needles and syringes	28	97%	25	100%	18	100%	1	100%
Sterile C-section instrument kits	28	97%	25	100%	18	100%	1	100%
Cord supplies for newborn: clamps, ties, scissors	2	7%	5	20%	12	67%	1	100%
IV sets, including sterilized needle and tube	27	93%	25	100%	17	94%	1	100%
IV fluids, including normal saline and ringer lactate	29	100%	25	100%	18	100%	1	100%
Index: availability of antenatal and pregnancy care items	**71.41**		**81.60**		**81.11**		**100.00**	
Index: availability of obstetric and neonatal care items	**64.66**		**76.00**		**89.93**		**100.00**	

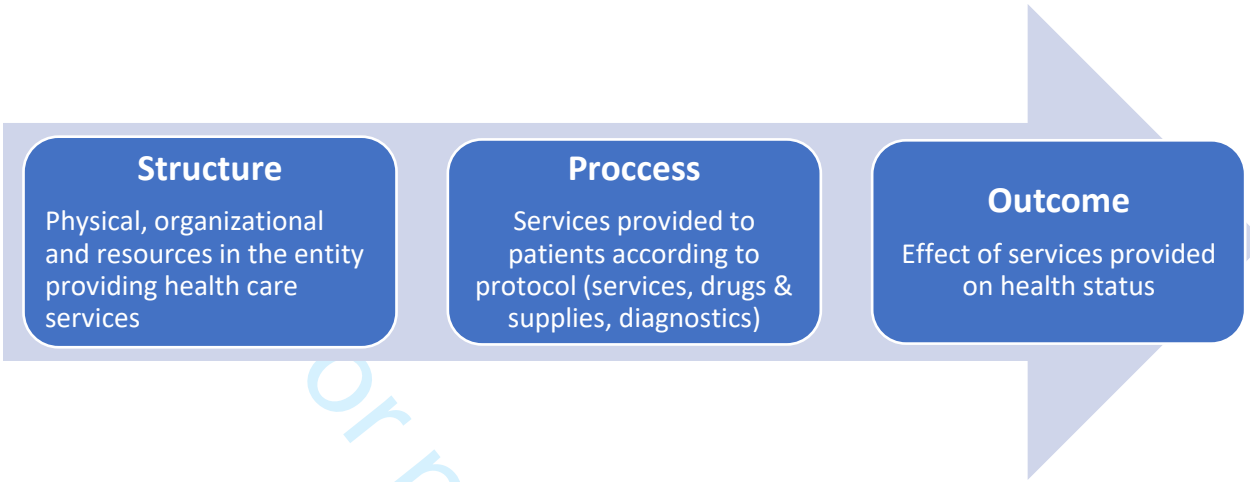
Source: 2015 Survey of health facilities in PNG (survey conducted by this study)

Table 4. Percentage of Health Facilities Able to Perform Signal Functions with Categorization of Facilities into Basic Emergency Obstetric Care and Comprehensive Emergency Obstetric Care Providers

Signal functions for obstetric and neonatal care	Ability to perform	Level 3 and 4 public % (n)	Level 3 and 4 church % (n)	Level 5 to 7 % (n)	Total % (n)
Signal functions 1-3: Have capacity to administer parenteral antibiotics, uterotonic drugs, parenteral anticonvulsants?	Yes, all three	76% (22)	80% (20)	89% (17)	81% (59)
	Yes, two of the three	10% (3)	16% (4)	5% (1)	11% (8)
	Yes, one of the three	3% (1)	4% (1)	0% (0)	3% (2)
Signal function 4: Have the ability for manual removal of placenta?	Yes	72% (21)	88% (22)	95% (18)	84% (61)
Signal function 5: Have ability to remove retained products?	Yes	59% (17)	80% (20)	95% (18)	75% (55)
Signal function 6: Have the capacity to perform assisted vaginal delivery?	Yes	59% (17)	72% (18)	89% (17)	71% (52)
Signal function 7: Have ability to Perform basic neonatal resuscitation	Yes	72% (21)	96% (24)	95% (18)	86% (63)
Signal function 8: Have ability to perform surgery and manage caesarean section	Yes	14% (4)	16% (4)	95% (18)	36% (26)
Signal function 9: Have capacity to do safe blood transfusion	Yes	14% (4)	20% (5)	89% (17)	36% (26)
Ability to perform first seven signal functions	Basic EmOC	38% (11)	52% (13)	84% (16)	55% (40)
Ability to perform all nine signal functions	Comprehensive EmOC	10% (3)	12% (3)	79% (15)	29% (21)

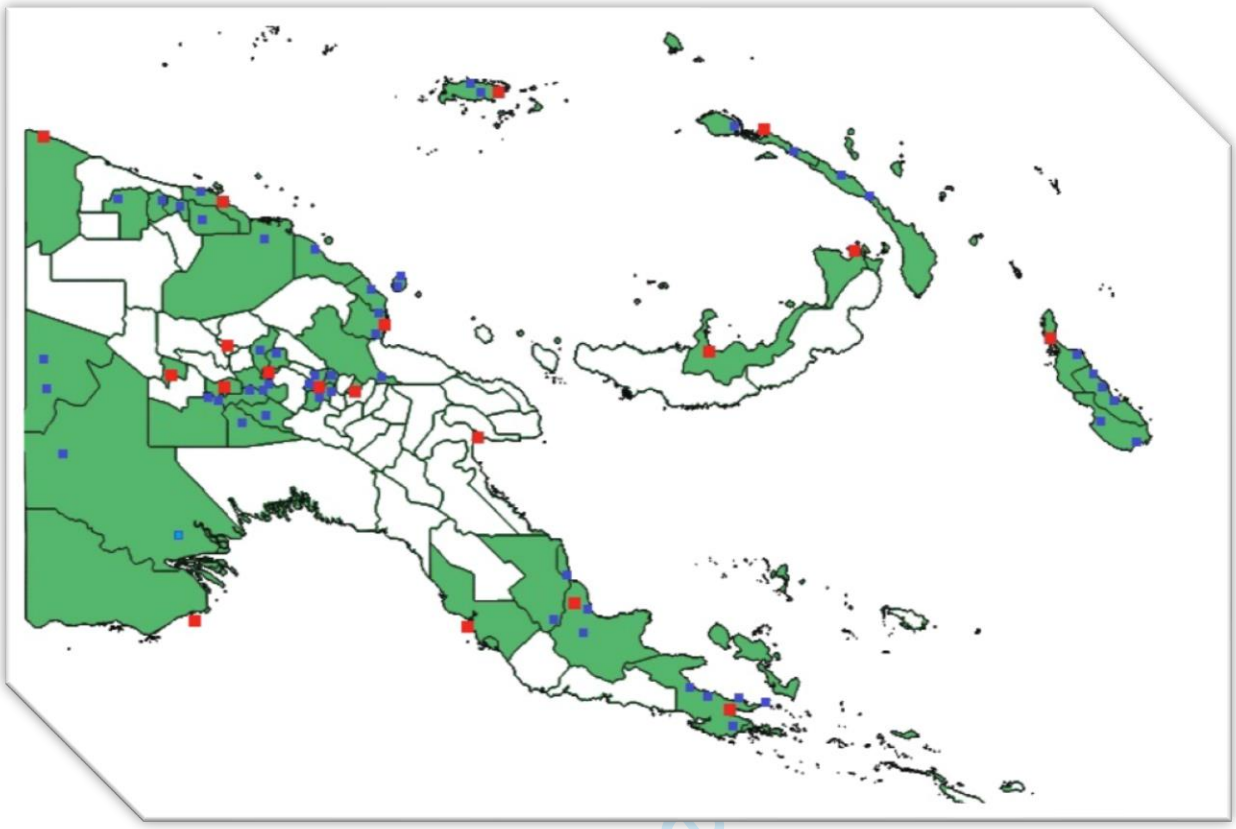
Source: 2015 Survey of health facilities in PNG (survey conducted by this study)

Figure 1. Three components of Donabedian approach of evaluating quality of care



Source: Donabedian (2005)

Figure 2. Map of PNG with Districts Visited (green) and Location of Surveyed Facilities



Note: Red squares represent the level 5 to 7 facilities while the blue squares represent the level 3 to 4 facilities surveyed.

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Readiness of Health Facilities to Provide Emergency Obstetric Care in Papua New Guinea – Evidence from a Cross-Sectional Survey

Readiness of Health Facilities to Provide Emergency Obstetric Care in Papua New Guinea - Evidence from a Cross-Sectional Survey

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Xiaohui Hou: Conceptualization, Methodology, Supervision, Project Administration, Resources, Writing-Original Draft, Writing – review & editing
M. Mahmud Khan: Conceptualization, Methodology, Supervision, Formal Analysis, Writing-Original Draft, Writing – review & editing
Justin Pulford: Conceptualization, Methodology, Data Curation, Data Validation, Writing-Review & Editing.
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Data availability statement

No additional data is available. Researchers interested in 2015 PNG Facility Assessment Survey data can contact the PI of the project, Dr. M. Mahmud Khan, at the email address Mahmud.Khan@uga.edu with a statement on the reasons for requesting the dataset and types of analyses to be conducted.

Abstract

Objective

To measure readiness of health facilities in Papua New Guinea (PNG) to provide obstetric care and other maternal health services.

Design

Cross-sectional study involving random sample of health centers, district/rural hospitals (levels 3 and 4 facilities) and all upper level hospitals operational at the time of survey. Structured questionnaires were used to collect data from health facilities.

Setting

Health facilities in PNG. Facility administrators and other facility personnel were interviewed. Number of facility personnel interviewed was usually one for health centers and two or more for hospitals.

Participants

19 upper-level facilities (levels 5-7, provincial, regional and national hospitals) and 60 lower-level facilities (levels 3 and 4, health centers and district/rural hospitals)

Outcome measures

Four service-types were used to understand readiness of surveyed health facilities in the provision of maternity care including obstetric care services: (1) facility readiness to provide clinical services; (2) availability of family planning items; (3) availability of maternal and neonatal equipment and materials; and (4) ability to provide emergency obstetric care.

Results

56% of lower level facilities were not able to provide Basic Emergency Obstetric Care (BEmOC). Even among higher level facilities, 16% were not able to perform one or more of the functions required to be considered a BEmOC provider. 11% of level 3 and 4 health facilities were able to provide comprehensive emergency obstetric care (CEmOC) as compared to 83% of higher level facilities.

Conclusion

Given the high fertility rate and maternal mortality ratio (MMR) in PNG, lack of BEmOC at the first level inpatient service providers is a major concern. To improve access to EmOC, level 3 and 4 facilities should be upgraded to at least BEmOC providers. Significant reduction in MMR will require improved access to CEmOC and optimal geographic location approach can identify facilities to be upgraded.

Strengths and limitations of this study

- This is the first empirical study that systematically examined availability of maternity care in health facilities in Papua New Guinea (PNG).
- All upper level hospitals and randomly selected fully functional health centers were surveyed.
- The readiness of facilities in the provision of obstetric care and actual provision of services were assessed using relevant indicators and signal functions.
- Service availability and readiness of facilities could not be linked with community level health outcomes.
- The sampling design selected fully functional health centers and district/rural hospitals in each of the surveyed districts implying overestimation of readiness and availability of obstetric care.

Introduction

Effective antenatal, neonatal and Emergency Obstetric Care (EmOC) are highly cost-effective interventions vital to avert common adverse pregnancy and/or birth outcomes, which significantly contribute to maternal mortality in poor resource settings.[1-4] Basic Emergency Obstetric Care (BEmOC) alone can avert a significant proportion of maternal deaths and up to 40% of neonatal deaths.[5] A global assessment found that BEmOC facilities are consistently not available in sufficient numbers in countries with high and moderate levels of maternal mortality.[6] Comprehensive Emergency Obstetric Care (CEmOC) availability, which includes the provision of caesarean and blood transfusion services in addition to the key functions included in BEmOC, is also quite poor in many low and middle income countries.[7]

Maternal and child health remains a key priority area in Papua New Guinea (PNG);[8] however, persistently high maternal and neonatal deaths reflect numerous deficiencies. The estimates of Maternal Mortality Ratio (MMR) in PNG vary considerably. One study by Mola and Kirby estimated the MMR for 2009 using facility-based health information system records and survey data on maternal mortality among unsupervised births from one province. The estimates imply that the average MMR in PNG should be approximately 500 per 100 000 live births.[9 10] The neonatal mortality in PNG is also high, around 28 per 1000 live births.[11] The World Health Organization model ranks PNG 130th in the world in terms of MMR.[12] The 2016-2018 PNG Demographic and Health Survey (DHS), using the sisterhood method, found that the MMR was about 205 per 100,000 live births.[13] Even though new DHS estimate represents a significant improvement from the previous estimate of 733 per 100,000 live births in 2006, the maternal mortality in PNG remains about 24 times the MMR in neighboring Australia.[12] The DHS report also indicates that only 17% of pregnancies received a prenatal visit in the first trimester and 49% had four or more prenatal visits over the whole pregnancy. During 2012-2017, about 55% of deliveries in PNG were supervised by trained health workers at health facilities[13] indicating limited access to modern maternal health care services.

To reduce the MMR in any country, it is important to understand the causes of death so that appropriate interventions can be designed and adopted. In PNG, the maternal mortality registry often does not report causes of death. Reviewing the causes of deaths mentioned in the general death registry and in maternal mortality registry, one study in early 1980s found that the main causes were puerperal sepsis, postpartum hemorrhage, medical and surgical complications, prolonged or obstructed labor, ruptured uterus, deaths associated with caesarean section.[14] It is likely that many of these causes of deaths have remained important even today. Clearly, deaths due to the causes indicated above cannot be avoided without timely access to health facilities that are equipped to provide a range of obstetric care services. A recent article mentioned geographically dispersed population, shortage of health care providers, poverty, gender inequality and low level of education as important determinants of maternal deaths.[15] These aspects are, however, directly related to access to care and readiness of health facilities in the provision of maternity care.

Lifetime risk of maternal death depends on the probability of maternal death per pregnancy and the average number of pregnancies per woman over the reproductive age. The 2016-2018 PNG DHS estimated that total fertility rate (TFR) was about 4.2 per woman, which is slightly lower than the TFR of 4.4 in 2006. Access to obstetric care and lifetime risk of maternal death can be improved by lowering the TFR as well.

Given the critical importance of timely access to appropriate obstetric care, it is essential to assess the ability and readiness of health facilities in the provision of emergency obstetric care in PNG. Due to high TFR of PNG, the demand for maternal health services will continue to increase rapidly, underscoring the urgent need for improving access to care and strengthening maternal healthcare service delivery.

Despite the high social value of maternal and newborn health care services in PNG, no macro-level information is available on the ability or readiness of health facilities in the provision of the services. One recent study assessed the capacity of 21 health facilities in the provision of essential surgery and anesthesia services.[16] No study on PNG, to date, has examined the readiness and ability of health facilities at the national level in the provision of obstetric care services. This study is the first attempt to understand the state of obstetric care availability in PNG.

The principal objective of this study is to measure health facility readiness to provide obstetric care and other maternal health services. Some of the measures reflect not only the readiness of the facilities in the provision of target services but also the quality of services offered. The nationally representative health facility survey allows measurement of various indicators of obstetric care services. These measures will be useful for policy makers to reform the health care delivery system to strengthen the provision of obstetric care and general clinical services.

Methods

Conceptual Framework

We use the Donabedian's framework to analyze the readiness of obstetric care and other related services offered through the health facilities in PNG. In general, the Donabedian's approach is used to evaluate quality of care by analyzing relevant structures, processes and outcomes.[17] The structure measures affect processes and then processes affect outcomes, as shown in figure 1. In this study, our focus is on the evaluation of 'structure' and 'process' measures relevant for maternity care. The structure and process variables help to better understand the ability of health facilities in the provision of different service-types. Although, the impact of service provision cannot be directly measured from the facility survey data, country-level estimates of maternal mortality and morbidity imply relatively poor outcomes indicating the need for improving infrastructure and processes associated with obstetric and other maternity services.

To evaluate the ability and readiness to provide general medical care services including obstetric care, health facilities should have several infrastructural characteristics and resources. Some of the structural measures are quite general, related to the provision of any clinical service, such as

general inpatient services. In addition, specific personnel, supplies and drugs must be available at the facility to be able to offer the right type of services at the right time based on the clinical needs of patients. The structural characteristics, although not directly related to maternity care, are the necessary aspects defining the "readiness" of the facility in the provision of effective health care services. Readiness, however, does not necessarily imply actual provision of services. The infrastructural aspects act as the foundation for the provision of services, and relevant health care resources must be combined with the infrastructure to offer services to patients whenever needed. The process variables reflect ability to offer different types of obstetric care services and functions. The process variables for monitoring obstetric care service provision, the signal functions, are well defined and we will use the facility-level signal functions for understanding the readiness of facilities in PNG.[18]

Study Setting

PNG is remarkably diverse with respect to geography, language, and infrastructure. The country is divided into 22 provinces across four regions (Highlands, Momase and Southern, and the New Guinea Islands). Most of the country's 8 million people live in rural or peri-urban communities and are faced with significant challenges with regard to equitable access to health, education and economic opportunities.

PNG has a government-funded health system throughout much of the country. It is supplemented by government-subsidized health services provided by various Christian missions. Overall, it is estimated that churches provide 47 percent of primary health services, particularly in rural areas.[19]

Health facilities are categorized by the number and cadre of health workers employed and the services they provide and are detailed in the National Health Services Standard (NHSS) of the Government of PNG (GoPNG).[20] The levels of health facilities in PNG are numbered 1 through 7, where levels 1 and 2 provide basic primary health care, specifically outpatient services only. Level 3 health facilities, or health centers, provide outpatient and basic inpatient services for deliveries and minor ailments requiring observation. Level 4 health facilities, district and rural hospitals, provide general admissions, limited clinical support services including basic pharmacy and laboratory services, and depending on the employment of a medical officer, may provide surgical intervention services. Levels 5 to 7 health facilities provide secondary and tertiary health services as well as clinical support services, including pharmacy, laboratory, and radiology. The only level 7 health facility, the Port Moresby General Hospital, is the largest and most advanced health care facility of PNG, employs the largest concentration of health care workers and provides comprehensive health care services.

Survey Design

We conducted a health facility survey of 73 health facilities in PNG in 2015. All operational upper level health facilities (levels 5 to 7) were selected for the survey. At the time of data collection,

PNG had 19 upper-level health facilities and all these 19 facilities were surveyed (although one of the facilities was not fully operational). The upper-level health facilities in the survey included the national referral hospital (Port Moresby General Hospital), three regional hospitals, and 15 provincial hospitals. At the national level, since about half of health centers and district/rural hospitals (levels 3 and 4) were Church-run, the survey design intended to sample equal number of publicly-run and Church-run facilities. For selecting facilities at these two levels, between six (New Guinea Islands) and eight (Southern, Highlands, and Momase) districts were randomly selected per region. The largest government- and Church-administered health facilities (one of each type based on outpatient numbers per annum as reported by the National Health Information System) were purposely selected per district. This sampling procedure allowed selection of 30 publicly run and 30 church-run facilities from the selected districts; however, during field visits, not all selected facilities were found to be operational. Where possible, closed health facilities were replaced by functional ones within the same district. In some districts there were no functional level 3 or 4 facilities, resulting in less than 60 facilities surveyed (N=54). Figure 2 shows the location of the health facilities surveyed for this study. The provinces shaded in green indicate where the survey was carried out. The red squares represent level 5 to 7 health facilities, while the blue squares represent levels 3 and 4.

Survey Procedure

The survey comprised of a health facility assessment and costing instrument as well as interviews with healthcare providers, inpatients, and outpatients. Each instrument is detailed in the survey report.[21] The facility assessment questionnaire can be found in the supplementary file of the article. Briefly, the health facility assessment collected information on various operational aspects of each health facility, while the costing instrument detailed expenditure on human resources, equipment, and consumables utilized for the provision of healthcare services. Both these instruments were completed with health facility managers and administrators. Upper level facilities offered many different types of specialized services and data collection at these levels required interviewing multiple facility personnel. The data collection was done by a team of 5 trained enumerators, who spent three to five days surveying each health facility. In total, 73 health facilities were surveyed.

Informed consents for the survey

For health facility costing and assessment, the survey team requested consent via email from the provincial, district and church health services, depending upon the facility to be surveyed. In addition, consent was requested from the officer in charge of each of the health facilities. The travel plan to the facilities was finalized after the consents were granted. Upon the team's arrival in the facility, the supervisor of the team met the officer in charge to confirm the consent received earlier and to get verbal consent to initiate the interviews.

For interviews with health care workers and patients, informed consent was requested in writing. The interviews were conducted only after the consents were granted. As much as possible, visual

and audible privacy was ensured for the interviews. All interview questionnaires were de-identified by assigning a code number. The code numbers are saved on a secure server at the PNGIMR.

Public Involvement

Stakeholder consultations were involved in the design and early dissemination of this research. During the feasibility stage, priority of research questions, choice of outcome measures, and methods were informed by discussions with stakeholders involving representatives from the National Department of Health, UN agencies, academics and other development partners in PNGs. The preliminary findings were also discussed with representatives from the National Department of Health, Provincial Health Authorities, hospitals and development partners in a stakeholder consultation workshop held in Port Moresby, PNG.

Ethics approval

The study was approved by the PNG Institute of Medical Research (IMR) Institutional Review Board (IRB) and the PNG Medical Research Advisory Committee (MRAC). The following approval numbers were allocated to the study: IRB No. 1414, 7 August 2014; MRAC No 14.26, 10 November 2014.

Outcome measures

The handbook on monitoring emergency obstetric care[18] identified a set of indicators to measure availability, access and provision of EmOC in a country or a region. Two types of measures were defined -the first type focuses on availability, adequate coverage and utilization of services at national or sub-national levels and the second type measures obstetric care related functions performed by health facilities. The functions identified to define the level of EmOC services offered from a health facility are: (1) Administer parenteral antibiotics, (2) Administer uterotonic drugs, (3) Administer parenteral anticonvulsants, (4) Manually remove the placenta, (5) Remove retained products, (6) Perform assisted vaginal delivery, (7) Perform basic neonatal resuscitation, (8) Perform surgery (e.g., caesarean section), and (9) Perform blood transfusion. When a facility can perform all the functions listed under 1-7, it is considered a Basic EmOC (BEmOC) provider while ability to perform all the nine functions defines the comprehensive EmOC (CEmOC) provider. This study has used these nine measures to categorize health facilities as either a BEmOC or a CEmOC. Note that all these signal functions are defined by the ability to perform specific functions pregnant women need at the time of delivery. Ability to perform the functions does not necessarily imply that the facilities actually provided the services in the recent past.

Since this study is based on facility-level survey data, community or patient related health outcome measures are not directly observable. To compensate for this, we have used additional measures to understand readiness of health facilities in the provision of general inpatient care. Availability of basic medical equipment and supplies and physical condition of the facility (infrastructural variables) may affect willingness of clients to utilize services from the facilities.

Another important intervention that may affect the demand for EmOC is the provision of family planning services. Family planning in PNG is expected to reduce total fertility rate implying that need for maternity services should decline with family planning. Therefore, in addition to nine EmOC functions listed above, other outcome variables considered in this analysis are: (a) readiness of facilities to provide clinical services; (b) availability of family planning items; and (c) availability of maternity care related equipment and materials. Availability of drugs and supplies is defined as having the item in stock at the time of the survey.

For the availability of equipment, instruments and supplies, several indexes were calculated to indicate degree of availability of the items. The index values range from 0 to 100, 100 implying that all the items used for the construction of the index were available in all the facilities surveyed.

Calculating readiness or availability index

The analysis has used facility level data to derive the readiness indicators and ability to perform signal functions for each facility in the survey (Stata version 12 was used). The results are presented as descriptive tables (Tables 1-4) to indicate the proportion of facilities having the instruments or able to perform the specific functions.

An equally weighted index was constructed based on the availability of the items included in each of the categories of service delivery. It reflects the percent of all readiness aspects or variables satisfied by the health facilities in a specific category. For example, if a facility reports having an instrument, a value of 1.0 was assigned for the facility for that equipment. The availability index was constructed to show the percent of listed equipment and items available in each of the facility categories. For example, if the family planning items availability index is 65 for level 3 and 4 facilities, it means that the facilities on the average had 65 percent of all the family planning equipment and items considered in the analysis.

Results

Facility readiness to provide clinical services

Table 1 reports facility readiness in the provision of services. As shown, 95% of level 5 to 7 facilities were connected to the main electric supply grid but only about a third of level 3 and 4 facilities. However, more than 80% of all facilities connected to the electric supply experienced blackout at least for some time in the week before the survey. All level 5 to 7 facilities had functional backup generators, while the percentage of level 3 and 4 facilities with backup generators was 76% for church-run facilities and 48% for public facilities. Half of the level 3 and 4 facilities with backup generators reported problems in operating the generator in the previous month.

If supply line and water tanks are considered, all level 5 to 7 facilities and 83% of level 3 and level 4 public health facilities and 84% of level 3 and level 4 church health facilities reported having access to water on the day of the survey. However, less than 10% of level 3 and 4 facilities were connected with water supply lines. Only 45% of level 3 and 4 public facilities had water

connection to the delivery room (and water availability on the day of the survey) compared to 72% at church-run facilities.

A significant share of health facilities, 62%, 44% and 38% of level 3 and 4 public, level 3 and 4 church, and level 5 and 6 facilities, respectively, experienced water shortages in 2014. The survey asked facility respondents whether the facility was responsible for maintaining the water supply system and it was observed that about 45% of public level 3-4 facilities were responsible for maintaining the water supply system. The proportions were 64% for church-run level 3 and 4 facilities and 68% for level 5 to 7 facilities.

Only 3 public (10%) and 3 church (12%) level 3 and 4 health facilities had ability to do direct blood transfusion. Proportion of facilities which could do blood transfusion was much higher, 89% among level 5 and 6 facilities and 100% for level 7. Percentage of health facilities that had operations theatre were much higher. 28% and 36% level of public and church level 3-4 health facilities and all level 5-7 health facilities had at least one operation theatre.

Both level 3 and 4 public and church-run health facilities show low readiness score for service delivery (Table 1). Readiness indexes were 40.3 for level 3 and 4 public sector facilities, 48.6 for level 3 and 4 church-run facilities, 84.6 for level 5 and 6 facilities, and 100 for the level 7 facility.

Availability of Family Planning Items

Table 2 presents the availability of family planning products and supplies in surveyed health facilities. The availability index of family planning items was 81.6 for level 3 and 4 public sector health facilities, 84.0 for level 3 and 4 church-run facilities, and 88.9 for level 5 and 6 facilities. Non-availability of family planning injections in the level 7 facility reduced the overall index of family planning item availability for the facility to 66.7. Since there is only one facility at level 7, non-availability of even a single item significantly reduces the overall index.

Availability of supplies and equipment for maternity care

A relatively large proportion of health facilities lacked very basic pregnancy and antenatal care related supplies and equipment as shown in table 3. The index values for the availability of antenatal care items were 76.9 and 88.6 for level 3 and 4 public- and Church-run facilities, respectively. The index was 87.3 for level 5 and 6 facilities and 100 for level 7 facility. The index of availability of obstetric and neonatal care items were worse in level 3 and level 4 facilities, 70.6 and 80.5 respectively for public and church facilities. The index was 95.52 for level 5 and 6 facilities. The survey also asked about the availability of vacuum extractors and forceps in the facilities for conducting deliveries. It is interesting that 74% of facilities reported having vacuum extractors and 95% reported having forceps although forceps are not used in PNG for deliveries.

Ability to provide emergency obstetric care services

Table 4 indicates the percent of facilities able to perform different obstetric functions. As mentioned earlier, WHO has defined nine functions to understand the level of obstetric services

provided from the facilities. The survey questionnaire combined first three signal functions (capacity to administer parenteral antibiotics, uterotonic drugs, parenteral anticonvulsants) into one and asked the respondents to report if the facility was able to perform all the three functions, two of the three or one of the three functions. Most level 3-4 facilities (about 80%) reported the ability to perform all these three functions. Two facilities at upper levels (levels 5-7) were not able to perform these three basic obstetric functions. One of the upper level facilities in the sample was not fully functional at the time of the survey. Ability to perform the signal functions 1 to 7 defines the "Basic EmOC" provider and table 4 shows that 38% of Church-run level 3-4 facilities and 52% of government-run level 3-4 facilities were BEmOC providers. Even among higher level facilities (levels 5, 6 and 7), 16% of facilities were not able to perform one or more of the necessary functions required to be considered a BEmOC provider.

If the signal functions for comprehensive emergency obstetric care are considered (all nine signal functions), only about 11% of level 3 and 4 health facilities were found to be CEmOC units. About 15% of level 3 and 4 facilities had the capacity to manage a caesarean section or do blood transfusion. Not all level 5 to 7 facilities were CEmOC providers – four of the 19 upper level facilities were not able to perform at least one of the nine signal functions.

Discussion

The overall health facility infrastructural condition in PNG is quite poor. Most facilities reported the need for major building repairs and emphasized the lack of adequate toilets, stable electrical supply, and consistent water supply. Many level 3 and 4 health facilities required better connectivity to electricity and clean water supply. One significant concern is the number of health facilities that did not have running water in the facility's delivery room. The quantity and quality of different types of clinical services provided crucially depends on the facility's readiness to offer services in general. Overall, level 3 and 4 facilities, both public and Church-run, scored low on the readiness index, implying that these facilities were not very reliable providers of services and patient-confidence in these facilities are likely to be low. The survey also revealed the need for improving the supply of basic medical items at level 3 and 4 public health facilities. Level 3 and 4 public facilities show lower availability of different medical items compared to those in Church-run facilities.

Comparison of health facility readiness across countries is often tricky because of differences in the level and comprehensiveness of facilities in different countries of the world. A World Bank report[22] indicates that 98 percent of public hospitals in Indonesia had electricity; in Laos, the index of basic amenities was reported as 64 percent[23] compared to 58 percent for PNG (weighted mean of the values in table 1).

This study showed that the index of availability of family planning supplies in levels 3 and 4 was about 83%. Family planning supplies should be available in all facilities, especially at the lower levels, to ensure uninterrupted access at all times, which is clearly not the case for PNG. In addition, availability of family planning supplies does not necessarily mean utilization of services.

The findings from the most recent PNG DHS survey showed access to family planning services quite limited. One quarter of currently married women (26%) have an unmet need for family planning, and only 59% of currently married women are satisfied with family planning services. Among those who have received family planning, about 9 in 10 users obtained their modern family planning supplies from a public (government) source. Therefore, there is an urgent need to identify potential gaps in the provision and utilization of family planning services to strengthen service provision from the government health facilities, especially at lower levels. Better access and utilization of family planning services can help reduce maternal and child mortality.[24-26]

While 79% of level 5 to 7 facilities were found to be CEmOC providers, the fact that about a fifth were not able to provide comprehensive emergency obstetric care is a major concern, given that these are the higher level referral hospitals in PNG. Consistent with the findings of this study, another study using a much smaller sample of facilities, concluded that the "Capacity for essential surgery and anesthesia services is severely limited in PNG due to shortfalls in physical infrastructure, human resources, and basic equipment and supplies."[16]

The results from the survey can be used to derive national level estimates of obstetric care availability. Using the proportions of CEmOC facilities at different levels and the total number of facilities in PNG at these levels, the total number of facilities ready to provide comprehensive obstetric care was only 50 at the time of the survey in 2015. Even if we arbitrarily assume balanced geographic distribution of these facilities, an emergency obstetric case will have to travel 53 km each way, on average, to reach a CEmOC facility. The distance to the nearest CEmOC facility is so large that for many emergency cases this is virtually synonymous of not having access to CEmOC. To reduce maternal mortality and morbidity significantly, it is essential to lower the average distance to the nearest CEmOC facility[27] implying that PNG will have to upgrade a significant number of levels 3, 4 and 5 facilities. Geographic information systems and geographical modelling tools can help identify the optimal location of CEmOC facilities and existing facilities closest to the optimal locations can be upgraded in the short-run to improve access.[28]

All facilities at level 3 or above should be able to provide basic EmOC. To improve access to emergency obstetric care, most level 3 and 4 facilities should be considered for immediate upgrading to BEmOC provider or better. The survey of facilities indicated that about 45 percent of levels 3 and 4 facilities were not ready to provide BEmOC. Despite this low readiness, equipping about 15 to 20% of these facilities to perform signal functions 5 and 6 can improve BEmOC availability from 55% of the facilities to about 80%. Although maternal and child health is a priority area, PNG has not allocated enough resources to achieve improved access to maternity and neonatal services. PNG spends more than 4.3% of its GDP on health (about $109 per capita in PPP dollars). Total health expenditure is not low compared to other countries with similar level of per capita income.[29] However, a significant part of health resources, including human resources, particularly doctors, are concentrated in a few major hospitals. Therefore, the resource allocation at the lower level health facilities (level 3 and level 4 facilities) are not

sufficient. Reallocation of public sector resources to lower level health facilities are needed to expand access to obstetric care and other preventive services.

To improve availability and access to quality maternity services in PNG, especially in remote rural areas, a program of training and upskilling of Community Health Workers was adopted.[30] Although the upskilling has increased utilization of basic maternity services, significant reductions in maternal mortality will require access to hospital-based obstetric care. Government of PNG may consider allocating funds to facilities, both public and church facilities, based on quantities of priority health services delivered rather than on number and mix of human resources and other administrative needs.[31] While the effectiveness of such performance based financing depend on how the schemes are implemented, evidence in low and middle income countries shows that the performance can be improved through financial incentives.[32] From the demand side, past research has found that providing pregnant women with health vouchers to ensure financial protection for accessing medical care has increased utilization of health services.[33] The payments received through the vouchers will also encourage facilities to become more sensitive to the needs of pregnant women and would have incentives to invest to become fully functional EmOC providers. An initiative in two provinces in PNG that provided incentive packages to pregnant women increased facility-based supervised birth rates by 80%[34] indicating that enhancing facility readiness combined with incentivizing pregnant women to utilize health facilities will be very effective in improving maternal and neonatal health.

Study Limitations

Several limitations of the study should be mentioned here. First, it is not possible to indicate overall geographic access to primary health care services in PNG using the survey data because the study did not collect information from level 1 and 2 health facilities. However, these facilities do not provide obstetric care services although some basic services like family planning and antenatal care can potentially be organized at these levels. Second, the survey, strictly speaking, is not a representative survey of level 3 and 4 facilities. The survey design selected high-demand fully functional level 3 and 4 facilities in target districts and the definition of fully functional led to the choice of facilities that showed relatively high level of utilization. Therefore, if anything, the results are likely to be significant overestimations of degree of readiness of the facilities in the provision of obstetric care and other related services in PNG. Even with this favorable selection of facilities, the percent of facilities able to perform BEmOC and CEmOC was quite low at levels 3 and 4 implying that the availability of obstetric care services could be significantly worse than what has been reported in this study. Third, the study did not try to connect the service availability and readiness with health outcomes of the population at the subnational level. In PNG, even the national level estimates of mortality and morbidity are considered unreliable and subnational level estimates would suffer from even higher degree of error in estimation. In any case, facility level information clearly indicates that many of the functional facilities are not ready to provide obstetric health services and a significant proportion of facilities lack medical equipment, instruments and supplies for the provision of quality maternity and neonatal services.

Conclusions

Inability of a health facility, irrespective of whether it is a primary, secondary and tertiary care facility, to provide obstetric care and other related services is an important concern for any health care system. It is especially true for a country like PNG where maternal and infant mortalities are high alongside a high fertility rate. Improved availability and utilization of family planning services can help reduce the demand for EmOC, lower maternal and neonatal mortality/morbidity and improve access to maternity services. Lowering the need for maternity services through interventions like family planning, however, is unlikely to improve access to maternity care significantly in the short-run. Supply-side interventions are necessary to ensure that the services are available in strategically located health facilities. Improving facility infrastructure, equipping the facilities with essential medical equipment and supplies and ensuring the presence of trained personnel in health facilities are needed to make the facilities BEmOC or CEmOC providers. Since the number of facilities in PNG offering EmOC is quite low compared to the needs, all level 3 and 4 facilities should be upgraded to at least the BEmOC level. Survey-based estimates suggest that only 50 facilities in PNG can be considered CEmOC providers and this number is inadequate to ensure equitable access to emergency obstetric cases. Increasing the number of CEmOC providers is urgently needed.

Figure caption

Figure 1. Three components of Donabedian approach of evaluating quality of care

Figure 2. Map of PNG with Districts Visited (green) and Location of Surveyed Facilities

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Table 1. Readiness Index for provision of general clinical services by Facility Level in Papua New Guinea

Readiness indicators	Level 3 and 4				Level 5 and 6		Level 7	
	Public	%	Church	%	*N*	%	*N*	%
Electricity connected to supply grid	10	34%	7	28%	17	94%	1	100%
Backup generator	14	48%	19	76%	18	100%	1	100%
Electricity availability (supply or generator)	20	69%	21	84%	18	100%	1	100%
Blackout last week	8	28%	6	24%	15	83%	0	0
Problem last month running generator due to fuel shortage	8	28%	10	40%	3	17%	0	0
Water from main line	2	7%	3	12%	15	83%	1	100%
Water shortage last year	18	62%	11	44%	7	39%	0	0
Water available for use by health care providers	24	83%	21	84%	18	100%	1	100%
Water available in delivery room	13	45%	18	72%	18	100%	1	100%
Facility does direct blood transfusion	3	10%	3	12%	16	89%	1	100%
Blood transfusions done last month	3	10%	3	12%	18	100%	1	100%
Facility has designated space for clinicians to provide service	20	69%	20	80%	18	100%	1	100%
Facility has on-call room or space for health care providers to take rest	3	10%	11	44%	10	56%	1	100%
Facility has telephone or shortwave radio	14	48%	14	56%	15	83%	1	100%
Facility has ambulance	26	90%	24	96%	17	94%	1	100%
Ambulance out of service last year	11	38%	10	40%	6	33%	0	0
Facility has other vehicles	8	28%	5	20%	18	100%	1	100%
Facility has operation theatre	8	28%	9	36%	18	100%	1	100%
Index of readiness	**40.3**		**48.5**		**84.6**		**100**	

Source: 2015 Survey of health facilities in PNG (survey conducted by this study)

Table 2. Availability of Family Planning Items by Facility Level in Papua New Guinea

Family planning (FP) items	Level 3 and 4 facilities				Level 5 and 6 facilities		Level 7 facilities	
	# of Public	% of Public	# of Church	% of Church	# of Public	% of Level 5 and 6	# of Public	% of Level 7
Oral pills	26	90%	21	84%	17	94%	1	100%
FP injections	22	76%	22	88%	15	83%	0	0%
Condoms	23	79%	20	80%	16	89%	1	100%
Index of FP items	**81.6**		**84.0**		**88.9**		**66.7**	

Source: 2015 Survey of health facilities in PNG (survey conducted by this study)

Table 3. Availability of Supplies and Equipment for Maternity Care in PNG by Health Facility Level

Antenatal, pregnancy, obstetric and neonatal care related equipment and supplies	Level 3 and 4 facilities				Level 5 and 6 facilities		Level 7 facility	
	# of Public	% of Public	# of Church	% of Church	# of Public	%	# of Public	%
Foetal stethoscope (or monitor)	27	93%	25	100%	14	78%	1	100%
Stethoscope and blood pressure cuff	22	76%	25	100%	16	89%	1	100%
Tape measure	23	79%	22	88%	16	89%	1	100%
Scale	28	97%	25	100%	16	89%	1	100%
Ultrasound machine (and gel)	28	97%	25	100%	17	94%	1	100%
Stethoscope	10	34%	11	44%	15	83%	1	100%
Pelvic procedure instruments such as speculum	18	62%	22	88%	16	89%	1	100%
Index: availability of antenatal care items	**76.85**		**88.57**		**87.30**		**100**	
Delivery light	24	83%	24	96%	18	100%	1	100%
Partograph	11	38%	13	52%	14	78%	1	100%
Sterilizer	15	52%	16	64%	13	72%	1	100%
Vacuum extractor	14	48%	21	84%	18	100%	1	100%
Forceps	25	86%	25	100%	18	100%	1	100%
Manual vacuum aspirator/suction bulb	27	93%	25	100%	17	94%	1	100%
Facility has at least two skilled birth attendants covering 24 hours a day	21	72%	19	76%	18	100%	1	100%
Delivery kit (instruments, supplies)	25	86%	25	100%	18	100%	1	100%
Resuscitation bag, newborn	4	14%	4	16%	15	83%	1	100%
Eye drops or ointment for newborn	27	93%	25	100%	18	100%	1	100%
Needles and syringes	28	97%	25	100%	18	100%	1	100%
Sterile C-section instrument kits	28	97%	25	100%	18	100%	1	100%
Cord supplies for newborn: clamps, ties, scissors	2	7%	5	20%	12	67%	1	100%
IV sets, including sterilized needle and tube	27	93%	25	100%	17	94%	1	100%
IV fluids, including normal saline and ringer lactate	29	100%	25	100%	18	100%	1	100%
Index: availability of obstetric and neonatal care items	**70.57**		**80.53**		**92.52**		**100**	

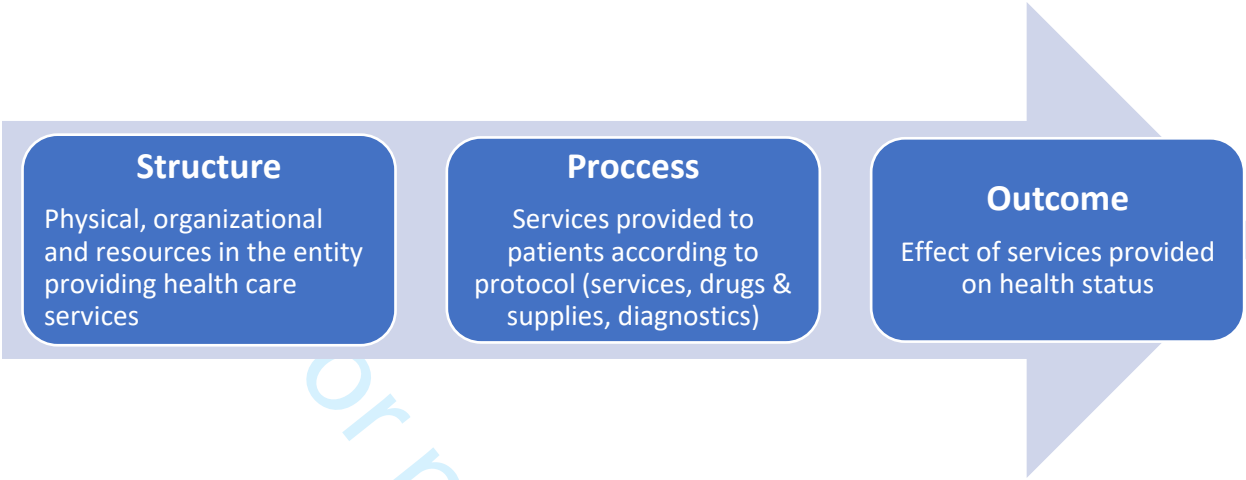
Source: 2015 Survey of health facilities in PNG (survey conducted by this study)

Table 4. Percentage of Health Facilities Able to Perform Signal Functions with Categorization of Facilities into Basic Emergency Obstetric Care and Comprehensive Emergency Obstetric Care Providers

Signal functions for obstetric and neonatal care	Ability to perform	Level 3 and 4 public % (n)	Level 3 and 4 church % (n)	Level 5 to 7 % (n)	Total % (n)
Signal functions 1-3: Have capacity to administer parenteral antibiotics, uterotonic drugs, parenteral anticonvulsants?	Yes, all three	76% (22)	80% (20)	89% (17)	81% (59)
	Yes, two of the three	10% (3)	16% (4)	5% (1)	11% (8)
	Yes, one of the three	3% (1)	4% (1)	0% (0)	3% (2)
Signal function 4: Have the ability for manual removal of placenta?	Yes	72% (21)	88% (22)	95% (18)	84% (61)
Signal function 5: Have ability to remove retained products?	Yes	59% (17)	80% (20)	95% (18)	75% (55)
Signal function 6: Have the capacity to perform assisted vaginal delivery?	Yes	59% (17)	72% (18)	89% (17)	71% (52)
Signal function 7: Have ability to Perform basic neonatal resuscitation	Yes	72% (21)	96% (24)	95% (18)	86% (63)
Signal function 8: Have ability to perform surgery and manage caesarean section	Yes	14% (4)	16% (4)	95% (18)	36% (26)
Signal function 9: Have capacity to do safe blood transfusion	Yes	14% (4)	20% (5)	89% (17)	36% (26)
Ability to perform first seven signal functions	Basic EmOC	38% (11)	52% (13)	84% (16)	55% (40)
Ability to perform all nine signal functions	Comprehensive EmOC	10% (3)	12% (3)	79% (15)	29% (21)

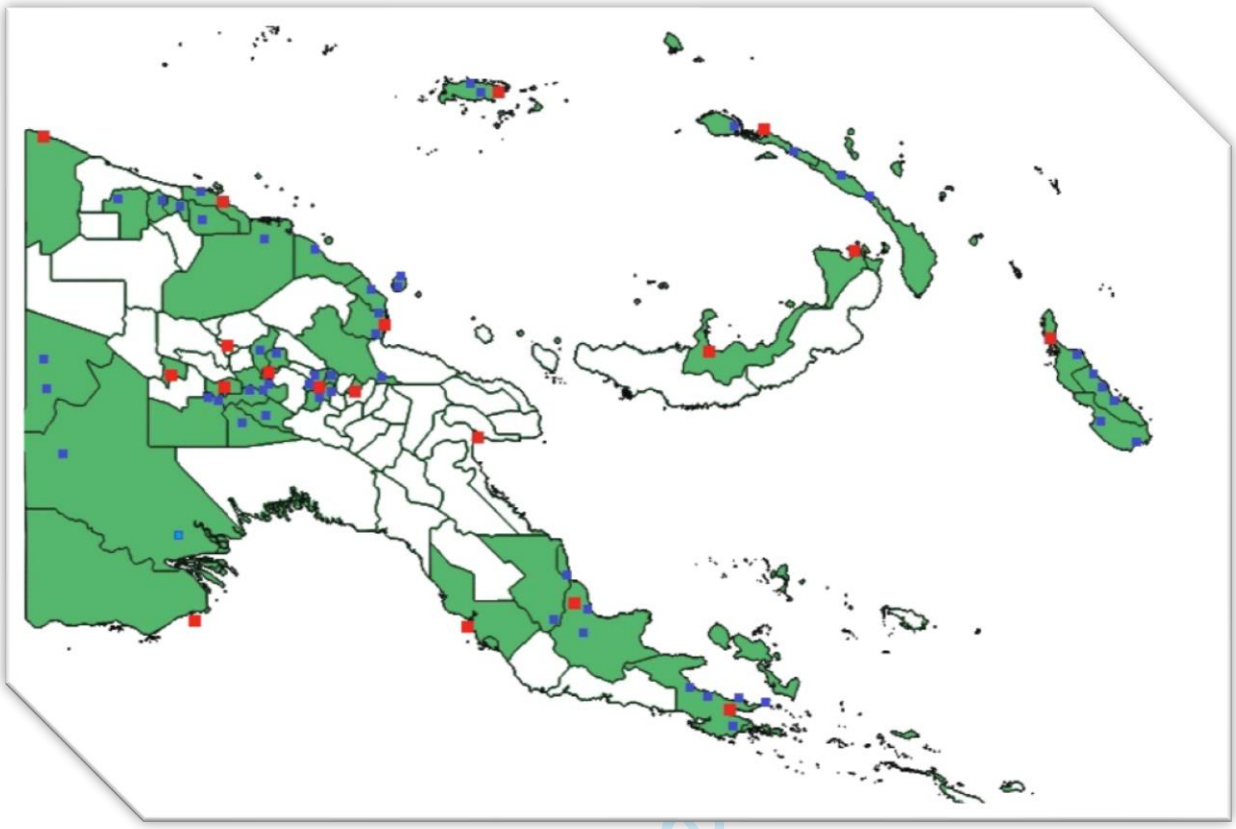
Source: 2015 Survey of health facilities in PNG (survey conducted by this study)

Figure 1. Three components of Donabedian approach of evaluating quality of care



Source: Donabedian (2005)

Figure 2. Map of PNG with Districts Visited (green) and Location of Surveyed Facilities



Note: Red squares represent the level 5 to 7 facilities while the blue squares represent the level 3 to 4 facilities surveyed.

Health Facility Efficiency Study in PNG with a Focus on Secondary Care

Health Facility Assessment 2014

Papua New Guinea Institute of Medical Research,
PO Box 60 Goroka, Papua New Guinea;
University of South Carolina, Columbia, South Carolina, USA;
and Nossal Institute for Global Health, Melbourne, Australia.

Face sheet for Health Facility Assessment

IDENTIFICATION

PROVINCE_____ ☐☐

DISTRICT_____ ☐☐

LOCAL LEVEL GOVERNMENT AREA _____ ☐☐

NAME AND TYPE/ID OF THE FACILITY_____ ☐☐

(HC=03, DLH =04, PH =05, RH=06, NH=07)

OWNERSHIP OF THE FACILITY_____ ☐☐

(PUBLIC =01, CHURCH CATHOLIC =02, CHURCH LUTHERAN=03, CHURCH SDA =04)

NAME AND DESIGNATION OF THE RESPONDENT_____ ☐☐

Consultant =01, OIC/Head Administrator = 02, Medical Officer =03, Dental Officer=04, Health Extension Officer =05, Nurse =06, Midwife=07, Community Health Worker =08, Other Allied Health worker = 09)

SEX OF THE RESPONDENT: MALE 1 FEMALE 2 ☐

Other persons interviewed for information : Name:	Designation (enter code in boxes from above):	
1. _____	1. _____	☐☐
2. _____	2 _____	☐☐
3. _____	3 _____	☐☐
4_____	4 _____	☐☐
5_____	5 _____	☐☐
6_____	6 _____	☐☐

INTERVIEWER VISITS

	1	2	3	FINAL VISIT (DDMMYYYY)
DATE				
INTERVIEWER'S NAME & CODE				CODE ☐☐
RESULT CODE*				RESULT CODE ☐

***RESULT CODES:**1: COMPLETED, 2: REFUSED, 3: PARTLY COMPLETED, 8: OTHER_____ (SPECIFY)

SUPERVISOR	FIELD EDITOR	OFFICE EDITOR	KEYED BY
NAME_____ ☐☐	NAME_____ ☐☐	NAME_____ ☐☐	NAME_____ ☐☐
DATE _____	DATE _____	DATE _____	DATE _____

Start time: Hour |___|___| Minute |___|___|

Section 1. General information

No	Questions and Filters	Coding categories	Response	Skip
101	Name and position of the person interviewed for the survey (transfer information from cover page)	Interviewee name _____ Position _____	☐☐	
102	Type of health facility (transfer information from cover page)	HC……03 DLH……04 PH……05 RH ……06 NH……07 Other_____ _____.....96	☐☐	
103	Ownership of the facility (transfer information from cover page)	Pubic……1 Church Catholic……2 Church Lutheran……3 Church SDA……4	☐	
104	Is there a signboard/sign with the facility name?	Yes……1 No ……2	☐	
105	Is this facility open 24 hours a day, seven days a week?	Yes……1 No ……2	☐	
106	The services available 24/7 from this facility FOR EACH SERVICE, IF AVAILABLE 24 HOURS RECORD "1", OTHERWISE RECORD "2"	A. Inpatient hospital services		
		B. Emergency room services		
		C. Outpatient clinics for adults		
		D. Outpatient clinics for children		
		E. Outpatient clinics for women		
		F. Lab and Diagnostic Services		
		G. Pharmacy Services		
		H. Snake-bite clinic services		
		I. Other Services (specify)_____		
107	How many days in a week the outpatient facility is open on weekdays?	Days	☐	
108	Opening time on Weekdays (Mon-Fri)	Hour : Min	|___|___| : |___|___|	
109	Closing time on Weekdays (Mon-Fri)	Hour : Min	|___|___| : |___|___|	
110	Does this facility provide outpatient services on Saturdays and Sundays?	Only Saturdays……1 Only Sundays……2 Both Saturdays and Sundays……3 Not open on weekends……4	☐	**If 4 ➔113**
111	Opening time on Weekends	Hour : Min	|___|___| : |___|___|	
112	Closing time on Weekends	Hour : Min	|___|___| : |___|___|	
113	Is the facility is connected to electric supply grid?	Yes……1 No ……2	☐	**If 2 ➔117**
114	Is the electricity available 24 hours a day from the grid in a normal week?	Yes……1 No ……2	☐	
115	Was electricity available through the grid all the time during the past one week?	Yes……1 No ……2	☐	
116	In last one week, how many hours the electricity was not available through the grid?	Hours	|___|___|___|	
117	Does the facility have a functional back up or standby generator or electricity?	Yes……1 No ……2	☐	

No	Questions and Filters	Coding categories	Response	Skip
118	Does the facility face problems with operating the backup system/generator due to lack of fuel in last one month?	Yes……1 No ……..……2	☐	
119	What is the health facility's main source of water now?	Piped……1 Water tank (Water stored from supply)…….2 Tube well……3 Bore hole ……4 Protected well ……5 Others (Specify)……..8	☐	
120	If water comes from supply line, how many hours the water is normally available in a day?	Hours	|___|___|	
121	In 2014, has water been available from this source all year?	Yes ……1 No ……2	☐	
122	Are health workers able to use this water source today when treating patients?	Yes ……..1 No ……2	☐	
123	Is the water supply connected to the delivery room and working today?	Yes ……1 No ……..2	☐	
124	If there is a problem with the water supply (fixtures and lines), who is responsible for fixing it?	Province……1 District……2 Church agency……3 This facility……4 Referral health facility ……5	☐	
125	How are expenses for fixing problems with the water supply met?	Request province……1 Request district……2 Own budget……3 Referral health facility ……4	☐	
126	Do you think that the facility has adequate number of toilets?	Adequate……1 Need few additional……..2 Not adequate at all……3	☐	
127	Is there a private pharmacy within walking distance from this facility?	Yes……1 No ……2	☐	
128	How many buildings are used to provide services in the facility?	Number of buildings	☐☐	
129	Total land area of the facility	Land area in decimals	☐☐☐☐	
130	Construction materials used in the construction of the main building of the facility	Cement/brick……1 Tin/other metals/tile……2 Wood…… 3 Leaves/other low-cost materials……4 Others _____.....8	Roof ☐ Wall ☐ Floor ☐	
131	Condition of the infrastructure	Most buildings/ building need major repairs……1 In general, minor repairs needed……..2 Does not require much repairs……..3	☐	
132	Is the land area around the health facility clean?	Yes……1 No ……..2	☐	
133	Is the main building raised?	Yes……1 No ……..2	☐	**If 2 ➔135**
134	How many meters the building is raised?	Meters (MM.M)	|___|___|.|___|	
135	Are there living quarters on campus?	Yes……1 No ……..2	☐	**If 2 ➔137**

No	Questions and Filters	Coding categories	Response	Skip
136	How many families can live on campus (No. of separate quarters)	If more than 98 families, enter 98. Not known= 99	☐☐	
137	Does the facility have a blood bank?	Yes……1 No ……2	☐	
138	Does the health unit have blood transfusion facility?	Yes……1 No ……2	☐	**If 2 ➔140**
139	Were there any blood transfusions done in the last one month?	Yes……1 No ……2 Not applicable……3	☐	
140	Does this facility have designated spaces for each of the doctors/key service providers to provide services after initial triage/examination?	Yes……1 No ……2 Not applicable……3	☐	
141	Is there an on-call room/space where health care professionals can rest during their on-call?	Yes……1 No ……2 Not applicable……3	☐	
142	Does this facility have working telephone or shortwave radio to call outside?	Yes……1 No ……2	☐	
143	Does this facility have ambulances?	Yes……1 No ……2	☐	**If 2 ➔147**
144	How many ambulances does the facility have?	Number	☐☐	
145	Was there any time this year when the ambulance was not in service?	Yes……1 No ……2	☐	
146	If yes, how many ambulances remained out of service and for how long on average over the last one year?	A. How many were out of service even temporarily? B. Average weeks of out-of-service	☐ ☐☐	
147	Does the facility have any other vehicles like cars, motorcycles etc.?	Yes……1 No ……2	☐	**If 2 ➔201**
148	How many vehicles does the facility have?	Car Motorcycles	☐☐ ☐☐	
149	Principal use of vehicles and ambulances in past seven days	Transporting patients to facility……1 Transporting patients from village/local area to facility……2 For use by health facility administrators……3 For conducting outreach service……4 Transporting healthcare providers to the facility..5	Ambulance ☐☐ Cars ☐☐ Motorcycles ☐☐ Boats ☐☐	
150	Who meets the costs for maintenance / servicing of the vehicles?	Province……1 District……2 Own budget……3 Referral health facility ……4	☐	

Section 2.1: Information on each of the buildings

No	Questions/ Items	Responses and codes	Building/ Structure #1	Building/ Structure #2
201	Name of the structure/ building			
202	Principal activities normally performed in the building/ structure	Inpatient services……1 Outpatient services……2 Both inpatient and outpatient……3 Lab/ diagnostic services……4 Administrative offices……5 Not used now……6 Others _____.....8 Specify	☐	☐
203	Total floor space of the building	Floor space in sq meters	|___|___|___|___|	|___|___|___|___|
204	Number of rooms in the structure (not including toilets, closets, hallways)	Number Don't know: 998	|___|___|___|___|	|___|___|___|___|
205	Do windows and doors of the building need repairs?	No repairs needed ……1 Few repairs needed……2 Many repairs needed……3	☐	☐
206	Do interior walls and roof of the building need repairs?	No repairs needed ……1 Few repairs needed……2 Many repairs needed……3	☐	☐
207	Does electric supply system of the facility need repairs?	No repairs needed ……1 Few repairs needed……2 Many repairs needed……3	☐	☐
208	Does water supply system of the facility need repair works?	No repairs needed ……1 Few repairs needed……2 Many repairs needed……3	☐	☐
209	Does toilet (latrine) for clients' use of the facility need repair works?	No repairs needed ……1 Few repairs needed……2 Many repairs needed……3 Not present……4	☐	☐
210	Number of toilets	Number Don't know: 98	|__|__|	|__|__|
211	Are most of the toilets functional?	Yes……1 No ……2	☐	☐
212	Are the toilets clean?	Yes, all the toilets are clean……1 Yes, most of the toilets are clean……2 No, most are not clean……3 No, all are unclean……4	☐	☐
213	How many rooms or areas in the building have water connection?	Number Don't know: 98	|__|__|	|__|__|
214	Are the water outlets are functional in toilet?	Yes……1 No ……2	☐	☐
215	Floor space of waiting rooms/space for clients	Floor space in sq meters	|___|___|___|___|	|___|___|___|___|
216	How many seating spaces are there in waiting rooms/spaces?	Number Don't know: 98	|__|__|	|__|__|
217	Are the waiting areas/rooms clean?	Yes……1 No ……2	☐	☐
218	Floor space of outpatient consultation (not including consultant's offices)	Floor space in sq meters	|___|___|___|___|	|___|___|___|___|

No	Questions/ Items	Responses and codes	Building/ Structure #1	Building/ Structure #2
219	Is there at least one site in the outpatient clinic area where both auditory and visual privacy can be maintained for client services?	Yes……1 No ……2	☐	☐
220	Is the building is accessible to persons with disabilities (e.g., wheel chair ramps, elevators if more than one floor, hand rails etc.)	Yes……1 No ……2	☐	☐
221	Floor space in the emergency department including waiting space	Floor space in sq meters	|___|___|___|___|	|___|___|___|___|
222	Floor space for blood bank, blood donation space, etc.	Floor space in sq meters	|___|___|___|___|	|___|___|___|___|
223	Number of observation beds in the building/ Structure (not including inpatient beds)	Number Don't know: 998	|___|___|___|	|___|___|___|
224	Number of inpatient wards in the building	Number Don't know: 998	|___|___|___|	|___|___|___|
225	Floor space of general adult wards	Floor space in sq meters	|___|___|___|___|	|___|___|___|___|
226	Number of inpatient beds in general adult wards (according to National Medical Standards)	Number Don't know: 998	|___|___|___|	|___|___|___|
227	How many patients are in the general ward today?	Number Don't know: 998	|___|___|___|	|___|___|___|
228	Floor space of pediatric wards	Floor space in sq meters	|___|___|___|___|	|___|___|___|___|
229	Number of inpatient beds in pediatric wards	Number Don't know: 998	|___|___|___|	|___|___|___|
230	Number of beds in pediatric wards (according to National Medical Standards)	Number Don't know: 998	|___|___|___|	|___|___|___|
231	How many patients are in the pediatric ward today?	Number Don't know: 998	|___|___|___|	|___|___|___|
232	Floor space of surgery wards	Floor space in sq meters	|___|___|___|___|	|___|___|___|___|
233	Number of inpatient beds in surgery wards (according to National Medical Standards)	Number Don't know: 998	|___|___|___|	|___|___|___|
234	How many patients are in the surgery ward today?	Number Don't know: 998	|___|___|___|	|___|___|___|
235	Other wards (specify) _____ward	Floor space in sq meters	|___|___|___|___|	|___|___|___|___|
236	Number of inpatient beds in _____ward	Number Don't know: 998	|___|___|___|	|___|___|___|
237	How many patients are in the _____ward today?	Number Don't know: 998	|___|___|___|	|___|___|___|
238	Other wards (specify) _____ward	Floor space in sq meters	|___|___|___|___|	|___|___|___|___|
239	Number of inpatient beds in _____ward	Number Don't know: 998	|___|___|___|	|___|___|___|
240	How many patients are in the _____ward today?	Number Don't know: 998	|___|___|___|	|___|___|___|

No	Questions/ Items	Responses and codes	Building/ Structure #1	Building/ Structure #2
241	Condition of the mattresses on the beds?	Good……1 Not so good/not so bad……2 Bad……3	☐	☐
242	Are there patients on floors in any of the wards or any other areas?	Yes……1 No ……2	☐	☐
243	Are the inpatient areas clean?	Yes……1 No ……2	☐	☐
244	Area of laboratory and diagnostic services including waiting areas	Floor space in sq meters	|___|___|___|___|	|___|___|___|___|
245	Are the lab/diagnostic services areas clean?	Yes……1 No ……2	☐	☐
246	Area used for drug, supply and medical instrument storage	Floor space in sq meters	|___|___|___|___|	|___|___|___|___|
247	Floor space in sq meters used for drug dispensing (if separate from storage)	Floor space in sq meters	|___|___|___|___|	|___|___|___|___|
248	Floor space in sq meters of delivery rooms	Floor space in sq meters	|___|___|___|___|	|___|___|___|___|
249	How many delivery rooms are there in this building?	Number Don't know: 998	|___|___|___|	|___|___|___|
250	Are the delivery rooms equipped with delivery beds, lights, etc.?	Yes……1 No ……2	☐	☐
251	Did the facility deliver babies in last seven days?	Yes……1 No ……2	☐	☐
252	Are the delivery rooms clean?	Yes……1 No ……2	☐	☐
253	Floor space in sq meters of operation theaters	Floor space in sq meters	|___|___|___|___|	|___|___|___|___|
254	How many operation theaters are there in the building?	Number Don't know: 998	|___|___|___|	|___|___|___|
255	Are the operation theaters functional and used regularly?	Yes……1 No ……2	☐	☐
256	Floor space in sq meters used by administrative personnel	Floor space in sq meters	|___|___|___|___|	|___|___|___|___|
257	Floor space in sq meters used by laundry services	Floor space in sq meters	|___|___|___|___|	|___|___|___|___|
258	Floor space in sq meters used by food services and kitchen	Floor space in sq meters	|___|___|___|___|	|___|___|___|___|
259	Floor space in sq meters of cafeteria for employees and clients	Floor space in sq meters	|___|___|___|___|	|___|___|___|___|
260	Meeting and other common areas for the use of facility personnel	Floor space in sq meters	|___|___|___|___|	|___|___|___|___|
261	Floor space used by research projects/ NGOs and other external entities	Floor space in sq meters (EXCLUDE DIRECT PATIENT CARE AREAS)	|___|___|___|___|	|___|___|___|___|
262	Floor space in sq meters used by security personnel	Floor space in sq meters	|___|___|___|___|	|___|___|___|___|
263	Floor space in sq meters used by mortuary	Floor space in sq meters	|___|___|___|___|	|___|___|___|___|
264	How many private rooms are there for inpatient stays?	Number of rooms Don't know: 98	|___|___|	|___|___|
265	How many beds are there in the private rooms?	Number Don't know: 998	|___|___|___|	|___|___|___|
266	Floor space in sq meters used by private rooms	Floor space in sq meters	|___|___|___|___|	|___|___|___|___|

Section 2: Information on each of the buildings (USE ADDITIONAL FORMS IF NEEDED)

No	Questions/ Items	Responses and codes	Building/ Structure #|___|	Building/ Structure #|___|
201	Name of the structure/ building			
202	Principal activities normally performed in the building/ structure	Inpatient services……1 Outpatient services……2 Both inpatient and outpatient……3 Lab/ diagnostic services……4 Administrative offices……5 Not used now……6 Others _____.....8 Specify	☐	☐
203	Total floor space of the building	Floor space in sq meters	|___|___|___|___|	|___|___|___|___|
204	Number of rooms in the structure (not including toilets, closets, hallways)	Number Don't know: 998	|___|___|___|___|	|___|___|___|___|
205	Do windows and doors of the building need repairs?	No repairs needed ……..1 Few repairs needed……2 Many repairs needed……3	☐	☐
206	Do interior walls and roof of the building need repairs?	No repairs needed ……..1 Few repairs needed……2 Many repairs needed……3	☐	☐
207	Does electric supply system of the facility need repairs?	No repairs needed ……..1 Few repairs needed……2 Many repairs needed……3	☐	☐
208	Does water supply system of the facility need repair works?	No repairs needed ……..1 Few repairs needed……2 Many repairs needed……3	☐	☐
209	Does toilet (latrine) for clients' use of the facility need repair works?	No repairs needed ……..1 Few repairs needed……2 Many repairs needed……3 Not present……4	☐	☐
210	Number of toilets	Number Don't know: 98	|___|___|	|___|___|
211	Are most of the toilets functional?	Yes……1 No ……2	☐	☐
212	Are the toilets clean?	Yes, all the toilets are clean……1 Yes, most of the toilets are clean……2 No, most are not clean……3 No, all are unclean……4	☐	☐
213	How many rooms or areas in the building have water connection?	Number Don't know: 98	|___|___|	|___|___|
214	Are the water outlets are functional in toilet?	Yes……1 No ……2	☐	☐
215	Floor space of waiting rooms/space for clients	Floor space in sq meters	|___|___|___|___|	|___|___|___|___|
216	How many seating spaces are there in waiting rooms/spaces?	Number Don't know: 98	|___|___|	|___|___|
217	Are the waiting areas/rooms clean?	Yes……1 No ……2	☐	☐
218	Floor space of outpatient consultation (not including consultant's offices)	Floor space in sq meters	|___|___|___|___|	|___|___|___|___|

No	Questions/ Items	Responses and codes	Building/ Structure #|___|	Building/ Structure #|___|
219	Is there at least one site in the outpatient clinic area where both auditory and visual privacy can be maintained for client services?	Yes……1 No ……..2	☐	☐
220	Is the building is accessible to persons with disabilities (e.g., wheel chair ramps, elevators if more than one floor, hand rails etc.)	Yes……1 No ……..2	☐	☐
221	Floor space in the emergency department including waiting space	Floor space in sq meters	|___|___|___|___|	|___|___|___|___|
222	Floor space for blood bank, blood donation space, etc.	Floor space in sq meters	|___|___|___|___|	|___|___|___|___|
223	Number of observation beds in the building/ Structure (not including inpatient beds)	Number Don't know: 998	|___|___|___|	|___|___|___|
224	Number of inpatient wards in the building	Number Don't know: 998	|___|___|___|	|___|___|___|
225	Floor space of general adult wards	Floor space in sq meters	|___|___|___|___|	|___|___|___|___|
226	Number of inpatient beds in general adult wards (according to National Medical Standards)	Number Don't know: 998	|___|___|___|	|___|___|___|
227	How many patients are in the general ward today?	Number Don't know: 998	|___|___|___|	|___|___|___|
228	Floor space of pediatric wards	Floor space in sq meters	|___|___|___|___|	|___|___|___|___|
229	Number of inpatient beds in pediatric wards	Number Don't know: 998	|___|___|___|	|___|___|___|
230	Number of beds in pediatric wards (according to National Medical Standards)	Number Don't know: 998	|___|___|___|	|___|___|___|
231	How many patients are in the pediatric ward today?	Number Don't know: 998	|___|___|___|	|___|___|___|
232	Floor space of surgery wards	Floor space in sq meters	|___|___|___|___|	|___|___|___|___|
233	Number of inpatient beds in surgery wards (according to National Medical Standards)	Number Don't know: 998	|___|___|___|	|___|___|___|
234	How many patients are in the surgery ward today?	Number Don't know: 998	|___|___|___|	|___|___|___|
235	Other wards (specify) _____ward	Floor space in sq meters	|___|___|___|___|	|___|___|___|___|
236	Number of inpatient beds in _____ward	Number Don't know: 998	|___|___|___|	|___|___|___|
237	How many patients are in the _____ward today?	Number Don't know: 998	|___|___|___|	|___|___|___|
238	Other wards (specify) _____ward	Floor space in sq meters	|___|___|___|___|	|___|___|___|___|
239	Number of inpatient beds in _____ward	Number Don't know: 998	|___|___|___|	|___|___|___|
240	How many patients are in the _____ward today?	Number Don't know: 998	|___|___|___|	|___|___|___|

No	Questions/ Items	Responses and codes	Building/ Structure #|___|	Building/ Structure #|___|
241	Condition of the mattresses on the beds?	Good……1 Not so good/not so bad……2 Bad……3	☐	☐
242	Are there patients on floors in any of the wards or any other areas?	Yes……1 No ……2	☐	☐
243	Are the inpatient areas clean?	Yes……1 No ……2	☐	☐
244	Area of laboratory and diagnostic services including waiting areas	Floor space in sq meters	|___|___|___|___|	|___|___|___|___|
245	Are the lab/diagnostic services areas clean?	Yes……1 No ……2	☐	☐
246	Area used for drug, supply and medical instrument storage	Floor space in sq meters	|___|___|___|___|	|___|___|___|___|
247	Floor space in sq meters used for drug dispensing (if separate from storage)	Floor space in sq meters	|___|___|___|___|	|___|___|___|___|
248	Floor space in sq meters of delivery rooms	Floor space in sq meters	|___|___|___|___|	|___|___|___|___|
249	How many delivery rooms are there in this building?	Number Don't know: 998	|___|___|___|	|___|___|___|
250	Are the delivery rooms equipped with delivery beds, lights, etc.?	Yes……1 No ……2	☐	☐
251	Did the facility deliver babies in last seven days?	Yes……1 No ……2	☐	☐
252	Are the delivery rooms clean?	Yes……1 No ……2	☐	☐
253	Floor space in sq meters of operation theaters	Floor space in sq meters	|___|___|___|___|	|___|___|___|___|
254	How many operation theaters are there in the building?	Number Don't know: 998	|___|___|___|	|___|___|___|
255	Are the operation theaters functional and used regularly?	Yes……1 No ……2	☐	☐
256	Floor space in sq meters used by administrative personnel	Floor space in sq meters	|___|___|___|___|	|___|___|___|___|
257	Floor space in sq meters used by laundry services	Floor space in sq meters	|___|___|___|___|	|___|___|___|___|
258	Floor space in sq meters used by food services and kitchen	Floor space in sq meters	|___|___|___|___|	|___|___|___|___|
259	Floor space in sq meters of cafeteria for employees and clients	Floor space in sq meters	|___|___|___|___|	|___|___|___|___|
260	Meeting and other common areas for the use of facility personnel	Floor space in sq meters	|___|___|___|___|	|___|___|___|___|
261	Floor space used by research projects/ NGOs and other external entities	Floor space in sq meters (EXCLUDE DIRECT PATIENT CARE AREAS)	|___|___|___|___|	|___|___|___|___|
262	Floor space in sq meters used by security personnel	Floor space in sq meters	|___|___|___|___|	|___|___|___|___|
263	Floor space in sq meters used by mortuary	Floor space in sq meters	|___|___|___|___|	|___|___|___|___|
264	How many private rooms are there for inpatient stays?	Number of rooms Don't know: 98	|___|___|	|___|___|
265	How many beds are there in the private rooms?	Number Don't know: 998	|___|___|___|	|___|___|___|
266	Floor space in sq meters used by private rooms	Floor space in sq meters	|___|___|___|___|	|___|___|___|___|

Section 3: Communications between this health facility and a referral facility

No	Questions and Filters	Coding categories	Response	Skip
301	How far is the closest referral facility from this facility?	Kilometers Don't know..... 998 Not applicable..... 999	|___|___|___|	
302	What type of facility is that (the referral facility)?	NH…… ..... 1 RH ..... 2 PH ..... 3 DH ..... 4 Other_____ _____.....9	☐	
303	On the average, how many patients are referred to other facilities in a month from this facility?	Number of patients referred Don't know……..998	|___|___|___|	
304	How long does it take to transfer sick patients to the referral hospital if transported by ambulance (hours and days)	Hours and/or days	|___|___| hours |___|___| days	
305	What is the average cost per trip for the patients, please specify	A. Travel person: _____PNG kina B. Accommodation per person: _____PNG kina C. Per diem per person _____PNG kina	|___|___|___| |___|___|___| |___|___|___|	
306	Do you budget specifically for patient transfers?	Yes ..... 1 No …. 2	☐	
307	Were the referred patients treated at the referral facility?	Yes……..1 No……2 Some, but not all……..3 Don't know……...8	☐	
308	Did the referral facilities refer some of the referred patients to another facility?	Yes……1 No……2 Don't know……8	☐	
309	What is the mode of communication between this facility and the usual referral center?	No formal communication system……1 Only discharge card……2 Telephone or mobile phone……..3 Two Way Radio……4 Other means_____.....9 (specify)	☐	
310	What is the most common form of transport when referring patients?	Using the facility's ambulance/vehicle……1 Using commercially available cars……2 Using vans……3 Using boats……4 Plane/helicopter……5 Other means_____.....9 (specify)	☐	
311	Does a health worker travel with a sick patient to the referral hospital?	Yes ..... 1 No …. 2	☐	
312	Does the referral hospital have to verbally confirm they will accept the patient before they can be transferred?	Yes ..... 1 No …. 2	☐	

Section 4: Repair and Medical Waste Management

No	Questions and Filters	Coding categories	Response	Skip
401	Who should be responsible for ensuring infrastructure maintenance is carried out?	Province…. ….1 District…. ….2 Church agency…. ….3 This facility…. ….4 Referral health facility …. ….5	☐	
402	Is it desirable for other maintenance (i.e. anything other than really simple tasks) being managed at a higher level?	Yes ……1 No ……2	☐	**If 2 ➔404**
403	If yes, by who?	Province…. ….1 District…. ….2 Church agency…. ….3 This facility…. ….4 Referral health facility …. ….5	☐	
404	Who should be responsible for ensuring basic utilities are maintained at the health facility?	Province…. ….1 District…. ….2 Church agency…. ….3 This facility…. ….4 Referral health facility ……5	☐	
405	Comments on repair needs or types of repair problems of the facility:			
	Medical waste treatment Verify use if incinerator use log is available			
406	Is there any incinerator (high temperature) available in the facility?	Available and used…. ….1 Available but not used …. ….2 Not available…. ….3	☐	
407	Is there any incinerator (1 chamber drum/brick) available in the facility?	Available and used…. ….1 Available but not used …. ….2 Not available…. ….3	☐	
408	Is there any burial pit for waste available in the facility?	Available and used…. ….1 Available but not used …. ….2 Not available…. ….3	☐	
409	Is there any system of segregating medical wastes into three colored waste baskets available in the facility?	Available and used…. ….1 Available but not used …. ….2 Not available…. ….3	☐	
410	Disposal practice of sharps (needles, glass, surgical instruments, etc.)	Incinerator ……1 Burn and bury ….2 Bury but do not burn ….3 Burn but do not bury ….4 Put in a covered pit (could be latrine) ….5 Put in an open pit ….6 Store, collect and move offsite ….7 Just throw out in the open ….8 Other _____ ….9 ….	☐	
411	Disposal practice of biomedical wastes (placenta, human body parts, laboratory waste, etc.)	Incinerator ……1 Burn and bury ….2 Bury but do not burn ….3 Burn but do not bury ….4 Put in a covered pit (could be latrine) ….5 Put in an open pit ….6 Store, collect and move offsite ….7 Just throw out in the open ….8 Other _____ ….9	☐	

Section 5: Food Services and Kitchen Area

Food Services and availability				
No	**Questions and Filters**	**Coding categories**	**Response**	**Skip**
501	Do you provide food service to inpatients?	Yes……1 No……2	☐	**If 2 ➔601**
502	Do you charge inpatients any money for food?	Yes ……1 No ……2	☐	
503	How much do you charge for food per person per day?	PGKina. (000 if patients are not charged)	|___|___|___|	
504	What is the cost of food per person per day?	PGKina	|___|___|___|	
505	Number of patients who were served with food yesterday?	Number of patients#	|___|___|___|___|	
506	Is there a protocol for feeding hospitalized infants (<1 year)?	Yes……1 No……2	☐	
507	How many meals are typically provided for infants in 24 hours?	Two to three times……1 Four to five times……2 Six times or more……3	☐	
508	Is the budget allocated for food service enough for buying groceries and other needs for all patients in the facility?	Yes ……1 No……2	☐	
509	Does the facility contract out food services?	Yes, only grocery procurement contracted out…….1 Yes, cooking +other food services contracted out..2 No……3	☐	
510	Is the food prepared on-site or prepared outside the facility?	Prepared in the facility……1 Not prepared in the facility……2	☐	**If 2 ➔601**
511	Is there a chimney or working exhaust fan in cooking area?	Yes …. ……1 No……2	☐	
512	Is soap/detergent present in cooking area for washing hands?	Yes ……1 No……2	☐	
513	Is soap/detergent present for washing pots, pans, plates, utensils	Yes ……1 No……2	☐	
514	Is the kitchen floor clean (no garbage on floor)?	Yes ……1 No……2	☐	
515	Is the wiping cloth used in the kitchen is clean, not smelly?	Yes …. ……1 No……2	☐	
516	Are there signs of cockroach/mice infestation in the kitchen area?	Yes …. ……1 No……2	☐	
517	Do cooking personnel tie hair back and/or wear caps?	Yes …. ……1 No……2	☐	
518	Do cooks wear gloves while handling food?	Yes …. ……1 No……2	☐	
519	Are prepared foods covered?	Yes …. ……1 No……2	☐	

Section 6: Services and other supplies

Section 6.1: Maternal and neonatal care: Antenatal care

	Questions and Filters	Coding categories	Response	Skip
601	Are Antenatal services provided at this facility?	Yes……1 No……2	☐	**If 2 ➔604**
602	How many days in a week the facility provide ANC?	#Days in a week	|___|	
603	Number of antenatal outreach clinics held in the last 3 months?	Number of outreach clinics held Don't know……998	|___|___|___|	
Antenatal clinic equipment and supplies: check to see whether the following items are present and functional in or near the area where antenatal services are provided				
604	Fetal stethoscope (or foetal monitor)	A. Number B. Number Working C. Number regularly used	|___|___| |___|___| |___|___|	
605	Stethoscope and blood pressure cuff	A. Number B. Number Working C. Number regularly used	|___|___| |___|___| |___|___|	
606	Tape measure	A. Number B. Number Working C. Number regularly used	|___|___| |___|___| |___|___|	
607	Scale	A. Number B. Number Working C. Number regularly used	|___|___| |___|___| |___|___|	
608	Ultrasound Machine (and gel)	A. Number B. Number Working C. Number regularly used	|___|___| |___|___| |___|___|	
MATERNAL AND NEONATAL CARE: Deliveries. *Ask the in charge to assist you with questions in this section.*				
609	Does the facility staff assist with deliveries, either in the facility or in the community?	Yes …. .....1 No…. 2	☐	**If 2➔611**
610	Does the facility staff assist with deliveries only in the facility, only in the community, or in both facility and community?	Only in facility .....1 Only in community.....2 Both in facility and community.....3	☐	
611	Does this facility have the capacity to administer antibiotics, oxytocics, and anticonvulsants for delivery of babies?	Yes, can do all of the three ……1 Can do two of the three …. .....2 Can do one of the three ……3 No…. 4	☐	
612	Does this facility have the ability/capacity for manual removal of the placenta?	Yes, can do now …. ..... …1 Usually, but nit now …. ..... …2 Does not have the capacity …. ..... …3	☐	
613	Does this facility have the capacity to remove retained products following miscarriage or abortion?	Yes, can do now …. ..... …1 Usually, but not now …. ..... …2 Does not have the capacity …. ..... …3	☐	
614	Does this facility have the capacity to do assisted vaginal delivery, preferably with vacuum extractor?	Yes, can do now …. ..... …1 Usually, but not now …. ..... …2 Does not have the capacity …. ..... …3	☐	
615	Does the facility have the capacity to provide newborn care?	Yes, can do now …. ..... …1 Usually, but not now …. ..... …2 Does not have the capacity …. ..... …3	☐	
616	Does the facility have the capacity to manage caesarean section?	Yes, can do now …. ..... …1 Usually, but not now …. ..... …2 Does not have the capacity …. ..... …3	☐	

617	Does the facility have the capacity to do safe blood transfusion?	Yes, can do now …. ..... …1 Usually, but not now …. ..... …2 Does not have the capacity …. ..... …3	☐	
618	Does the facility have the capacity to administer anesthesia?	Yes, can do now …. ..... …1 Usually, but not now …. ..... …2 Does not have the capacity …. ..... …3	☐	
619	Does the facility have the capacity to care for sick and low-birth weight newborns, including resuscitation?	Yes, can do now …. ..... …1 Usually, but not now …. ..... …2 Does not have the capacity …. ..... …3	☐	
620	Does the facility have at least two skilled attendants covering 24 hours a day and seven days a week, assisted by trained support staff?	Yes ..... No……..2	☐	
MATERNAL AND NEONATAL CARE: Delivery room equipment and supplies *Check to see whether the following items are present and functional in or near the delivery room.*				
621	Delivery kit (instruments, supplies)	Present and complete..... 1 Present but not complete..... 2 Not present……..3	☐	
check to see whether the following items are present and functional in or near the area where antenatal services are provided				
622	Stethoscope	A. Number B. Number Working C. Number regularly used	|___|___| |___|___| |___|___|	
623	Partograph	A. Number B. Number Working C. Number regularly used	|___|___| |___|___| |___|___|	
624	Pelvic procedure instruments like speculum	A. Number B. Number Working C. Number regularly used	|___|___| |___|___| |___|___|	
625	Delivery light	A. Number B. Number Working C. Number regularly used	|___|___| |___|___| |___|___|	
626	Sterilizer	A. Number B. Number Working C. Number regularly used	|___|___| |___|___| |___|___|	
627	Vacuum extractor	A. Number B. Number Working C. Number regularly used	|___|___| |___|___| |___|___|	
628	Forceps	A. Number B. Number Working C. Number regularly used	|___|___| |___|___| |___|___|	
629	Manual vacuum aspirator/suction bulb	A. Number B. Number Working C. Number regularly used	|___|___| |___|___| |___|___|	
630	Resuscitation bag , newborn	A. Number B. Number Working C. Number regularly used	|___|___| |___|___| |___|___|	
631	Eye drops or ointment for newborn	A. Number B. Number Working C. Number regularly used	|___|___| |___|___| |___|___|	
632	Needles and syringes (10-20 cc)	A. Number B. Number Working C. Number regularly used	|___|___| |___|___| |___|___|	

633	Sterile C-section instrument kits	A. Number B. Number Working C. Number regularly used	|___|___| |___|___| |___|___|	
634	Cord supplies for new born: clamps, ties, scissors	A. Number B. Number Working C. Number regularly used	|___|___| |___|___| |___|___|	
635	IV sets, including sterilized needle and tube	A. Number B. Number Working C. Number regularly used	|___|___| |___|___| |___|___|	
636	IV fluids, including normal saline and ringer lactate	A. Number B. Number Working C. Number regularly used	|___|___| |___|___| |___|___|	
MATERNAL AND NEONATAL CARE: Postpartum Care				
637	Are postpartum care services offered routinely?	Yes, in the facility as part of routine services only…….1 Yes, in the facility as part of routine services and in special clinics…2 NO, not as part of routine services but only in special clinics……3 NO, not offered at this facility.....4	☐	**If 4 ➔645**
Are the following services provided?				
638	Maternal examination & treatment	Yes ..... 1 No…. 2	☐	
639	Breast feeding counseling	Yes ..... 1 No…. 2	☐	
640	Newborn examination & treatment	Yes ..... 1 No…. 2	☐	
641	Growth Monitoring & promotion	Yes ..... 1 No…. 2	☐	
642	Vaccination counseling	Yes ..... 1 No…. 2	☐	
643	Family planning counseling	Yes ..... 1 No…. 2	☐	
644	Treatment of severe malnutrition	Yes ..... 1 No…. 2	☐	

Section 6.2: Protocols, Guidelines and Templates

Ask to see the protocols and guidelines and check to see which of the following are present.

No	Questions and Filters	Coding categories	Response	Skip
645	IMCI chart book or wall chart	Present …. ..... 1 Not Present..... 2	☐	
646	*ARI (NOT PART OF IMCI)*	Present …. ..... 1 Not Present..... 2	☐	
647	*Diagnosis and treatment of diarrhea (NOT PART OF IMCI)*	Present …. ..... 1 Not Present..... 2	☐	
648	*Graphs for growth monitoring*	Present …. ..... 1 Not Present..... 2	☐	
649	Treatment of severe malnutrition	Present …. ..... 1 Not Present..... 2	☐	
650	Tuberculosis diagnosis and treatment	Present …. ..... 1 Not Present..... 2	☐	
651	NHIS guidelines	Present …. ..... 1 Not Present..... 2	☐	

652	Malaria Protocol	Present …. ..... 1 Not Present..... 2	☐	
653	Immunization schedule	Present …. ..... 1 Not Present..... 2	☐	
654	Family planning	Present …. ..... 1 Not Present..... 2	☐	
655	Are patient education materials displayed?	Present …. ..... 1 Not Present..... 2	☐	

Section 6.3: Laboratory tests

Ask to see the protocols and guidelines and check to see which of the following are present.

No	Questions and Filters	Coding categories	Response	Skip
656	Malaria tests (Malaria RDT)	Able to do this test today …. ..... 1 Able to do this test in past 6 months but not today….2 Cannot do this test 3	☐	
657	Does this facility perform laboratory tests other than malaria test?	Yes …. ..... 1 No…. 2	☐	**If 2 ➔670**
658	Anemia testing	Able to do this test today …. ..... 1 Able to do this test in past 6 months but not today….2 Cannot do this test 3	☐	
659	Urine for R/M/E	Able to do this test today …. ..... 1 Able to do this test in past 6 months but not today….2 Cannot do this test 3	☐	
660	Blood Glucose	Able to do this test today …. ..... ….1 Able to do this test in past 6 months but not today….2 Cannot do this test 3	☐	
661	Stool for RE	Able to do this test today …. ..... 1 Able to do this test in past 6 months but not today….2 Cannot do this test 3	☐	
662	HIV Testing	Able to do this test today …. ..... 1 Able to do this test in past 6 months but not today….2 Cannot do this test 3	☐	
663	TB Smears	Able to do this test today …. ..... 1 Able to do this test in past 6 months but not today….2 Cannot do this test 3	☐	
664	Gram Stains	Able to do this test today …. ..... 1 Able to do this test in past 6 months but not today….2 Cannot do this test 3	☐	
665	Blood Typing and cross matching	Able to do this test today …. ..... 1 Able to do this test in past 6 months but not today….2 Cannot do this test 3	☐	
666	Syphilis testing	Able to do this test today …. ..... 1 Able to do this test in past 6 months but not today….2 Cannot do this test 3	☐	
667	Liver function testing	Able to do this test today …. ..... 1 Able to do this test in past 6 months but not today….2 Cannot do this test 3	☐	
668	Pregnancy testing	Able to do this test today …. ..... 1 Able to do this test in past 6 months but not today….2 Cannot do this test 3	☐	
669	Hepatitis	Able to do this test today …. ..... 1 Able to do this test in past 6 months but not today….2 Cannot do this test 3	☐	

Section 6.4: Pharmacy room, drug storage area and supply system

No	Questions and Filters	Coding categories	Response	Skip
670	Is there a separate room/space for drug storage?	Yes ….....1 No …. 2	☐	**If 2 ➔749**
671	Are doors and windows secured in the drug storage area?	Yes ….....1 No…. 2	☐	
672	Drug storage area has ventilation?	Yes ….....1 No…. 2	☐	
673	Are there enough shelves for storing drugs/other supplies (nothing on the floor)?	Yes ….....1 No…. 2	☐	
674	Are the stored items protected from sun?	Yes ….....1 No…. 2	☐	
675	Are the stored items protected from rain?	Yes ….....1 No…. 2	☐	
676	Is/are there functioning refrigerator/s for storing drugs?	Yes ….....1 No…. 2	☐	
677	How many boxes of drugs did you receive in the last six months (Push system)?	Number of Boxes	|___|___|___|	
678	When do you think you might get next batch of boxes (Push system)?	Less than 2 weeks……..1 2 weeks to 1 month……2 1 to 2 months……...3 More than 2 months……4	☐	
679	Currently, do you or your staff order medicines for the health facility?	Yes ….....1 No…. 2	☐	
680	If yes, from where do you order most of the drugs used in the facility?	Referral health facility / Hospital…. ..... …1 Provincial / district health office…..... …2 Area Medical store …..... …3 Provincial Medical Store ……..4 NDoH……5	☐	
681	When did you order drugs last time?	Less than a month ago……..1 1 month to less than 2 months……..2 2 months to less than 3 months……3 3 months to less than 4 months……4 4 months to less than 6 months……5 6 months to less than 9 months……6 9 months to less than 1 year……7 More than 1 year ago……8	☐	
682	Where did you order for the drug last time?	Referral health facility / Hospital…. ..... …1 Provincial / district health office…..... …2 Area Medical store …..... …3 Provincial Medical Store ……..4 NDoH……5	☐	
683	The previous order you received (not the last order), how long it took for the drugs to arrive after the placement of order?	Less than 2 weeks……..1 2 weeks to 1 month……2 1 to 2 months……...3 More than 2 months……4	☐	
684	Do you always get the drugs you ordered?	Yes ….....1 No …. 2	☐	**If 2 ➔691**
685	On average, what percentage of drugs ordered are received?	Percent of drugs ordered received	|___|___|	

686	Who normally makes the collection from the facility?	Community health worker…. ..... …1 Volunteer…..... …2 Nurse…. ..... …3 Brought to the facility by suppliers…. ..... …4	☐	
687	How is the drug delivered to the facility?	Facility gets the drug from medical store/NDoH….1 Medical store/NDoH delivers to the facility…. .. …2 Others deliver to the facility ..... …3	☐	
688	How do you pay the expenses for collecting drugs ordered?	Province…. ..... …1 Own budget…..... …2 Referral health facility …. ..... …3 Others …. ..... …4	☐	
689	How much does it cost (all expenses) on one average pick up?	PNG Kina Don't Know: 99999	|___|___|___|___|	
690	Where did you go last time to collect medical supplies?	Please specify	☐☐	
Medical Supply Kits (Push System)				
691	What month and year did you receive your last round of medical supply kits?	Month Year	|__|__| |__|__|	
692	Were the medical supply kits delivered directly or did the facility pick up the kits?	Delivered ..... …1 Picked up..... …2	☐	
693	List three drugs that you think are more than enough based on needs here in the facility WRITE NAME AND CODE OF THE DRUGS FROM THE SUPPLY KITS DRUG LIST	A_____ B_____ C_____	|___|___|___| |___|___|___| |___|___|___|	
694	List three drugs that you think are not enough based on needs in the facility? WRITE NAME AND CODE OF THE DRUGS FROM THE SUPPLY KITS DRUG LIST	A_____ B_____ C_____	|___|___|___| |___|___|___| |___|___|___|	
Purchased Drugs				
695	Have you purchased additional medicines or medical supplies this year?	Yes …..1 No …. 2	☐	
696	If yes, how did you pay for this purchase?	Request province…. ..... …1 Own budget…. ..... …2 Referral health facility …. ..... …3	☐	
697	How much did you spend on additional drugs in 2014?	PNG Kina	|___|___|___|___|	
698	Are you planning on purchasing additional drugs in 2015?	Yes …..1 No …. 2	☐	

Section 7.1: Availability of Essential Drugs or supplies

SL #	Drug	Question	Response	Question	Response
		Drugs continuously available last 30 days without any stock-outs?	A	Are expired drug present?	B
701	Panadol/ Paracetamol tablet	Yes .....1 No 2	☐	Yes.....1 No .....2 No expiratory date ...3 Drug is not present ...4	☐
702	Paracetamol liquid	Yes .....1 No 2	☐	Yes.....1 No .....2 No expiratory date ...3 Drug is not present ...4	☐
703	Diclofenac (pain/inflammation) capsule or tab	Yes .....1 No 2	☐	Yes.....1 No .....2 No expiratory date ...3 Drug is not present ...4	☐
704	Pethidine	Yes .....1 No 2	☐	Yes.....1 No .....2 No expiratory date ...3 Drug is not present ...4	☐
705	Chloroquine	Yes .....1 No 2	☐	Yes.....1 No .....2 No expiratory date ...3 Drug is not present ...4	☐
706	Quinine Injection	Yes .....1 No 2	☐	Yes.....1 No .....2 No expiratory date ...3 Drug is not present ...4	☐
707	Primaquine	Yes .....1 No 2	☐	Yes.....1 No .....2 No expiratory date ...3 Drug is not present ...4	☐
708	Amodiaquine	Yes .....1 No 2	☐	Yes.....1 No .....2 No expiratory date ...3 Drug is not present ...4	☐
709	Artemisinin combination	Yes .....1 No 2	☐	Yes.....1 No .....2 No expiratory date ...3 Drug is not present ...4	☐
710	Fansidar	Yes .....1 No 2	☐	Yes.....1 No .....2 No expiratory date ...3 Drug is not present ...4	☐
711	Sulfadoxine tab.	Yes .....1 No 2	☐	Yes.....1 No .....2 No expiratory date ...3 Drug is not present ...4	☐
712	Pyrimethamine tab.	Yes .....1 No 2	☐	Yes.....1 No .....2 No expiratory date ...3 Drug is not present ...4	☐

SL #	Drug	Question	Response	Question	Response
		Drugs continuously available last 30 days without any stock-outs?	**A**	**Are expired drug present?**	**B**
713	Rifampicin	Yes .....1 No 2	☐	Yes.....1 No .....2 No expiratory date ...3 Drug is not present ...4	☐
714	Isoniazid	Yes .....1 No 2	☐	Yes.....1 No .....2 No expiratory date ...3 Drug is not present ...4	☐
715	Ethambutol	Yes .....1 No 2	☐	Yes.....1 No .....2 No expiratory date ...3 Drug is not present ...4	☐
716	Pyrazinamide	Yes .....1 No 2	☐	Yes.....1 No .....2 No expiratory date ...3 Drug is not present ...4	☐
717	Streptomycin	Yes .....1 No 2	☐	Yes.....1 No .....2 No expiratory date ...3 Drug is not present ...4	☐
718	TB blister packs	Yes .....1 No 2	☐	Yes.....1 No .....2 No expiratory date ...3 Drug is not present ...4	☐
719	Oxytocin	Yes .....1 No 2	☐	Yes.....1 No .....2 No expiratory date ...3 Drug is not present ...4	☐
720	Ergometrine	Yes .....1 No 2	☐	Yes.....1 No .....2 No expiratory date ...3 Drug is not present ...4	☐
721	Lignocaine	Yes .....1 No 2	☐	Yes.....1 No .....2 No expiratory date ...3 Drug is not present ...4	☐
722	Depo-provera	Yes .....1 No 2	☐	Yes.....1 No .....2 No expiratory date ...3 Drug is not present ...4	☐
723	Ferrous sulphate	Yes .....1 No 2	☐	Yes.....1 No .....2 No expiratory date ...3 Drug is not present ...4	☐
724	Liniment	Yes .....1 No 2	☐	Yes.....1 No .....2 No expiratory date ...3 Drug is not present ...4	☐

SL #	Drug	Question	Response	Question	Response
		Drugs continuously available last 30 days without any stock-outs?	**A**	**Are expired drug present?**	**B**
725	Flagyl/ Metronidazole	Yes .....1 No 2	☐	Yes.....1 No .....2 No expiratory date ...3 Drug is not present ...4	☐
726	Amoxicillin capsule or tablets	Yes .....1 No 2	☐	Yes.....1 No .....2 No expiratory date ...3 Drug is not present ...4	☐
727	Co-trimoxazole oral susp or tablet	Yes .....1 No 2	☐	Yes.....1 No .....2 No expiratory date ...3 Drug is not present ...4	☐
728	Diazepam capsule or tablet	Yes .....1 No 2	☐	Yes.....1 No .....2 No expiratory date ...3 Drug is not present ...4	☐
729	Amitriptyline 25 mg, capsule or tablet (depression medicine)	Yes .....1 No 2	☐	Yes.....1 No .....2 No expiratory date ...3 Drug is not present ...4	☐
730	Paraldehyde	Yes .....1 No 2	☐	Yes.....1 No .....2 No expiratory date ...3 Drug is not present ...4	☐
731	Albendazole tab	Yes .....1 No 2	☐	Yes.....1 No .....2 No expiratory date ...3 Drug is not present ...4	☐
732	Tinidazole tab	Yes .....1 No 2	☐	Yes.....1 No .....2 No expiratory date ...3 Drug is not present ...4	☐
733	Ciprofloxacin capsule or tablet (usually 500 mg)	Yes .....1 No 2	☐	Yes.....1 No .....2 No expiratory date ...3 Drug is not present ...4	☐
734	Crystalline penicillin injection	Yes .....1 No 2	☐	Yes.....1 No .....2 No expiratory date ...3 Drug is not present ...4	☐
735	Ceftriaxone 1g/vial injection	Yes .....1 No 2	☐	Yes.....1 No .....2 No expiratory date ...3 Drug is not present ...4	☐
736	Chloramphenicol injection	Yes .....1 No 2	☐	Yes.....1 No .....2 No expiratory date ...3 Drug is not present ...4	☐

SL #	Drug	Question	Response	Question	Response
		Drugs continuously available last 30 days without any stock-outs?	**A**	**Are expired drug present?**	**B**
737	Mala wan (1)	Yes .....1 No 2	☐	Yes.....1 No .....2 No expiratory date ...3 Drug is not present ...4	☐
738	Captopril, 25 mg, capsule or tab	Yes .....1 No 2	☐	Yes.....1 No .....2 No expiratory date ...3 Drug is not present ...4	☐
739	Atenolol 50 mg, capsule or tablet (Cardiovascular disease drug)	Yes .....1 No 2	☐	Yes.....1 No .....2 No expiratory date ...3 Drug is not present ...4	☐
740	Simvastatin 20 mg, capsule or tablet	Yes .....1 No 2	☐	Yes.....1 No .....2 No expiratory date ...3 Drug is not present ...4	☐
741	Glibenclamide 5mg, capsule or tablet (for diabetes)	Yes .....1 No 2	☐	Yes.....1 No .....2 No expiratory date ...3 Drug is not present ...4	☐
742	Salbutamol tab 4 mg	Yes .....1 No 2	☐	Yes.....1 No .....2 No expiratory date ...3 Drug is not present ...4	☐
743	CMP(Chlorpheniramine maleate) tablet	Yes .....1 No 2	☐	Yes.....1 No .....2 No expiratory date ...3 Drug is not present ...4	☐
744	Omeprazole (capsule or tablet)	Yes .....1 No 2	☐	Yes.....1 No .....2 No expiratory date ...3 Drug is not present ...4	☐
745	ART for HIV/AIDS	Yes .....1 No 2	☐	Yes.....1 No .....2 No expiratory date ...3 Drug is not present ...4	☐

Table 7.2: Availability and Stock-out information of other supplies

SL #		Available for use today (Yes=1, No=2)	Continuously available in the last 30 days without any stock-outs? (Yes=1, No=2)
Family Planning items			
749	Family planning: Oral pills		
750	Family planning Injections		
751	Condoms		
Vaccines and related items			
752	BCG		
753	HEP B		
754	Vitamin A		
755	Sabin		
756	DTP/Hib		
757	Measles		
758	Tetanus Toxoid		
759	Iron tablet or folic acid		
Availability of Kits for Malaria, TB and HIV/AIDS			
760	HIV/AIDS Test Kit		
761	RDT Test kit for Malaria		
762	TB Category 1 kit		
762	TB Category 2 kit		
Other items			
763	ORS for diarrhea		
764	HS Darrows		
765	Oxygen		
766	Baby/scale book		
767	Mother's health book		
768	Quarterly TB report book		
769	Monthly report forms		
770	Health center record books		
771	Daily summary book		

Section 7.3: EPI and Cold Chain

No	Questions and Filters	Coding categories	Response	Skip
772	Does this facility provide EPI services?	Yes ..... 1 No..... 2	☐	**If 2 ➔801**
773	Does this facility provide opportunistic immunizations (i.e., immunization provided when an unimmunized child shows up)?	Yes ..... 1 No..... 2	☐	
774	Are child immunizations regularly given to children at this facility or in outreach EPI activities?	Yes, at facility only ..... 1 Yes, at outreach only ..... 2 Yes, both facilities & outreach 3	☐	**If 1 ➔777**
775	How many EPI outreach activities were conducted in the past 3 months?	Number EPI outreach activities	|___|___|___|	
776	How many children were vaccinated during past three months and what proportion of total children was vaccinated through outreach activities?	A. Total immunized B. % immunize through outreach	☐☐☐ |___|___|__|	
777	How is the main vaccine refrigerator powered?	None ..... 1 Fuel ..... 2 Electric ..... 3 Solar ..... 4 Gas ..... 5 Other ..... 6 *Specify*	☐	**If 1 ➔782**
778	Is the main vaccine refrigerator working?	Yes ..... 1 No 2	☐	
779	Is the main vaccine thermometer present and working?	Yes ..... 1 No 2	☐	
780	Is a temperature log kept	At least twice a day for past 30 days ..... 1 Less than twice a day readings ..... 2 No vaccine log kept 3	☐	**If 1 ➔782**
781	# of days in the past **month** in which refrigerator temp over 8^0C or under 0^0C	Number of days Don't know 98	|___|___|	
782	Are most of the cold boxes/vaccine carriers functional /working?	Almost all working ..... 1 Most not working ..... 2 Do not have 3	☐	
783	Are ice packs present and in good condition?	Present, good condition ..... 1 Present, not good condition ..... 2 Not present 3	☐	
784	Are adequate immunization cards present for at least 30 days? *(Based on estimation by in-charge)*	Yes ..... 1 No 2	☐	

Section 8.1 Health Outreach Patrols

SL No	Questions and Filters	Coding categories	Response	Skip
801	Does this facility conduct outreach patrols in the community?	Yes ..... 1 No 2	☐	**If 2 ➔822**
802	How many health outreach patrols to villages were planned in 2014?	Number of days Don't know 998	|___|___|___|	
803	How many health outreach patrols to villages were conducted in 2014?	Number of days Don't know 998	|___|___|___|	
804	How many for each of the following types conducted in 2014?	A. Maternal and child health (MCH) B. Immunization C. Joint outreach clinics	|___|___|___| |___|___|___| |___|___|___|	
805	If the number conducted is less than the number planned, what are the reasons?	Lack of funds..... …1 Lack of fuel ..... …2 Lack of staff ..... …3 Unwillingness of staff to travel.... ..... …4	☐	
806	How many villages/patrol sites are reached on a typical patrol?	Number Don't know 98	|___|___|	
807	What is the typical average time taken to conduct one patrol? i.e., how long are health workers normally away from the facility at a time.	Half day..... …1 One day ..... …2 Two days ..... …3 Three days..... …4 More than three days..... …5	☐	
808	Do health workers receive an allowance to go out on patrol?	Yes ..... No 2	☐	
809	If yes, how much per typical patrol?	PNG Kina Don't know 998	|___|___|___|___|	
810	Are porters / volunteers / casual health staff used to help this facility carry out patrols?	Yes ..... 1 No 2	☐	
811	Is the health information gathered from conducting a patrol incorporated into monthly reporting for this health facility?	Yes ..... No 2	☐	
812	What proportion of total catchment population is served either through the facility or the outreach patrols in a quarter?	Almost all served ..... 1 Majority served ..... 2 More than quarter served ..... 3 Less than quarter served ..... 4 None served 5	☐	
813	What proportion of total catchment population do you think live in "remote areas" (at least a day's walk from an operational road)?	% of population	|___|___|___|	
814	What proportion of the "remote areas" population covered?	% of population	|___|___|___|	
815	Do you receive support and involvement from 'higher levels' (i.e. hospitals, district health office) such as doctors, specialists accompanying you on patrols?	Yes ..... No 2	☐	

SL No	Questions and Filters	Coding categories	Response	Skip
816	If yes, please specify the designation of that personnel RECORD 1 IF THE PERSONNEL ACCOMPANIED AND 2 IF NOT ACCOMPANIED	A. Doctor		
		B. Specialist		
		C. Administrators/ Managers		
		D. Other health personnel		
		E. Security personnel		
		F. Other_____ Specify		
817	In your opinion, has the system of conducting regular outreach patrols to rural and remote communities in the past five years gotten better, worse or stagnated?	Better.....1 Stagnated.....2 Worse.....3	☐	
818	The reasons for this change over the last five years RECORD 1 IF THE REASON IS MENTIONED AND 2 IF NOT MENTIONED	A. Availability of funds		
		B. Availability of transportation		
		C. Availability of staff		
		D. Weather		
		E. Unrest		
		F. Other_____ Specify		
819	If a health patrol finds very sick patients in remote areas, what action is normally taken?	Ask community for help ..... …1 Call health centre..... …2 Report back to health facility. ..... …3 Other, specify. ..... …4	☐	
820	Do you have the means to respond immediately to the health emergency?	Yes ..... 1 No 2	☐	**If 2 ➔822**
821	How do you respond to health emergencies RECORD 1 IF THE WAY IS MENTIONED AND 2 IF NOT MENTIONED	A. Call ambulance or vehicle to transport patient		
		B. Call specialist from the local hospital		
		C. Inform emergency situation to NDOH		
		D. Other_____ Specify		

Section 8.2: Administration and management

SL No	Questions and Filters	Coding categories	Response	Skip
822	How many health care providers arrived at the facility on time today (+/- 10 minutes)	Number of days Don't know.....9998	|___|___|___|___|	
823	How many HEOs, nurses, midwives, and CHWs arrived on time at the facility today?	Number of days Don't know.....9998	|___|___|___|___|	
824	How many doctors are present now? RECORD "98" FOR THE NUMBER IF NOT KNOWN	A. Time now: Hour and Minute C. Number present:	|___|___| |___|___| |___|___|	
825	Are there enough official registers, stationery and other supplies?	Yes .....1 No.....2	☐	
826	Are there enough forms for the admission and discharge?	Yes .....1 No.....2 Not applicable.....2	☐	
827	How many meetings of the facility staff were held in past three months?	Number Don't know.....98	|___|___|	
828	Is there a Hospital/facility community advisory committee/Village Health Committees in this area?	Yes.....1 No.....2	☐	**If 2 ➔831**
829	How many meetings of the Hospital/facility community advisory committee were held in past three months?	Number held in past year Don't know.....998	|___|___|___|	
830	Does the facility have written records of activities carried out by the Hospital/facility community advisory committee?	Yes .....1 No.....2	☐	
831	Is there an asset registry (equipment and furniture inventory)? *Ask to see the inventory; if health staff report having list but do not show it to you, circle 4.*	Yes.....1 Present, not complete.....2 Not present..... 3 Staff report having inventory but do not show it to surveyor 4	☐	
832	When was the last time inventory updated?	Within last one month.....1 With last three months.....2 Within last six months.....3 More than six months ago.....4	☐	
833	Did the health facility have to close for any reason this year?	Yes .....1 No 2	☐	**If 2 ➔835**
834	If yes, how long and the reason for disruption in operations.	A. Days remaining closed last year: B. Reason (please specify):_____	|___|___|___| ☐☐	

Section 8.3: Supervision

SL No	Questions and Filters	Coding categories	Response	Skip
835	Is there at least one officially assigned external supervisor for this health facility?	Yes……1 No……2	☐	**If 2 ➔838**
836	What are the designations of the supervisors who visited the health facility in the last one year and how many times did they visit? RECORD THE NUMBER OF VISITS FOR EACH KIND OF SUPERVISOR IN RESPONSE COLUMN AND RECORD 00 IF NO SUPERVISION DONE BY THAT TYPE OF PERSONNEL	A. Doctor B. PHO C. DHA D. PDCO E. Maternal and Child Health F. Church Health Secretary G. Other_____ Specify		
837	What were the purpose/ reasons for latest supervisor's visit? RECORD 1 IF THE REASON MENTIONED AND 2 IF NOT MENTIONED	A. Overall activities in the facility B. Drug Storage and Distribution C. Auditing the finance D. Maternal/Child health Services E. Immunization program F. Other_____ Specify		
838	Does a doctor work at this health facility?	Yes.....1 No ……2	☐	**If 1 ➔840**
839	If no, how many times has a doctor visited this health facility in 2014?	Number Don't know……998	|___|___|___|	
840	Does a Health Extension Officer work at this health facility?	Yes……1 No ……2	☐	**If 1 ➔842**
841	If no, how many times did a Health Extension Officer (HEO) visit this health facility in 2014?	Number Don't know……998	|___|___|___|	
842	Does this health facility supervise aid posts / sub-health centers?	Yes ..... 1 No……..2	☐	**If 2 ➔844**
843	If yes, how many?	Number Don't know……..998	|___|___|___|	
844	How many supervisory visits were made to these clinics in 2014?	Number Don't know……..998	|___|___|___|	
845	How are the costs for supervisory visits paid for at the health facility?	Request province……1 Request district……2 Own budget……3 Referral health facility ……4	☐	
846	Are any other tasks carried out in conjunction with conducting supervisory visits? RECORD 1 IF THE TASK MENTIONED AND 2 IF NOT MENTIONED	A. Consultation to patients B. MCH services C. Care in Well baby Clinic D. Immunization services E. Other_____ Specify		
847	Were recommendations written in a supervision book from last supervision?	Book present, recommendations written…….1 Book present, No recommendations……2 No book……3	☐	

Section 8.4: Autonomy [Respondent: Health Facility Manager only]

SL No	Questions and Filters	Coding categories	Response	Skip
848	What authority do you have to make decision on expenditure of funds provided to your facility? RECORD 1 IF THE DECISION MENTIONED AND 2 IF NOT MENTIONED	A. Total amount to be spent		
		B. Reallocation of money within same category		
		C. Reallocation between exp categories		
		D. Months in which expenditures can be made		
		E. Can sign cheques to pay suppliers and other vendors		
849	Do you need preapprovals for exercising the authorities you have related to fund allocation?	Yes ..... 1 No 2	☐	
850	What authority do you have in decisions related to facility personnel? RECORD 1 IF THE DECISION MENTIONED AND 2 IF NOT MENTIONED	A. Disciplinary action/reporting for poor performance		
		B. Identify needs for additional / new staff		
		C. Hiring of new staff		
		D. Determine level of payment for staff		
		E. Allocating tasks/duties to existing staff		
		F. Commending staff for good performance		
		G. Promoting staff to higher position		
		H. Dismissal of staff		
		I. Other_____ Specify		
851	Do you need preapprovals for exercising the authorities you have related to fund allocation?	Yes ..... 1 No 2	☐	
852	What authority do you have in decisions on the type/organizations of service provision? RECORD 1 IF THE DECISION MENTIONED AND 2 IF NOT MENTIONED	A. Planning the schedule of services		
		B. Changing the content of services delivered		
		C. Quality of services		
		D. Operating procedures		
		E. Procedures for accessing services		
		F. Charges for services		
		G. Addition of new services		
		H. Other_____ Specify		
853	For each area of authority: are you satisfied with the level of authority you have?	Yes ..... 1 No 2	☐	
854	If not what type of authority you think you need for improving performance of the health facility? RECORD 1 IF THE AUTHROITY MENTIONED AND 2 IF NOT MENTIONED	A. Authority to generate revenue for facility		
		B. Authority to allocate budget		
		C. Authority to hire and fire staff		
		D. Authority to give reward/punishment		
		E. Authority to plan		
		F. Authority of quality assurance		
		G. Other_____ Specify		

Section 8.5: Barriers to managing facility

856	What are the three main constraints you face in managing this facility effectively?	*1.* *2.* *3.* No problem 9	
857	Please identify three ways in which the government or your organization could help you do your job better.	*1.* *2.* *3.* No problem 9	
858	Suggest three ways of better involving the community with the health facility activities.	*1.* *2.* *3.* No problem 9	

Section 8.6: Facility health information systems

Review records for the last completed month.		*Record the appropriate number in the "Response" column*					*Response*
		1. Do not provide the service, no register	**2. Register Present, fully completed**	**3. Register Present, not fully completed**	**4. Report having but did not show it to surveyor**	**5. Not present**	
859	ANC register	1	2	3	4	5	
860	Delivery/maternity register	1	2	3	4	5	
861	OT register	1	2	3	4	5	
862	Blood bank register	1	2	3	4	5	
863	HIV Register	1	2	3	4	5	
864	TB Register	1	2	3	4	5	
865	Hospital activity report	1	2	3	4	5	
866	EPI report	1	2	3	4	5	
867	Family Planning report	1	2	3	4	5	
868	Leprosy report	1	2	3	4	5	
869	Lab register	1	2	3	4	5	
870	Morbidity/ Mortality report	1	2	3	4	5	
871	Malaria, Kala-azar report	1	2	3	4	5	
872	Notifiable Disease report	1	2	3	4	5	
873	IMCI report	1	2	3	4	5	
874	Equipment status report	1	2	3	4	5	
875	Other _____	1	2	3	4	5	
876	Other _____	1	2	3	4	5	
877	Other _____	1	2	3	4	5	
878	Other _____	1	2	3	4	5	
879	Other _____	1	2	3	4	5	

Section 9: Number of cases by disease or medical conditions for the latest month (based on the latest Health Center Monthly Summary Report available)

SL #	Question or items	Response instructions	Record Response	Skip
901	Does the facility have monthly reports available for review (either from facility or elsewhere)?	Yes……..1 No……..……2	☐	If 2 ➔904
902	The month and year of latest monthly report available in the facility or obtained from upper administrative level	Month (MM) and Year (YY)	☐☐ ☐☐	
903	Is the latest monthly report complete?	All fields are recorded/completed…….1 Most of the fields completed……2 Most of the fields not completed……..3 Only very few items are recorded……..4	☐	

Table 9.1: Outpatients (from monthly report)

SL No	Diseases	Male (Number of cases)	Female (Number of cases)
		A	B
904	Measles (suspected)	|___|___|___|___|___|	|___|___|___|___|___|
905	Pertussis	|___|___|___|___|___|	|___|___|___|___|___|
906	Simple cough	|___|___|___|___|___|	|___|___|___|___|___|
907	Pneumonia (<1 year)	|___|___|___|___|___|	|___|___|___|___|___|
908	Pneumonia (1-4 yrs)	|___|___|___|___|___|	|___|___|___|___|___|
909	Pneumonia (5 yrs+)	|___|___|___|___|___|	|___|___|___|___|___|
910	Chronic Obstructive Pulmonary Diseases	|___|___|___|___|___|	|___|___|___|___|___|
911	Asthma	|___|___|___|___|___|	|___|___|___|___|___|
912	Other upper respiratory tract infections	|___|___|___|___|___|	|___|___|___|___|___|
913	Diarrhea (<1 year)	|___|___|___|___|___|	|___|___|___|___|___|
914	Diarrhea (1-4 yrs)	|___|___|___|___|___|	|___|___|___|___|___|
915	Diarrhea (5 yrs+)	|___|___|___|___|___|	|___|___|___|___|___|
916	Malaria (<1 year)	|___|___|___|___|___|	|___|___|___|___|___|
917	Malaria (1-4 yrs)	|___|___|___|___|___|	|___|___|___|___|___|
918	Malaria (5 yrs+)	|___|___|___|___|___|	|___|___|___|___|___|
919	Malaria (Pregnant women)		|___|___|___|___|___|
920	Pyrexia (Fever) of unknown cause (PUO)	|___|___|___|___|___|	|___|___|___|___|___|
921	Anaemia	|___|___|___|___|___|	|___|___|___|___|___|
922	Malnutrition (<1 yr)	|___|___|___|___|___|	|___|___|___|___|___|
923	Malnutrition (1-4 yrs)	|___|___|___|___|___|	|___|___|___|___|___|
924	Accident /injuries	|___|___|___|___|___|	|___|___|___|___|___|
925	Genital ulcers	|___|___|___|___|___|	|___|___|___|___|___|
926	Urethral discharge	|___|___|___|___|___|	
927	Vaginal discharge		|___|___|___|___|___|
928	Pelvic Inflammatory Disease		|___|___|___|___|___|
929	Genital warts	|___|___|___|___|___|	|___|___|___|___|___|
930	Latent syphilis (blood test)	|___|___|___|___|___|	|___|___|___|___|___|
931	Other STI	|___|___|___|___|___|	|___|___|___|___|___|

SL No	Diseases or medical conditions	Male (Number of cases)	Female (Number of cases)
		A	B
932	Pulmonary TB suspect	|___|___|___|___|___|	|___|___|___|___|___|
933	Pulmonary TB confirmed by sputum test	|___|___|___|___|___|	|___|___|___|___|___|
934	Leprosy	|___|___|___|___|___|	|___|___|___|___|___|
935	Yaws	|___|___|___|___|___|	|___|___|___|___|___|
936	Other skin diseases	|___|___|___|___|___|	|___|___|___|___|___|
937	Ear infections (including both middle and outer ear infections)	|___|___|___|___|___|	|___|___|___|___|___|
938	Eye infections	|___|___|___|___|___|	|___|___|___|___|___|
939	All other new cases	|___|___|___|___|___|	|___|___|___|___|___|

Table 9.2: Inpatients (Number of discharges from monthly report)

SL No	Diseases or medical conditions	Male (discharges)	Female (discharges)
		A	B
940	Diphtheria	|___|___|___|___|___|	|___|___|___|___|___|
941	Neonatal Tetanus	|___|___|___|___|___|	|___|___|___|___|___|
942	Acute Flaccid Paralysis	|___|___|___|___|___|	|___|___|___|___|___|
943	Measles (suspected)	|___|___|___|___|___|	|___|___|___|___|___|
944	Pertussis	|___|___|___|___|___|	|___|___|___|___|___|
945	Neonatal sepsis	|___|___|___|___|___|	|___|___|___|___|___|
946	Pneumonia (<1 year)	|___|___|___|___|___|	|___|___|___|___|___|
947	Pneumonia (1-4 yrs)	|___|___|___|___|___|	|___|___|___|___|___|
948	Pneumonia (5 yrs+)	|___|___|___|___|___|	|___|___|___|___|___|
949	Chronic Obstructive Pulmonary Diseases	|___|___|___|___|___|	|___|___|___|___|___|
950	Asthma	|___|___|___|___|___|	|___|___|___|___|___|
951	Other respiratory	|___|___|___|___|___|	|___|___|___|___|___|
952	Diarrhea (<1 year)	|___|___|___|___|___|	|___|___|___|___|___|
953	Diarrhea (1-4 yrs)	|___|___|___|___|___|	|___|___|___|___|___|
954	Diarrhea (5 yrs+)	|___|___|___|___|___|	|___|___|___|___|___|
955	Malaria (Clinical diagnosis) (0-4 years)	|___|___|___|___|___|	|___|___|___|___|___|
956	Malaria (Clinical diagnosis) (5-14 years)	|___|___|___|___|___|	|___|___|___|___|___|
957	Malaria (Clinical diagnosis) (15 yrs+)	|___|___|___|___|___|	|___|___|___|___|___|
958	Malaria (Clinical diagnosis) (Pregnant)		|___|___|___|___|___|
959	Malaria (Slide or RDT diagnosis) (0-4 years)	|___|___|___|___|___|	|___|___|___|___|___|
960	Malaria (Slide or RDT diagnosis) (5-14 years)	|___|___|___|___|___|	|___|___|___|___|___|
961	Malaria (Slide or RDT diagnosis) (15 yrs +)	|___|___|___|___|___|	|___|___|___|___|___|
962	Malaria (Slide or RDT diagnosis) (Pregnant)		|___|___|___|___|___|
963	Anemia	|___|___|___|___|___|	|___|___|___|___|___|
964	Malnutrition (<1 yr)	|___|___|___|___|___|	|___|___|___|___|___|
965	Malnutrition (1-4 yrs)	|___|___|___|___|___|	|___|___|___|___|___|
966	All accidents/injuries	|___|___|___|___|___|	|___|___|___|___|___|

SL No	Diseases or medical conditions	Male (discharges)	Female (discharges)
		A	B
967	Typhoid	|___|___|___|___|___|	|___|___|___|___|___|
968	TB	|___|___|___|___|___|	|___|___|___|___|___|
969	Leprosy	|___|___|___|___|___|	|___|___|___|___|___|
970	Meningitis (<1 year)	|___|___|___|___|___|	|___|___|___|___|___|
971	Meningitis (1-4 years)	|___|___|___|___|___|	|___|___|___|___|___|
972	Meningitis (5 years+)	|___|___|___|___|___|	|___|___|___|___|___|
973	Snakebite	|___|___|___|___|___|	|___|___|___|___|___|
974	Skin diseases	|___|___|___|___|___|	|___|___|___|___|___|
975	HIV/AIDS (<5 years)	|___|___|___|___|___|	|___|___|___|___|___|
976	HIV/AIDS (5-14 years)	|___|___|___|___|___|	|___|___|___|___|___|
977	HIV/AIDS (15-24 years)	|___|___|___|___|___|	|___|___|___|___|___|
978	HIV/AIDS (25 years+)	|___|___|___|___|___|	|___|___|___|___|___|
979	TB-HIV Patients	|___|___|___|___|___|	|___|___|___|___|___|
980	Ischemic heart diseases	|___|___|___|___|___|	|___|___|___|___|___|
981	Cancer	|___|___|___|___|___|	|___|___|___|___|___|
982	Hypertension	|___|___|___|___|___|	|___|___|___|___|___|
983	Diabetes	|___|___|___|___|___|	|___|___|___|___|___|
984	Other discharges not included above	|___|___|___|___|___|	|___|___|___|___|___|

Table 9.3: Family Planning Services Provided

SL No	FP Methods and services	New attendance in facility	Re-attendance in facility	New attendance in Aidpost	Re-attendance in Aidpost
		A	B	C	D
985	Breast feeding	|___|___|___|___|___|	|___|___|___|___|___|	|___|___|___|___|___|	|___|___|___|___|___|
986	Com. Pill (OCP)	|___|___|___|___|___|	|___|___|___|___|___|	|___|___|___|___|___|	|___|___|___|___|___|
987	Injection	|___|___|___|___|___|	|___|___|___|___|___|	|___|___|___|___|___|	|___|___|___|___|___|
988	Ovulation	|___|___|___|___|___|	|___|___|___|___|___|	|___|___|___|___|___|	|___|___|___|___|___|
989	Condom	|___|___|___|___|___|	|___|___|___|___|___|	|___|___|___|___|___|	|___|___|___|___|___|
990	Loops/IUD	|___|___|___|___|___|	|___|___|___|___|___|	|___|___|___|___|___|	|___|___|___|___|___|
991	T/ligation	|___|___|___|___|___|		|___|___|___|___|___|	
992	Vasectomy	|___|___|___|___|___|		|___|___|___|___|___|	
993	Referred out to other facilities	|___|___|___|___|___|		|___|___|___|___|___|	

Table 9.4: Maternal, Neonatal and Child Health Services

SL No	Antenatal care	Number
994	First visit	|___|___|___|___|___|
995	Fourth visit	|___|___|___|___|___|
996	Other	|___|___|___|___|___|
997	First dose TT	|___|___|___|___|___|
998	Second dose TT	|___|___|___|___|___|
999	Booster	|___|___|___|___|___|

	Deliveries	Number
1000	Uncomplicated deliveries in health facility	|___|___|___|___|___|
1001	Deliveries with complications in health facility	|___|___|___|___|___|
1002	Transferred to hospital for pregnancy and delivery complications	|___|___|___|___|___|
1003	Birth weight <2500 grams	|___|___|___|___|___|
1004	Still births	|___|___|___|___|___|
1005	Born before arrival	|___|___|___|___|___|
1006	Village births attended (total)	|___|___|___|___|___|

Table 9.5 Well Baby Clinic

SL Number	Type of service	New attend	Re-attend
		A	B
1007	Clinic Attendances (<1 year)	|___|___|___|___|___|	|___|___|___|___|___|
1008	Clinic Attendances (1-4 years)	|___|___|___|___|___|	|___|___|___|___|___|

Table 9.6: Immunizations administered

Serial No	Vaccine type administered	Administered in clinic or in outreach	Administered by Aidposts
		A	B
1009	BCG (Within 24 hours of birth)	|___|___|___|___|___|	|___|___|___|___|___|
1010	BCG (<1 week but not within 24 hours of birth)	|___|___|___|___|___|	|___|___|___|___|___|
1011	BCG (> 1 week)	|___|___|___|___|___|	|___|___|___|___|___|
1012	Hepatitis B (Within 24 hours of birth)	|___|___|___|___|___|	|___|___|___|___|___|
1013	Hepatitis B (> 24 hours)	|___|___|___|___|___|	|___|___|___|___|___|
1014	DTP/Hib (Hep B) (First dose < 1 year)	|___|___|___|___|___|	|___|___|___|___|___|
1015	DTP/Hib (Hep B) (Second dose < 1 year)	|___|___|___|___|___|	|___|___|___|___|___|
1016	DTP/Hib (Hep B) (Third dose < 1 year)	|___|___|___|___|___|	|___|___|___|___|___|
1017	DTP/Hib (Hep B) (> 1 year)	|___|___|___|___|___|	|___|___|___|___|___|
1018	Sabin Polio Vaccine (First dose < 1 year)	|___|___|___|___|___|	|___|___|___|___|___|
1019	Sabin Polio Vaccine (Second dose < 1 year)	|___|___|___|___|___|	|___|___|___|___|___|
1020	Sabin Polio Vaccine (Third dose < 1 year)	|___|___|___|___|___|	|___|___|___|___|___|
1021	Sabin Polio Vaccine (> 1 year)	|___|___|___|___|___|	|___|___|___|___|___|
1022	Measles (6-8 months)	|___|___|___|___|___|	|___|___|___|___|___|
1023	Measles (9-11 months)	|___|___|___|___|___|	|___|___|___|___|___|
1024	Measles (>1 year)	|___|___|___|___|___|	|___|___|___|___|___|
1025	Vitamin A (6 months)	|___|___|___|___|___|	|___|___|___|___|___|
1026	Vitamin A (12 months)	|___|___|___|___|___|	|___|___|___|___|___|
1027	Vitamin A (>1 year)	|___|___|___|___|___|	|___|___|___|___|___|

Survey completed at: Hour |___|___| Minutes |___|___|

Phone number for future contact |___|___||___|___| |___|___||___|___|

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Readiness of Health Facilities to Provide Emergency Obstetric Care in Papua New Guinea – Evidence from a Cross-Sectional Survey

Readiness of Health Facilities to Provide Emergency Obstetric Care in Papua New Guinea - Evidence from a Cross-Sectional Survey

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Xiaohui Hou: Conceptualization, Methodology, Supervision, Project Administration, Resources, Writing-Original Draft, Writing – review & editing
M. Mahmud Khan: Conceptualization, Methodology, Supervision, Formal Analysis, Writing-Original Draft, Writing – review & editing
Justin Pulford: Conceptualization, Methodology, Data Curation, Data Validation, Writing-Review & Editing.
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Data availability statement

No additional data is available. Researchers interested in 2015 PNG Facility Assessment Survey data can contact Dr. Xiaohui Hou at xhou@worldbank.org and copy the PI of the project, Dr. M. Mahmud Khan, at the email address Mahmud.Khan@uga.edu, with a statement on the reasons for requesting the dataset and types of analyses to be conducted.

Competing Interest statement

There is no competing interest.

Abstract

Objective

To measure readiness of health facilities in Papua New Guinea (PNG) to provide obstetric care and other maternal health services.

Design

Cross-sectional study involving random sample of health centers, district/rural hospitals (levels 3 and 4 facilities) and all upper level hospitals operational at the time of survey. Structured questionnaires were used to collect data from health facilities.

Setting

Health facilities in PNG. Facility administrators and other facility personnel were interviewed. Number of facility personnel interviewed was usually one for health centers and two or more for hospitals.

Participants

19 upper-level facilities (levels 5-7, provincial, regional and national hospitals) and 60 lower-level facilities (levels 3 and 4, health centers and district/rural hospitals)

Outcome measures

Four service-types were used to understand readiness of surveyed health facilities in the provision of maternity care including obstetric care services: (1) facility readiness to provide clinical services; (2) availability of family planning items; (3) availability of maternal and neonatal equipment and materials; and (4) ability to provide emergency obstetric care.

Results

56% of lower level facilities were not able to provide Basic Emergency Obstetric Care (BEmOC). Even among higher level facilities, 16% were not able to perform one or more of the functions required to be considered a BEmOC provider. 11% of level 3 and 4 health facilities were able to provide comprehensive emergency obstetric care (CEmOC) as compared to 83% of higher level facilities.

Conclusion

Given the high fertility rate and maternal mortality ratio (MMR) in PNG, lack of BEmOC at the first level inpatient service providers is a major concern. To improve access to EmOC, level 3 and 4 facilities should be upgraded to at least BEmOC providers. Significant reduction in MMR will require improved access to CEmOC and optimal geographic location approach can identify facilities to be upgraded.

Strengths and limitations of this study

- This is the first empirical study that systematically examined availability of maternity care in health facilities in Papua New Guinea (PNG).
- All upper level hospitals and randomly selected fully functional health centers were surveyed.
- The readiness of facilities in the provision of obstetric care and actual provision of services were assessed using relevant indicators and signal functions.
- Service availability and readiness of facilities could not be linked with community level health outcomes.
- The sampling design selected fully functional health centers and district/rural hospitals in each of the surveyed districts implying overestimation of readiness and availability of obstetric care.

Introduction

Effective antenatal, neonatal and Emergency Obstetric Care (EmOC) are highly cost-effective interventions vital to avert common adverse pregnancy and/or birth outcomes, which significantly contribute to maternal mortality in poor resource settings.[1-4] Basic Emergency Obstetric Care (BEmOC) alone can avert a significant proportion of maternal deaths and up to 40% of neonatal deaths.[5] A global assessment found that BEmOC facilities are consistently not available in sufficient numbers in countries with high and moderate levels of maternal mortality.[6] Comprehensive Emergency Obstetric Care (CEmOC) availability, which includes the provision of caesarean and blood transfusion services in addition to the key functions included in BEmOC, is also quite poor in many low and middle income countries.[7]

Maternal and child health remains a key priority area in Papua New Guinea (PNG);[8] however, persistently high maternal and neonatal deaths reflect numerous deficiencies. The estimates of Maternal Mortality Ratio (MMR) in PNG vary considerably. One study by Mola and Kirby estimated the MMR for 2009 using facility-based health information system records and survey data on maternal mortality among unsupervised births from one province. The estimates imply that the average MMR in PNG should be approximately 500 per 100 000 live births.[9 10] The neonatal mortality in PNG is also high, around 28 per 1000 live births.[11] The World Health Organization model ranks PNG 130th in the world in terms of MMR.[12] The 2016-2018 PNG Demographic and Health Survey (DHS), using the sisterhood method, found that the MMR was about 205 per 100,000 live births.[13] Even though new DHS estimate represents a significant improvement from the previous estimate of 733 per 100,000 live births in 2006, the maternal mortality in PNG remains about 24 times the MMR in neighboring Australia.[12] The DHS report also indicates that only 17% of pregnancies received a prenatal visit in the first trimester and 49% had four or more prenatal visits over the whole pregnancy. During 2012-2017, about 55% of deliveries in PNG were supervised by trained health workers at health facilities[13] indicating limited access to modern maternal health care services.

To reduce the MMR in any country, it is important to understand the causes of death so that appropriate interventions can be designed and adopted. In PNG, the maternal mortality registry often does not report causes of death. Reviewing the causes of deaths mentioned in the general death registry and in maternal mortality registry, one study in early 1980s found that the main causes were puerperal sepsis, postpartum hemorrhage, medical and surgical complications, prolonged or obstructed labor, ruptured uterus, deaths associated with caesarean section.[14] It is likely that many of these causes of deaths have remained important even today. Clearly, deaths due to the causes indicated above cannot be avoided without timely access to health facilities that are equipped to provide a range of obstetric care services. A recent article mentioned geographically dispersed population, shortage of health care providers, poverty, gender inequality and low level of education as important determinants of maternal deaths.[15] These aspects are, however, directly related to access to care and readiness of health facilities in the provision of maternity care.

Lifetime risk of maternal death depends on the probability of maternal death per pregnancy and the average number of pregnancies per woman over the reproductive age. The 2016-2018 PNG DHS estimated that total fertility rate (TFR) was about 4.2 per woman, which is slightly lower than the TFR of 4.4 in 2006. Access to obstetric care and lifetime risk of maternal death can be improved by lowering the TFR as well.

Given the critical importance of timely access to appropriate obstetric care, it is essential to assess the ability and readiness of health facilities in the provision of emergency obstetric care in PNG. Due to high TFR of PNG, the demand for maternal health services will continue to increase rapidly, underscoring the urgent need for improving access to care and strengthening maternal healthcare service delivery.

Despite the high social value of maternal and newborn health care services in PNG, no macro-level information is available on the ability or readiness of health facilities in the provision of the services. One recent study assessed the capacity of 21 health facilities in the provision of essential surgery and anesthesia services.[16] No study on PNG, to date, has examined the readiness and ability of health facilities at the national level in the provision of obstetric care services. This study is the first attempt to understand the state of obstetric care availability in PNG.

The principal objective of this study is to measure health facility readiness to provide obstetric care and other maternal health services. Some of the measures reflect not only the readiness of the facilities in the provision of target services but also the quality of services offered. The nationally representative health facility survey allows measurement of various indicators of obstetric care services. These measures will be useful for policy makers to reform the health care delivery system to strengthen the provision of obstetric care and general clinical services.

Methods

Conceptual Framework

We use the Donabedian's framework to analyze the readiness of obstetric care and other related services offered through the health facilities in PNG. In general, the Donabedian's approach is used to evaluate quality of care by analyzing relevant structures, processes and outcomes.[17] The structure measures affect processes and then processes affect outcomes, as shown in figure 1. In this study, our focus is on the evaluation of 'structure' and 'process' measures relevant for maternity care. The structure and process variables help to better understand the ability of health facilities in the provision of different service-types. Although, the impact of service provision cannot be directly measured from the facility survey data, country-level estimates of maternal mortality and morbidity imply relatively poor outcomes indicating the need for improving infrastructure and processes associated with obstetric and other maternity services.

To evaluate the ability and readiness to provide general medical care services including obstetric care, health facilities should have several infrastructural characteristics and resources. Some of the structural measures are quite general, related to the provision of any clinical service, such as

general inpatient services. In addition, specific personnel, supplies and drugs must be available at the facility to be able to offer the right type of services at the right time based on the clinical needs of patients. The structural characteristics, although not directly related to maternity care, are the necessary aspects defining the "readiness" of the facility in the provision of effective health care services. Readiness, however, does not necessarily imply actual provision of services. The infrastructural aspects act as the foundation for the provision of services, and relevant health care resources must be combined with the infrastructure to offer services to patients whenever needed. The process variables reflect ability to offer different types of obstetric care services and functions. The process variables for monitoring obstetric care service provision, the signal functions, are well defined and we will use the facility-level signal functions for understanding the readiness of facilities in PNG.[18]

Study Setting

PNG is remarkably diverse with respect to geography, language, and infrastructure. The country is divided into 22 provinces across four regions (Highlands, Momase and Southern, and the New Guinea Islands). Most of the country's 8 million people live in rural or peri-urban communities and are faced with significant challenges with regard to equitable access to health, education and economic opportunities.

PNG has a government-funded health system throughout much of the country. It is supplemented by government-subsidized health services provided by various Christian missions. Overall, it is estimated that churches provide 47% of primary health services, particularly in rural areas.[19]

Health facilities are categorized by the number and cadre of health workers employed and the services they provide and are detailed in the National Health Services Standard (NHSS) of the Government of PNG (GoPNG).[20] The levels of health facilities in PNG are numbered 1 through 7, where levels 1 and 2 provide basic primary health care, specifically outpatient services only. Level 3 health facilities, or health centers, provide outpatient and basic inpatient services for deliveries and minor ailments requiring observation. Level 4 health facilities, district and rural hospitals, provide general admissions, limited clinical support services including basic pharmacy and laboratory services, and depending on the employment of a medical officer, may provide surgical intervention services. Levels 5 to 7 health facilities provide secondary and tertiary health services as well as clinical support services, including pharmacy, laboratory, and radiology. The only level 7 health facility, the Port Moresby General Hospital, is the largest and most advanced health care facility of PNG, employs the largest concentration of health care workers and provides comprehensive health care services.

Survey Design

We conducted a health facility survey of 73 health facilities in PNG in 2015. All operational upper level health facilities (levels 5 to 7) were selected for the survey. At the time of data collection,

PNG had 19 upper-level health facilities and all these 19 facilities were surveyed (although one of the facilities was not fully operational). The upper-level health facilities in the survey included the national referral hospital (Port Moresby General Hospital), three regional hospitals, and 15 provincial hospitals. At the national level, since about half of health centers and district/rural hospitals (levels 3 and 4) were Church-run, the survey design intended to sample equal number of publicly-run and Church-run facilities. For selecting facilities at these two levels, between six (New Guinea Islands) and eight (Southern, Highlands, and Momase) districts were randomly selected per region. The largest government- and Church-administered health facilities (one of each type based on outpatient numbers per annum as reported by the National Health Information System) were purposely selected per district. This sampling procedure allowed selection of 30 publicly run and 30 church-run facilities from the selected districts; however, during field visits, not all selected facilities were found to be operational. Where possible, closed health facilities were replaced by functional ones within the same district. In some districts there were no functional level 3 or 4 facilities, resulting in less than 60 facilities surveyed (N=54). Figure 2 shows the location of the health facilities surveyed for this study. The provinces shaded in green indicate where the survey was carried out. The red squares represent level 5 to 7 health facilities, while the blue squares represent levels 3 and 4.

Survey Procedure

The survey comprised of a health facility assessment and costing instrument as well as interviews with healthcare providers, inpatients, and outpatients. Each instrument is detailed in the survey report.[21] The facility assessment questionnaire can be found in the supplementary file of the article and standard health facility questionnaires were adapted to the PNG context using the NHSS document.[20] Briefly, the health facility assessment collected information on various operational aspects of each health facility, while the costing instrument detailed expenditure on human resources, equipment, and consumables utilized for the provision of healthcare services. Both these instruments were completed with health facility managers and administrators. Upper level facilities offered many different types of specialized services and data collection at these levels required interviewing multiple facility personnel. The data collection was done by a team of 5 trained enumerators, who spent three to five days surveying each health facility. In total, 73 health facilities were surveyed.

Informed consents for the survey

For health facility costing and assessment, the survey team requested consent via email from the provincial, district and church health services, depending upon the facility to be surveyed. In addition, consent was requested from the officer in charge of each of the health facilities. The travel plan to the facilities was finalized after the consents were granted. Upon the team's arrival in the facility, the supervisor of the team met the officer in charge to confirm the consent received earlier and to get verbal consent to initiate the interviews.

For interviews with health care workers and patients, informed consent was requested in writing. The interviews were conducted only after the consents were granted. As much as possible, visual and audible privacy was ensured for the interviews. All interview questionnaires were de-identified by assigning a code number. The code numbers are saved on a secure server at the PNGIMR.

Public Involvement

Stakeholder consultations were involved in the design and early dissemination of this research. During the feasibility stage, priority of research questions, choice of outcome measures, and methods were informed by discussions with stakeholders involving representatives from the National Department of Health, UN agencies, academics and other development partners in PNGs. The preliminary findings were also discussed with representatives from the National Department of Health, Provincial Health Authorities, hospitals and development partners in a stakeholder consultation workshop held in Port Moresby, PNG.

Ethics approval

The study was approved by the PNG Institute of Medical Research (IMR) Institutional Review Board (IRB) and the PNG Medical Research Advisory Committee (MRAC). The following approval numbers were allocated to the study: IRB No. 1414, 7 August 2014; MRAC No 14.26, 10 November 2014.

Outcome measures

The handbook on monitoring emergency obstetric care[18] identified a set of indicators to measure availability, access and provision of EmOC in a country or a region. Two types of measures were defined -the first type focuses on availability, adequate coverage and utilization of services at national or sub-national levels and the second type measures obstetric care related functions performed by health facilities. The functions identified to define the level of EmOC services offered from a health facility are: (1) Administer parenteral antibiotics, (2) Administer uterotonic drugs, (3) Administer parenteral anticonvulsants, (4) Manually remove the placenta, (5) Remove retained products, (6) Perform assisted vaginal delivery, (7) Perform basic neonatal resuscitation, (8) Perform surgery (e.g., caesarean section), and (9) Perform blood transfusion. When a facility can perform all the functions listed under 1-7, it is considered a Basic EmOC (BEmOC) provider while ability to perform all the nine functions defines the comprehensive EmOC (CEmOC) provider. This study has used these nine measures to categorize health facilities as either a BEmOC or a CEmOC. Note that all these signal functions are defined by the ability to perform specific functions pregnant women need at the time of delivery. Ability to perform the functions does not necessarily imply that the facilities actually provided the services in the recent past.

Since this study is based on facility-level survey data, community or patient related health outcome measures are not directly observable. To compensate for this, we have used additional measures to understand readiness of health facilities in the provision of general inpatient care.

Availability of basic medical equipment and supplies and physical condition of the facility (infrastructural variables) may affect willingness of clients to utilize services from the facilities. Another important intervention that may affect the demand for EmOC is the provision of family planning services. Family planning in PNG is expected to reduce total fertility rate implying that need for maternity services should decline with family planning. Therefore, in addition to nine EmOC functions listed above, other outcome variables considered in this analysis are: (a) readiness of facilities to provide clinical services; (b) availability of family planning items; and (c) availability of maternity care related equipment and materials. Availability of drugs and supplies is defined as having the item in stock at the time of the survey.

For the availability of equipment, instruments and supplies, several indexes were calculated to indicate degree of availability of the items. The index values range from 0 to 100, 100 implying that all the items used for the construction of the index were available in all the facilities surveyed.

Calculating readiness or availability index

The analysis has used facility level data to derive the readiness indicators and ability to perform signal functions for each facility in the survey (Stata version 12 was used). The results are presented as descriptive tables (Tables 1-4) to indicate the proportion of facilities having the instruments or able to perform the specific functions.

An equally weighted index was constructed based on the availability of the items included in each of the categories of service delivery. It reflects the percent of all readiness aspects or variables satisfied by the health facilities in a specific category. For example, if a facility reports having an instrument, a value of 1.0 was assigned for the facility for that equipment. The availability index was constructed to show the percent of listed equipment and items available in each of the facility categories. For example, if the family planning items availability index is 65 for level 3 and 4 facilities, it means that the facilities on the average had 65% of all the family planning equipment and items considered in the analysis.

Results

Facility readiness to provide clinical services

Table 1 reports facility readiness in the provision of services. As shown, 95% (18 out of 19) of level 5 to 7 facilities were connected to the main electric supply grid but only about a third of level 3 and 4 facilities (17 out of 54). However, more than 80% of all facilities connected to the electric supply experienced blackout at least for some time in the week before the survey. All level 5 to 7 facilities had functional backup generators, while the percentage of level 3 and 4 facilities with backup generators was 76% for church-run facilities and 48% for public facilities. Half of the level 3 and 4 facilities with backup generators reported problems in operating the generator in the previous month.

If supply line and water tanks are considered, all level 5 to 7 facilities and 83% of level 3 and level 4 public health facilities and 84% of level 3 and level 4 church health facilities reported having

access to water on the day of the survey. However, less than 10% of level 3 and 4 facilities were connected with water supply lines. Only 45% of level 3 and 4 public facilities had water connection to the delivery room (and water availability on the day of the survey) compared to 72% at church-run facilities.

A significant share of health facilities, 62%, 44% and 38% of level 3 and 4 public, level 3 and 4 church, and level 5 and 6 facilities, respectively, experienced water shortages in 2014. The survey asked facility respondents whether the facility was responsible for maintaining the water supply system and it was observed that about 45% of public level 3-4 facilities were responsible for maintaining the water supply system. The proportions were 64% for church-run level 3 and 4 facilities and 68% for level 5 to 7 facilities.

Only 10% public (n=3) and 12% church (n=3) level 3 and 4 health facilities had ability to do direct blood transfusion. Proportion of facilities which could do blood transfusion was much higher, 89% among level 5 and 6 facilities and 100% for level 7. Percentage of health facilities that had operations theatre were much higher. 28% and 36% level of public and church level 3-4 health facilities and all level 5-7 health facilities had at least one operation theatre.

Both level 3 and 4 public and church-run health facilities show low readiness score for service delivery (Table 1). Readiness indexes were 40.3 for level 3 and 4 public sector facilities, 48.6 for level 3 and 4 church-run facilities, 84.6 for level 5 and 6 facilities, and 100 for the level 7 facility.

Availability of Family Planning Items

Table 2 presents the availability of family planning products and supplies in surveyed health facilities. The availability index of family planning items was 81.6 for level 3 and 4 public sector health facilities, 84.0 for level 3 and 4 church-run facilities, and 88.9 for level 5 and 6 facilities. Non-availability of family planning injections in the level 7 facility reduced the overall index of family planning item availability for the facility to 66.7. Since there is only one facility at level 7, non-availability of even a single item significantly reduces the overall index.

Availability of supplies and equipment for maternity care

A relatively large proportion of health facilities lacked very basic pregnancy and antenatal care related supplies and equipment as shown in table 3. The index values for the availability of antenatal care items were 76.9 and 88.6 for level 3 and 4 public- and Church-run facilities, respectively. The index was 87.3 for level 5 and 6 facilities and 100 for level 7 facility. The index of availability of obstetric and neonatal care items were worse in level 3 and level 4 facilities, 70.6 and 80.5 respectively for public and church facilities. The index was 95.52 for level 5 and 6 facilities. The survey also asked about the availability of vacuum extractors and forceps in the facilities for conducting deliveries. It is interesting that 74% of facilities reported having vacuum extractors and 95% reported having forceps although forceps are not used in PNG for deliveries.

Ability to provide emergency obstetric care services

Table 4 indicates the percent of facilities able to perform different obstetric functions. As mentioned earlier, WHO has defined nine functions to understand the level of obstetric services provided from the facilities. The survey questionnaire combined first three signal functions (capacity to administer parenteral antibiotics, uterotonic drugs, parenteral anticonvulsants) into one and asked the respondents to report if the facility was able to perform all the three functions, two of the three or one of the three functions. Most level 3-4 facilities, about 80% (n=42), reported the ability to perform all these three functions. Two facilities at upper levels (levels 5-7) were not able to perform these three basic obstetric functions. One of the upper level facilities in the sample was not fully functional at the time of the survey. Table 4 shows that 38% of Church-run level 3-4 facilities and 52% of government-run level 3-4 facilities were BEmOC providers. Even among higher level facilities (levels 5, 6 and 7), 11% (n=2) of facilities were not able to perform one or more of the necessary functions required to be considered a BEmOC provider.

If the signal functions for comprehensive emergency obstetric care are considered (all nine signal functions), only about 11% (n=6) of level 3 and 4 health facilities were found to be CEmOC units. About 15% of level 3 and 4 facilities had the capacity to manage a caesarean section or do blood transfusion. Not all level 5 to 7 facilities were CEmOC providers – 21% (n=4) of upper level facilities were not able to perform at least one of the nine signal functions.

Discussion

The overall health facility infrastructural condition in PNG is quite poor. Most facilities reported the need for major building repairs and emphasized the lack of adequate toilets, stable electrical supply, and consistent water supply. Many level 3 and 4 health facilities required better connectivity to electricity and clean water supply. One significant concern is the number of health facilities that did not have running water in the facility's delivery room. The quantity and quality of different types of clinical services provided crucially depends on the facility's readiness to offer services in general. Overall, level 3 and 4 facilities, both public and Church-run, scored low on the readiness index, implying that these facilities were not very reliable providers of services and patient-confidence in these facilities are likely to be low. The survey also revealed the need for improving the supply of basic medical items at level 3 and 4 public health facilities. Level 3 and 4 public facilities show lower availability of different medical items compared to those in Church-run facilities.

Comparison of health facility readiness across countries is often tricky because of differences in the level and comprehensiveness of facilities in different countries of the world. A World Bank report[22] indicates that 98% of public hospitals in Indonesia had electricity; in Laos, the index of basic amenities was reported as 64%[23] compared to 58% for PNG (weighted mean of the values in table 1).

This study showed that the index of availability of family planning supplies in levels 3 and 4 was about 83%. Family planning supplies should be available in all facilities, especially at the lower levels, to ensure uninterrupted access at all times, which is clearly not the case for PNG. In

addition, availability of family planning supplies does not necessarily mean utilization of services. The findings from the most recent PNG DHS survey showed access to family planning services quite limited. One quarter of currently married women have an unmet need for family planning, and only 59% of currently married women are satisfied with family planning services. Among those who have received family planning, about 9 in 10 users obtained their modern family planning supplies from a public (government) source. Therefore, there is an urgent need to identify potential gaps in the provision and utilization of family planning services to strengthen service provision from the government health facilities, especially at lower levels. Better access and utilization of family planning services can help reduce maternal and child mortality.[24-26]

While 79% of level 5 to 7 facilities were found to be CEmOC providers, the fact that about a fifth were not able to provide comprehensive emergency obstetric care is a major concern, given that these are the higher level referral hospitals in PNG. Consistent with the findings of this study, another study using a much smaller sample of facilities, concluded that the "Capacity for essential surgery and anesthesia services is severely limited in PNG due to shortfalls in physical infrastructure, human resources, and basic equipment and supplies."[16]

The results from the survey can be used to derive national level estimates of obstetric care availability. Using the proportions of CEmOC facilities at different levels and the total number of facilities in PNG at these levels, the total number of facilities ready to provide comprehensive obstetric care was only 50 at the time of the survey in 2015. Even if we arbitrarily assume balanced geographic distribution of these facilities, an emergency obstetric case will have to travel 53 km each way, on average, to reach a CEmOC facility. The distance to the nearest CEmOC facility is so large that for many emergency cases this is virtually synonymous of not having access to CEmOC. To reduce maternal mortality and morbidity significantly, it is essential to lower the average distance to the nearest CEmOC facility[27] implying that PNG will have to upgrade a significant number of levels 3, 4 and 5 facilities. Geographic information systems and geographical modelling tools can help identify the optimal location of CEmOC facilities and existing facilities closest to the optimal locations can be upgraded in the short-run to improve access.[28]

All facilities at level 3 or above should be able to provide basic EmOC. To improve access to emergency obstetric care, most level 3 and 4 facilities should be considered for immediate upgrading to BEmOC provider or better. The survey of facilities indicated that about 45% of levels 3 and 4 facilities were not ready to provide BEmOC. Despite this low readiness, equipping about 15 to 20% of these facilities to perform signal functions 5 and 6 can improve BEmOC availability from 55% of the facilities to about 80%. Although maternal and child health is a priority area, PNG has not allocated enough resources to achieve improved access to maternity and neonatal services. PNG spends more than 4.3% of its GDP on health (about $109 per capita in PPP dollars). Total health expenditure is not low compared to other countries with similar level of per capita income.[29] However, a significant part of health resources, including human resources, particularly doctors, are concentrated in a few major hospitals. Therefore, the resource allocation at the

lower level health facilities (level 3 and level 4 facilities) are not sufficient. Reallocation of public sector resources to lower level health facilities are needed to expand access to obstetric care and other preventive services.

To improve availability and access to quality maternity services in PNG, especially in remote rural areas, a program of training and upskilling of Community Health Workers was adopted.[30] Although the upskilling has increased utilization of basic maternity services, significant reductions in maternal mortality will require access to hospital-based obstetric care. Government of PNG may consider allocating funds to facilities, both public and church facilities, based on quantities of priority health services delivered rather than on number and mix of human resources and other administrative needs.[31] While the effectiveness of such performance based financing depend on how the schemes are implemented, evidence in low and middle income countries shows that the performance can be improved through financial incentives.[32] From the demand side, past research has found that providing pregnant women with health vouchers to ensure financial protection for accessing medical care has increased utilization of health services.[33] The payments received through the vouchers will also encourage facilities to become more sensitive to the needs of pregnant women and would have incentives to invest to become fully functional EmOC providers. An initiative in two provinces in PNG that provided incentive packages to pregnant women increased facility-based supervised birth rates by 80%[34] indicating that enhancing facility readiness combined with incentivizing pregnant women to utilize health facilities will be very effective in improving maternal and neonatal health.

Study Limitations

Several limitations of the study should be mentioned here. First, it is not possible to indicate overall geographic access to primary health care services in PNG using the survey data because the study did not collect information from level 1 and 2 health facilities. However, these facilities do not provide obstetric care services although some basic services like family planning and antenatal care can potentially be organized at these levels. Second, the survey, strictly speaking, is not a representative survey of level 3 and 4 facilities. The survey design selected high-demand fully functional level 3 and 4 facilities in target districts and the definition of fully functional led to the choice of facilities that showed relatively high level of utilization. Therefore, if anything, the results are likely to be significant overestimations of degree of readiness of the facilities in the provision of obstetric care and other related services in PNG. Even with this favorable selection of facilities, the percent of facilities able to perform BEmOC and CEmOC was quite low at levels 3 and 4 implying that the availability of obstetric care services could be significantly worse than what has been reported in this study. Third, the study did not try to connect the service availability and readiness with health outcomes of the population at the subnational level. In PNG, even the national level estimates of mortality and morbidity are considered unreliable and subnational level estimates would suffer from even higher degree of error in estimation. In any case, facility level information clearly indicates that many of the functional facilities are not

ready to provide obstetric health services and a significant proportion of facilities lack medical equipment, instruments and supplies for the provision of quality maternity and neonatal services.

Conclusions

Inability of a health facility, irrespective of whether it is a primary, secondary and tertiary care facility, to provide obstetric care and other related services is an important concern for any health care system. It is especially true for a country like PNG where maternal and infant mortalities are high alongside a high fertility rate. Improved availability and utilization of family planning services can help reduce the demand for EmOC, lower maternal and neonatal mortality/morbidity and improve access to maternity services. Lowering the need for maternity services through interventions like family planning, however, is unlikely to improve access to maternity care significantly in the short-run. Supply-side interventions are necessary to ensure that the services are available in strategically located health facilities. Improving facility infrastructure, equipping the facilities with essential medical equipment and supplies and ensuring the presence of trained personnel in health facilities are needed to make the facilities BEmOC or CEmOC providers. Since the number of facilities in PNG offering EmOC is quite low compared to the needs, all level 3 and 4 facilities should be upgraded to at least the BEmOC level. Survey-based estimates suggest that only 50 facilities in PNG can be considered CEmOC providers and this number is inadequate to ensure equitable access to emergency obstetric cases. Increasing the number of CEmOC providers is urgently needed.

Figure caption

Figure 1. Three components of Donabedian approach of evaluating quality of care

Figure 2. Map of PNG with Districts Visited (green) and Location of Surveyed Facilities

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Table 1. Readiness Index for provision of general clinical services by Facility Level in Papua New Guinea

Readiness indicators	Level 3 and 4				Level 5 and 6		Level 7	
	Public	%	Church	%	*N*	%	*N*	%
Electricity connected to supply grid	10	34%	7	28%	17	94%	1	100%
Backup generator	14	48%	19	76%	18	100%	1	100%
Electricity availability (supply or generator)	20	69%	21	84%	18	100%	1	100%
Blackout last week	8	28%	6	24%	15	83%	0	0
Problem last month running generator due to fuel shortage	8	28%	10	40%	3	17%	0	0
Water from main line	2	7%	3	12%	15	83%	1	100%
Water shortage last year	18	62%	11	44%	7	39%	0	0
Water available for use by health care providers	24	83%	21	84%	18	100%	1	100%
Water available in delivery room	13	45%	18	72%	18	100%	1	100%
Facility does direct blood transfusion	3	10%	3	12%	16	89%	1	100%
Blood transfusions done last month	3	10%	3	12%	18	100%	1	100%
Facility has designated space for clinicians to provide service	20	69%	20	80%	18	100%	1	100%
Facility has on-call room or space for health care providers to take rest	3	10%	11	44%	10	56%	1	100%
Facility has telephone or shortwave radio	14	48%	14	56%	15	83%	1	100%
Facility has ambulance	26	90%	24	96%	17	94%	1	100%
Ambulance out of service last year	11	38%	10	40%	6	33%	0	0
Facility has other vehicles	8	28%	5	20%	18	100%	1	100%
Facility has operation theatre	8	28%	9	36%	18	100%	1	100%
Index of readiness	**40.3**		**48.5**		**84.6**		**100**	

Source: 2015 Survey of health facilities in PNG (survey conducted by this study)

Table 2. Availability of Family Planning Items by Facility Level in Papua New Guinea

Family planning (FP) items	Level 3 and 4 facilities				Level 5 and 6 facilities		Level 7 facilities	
	# of Public	% of Public	# of Church	% of Church	# of Public	% of Level 5 and 6	# of Public	% of Level 7
Oral pills	26	90%	21	84%	17	94%	1	100%
FP injections	22	76%	22	88%	15	83%	0	0%
Condoms	23	79%	20	80%	16	89%	1	100%
Index of FP items	**81.6**		**84.0**		**88.9**		**66.7**	

Source: 2015 Survey of health facilities in PNG (survey conducted by this study)

Table 3. Availability of Supplies and Equipment for Maternity Care in PNG by Health Facility Level

Antenatal, pregnancy, obstetric and neonatal care related equipment and supplies	Level 3 and 4 facilities				Level 5 and 6 facilities		Level 7 facility	
	# of Public	% of Public	# of Church	% of Church	# of Public	%	# of Public	%
Foetal stethoscope (or monitor)	27	93%	25	100%	14	78%	1	100%
Stethoscope and blood pressure cuff	22	76%	25	100%	16	89%	1	100%
Tape measure	23	79%	22	88%	16	89%	1	100%
Scale	28	97%	25	100%	16	89%	1	100%
Ultrasound machine (and gel)	28	97%	25	100%	17	94%	1	100%
Stethoscope	10	34%	11	44%	15	83%	1	100%
Pelvic procedure instruments such as speculum	18	62%	22	88%	16	89%	1	100%
Index: availability of antenatal care items	**76.85**		**88.57**		**87.30**		**100**	
Delivery light	24	83%	24	96%	18	100%	1	100%
Partograph	11	38%	13	52%	14	78%	1	100%
Sterilizer	15	52%	16	64%	13	72%	1	100%
Vacuum extractor	14	48%	21	84%	18	100%	1	100%
Forceps	25	86%	25	100%	18	100%	1	100%
Manual vacuum aspirator/suction bulb	27	93%	25	100%	17	94%	1	100%
Facility has at least two skilled birth attendants covering 24 hours a day	21	72%	19	76%	18	100%	1	100%
Delivery kit (instruments, supplies)	25	86%	25	100%	18	100%	1	100%
Resuscitation bag, newborn	4	14%	4	16%	15	83%	1	100%
Eye drops or ointment for newborn	27	93%	25	100%	18	100%	1	100%
Needles and syringes	28	97%	25	100%	18	100%	1	100%
Sterile C-section instrument kits	28	97%	25	100%	18	100%	1	100%
Cord supplies for newborn: clamps, ties, scissors	2	7%	5	20%	12	67%	1	100%
IV sets, including sterilized needle and tube	27	93%	25	100%	17	94%	1	100%
IV fluids, including normal saline and ringer lactate	29	100%	25	100%	18	100%	1	100%
Index: availability of obstetric and neonatal care items	**70.57**		**80.53**		**92.52**		**100**	

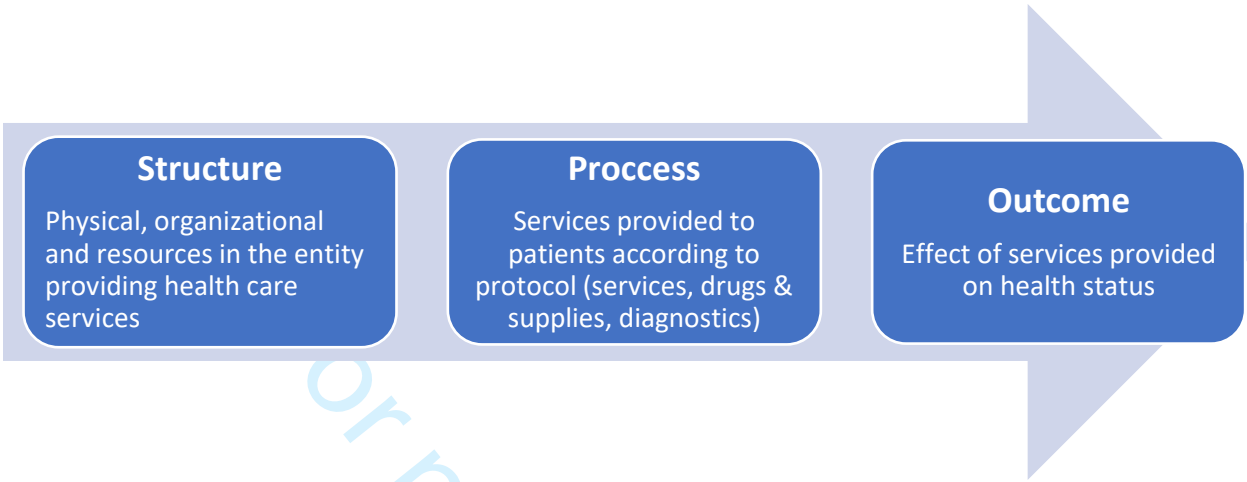
Source: 2015 Survey of health facilities in PNG (survey conducted by this study)

Table 4. Percentage of Health Facilities Able to Perform Signal Functions with Categorization of Facilities into Basic Emergency Obstetric Care and Comprehensive Emergency Obstetric Care Providers

Signal functions for obstetric and neonatal care	Ability to perform	Level 3 and 4 public % (n)	Level 3 and 4 church % (n)	Level 5 to 7 % (n)	Total % (n)
Signal functions 1-3: Have capacity to administer parenteral antibiotics, uterotonic drugs, parenteral anticonvulsants?	Yes, all three	76% (22)	80% (20)	89% (17)	81% (59)
	Yes, two of the three	10% (3)	16% (4)	5% (1)	11% (8)
	Yes, one of the three	3% (1)	4% (1)	0% (0)	3% (2)
Signal function 4: Have the ability for manual removal of placenta?	Yes	72% (21)	88% (22)	95% (18)	84% (61)
Signal function 5: Have ability to remove retained products?	Yes	59% (17)	80% (20)	95% (18)	75% (55)
Signal function 6: Have the capacity to perform assisted vaginal delivery?	Yes	59% (17)	72% (18)	89% (17)	71% (52)
Signal function 7: Have ability to Perform basic neonatal resuscitation	Yes	72% (21)	96% (24)	95% (18)	86% (63)
Signal function 8: Have ability to perform surgery and manage caesarean section	Yes	14% (4)	16% (4)	95% (18)	36% (26)
Signal function 9: Have capacity to do safe blood transfusion	Yes	14% (4)	20% (5)	89% (17)	36% (26)
Ability to perform first seven signal functions	Basic EmOC	38% (11)	52% (13)	84% (16)	55% (40)
Ability to perform all nine signal functions	Comprehensive EmOC	10% (3)	12% (3)	79% (15)	29% (21)

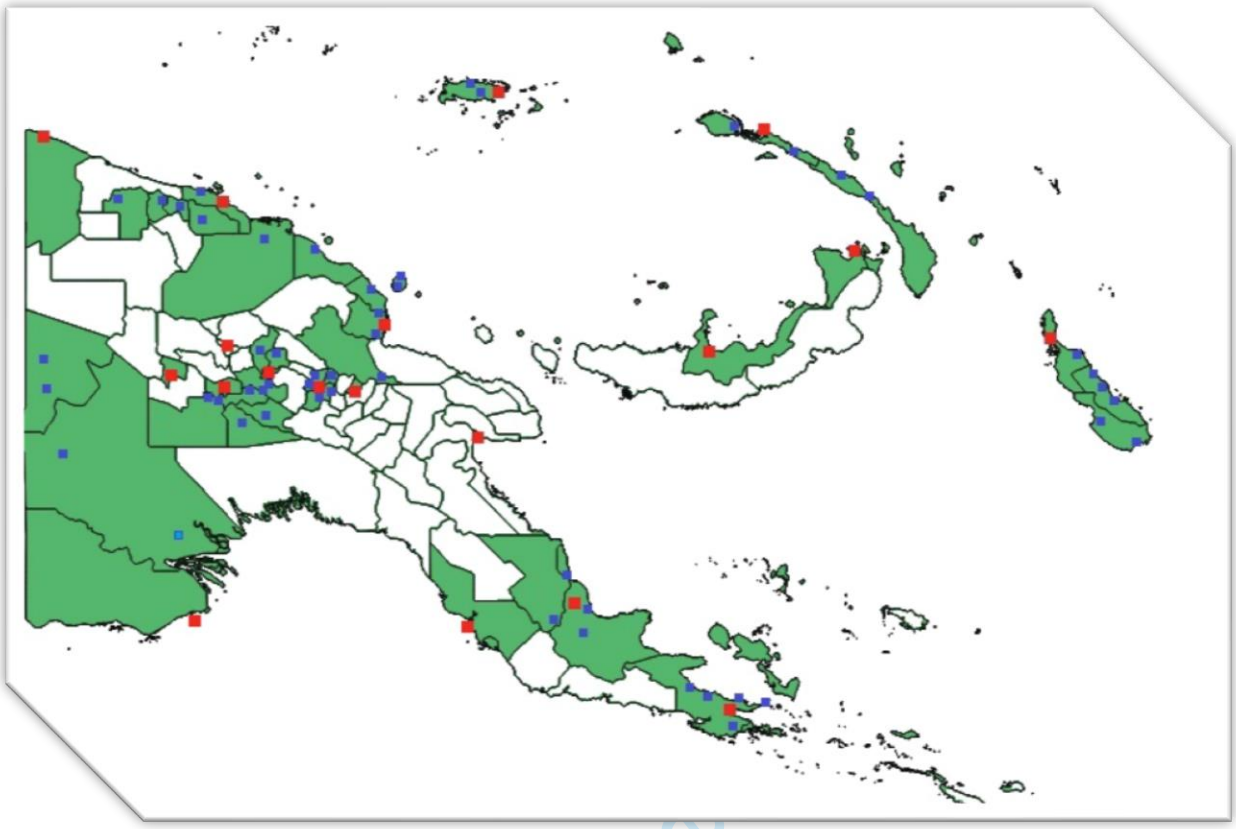
Source: 2015 Survey of health facilities in PNG (survey conducted by this study)

Figure 1. Three components of Donabedian approach of evaluating quality of care



Source: Donabedian (2005)

Figure 2. Map of PNG with Districts Visited (green) and Location of Surveyed Facilities



Note: Red squares represent the level 5 to 7 facilities while the blue squares represent the level 3 to 4 facilities surveyed.

Health Facility Efficiency Study in PNG with a Focus on Secondary Care

Health Facility Assessment 2014

Papua New Guinea Institute of Medical Research,
PO Box 60 Goroka, Papua New Guinea;
University of South Carolina, Columbia, South Carolina, USA;
and Nossal Institute for Global Health, Melbourne, Australia.

Face sheet for Health Facility Assessment

IDENTIFICATION

PROVINCE_____ ☐☐

DISTRICT_____ ☐☐

LOCAL LEVEL GOVERNMENT AREA _____ ☐☐

NAME AND TYPE/ID OF THE FACILITY_____ ☐☐

(HC=03, DLH =04, PH =05, RH=06, NH=07)

OWNERSHIP OF THE FACILITY_____ ☐☐

(PUBLIC =01, CHURCH CATHOLIC =02, CHURCH LUTHERAN=03, CHURCH SDA =04)

NAME AND DESIGNATION OF THE RESPONDENT_____ ☐☐

Consultant =01, OIC/Head Administrator = 02, Medical Officer =03, Dental Officer=04, Health Extension Officer =05, Nurse =06, Midwife=07, Community Health Worker =08, Other Allied Health worker = 09)

SEX OF THE RESPONDENT: MALE 1 FEMALE 2 ☐

Other persons interviewed for information : Name:	Designation (enter code in boxes from above):	
1. _____	1. _____	☐☐
2. _____	2 _____	☐☐
3. _____	3 _____	☐☐
4_____	4 _____	☐☐
5_____	5 _____	☐☐
6_____	6 _____	☐☐

INTERVIEWER VISITS

	1	2	3	FINAL VISIT (DDMMYYYY)
DATE				
INTERVIEWER'S NAME & CODE				CODE ☐☐
RESULT CODE*				RESULT CODE ☐

***RESULT CODES:**1: COMPLETED, 2: REFUSED, 3: PARTLY COMPLETED, 8: OTHER_____ (SPECIFY)

SUPERVISOR	FIELD EDITOR	OFFICE EDITOR	KEYED BY
NAME_____ ☐☐	NAME_____ ☐☐	NAME_____ ☐☐	NAME_____ ☐☐
DATE _____	DATE _____	DATE _____	DATE _____

Start time: Hour |___|___| Minute |___|___|

Section 1. General information

No	Questions and Filters	Coding categories	Response	Skip
101	Name and position of the person interviewed for the survey (transfer information from cover page)	Interviewee name _____ Position _____	☐☐	
102	Type of health facility (transfer information from cover page)	HC……03 DLH……04 PH……05 RH ……06 NH……07 Other_____ _____.....96	☐☐	
103	Ownership of the facility (transfer information from cover page)	Pubic……1 Church Catholic……2 Church Lutheran……3 Church SDA……4	☐	
104	Is there a signboard/sign with the facility name?	Yes……1 No ……2	☐	
105	Is this facility open 24 hours a day, seven days a week?	Yes……1 No ……2	☐	
106	The services available 24/7 from this facility FOR EACH SERVICE, IF AVAILABLE 24 HOURS RECORD "1", OTHERWISE RECORD "2"	A. Inpatient hospital services		
		B. Emergency room services		
		C. Outpatient clinics for adults		
		D. Outpatient clinics for children		
		E. Outpatient clinics for women		
		F. Lab and Diagnostic Services		
		G. Pharmacy Services		
		H. Snake-bite clinic services		
		I. Other Services (specify)_____		
107	How many days in a week the outpatient facility is open on weekdays?	Days	☐	
108	Opening time on Weekdays (Mon-Fri)	Hour : Min	|___|___| : |___|___|	
109	Closing time on Weekdays (Mon-Fri)	Hour : Min	|___|___| : |___|___|	
110	Does this facility provide outpatient services on Saturdays and Sundays?	Only Saturdays……1 Only Sundays……2 Both Saturdays and Sundays……3 Not open on weekends……4	☐	**If 4 ➔113**
111	Opening time on Weekends	Hour : Min	|___|___| : |___|___|	
112	Closing time on Weekends	Hour : Min	|___|___| : |___|___|	
113	Is the facility is connected to electric supply grid?	Yes……1 No ……2	☐	**If 2 ➔117**
114	Is the electricity available 24 hours a day from the grid in a normal week?	Yes……1 No ……2	☐	
115	Was electricity available through the grid all the time during the past one week?	Yes……1 No ……2	☐	
116	In last one week, how many hours the electricity was not available through the grid?	Hours	|___|___|___|	
117	Does the facility have a functional back up or standby generator or electricity?	Yes……1 No ……2	☐	

No	Questions and Filters	Coding categories	Response	Skip
118	Does the facility face problems with operating the backup system/generator due to lack of fuel in last one month?	Yes……1 No ……..……2	☐	
119	What is the health facility's main source of water now?	Piped……1 Water tank (Water stored from supply)…….2 Tube well……3 Bore hole ……4 Protected well ……5 Others (Specify)……..8	☐	
120	If water comes from supply line, how many hours the water is normally available in a day?	Hours	|___|___|	
121	In 2014, has water been available from this source all year?	Yes ……1 No ……2	☐	
122	Are health workers able to use this water source today when treating patients?	Yes ……..1 No ……2	☐	
123	Is the water supply connected to the delivery room and working today?	Yes ……1 No ……..2	☐	
124	If there is a problem with the water supply (fixtures and lines), who is responsible for fixing it?	Province……1 District……2 Church agency……3 This facility……4 Referral health facility ……5	☐	
125	How are expenses for fixing problems with the water supply met?	Request province……1 Request district……2 Own budget……3 Referral health facility ……4	☐	
126	Do you think that the facility has adequate number of toilets?	Adequate……1 Need few additional……..2 Not adequate at all……3	☐	
127	Is there a private pharmacy within walking distance from this facility?	Yes……1 No ……2	☐	
128	How many buildings are used to provide services in the facility?	Number of buildings	☐☐	
129	Total land area of the facility	Land area in decimals	☐☐☐☐	
130	Construction materials used in the construction of the main building of the facility	Cement/brick……1 Tin/other metals/tile……2 Wood…… 3 Leaves/other low-cost materials……4 Others _____.....8	Roof ☐ Wall ☐ Floor ☐	
131	Condition of the infrastructure	Most buildings/ building need major repairs……1 In general, minor repairs needed……..2 Does not require much repairs……..3	☐	
132	Is the land area around the health facility clean?	Yes……1 No ……..2	☐	
133	Is the main building raised?	Yes……1 No ……..2	☐	If 2 ➔135
134	How many meters the building is raised?	Meters (MM.M)	|___|___|.|___|	
135	Are there living quarters on campus?	Yes……1 No ……..2	☐	If 2 ➔137

No	Questions and Filters	Coding categories	Response	Skip
136	How many families can live on campus (No. of separate quarters)	If more than 98 families, enter 98. Not known= 99	☐☐	
137	Does the facility have a blood bank?	Yes……1 No ……2	☐	
138	Does the health unit have blood transfusion facility?	Yes……1 No ……2	☐	**If 2 ➔140**
139	Were there any blood transfusions done in the last one month?	Yes……1 No ……2 Not applicable……3	☐	
140	Does this facility have designated spaces for each of the doctors/key service providers to provide services after initial triage/examination?	Yes……1 No ……2 Not applicable……3	☐	
141	Is there an on-call room/space where health care professionals can rest during their on-call?	Yes……1 No ……2 Not applicable……3	☐	
142	Does this facility have working telephone or shortwave radio to call outside?	Yes……1 No ……2	☐	
143	Does this facility have ambulances?	Yes……1 No ……2	☐	**If 2 ➔147**
144	How many ambulances does the facility have?	Number	☐☐	
145	Was there any time this year when the ambulance was not in service?	Yes……1 No ……2	☐	
146	If yes, how many ambulances remained out of service and for how long on average over the last one year?	A. How many were out of service even temporarily? B. Average weeks of out-of-service	☐ ☐☐	
147	Does the facility have any other vehicles like cars, motorcycles etc.?	Yes……1 No ……2	☐	**If 2 ➔201**
148	How many vehicles does the facility have?	Car Motorcycles	☐☐ ☐☐	
149	Principal use of vehicles and ambulances in past seven days	Transporting patients to facility……1 Transporting patients from village/local area to facility……2 For use by health facility administrators……3 For conducting outreach service……4 Transporting healthcare providers to the facility..5	Ambulance ☐☐ Cars ☐☐ Motorcycles ☐☐ Boats ☐☐	
150	Who meets the costs for maintenance / servicing of the vehicles?	Province……1 District……2 Own budget……3 Referral health facility ……4	☐	

Section 2.1: Information on each of the buildings

No	Questions/ Items	Responses and codes	Building/ Structure #1	Building/ Structure #2
201	Name of the structure/ building			
202	Principal activities normally performed in the building/ structure	Inpatient services……1 Outpatient services……2 Both inpatient and outpatient……3 Lab/ diagnostic services……4 Administrative offices……5 Not used now……6 Others _____.....8 Specify	☐	☐
203	Total floor space of the building	Floor space in sq meters	|___|___|___|___|	|___|___|___|___|
204	Number of rooms in the structure (not including toilets, closets, hallways)	Number Don't know: 998	|___|___|___|___|	|___|___|___|___|
205	Do windows and doors of the building need repairs?	No repairs needed ……1 Few repairs needed……2 Many repairs needed……3	☐	☐
206	Do interior walls and roof of the building need repairs?	No repairs needed ……1 Few repairs needed……2 Many repairs needed……3	☐	☐
207	Does electric supply system of the facility need repairs?	No repairs needed ……1 Few repairs needed……2 Many repairs needed……3	☐	☐
208	Does water supply system of the facility need repair works?	No repairs needed ……1 Few repairs needed……2 Many repairs needed……3	☐	☐
209	Does toilet (latrine) for clients' use of the facility need repair works?	No repairs needed ……1 Few repairs needed……2 Many repairs needed……3 Not present……4	☐	☐
210	Number of toilets	Number Don't know: 98	|__|__|	|__|__|
211	Are most of the toilets functional?	Yes……1 No ……2	☐	☐
212	Are the toilets clean?	Yes, all the toilets are clean……1 Yes, most of the toilets are clean……2 No, most are not clean……3 No, all are unclean……4	☐	☐
213	How many rooms or areas in the building have water connection?	Number Don't know: 98	|__|__|	|__|__|
214	Are the water outlets are functional in toilet?	Yes……1 No ……2	☐	☐
215	Floor space of waiting rooms/space for clients	Floor space in sq meters	|___|___|___|___|	|___|___|___|___|
216	How many seating spaces are there in waiting rooms/spaces?	Number Don't know: 98	|__|__|	|__|__|
217	Are the waiting areas/rooms clean?	Yes……1 No ……2	☐	☐
218	Floor space of outpatient consultation (not including consultant's offices)	Floor space in sq meters	|___|___|___|___|	|___|___|___|___|

No	Questions/ Items	Responses and codes	Building/ Structure #1	Building/ Structure #2
219	Is there at least one site in the outpatient clinic area where both auditory and visual privacy can be maintained for client services?	Yes……1 No ……2	☐	☐
220	Is the building is accessible to persons with disabilities (e.g., wheel chair ramps, elevators if more than one floor, hand rails etc.)	Yes……1 No ……2	☐	☐
221	Floor space in the emergency department including waiting space	Floor space in sq meters	|___|___|___|___|	|___|___|___|___|
222	Floor space for blood bank, blood donation space, etc.	Floor space in sq meters	|___|___|___|___|	|___|___|___|___|
223	Number of observation beds in the building/ Structure (not including inpatient beds)	Number Don't know: 998	|___|___|___|	|___|___|___|
224	Number of inpatient wards in the building	Number Don't know: 998	|___|___|___|	|___|___|___|
225	Floor space of general adult wards	Floor space in sq meters	|___|___|___|___|	|___|___|___|___|
226	Number of inpatient beds in general adult wards (according to National Medical Standards)	Number Don't know: 998	|___|___|___|	|___|___|___|
227	How many patients are in the general ward today?	Number Don't know: 998	|___|___|___|	|___|___|___|
228	Floor space of pediatric wards	Floor space in sq meters	|___|___|___|___|	|___|___|___|___|
229	Number of inpatient beds in pediatric wards	Number Don't know: 998	|___|___|___|	|___|___|___|
230	Number of beds in pediatric wards (according to National Medical Standards)	Number Don't know: 998	|___|___|___|	|___|___|___|
231	How many patients are in the pediatric ward today?	Number Don't know: 998	|___|___|___|	|___|___|___|
232	Floor space of surgery wards	Floor space in sq meters	|___|___|___|___|	|___|___|___|___|
233	Number of inpatient beds in surgery wards (according to National Medical Standards)	Number Don't know: 998	|___|___|___|	|___|___|___|
234	How many patients are in the surgery ward today?	Number Don't know: 998	|___|___|___|	|___|___|___|
235	Other wards (specify) _____ward	Floor space in sq meters	|___|___|___|___|	|___|___|___|___|
236	Number of inpatient beds in _____ward	Number Don't know: 998	|___|___|___|	|___|___|___|
237	How many patients are in the _____ward today?	Number Don't know: 998	|___|___|___|	|___|___|___|
238	Other wards (specify) _____ward	Floor space in sq meters	|___|___|___|___|	|___|___|___|___|
239	Number of inpatient beds in _____ward	Number Don't know: 998	|___|___|___|	|___|___|___|
240	How many patients are in the _____ward today?	Number Don't know: 998	|___|___|___|	|___|___|___|

No	Questions/ Items	Responses and codes	Building/ Structure #1	Building/ Structure #2
241	Condition of the mattresses on the beds?	Good……1 Not so good/not so bad……2 Bad……3	☐	☐
242	Are there patients on floors in any of the wards or any other areas?	Yes……1 No ……2	☐	☐
243	Are the inpatient areas clean?	Yes……1 No ……2	☐	☐
244	Area of laboratory and diagnostic services including waiting areas	Floor space in sq meters	|___|___|___|___|	|___|___|___|___|
245	Are the lab/diagnostic services areas clean?	Yes……1 No ……2	☐	☐
246	Area used for drug, supply and medical instrument storage	Floor space in sq meters	|___|___|___|___|	|___|___|___|___|
247	Floor space in sq meters used for drug dispensing (if separate from storage)	Floor space in sq meters	|___|___|___|___|	|___|___|___|___|
248	Floor space in sq meters of delivery rooms	Floor space in sq meters	|___|___|___|___|	|___|___|___|___|
249	How many delivery rooms are there in this building?	Number Don't know: 998	|___|___|___|	|___|___|___|
250	Are the delivery rooms equipped with delivery beds, lights, etc.?	Yes……1 No ……2	☐	☐
251	Did the facility deliver babies in last seven days?	Yes……1 No ……2	☐	☐
252	Are the delivery rooms clean?	Yes……1 No ……2	☐	☐
253	Floor space in sq meters of operation theaters	Floor space in sq meters	|___|___|___|___|	|___|___|___|___|
254	How many operation theaters are there in the building?	Number Don't know: 998	|___|___|___|	|___|___|___|
255	Are the operation theaters functional and used regularly?	Yes……1 No ……2	☐	☐
256	Floor space in sq meters used by administrative personnel	Floor space in sq meters	|___|___|___|___|	|___|___|___|___|
257	Floor space in sq meters used by laundry services	Floor space in sq meters	|___|___|___|___|	|___|___|___|___|
258	Floor space in sq meters used by food services and kitchen	Floor space in sq meters	|___|___|___|___|	|___|___|___|___|
259	Floor space in sq meters of cafeteria for employees and clients	Floor space in sq meters	|___|___|___|___|	|___|___|___|___|
260	Meeting and other common areas for the use of facility personnel	Floor space in sq meters	|___|___|___|___|	|___|___|___|___|
261	Floor space used by research projects/ NGOs and other external entities	Floor space in sq meters (EXCLUDE DIRECT PATIENT CARE AREAS)	|___|___|___|___|	|___|___|___|___|
262	Floor space in sq meters used by security personnel	Floor space in sq meters	|___|___|___|___|	|___|___|___|___|
263	Floor space in sq meters used by mortuary	Floor space in sq meters	|___|___|___|___|	|___|___|___|___|
264	How many private rooms are there for inpatient stays?	Number of rooms Don't know: 98	|___|___|	|___|___|
265	How many beds are there in the private rooms?	Number Don't know: 998	|___|___|___|	|___|___|___|
266	Floor space in sq meters used by private rooms	Floor space in sq meters	|___|___|___|___|	|___|___|___|___|

Section 2: Information on each of the buildings (USE ADDITIONAL FORMS IF NEEDED)

No	Questions/ Items	Responses and codes	Building/ Structure #|___|	Building/ Structure #|___|
201	Name of the structure/ building			
202	Principal activities normally performed in the building/ structure	Inpatient services……1 Outpatient services……2 Both inpatient and outpatient……3 Lab/ diagnostic services……4 Administrative offices……5 Not used now……6 Others _____.....8 Specify	☐	☐
203	Total floor space of the building	Floor space in sq meters	|___|___|___|___|	|___|___|___|___|
204	Number of rooms in the structure (not including toilets, closets, hallways)	Number Don't know: 998	|___|___|___|___|	|___|___|___|___|
205	Do windows and doors of the building need repairs?	No repairs needed ……..1 Few repairs needed……2 Many repairs needed……3	☐	☐
206	Do interior walls and roof of the building need repairs?	No repairs needed ……..1 Few repairs needed……2 Many repairs needed……3	☐	☐
207	Does electric supply system of the facility need repairs?	No repairs needed ……..1 Few repairs needed……2 Many repairs needed……3	☐	☐
208	Does water supply system of the facility need repair works?	No repairs needed ……..1 Few repairs needed……2 Many repairs needed……3	☐	☐
209	Does toilet (latrine) for clients' use of the facility need repair works?	No repairs needed ……..1 Few repairs needed……2 Many repairs needed……3 Not present……4	☐	☐
210	Number of toilets	Number Don't know: 98	|___|___|	|___|___|
211	Are most of the toilets functional?	Yes……1 No ……2	☐	☐
212	Are the toilets clean?	Yes, all the toilets are clean……1 Yes, most of the toilets are clean……2 No, most are not clean……3 No, all are unclean……4	☐	☐
213	How many rooms or areas in the building have water connection?	Number Don't know: 98	|___|___|	|___|___|
214	Are the water outlets are functional in toilet?	Yes……1 No ……2	☐	☐
215	Floor space of waiting rooms/space for clients	Floor space in sq meters	|___|___|___|___|	|___|___|___|___|
216	How many seating spaces are there in waiting rooms/spaces?	Number Don't know: 98	|___|___|	|___|___|
217	Are the waiting areas/rooms clean?	Yes……1 No ……2	☐	☐
218	Floor space of outpatient consultation (not including consultant's offices)	Floor space in sq meters	|___|___|___|___|	|___|___|___|___|

No	Questions/ Items	Responses and codes	Building/ Structure #|___|	Building/ Structure #|___|
219	Is there at least one site in the outpatient clinic area where both auditory and visual privacy can be maintained for client services?	Yes……1 No ……..2	☐	☐
220	Is the building is accessible to persons with disabilities (e.g., wheel chair ramps, elevators if more than one floor, hand rails etc.)	Yes……1 No ……..2	☐	☐
221	Floor space in the emergency department including waiting space	Floor space in sq meters	|___|___|___|___|	|___|___|___|___|
222	Floor space for blood bank, blood donation space, etc.	Floor space in sq meters	|___|___|___|___|	|___|___|___|___|
223	Number of observation beds in the building/ Structure (not including inpatient beds)	Number Don't know: 998	|___|___|___|	|___|___|___|
224	Number of inpatient wards in the building	Number Don't know: 998	|___|___|___|	|___|___|___|
225	Floor space of general adult wards	Floor space in sq meters	|___|___|___|___|	|___|___|___|___|
226	Number of inpatient beds in general adult wards (according to National Medical Standards)	Number Don't know: 998	|___|___|___|	|___|___|___|
227	How many patients are in the general ward today?	Number Don't know: 998	|___|___|___|	|___|___|___|
228	Floor space of pediatric wards	Floor space in sq meters	|___|___|___|___|	|___|___|___|___|
229	Number of inpatient beds in pediatric wards	Number Don't know: 998	|___|___|___|	|___|___|___|
230	Number of beds in pediatric wards (according to National Medical Standards)	Number Don't know: 998	|___|___|___|	|___|___|___|
231	How many patients are in the pediatric ward today?	Number Don't know: 998	|___|___|___|	|___|___|___|
232	Floor space of surgery wards	Floor space in sq meters	|___|___|___|___|	|___|___|___|___|
233	Number of inpatient beds in surgery wards (according to National Medical Standards)	Number Don't know: 998	|___|___|___|	|___|___|___|
234	How many patients are in the surgery ward today?	Number Don't know: 998	|___|___|___|	|___|___|___|
235	Other wards (specify) _____ward	Floor space in sq meters	|___|___|___|___|	|___|___|___|___|
236	Number of inpatient beds in _____ward	Number Don't know: 998	|___|___|___|	|___|___|___|
237	How many patients are in the _____ward today?	Number Don't know: 998	|___|___|___|	|___|___|___|
238	Other wards (specify) _____ward	Floor space in sq meters	|___|___|___|___|	|___|___|___|___|
239	Number of inpatient beds in _____ward	Number Don't know: 998	|___|___|___|	|___|___|___|
240	How many patients are in the _____ward today?	Number Don't know: 998	|___|___|___|	|___|___|___|

No	Questions/ Items	Responses and codes	Building/ Structure #|___|	Building/ Structure #|___|
241	Condition of the mattresses on the beds?	Good……1 Not so good/not so bad……2 Bad……3	☐	☐
242	Are there patients on floors in any of the wards or any other areas?	Yes……1 No ……2	☐	☐
243	Are the inpatient areas clean?	Yes……1 No ……2	☐	☐
244	Area of laboratory and diagnostic services including waiting areas	Floor space in sq meters	|___|___|___|___|	|___|___|___|___|
245	Are the lab/diagnostic services areas clean?	Yes……1 No ……2	☐	☐
246	Area used for drug, supply and medical instrument storage	Floor space in sq meters	|___|___|___|___|	|___|___|___|___|
247	Floor space in sq meters used for drug dispensing (if separate from storage)	Floor space in sq meters	|___|___|___|___|	|___|___|___|___|
248	Floor space in sq meters of delivery rooms	Floor space in sq meters	|___|___|___|___|	|___|___|___|___|
249	How many delivery rooms are there in this building?	Number Don't know: 998	|___|___|___|	|___|___|___|
250	Are the delivery rooms equipped with delivery beds, lights, etc.?	Yes……1 No ……2	☐	☐
251	Did the facility deliver babies in last seven days?	Yes……1 No ……2	☐	☐
252	Are the delivery rooms clean?	Yes……1 No ……2	☐	☐
253	Floor space in sq meters of operation theaters	Floor space in sq meters	|___|___|___|___|	|___|___|___|___|
254	How many operation theaters are there in the building?	Number Don't know: 998	|___|___|___|	|___|___|___|
255	Are the operation theaters functional and used regularly?	Yes……1 No ……2	☐	☐
256	Floor space in sq meters used by administrative personnel	Floor space in sq meters	|___|___|___|___|	|___|___|___|___|
257	Floor space in sq meters used by laundry services	Floor space in sq meters	|___|___|___|___|	|___|___|___|___|
258	Floor space in sq meters used by food services and kitchen	Floor space in sq meters	|___|___|___|___|	|___|___|___|___|
259	Floor space in sq meters of cafeteria for employees and clients	Floor space in sq meters	|___|___|___|___|	|___|___|___|___|
260	Meeting and other common areas for the use of facility personnel	Floor space in sq meters	|___|___|___|___|	|___|___|___|___|
261	Floor space used by research projects/ NGOs and other external entities	Floor space in sq meters (EXCLUDE DIRECT PATIENT CARE AREAS)	|___|___|___|___|	|___|___|___|___|
262	Floor space in sq meters used by security personnel	Floor space in sq meters	|___|___|___|___|	|___|___|___|___|
263	Floor space in sq meters used by mortuary	Floor space in sq meters	|___|___|___|___|	|___|___|___|___|
264	How many private rooms are there for inpatient stays?	Number of rooms Don't know: 98	|___|___|	|___|___|
265	How many beds are there in the private rooms?	Number Don't know: 998	|___|___|___|	|___|___|___|
266	Floor space in sq meters used by private rooms	Floor space in sq meters	|___|___|___|___|	|___|___|___|___|

Section 3: Communications between this health facility and a referral facility

No	Questions and Filters	Coding categories	Response	Skip
301	How far is the closest referral facility from this facility?	Kilometers Don't know..... 998 Not applicable..... 999	|___|___|___|	
302	What type of facility is that (the referral facility)?	NH…… ..... 1 RH ..... 2 PH ..... 3 DH ..... 4 Other_____ _____.....9	☐	
303	On the average, how many patients are referred to other facilities in a month from this facility?	Number of patients referred Don't know……..998	|___|___|___|	
304	How long does it take to transfer sick patients to the referral hospital if transported by ambulance (hours and days)	Hours and/or days	|___|___| hours |___|___| days	
305	What is the average cost per trip for the patients, please specify	A. Travel person: _____PNG kina B. Accommodation per person: _____PNG kina C. Per diem per person _____PNG kina	|___|___|___| |___|___|___| |___|___|___|	
306	Do you budget specifically for patient transfers?	Yes ..... 1 No …. 2	☐	
307	Were the referred patients treated at the referral facility?	Yes……..1 No……2 Some, but not all……..3 Don't know……...8	☐	
308	Did the referral facilities refer some of the referred patients to another facility?	Yes……1 No……2 Don't know……8	☐	
309	What is the mode of communication between this facility and the usual referral center?	No formal communication system……1 Only discharge card……2 Telephone or mobile phone……..3 Two Way Radio……4 Other means_____.....9 (specify)	☐	
310	What is the most common form of transport when referring patients?	Using the facility's ambulance/vehicle……1 Using commercially available cars……2 Using vans……3 Using boats……4 Plane/helicopter……5 Other means_____.....9 (specify)	☐	
311	Does a health worker travel with a sick patient to the referral hospital?	Yes ..... 1 No …. 2	☐	
312	Does the referral hospital have to verbally confirm they will accept the patient before they can be transferred?	Yes ..... 1 No …. 2	☐	

Section 4: Repair and Medical Waste Management

No	Questions and Filters	Coding categories	Response	Skip
401	Who should be responsible for ensuring infrastructure maintenance is carried out?	Province…. ….1 District…. ….2 Church agency…. ….3 This facility…. ….4 Referral health facility …. ….5	☐	
402	Is it desirable for other maintenance (i.e. anything other than really simple tasks) being managed at a higher level?	Yes ……1 No ……2	☐	**If 2 ➔404**
403	If yes, by who?	Province…. ….1 District…. ….2 Church agency…. ….3 This facility…. ….4 Referral health facility …. ….5	☐	
404	Who should be responsible for ensuring basic utilities are maintained at the health facility?	Province…. ….1 District…. ….2 Church agency…. ….3 This facility…. ….4 Referral health facility ……5	☐	
405	Comments on repair needs or types of repair problems of the facility:			
	Medical waste treatment Verify use if incinerator use log is available			
406	Is there any incinerator (high temperature) available in the facility?	Available and used…. ….1 Available but not used …. ….2 Not available…. ….3	☐	
407	Is there any incinerator (1 chamber drum/brick) available in the facility?	Available and used…. ….1 Available but not used …. ….2 Not available…. ….3	☐	
408	Is there any burial pit for waste available in the facility?	Available and used…. ….1 Available but not used …. ….2 Not available…. ….3	☐	
409	Is there any system of segregating medical wastes into three colored waste baskets available in the facility?	Available and used…. ….1 Available but not used …. ….2 Not available…. ….3	☐	
410	Disposal practice of sharps (needles, glass, surgical instruments, etc.)	Incinerator ……1 Burn and bury ….2 Bury but do not burn ….3 Burn but do not bury ….4 Put in a covered pit (could be latrine) ….5 Put in an open pit ….6 Store, collect and move offsite ….7 Just throw out in the open ….8 Other _____ ….9 ….	☐	
411	Disposal practice of biomedical wastes (placenta, human body parts, laboratory waste, etc.)	Incinerator ……1 Burn and bury ….2 Bury but do not burn ….3 Burn but do not bury ….4 Put in a covered pit (could be latrine) ….5 Put in an open pit ….6 Store, collect and move offsite ….7 Just throw out in the open ….8 Other _____ ….9	☐	

Section 5: Food Services and Kitchen Area

Food Services and availability				
No	**Questions and Filters**	**Coding categories**	**Response**	**Skip**
501	Do you provide food service to inpatients?	Yes……..1 No……..2	☐	**If 2 ➔601**
502	Do you charge inpatients any money for food?	Yes ……..1 No ……..2	☐	
503	How much do you charge for food per person per day?	PGKina. (000 if patients are not charged)	|___|___|___|	
504	What is the cost of food per person per day?	PGKina	|___|___|___|	
505	Number of patients who were served with food yesterday?	Number of patients#	|___|___|___|___|	
506	Is there a protocol for feeding hospitalized infants (<1 year)?	Yes……..1 No……..2	☐	
507	How many meals are typically provided for infants in 24 hours?	Two to three times……..1 Four to five times……..2 Six times or more……..3	☐	
508	Is the budget allocated for food service enough for buying groceries and other needs for all patients in the facility?	Yes ……..1 No……..2	☐	
509	Does the facility contract out food services?	Yes, only grocery procurement contracted out…….1 Yes, cooking +other food services contracted out..2 No……..3	☐	
510	Is the food prepared on-site or prepared outside the facility?	Prepared in the facility……..1 Not prepared in the facility……..2	☐	**If 2 ➔601**
511	Is there a chimney or working exhaust fan in cooking area?	Yes …. ……..1 No……..2	☐	
512	Is soap/detergent present in cooking area for washing hands?	Yes ……..1 No……..2	☐	
513	Is soap/detergent present for washing pots, pans, plates, utensils	Yes ……..1 No……..2	☐	
514	Is the kitchen floor clean (no garbage on floor)?	Yes ……..1 No……..2	☐	
515	Is the wiping cloth used in the kitchen is clean, not smelly?	Yes …. ……..1 No……..2	☐	
516	Are there signs of cockroach/mice infestation in the kitchen area?	Yes …. ……..1 No……..2	☐	
517	Do cooking personnel tie hair back and/or wear caps?	Yes …. ……..1 No……..2	☐	
518	Do cooks wear gloves while handling food?	Yes …. ……..1 No……..2	☐	
519	Are prepared foods covered?	Yes …. ……..1 No……..2	☐	

Section 6: Services and other supplies

Section 6.1: Maternal and neonatal care: Antenatal care

	Questions and Filters	Coding categories	Response	Skip
601	Are Antenatal services provided at this facility?	Yes……1 No……2	☐	**If 2 ➔604**
602	How many days in a week the facility provide ANC?	#Days in a week	|___|	
603	Number of antenatal outreach clinics held in the last 3 months?	Number of outreach clinics held Don't know……998	|___|___|___|	
Antenatal clinic equipment and supplies: check to see whether the following items are present and functional in or near the area where antenatal services are provided				
604	Fetal stethoscope (or foetal monitor)	A. Number B. Number Working C. Number regularly used	|___|___| |___|___| |___|___|	
605	Stethoscope and blood pressure cuff	A. Number B. Number Working C. Number regularly used	|___|___| |___|___| |___|___|	
606	Tape measure	A. Number B. Number Working C. Number regularly used	|___|___| |___|___| |___|___|	
607	Scale	A. Number B. Number Working C. Number regularly used	|___|___| |___|___| |___|___|	
608	Ultrasound Machine (and gel)	A. Number B. Number Working C. Number regularly used	|___|___| |___|___| |___|___|	
MATERNAL AND NEONATAL CARE: Deliveries. *Ask the in charge to assist you with questions in this section.*				
609	Does the facility staff assist with deliveries, either in the facility or in the community?	Yes ….1 No….2	☐	**If 2➔611**
610	Does the facility staff assist with deliveries only in the facility, only in the community, or in both facility and community?	Only in facility ….1 Only in community….2 Both in facility and community….3	☐	
611	Does this facility have the capacity to administer antibiotics, oxytocics, and anticonvulsants for delivery of babies?	Yes, can do all of the three ……1 Can do two of the three …. ……2 Can do one of the three ……3 No…. ……4	☐	
612	Does this facility have the ability/capacity for manual removal of the placenta?	Yes, can do now …. …1 Usually, but nit now …. …2 Does not have the capacity …. …3	☐	
613	Does this facility have the capacity to remove retained products following miscarriage or abortion?	Yes, can do now …. …1 Usually, but not now …. …2 Does not have the capacity …. …3	☐	
614	Does this facility have the capacity to do assisted vaginal delivery, preferably with vacuum extractor?	Yes, can do now …. …1 Usually, but not now …. …2 Does not have the capacity …. …3	☐	
615	Does the facility have the capacity to provide newborn care?	Yes, can do now …. …1 Usually, but not now …. …2 Does not have the capacity …. …3	☐	
616	Does the facility have the capacity to manage caesarean section?	Yes, can do now …. …1 Usually, but not now …. …2 Does not have the capacity …. …3	☐	

617	Does the facility have the capacity to do safe blood transfusion?	Yes, can do now …. ..... …1 Usually, but not now …. ..... …2 Does not have the capacity …. ..... …3	☐	
618	Does the facility have the capacity to administer anesthesia?	Yes, can do now …. ..... …1 Usually, but not now …. ..... …2 Does not have the capacity …. ..... …3	☐	
619	Does the facility have the capacity to care for sick and low-birth weight newborns, including resuscitation?	Yes, can do now …. ..... …1 Usually, but not now …. ..... …2 Does not have the capacity …. ..... …3	☐	
620	Does the facility have at least two skilled attendants covering 24 hours a day and seven days a week, assisted by trained support staff?	Yes ..... No……..2	☐	
MATERNAL AND NEONATAL CARE: Delivery room equipment and supplies *Check to see whether the following items are present and functional in or near the delivery room.*				
621	Delivery kit (instruments, supplies)	Present and complete..... 1 Present but not complete..... 2 Not present……..3	☐	
check to see whether the following items are present and functional in or near the area where antenatal services are provided				
622	Stethoscope	A. Number B. Number Working C. Number regularly used	|___|___| |___|___| |___|___|	
623	Partograph	A. Number B. Number Working C. Number regularly used	|___|___| |___|___| |___|___|	
624	Pelvic procedure instruments like speculum	A. Number B. Number Working C. Number regularly used	|___|___| |___|___| |___|___|	
625	Delivery light	A. Number B. Number Working C. Number regularly used	|___|___| |___|___| |___|___|	
626	Sterilizer	A. Number B. Number Working C. Number regularly used	|___|___| |___|___| |___|___|	
627	Vacuum extractor	A. Number B. Number Working C. Number regularly used	|___|___| |___|___| |___|___|	
628	Forceps	A. Number B. Number Working C. Number regularly used	|___|___| |___|___| |___|___|	
629	Manual vacuum aspirator/suction bulb	A. Number B. Number Working C. Number regularly used	|___|___| |___|___| |___|___|	
630	Resuscitation bag , newborn	A. Number B. Number Working C. Number regularly used	|___|___| |___|___| |___|___|	
631	Eye drops or ointment for newborn	A. Number B. Number Working C. Number regularly used	|___|___| |___|___| |___|___|	
632	Needles and syringes (10-20 cc)	A. Number B. Number Working C. Number regularly used	|___|___| |___|___| |___|___|	

633	Sterile C-section instrument kits	A. Number B. Number Working C. Number regularly used	|___|___| |___|___| |___|___|	
634	Cord supplies for new born: clamps, ties, scissors	A. Number B. Number Working C. Number regularly used	|___|___| |___|___| |___|___|	
635	IV sets, including sterilized needle and tube	A. Number B. Number Working C. Number regularly used	|___|___| |___|___| |___|___|	
636	IV fluids, including normal saline and ringer lactate	A. Number B. Number Working C. Number regularly used	|___|___| |___|___| |___|___|	
MATERNAL AND NEONATAL CARE: Postpartum Care				
637	Are postpartum care services offered routinely?	Yes, in the facility as part of routine services only…….1 Yes, in the facility as part of routine services and in special clinics…2 NO, not as part of routine services but only in special clinics……3 NO, not offered at this facility.....4	☐	**If 4 ➔645**
Are the following services provided?				
638	Maternal examination & treatment	Yes ..... 1 No…. 2	☐	
639	Breast feeding counseling	Yes ..... 1 No…. 2	☐	
640	Newborn examination & treatment	Yes ..... 1 No…. 2	☐	
641	Growth Monitoring & promotion	Yes ..... 1 No…. 2	☐	
642	Vaccination counseling	Yes ..... 1 No…. 2	☐	
643	Family planning counseling	Yes ..... 1 No…. 2	☐	
644	Treatment of severe malnutrition	Yes ..... 1 No…. 2	☐	

Section 6.2: Protocols, Guidelines and Templates

Ask to see the protocols and guidelines and check to see which of the following are present.

No	Questions and Filters	Coding categories	Response	Skip
645	IMCI chart book or wall chart	Present …. ..... 1 Not Present..... 2	☐	
646	*ARI (NOT PART OF IMCI)*	Present …. ..... 1 Not Present..... 2	☐	
647	*Diagnosis and treatment of diarrhea (NOT PART OF IMCI)*	Present …. ..... 1 Not Present..... 2	☐	
648	*Graphs for growth monitoring*	Present …. ..... 1 Not Present..... 2	☐	
649	Treatment of severe malnutrition	Present …. ..... 1 Not Present..... 2	☐	
650	Tuberculosis diagnosis and treatment	Present …. ..... 1 Not Present..... 2	☐	
651	NHIS guidelines	Present …. ..... 1 Not Present..... 2	☐	

652	Malaria Protocol	Present …. ..... 1 Not Present..... 2	☐	
653	Immunization schedule	Present …. ..... 1 Not Present..... 2	☐	
654	Family planning	Present …. ..... 1 Not Present..... 2	☐	
655	Are patient education materials displayed?	Present …. ..... 1 Not Present..... 2	☐	

Section 6.3: Laboratory tests

Ask to see the protocols and guidelines and check to see which of the following are present.

No	Questions and Filters	Coding categories	Response	Skip
656	Malaria tests (Malaria RDT)	Able to do this test today …. ..... 1 Able to do this test in past 6 months but not today….2 Cannot do this test 3	☐	
657	Does this facility perform laboratory tests other than malaria test?	Yes …. ..... 1 No…. 2	☐	**If 2 ➔670**
658	Anemia testing	Able to do this test today …. ..... 1 Able to do this test in past 6 months but not today….2 Cannot do this test 3	☐	
659	Urine for R/M/E	Able to do this test today …. ..... 1 Able to do this test in past 6 months but not today….2 Cannot do this test 3	☐	
660	Blood Glucose	Able to do this test today …. ..... ….1 Able to do this test in past 6 months but not today….2 Cannot do this test 3	☐	
661	Stool for RE	Able to do this test today …. ..... 1 Able to do this test in past 6 months but not today….2 Cannot do this test 3	☐	
662	HIV Testing	Able to do this test today …. ..... 1 Able to do this test in past 6 months but not today….2 Cannot do this test 3	☐	
663	TB Smears	Able to do this test today …. ..... 1 Able to do this test in past 6 months but not today….2 Cannot do this test 3	☐	
664	Gram Stains	Able to do this test today …. ..... 1 Able to do this test in past 6 months but not today….2 Cannot do this test 3	☐	
665	Blood Typing and cross matching	Able to do this test today …. ..... 1 Able to do this test in past 6 months but not today….2 Cannot do this test 3	☐	
666	Syphilis testing	Able to do this test today …. ..... 1 Able to do this test in past 6 months but not today….2 Cannot do this test 3	☐	
667	Liver function testing	Able to do this test today …. ..... 1 Able to do this test in past 6 months but not today….2 Cannot do this test 3	☐	
668	Pregnancy testing	Able to do this test today …. ..... 1 Able to do this test in past 6 months but not today….2 Cannot do this test 3	☐	
669	Hepatitis	Able to do this test today …. ..... 1 Able to do this test in past 6 months but not today….2 Cannot do this test 3	☐	

Section 6.4: Pharmacy room, drug storage area and supply system

No	Questions and Filters	Coding categories	Response	Skip
670	Is there a separate room/space for drug storage?	Yes ….....1 No …. 2	☐	**If 2 ➔749**
671	Are doors and windows secured in the drug storage area?	Yes ….....1 No…. 2	☐	
672	Drug storage area has ventilation?	Yes ….....1 No…. 2	☐	
673	Are there enough shelves for storing drugs/other supplies (nothing on the floor)?	Yes ….....1 No…. 2	☐	
674	Are the stored items protected from sun?	Yes ….....1 No…. 2	☐	
675	Are the stored items protected from rain?	Yes ….....1 No…. 2	☐	
676	Is/are there functioning refrigerator/s for storing drugs?	Yes ….....1 No…. 2	☐	
677	How many boxes of drugs did you receive in the last six months (Push system)?	Number of Boxes	|___|___|___|	
678	When do you think you might get next batch of boxes (Push system)?	Less than 2 weeks……..1 2 weeks to 1 month……2 1 to 2 months……...3 More than 2 months……4	☐	
679	Currently, do you or your staff order medicines for the health facility?	Yes ….....1 No…. 2	☐	
680	If yes, from where do you order most of the drugs used in the facility?	Referral health facility / Hospital…. ..... …1 Provincial / district health office…..... …2 Area Medical store …..... …3 Provincial Medical Store ……..4 NDoH……5	☐	
681	When did you order drugs last time?	Less than a month ago……..1 1 month to less than 2 months……..2 2 months to less than 3 months……3 3 months to less than 4 months……4 4 months to less than 6 months……5 6 months to less than 9 months……6 9 months to less than 1 year……7 More than 1 year ago……8	☐	
682	Where did you order for the drug last time?	Referral health facility / Hospital…. ..... …1 Provincial / district health office…..... …2 Area Medical store …..... …3 Provincial Medical Store ……..4 NDoH……5	☐	
683	The previous order you received (not the last order), how long it took for the drugs to arrive after the placement of order?	Less than 2 weeks……..1 2 weeks to 1 month……2 1 to 2 months……...3 More than 2 months……4	☐	
684	Do you always get the drugs you ordered?	Yes ….....1 No …. 2	☐	**If 2 ➔691**
685	On average, what percentage of drugs ordered are received?	Percent of drugs ordered received	|___|___|	

686	Who normally makes the collection from the facility?	Community health worker…. ..... …1 Volunteer…..... …2 Nurse…. ..... …3 Brought to the facility by suppliers…. ..... …4	☐	
687	How is the drug delivered to the facility?	Facility gets the drug from medical store/NDoH….1 Medical store/NDoH delivers to the facility…. .. …2 Others deliver to the facility ..... …3	☐	
688	How do you pay the expenses for collecting drugs ordered?	Province…. ..... …1 Own budget..... …2 Referral health facility …. ..... …3 Others …. ..... …4	☐	
689	How much does it cost (all expenses) on one average pick up?	PNG Kina Don't Know: 99999	|___|___|___|___|	
690	Where did you go last time to collect medical supplies?	Please specify	☐☐	
Medical Supply Kits (Push System)				
691	What month and year did you receive your last round of medical supply kits?	Month Year	|__|__| |__|__|	
692	Were the medical supply kits delivered directly or did the facility pick up the kits?	Delivered ..... …1 Picked up..... …2	☐	
693	List three drugs that you think are more than enough based on needs here in the facility WRITE NAME AND CODE OF THE DRUGS FROM THE SUPPLY KITS DRUG LIST	A_____ B_____ C_____	|___|___|___| |___|___|___| |___|___|___|	
694	List three drugs that you think are not enough based on needs in the facility? WRITE NAME AND CODE OF THE DRUGS FROM THE SUPPLY KITS DRUG LIST	A_____ B_____ C_____	|___|___|___| |___|___|___| |___|___|___|	
Purchased Drugs				
695	Have you purchased additional medicines or medical supplies this year?	Yes …..1 No …. 2	☐	
696	If yes, how did you pay for this purchase?	Request province…. ..... …1 Own budget…. ..... …2 Referral health facility …. ..... …3	☐	
697	How much did you spend on additional drugs in 2014?	PNG Kina	|___|___|___|___|	
698	Are you planning on purchasing additional drugs in 2015?	Yes …..1 No …. 2	☐	

Section 7.1: Availability of Essential Drugs or supplies

SL #	Drug	Question	Response	Question	Response
		Drugs continuously available last 30 days without any stock-outs?	A	Are expired drug present?	B
701	Panadol/ Paracetamol tablet	Yes .....1 No 2	☐	Yes.....1 No .....2 No expiratory date ...3 Drug is not present ...4	☐
702	Paracetamol liquid	Yes .....1 No 2	☐	Yes.....1 No .....2 No expiratory date ...3 Drug is not present ...4	☐
703	Diclofenac (pain/inflammation) capsule or tab	Yes .....1 No 2	☐	Yes.....1 No .....2 No expiratory date ...3 Drug is not present ...4	☐
704	Pethidine	Yes .....1 No 2	☐	Yes.....1 No .....2 No expiratory date ...3 Drug is not present ...4	☐
705	Chloroquine	Yes .....1 No 2	☐	Yes.....1 No .....2 No expiratory date ...3 Drug is not present ...4	☐
706	Quinine Injection	Yes .....1 No 2	☐	Yes.....1 No .....2 No expiratory date ...3 Drug is not present ...4	☐
707	Primaquine	Yes .....1 No 2	☐	Yes.....1 No .....2 No expiratory date ...3 Drug is not present ...4	☐
708	Amodiaquine	Yes .....1 No 2	☐	Yes.....1 No .....2 No expiratory date ...3 Drug is not present ...4	☐
709	Artemisinin combination	Yes .....1 No 2	☐	Yes.....1 No .....2 No expiratory date ...3 Drug is not present ...4	☐
710	Fansidar	Yes .....1 No 2	☐	Yes.....1 No .....2 No expiratory date ...3 Drug is not present ...4	☐
711	Sulfadoxine tab.	Yes .....1 No 2	☐	Yes.....1 No .....2 No expiratory date ...3 Drug is not present ...4	☐
712	Pyrimethamine tab.	Yes .....1 No 2	☐	Yes.....1 No .....2 No expiratory date ...3 Drug is not present ...4	☐

SL #	Drug	Question	Response	Question	Response
		Drugs continuously available last 30 days without any stock-outs?	**A**	**Are expired drug present?**	**B**
713	Rifampicin	Yes .....1 No 2	☐	Yes.....1 No .....2 No expiratory date ...3 Drug is not present ...4	☐
714	Isoniazid	Yes .....1 No 2	☐	Yes.....1 No .....2 No expiratory date ...3 Drug is not present ...4	☐
715	Ethambutol	Yes .....1 No 2	☐	Yes.....1 No .....2 No expiratory date ...3 Drug is not present ...4	☐
716	Pyrazinamide	Yes .....1 No 2	☐	Yes.....1 No .....2 No expiratory date ...3 Drug is not present ...4	☐
717	Streptomycin	Yes .....1 No 2	☐	Yes.....1 No .....2 No expiratory date ...3 Drug is not present ...4	☐
718	TB blister packs	Yes .....1 No 2	☐	Yes.....1 No .....2 No expiratory date ...3 Drug is not present ...4	☐
719	Oxytocin	Yes .....1 No 2	☐	Yes.....1 No .....2 No expiratory date ...3 Drug is not present ...4	☐
720	Ergometrine	Yes .....1 No 2	☐	Yes.....1 No .....2 No expiratory date ...3 Drug is not present ...4	☐
721	Lignocaine	Yes .....1 No 2	☐	Yes.....1 No .....2 No expiratory date ...3 Drug is not present ...4	☐
722	Depo-provera	Yes .....1 No 2	☐	Yes.....1 No .....2 No expiratory date ...3 Drug is not present ...4	☐
723	Ferrous sulphate	Yes .....1 No 2	☐	Yes.....1 No .....2 No expiratory date ...3 Drug is not present ...4	☐
724	Liniment	Yes .....1 No 2	☐	Yes.....1 No .....2 No expiratory date ...3 Drug is not present ...4	☐

SL #	Drug	Question	Response	Question	Response
		Drugs continuously available last 30 days without any stock-outs?	**A**	**Are expired drug present?**	**B**
725	Flagyl/ Metronidazole	Yes .....1 No 2	☐	Yes.....1 No .....2 No expiratory date ...3 Drug is not present ...4	☐
726	Amoxicillin capsule or tablets	Yes .....1 No 2	☐	Yes.....1 No .....2 No expiratory date ...3 Drug is not present ...4	☐
727	Co-trimoxazole oral susp or tablet	Yes .....1 No 2	☐	Yes.....1 No .....2 No expiratory date ...3 Drug is not present ...4	☐
728	Diazepam capsule or tablet	Yes .....1 No 2	☐	Yes.....1 No .....2 No expiratory date ...3 Drug is not present ...4	☐
729	Amitriptyline 25 mg, capsule or tablet (depression medicine)	Yes .....1 No 2	☐	Yes.....1 No .....2 No expiratory date ...3 Drug is not present ...4	☐
730	Paraldehyde	Yes .....1 No 2	☐	Yes.....1 No .....2 No expiratory date ...3 Drug is not present ...4	☐
731	Albendazole tab	Yes .....1 No 2	☐	Yes.....1 No .....2 No expiratory date ...3 Drug is not present ...4	☐
732	Tinidazole tab	Yes .....1 No 2	☐	Yes.....1 No .....2 No expiratory date ...3 Drug is not present ...4	☐
733	Ciprofloxacin capsule or tablet (usually 500 mg)	Yes .....1 No 2	☐	Yes.....1 No .....2 No expiratory date ...3 Drug is not present ...4	☐
734	Crystalline penicillin injection	Yes .....1 No 2	☐	Yes.....1 No .....2 No expiratory date ...3 Drug is not present ...4	☐
735	Ceftriaxone 1g/vial injection	Yes .....1 No 2	☐	Yes.....1 No .....2 No expiratory date ...3 Drug is not present ...4	☐
736	Chloramphenicol injection	Yes .....1 No 2	☐	Yes.....1 No .....2 No expiratory date ...3 Drug is not present ...4	☐

SL #	Drug	Question	Response	Question	Response
		Drugs continuously available last 30 days without any stock-outs?	**A**	**Are expired drug present?**	**B**
737	Mala wan (1)	Yes .....1 No 2	☐	Yes.....1 No .....2 No expiratory date ...3 Drug is not present ...4	☐
738	Captopril, 25 mg, capsule or tab	Yes .....1 No 2	☐	Yes.....1 No .....2 No expiratory date ...3 Drug is not present ...4	☐
739	Atenolol 50 mg, capsule or tablet (Cardiovascular disease drug)	Yes .....1 No 2	☐	Yes.....1 No .....2 No expiratory date ...3 Drug is not present ...4	☐
740	Simvastatin 20 mg, capsule or tablet	Yes .....1 No 2	☐	Yes.....1 No .....2 No expiratory date ...3 Drug is not present ...4	☐
741	Glibenclamide 5mg, capsule or tablet (for diabetes)	Yes .....1 No 2	☐	Yes.....1 No .....2 No expiratory date ...3 Drug is not present ...4	☐
742	Salbutamol tab 4 mg	Yes .....1 No 2	☐	Yes.....1 No .....2 No expiratory date ...3 Drug is not present ...4	☐
743	CMP(Chlorpheniramine maleate) tablet	Yes .....1 No 2	☐	Yes.....1 No .....2 No expiratory date ...3 Drug is not present ...4	☐
744	Omeprazole (capsule or tablet)	Yes .....1 No 2	☐	Yes.....1 No .....2 No expiratory date ...3 Drug is not present ...4	☐
745	ART for HIV/AIDS	Yes .....1 No 2	☐	Yes.....1 No .....2 No expiratory date ...3 Drug is not present ...4	☐

Table 7.2: Availability and Stock-out information of other supplies

SL #		Available for use today (Yes=1, No=2)	Continuously available in the last 30 days without any stock-outs? (Yes=1, No=2)
Family Planning items			
749	Family planning: Oral pills		
750	Family planning Injections		
751	Condoms		
Vaccines and related items			
752	BCG		
753	HEP B		
754	Vitamin A		
755	Sabin		
756	DTP/Hib		
757	Measles		
758	Tetanus Toxoid		
759	Iron tablet or folic acid		
Availability of Kits for Malaria, TB and HIV/AIDS			
760	HIV/AIDS Test Kit		
761	RDT Test kit for Malaria		
762	TB Category 1 kit		
762	TB Category 2 kit		
Other items			
763	ORS for diarrhea		
764	HS Darrows		
765	Oxygen		
766	Baby/scale book		
767	Mother's health book		
768	Quarterly TB report book		
769	Monthly report forms		
770	Health center record books		
771	Daily summary book		

Section 7.3: EPI and Cold Chain

No	Questions and Filters	Coding categories	Response	Skip
772	Does this facility provide EPI services?	Yes ……1 No…. ……2	☐	**If 2 ➔801**
773	Does this facility provide opportunistic immunizations (i.e., immunization provided when an unimmunized child shows up)?	Yes ……1 No…. ……2	☐	
774	Are child immunizations regularly given to children at this facility or in outreach EPI activities?	Yes, at facility only……1 Yes, at outreach only……2 Yes, both facilities & outreach …….3	☐	**If 1 ➔777**
775	How many EPI outreach activities were conducted in the past 3 months?	Number EPI outreach activities	|___|___|___|	
776	How many children were vaccinated during past three months and what proportion of total children was vaccinated through outreach activities?	A. Total immunized B. % immunize through outreach	☐☐☐ |___|___|__|	
777	How is the main vaccine refrigerator powered?	None……1 Fuel ……2 Electric……3 Solar ……4 Gas……5 Other ……6 *Specify*	☐	**If 1 ➔782**
778	Is the main vaccine refrigerator working?	Yes ……1 No……2	☐	
779	Is the main vaccine thermometer present and working?	Yes ……1 No……2	☐	
780	Is a temperature log kept	At least twice a day for past 30 days……1 Less than twice a day readings ……2 No vaccine log kept ……3	☐	**If 1 ➔782**
781	# of days in the past **month** in which refrigerator temp over 8^0C or under 0^0C	Number of days Don't know……98	|___|___|	
782	Are most of the cold boxes/vaccine carriers functional /working?	Almost all working ……1 Most not working ……2 Do not have ……3	☐	
783	Are ice packs present and in good condition?	Present, good condition……1 Present, not good condition……2 Not present……3	☐	
784	Are adequate immunization cards present for at least 30 days? *(Based on estimation by in-charge)*	Yes ……1 No……2	☐	

Section 8.1 Health Outreach Patrols

SL No	Questions and Filters	Coding categories	Response	Skip
801	Does this facility conduct outreach patrols in the community?	Yes .....1 No 2	☐	**If 2 ➔822**
802	How many health outreach patrols to villages were planned in 2014?	Number of days Don't know.....998	|___|___|___|	
803	How many health outreach patrols to villages were conducted in 2014?	Number of days Don't know.....998	|___|___|___|	
804	How many for each of the following types conducted in 2014?	A. Maternal and child health (MCH) B. Immunization C. Joint outreach clinics	|___|___|___| |___|___|___| |___|___|___|	
805	If the number conducted is less than the number planned, what are the reasons?	Lack of funds..... …1 Lack of fuel ..... …2 Lack of staff ..... …3 Unwillingness of staff to travel.... ..... …4	☐	
806	How many villages/patrol sites are reached on a typical patrol?	Number Don't know.....98	|___|___|	
807	What is the typical average time taken to conduct one patrol? i.e., how long are health workers normally away from the facility at a time.	Half day..... …1 One day ..... …2 Two days ..... …3 Three days..... …4 More than three days..... …5	☐	
808	Do health workers receive an allowance to go out on patrol?	Yes ..... No 2	☐	
809	If yes, how much per typical patrol?	PNG Kina Don't know.....998	|___|___|___|___|	
810	Are porters / volunteers / casual health staff used to help this facility carry out patrols?	Yes .....1 No 2	☐	
811	Is the health information gathered from conducting a patrol incorporated into monthly reporting for this health facility?	Yes ..... No 2	☐	
812	What proportion of total catchment population is served either through the facility or the outreach patrols in a quarter?	Almost all served .....1 Majority served .....2 More than quarter served .....3 Less than quarter served.....4 None served 5	☐	
813	What proportion of total catchment population do you think live in "remote areas" (at least a day's walk from an operational road)?	% of population	|___|___|___|	
814	What proportion of the "remote areas" population covered?	% of population	|___|___|___|	
815	Do you receive support and involvement from 'higher levels' (i.e. hospitals, district health office) such as doctors, specialists accompanying you on patrols?	Yes ..... No 2	☐	

SL No	Questions and Filters	Coding categories	Response	Skip
816	If yes, please specify the designation of that personnel RECORD 1 IF THE PERSONNEL ACCOMPANIED AND 2 IF NOT ACCOMPANIED	A. Doctor		
		B. Specialist		
		C. Administrators/ Managers		
		D. Other health personnel		
		E. Security personnel		
		F. Other_____ Specify		
817	In your opinion, has the system of conducting regular outreach patrols to rural and remote communities in the past five years gotten better, worse or stagnated?	Better……1 Stagnated……2 Worse……3	☐	
818	The reasons for this change over the last five years RECORD 1 IF THE REASON IS MENTIONED AND 2 IF NOT MENTIONED	A. Availability of funds		
		B. Availability of transportation		
		C. Availability of staff		
		D. Weather		
		E. Unrest		
		F. Other_____ Specify		
819	If a health patrol finds very sick patients in remote areas, what action is normally taken?	Ask community for help ..... …1 Call health centre..... …2 Report back to health facility. ..... …3 Other, specify. ..... …4	☐	
820	Do you have the means to respond immediately to the health emergency?	Yes …..1 No …. 2	☐	**If 2 ➔822**
821	How do you respond to health emergencies RECORD 1 IF THE WAY IS MENTIONED AND 2 IF NOT MENTIONED	A. Call ambulance or vehicle to transport patient		
		B. Call specialist from the local hospital		
		C. Inform emergency situation to NDOH		
		D. Other_____ Specify		

Section 8.2: Administration and management

SL No	Questions and Filters	Coding categories	Response	Skip
822	How many health care providers arrived at the facility on time today (+/- 10 minutes)	Number of days Don't know.....9998	|___|___|___|___|	
823	How many HEOs, nurses, midwives, and CHWs arrived on time at the facility today?	Number of days Don't know.....9998	|___|___|___|___|	
824	How many doctors are present now? RECORD "98" FOR THE NUMBER IF NOT KNOWN	A. Time now: Hour and Minute C. Number present:	|___|___| |___|___| |___|___|	
825	Are there enough official registers, stationery and other supplies?	Yes .....1 No.....2	☐	
826	Are there enough forms for the admission and discharge?	Yes .....1 No.....2 Not applicable.....2	☐	
827	How many meetings of the facility staff were held in past three months?	Number Don't know.....98	|___|___|	
828	Is there a Hospital/facility community advisory committee/Village Health Committees in this area?	Yes.....1 No.....2	☐	**If 2 ➔831**
829	How many meetings of the Hospital/facility community advisory committee were held in past three months?	Number held in past year Don't know.....998	|___|___|___|	
830	Does the facility have written records of activities carried out by the Hospital/facility community advisory committee?	Yes .....1 No.....2	☐	
831	Is there an asset registry (equipment and furniture inventory)? *Ask to see the inventory; if health staff report having list but do not show it to you, circle 4.*	Yes.....1 Present, not complete.....2 Not present..... 3 Staff report having inventory but do not show it to surveyor 4	☐	
832	When was the last time inventory updated?	Within last one month.....1 With last three months.....2 Within last six months.....3 More than six months ago.....4	☐	
833	Did the health facility have to close for any reason this year?	Yes .....1 No 2	☐	**If 2 ➔835**
834	If yes, how long and the reason for disruption in operations.	A. Days remaining closed last year: B. Reason (please specify):_____	|___|___|___| ☐☐	

Section 8.3: Supervision

SL No	Questions and Filters	Coding categories	Response	Skip
835	Is there at least one officially assigned external supervisor for this health facility?	Yes……1 No……2	☐	**If 2 ➔838**
836	What are the designations of the supervisors who visited the health facility in the last one year and how many times did they visit? RECORD THE NUMBER OF VISITS FOR EACH KIND OF SUPERVISOR IN RESPONSE COLUMN AND RECORD 00 IF NO SUPERVISION DONE BY THAT TYPE OF PERSONNEL	A. Doctor		
		B. PHO		
		C. DHA		
		D. PDCO		
		E. Maternal and Child Health		
		F. Church Health Secretary		
		G. Other_____ Specify		
837	What were the purpose/ reasons for latest supervisor's visit? RECORD 1 IF THE REASON MENTIONED AND 2 IF NOT MENTIONED	A. Overall activities in the facility		
		B. Drug Storage and Distribution		
		C. Auditing the finance		
		D. Maternal/Child health Services		
		E. Immunization program		
		F. Other_____ Specify		
838	Does a doctor work at this health facility?	Yes……1 No ……2	☐	**If 1 ➔840**
839	If no, how many times has a doctor visited this health facility in 2014?	Number Don't know……998	|___|___|___|	
840	Does a Health Extension Officer work at this health facility?	Yes……1 No ……2	☐	**If 1 ➔842**
841	If no, how many times did a Health Extension Officer (HEO) visit this health facility in 2014?	Number Don't know……998	|___|___|___|	
842	Does this health facility supervise aid posts / sub-health centers?	Yes ……1 No……2	☐	**If 2 ➔844**
843	If yes, how many?	Number Don't know……998	|___|___|___|	
844	How many supervisory visits were made to these clinics in 2014?	Number Don't know……998	|___|___|___|	
845	How are the costs for supervisory visits paid for at the health facility?	Request province……1 Request district……2 Own budget……3 Referral health facility ……4	☐	
846	Are any other tasks carried out in conjunction with conducting supervisory visits? RECORD 1 IF THE TASK MENTIONED AND 2 IF NOT MENTIONED	A. Consultation to patients		
		B. MCH services		
		C. Care in Well baby Clinic		
		D. Immunization services		
		E. Other_____ Specify		
847	Were recommendations written in a supervision book from last supervision?	Book present, recommendations written……1 Book present, No recommendations……2 No book……3	☐	

Section 8.4: Autonomy [Respondent: Health Facility Manager only]

SL No	Questions and Filters	Coding categories	Response	Skip
848	What authority do you have to make decision on expenditure of funds provided to your facility? RECORD 1 IF THE DECISION MENTIONED AND 2 IF NOT MENTIONED	A. Total amount to be spent		
		B. Reallocation of money within same category		
		C. Reallocation between exp categories		
		D. Months in which expenditures can be made		
		E. Can sign cheques to pay suppliers and other vendors		
849	Do you need preapprovals for exercising the authorities you have related to fund allocation?	Yes ..... 1 No 2	☐	
850	What authority do you have in decisions related to facility personnel? RECORD 1 IF THE DECISION MENTIONED AND 2 IF NOT MENTIONED	A. Disciplinary action/reporting for poor performance		
		B. Identify needs for additional / new staff		
		C. Hiring of new staff		
		D. Determine level of payment for staff		
		E. Allocating tasks/duties to existing staff		
		F. Commending staff for good performance		
		G. Promoting staff to higher position		
		H. Dismissal of staff		
		I. Other_____ Specify		
851	Do you need preapprovals for exercising the authorities you have related to fund allocation?	Yes ..... 1 No 2	☐	
852	What authority do you have in decisions on the type/organizations of service provision? RECORD 1 IF THE DECISION MENTIONED AND 2 IF NOT MENTIONED	A. Planning the schedule of services		
		B. Changing the content of services delivered		
		C. Quality of services		
		D. Operating procedures		
		E. Procedures for accessing services		
		F. Charges for services		
		G. Addition of new services		
		H. Other_____ Specify		
853	For each area of authority: are you satisfied with the level of authority you have?	Yes ..... 1 No 2	☐	
854	If not what type of authority you think you need for improving performance of the health facility? RECORD 1 IF THE AUTHROITY MENTIONED AND 2 IF NOT MENTIONED	A. Authority to generate revenue for facility		
		B. Authority to allocate budget		
		C. Authority to hire and fire staff		
		D. Authority to give reward/punishment		
		E. Authority to plan		
		F. Authority of quality assurance		
		G. Other_____ Specify		

Section 8.5: Barriers to managing facility

856	What are the three main constraints you face in managing this facility effectively?	*1.* *2.* *3.* No problem 9	
857	Please identify three ways in which the government or your organization could help you do your job better.	*1.* *2.* *3.* No problem 9	
858	Suggest three ways of better involving the community with the health facility activities.	*1.* *2.* *3.* No problem 9	

Section 8.6: Facility health information systems

Review records for the last completed month.		*Record the appropriate number in the "Response" column*					*Response*
		1. Do not provide the service, no register	**2. Register Present, fully completed**	**3. Register Present, not fully completed**	**4. Report having but did not show it to surveyor**	**5. Not present**	
859	ANC register	1	2	3	4	5	
860	Delivery/maternity register	1	2	3	4	5	
861	OT register	1	2	3	4	5	
862	Blood bank register	1	2	3	4	5	
863	HIV Register	1	2	3	4	5	
864	TB Register	1	2	3	4	5	
865	Hospital activity report	1	2	3	4	5	
866	EPI report	1	2	3	4	5	
867	Family Planning report	1	2	3	4	5	
868	Leprosy report	1	2	3	4	5	
869	Lab register	1	2	3	4	5	
870	Morbidity/ Mortality report	1	2	3	4	5	
871	Malaria, Kala-azar report	1	2	3	4	5	
872	Notifiable Disease report	1	2	3	4	5	
873	IMCI report	1	2	3	4	5	
874	Equipment status report	1	2	3	4	5	
875	Other _____	1	2	3	4	5	
876	Other _____	1	2	3	4	5	
877	Other _____	1	2	3	4	5	
878	Other _____	1	2	3	4	5	
879	Other _____	1	2	3	4	5	

Section 9: Number of cases by disease or medical conditions for the latest month (based on the latest Health Center Monthly Summary Report available)

SL #	Question or items	Response instructions	Record Response	Skip
901	Does the facility have monthly reports available for review (either from facility or elsewhere)?	Yes……..1 No……..……2	☐	If 2 ➔904
902	The month and year of latest monthly report available in the facility or obtained from upper administrative level	Month (MM) and Year (YY)	☐☐ ☐☐	
903	Is the latest monthly report complete?	All fields are recorded/completed…….1 Most of the fields completed……2 Most of the fields not completed……..3 Only very few items are recorded……..4	☐	

Table 9.1: Outpatients (from monthly report)

SL No	Diseases	Male (Number of cases)	Female (Number of cases)
		A	B
904	Measles (suspected)	|___|___|___|___|___|	|___|___|___|___|___|
905	Pertussis	|___|___|___|___|___|	|___|___|___|___|___|
906	Simple cough	|___|___|___|___|___|	|___|___|___|___|___|
907	Pneumonia (<1 year)	|___|___|___|___|___|	|___|___|___|___|___|
908	Pneumonia (1-4 yrs)	|___|___|___|___|___|	|___|___|___|___|___|
909	Pneumonia (5 yrs+)	|___|___|___|___|___|	|___|___|___|___|___|
910	Chronic Obstructive Pulmonary Diseases	|___|___|___|___|___|	|___|___|___|___|___|
911	Asthma	|___|___|___|___|___|	|___|___|___|___|___|
912	Other upper respiratory tract infections	|___|___|___|___|___|	|___|___|___|___|___|
913	Diarrhea (<1 year)	|___|___|___|___|___|	|___|___|___|___|___|
914	Diarrhea (1-4 yrs)	|___|___|___|___|___|	|___|___|___|___|___|
915	Diarrhea (5 yrs+)	|___|___|___|___|___|	|___|___|___|___|___|
916	Malaria (<1 year)	|___|___|___|___|___|	|___|___|___|___|___|
917	Malaria (1-4 yrs)	|___|___|___|___|___|	|___|___|___|___|___|
918	Malaria (5 yrs+)	|___|___|___|___|___|	|___|___|___|___|___|
919	Malaria (Pregnant women)		|___|___|___|___|___|
920	Pyrexia (Fever) of unknown cause (PUO)	|___|___|___|___|___|	|___|___|___|___|___|
921	Anaemia	|___|___|___|___|___|	|___|___|___|___|___|
922	Malnutrition (<1 yr)	|___|___|___|___|___|	|___|___|___|___|___|
923	Malnutrition (1-4 yrs)	|___|___|___|___|___|	|___|___|___|___|___|
924	Accident /injuries	|___|___|___|___|___|	|___|___|___|___|___|
925	Genital ulcers	|___|___|___|___|___|	|___|___|___|___|___|
926	Urethral discharge	|___|___|___|___|___|	
927	Vaginal discharge		|___|___|___|___|___|
928	Pelvic Inflammatory Disease		|___|___|___|___|___|
929	Genital warts	|___|___|___|___|___|	|___|___|___|___|___|
930	Latent syphilis (blood test)	|___|___|___|___|___|	|___|___|___|___|___|
931	Other STI	|___|___|___|___|___|	|___|___|___|___|___|

SL No	Diseases or medical conditions	Male (Number of cases)	Female (Number of cases)
		A	B
932	Pulmonary TB suspect	|___|___|___|___|___|	|___|___|___|___|___|
933	Pulmonary TB confirmed by sputum test	|___|___|___|___|___|	|___|___|___|___|___|
934	Leprosy	|___|___|___|___|___|	|___|___|___|___|___|
935	Yaws	|___|___|___|___|___|	|___|___|___|___|___|
936	Other skin diseases	|___|___|___|___|___|	|___|___|___|___|___|
937	Ear infections (including both middle and outer ear infections)	|___|___|___|___|___|	|___|___|___|___|___|
938	Eye infections	|___|___|___|___|___|	|___|___|___|___|___|
939	All other new cases	|___|___|___|___|___|	|___|___|___|___|___|

Table 9.2: Inpatients (Number of discharges from monthly report)

SL No	Diseases or medical conditions	Male (discharges)	Female (discharges)
		A	B
940	Diphtheria	|___|___|___|___|___|	|___|___|___|___|___|
941	Neonatal Tetanus	|___|___|___|___|___|	|___|___|___|___|___|
942	Acute Flaccid Paralysis	|___|___|___|___|___|	|___|___|___|___|___|
943	Measles (suspected)	|___|___|___|___|___|	|___|___|___|___|___|
944	Pertussis	|___|___|___|___|___|	|___|___|___|___|___|
945	Neonatal sepsis	|___|___|___|___|___|	|___|___|___|___|___|
946	Pneumonia (<1 year)	|___|___|___|___|___|	|___|___|___|___|___|
947	Pneumonia (1-4 yrs)	|___|___|___|___|___|	|___|___|___|___|___|
948	Pneumonia (5 yrs+)	|___|___|___|___|___|	|___|___|___|___|___|
949	Chronic Obstructive Pulmonary Diseases	|___|___|___|___|___|	|___|___|___|___|___|
950	Asthma	|___|___|___|___|___|	|___|___|___|___|___|
951	Other respiratory	|___|___|___|___|___|	|___|___|___|___|___|
952	Diarrhea (<1 year)	|___|___|___|___|___|	|___|___|___|___|___|
953	Diarrhea (1-4 yrs)	|___|___|___|___|___|	|___|___|___|___|___|
954	Diarrhea (5 yrs+)	|___|___|___|___|___|	|___|___|___|___|___|
955	Malaria (Clinical diagnosis) (0-4 years)	|___|___|___|___|___|	|___|___|___|___|___|
956	Malaria (Clinical diagnosis) (5-14 years)	|___|___|___|___|___|	|___|___|___|___|___|
957	Malaria (Clinical diagnosis) (15 yrs+)	|___|___|___|___|___|	|___|___|___|___|___|
958	Malaria (Clinical diagnosis) (Pregnant)		|___|___|___|___|___|
959	Malaria (Slide or RDT diagnosis) (0-4 years)	|___|___|___|___|___|	|___|___|___|___|___|
960	Malaria (Slide or RDT diagnosis) (5-14 years)	|___|___|___|___|___|	|___|___|___|___|___|
961	Malaria (Slide or RDT diagnosis) (15 yrs +)	|___|___|___|___|___|	|___|___|___|___|___|
962	Malaria (Slide or RDT diagnosis) (Pregnant)		|___|___|___|___|___|
963	Anemia	|___|___|___|___|___|	|___|___|___|___|___|
964	Malnutrition (<1 yr)	|___|___|___|___|___|	|___|___|___|___|___|
965	Malnutrition (1-4 yrs)	|___|___|___|___|___|	|___|___|___|___|___|
966	All accidents/injuries	|___|___|___|___|___|	|___|___|___|___|___|

SL No	Diseases or medical conditions	Male (discharges)	Female (discharges)
		A	B
967	Typhoid	|___|___|___|___|___|	|___|___|___|___|___|
968	TB	|___|___|___|___|___|	|___|___|___|___|___|
969	Leprosy	|___|___|___|___|___|	|___|___|___|___|___|
970	Meningitis (<1 year)	|___|___|___|___|___|	|___|___|___|___|___|
971	Meningitis (1-4 years)	|___|___|___|___|___|	|___|___|___|___|___|
972	Meningitis (5 years+)	|___|___|___|___|___|	|___|___|___|___|___|
973	Snakebite	|___|___|___|___|___|	|___|___|___|___|___|
974	Skin diseases	|___|___|___|___|___|	|___|___|___|___|___|
975	HIV/AIDS (<5 years)	|___|___|___|___|___|	|___|___|___|___|___|
976	HIV/AIDS (5-14 years)	|___|___|___|___|___|	|___|___|___|___|___|
977	HIV/AIDS (15-24 years)	|___|___|___|___|___|	|___|___|___|___|___|
978	HIV/AIDS (25 years+)	|___|___|___|___|___|	|___|___|___|___|___|
979	TB-HIV Patients	|___|___|___|___|___|	|___|___|___|___|___|
980	Ischemic heart diseases	|___|___|___|___|___|	|___|___|___|___|___|
981	Cancer	|___|___|___|___|___|	|___|___|___|___|___|
982	Hypertension	|___|___|___|___|___|	|___|___|___|___|___|
983	Diabetes	|___|___|___|___|___|	|___|___|___|___|___|
984	Other discharges not included above	|___|___|___|___|___|	|___|___|___|___|___|

Table 9.3: Family Planning Services Provided

SL No	FP Methods and services	New attendance in facility	Re-attendance in facility	New attendance in Aidpost	Re-attendance in Aidpost
		A	B	C	D
985	Breast feeding	|___|___|___|___|___|	|___|___|___|___|___|	|___|___|___|___|___|	|___|___|___|___|___|
986	Com. Pill (OCP)	|___|___|___|___|___|	|___|___|___|___|___|	|___|___|___|___|___|	|___|___|___|___|___|
987	Injection	|___|___|___|___|___|	|___|___|___|___|___|	|___|___|___|___|___|	|___|___|___|___|___|
988	Ovulation	|___|___|___|___|___|	|___|___|___|___|___|	|___|___|___|___|___|	|___|___|___|___|___|
989	Condom	|___|___|___|___|___|	|___|___|___|___|___|	|___|___|___|___|___|	|___|___|___|___|___|
990	Loops/IUD	|___|___|___|___|___|	|___|___|___|___|___|	|___|___|___|___|___|	|___|___|___|___|___|
991	T/ligation	|___|___|___|___|___|		|___|___|___|___|___|	
992	Vasectomy	|___|___|___|___|___|		|___|___|___|___|___|	
993	Referred out to other facilities	|___|___|___|___|___|		|___|___|___|___|___|	

Table 9.4: Maternal, Neonatal and Child Health Services

SL No	Antenatal care	Number
994	First visit	|___|___|___|___|___|
995	Fourth visit	|___|___|___|___|___|
996	Other	|___|___|___|___|___|
997	First dose TT	|___|___|___|___|___|
998	Second dose TT	|___|___|___|___|___|
999	Booster	|___|___|___|___|___|

	Deliveries	Number
1000	Uncomplicated deliveries in health facility	|___|___|___|___|___|
1001	Deliveries with complications in health facility	|___|___|___|___|___|
1002	Transferred to hospital for pregnancy and delivery complications	|___|___|___|___|___|
1003	Birth weight <2500 grams	|___|___|___|___|___|
1004	Still births	|___|___|___|___|___|
1005	Born before arrival	|___|___|___|___|___|
1006	Village births attended (total)	|___|___|___|___|___|

Table 9.5 Well Baby Clinic

SL Number	Type of service	New attend	Re-attend
		A	B
1007	Clinic Attendances (<1 year)	|___|___|___|___|___|	|___|___|___|___|___|
1008	Clinic Attendances (1-4 years)	|___|___|___|___|___|	|___|___|___|___|___|

Table 9.6: Immunizations administered

Serial No	Vaccine type administered	Administered in clinic or in outreach	Administered by Aidposts
		A	B
1009	BCG (Within 24 hours of birth)	|___|___|___|___|___|	|___|___|___|___|___|
1010	BCG (<1 week but not within 24 hours of birth)	|___|___|___|___|___|	|___|___|___|___|___|
1011	BCG (> 1 week)	|___|___|___|___|___|	|___|___|___|___|___|
1012	Hepatitis B (Within 24 hours of birth)	|___|___|___|___|___|	|___|___|___|___|___|
1013	Hepatitis B (> 24 hours)	|___|___|___|___|___|	|___|___|___|___|___|
1014	DTP/Hib (Hep B) (First dose < 1 year)	|___|___|___|___|___|	|___|___|___|___|___|
1015	DTP/Hib (Hep B) (Second dose < 1 year)	|___|___|___|___|___|	|___|___|___|___|___|
1016	DTP/Hib (Hep B) (Third dose < 1 year)	|___|___|___|___|___|	|___|___|___|___|___|
1017	DTP/Hib (Hep B) (> 1 year)	|___|___|___|___|___|	|___|___|___|___|___|
1018	Sabin Polio Vaccine (First dose < 1 year)	|___|___|___|___|___|	|___|___|___|___|___|
1019	Sabin Polio Vaccine (Second dose < 1 year)	|___|___|___|___|___|	|___|___|___|___|___|
1020	Sabin Polio Vaccine (Third dose < 1 year)	|___|___|___|___|___|	|___|___|___|___|___|
1021	Sabin Polio Vaccine (> 1 year)	|___|___|___|___|___|	|___|___|___|___|___|
1022	Measles (6-8 months)	|___|___|___|___|___|	|___|___|___|___|___|
1023	Measles (9-11 months)	|___|___|___|___|___|	|___|___|___|___|___|
1024	Measles (>1 year)	|___|___|___|___|___|	|___|___|___|___|___|
1025	Vitamin A (6 months)	|___|___|___|___|___|	|___|___|___|___|___|
1026	Vitamin A (12 months)	|___|___|___|___|___|	|___|___|___|___|___|
1027	Vitamin A (>1 year)	|___|___|___|___|___|	|___|___|___|___|___|

Survey completed at: Hour |___|___| Minutes |___|___|

Phone number for future contact |___|___||___|___| |___|___||___|___|

STROBE Statement—Checklist of items that should be included in reports of *cross-sectional studies*

	Item No	Recommendation	Page #
Title and abstract	1	(*a*) Indicate the study's design with a commonly used term in the title or the abstract: DONE	1, 2
		(*b*) Provide in the abstract an informative and balanced summary of what was done and what was found	4
Introduction			
Background/ rationale	2	Explain the scientific background and rationale for the investigation being reported: SEE INTRODUCTION SECTION	6 and 7
Objectives	3	State specific objectives, including any prespecified hypotheses:	7
Methods			
Study design	4	Present key elements of study design early in the paper:	7-11
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	8-9
Participants	6	(*a*) Give the eligibility criteria, and the sources and methods of selection of participants	8,9
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable. SEE THE SECTION ON "OUTCOME MEASURES"	10-11
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	10-11
Bias	9	Describe any efforts to address potential sources of bias	10
Study size	10	Explain how the study size was arrived at: SEE SURVEY DESIGN	8-9
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	10-11
Statistical methods	12	(*a*) Describe all statistical methods, including those used to control for confounding	10-11
		(*b*) Describe any methods used to examine subgroups and interactions.	10-11
		(*c*) Explain how missing data were addressed. NOT APPLICABLE	NA
		(*d*) If applicable, describe analytical methods taking account of sampling strategy. NOT APPLICABLE	
		(*e*) Describe any sensitivity analyses. NOT APPLICABLE	
Results			
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	8-9
		(b) Give reasons for non-participation at each stage: NO PARTICIPATION ISSUE. THE FACILITIES VISITED WERE SURVEYED.	NA
		(c) Consider use of a flow diagram: NOT APPLICABLE FOR THE STUDY	NA

Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	NA
		(b) Indicate number of participants with missing data for each variable of interest: FACILITY LEVEL DATA HAD NO MISSING VALUES.	NA
Outcome data	15*	Report numbers of outcome events or summary measures: SEE THE TABLES TO PRESENT THE RESULTS	21-24
Main results	16	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included: SEE TABLES. AVERAGES ARE USED FOR COMPARATIVE PURPOSES.	21-24
		(*b*) Report category boundaries when continuous variables were categorized. NOT RELEVANT	NA
		(*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period. NOT RELEVANT	NA
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses. NOT RELEVANT	NA
Discussion			
Key results	18	Summarise key results with reference to study objectives. LAST PARAGRAPH OF PAGE 13 AND FIRST 2 PARAGRAPHS OF PAGE 14	13-14
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias SEE STUDY LIMITATIONS SECTION, PAGE 15.	15
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence CONCLUSIONS SECTION, PAGE 16	16
Generalisability	21	Discuss the generalisability (external validity) of the study results FIRST PART OF DISCUSSION SECTION.	13
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	3