DECEMBER 2021

DISCUSSION PAPER SERIES NO. 2021-32

Assessment of the Service Capability and Readiness of Philippine Hospitals to Provide High-Quality Health Care

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Abstract

In the Philippines, decision-makers mostly rely on access indicators in measuring health system performance. However, as the country embarks on path-breaking Universal Health Coverage (UHC) reforms, assessing healthcare quality is more important than ever. In this study, we examined the management practices and service capacity and readiness of hospitals, both structural measures of healthcare quality. Using a validated self-administered online questionnaire, we collected a wide range of data on hospital management and service delivery from selected public and private hospitals. Our findings reveal the longstanding challenges in hospital management and their limitations to provide even the most rudimentary components of medical care - diagnostics and drugs. Our recommendations revolve around the systematic collection of healthcare quality indicators and the use of incentives and grants to facilitate the collection, measurement, and submission of data from facilities.

Keywords: Healthcare quality, service capability, universal health care, Philippines

Disclaimer: This article/report reflects the points of view and thoughts of the authors, and the information, conclusions, and recommendations presented are not to be misconstrued as those of the Department of Health (DOH). Furthermore, this article/report has not yet been reviewed by our collaborators at the DOH at the time of writing. The material presented here, however, is done in the spirit of promoting open access and meaningful dialogue for policy/plan/program improvement, and the responsibility for its interpretation and use lies with the reader.

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Assessment of the Service Capability and Readiness of Philippines Hospitals to Provide High-Quality Health Care

Valerie Gilbert Ulep, Jhanna Uy, Lyle Daryll Casas, and Christian Edward Nuevo[1]

I. Background

In recent decades, the majority of global and national goals have focused on access to essential healthcare services (Hanefeld et al., 2017). However, access alone is insufficient to improve population health and well-being. Even if health services are available but patients do not want to utilize them because of perceived poor quality or the care they receive are ineffective and does not abide by evidenced-based clinical standards, health outcome improvements will be modest (Akachi & Kruk, 2017; Hanefeld et al., 2017; Powell-Jackson et al., 2015). While healthcare access has increased in most countries, health outcomes have barely improved potentially because of poor quality of care. Emerging studies demonstrate that many LMIC struggle to consistently provide good quality of care (Akachi & Kruk, 2017).

In low- and middle-income countries (LMICs), healthcare quality is "under-defined and under-researched." There is no single definition of high-quality care and agreed-upon metrics to measure it (Kruk et al., 2017). While multiple frameworks have been put forth by various experts and bodies to describe, explore, and analyze the components of healthcare quality, they are challenging to operationalize especially in low-resource settings. Despite limitations, healthcare quality is recognized as one of the elements of universal coverage (UHC) and is necessary in achieving health system goals. It is imperative therefore for governments to consider healthcare quality as one of the cornerstones of well-functioning health systems (Atun, 2009). The World Health Organization (WHO) defines healthcare quality based on three (3) elements: (1) effectiveness, (2) safety, and (2) responsiveness. The United States' Institute of Medicine (IOM), a global authority on healthcare quality, also carries these elements. IOM (1990) defines healthcare quality as "the degree to which health care services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge" (IOM 2001, p.44).

In the Philippines, healthcare quality has been overlooked as a core element of the healthcare system. The Department of Health (DOH) has developed frameworks related to healthcare quality and/or its specific elements but are in nascent stages. Also, healthcare quality is barely considered in assessing health system performance and not included in major national health plans and goals. At present, tracking of health system performance mostly relies on access and financial protection indicators. While there is no standard definition and metrics of healthcare quality, countries have put systems in place to track effectiveness, safety, and responsiveness of healthcare services.

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[1] Senior Research Fellow, Supervising Research Specialist, Research Analyst, and Consultant, respectively. This study was done in collaboration with the Department of Health - Health Facility and Development Bureau (DOH-HFDB). The authors would like to thank Dr. Gabrielle Ann Dela Paz and Dr. Terence John M. Antonio for their valuable support and insights for the study.

The success of Philippine healthcare reforms is hinged on robust monitoring of healthcare quality. In the recent decade, the government has passed significant health laws. The UHC Act (2019) provides a wide-range of reforms, including how healthcare should be governed (*that is*, strengthening local health system at the province level), delivered (*that is,* shifting from a hospital-centric system to primary care oriented and integrated care) and financed (*that is,* strengthening provider-purchaser split and provider payment reforms). However, these reforms could only be realized through robust monitoring of healthcare quality. The implementation of primary care requires measurement of effectiveness of referral systems between and among facilities and the magnitude of healthcare waste and cost-savings, which are elements of healthcare quality. Strategic purchasing requires robust monitoring of service of providers if they are aligned with clinical standards. As the country pursues these reforms against the backdrop of increasing household income and changing epidemiologic profiles, the demand for high-quality care from citizens is stronger than ever.

This paper adds to the scarce body of literature on healthcare quality in the Philippines. It aims to measure whether both private and public hospitals have the necessary structures and inputs to provide high quality health care services. The results of this study may point out gaps in knowledge or opportunities for improvement to health providers. This study could also provide a baseline on the service capability and readiness of hospitals as we do not have this to check whether our vast public investments produced hospitals equipped to provide quality care and give insight to DOH and PhilHealth on how to improve their continuous quality improvement programs for health facilities.

1.1 Quality of care in the Philippines

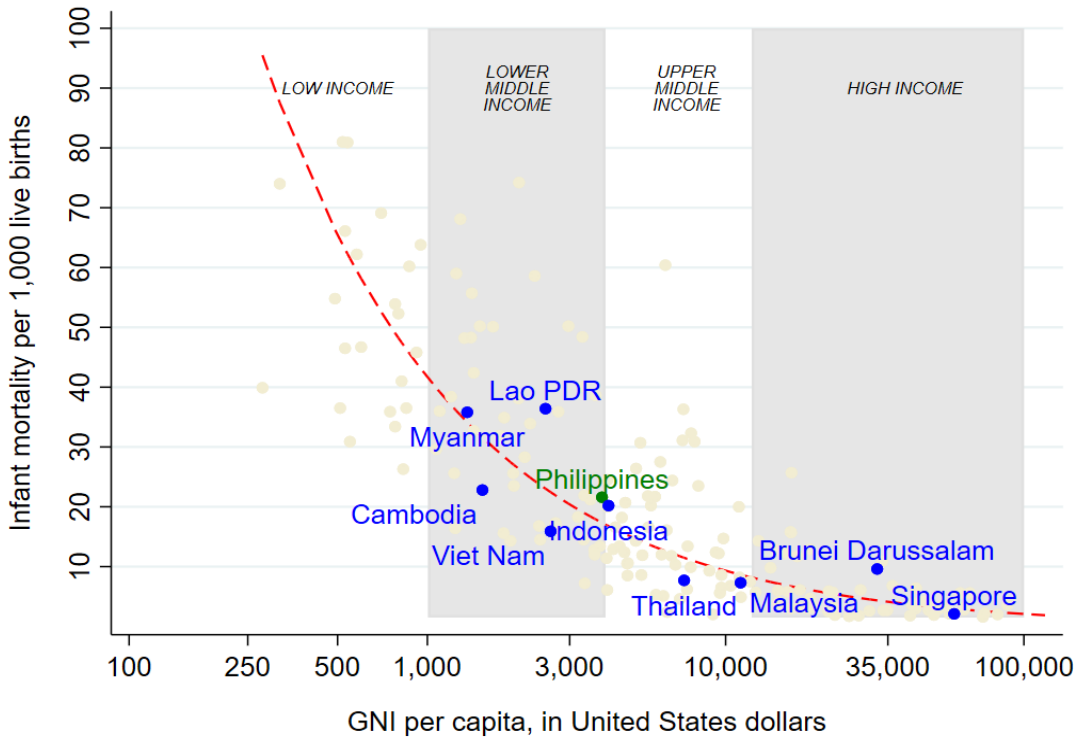
1.1.1 Quantity vs. Quality

In the Philippines, health outcomes have modestly improved in recent decades. Infant mortality rate (IMR), the most sensitive measure of population health and well-being, has declined from 66.4 per 1,000 live births in the 1960s to 21.6 live births in 2019. Despite progress, the country's health outcomes remain poor relative to its level of economic development (See **Figure 1**). Although in decline, IMR remains high, twice larger than the average for upper-middle-income countries (UMIC), the level of economic development the country is projected to become by 2022. In the last 20 years, the Philippines recorded the slowest decline in IMR among Association of Southeast Asian Nations (ASEAN) countries (See **Figure 2**). With the sluggish improvement in health outcomes, the country failed to achieve its Millennium Development Goals (MDG) health targets in 2015. Myanmar and the Philippines were the only countries in the region that failed to achieve all the four child and maternal health targets. Without path-breaking interventions, the country is projected to fall short again on its Sustainable Development Goals (SDG) (Ulep & Casas, 2021).

The modest improvement in health outcomes could be attributed partly to poor quality of care. The MDG movement catapulted more investments in the health sector. The uptake of healthcare services has substantially improved (e.g., prenatal visits, access to facility-based and skilled birth attendance), but challenges in achieving universal coverage particularly among vulnerable populations remains. The focus on improving quantity in recent decades compromised one important element of the health system – *quality*. For example, while the prevalence of mothers with adequate quantity of prenatal care visits (at least four) has increased, emerging evidence suggests that quality of care remains an issue. In the latest National Nutrition Survey (NNS), only 44.2% of those who visited health facilities for their

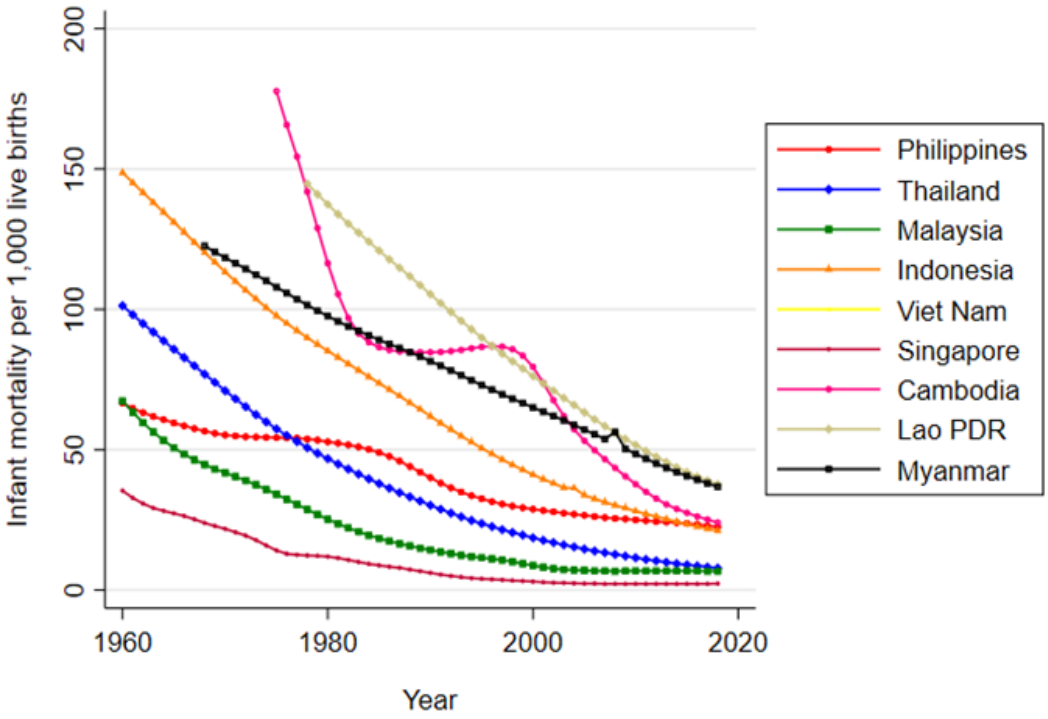
prenatal received proper nutrition and health advice (DOST-FNRI, 2020). This pattern was observed in impact evaluation of health insurance. While the expansion of health insurance in developing countries reduced financial barriers thereby increasing healthcare visits (i.e., quantity), it did not translate to improvement in health outcomes largely because of poor quality of prenatal care (Buchmueller et al., 2005; Erlangga et al., 2019; Guindon, 2014).

Figure 1. Infant mortality rates and GNI per capita



Source: World Development Indicators

Figure 2. Infant mortality rates and GNI per capita, ASEAN countries



1.1.2 National Policies on Quality of Care

In the last decade, the Department of Health (DOH) has issued policies on healthcare quality. The National Framework for Quality of Health of the DOH (Administrative Order no. 2010-0007) provides the basis to improve healthcare quality through institutionalization of licensing and accreditation of health facilities, improvement of local clinical practice by doing medical audits, adverse and sentinel events monitoring, and mechanism for feedback and corrective action. While the policy has been in place for almost a decade, it only serves as a broad principle and does not provide specific strategy.

As part of its regulatory functions, the Department of Health (DOH) issues licenses to both public and private health facilities before they can operate. Hospitals are licensed based mostly on structural components, supported by processes aimed to facilitate use of hospital inputs. The licensing scheme of the DOH is specific for each facility type (e.g., hospitals, infirmaries, general clinic laboratory, primary health care facilities), and/or specific services (e.g., ambulance capacity, lab equipment). These policies set standards on structural components (e.g., personnel, physical plant, equipment/instruments) needed by each facility type to be able to deliver their supposed function. Standards include enabling components such as managerial capacity (e.g., presence of important hospital policies), support systems (e.g., information systems), and implementation mechanisms (e.g., disease registries, antimicrobial stewardship). However, because the DOH licensing scheme only captures the capacity of health facilities to operate based on structural inputs, it does not fully capture other important elements of quality.

PhilHealth, the country's national health purchaser, previously pursued an accreditation system. In 2002, PhilHealth implemented a three-tier scheme for accreditation, where hospitals may be recognized as Center for Safety, Center for Quality, or Center for Excellence. An accreditation *Bench book* contains the standard requirements for facilities to reach these levels, based on core (mandatory) and non-core (conditional) indicators. Most core indicators are inputs or processes directly observable at the time of accreditation. Non-core indicators include process and outcomes. The indicators of focus were safety, effectiveness and appropriateness of healthcare, consumer participation, and efficiency of service provision. The tiering does not affect payment rates and is only used by facilities for marketing purposes. However, the awarding of Centers for Safety, Quality, and Excellence was discontinued because the implementation was faced with considerable difficulties. Health facilities did not have sufficient data and information systems to provide the needed details to guide the accreditation. They did not conduct regular patient satisfaction surveys making it difficult to obtain information such as perceptions on quality. They complained that the standards were too stringent and "higher than necessary', which further diminished its favorability. Selected core indicators, however, have been adopted in the DOH licensing tool (Dayrit et al., 2018; PHIC, 2009; Picazo et al., 2015).

The accreditation scheme of PhilHealth seeks to ensure that proper and quality care is provided for its members, but faces implementation challenges. Accreditation for facilities is done in either of two ways – as a provider of specific benefit packages i.e., Z-Benefits (catastrophic conditions), or its outpatient specialist packages (e.g., HIV/AIDS, TB-DOTS, MCP)[2], or inpatient facility to file reimbursement claims through the All Case Rates (ACR) system. Both accreditation schemes assess presence and adequacy of structural inputs and components, which have been criticized for duplicate licensing of DOH. However, the reported outcomes of cases from accredited health facilities are neither monitored nor affect the payments to the facility, and/or its future accreditation (PHIC, 2009).

The Universal Health Care (UHC) Act of 2019 reinforces the needed reforms to improve healthcare quality. The UHC Act guarantees all Filipinos access to affordable and high-quality care that is responsive to their needs and preferences. The progressive realization of the UHC is enshrined in the major investment programs and plans, such as the benefit expansion plan of PhilHealth, and the Human Resources for Health Deployment Program (HRHDP) and Health Facilities Enhancement Program (HFEP) of the DOH. These plans largely focus on improving financial and geographical access. To complement these plans, in 2020, the DOH released a policy (Administrative Order no. 2020-0034) on patient safety, which requires health facilities to have a (1) patient safety unit or committee, to oversee management of the patient safety program, (2) safety checklists, and other protocols ensuring patient safety should be in place, and (3) reporting of adverse events are also required. Hospitals are also required to have a quality improvement plan and reports to be submitted to their respective reporting units quarterly (Department of Health, 2020b). In the same year, DOH also developed a strategic framework (Administrative Order no. 2020-0003) adopting people-centeredness, one of the core elements of healthcare quality (Department of Health, 2020a). The framework prescribes a unified client experience survey tool to measure responsiveness and will be used by the health facilities in planning, monitoring, awarding, and regulatory processes.

[2] Human immunodeficiency virus (HIV)/acquired immunodeficiency syndrome; tuberculosis - directly observed treatment short-course; maternal care package

1.3. Local Studies on Quality of Care

Several studies examine the magnitude of healthcare quality in the Philippines. Bautista and Tangsoc (2006) reveal the challenges in structural inputs in health facilities (i.e., equipment/facilities and administrative services) that influence the process and outcome domains of quality. Ramos (2016) shows that poor structural capacity of primary care facilities hindered the provision of high-quality care. About one third of patients in rural health units (RHUs) faced practices in delivery that are potentially harmful. Only 22% district hospitals could execute caesarian sections, and less than 70% could give blood transfusions. These findings reinforce that while the number of birthing clinics has been increased through the government's capital investment program, HFEP, maternal mortality rate (MMR) remained considerably high.

Local studies suggest that having improved processes and standards could lead to high-quality and efficient health care (e.g., cost-savings). Silvestre et al (2018) reveal that newborn care practices (e.g., immediate drying, delayed cord clamping, timing and duration of breastfeeding, dry cord care and delayed bathing) improved with better hospital policies, environment, and health worker practices. Newborn health outcomes significantly improved after implementing a national initiative to improve quality of delivery and newborn care. This supports the concept of having improved care processes lead to better quality of care. James et. al (2011) assessed the quality of medical treatment given by asking the randomly selected doctors in participating hospitals. Results from the clinical performance vignettes showed that in 69% of the cases, the doctors gave both insufficient and unnecessary treatment to under-five children. Unnecessary care was common, such as antibiotic overuse (47%) and unnecessary hospitalization (34%) (James et al., 2011).

Local studies reveal that financial incentives vastly improve healthcare quality. Using an experimental study design, Peabody et al (2011) and Quimbo et al (2008) find the bonuses and health facility-level incentives improve the quality of care as measured by clinical vignettes scores. The results suggest that accreditation, and carefully designed financial incentives and financial payments could have a large impact on quality of care. From a health system perspective, the finding suggests the intersections of provider payment reforms and quality of care (Peabody et al., 2011; Quimbo et al., 2008).

1.4. Measuring healthcare quality

Measuring healthcare quality is challenging in LMICs. Measuring quality of care requires harmonized indicators from different government agencies, standardized tools, and systematic data collection. However, existing tools on quality in LMICs are limited (Board on Global Health et al., 2015; Macarayan et al., 2018; Rios-Zertuche et al., 2019). Common indicators are bare minimum structural assessment indicators (e.g., walls, floors, ramps), while only few ask for data on hospital bed census, nutrition services, and environmental health services. For governance management, tools focused on ownership and limited indicators for the quality of leadership. For financing, not all tools contained indicators on how a facility is financed and if user fees were charged. For human resources, only a few contained indicators in measuring the operation hours of the facility and the availability of emergency staff in-house 24-hours a day.

For medical technologies, the specificity of indicators varied, but general questions of diagnostic capacity are available. For information and research, caseload data (priority diseases e.g., HIV, tuberculosis) was the most frequently collected, following NCD data. Some tools have assessed whether the practitioners had continuing medical education for the past two years (Nickerson et al., 2015). Overall, data being collected from health facilities are inconsistent, incomplete, and difficult to compare.

Measuring quality of care in health facilities is data intensive and requires investments. Table 1 shows data collection tools and systems commonly used under each domain, including their strengths and weaknesses.

Table 1. Various data sources and its strengths and weaknesses

Domain	Tool	Strengths	Weaknesses
Structure	Facility records systems & routine facility surveys (administrative)	Contains the data regarding infrastructure, staffing, clinical trainings, Offers comparison and analysis through standardized codes and classifications	Generally unstandardized, incomplete, and inaccurate Delayed reporting Restricted to few services Incomplete picture of the current state
Process	Clinical performance vignettes	Providers' responses are scored based on established (evidence-based) criteria for managing specific disease Common way of evaluating clinical performance	Requires training of personnel who will administer
	Abstraction of medical records	Used to identify standards-based practice Main source of information at the patient level Information on medical, nursing, and allied health care	Validity is undermined by the lack and inconsistency of records as it relies on sound documentation Requires training of personnel who will administer Paper-based systems require lots of effort to retrieve
	Clinical observation	Considered the gold standard Does not rely on staff reporting/documentation Direct verification of observable events	Resource-intensive and difficult to scale up Limited utility for assessing the care for serious conditions Not all quality issues can be gathered through this
Outcomes	Patient follow-ups	A care-sensitive outcome-- which is a mainstay of quality measurement	Challenging in low-income setting due to

		lack of systemic collection or data Needs health information systems to be upgraded
Population surveys/national census	Data on health outcomes may be linked to care quality Disaggregated to various levels of population, age, and other demographics	Needs systematic data collection

Source: (Akachi & Kruk, 2017; OECD & World Health Organization, 2019; WHO, 2018)

II. Objectives

The general objective of this study is to assess whether hospitals in the Philippines have the necessary structures and inputs that facilitate high quality health care services.

The specific objectives are as follows:

- To describe the management practices of hospitals in the Philippines
- Describe the service capability and readiness of Philippine hospitals to provide general health services in the following domains: health information system (HIS), health workforce, and medicine, equipment, and technology

III. Methodology

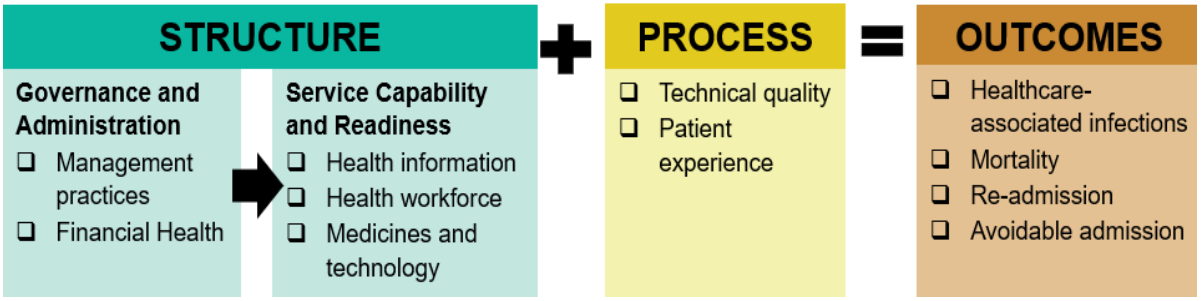
3.1 Conceptual Framework

In assessing the state of healthcare quality in hospitals, we used the classic framework of Donabedian (1998) with refinements by the United States Institute of Medicine in 2001 and by the Committee on Improving the Quality of Health Care Globally in 2018 (Donabedian, 1988; Institute of Medicine, 2001; OECD & World Health Organization, 2019; WHO, 2018). According to this framework, when looking at the quality of care, three interconnected components are examined (see **Figure 3**):

- **Structures** - service readiness or minimum inputs necessary for a healthcare facility to function (e.g., management, financing, human resources, physical infrastructure)
- **Processes** - content of and manner the care is delivered and whether it is aligned to technical guidelines or conducive to creating positive patient experiences
- **Outcomes** - patient satisfaction with care and improvements in functional status or prevention of mortality

Structures provide the setting in which **processes** and activities are implemented to provide care to patients with the goal of improving their **health outcomes.** Improved health outcomes will only occur if processes are of good technical quality and responsive to patient needs. Such processes, in turn, will only be possible if facility structures provide an adequate environment and have systems that enable good processes. Under each of the three (3) domains, several elements of quality could be identified further.

Figure 3. Conceptual framework for this study on healthcare quality in hospitals



This study focuses only on hospital structures. Assessment of the *process* and *outcomes* require in-depth and extensive data collection. Processes must be evaluated against evidenced-based standards which are different depending on the specific disease or health care service in question. Data collection for processes may involve clinical performance vignettes, clinical observation with standardized patients, medical records, and direct observation (OECD & World Health Organization, 2019). Meanwhile, collection of data for patient outcomes requires the review of medical records and patient follow-ups to link outcomes across episodes of care. Patient data is the most tedious and costly to collect and is challenging for most low-income settings, like the Philippines, where health information systems are not robust or standardized to collect such data across hospitals (Akachi & Kruk, 2017). However, while we do not focus on patient outcomes, we explore what quality assurance activities and patient monitoring indicators hospitals are currently implementing.

3.2 Study design and Target Population

The study is a cross-sectional design collected using an online health facility questionnaire. The target population is 1,302 licensed Philippine hospitals (See Table 2). We excluded primary care clinics and infirmary and hospitals.

Table 2. Distribution of licensed hospitals in the Philippines

Island Group	Level 1	Level 2	Level 3	Totals
National Capital Region	71	33	57	161
Luzon	444	186	31	661
Visayas	112	47	20	179
Mindanao	209	81	11	301
Totals	836	347	119	1,302

Source: DOH National Health Facility Registry, extracted June 2021

In partnership with the Department of Health-Health Facility Development Bureau (DOH-HFDB), we conducted a census of hospitals through the DOH's annual Health Facility Profiling system (DOH AO 2021-0419) and the accompanying online platform developed by the DOH-Knowledge Management and Information Technology Service (KMITS). The questionnaire covered the following variables:

- Management: accreditations, maturity of managerial practices for operations
- Human resources for health: filled positions, contractual staff, continuous education, turnover

- Basic infrastructure: electricity, water, sanitation, ambulances/emergency vehicles, forms of communication
- Technology and Medicines: functional equipment, laboratory, 16 essential medicines
- Health information systems: use of electronic medical records, internet
- Health outcomes: presence of quality assurance activities, monitoring of specific quality indicators (e.g., surgery-related mortality, preventable admissions, readmission)

Prior to the start of data collection (15 October 2021), we pre-tested the questionnaire in four (4) hospitals. The Department of Health conducted virtual orientations together with data coordinators on the questionnaire to ensure uniform and correct understanding. Two data coordinators continuously fielded the questions, monitored hospital submissions, ascertained data quality, and validated submissions. The study was delayed due to the COVID-19 surge in the second and third quarters of the year. Data collection is still ongoing with continual follow-up. As of 1 December 2021, our sample for this paper includes 344 hospitals with an overall response rate of 26% (See **Table 3**).

Table 3. Distribution and response rate of DOH- and LGU-owned public hospitals

Hospital Level	Sampling Frame	Responded	Response Rate
Level 1	836	216	26%
Level 2	347	92	27%
Level 3	119	36	30%
Total	1,302	344	26%

IV. Results

Our preliminary analysis includes data from 344 hospitals that submitted and completed the online health facility survey as of December 1, 2021 (i.e., 26% of total hospitals in the country). The majority of respondents are private hospitals (63%). In terms of functional capacity, the majority are level 1(63%). Examining the ownership and functional capacity shows large variation; most national/DOH hospitals in the sample are level 3, while LGU-owned and private hospitals are level 1 (See **Table 4**).

Table 4. Hospital sample characteristics

Variable, n (%)	All Hospitals n=344	National n=29	LGU-owned n=97	Private n=218
Bed capacity, median IQR)	50 (28-100)	350 (100-450)	50 (25-75)	50 (30-100)
Ownership				
Public (National)	29 (8)			
Public (LGU-owned)	97 (28)			
Private	218 (63)			

Functional Capacity, n (%)				
Level 1	216 (63)	11 (38)	89 (92)	116 (53)
Level 2	92 (27)	4 (14)	6 (6)	82 (38)
Level 3	36 (10)	14 (48)	2 (2)	20 (9)
Location, n (%)				
National Capital Region	19 (6)	3 (10)	3 (3)	13 (6)
Luzon	190 (55)	11 (38)	53 (55)	126 (58)
Visayas	54 (16)	7 (24)	21 (22)	26 (12)
Mindanao	81 (24)	8 (28)	20 (21)	53 (24)

* Includes one (1) infirmary and one (1) custodial psychiatric care facility.

Majority of hospitals in the study have some form of accreditation, which is a voluntary external peer review process that evaluates a facility's compliance with performance standards (See **Table 5**). Almost 90% of hospitals have basic accreditation from PhilHealth, which is a requirement for reimbursement. Less than 17% were accredited by external evaluation (e.g., International Organization for Standardization (ISO), Philippine Council on Accreditation of Healthcare Organizations (PCAHO) and other international accreditations bodies).

Table 5. Hospital accreditation

Variable, n (%)	All Hospitals n=344	National n=29	LGU-owned n=97	Private n=218
International Organization for Standardization (ISO)	54 (17)	27 (96)	10 (11)	17 (8)
Philippine Council on Accreditation of Healthcare Organizations (PCAHO)	16 (5)	3 (11)	3 (3)	10 (5)
Any other international accreditations	12 (4)	3 (11)	2 (2)	7 (3)
PhilHealth Accreditation				
None	3 (1)	1 (4)	0 (0)	2 (1)
Basic	290 (90)	19 (68)	88 (98)	183 (89)
Advanced	31 (10)	8 (29)	2 (2)	21 (10)

4.1 Structure: Governance and administration

Following the conceptual framework (in **Figure 3**), the *structure* domain is further classified into (1) governance and administration and (2) service capability and readiness. **Hospital governance and administration** refers to management processes and practices. Adopting the World Management Survey (WMS), we present the hospital management capacity in terms of

the following: standardization of care (e.g., patient flow, clinical pathways), performance management, target management, and talent management (See **Table 6**).[3]

4.1.1 Patient flow

Patient flow pertains to the movement of patients throughout the hospital. It reflects the efficiency of medical care, physical design, and internal systems in place. Poor patient flow occurs because of faulty admission and scheduling systems exacerbated by suboptimal physical layout of the facility. Poorly managed patient flow in hospitals could lead to overcrowding and delayed care, which compromises patient safety and quality of care. Hospitals with poor patient flow have higher readmissions and mortality rates.

In the Philippines, while hospital layout is part of the hospital licensing requirements of the DOH, a significant number of hospital respondents expressed challenges in the physical layout of their hospitals potentially compromising patient flow. In our study, only 3 in every 4 (75%) hospital respondents reported having optimized hospital layout throughout their facility. We did not observe conspicuous differences between public and private hospitals. Among government hospitals, respondents from LGUs-owned hospitals are more likely to report constraints in their hospital layout.

4.1.2 Clinical pathways

Clinical pathways are initiatives aimed to organize and standardize the processing, sequencing, and timing of interventions by health workers for a particular diagnosis in hospitals, hence improving patient safety, and healthcare quality and efficiency (Evans et al., 2020; Hilario et al., 2018). Clinical practice guidelines (CPGs) and evidence-based medicine are the hallmarks of clinical pathways (Lawal et al., 2016; Li et al., 2014; Rotter et al., 2010).

The adoption of clinical pathways in medical practice are still in nascent stages in the Philippines. Only half (50%) of hospital respondents reported having formalized patient pathways in their facility. National/DOH-owned government hospitals are more likely to have clinical pathways and standardized service protocols compared to LGU hospitals and private hospitals. Whilst it warrants more in-depth investigation on the degree of adherence to these clinical pathways and service protocols, the finding provides a glimpse on the limited efforts in addressing the potentially large variation of medical practice within private hospitals. High variability of medical practice is problematic because it leads to unpredictable and higher costs of medical care (Rodziewicz et al., 2021). The high variation of medical care is largely driven by the current incentive structures of medical practice and the weak regulatory environment of private healthcare markets. The findings reinforce the notion that rigid application of clinical pathways compromises personalized patient care and clinical experience. Currently, there is no systematic assessment on the magnitude of variability of medical practice in the country.

[3] A separate paper assessing the financial health hospitals will be released as PIDS Discussion Paper.

Table 6. Hospital operations, patient flow, and standardization of care

Variable, n (%)	All Hospitals n=344	National n=29	LGU-owned n=97	Private n=218
Patient Flow - Hospital Layout				
Patients often lost or way is long	21 (6)	1 (3)	8 (8)	12 (6)
Effort to optimize as far as possible, but constraints remain	76 (22)	6 (21)	22 (23)	48 (22)
Layout optimized and efficient as possible, overcoming constraints	245 (72)	22 (76)	67 (69)	156 (72)
Patient Pathway Management				
Never/rarely revised	68 (20)	3 (10)	26 (27)	39 (18)
Sometimes, when there are accidents, a system but not fully formalized	101 (30)	7 (24)	23 (24)	71 (33)
Formally reviewed and revised often or continuously	172 (50)	19 (66)	48 (49)	105 (49)
Standardization and Protocols for Services				
None, mostly informal, or less than 50% of processes standardized	33 (10)	1 (3)	11 (11)	21 (10)
Around 50%-75% of processes standardized, for common cases or from regulatory agencies, not user-friendly nor strictly implemented or updated	47 (14)	3 (10)	10 (10)	34 (16)

4.1.3 Monitoring of performance management

The principle of continuous improvement (CI) has been increasingly embedded in hospital performance management in improving quality of care. Important elements of CI include proactive engagement of senior managers in the decision-making and problem-solving activities. It includes empowerment of staff and creation of feedback mechanisms in the delivery of safe, high-quality, and reliable care. The presence of real-time monitoring of performance could facilitate the identification of the root causes of arising problem hospital operations and management.

In our study, about 90% of hospital respondents suggest the presence of formal systems that allow proactive dialogue between senior managers and staff to identify and solve problems (See Table 7). Also, hospital respondents claimed that they are able to resolve problems immediately or after 1-2 weeks with no conspicuous difference across hospital ownership. More in-depth analysis is needed to understand any incentive mechanisms in place that allows hospitals to solve and manage problems quickly.

In terms of performance tracking, all (100%) DOH-government hospitals reported having wide-range of indicators in measuring hospital performance, which allows them to diagnose

and address operational challenges in a timely manner. However, only 60%-70% of LGU-owned government and private companies use multiple indicators to track performance. Ideally, managers should have access to a wide range of performance indicators, such as patient quantity, efficiency, and quality indicators.

Table 7. Performance management

Variable, n (%)	All Hospitals n=344	National n=29	LGU-owned n=97	Private n=218
Continuous Improvement for Problems				
Problems rarely reported to managers, problems not documented	5 (1)	0 (0)	2 (2)	3 (1)
Managers often/always informed about problems, always documented, but not reviewed to prevent further issues	37 (11)	2 (7)	12 (13)	23 (11)
Managers always informed about problems and document them; exposing and solving problems is an integral responsibility of managers	299 (88)	27 (93)	82 (85)	190 (88)
Consequence Management for Problems				
Takes about 6 months or more for action	2 (1)	0 (0)	2 (2)	0 (0)
Takes about 1 to 3 months for action	15 (4)	1 (3)	5 (5)	9 (4)
Immediately or 1 to 2 weeks for action	324 (95)	28 (97)	89 (93)	207 (96)
Performance Indicators				
Only government-required metrics such as patient volume and basic expenditures, additional 1-2 main indicators, no view of how the hospital is doing overall	31 (9)	0 (0)	13 (14)	18 (8)
Indicators beyond government-required metrics, mostly on operations, but still no view of how the hospital is doing overall	78 (23)	0 (0)	19 (20)	59 (28)
A range of indicators that show how the hospital is doing overall, senior managers may be able to recite the key indicators off the top of their heads	229 (68)	29 (100)	64 (67)	136 (64)

While almost 70% of hospitals reported having multiple indicators and regular tracking performance, critical process and health outcome indicators are not used (see **Table 8**). A majority of hospitals reported having routine quality systems, **but only 20-30% measure inpatient quality indicators used in many health systems globally, such as post-discharge mortality, readmissions, and avoidable admissions.** We did not observe conspicuous

differences across hospital ownership. Our findings require deeper examination on the quality and comprehensiveness of quality indicators used in tracking their performance.

Table 8. Hospital quality assurance monitoring

Variable	All Hospitals n=344	National n=29	LGU-owned n=97	Private n=218
Presence of routine quality systems				
Quality assurance activities	321 (96)	28 (97)	87 (95)	206 (97)
Formal reviews for inpatient management	268 (82)	27 (93)	71 (77)	170 (82)
Death reviews for inpatients	233 (71)	26 (93)	63 (68)	144 (70)
Specific Inpatient Quality Indicators				
Hospital Acquired Infections	260 (78)	28 (97)	62 (67)	170 (81)
Bloodstream Infections, n (%)	160 (51)	18 (69)	27 (31)	115 (57)
Urinary Tract Infection (UTI), n (%)	178 (58)	21 (84)	36 (42)	121 (61)
Ventilator acquired pneumonia (VAP), n (%)	122 (40)	18 (72)	15 (18)	89 (45)
Inpatient Deaths	269 (83)	26 (96)	71 (77)	172 (83)
Deaths within 30-days Post-discharge	77 (24)	8 (30)	19 (21)	50 (25)
Hospital Readmission within 30-days Post-Discharge	101 (32)	6 (22)	29 (33)	66 (33)
Avoidable Admissions	106 (33)	4 (15)	32 (35)	70 (34)
Surgical / Post-Operative Complications	202 (79)	16 (84)	48 (72)	138 (81)
Mortality	156 (60)	12 (57)	35 (51)	109 (64)
Surgical Wound Infection	155 (61)	9 (43)	35 (51)	111 (66)
Sepsis	150 (59)	8 (38)	33 (49)	109 (65)
Pulmonary Embolism	130 (50)	5 (25)	27 (40)	98 (57)

4.1.4 Target management

Setting targets is a mechanism that motivates managers and staff to achieve specific organizational objectives. It has become an important method of driving performance improvement (Locke & Latham, 1990). **In our study, only 70 % of hospital respondents reported having performance targets (**See **Table 9). However, we observed a large**

difference across hospital ownership, in which DOH-owned hospitals are more likely to have goals compared to private hospitals and LGU-owned hospitals.

Routine meetings and consultations to revisit and re-adjust goals and targets are effective practice towards inclusive hospital management. **Only 60% of hospitals have regular meetings to revisit performance targets. Again, we observe a similar pattern. National/DOH-hospitals appear to have routine meetings and consultations.**

Benchmarking is not universally practiced among hospitals in the Philippines. Benchmark comparisons is one mechanism to learn how well the hospital is performing on an array of measures, and it can aid in identifying the measures for which the hospital is doing well and others for which its performance is lower than others. **Only 60% of hospital respondents have a benchmarking system, with LGU-owned having the least share (43%).** However, our findings require deeper assessment to determine the quality of benchmarks (see US AHRQ tools). In other countries with advanced and standardized quality benchmarking systems/tools, it might not be the case in the Philippines.

Table 9. Target management

Variable, n (%)	All Hospitals n=344	National n=29	LGU-owned n=97	Private n=218
Target Balance - Goals and Metrics				
No goal metrics or just a general/informal sense of wanting to improve on 1 or 2 main clinical outcomes	53 (16)	2 (7)	19 (20)	32 (15)
Quantitative clinical goals, with or without financial goals - all tangibly defined	60 (18)	1 (3)	13 (14)	46 (21)
Quantitative goals for clinical outcomes, finances, efficiency, operations, etc., may have identification of which units/staff contribute	228 (67)	26 (90)	64 (67)	138 (64)
Target Interconnection - Cascade to staff				
Informal process to communicate hospital and individual goals (e.g. word-of-mouth, once during annual meetings)	33 (10)	0 (0)	7 (7)	26 (12)
Formal, but sporadic communication - during annual meetings or some meetings for specific goals throughout the year	115 (34)	5 (17)	31 (32)	79 (37)
Routine professional development meetings at least twice a year, regular revision of goals, manager tracks staff development and patient outcomes	193 (57)	24 (83)	58 (60)	111 (51)

Target Stretch - Benchmarks				
None or only for hospitals in municipality/city	61 (18)	0 (0)	9 (9)	52 (24)
Hospitals in province or government standards only	80 (24)	6 (21)	46 (48)	28 (13)
Above with expanded suite of internal and external benchmarks	199 (59)	23 (79)	41 (43)	135 (63)

4.1.5 Talent management

Talent management is the process of attraction, development, and preservation of health workers (Budhwar & Mellahi, 2007). Studies show that the implementation of a good talent management system enhances the clinical skills of health workers, increases their work satisfaction, improves specialized skills, and increases the organization's efficiency and reduces wastes (Hosseinzadeh Nojedeh & Sattari Ardabili, 2015). One aspect of talent management is hiring and ensuring sufficient staff mix, *that is,* having a system that allows the management to determine the needed health workforce and having the full control to address such need. In **our study, 60% of hospitals have such a system, with large variation across ownership (**See **Table 9).** About 80% of national/DOH-owned hospitals and private hospitals have full control in reviewing and addressing staff complement, but this is not the case for LGU-owned hospitals (only 20%). Also, while the majority of hospital respondents do have the ability to identify good and bad performers, systematic ways of providing incentives for top performers is lacking in the majority of hospitals, particularly among LGU-owned.

Table 10. Talent management

Variable, n (%)	All Hospitals n=344	National n=29	LGU-owned n=97	Private n=218
Hiring - ensuring sufficient staff mix				
No formal control on hiring, may make suggestions or engage central/higher authority for staff	40 (12)	2 (7)	27 (28)	11 (5)
Some or full control of hiring, may take some time to hire - require approval, or only done at end of the year	86 (25)	3 (10)	50 (52)	33 (15)
Full control, regular review of staff complement, quarterly or active changes to align with hospital goals for patient outcomes	215 (63)	24 (83)	19 (20)	172 (80)
Identifying Good/Poor performers				
None or no formal/systematic identification	54 (16)	3 (10)	22 (23)	29 (13)
Formal, regularly, but small set of criteria to identify	77 (23)	6 (21)	17 (18)	54 (25)

Formal, regularly, with broad set of criteria - operational and may include leadership and teamwork	210 (62)	20 (69)	57 (59)	133 (62)
Development of Good Performers				
None or not tracked even if encouraged	29 (9)	1 (3)	7 (7)	21 (10)
Managers actively track, may provide training incentives to top performers, but not systematic/routine	182 (54)	14 (48)	68 (71)	100 (47)
Systematic development of top performers, may include individual evaluations, development plans, leadership training and opportunities	129 (38)	14 (48)	21 (22)	94 (44)

In summary, our bivariate analyses show that DOH-hospitals have relatively better hospital management practices compared to LGU-owned hospitals and private hospitals. However, the observed difference could be attributed to confounding. It is important to note that a large portion of national/DOH hospitals are end-referral hospitals. Hence, aspects of management examined in the study are more likely to be present in national/DOH hospitals. To address this possible problem, we conducted OLS regression and controlled for functional capacity and island grouping. The results suggest that, on average, the hospital management score[4] LGU-owned and private hospitals are -0.14 and -0.08 lower than national/DOH-retained hospitals (See Table 11). After controlling for functional capacity and island grouping, the coefficient for LGU-owned hospitals remains statistically significant. Although the coefficient remains negative for private hospitals, it is not statistically significant anymore. Our study needs well-powered survey data to fully assess whether hospital management practices of government and private hospitals are indeed significantly different.

Table 11. OLS regression results

Explanatory variable	Model 1	Model 2	Model 3
Ownership			
LGU-owned (Ref: National)	-0.146*** (-3.89)	-0.0905* (-2.27)	-0.0973* (-2.44)
Private hospital	-0.0858* (-2.45)	-0.0528 (-1.44)	-0.0569 (-1.55)

[4] We conducted the following steps in measuring hospital management. First, we conducted data standardization using the Min-Max method for all the indicators under each element, namely. (1) standardization of care, (2) performance management, (3) target management, and (4) talent management. This transforms the indicators measured in different scales into normalized indices with identical range of values between 0 and 1. Second, we averaged the transformed score for each domain. Third, the overall score is then computed as the geometric mean of the five-dimension indices. The higher the score the better the hospital management is (min: 0; max: 1).

Service Capability Level			
Level 2 (Ref: Level 1)		0.0485* (-2.13)	0.0508* (-2.23)
Level 3		0.118*** (-3.5)	0.108** (-3.06)
Island group			
Luzon (Ref: NCR)			-0.0107 (-0.24)
Visayas			0.00384 (-0.08)
Mindanao			-0.0514 (-1.11)
_cons	-0.807*** (-24.43)	0.745*** (-20.4)	0.767*** (-13.73)
N	341	341	341

t statistics in parentheses
*p<0.05, **p<0.01,*p<0.001

4.2 Structure: Service capability and readiness

4.2.1 Physical Inputs

While the basic infrastructures are present in most hospitals, it is still not present and reliable in all the facilities (See **Table 12**). Reliable electricity is an important factor in improving the quality and resilience of healthcare facilities (Source). Modern equipment operates with reliable electricity (Ani, 2021; Suhlrie et al., 2018). **While all hospital's main source is electricity and all have functional generators, it is reported unreliable in 37% of the facilities.**

Reliable running water supply is present in all the facilities, but not all of them have clean drinking water sources. Some hospitals (28%) have no access to clean drinking water sources. Highest proportion of hospitals with access to this come from private (82%), while the lowest proportion is found in public LGU-owned hospitals (52%). Healthcare facilities need to have clean and safe water sources otherwise patients and healthcare workers are at an increased risk of disease and they could get sick with waterborne diseases (CDC, 2020; Cronk & Bartram, 2018). Hospitals' primary waste disposal are septic or concrete vault (40%) and sanitary landfill (23%). This is a gap because the Department of Environment and Natural Resources (DENR) and Department of Health (DOH) Joint-Circular 2005-02 states that hospitals should have their own Wastewater Treatment Facility or sewage treatment plant.

Almost all the hospitals (90%) have at least one emergency vehicle, regardless if it is an ambulance or not. Ambulance is important in the delivery of quality care as it is needed in the movement or flow of patients through and from the health system (Hayes, 2013). The lack of

ambulances during emergencies may result in avoidable complications and risks for the patients. While the DOH set standards for the required ambulance type for each hospital service capability level, not all the hospitals are meeting the standards.

Table 12. Basic infrastructure, utilities, and vehicles

Variable, n (%)	All Hospitals n=344	National n=29	LGU-owned n=97	Private n=218
Utilities: Electricity, Water, and Sanitation				
Power				
Main source is Electricity	316 (99)	28 (100)	88 (99)	200 (100)
Reliability of Power - no interruptions at all	212 (67)	12 (43)	51 (58)	149 (74)
Functional Generator Available	317 (100)	28 (100)	88 (100)	201 (100)
Water				
Running water in ALL toilets	313 (99)	28 (100)	85 (98)	200 (100)
Clean drinking water for patients (piped filtered water, bottled)	229 (72)	18 (64)	46 (52)	165 (82)
Gaps in Waste Disposal				
Sanitary Landfill	74 (23)	5 (19)	16 (18)	53 (26)
Septic/concrete Vault	126 (40)	12 (44)	47 (53)	67 (33)
Burial Pit	7 (2)	1 (4)	2 (2)	4 (2)
Ambulances and Vehicles				
At least 1 emergency vehicle (ambulance or not)	311 (90)	27 (93)	85 (88)	199 (91)
Met DOH standards for required ambulance	295 (86)	24 (83)	83 (86)	188 (86)

All hospitals have forms of communication. However, some lack dedicated phones for patient referrals. Communication across health facilities is very critical in a continuum of healthcare service delivery. However, its presence as a bare minimum is not enough in the delivery of high-quality health care. Present forms of communication must be reliable and easily reached. While 98% of the private hospitals have dedicated phones for referrals, in public hospitals, only 85% and 91% (national and LGU-owned hospitals, respectively) have one. If hospitals lack dedicated lines for referral, bottlenecks in the referral process may be experienced due to the traffic and unavailability of communication lines. Not all hospitals have adopted digital technologies in patient's medical records or health information systems. Less

than a quarter (21%) of the hospitals have no electronic medical records present, with the largest proportion coming from the private hospitals (23%). Electronic medical records contribute to the improvement of quality of care provided because there will be management improvements, medication error reductions, and improved communication and interactions across healthcare workers and providers in the health system (Manca, 2015).

Basic diagnostic or imaging medical equipment should also be present in all hospitals. However, a few hospitals that do not have X-ray, ECG, and ultrasound equipment present (5%, 6%, and 15%, respectively). An X-ray machine creates images of the internal structures (i.e., bones) through the use of electromagnetic radiation On the other hand, electrocardiogram (ECG) machines record electrical activities of the heart which aids in monitoring its rhythm and abnormalities. Moreover, ultrasound equipment uses sound waves to transmit images helping the healthcare provider examine pregnant women, cardiac patients, and patients with abdominal issues (World Health Organization, 2011, 2021). The lack of these equipment influences the quality of care provided in the facility because without this, appropriate medical interventions could not be ensured due to the lack of confirmation from the results this equipment can generate.

Should patients need a diagnostic test using this equipment, they may need to be referred to another facility having such technologies. While all facilities have laboratories, a few hospitals (7%) do not meet standards for their facility level or have functional sterilization equipment (20%). Not being able to meet the standards for the laboratory depending on their service capability level may be indicative that the laboratories in these hospitals cannot provide the expected services and may influence in the diagnostics critical to the provision of quality care. The lack of functional sterilization equipment in laboratories may expose the patients and the healthcare providers to risks of cross-contamination and infection that could cause devastating effects.

Table 13. Health information system, equipment, laboratory

Variable, n (%)	All Hospitals n=344	National n=29	LGU-owned n=97	Private n=218
Communication and Health Information System				
Any form of communication: landline, radio, cellphone	318 (100)	28 (100)	89 (100)	201 (100)
Has dedicated cellphone for referral	299 (95)	23 (85)	80 (91)	196 (98)
Using Electronic Patient Records				
None (paper-based records)	66 (21)	2 (7)	19 (22)	45 (23)
DOH-iHOMIS or any government EMR	73 (23)	15 (56)	52 (60)	6 (3)
Private EMR	138 (44)	7 (26)	9 (10)	122 (62)
Both Government and Private EMR	35 (11)	3 (11)	7 (8)	25 (13)

Functional Equipment, median (IQR)				
Basic				
X-ray	307 (95)	27 (96)	83 (92)	197 (96)
ECG	306 (94)	25 (89)	83 (92)	198 (96)
Ultrasound	277 (85)	28 (100)	65 (72)	184 (89)
Laboratory				
Laboratory Present in facility	313 (99)	28 (100)	85 (99)	200 (100)
Laboratory meets standards for facility level	294 (93)	28 (100)	77 (89)	189 (94)
Functional autoclave equipment (laboratory)	251 (80)	23 (82)	63 (74)	165 (83)

4.3 Health workforce

Health workforce pertains to the people providing healthcare services (World Health Organization, 2009). These include healthcare service delivery staff (e.g., physicians, nurses, pharmacists, and other allied health staff). It is critical that health facilities have adequate health workers and adhere to staffing standards. An increasing body of evidence shows adequate and appropriate staffing contributes to improved patient outcomes and greater satisfaction of both patient and staff (AIKEN et al., 2002; Cho et al., 2009; Clarke & Donaldson, 2008; Haegdorens et al., 2019).

Almost all hospitals have filled their staff complement (both permanent and contractual[5]) for physicians (See Table 14). Some DOH/national hospitals, however, were not able to do so. In some hospitals, unfilled staff complement for physicians could reach up to 60%. A deeper investigation is needed to identify barriers, which prohibits them from hiring more physicians despite the obvious need for health workers (e.g., lack of applicants, low remuneration). In some cases, hospital management has the incentive to unfill staff complement to reduce costs and increase savings. We did not observe high turnover rates of physicians across hospital ownership.

For the registered nurses, less than half (41%) of the public hospitals meet the staffing pattern set by the DBM-DOH Joint-Circular 2013-01 for Nurses. The policy states the number of nurses a hospital should have depending on the service capability level and bed capacity. Having unmet staffing pattern standards may result in higher workload of the staff leading to loss of motivation and staff turnover.
Staff turnover for nurses has been a ubiquitous problem, which could impact the operations and delivery of patient care in hospitals. **The highest staff turnover for nurses is seen in private hospitals for both permanent and contractual posts (on the median, 21% and**

[5] Permanent appointment refers to regular employment where the employee meets all the qualification requirements of the position and with security of tenure while contractual appointment refers to employment in accordance with a special contract to undertake specific work to be accomplished within a specific period (Source).

26%, respectively). There are multiple reasons that could explain the high the high turnover in private hospitals earn less, have fewer benefits than RNs in government hospitals; thus, they tend to leave and seek for better opportunities (Perrin et al., 2007).

Table 14. Health workforce

Variable, median (IQR)	All Hospitals n=344	National n=29	LGU-owned n=97	Private n=218
General Physicians				
Staff to bed ratio	0.1 (0.1-0.2)	0.2 (0.1-0.4)	0.1 (0.1-0.2)	0.1 (0.0-0.2)
% Staff contractual	0 (0-50)	0 (0-20)	36 (10-58)	0 (0-42)
% Filled positions**				
Permanent	100 (80-100)	84 (66-96)	100 (76-100)	100 (100-100)
Contractual	100 (80-100)	100 (58-100)	100 (100-100)	100 (56-100)
% Turnover				
Permanent	0 (0-10)	5 (0-16)	0 (0-6)	0 (0-14)
Contractual	0 (0-28)	13 (0-44)	0 (0-34)	0 (0-0)
Registered Nurses				
Met the staffing standards*, n (%)	142 (41)	14 (48)	62 (64)	
Staff to bed ratio	0.7 (0.5-1.0)	0.9 (0.6-1.1)	0.6 (0.4-0.8)	0.8 (0.5-1.1)
% Staff contractual	0 (0-44)	2 (0-24)	63 (33-76)	0 (0-0)
% Filled positions**				
Permanent	92 (68-100)	92 (84-96)	94 (80-100)	90 (63-100)
Contractual	100 (92-100)	100 (100-100)	100 (96-100)	100 (48-100)
% Turnover				
Permanent	10 (0-30)	2 (2-4)	0 (0-3)	21 (10-38)
Contractual	8 (0-26)	15 (6-18)	4 (0-12)	26 (0-100)

*Staffing standards according to DOH-DBM Joint Circular 2013-01. This does not apply in private hospitals.
**Contract of services/job-order positions were not captured in this assessment.

4.4 Health delivery

LGU hospitals were implementing a bed capacity higher than what was authorized (See Table 15). Half of LGU hospitals in the study implement a bed capacity of more than the number of hospital beds stipulated in their license potentially because of higher hospital demand.

On the median, the bed occupancy rate (BOR), which is an indicator of how heavily inpatients use hospital resources, is below the 85% threshold. In general, hospitals with BORs of above 85% are generally considered to have bed shortages. Further analysis is needed to explain the higher-than-expected 'technical efficiency' in most hospitals during the time of COVID-19, particularly among private hospitals.

Table 15. Health delivery

Variable, median (IQR)	All Hospitals n=344	National n=29	LGU-owned n=97	Private n=218
Implementing to Authorized beds (%)	100 (100-119)	100 (78.1-126.1)	150 (100-220)	100 (81.3-100)
Inpatients to bed ratio				
Latest month (per month)	3.1 (1.6-5.5)	2.8 (2-4.9)	4.2 (2.8-6.6)	2.8 (1.4-4.7)
2020 (annual)	40 (26.6-57.4)	34.8 (24.2-44)	46.8 (28.2-63.2)	39.3 (26.4-57.4)
% Outpatient (over inpatient + outpatient)				
Latest month	73.4 (52.6-88.4)	71.1 (57.2-83.4)	67.9 (52.8-82.3)	77.0 (47.8-92.0)
2020	76.5 (58.6-87.2)	80.7 (76.2-83.2)	77.3 (65.0-87.2)	71.9 (54.0-87.3)
Bed occupancy rate (BOR) %	49.3 (31-74.5)	76.8 (57.5-108)	84.1 (58.3-145.2)	39.5 (24-51)
Average length of stay	4 (3-5)	6 (5-7.5)	4 (3-5)	4 (3-5)

4.5 Medicines

The WHO defines essential drugs as the minimum needed medicines, which are most efficacious, safe and cost–effective, for a basic healthcare system targeting priority conditions (World Health Organization, 2019). As medicine being one of the critical components in the provision of patient care, lack of access and availability would have a negative impact on patient conditions, especially in patients with chronic diseases (Modisakeng et al., 2020; Phuong et al., 2019).

Essential drugs were not available in some LGU-hospitals and private hospitals (See Table 16). Only 2 in every 10 hospitals have complete 16 essential medicines with the lowest proportion in LGU-owned hospitals and private hospitals. Majority of the hospitals (79%) have 11-15 essential drugs, but they usually do not carry Selective Serotonin Reuptake Inhibitors (SSRI) and Amoxicillin suspension. SSRIs are usually prescribed to treat severe or persistent cases of depression while amoxicillin suspension is an antibiotic used to treat certain bacterial infections and to lower risk for community acquired pneumonia usually given to pediatric patients.

Stockouts are present in all the hospitals, both public and private. Less than half (40%) of the hospitals were able to carry drugs with no stockout with the largest proportion from private hospitals (46%) followed by LGU-owned (31%) and national hospitals (21%).

Table 16. Availability and stockout of essential medicines

Variable, n (%)	All Hospitals n=344	National n=29	LGU-owned n=97	Private n=218
Number of essential drugs available				
11 to 15	273 (79)	10 (34)	91 (94)	172 (79)
All 16	66 (19)	19 (66)	4 (4)	43 (20)
% Carried drugs with no stockout	137 (40)	6 (21)	30 (31)	101 (46)
Infectious Diseases				
Amoxicillin (500mg capsule/tablet)	316 (92)	29 (100)	90 (93)	197 (90)
No stockout at all in 2020	251 (80)	21 (72)	66 (74)	164 (83)
Amoxicillin (250mg/5mL suspension)	264 (77)	26 (90)	70 (72)	168 (77)
No stockout at all in 2020	208 (79)	22 (85)	50 (71)	136 (81)
Cefuroxime (500mg/tablet)	342 (99)	29 (100)	96 (99)	217 (100)
No stockout at all in 2020	260 (76)	22 (76)	59 (61)	179 (82)
Ampicillin-Sulbactam (1.5g/vial injection)	319 (93)	28 (97)	84 (87)	207 (95)
No stockout at all in 2020	236 (74)	24 (86)	47 (57)	165 (80)
Ceftriaxone (1 g/vial injection)	341 (99)	29 (100)	96 (100)	216 (99)
No stockout at all in 2020	262 (77)	22 (76)	58 (60)	182 (85)
Non-communicable diseases				
Salbutamol (5mg/2.5mL or 1mg/mL nebule)	341 (99)	28 (97)	95 (98)	218 (100)
No stockout at all in 2020	273 (81)	25 (89)	65 (68)	183 (85)
Metformin (500mg/tablet)	331 (97)	29 (100)	93 (97)	209 (96)
No stockout at all in 2020	250 (76)	18 (62)	59 (63)	173 (83)
Aspirin (80mg/tablet)	336 (98)	29 (100)	93 (96)	214 (98)
No stockout at all in 2020	246 (74)	19 (66)	51 (56)	176 (83)
ACE Inhibitors or ARBs	336 (98)	28 (97)	95 (98)	213 (98)
No stockout at all in 2020	237 (71)	15 (54)	59 (63)	163 (77)
Simvastatin (20mg capsule/tablet)	272 (79)	27 (93)	84 (87)	161 (74)
No stockout at all in 2020	194 (71)	17 (63)	56 (67)	121 (75)
Other diseases				
Selective Serotonin Reuptake Inhibitors	107 (31)	24 (83)	6 (6)	77 (35)
No stockout at all in 2020	71 (66)	10 (42)	3 (50)	58 (75)
Diazepam (10mg/2mL ampule)	324 (94)	27 (93)	86 (89)	211 (97)
No stockout at all in 2020	242 (75)	21 (78)	62 (72)	159 (75)
Paracetamol (300mg/ampule)	341 (99)	28 (97)	95 (98)	218 (100)
No stockout at all in 2020	269 (79)	20 (71)	66 (70)	183 (84)

Paracetamol (suspension)	333 (97)	27 (93)	91 (94)	215 (99)
No stockout at all in 2020	266 (80)	22 (81)	69 (76)	175 (82)
Mefanamic acid (500mg/capsule)	340 (99)	29 (100)	94 (97)	217 (100)
No stockout at all in 2020	269 (80)	25 (86)	59 (63)	185 (86)
Omeprazole (40mg/vial)	342 (99)	29 (100)	96 (99)	217 (100)
No stockout at all in 2020	271 (79)	23 (79)	60 (63)	188 (87)

V. Conclusions and Recommendations

According to the classic framework of Donabedian (1998), there are three components to consider when examining healthcare quality: structure, process, and health outcomes. In this paper, we have presented the initial results of our study focusing only on two structural measures of healthcare quality: (1) governance and administration; and (2) service capacity and readiness. Using a validated self-administered online questionnaire, we collected a wide-range of data on hospital management and service delivery from selected public and private hospitals in the Philippines. We highlight the critical findings according to these two structural measures:

Governance and administration

We have assessed four domains of hospital management: standardization of care, performance management, target management, and talent management. Analyzing these four domains as a whole suggests the large room for improvement in the hospital sector. **In our study, we revealed the conspicuous difference in the hospital management capacity across ownership.** Of the three types ownerships (i.e., DOH/national, LGU and private), private and LGU hospitals consistently behind in all four (4) domains. Zooming in to individual domain unfolds insights, in which in our opinion carries important policy and programmatic implications.

- **Standardization of care and protocols are not a common practice particularly among LGU and private hospitals.** This reinforces the potentially large variation of medical care in Philippine hospitals. Currently, there is no comprehensive study that examines the extent of variability of care in the Philippines, particularly in the private healthcare sector. High variability of medical care does not improve health outcomes; it also exacerbates healthcare waste and poor quality of care. Many health systems both in HICs and LMICs have already institutionalized approaches to facilitate standardization of care. While some hospitals have clinical pathways and service protocols, additional assessment is needed to determine the level of adherence.
- **In general, both public and private hospitals do not use relevant quality and efficiency indicators in measuring their performance.** While hospitals reveal that they use wide-range of indicators, as high as 70% of respondents do not collect quality and efficiency indicators commonly used in advanced health systems. What we have observed is, although hospitals typically report having process and systems in place, critical indicators are not typically measured, for instance, re-admissions or pot-discharge mortality rates. This observation is true for both public and private hospitals. It is important to note however that the ability to track these indicators require robust health information system (HIS), which has been a recurrent problem in many health facilities, both public and private.

- **A significant number public and private hospitals do not practice systematic target management. For instance, only 60% of hospital respondents have a benchmarking system and the same percentage conduct regular meetings to revisit performance targets.** Our findings require deeper assessment to determine the 'quality' of benchmarks exercises and understand how they typically apply such approach in their management and operations. In other countries, standardized quality benchmarking systems and tools are in place as reimbursement and regulatory requirements (e.g. US AHRQ), and this is not the case in the Philippines.

Service readiness and capacity

We have examined different domains under service readiness and capacity*, i.e.,* physical inputs, health workforce, and medicines and technology.

- A large number of hospitals still lack reliable electricity, stable communication system, and even the most basic – stable water supply. For instance, **while all hospital's main source is electricity and all have functional generators,** it is reported unreliable in 37% of the facilities. Reliable water and communication supply are the most rudimentary measures of quality and resilience, and the lack of such reflects the capacity and readiness of other aspects of healthcare delivery.
- **Basic diagnostic or imaging medical equipment should also be present in all hospitals regardless of level.** However, a few hospitals that do not have X-ray, ECG, and ultrasound equipment present at 5%, 6%, and 15%, respectively.
- **Less than half (41%) of the public hospitals meet the staffing pattern set by the Department of Health.** Having unmet staffing pattern standards may result in higher workload of the staff leading to loss of motivation and staff turnover. In the private sector, high turn-over rates are ubiquitous. The highest staff turnover for nurses is seen in private hospital at 20-25%.
- **Essential drugs were not available in some LGU-hospitals and private hospitals.** Only 2 in every 10 hospitals have complete 16 essential medicines with the lowest proportion in LGU-owned hospitals and private hospitals. Alarmingly stockouts are present in all of the hospitals, both public and private. The lack of availability of essential medicines, particularly in private hospitals, has serious equity and efficiency implications. Patients need to purchase medicines outside facilities using OOP, which in the first place should be included as part of a PhilHealth benefit package.

Healthcare quality is not usually considered in monitoring health system performance, and this needs to change. From a health system perspective, as the country embarks on UHC reforms, monitoring wide-range of quality of care indicators are more crucial than ever. The success of primary care and service contracting reforms hinges on the capacity of the government and the purchaser (e.g., PhilHealth) to understand both the quantity and quality of services being provided to patients - are they safe, effective and responsive? Without these data, significant information asymmetry between the provider (i.e., hospitals) and purchaser (i.e., PhilHealth) will occur and contracting arrangement will always fail leading ineffective medical care. From the perspective of providers, collection and measurement of health quality informs their operations and management decision leading to better health outcomes and cost-savings.

This study only examines one component of healthcare quality -structural inputs. Based on our initial findings, we recommend the following:

- **Systematically collect and measure a wide-range of quality healthcare indicators.** The DOH as part of its regulatory and stewardship function should lead the development of comprehensive health information system (HIS) framework, which captures comprehensive elements of healthcare quality. This framework shall then inform the structure of health information system (HIS) that needs to be developed and implemented in both public and private hospitals.
- **Hinge quality of healthcare to financing. In addition to regulation (e.g., licensing),** leveraging the monopsonic power of PhilHealth and its ability to provide incentives and grants, the government should encourage providers to start collecting, submitting and measuring healthcare quality data. This is the intuition behind the defunct Bench book, tha*t is,* compliance to reimbursement payment. This time, instead of 'stick', the government should consider providing 'carrots' such as performance grants, particularly to LGU hospitals.

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