



Mix of Resources in Seven Devolved Antique Hospitals and their Corresponding Output/ Outcome Indicators, 1998-2002: Policy Implications

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Introduction

In a Health Sector Reform Agenda monograph series published by the Philippine Department of Health, the performance of provincial and district hospitals was generally described as poor (DOH 1999). This study was undertaken after the implementation of Republic Act No. 7160 which mandated, among other things, that provincial, district, and municipal hospitals be devolved to the provincial governments. In a Samar study, it was discovered that 25- and 10-bed hospitals were economically inefficient to maintain (Rillon, et. al 2002) after hospitals were devolved to the local government units in 1993. In a study by the Economic Development Foundation, which was commissioned by the Department of Health and looked into the effects of devolving hospitals to the local government units, one of the findings was that internal revenue allotments (IRAs) received by the provinces were inadequate to finance the costs of devolution. Since there was no separate funding allocated for the costs of devolution, provinces had to finance these out of their IRA and, consequently, they experienced shortfalls in their operating budgets. Because of this situation, the local government units had to

substantially decrease their support for devolved units. Infrastructure projects were considered by some local executives to be more important than health services or public health programs. Consequently, funding of the latter was neglected. One of the recommendations of the study was to extend assistance in conducting studies to determine the viability of inter-local government unit collaboration in the form of user-charging for a more effective and efficient hospital operation. Hence, it is important to continually assess the effects and the progress so far achieved in the implementation of devolving public hospitals to local government units.

The objectives of this research study are:

- 1) To describe the profile of the primary and secondary public hospitals in Antique using the following indicators:
 - (a) Proxy Indicators of Efficiency (Averaged from 1998-2002)
 - (i) Bed Occupancy Rate
 - (ii) Cost per In-patient Discharge
 - (iii) Cost per In-patient Day
 - (b) Proxy Indicators of Quality of Care (Averaged from 1998-2002)
 - (i) Gross Death Rate
 - (ii) Net Death Rate
 - (iii) Infant Mortality Rate
 - (iv) Fetal Death Rate
 - (v) Maternal Mortality Rate
 - (vi) Neonatal Death Rate
 - (vii) Cesarean Section Rate
- 2) To explore possible mechanisms which can be adopted or developed to augment the budget for health services in municipal and district hospitals to ensure continued operations and viability of these devolved hospitals by studying the operational and financial reports of the seven devolved hospitals in Antique province;
- 3) To determine the relative mix of resources used in these hospitals and to establish relationships between the mix of resources of these hospitals and their corresponding output or outcome indicators which can consequently

be used for planning and for policy formulation and development especially insofar as hospital reforms are concerned.

Materials and Methods

This is a descriptive-analytical study which utilized the following operational and financial reports of the seven devolved hospitals in Antique province for the years 1998-2002: 1) hospital statistical reports, 2) itemized hospital collections, 3) itemized statement of expenditures, and 4) hospital assets listings. Operational and financial rates and ratios were computed, averaged from 1998-2002, analyzed, compared with each other, and interpreted.

Hospital data were categorized into two groups according to implementing bed capacity (25 beds and ≤ 15 beds). The three secondary and one primary 25-implementing beds hospitals therefore comprised one group while all the three 15- and 10-implementing beds primary hospitals comprised the second group. Categorizing these hospitals into these two groupings ensured a homogenous patient mix, disease patterns, manpower complements within each category.

The following seven devolved hospitals of Antique province were included in this study:

Name of Hospital	Implementing Bed Capacity	Hospital Classification
1. Valderrama Municipal Hospital (VMH)	10	Primary
2. Bugasong Medicare Community Hospital (BMCH)	15	Primary
3. Pedro Gindap Municipal Hospital (PGMH)	15	Primary
4. Culasi District Hospital (CDH)	25	Secondary
5. Gen. Leandro L. Fullon General Hospital (GLLFGH)	25	Secondary
6. Pres. Diosdado Macapagal Hospital (formerly Gov. Mamerto Portillo District Hospital) (PDMH)	25	Primary
7. Ramon Maza Sr. Memorial DistrictHospital (RMSMDH)	25	Secondary

By definition, a primary hospital has the service capability to render primary care services in medicine, pediatrics, obstetrics and minor surgery. A secondary hospital, on the other hand, renders gynecology, general surgery, ophthalmology, anesthesia and other ancillary services in addition to the services provided by a primary hospital.

The proxy indicators used in this study were performance indicators, such as bed occupancy rate, and financial indicators, such as average total expenditures. These indicators were correlated with output indicators such as average total in-patient days of care and average in-patient discharges among the hospitals in the two categories, input mix indicators such as the full time employees per implementing bed, and output-input mix indicators such as average cost per patient day and average cost per discharge. Their formulae are given in Annex 1.

The proxy indicators of quality of care used in this study are composed of seven rates which are commonly used in studies involving hospital operations. Their defining formulae are given in Annex 1.

In this study, proxy indicators of economic efficiency are defined as follows:

- Bed occupancy rate – 70% (based on Hospital Medical Records Management Manual, DOH, 2nd Edition)
- Cost per in-patient day – approaching PhP 1,550.00/day (based on PhP 1,539.00 for uninsured patient, DOH, 1999)
- Cost per discharge – approaching PhP 6,000.00 (for four days of hospitalization, based on PhP 5,881.00, DOH, 1999)

In this study, the proxy indicators of quality of care are defined as follows (based on Hospital Medical Records Manual, DOH, 2nd Edition):

- Gross Death Rate – below 3%
- Net Death Rate – below 2.5% (acceptable by Western standards)
- Infant Mortality Rate – below 2% (acceptable by Western standards)
- Fetal Death Rate – below 2%
- Maternal Mortality Rate – up to 25%
- Cesarean Section Rate – 3-4% (acceptable by Western standards)

Results

Pres. Diosdado Macapagal Hospital, in the cluster of 25-implementing beds hospitals, and Bugasong Medicare Community Hospital, in the grouping of ≤ 15 beds, were the most efficiently run in terms of their input-output mix or ratios. This means that they had the lowest resources or inputs (e.g., full time employees, full time employees per implementing bed, personal services, salaries, total budget) while still having comparable output indicators as the other hospitals in their respective categories (e.g., admissions, discharges, patient days of care, total revenues) (Tables 1-2).

TABLE 1. Average Operational & Financial Statistics for Four 25-Implementing Beds Hospitals in Antique, 1998 - 2002

	Culasi District Hospital (5 yr. ave.)	Gen. Leandro L. Fullon Gen. Hosp. (4 yr. ave.)	Pres. Diosdado Macapagal Hosp. (3 yr. ave.)	Ramon Maza Sr. Memorial D District Hospital (5 yr. ave.)
Implementing FTE	47	43	40	46 (4 yr. ave.)
FTE per Implementing Bed	3.006	2.745	2.5	2.27 (4 yr. ave.)
Personal Services	Php 7,486,044	Php 6,631,230 (5 yr. ave.)	Php 6,287,998 (5 yr. ave.)	Php 7,881,541
Salaries	Php 4,515,600	Php 3,882,176 (5 yr. ave.)	Php 3,779,079 (5 yr. ave.)	Php 4,636,426
Admissions	1,377	1,612	1,672	2,566
Discharges	1,417	1,762	1,708	2,664
Patient Days of Care	5,911	5,865	5,798	7,605
Total Budget	Php 8,405,554	Php 8,103,169	Php 8,869,322	Php 8,858,664
Total Revenues	Php 530,635	Php 405,133	Php 633,563	Php 727,195
Total Expend.	Php 8,382,516	Php 7,460,529	Php 7,248,711	Php 9,060,465

TABLE 2. Average Operational & Financial Statistics For the Two 15-Implementing Beds Hospitals & One 10-Beds Hospital in Antique, 1998-2002

	Bugasong Medicare Community Hosp. (BMCH) 5 Years' Average	Pedro Gindap Municipal Hospital (PGMH) 4 Years' Average	Valderrama Municipal Hospital (VMH) 4 Years' Average
Implementing FTE	23.5 (4 yr. ave.)	27	21
FTE/Implementing Bed	1.96 (4 yr. ave.)	2.79	2.69
Personal Services	Php 3,913,515	Php 4,432,828 (5 yr. ave)	Php 3,245,144 (5 yr. ave.)
Salaries	Php 2,277,686	Php 2,676,826 (5 yr. ave.)	Php 1,934,465 (5 yr. ave.)
Admissions	1,147	1,127	576 (3 yr. ave.)
Discharges	1,188	1,126	561
Patient Days of Care	4,464	4,288	2,812
Total Budget	Php 4,779,955	Php 5,089,368 (5 yr. ave.)	Php 3,863,484
Total Revenues	Php 215,021	Php 248,808 (5 yr. ave.)	Php 142,401 (5 yr. ave.)
Total Expenditures	Php 4,316,090	Php 5,030,826 (5 yr. ave.)	Php 3,569,918 (5 yr. ave.)

The average gross and net death rates of the 25-implementing beds hospitals and the ≤ 15 beds hospitals were within comparable ranges. Average infant mortality rates and fetal death rates were similarly comparable. Average maternal mortality rates and neonatal death rates were either zero or near zero. Cesarean section rate was zero for all hospitals except for Culasi District Hospital which had a rate of 8. (Tables 3-4).

The range of the average bed occupancy rate of the 25-implementing beds hospitals was 63-83% while that of the ≤ 15 beds hospitals was 77-82% (Tables 3-4).

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TABLE 3. Averages of Selected Hospital Operations Indicators of Four 25-Implementing Beds Hospitals in Antique, 1998-2002

	Culasi District Hosp. (CDH) (5 yr. ave.)	Gen. Leandro L. Fullon Gen. Hosp. (GLLFGH) (4 yr. ave.)	Pres. Diosdado Macapagal Hosp. (PDMH) (3 yr. ave.)	Ramon Maza Sr. Memorial District Hosp. (5 yr. ave.)
Gross Death Rate	3.098	1.95	1.77	1.49
Net Death Rate	1.1	1	0.18	1.01
Infant Mortality Rate	0	1.56	0.11	0
Fetal Death Rate	0	2.06	0	0.15
Maternal Mortality Rate	0	0	0	0
Neonatal Death Rate	0	0.15	0.30	0
Cesarean Section Rate	8	0	0	0
Bed Occupancy Rate (Implementing)	65%	64%	63%	83%

TABLE 4. Averages of Selected Hospital Operations Indicators of Two 15-Implementing Beds Hospital & One 10-Beds Hospital in Antique, 1998-2002

	Bugasong Medicare Community Hospital (BMCH) 5 Yr. Ave.	Pedro Gindap Municipal Hospital (PGMH) 4 Yr. Ave.	Valderrama Municipal Hospital (VMH) 4 Yr. Ave.
Gross Death Rate	2.008	2.31	1.65
Net Death Rate	0.49	0.515	0.04
Infant Mortality Rate	0.25	1.12	0
Fetal Death Rate	3.16	0	0
Maternal Mortality Rate	0	0	0
Neonatal Death Rate	0	0	0.81
Cesarean Section Rate	0	0	0
Bed Occupancy Rate (Implementing)	82%	78%	77%

Selected financial parameters point to the efficient performance of Pres. Diosdado Macapagal Hospital in terms of having the lowest average total expenditures, highest average net income, highest average profit margin among the hospitals in the same category (Table 5). Contributory to its good financial performance was its having the highest average percentage of PhilHealth patients which resulted in its having the highest average total in-patient revenues and average total outpatient revenues (Table 6).

Bugasong Medicare Community Hospital, which was in the ≤ 15 beds hospitals cluster, likewise had the highest average net income and highest average profit margin. Its efficient performance was due to its having the lowest average cost of in-patient discharge, average cost of in-patient day and average total expenditures on the one hand, and higher average total in-patient days of care and average in-patient discharges on the other. Table 7 compares this hospital to the other hospitals in the same category.

The four 25-implementing beds Antique hospitals had a range of PhP 2,421.00 – 4,142.00 for the average cost per discharge and a range of PhP 842.00 – 1,029.00 for the average cost per patient day (Table 5).

TABLE 5. Averages of Selected Financial & Operational Parameters of Four 25-Implementing Beds Hospitals In Antique, 1998 - 2002

	Culasi District Hospital (CDH) 5 Yr. Ave.	Gen. Leandro L. Fullon Gen. Hosp. (GLLFGH) 5 Yr. Ave.	Pres. Diosdado Macapagal Hosp. (PDMH) 5 Yr. Ave.	Ramon Maza Sr. Memorial District Hospital (RMSMDH) 5 Yr. Ave.
Total Budget	Php 8,405,554	Php 8,103,169	Php 8,869,322	Php 8,858,664
Total Revenues	Php 530,635	Php 405,137	Php 633,563	Php 727,195
Total Expenditures	Php 8,350,516	Php 7,460,529	Php 7,248,711	Php 9,060,465
Net Income	Php 585,674	Php 1,047,777	Php 2,154,353	Php 525,394
Cost per Inpatient				
Discharge	Php 4,142	Php 3,030	Php 2,984	Php 2,421
Cost per Inpatient Day	Php 1,029	Php 925	Php 877	Php 842

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TABLE 6. Averages of Selected Financial & Operational Parameters of Four 25-Implementing Beds Hospitals in Antique, 1998 - 2002

	Culasi District Gen. Hospital (CDH) 5 Yr. Ave.	Leandro L. Fullon Gen. Hosp. (GLLFGH) 4 Yr. Ave.	Pres. Diosdado Macapagal Hospital (PDMH) 3 Yr. Ave.	Ramon Maza Sr. Memorial District Hospital (RMSMDH) 5 Yr. Ave.
PhilHealth Patients %	21	6	25	15
Charity Patients %	63	88	52	54
Pay Patients %	22	6	23	32
Total Inpatient				
Revenues	Php 405,869	Php 192,484 (3 yr. ave.)	Php 482,533 (2 yr. ave.)	Php 500,021 (4 yr. ave.)
Total Outpatient				
Revenues	Php 124,773	Php 196,093 (3 yr. ave.)	Php 225,160 (2 yr. ave.)	Php 179,532 (4 yr. ave.)

TABLE 7. Averages of Selected Financial & Operational Parameters Of Two 15-Implementing Beds Hospitals & One 10-Beds Hospital in Antique, 1998-2002

	Bugasong Medicare Community Hospital (BMCH) 5 Yr. Ave.	Pedro Gindap Municipal Hospital (PGMH) 5 Yr. Ave.	Valderrama Municipal Hospital (VMH) 5 Yr. Ave.
Total Budget	Php 4,779,955	Php 5,089,368	Php 3,863,485 (4 yr. ave.)
Total Revenues	Php 215,021	Php 248,808	Php 142,401
Total Expenditures	Php 4,316,090	Php 5,030,826	Php 3,569,918
Net Income	Php 678,886	Php 307,350	Php 328,215 (4 yr. ave.)
Cost per Inpatient Discharge	Php 2,620	Php 3,047 (4 yr. ave.)	Php 4,788 (4 yr. ave.)
Cost per Inpatient Day	Php 687	Php 986 (4 yr. ave.)	Php 936 (4 yr. ave.)

TABLE 8. Averages of Selected Financial & Operational Indicators of Two 15-Implementing Beds Hospitals & One 10-Beds Hospital in Antique, 1998-2002

	Bugasong Medicare Community Hospital (BMCH) 5 Yr. Ave.	Pedro Gindap Municipal Hospital (PGMH) 4 Yr. Ave.	Valderrama Municipal Hospital (VMH) 4 Yr. Ave.
PhilHealth Patients %	8	8	13
Charity Patients %	12	85	61
Pay Patients %	84	7	28
Total Inpatient Revenues	Php 108,441	Php 80,870	NA
Total Outpatient Revenues	Php 106,508	Php 121,437	NA

The range of the average cost per discharge in the ≤ 15 implementing beds Antique hospitals was PhP 2,620.00 – 4,788.00 while the range of the average cost per in-patient day for the same hospitals was PhP 687.00 – 986.00 (Table 7).

Discussion

In a 2001 study of 24 primary hospitals (grouped into < 25 beds and ≤ 25 beds) in four provinces (Benguet, Laguna, Samar, Eastern Leyte), Maligat (2002) found that hospitals with ≤ 25 beds had slightly more than the required hospital personnel (91 actual vs. 90 required) while hospitals with < 25 beds had less actual personnel (21) than the required number (26). It can be deduced that the 25-implementing beds Antique hospitals had actually less full-time personnel compared to the number in Maligat's study while the ≤ 15 beds hospitals had comparable numbers. Hence, it would seem that a primary hospital can still manage to perform efficiently even if its manpower is less than the required or standard number.

The cesarean section rate of 8% of Culasi District Hospital, though higher than the zero rate of comparable hospitals in the same category and higher than the 3-4% acceptable by Western standards, is still in the acceptable range when compared to the findings of Lawas (1997) in his 1988-1995 study of secondary government

hospitals across the Philippines. Lawas found cesarean section rates of 29 in 1995 and 47 in 1993.

The bed occupancy rates of the hospitals in the two categories were even better than the rates found by Lawas (1997) in his study of similar categories of hospitals across the Philippines from 1993-1995 and the bed occupancy rates in this study were likewise better than the rates found by Maligat (2002) in his study involving similar categories of hospitals in 4 provinces. Thus, the Antique hospitals, aside from being run efficiently, were moreover managed well in terms of providing quality of care.

Economies of scale played a crucial role in the attainment of the good results by the Bugasong Medicare Community Hospital in relation to the proxy indicators of efficiency since it was able to achieve lower unit costs by apportioning or allocating its operating costs over a greater number of patients, compared to the other hospitals in the same category.

Comparing the unit costs of the Antique hospitals with this study's earlier definitions of the proxy indicators of economic efficiency and with those computed by Maligat (2002) in his study involving comparable hospitals in four provinces, the Antique hospitals were more efficiently run (range of PhP 2,421.00 – 4,142.00 for the average cost per discharge for the four

25-implementing beds Antique hospitals as against Maligat's finding of PhP5,112.00 mean cost per discharge for 8 hospitals in 4 provinces and the DOH's cost per discharge of PhP 5,881.00 set in 1999 based on four days of hospitalization). In relation to cost per in-patient day, the

Antique 25-implementing beds hospitals' range of average cost per in-patient day was PhP 842.00 – 1,029.00 while the mean cost per in-patient day of the 8 hospitals in Maligat's study was PhP 1,373.00 and the DOH's cost per in-patient day was PhP 1,539.00 in 1999.

The disparity is even more glaring when the ≤ 15 beds Antique hospitals are considered. The range of the Antique hospitals' average cost per discharge was PhP2,620.00 – 4,788.00 as against the mean cost per discharge of 13 hospitals in Maligat's study of PhP 25,983.00 and the DOH's PhP 5,881.00. In relation to cost per in-patient day, the range for the Antique ≤ 15 -implementing beds hospitals was

PhP 687.00 – 986.00 compared to that in Maligat’s study which was PhP 11,121.00 and the DOH’s PhP 1,500.00.

It is worthwhile to mention that the 15-implementing beds Bugasong Medicare Community Hospital was able to attract the highest percentage of pay patients among all the hospitals, with the revenues used to augment its budget. The percentage of pay patients of three 25-implementing beds hospitals were over 20 per cent which

It is heartening to note that the three better performing 25-implementing beds hospitals have been strategizing to conform to the hospital reforms options of the Health Sector Reform Agenda by increasing hospital revenues through increased PhilHealth reimbursements of medical and surgical cases and attracting more pay patients.

also worked to their advantage in the sense that the additional revenues from these patients supplemented the hospitals’ budget. Another incidental discovery, attributed to the co-author coming from and working in the area, is that the 25-implementing beds Pres. Diosdado Macapagal Hospital (formerly Gov. Mamerto Portillo District Hospital) was recently assigned a surgeon as its chief of hospital and this resulted in more surgical paying patients being serviced by the hospital and an increased PhilHealth reimbursement of surgical cases

attended to in the hospital which contributed to its favorable financial performance. Culasi District Hospital has also been attracting more surgical pay patients and more PhilHealth reimbursements for surgical cases as well, since a surgeon occupied the Chief of Hospital position. This is not to imply, however, that having more PhilHealth reimbursements for surgical cases and having more paying surgical patients, will negatively impact on equity or will be disadvantageous to the poor patients since the three better performing 25-implementing beds hospitals had an average range of 52-63 percentage of charity patients despite having an average range of 15-25 percentage of PhilHealth patients and an average range of 22-32 percentage of pay patients. Charity patients still comprised the major share of these

hospitals' patients and the bed occupancy rates of these hospitals were in the 63-83 percentage range, which implies that there were still beds which any patient could occupy, whether paying or charity.

It is heartening to note that the three better performing 25-implementing beds hospitals have been strategizing to conform to the hospital reforms options of the Health Sector Reform Agenda by increasing hospital revenues through increased PhilHealth reimbursements of medical and surgical cases and attracting more pay patients. The next step would be ensuring fiscal autonomy by increasing revenue collection from revenue-generating activities such as revolving funds for cost generating areas, and increasing the percentage of PhilHealth reimbursements through PhilHealth wards and private rooms, and developing cost sharing mechanisms with the local government units (LGUs) served by these hospitals. Since the mandate of health financing and delivery is shared between the LGUs and PhilHealth, this results in the LGUs sharing in the premium contribution of their indigent residents who can be enrolled and subsequently be entitled to either in-patient or outpatient services. The LGUs can optimize their health expenditure budget either through their own health program by direct provision or channelling their resources to PhilHealth's Medicare para sa Masa which provides in-patient and outpatient benefit packages.

Conclusion

Based on both the proxy indicators of economic efficiency and of quality care used and defined in this study, the 25-implementing beds and the ≤ 15 -implementing beds Antique hospitals were performing efficiently while providing quality of care. Average bed occupancy rates were nearly 70% for the three 25-implementing beds hospitals and over 70% for all the ≤ 15 implementing-beds hospitals. All the hospitals had an average cost per discharge and average cost per in-patient day which were less than the defined cost based on the DOH standard and which were found to be lower than the figures quoted in other studies. The seven proxy indicators of quality of care were comparable within hospitals belonging to the same category and were found to be either lower or within acceptable levels compared to DOH standards and the rates quoted in other studies.

Recommendations

Conducting regular or periodic reviews, analyses and interpretation of operational and financial statistics and computation of selected operational and financial rates and ratios will definitely improve the management and operations of the seven devolved hospitals in the province of Antique because these could aid the local or provincial chief executives and hospital chiefs in planning and decision-making. This function can be undertaken by a Financial Planning and Monitoring Committee in the hospital. The DOH issued Department Memorandum No. 183 s. 2000 which mandated the separation of the Finance Section/Division from the Administrative Section/Division in all government hospitals and directed the implementation of policy guidelines and standard operating procedures on financial management reforms in the context of the HSRA. This memorandum was the basis for the creation of Financial Planning and Monitoring Committees. Since the six Antique hospitals have been performing well operationally and financially based on their 1998-2002 performance, they are ripe for the creation of Financial Planning and Monitoring Committees since the Provincial Health Officer, the DOH-CHD head and some other chiefs of hospitals already obtained their master of hospital administration degree from the University of the Philippines Manila College of Public Health. Trained in interpreting financial reports, price and rate setting and cost procedures, improved financial management system (e.g., efficient billing and collection), they can: (1) develop cost sharing mechanisms with the LGUs served by their hospitals and inform the LGUs about the hospitalization costs of their constituents particularly the primary and secondary cases; (2) help ensure timely remittance of LGU contributions for the Sponsored Program; (3) target that 50% of total treatment cost in LGU hospitals be shouldered by PhilHealth, 30% from LGU subsidy, and maintain 20% out-of-pocket participation from the patients; (4) increase the enrollment to Individually-Paying Program of PhilHealth by identifying organized groups, and establishing enrollment desks in their hospitals.

Eventually the LGU hospitals can undergo rationalization of their development projects to prioritize their upgrading to meet Philippine Health Insurance Corporation's accreditation standards. They can enhance cost recovery schemes without compromising equity objectives. In addition, they can introduce guidelines

for socialized cost recovery schemes because their cost per in-patient and cost per discharge for 1998-2002 were lower than the DOH standards and those obtained in other local studies. The situation is ideal because (1) Region VI is a convergence site which means it has provinces (Capiz and Iloilo) or highly urbanized cities that are considered advanced implementation sites in the Health Sector Reform Agenda Implementation Plan, (2) the Governor of Antique is fully supportive and committed to the health development of the constituents of the province and provides the necessary environment for effective governance, (3) the DOH-Center for Health Development head, the provincial health officer, the chiefs of hospitals have the requisite academic preparation, qualifications, skills, and work experience to implement the strategies targeting the hospital reforms options.

ANNEX 1. Formulae of Proxy Indicators of Economic Efficiency and Quality of Care Used in the Study

The proxy indicators of economic efficiency are: (Averaged from 1998-2002)

$$1.1 \text{ Bed Occupancy Rate} = \frac{\text{Annual Census}}{\text{Implementing Bed Capacity} \times 365} \times 100$$

$$1.2 \text{ Cost per Inpatient Discharge} = \frac{\text{Inpatient Operating Expenses}}{\text{Total Inpatient Discharges}} \text{ where}$$

inpatient operating expenses represented 70% of total operating expenses based on ratio of inpatient to outpatient expenditures which was 70:30

$$1.3 \text{ Cost per Inpatient Day} = \frac{\text{Inpatient Operating Expenses}}{\text{Total Inpatient Days}} \text{ where}$$

inpatient operating expenses represented 70% of total operating expenses based on agreed ratio of inpatient to outpatient expenditures which was 70:30

The proxy indicators of quality of care are: (Averaged from 1998-2002)

$$1.1 \text{ Gross Death Rate} = \frac{\text{total number of deaths (including newborns) for the period}}{\text{total number of discharges (including deaths \& newborn deaths)}} \times 100$$

$$1.2 \text{ Net Death Rate} = \frac{\text{deaths (including newborns) – those under 48 hrs. for the period}}{\text{total number of discharges (including deaths \& newborns) – deaths under 48 hrs. for the period}} \times 100$$

$$1.3 \text{ Infant Mortality Rate} = \frac{\text{total number of newborn deaths for the period}}{\text{total number of newborn infant discharges (including deaths) for the period}} \times 100$$

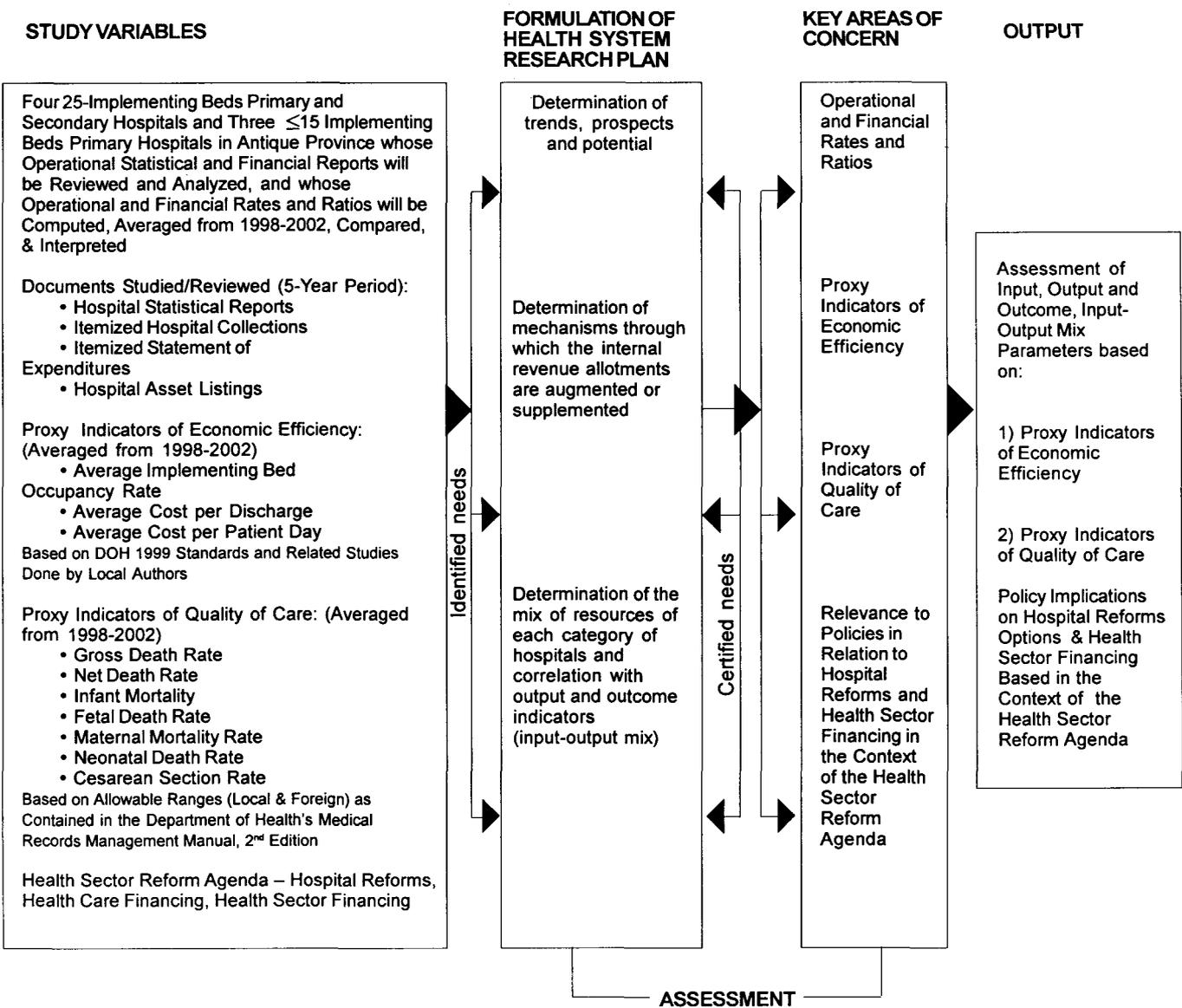
$$1.4 \text{ Fetal Death Rate} = \frac{\text{total number of intermediate \& late fetal deaths for the period}}{\text{total number of maternal (obstetric) discharges (including deaths)}} \times 100$$

$$1.5 \text{ Maternal Mortality Rate} = \frac{\text{total number of deaths of obstetrics patients for the period}}{\text{total number of discharges (and deaths) of obstetric patients for the period}} \times 100$$

$$1.6 \text{ Neonatal Death Rate} = \frac{\text{total no. of infant deaths occurring w/in 28 days of birth}}{\text{total no. of newborn infants discharged including deaths during the period}} \times 100$$

$$1.7 \text{ Cesarean Section Rate} = \frac{\text{total number of cesarean sections performed in the period}}{\text{total number of deliveries in the period}} \times 100$$

ANNEX 2. Schema of the Research Study



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