

Bontile, Honey Loveleen R.

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## Performance of DOH-Retained Hospitals in the Philippines

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Philippine Institute for Development Studies  
*Surian sa mga Pag-aaral Pangkaunlaran ng Pilipinas*

## Performance of DOH-Retained Hospitals in the Philippines

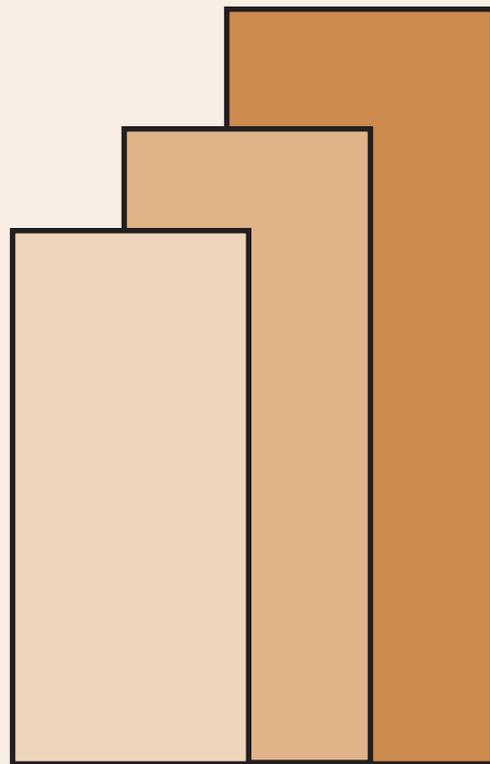
*Honey Loveleen R. Bontile*

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For comments, suggestions or further inquiries please contact:

**The Research Information Staff**, Philippine Institute for Development Studies  
5th Floor, NEDA sa Makati Building, 106 Amorsolo Street, Legaspi Village, Makati City, Philippines  
Tel Nos: (63-2) 8942584 and 8935705; Fax No: (63-2) 8939589; E-mail: [publications@pids.gov.ph](mailto:publications@pids.gov.ph)  
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**Honey Bontile, RND**

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# AN ASSESSMENT OF PERFORMANCE AMONG DOH GENERAL HOSPITALS IN 2011

Honey Loveleen R. Bontile, RND

## ABSTRACT

**Background:** The national government has been aiming for the provision of essential health services that are accessible, affordable and equitable. With the LGU Code of 1991, DOH retained 45 hospitals nationwide and in 2011, with the exclusion of drug abuse treatment and rehabilitation centers, 21 renationalized and 4 new hospitals were added to the list: 51 hospitals were classified as general and 19 are specialty hospitals. Aside from accessibility, quality health care is what people seek when getting medical attention while health providers use quality care to increase their market share. However, perception of quality differs between patients and health providers.

**Significance of the study:** Since one of the functions of the NCHFD is to provide technical assistance, an assessment of the 2011 hospital performance during the first year implementation of the KP thrust is beneficial. The study may determine areas for improving levels of performance and provide evidence for policy development. Results can serve as basis in ranking DOH hospitals in the PBB implementation. Furthermore, application of hospital performance specific indicators can be used in the planned hospital scorecard.

**Methodology:** The study focused its analysis on the 51 general DOH hospitals. Data were based on the annual hospital statistics reports submitted to the BHFS and NCHFD. Indirect indicators were used as recommended and agreed upon by the hospital information management team since the direct measures of quality care cannot be used. Generated results were compared to the standards proposed by McGibony (1969) and used as reference by the DOH (A.O. 147 s.2004).

**Results:** DOH hospitals seem to have met the criteria set for quality health care. With the standard range of 0.5-2.5% net death rate, 2% of the DOH hospitals fell within the range and 98% were even below the lower limit. The standard range for the net infection rate is below 1%. Of the 51 DOH hospitals, 1% had a 0.0% infection and 63% had a net infection rate below 1%. However, DOH failed to meet the criteria for access to care. The standard bed occupancy rate is 80-85%. Based on implemented beds, level 2 (33%) and level 3 (36%) hospitals were below the 80% occupancy rate. However, level 3 (37%) hospitals were within the 86-100% occupancy rate and level 4 (62.50%) hospitals had more than 100% occupancy rate.

Keywords: Philippines, DOH, general hospitals, performance assessment

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## BACKGROUND

Health facilities are important components of the health care system. The national government has been aiming for the provision of essential health services that are accessible, affordable and equitable. Department of Health (DOH) hospitals have been allowed fiscal autonomy with full income retention and to receive subsidy from the national government (A.O. No. 181 s. 2001). Since 1991, DOH has been co-responsible with LGUs for healthcare (LGU Code, 1991). DOH retained 45 hospitals nationwide and in 2011, excluding drug abuse treatment and rehabilitation centers, 25 new or renationalized hospitals were added to the list. As categorized by the Bureau of Health Facility Services (BHFS), 51 hospitals were classified as general and 19 are specialty hospitals. Since the quality of care delivered to people in need is critical, the DOH created specific guidelines and indicators that will determine appropriate and effective courses of action.

Quality is the most overused yet underachieved concept in health care (Enriquez, 2002). Patients often consider quality health service when looking for medical care; health providers advertise quality service for increased market share. However, perception of both parties on quality does not always connect (Trigg, 2011). Nonetheless, access to quality care is an important element of the health system as affirmed by the third strategic thrust of the *Kalusugan Pangkalahatan (KP)*.

## **SIGNIFICANCE OF THE STUDY**

One of the functions of the National Center for Health Facility Development (NCHFD) is to provide technical assistance particularly to the DOH hospitals. The Hospital Information Management team desires to assess the hospital performance of DOH hospitals in 2011, the first year of KP implementation. Determining the current status of the DOH general hospitals can help identify strategies in increasing the level of performance. The results of this study can be beneficial in providing evidence for policy development. It will also serve as basis for ranking the performance of DOH general hospitals in anticipation of the Performance-based Budgeting (PBB) implementation. In addition, it will validate the ease of application of specific indicators of hospital performance and be used in the planned hospital scorecard.

## **REVIEW OF LITERATURE**

Hospitals, as stated in the Administrative Order No. 107 s 2004, diagnose, treat, and provide medical and surgical care. Performance indicators are statistics of information that reflect directly or indirectly whether the magnitude of a projected outcome is achieved (NPHC, 2001). As described by Enriquez and colleagues (2002), performance indicators are quantitative information that can be useful in decision making. There are three sectors that depend on these indicators: (1) health consumers depend on the performance indicators in selecting the best treatment option available for them; (2) health providers use the performance indicators in evaluating how well they perform with respect to quality patient care; and (3) health purchasers make policies and procure the proper equipment through the performance indicators (Enriquez, 2002).

Through the hospital status and quality service, the administrators will be able to recognize limitations and adjust the strengths accordingly (Enriquez, 2002). Performance Assessment Tool for Quality Improvement in Hospitals (PATH) was used to evaluate hospital performance in the European Union. Ng and colleagues (2008) developed the Comprehensive Hospital Assessment and Review Tool (CHART) as inspired by the PATH. The six dimensions of hospital performance (clinical effectiveness, hospital efficiency, staff orientation, responsible governance, safety and patient-centeredness) were adapted. Although the number of indicators was cut down from 250 to 64, multiple indicators remained too tedious for the hospital. Enriquez and colleagues categorized performance indicators into different aspects of hospital evaluation: (1) access to care (2) appropriateness of care (3) effectiveness of care (4) technical proficiency (5) continuity of care (6) patient satisfaction. However, the study utilized only the three readily available facets of hospital evaluation: (1) Access to care, (2) Efficiency and (3) Effectiveness of care. Means and ranges were obtained from a three-year period while Cuerpo's study used one-year data. Goshtasebi and colleagues used the Pabon Lasso Model, one of the most useful tools for comparing different hospitals (Goshtasebi, 2009). This model used three indicators: (1) Bed Occupancy Rate (BOR), (2) Average Length of Stay (ALS), and (3) Bed Turnover (BTO).

## **STATEMENT OF THE PROBLEM**

To achieve the Universal Health Care (*Kalusugan Pangkalahatan*), the Aquino Health Agenda formed three strategic thrusts: (1) using national subsidies to support the poor, (2) upgrading public health facilities to improve access to quality health facilities, (3) applying additional effort and resources in localities with families unable to receive critical public health services. Aligned with these thrusts, this paper intends to evaluate whether access and quality health care were achieved by the DOH general hospitals in 2011 using certain indices from the Revised Annual Statistical Hospital Report of 2005.

## OBJECTIVES OF THE STUDY

The study aims to assess the performance of the general DOH hospitals for the year 2011 against the standard values. Specific objectives are as follows:

1. To describe DOH general hospitals in terms of access to care:
  - a. bed capacity
  - b. occupancy rate
  - c. number of OPD consultations
2. To describe the performance of DOH general hospital in terms of quality:
  - a. net death rates
  - b. net infection rate

## METHODOLOGY

The DOH directly administers 70 hospitals categorized either as general (51) or specialty hospitals (19). The study focused its analysis on the 51 general DOH hospitals. The hospital statistics report submitted to the BHFS and NCHFD was reviewed through secondary data collection. Accumulated data were organized to stabilize various types of data. Erroneous and incomplete values were declared missing. In this study, since the direct measures of quality care cannot be used, indirect indicators of care were recommended and agreed upon by the hospital information management team. Indicators in terms of utilization were used to measure access to care. Results were generated using STATA 12 and compared to the standards proposed by McGibony (1969) and used as reference by the DOH (A.O. 147 s.2004). Bed occupancy rate were compared to the WHO standards.

## LIMITATIONS OF THE STUDY

The assessment of the study was limited to a one-year secondary data. The relationship of indicators was not included in the analysis. Direct indicators for quality care were not in the database. The study did not include the reclassification of hospital license levels since the implementation was fairly recent. Hospitals were given three years to complete the requirements. Thus, no data is available to examine the effect of reclassification from the old category. Access to healthcare may be measured in terms of accessibility, availability and affordability. Since the results were taken from a secondary data, only the available indicators within the dimension of bed capacity, occupancy rates and OPD consultations were evaluated.

## RESULTS AND DISCUSSION

DOH general hospitals were licensed according to service capabilities (See Annex: Definition of Terms). Certain requirements must be presented to the BHFS and procedure of application must be completed to obtain hospital permit and license (DOH, 2011). Table 1 shows that as of 2011, there are 4 (7.84%) general hospitals licensed to level 1, 13 (25.49%) on level 2, 9 (17.65%) on level 3 and 25 (49.02%) on level 4.

**Table 1 Frequency distribution of DOH general hospitals per license level, 2011**

Hospital Level	Frequency	%
1	4	7.84
2	13	25.49
3	9	17.65
4	25	49.02
<b>TOTAL</b>	<b>51</b>	<b>100.00</b>

## Access to Care

To describe access to care, the available indicators used in the study are bed capacity, occupancy rate and number of outpatient (OPD) consultations. Table 2 shows that the average authorized bed capacity of the 51 DOH hospitals is 241.96 ( $\pm 165.58$  SD) that ranges from 10 to 600 beds. The wide variation in bed capacity is explained by the number of assigned beds per hospital levels. Bed occupancy rate ranges from 23 to 350% with the average of 121% ( $\pm 0.703$  SD). The wide range in bed occupancy rate accounts for the different service capabilities of the DOH hospitals. The average number OPD consultation is 67,784.15 ( $\pm 61239.23$  SD) ranging from 5,616 to 26,821 per year.

**Table 2 Access to care indicators of DOH general hospitals, 2011**

Access to care	Mean	SD	Range
Authorized Bed Capacity	241.96	165.58	10-600
Bed Occupancy Rate	121	0.703	23-250
No. OPD Consultation	67,784.15	61,239.23	5,616-26,821

## Bed Capacity

As a government policy, bed capacity per hospital category was assigned to ensure accessibility of services. In 2011, 10 (19.61%) of the DOH hospitals were authorized to have 75 and below bed capacity; 27 (52.94%) were assigned with 100 to 300 beds and 15 (29.41%) were allowed to house more than 300 patients (Table 3). However, depending on patient demand, some hospitals require more bed capacity while others can only utilize fewer beds. Implementation of hospital beds more than the official bed assignment depends upon the facility management decision. Twenty-five percent of the hospitals were implementing below the 75 bed capacity, 45.10% were implementing 100 to 300 beds and 29.10% were implementing more than 300 beds.

**Table 3 Frequency Distribution of DOH general hospitals to authorized bed capacity, 2011**

Bed Capacity	Authorized		Implemented	
	N	%	N	%
<75	10	19.61	13	25.49
100-300	27	52.94	23	45.10
>300	15	29.41	15	29.10
<b>TOTAL</b>	51	100	51	100

The average authorized bed capacity among level 1 hospitals is 13.75 ( $\pm 7.5$ ); 93.08 ( $\pm 60.36$ ) in level 2; 225 ( $\pm 75$  SD) in level 3; and 362 ( $\pm 132.7$ ) in level 4 (Table 4). Of the 51 DOH general hospitals, an average of 4 beds was implemented beyond the authorized capacity. Hospitals in level 1 and 4 have implemented beyond the authorized capacity while those of level 2 and 3 have implemented fewer beds. Adjustment of bed capacity depends on the readiness of the facility, available manpower and adequate resources.

**Table 4 Average bed capacity per DOH hospital level, 2011**

Hospital Level	Authorized Bed Capacity		Implementing Bed Capacity		Bed Capacity Beyond the Authorized Capacity	
	Mean	SD	Mean	SD	Mean	SD
1	13.75	$\pm 7.5$	21.25	$\pm 7.5$	7.5	$\pm 8.66$
2	93.08	$\pm 60.36$	65.92	$\pm 45.86$	-27.15	$\pm 53.73$
3	225	$\pm 75$	208.89	$\pm 47.02$	-16.11	$\pm 68.18$
4	362	$\pm 132.7$	389.12	$\pm 222.68$	27.12	$\pm 142.95$
<b>TOTAL</b>	241.96	$\pm 165.58$	246.08	$\pm 218.23$	4.11	$\pm 108.82$

Among all hospitals, 37.25% has implemented beyond the authorized bed capacity while remaining hospitals have either implemented fewer beds or as assigned. Half of the DOH general hospitals in level 1 have exceeded the limit. While more than half (55.55%) of the level 3 hospitals utilize the authorized beds, results showed that 48% of the level 4 hospitals are implementing more beds than the authorized capacity. Interestingly, 53.85% of the level 2 hospitals were implementing below the authorized bed capacity, followed by level 3 hospitals (33.33%). Summary of results are shown in Table 5.

**Table 5 Distribution of DOH general hospital levels and implemented beds in relation to authorized beds, 2011**

Hospital Level	Actual Bed Implementation			TOTAL
	=Authorized (%)	>Authorized (%)	<Authorized (%)	
1	50	50	0	100
2	23.08	23.08	53.85	100
3	55.55	22.22	22.22	100
4	24.00	48.00	28.00	100
<b>TOTAL</b>	31.37	37.25	31.37	100

### **Bed Occupancy Rate**

Bed occupancy rate refers to the percentage of beds occupied at a given period of time. This indicator assists the hospital staff and medical specialists to decide how many admissions can be accepted and how many inpatients need to be discharged to accommodate new arrivals. Based on authorized bed capacity, the average bed occupancy rate in the level 1 hospitals is 145%, 112% in level 2, 136% in level 3 and 115% in level 4. In contrast, the average bed occupancy rate based on actual bed use in level 1 is 73%; 104% in level 2; 114% in level 3; and 109% in level 4. The ranges on bed occupancy rates are summarized in Table 6.

**Table 6 Average bed occupancy rate per DOH hospital level, 2011**

Hospital Level	Authorized Bed Capacity			Implementing Bed Capacity		
	Mean (%)	SD	Min-Max	Mean (%)	SD	Min-Max
1	145	116	23-284	73	46	23-114
2	112	79	24- 269	104	59	43-269
3	136	90	68-350	114	39	73-200
4	115	52	34-215	109	44	34-269

The WHO standard for bed occupancy rate ranges from 80-85%. Based on the authorized bed capacity, 25% of the hospitals in level 1 met the criteria. Thirty-six percent of the hospitals in level 2 have below 80% occupancy rate while both level 3 (62.50%) and 4 hospitals (62.50%) have over 100% occupancy rate. Summary of results are found in Table 7. Based on the implemented bed capacity, 36.36% of level 2 hospitals were below 80% occupancy rate, 33.33% of level 1 hospitals were within the standard. In addition, 37.50% of level 3 hospitals were within 86-100% while 62.50% of level 4 hospitals had more than 100% occupancy rate (Table 8). This means that despite the adjustment of bed capacity, bed occupancy still exceeds the limit. Health experts warn that the quality of care can suffer if more than 85% of hospital beds are being utilized.

**Table 7 Authorized bed occupancy rate per DOH hospital level, 2011**

Hospital Level	< 80%	80-85%	86-100%	>100%	TOTAL
1	25.00	25.00	0	50.00	100
2	36.36	0	9.09	54.55	100
3	25.00	0	12.50	62.50	100
4	29.17	4.17	4.17	62.50	100
<b>TOTAL</b>	29.79	4.26	6.38	59.57	100

**Table 8 Implemented bed occupancy rate per DOH hospital level, 2011**

Hospital Level	< 80%	80-85%	86-100%	>100%	TOTAL
1	33.33	33.33	0	33.33	100
2	36.36	0	9.09	54.55	100
3	12.50	0	37.50	50.00	100
4	16.67	0	20.83	62.50	100
<b>TOTAL</b>	21.74	2.17	19.57	56.52	100

**Number of OPD Consultation**

In hospital level 1, the average number of OPD consultation is 9,306 ( $\pm 4,962.22$  SD) and ranges from 5,616 to 16,275. Level 2 hospitals has an average of 15,046 ( $\pm 5671.12$ , SD) that ranges from 6,524 to 23,499 OPD consultations. An average of 57,718 ( $\pm 22,266.22$  SD) ranging from 39,714 to 104,235 OPD consultations were observed among level 3 hospitals. And lastly, level 4 hospitals has the highest number of OPD consultations that average to 103,566 ( $\pm 63,015.44$  SD, 32,992-268,621) (Table 9). Evidently, as the level of hospital increases, the number of OPD consultation also increases. Possible reasons include geographic location, hospital level of service, and the clinical care and management sought by patients. For instance, some patients would require ancillary services such as laboratory and radiology; thus, patients seek direct health care in higher hospital levels.

**Table 9 Average number OPD consultation per DOH hospital level, 2011**

Hospital Level	Mean	SD	Min	Max
1	9306	4962.22	5616	16275
2	15046.18	5671.116	6524	23499
3	57718.75	22266.99	39714	104235
4	103566.3	63015.44	32992	268621

**Quality**

The indicators available in describing quality health care included net death rate and net infection rate (Table 10). Results showed that in 2011, hospitals had an average net death rate of 0.06% and an average net infection rate of 0.23%. The reference standard used for net death rate is between 0.5-2.5%, and the benchmark for the net infection rate is below 1%. This means that on average, DOH general hospitals met the criteria for quality health care. However, results were solely based on indirect indicators.

**Table 10 Quality Indicators of DOH General Hospitals, 2011**

Quality	Mean	SD	Range
Net death rate	0.06	0.219	0.0018-1.43
Net infection rate	0.23	0.105	0-0.58

**Net Death Rate (NDR)**

Health outcome is a measure of quality care. Net death rate is a more sensitive indicator of quality health than gross death rate. By excluding outcome of care within the first 48 hours, the health provider-to-patient relationship has been established. Forty-one out of the 51 hospitals submitted the NDR data. Among those who submitted, only one (2.44%) fell within the standard range of 0.5-2.5% while the rest (97.56%) are lower than the standard range (Table 11). The mean death rates per hospital level are described in Table 12. Results showed that the occurrence of institutional deaths is even lower than the set criteria.

**Table 11 Distribution of DOH hospitals per net death rate, 2011**

Net death rate	N	%
<0.5	40	97.56
0.5-2.5	1	2.44
>2.5	0	0
<b>TOTAL</b>	41	100

**Table 12 Average net death rate per DOH hospital level, 2011**

Hospital Level	Mean	SD	Min	Max
1	.0059	.0058	.0018	.01
2	.1521	.4490	.0024	1.43
3	.0259	.0077	.0182	.04
4	.0349	.0114	.014	.0606

**Net Infection Rate (NIR)**

Net infection rate reflects hospital-acquired infection that occurred beyond 72 hours during the hospital stay. Ideally, hospitals must strive for 0.0% net infection rate. However, a net infection rate of 1% and below is accepted according to the reference standard. Only 30 of the 51 DOH general hospitals submitted the data on net infection rate. Based on the data gathered, 36.67% had a 0.0% net infection rate, and 63.33% had an average net infection rate below 1% (Table 13). Shown in Table 14 is the summary of net infection rate per hospital level. Results showed that hospitals in level 1 had 0.0% net infection rate.

**Table 13 Distribution of DOH hospitals according to net infection rate, 2011**

Net infection rate	N	%
0	11	36.67
0.0001 - 1%	19	63.33
>1%	0	0
<b>TOTAL</b>	30	100

**Table 14 Average net infection rate per DOH hospital level, 2011**

Hospital Level	Mean	SD	Min	Max
1	0	0	0	0
2	.0019167	.0045495	0	.0112
3	.0728875	.2049054	0	.58
4	.0068786	.0074484	0	.0274

**CONCLUSION**

Based on the standards set by McGibony (1964), the results of the study suggested that DOH general hospitals met the criteria for quality health care based on the indirect indicators used. However, the use of indirect indicators weakened the validity of the analysis. Very low net death rate indicates that the hospital functions as outpatient care or that the referral hospitals are located near to the point of inefficiency. In addition, information on patient satisfaction could add weight in evaluating quality of care provided. However, no data was submitted by the hospitals. Data on certain diseases such as respiratory, urinary tract and surgical site infections and its relationship to the average length of stay (ALOS) could support the findings.

As a human right, health must be enjoyed by all citizens (DOH, 2004). National government policies aim to ensure that access to healthcare is made available to everyone. Regional Health Units (RHUs) and Barangay Health Stations (BHS) are the gatekeepers in the health delivery system. However, because of poor quality and the limited services provided, patients proceed to hospitals for medical care. Results showed that majority of the over implemented beds were from level 1 hospitals, followed by the hospitals in level 4. This huge gap may be explained by the services offered by the two hospitals. Other possible reasons include severity of illness, geographic location, demography and the cost of medical treatment. Despite the adjustment, a large percentage of hospitals still exceeded 100% bed occupancy. Patients are possibly stationed in the hallway exposed to different kinds of diseases. Since the measure of bed occupancy rate only indicates the percentage of beds occupied at a given period, results did not reflect the actual number of patients occupying one bed, as in the case of some specialty hospitals.

Interestingly, net infection rate is below 1%. In contrast, hospitals in level 2 and 3 have the most number of under implemented beds which may be explained by the poor referral system. Since the devolution in 1991, the referral network failed to operate as planned (Lavado, 2010). Higher level hospitals generally attend to all the cases including the primary ones. Moreover, an increasing trend was observed in the average number of OPD consultations. Patient load increases with the level of hospital. This indicates that patients seek direct utilization of care depending on the services offered by the hospital and needed by the patients.

## **RECOMMENDATIONS**

### **Research**

A second-stage study should be done to validate the findings. This should involve the new classification for license levels, direct (e.g. patient satisfaction and infectious diseases) and other indicators (e.g. ALOS). Results of the studies can be useful in developing hospital performance scorecard. The relationship of occupancy rates and ALOS should be examined. Results can determine if over utilization of beds is associated with prolonged length of stay. In addition, NCHFD should also examine the relationship of bed capacity, bed occupancy rates and the development of Health Facilities Enhancement Program (HFEP). Understanding how patients flow through the hospital can help identify the causes of capacity problems. Findings can help in the prioritization of facility enhancement.

### **Policy**

Net death rate reflects the efficiency by which accurate diagnosis and correct measurement are given to care. Therefore, DOH should review and enforce accurate reporting of net death rates and net infection rates.

The Annual Hospital Statistical Report should also be extensively reviewed by the NCHFD committee and ensure to reflect the direct indicators that will measure the quality of care.

DOH hospitals should measure performance in the key areas that affect the patient flow and capacity. The drivers of capacity constraints and key opportunities for performance improvement must also be identified.

Bed capacity is approved per license issued; implemented bed capacity is requested upon the hospital management decision. Since hospitals are exceeding the allocated bed capacity following the adjustment, NCHFD and BHFS should encourage build-up of general hospital resources and begin with the health human resource.

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## ANNEX: Definition of Terms

1. **Hospital category** – refers to the classification of hospital according to ownership (government or private), scope of services (general or specialty), and service capability (Licence Level).
2. **General Hospital** – refers to hospitals that provide services for all kinds of illnesses, diseases, injuries or deformities. It provides medical and surgical care to the sick, injured, including maternity, newborn, and child care.
3. **Specialty Hospital** – refers to the hospitals that provide services to specific kinds of illnesses, diseases, injuries or deformities. It must have an ancillary and support services appropriate for a given service capability.
4. **Service Capability** – refers to the level of services, clinical care and management provided by the hospital. Categorized according to license level:
  - a. **Level 1** – An emergency hospital that provides initial clinical care to patients requiring immediate medical attention. It provides clinical, general administrative and ancillary services including nursing care to patients requiring minimal category of supervised care.
  - b. **Level 2** – A non-departmentalized hospital that provides clinical care and management on the prevalent disease in the locality. It provides clinical, appropriate administrative and ancillary services such as laboratory, pharmacy and radiology. Nursing service in this level provides intermediate, moderate and partial category of supervised care.
  - c. **Level 3** – A departmentalized hospital that provides clinical care and management on the prevalent disease. It provides particular forms of treatment, surgical procedure and intensive care. Clinical service with specialty care is provided as well as the administrative and ancillary services. Nursing care is provided with total and intensive skilled care.
  - d. **Level 4** – A teaching and training hospital that provides care and management with specialized and subspecialized form of treatment, surgical procedure and intensive care. It provides clinical service with sub-specialty care and tertiary level of administrative and ancillary services. Nursing care provided is continuous and highly specialized critical care.
5. **Hospital Death Rate** – the ratio of all inpatients for a given period to the total number discharges and deaths in the same period.
  - a. **Gross Death Rate** – the ratio of all inpatient deaths (mortality rate) including newborns for a given period to the total number of discharges including deaths for a given period. Measured as:
$$GDR = \frac{\text{total deaths including newborn for a given period}}{\text{Total number of discharges and deaths for the same period}} \times 100$$
  - b. **Net Death Rate** – refers to the adjusted death rate (institutional death rate) excluding those that occur within the 48 hour period. It is measured as:
$$NDR = \frac{(\text{total deaths including newborn}) - (\text{deaths} < 48 \text{ hours for a given period})}{(\text{Total discharges including newborn}) - (\text{deaths} < 48 \text{ hours for the same period})} \times 100$$
6. **Hospital Infection** – refers to all hospital-acquired infection that occurs during the patient's hospital stay. May be calculated for the entire hospital or a specific unit.
  - a. **Net Infection Rate** – refers to all the infection debited against the hospital for the period divided to the total discharges and death for the same period.
  - b. **Gross Infection Rate** - refers to all the infection in the hospital for the period divided to the total discharges and death for the same period.

7. **Hospital Bed Capacity** – the number of bed assigned to a hospital and constructed to contain.
  - a. **Authorized Bed Capacity (ABC)** - Approved number of beds as per issued license to operate in the hospital and other health facilities
  - b. **Implementing Bed Capacity (IBC)** - Actual beds use based on hospital/facility management decision.

8. **Bed Occupancy Rate** – the percentage of beds (authorized or implemented) occupied by hospital inpatients at a given period of time. Measured as:

$$BOR = \frac{\text{total in patient service days for a period}}{(\text{total no days in authorized or implemented beds same period})} \times 100$$

9. **Outpatient Consultation** – refers to the attended patients receiving physician, dentist or allied services while not lodged in a hospital.