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Costs of In-patient Hospital Care for Bronchopneumonia and Acute Myocardial Infarction (AMI) in Manila

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Costs of In-patient Hospital Care for Bronchopneumonia and Acute Myocardial Infarction in Manila

Tessa L. Tan-Torres

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*Costs of In-patient Hospital Care
for Bronchopneumonia and Acute
Myocardial Infarction in Manila*

Tessa L. Tan-Torres, M.D., M.Sc.
December, 1994

ABSTRACT

COSTS OF IN-PATIENT HOSPITAL CARE FOR BRONCHOPNEUMONIA AND ACUTE MYOCARDIAL INFARCTION IN MANILA. T Tan-Torres. Clinical Epidemiology Unit, University of the Philippines College of Medicine.

OBJECTIVES: 1. to describe the mean age of patients, their hospital outcomes, frequency of utilization of tests, median cost of medications and length of stay for pneumonia (acute myocardial infarction) in selected hospitals in Metro Manila; 2. using a standard set of prices, compare the median costs of hospitalization for pneumonia (and AMI) in the different hospitals; 3. if there is a difference, to estimate the contribution of three hospital descriptors: level of care (1,2,3), ownership (private and government) and teaching status (teaching and non-teaching) 4. if the descriptor contributed an increase, to determine the extent of increase in the cost categories of diagnosis, treatment and hospital stay.

SAMPLE: First Stage: Hospitals who had participated in a previous survey constituted the sampling frame. A hospital was selected if it represented different descriptors (e.g. primary, government, non-teaching) and the administrator agreed to allow access to patient records. Second Stage: 200 consecutive patients who were admitted to the hospital with the diagnosis of pneumonia or AMI were included.

METHODS: Charts were reviewed to get utilization data on diagnostic tests, medications, procedures and length of stay. Standardized costs were obtained from a previous study which derived costs by estimating actual resource use. The data were analyzed using descriptive statistics of medians and ranges. Comparison between groups was performed with Kruskal-wallis test.

RESULTS: For Pneumonia: There were 6 hospitals in the pneumonia data set which could demonstrate contrasts between first and second level of care for government-owned, private and government-owned in secondary and tertiary care levels. Mean age ranged from 1.1 to 1.9 years. Death rates ranged from 0-7.9%. Length of stay varied from 2.5 to 6 days, number of diagnostic tests performed ranged from 2.4 to 12 and costs of treatment ranged from P929 to P2959. For the same level of

care, government hospitals had higher total costs of hospitalization ($P < 0.05$) and for private hospitals, a higher level of care was associated with a higher cost of hospitalization ($P < 0.05$).

For Acute Myocardial Infarction: Four tertiary care, teaching hospitals entered the study. The only contrast possible was private versus government. Mean age ranged from 49 to 53 years and death rates varied from 2.6 to 10.3%. Length of stay ranged from 8.3 to 12.3 days, diagnostic tests from 20 to 33 tests and treatment costs from P522 to P729. The private hospital had lower hospitalization costs compared to the government hospitals.

CONCLUSIONS: Data collected in the pneumonia data set are consistent with current literature of obtaining higher costs in government-owned and higher level facilities. Most of the additional costs occurred in length of stay and diagnostic tests. For AMI, there were higher costs and higher mortality rates seen in the government hospital. No information could be obtained on the role of teaching versus non-teaching hospitals as no contrasts were obtained in either data set.

RECOMMENDATIONS: 1. recommend the use of validated algorithms to standardize care and possibly, increase efficiency; 2. enrol more patients and additional hospitals in a prospective study to allow better data collection including standardizing for severity of illness

INTRODUCTION:

Hospital care, by the nature of its technology, is very resource-intensive. Over the past ten years, it has accounted for not less than 60% of the budgetary outlay of the Department of Health (1). In 1990, approximately P5 million was allocated for hospitals. Compared to expenditures for primary care interventions like immunization, this amount benefits fewer individuals.

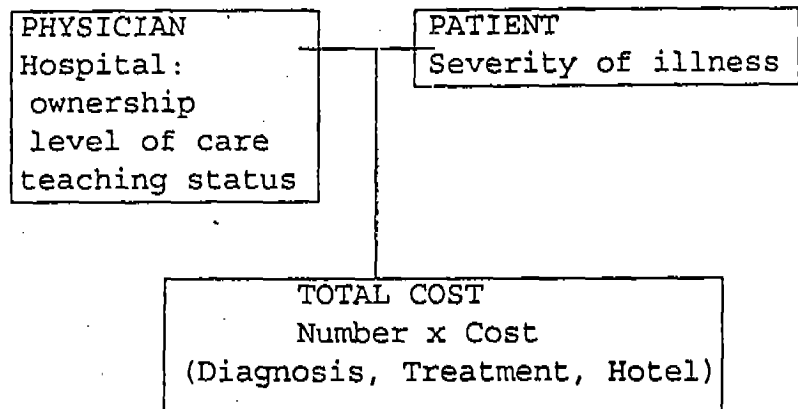
Considering the disproportionately large sums of money spent on the hospitals, it is imperative that the practices in the hospital are constantly examined and reviewed for effectiveness and efficiency. As a first step, the costs of hospitalizing ill individuals can be determined and the impact of hospitalization on the patients' health status documented.

Data can subsequently be aggregated for analysis to answer questions on resource utilization, practice patterns and patient outcomes. What is the cost of treating a patient with pneumonia in a tertiary care setting? What if the care was provided in a lower level facility? Is it less costly? Is it, at least, equally effective? Would a teaching hospital produce better patient outcomes compared to a non-teaching hospital? Would they carry out more tests? Are there differences in the cost and quality of care being provided in a private versus a government hospital? What would account for these differences, if any?

The information obtained can provide policymakers with a basis for planning and financing services within the hospital sector. It can suggest areas where policy action is needed, define which policies will have better chances of successful implementation and indicate where more studies have to be undertaken.

Conceptual Framework:

To systematically explore the issues raised, the conceptual framework in fig. 1 will be used.



The cost of hospitalization for an illness can be obtained by summing the products of number of units (of diagnostic or therapeutic interventions, including "hotel" stay) and the cost of each unit. Algebraically, this can be represented by

$$TC = Ndx Cdx + Ntx Ctx + Nho Cho$$

where:

TC = total cost

N = number

C = cost

dx = diagnostic interventions

tx = therapeutic interventions, including procedures

ho = hotel stay or room and board.

The rate of utilization N depends on the physician and his assessment of the patient's condition. The physician functions as the gatekeeper to the use of resources (2). He is the person who actually writes down the orders for which tests will be done and what medications will be given. His decisions are primarily influenced by the existing standards of care in his area (3), adjusted for the level of severity of illness of the patient. In general, the more severe the illness, the more intensive the use of resources in the management of the patient.

The standards of care in a given area can be approximated by defining the type of hospital the physician practises in. The environment can be described in terms of availability of

technology, presence of external (dis)incentives to improve efficiency and teaching/training status.

The availability of technology simply means that if it is there, it can be used. For example, a device called a pulse oximeter monitors the amount of oxygen in the blood and can be used to assist anesthesiologists providing general anesthesia to a patient. The device can determine the adequacy of respiration in a patient more precisely than clinical observation. This increase in precision theoretically should lead to better patient outcomes.

A randomized trial has not demonstrated any difference in patient outcomes in terms of perioperative complications and deaths but 80% of anesthesiologists felt more secure with the device and 18% of them could recall an episode where the use of the oximeter had helped to avoid a serious incident. Despite the absence of convincing information with regard to impact on the patients, the pulse oximeter is now widely used in North America (4).

The availability of technology defines the level of care which can be provided to patients. Higher level hospitals have high import intensities (ratio of total imports generated to gross output) and cost more to maintain. In Malawi, average costs per inpatient in a general hospital is at least twice the cost in a district hospital (5).

The ownership of the technology available also influences its use. Supplier-induced demand is a phenomenon which has been documented empirically. Physicians who own equipment, e.g. radiation therapy machines, may practise "self-referral" and increase utilization rates beyond those expected for the type of patients being seen (6).

Viewed in a different light, privately-owned hospitals may be managed more efficiently than those owned by the government. Theoretically, administrators or physicians will have an incentive to provide services of a given quality at a minimum cost if they have "rights to the future profits resulting from the operation of the hospital".

Among government hospitals, the connection between rights to future profits and performance is nebulous and in fact, the

government hospital has a stated mission of providing medical care to all (as a last resort) which might conflict with the aim of maximizing the value of their future income (7).

In Lesotho, average cost per inpatient in a public hospital was three times higher than that in a private hospital (5). However, case studies of transfer of public hospitals from local governments to more autonomous agencies in the US were not able to show any clear gains in operating efficiency (7). In Malawi, there was also no difference demonstrated (5).

Finally, standards of practice associated with academic settings usually imply higher rates of utilization. Teaching physicians may order a test because of the need to document a phenomenon, whether or not documentation of such phenomenon can influence the patient's outcome. Residents and training fellows, due to inexperience and inadequate supervision, may order more tests unnecessarily (7,8). There is some evidence to show that costs increase proportionately with expansion of a teaching program (7).

To test the soundness of the model, two illnesses were selected for study, acute myocardial infarction (AMI) and bronchopneumonia (BPN). The two were selected to represent the opposite poles of an epidemiologic transition, infectious and degenerative. In addition, pneumonia is primarily a disease of children and myocardial infarction, a disease of adults. Finally, both diseases have widely accepted clinical grading systems which can be applied to assess severity of illness for purposes of controlling this variable.

Acute Myocardial Infarction:

Acute myocardial infarction or 'heart attack' as it is more commonly known, is the medical term used when a portion of the muscles of the heart dies because of lack of oxygen. This is usually due to blockage, by deposits or inflammation, of the blood vessels supplying the area effectively preventing the continuous flow of blood bringing the oxygen.

Mortality rate due to AMI is 22.6/100,000 population with a total of 9006 deaths reported. It is classified under diseases of the heart which is the leading cause of death in

the country in 1993. The five year average puts it as the second leading cause of death (9).

There are no national figures for morbidity due to AMI. An ongoing cohort study on AMI started in 1992 by the Philippine Heart Association and the Philippine College of Physicians reveals a case fatality rate of 12% with a range of 6-24%. This is based on the data from 600 AMI patients admitted to various hospitals, mainly in Metro Manila (personal communication, Dr. A. Dans).

Applying this case fatality rate on the 9006 deaths, there would have been at least 75,050 individuals who suffered an AMI in 1990. Admittedly, this is a very crude approximation of the burden of illness due to AMI. However, it clearly constitutes a major burden, particularly on the males during their productive years (see figure 2).

Acute myocardial infarction strikes suddenly and the individuals are usually unprepared for the financial burden that it imposes. Individuals who suffer an AMI and reach a hospital alive (10% don't) are hospitalized, usually in an intensive care or coronary care unit.

In the United States, 1988 figures suggest that approximately one million individuals suffer an AMI with Medicare charges reaching an average of \$7,200 per initial hospitalization using conventional treatment (10). The advent of invasive diagnostic and therapeutic procedures like angioplasty or coronary artery bypass surgery (operative repair or replacement of blocked blood vessels) and the introduction of thrombolytic therapy ("clot-busters" for the blocked blood vessel) have made available a new array of effective and expensive choices for the management of these patients (11).

Given patients standardized for age and other demographic characteristics, variation in use of procedures, e.g. coronary artery bypass grafting (12), has been demonstrated in North America. Availability of on-site facilities to perform these procedures increases the odds of the procedure being performed by seven times for angioplasty, five times for cardiac catheterization and two times for bypass surgery (13).

The teaching status of a hospital may also influence resource utilization. However, a recent study on the influence of teaching status on costs of care specific to the diagnosis of acute myocardial infarction showed that patients in a teaching service had a median length of stay shorter by 0.5 days ($p=0.009$) and hospital charges lesser by \$1,653 ($p=0.07$) compared to patients on a non-teaching service in the same hospital.

Patients on the teaching service also had 15% fewer cardiac catheterizations and 9% fewer revascularization procedures. Results were obtained after adjusting for demographic characteristics and severity of illness based on clinical parameters.

This surprising finding was hypothesized to be due to the increasing awareness of clinicians about costs starting in the early 80's and the rigorous assessment of severity of illness based on clinical parameters specific to AMI. Previous studies illustrating increased costs associated with teaching hospitals were carried out mostly prior to the 80's. Also, among the more recent studies, severity of illness was controlled using DRG (diagnosis-related groups) case mix adjustment. This might not have been sensitive enough to truly adjust for severity of illness. Extraneous sources of variation were also minimized by the use of one hospital with teaching and non-teaching services (14).

Bronchopneumonia:

Bronchopneumonia in children under the age of five years is a leading cause of death among children in developing countries (15). In the Philippines, a cohort of children in this age group in 709 households was followed up from 1985 to 1987 to determine the incidence of pneumonia. The incidence of pneumonia, both moderate and severe cases was 0.5/child/year (16). Of this, 4-13% would require hospitalization (17). If the population at risk in 1990 was 8,505,079 (9), a minimum of 170,101 children needed to be hospitalized for severe pneumonia.

There are very few studies on costs of treatment of pneumonia in children (18). The large economic burden of illness due to pneumonia is due more to the frequency with which the

condition occurs rather than to use of expensive technology, e.g. a small ticket item which adds up to a large amount. A local study on hospital costs in a rural area in 1989, estimated the cost of hospitalization to be P2,144 for five days (17). The care of children with acute respiratory infections is included in the care of the sick child, a cost-effective package recommended in the World Development Report 1993 (19).

OBJECTIVES:

This project was carried out to:

1. describe the mean age of patients, their hospital outcomes, frequency of utilization of tests, mean costs of medications and length of stay for pneumonia (and acute myocardial infarction) in different hospitals in Metro Manila;
2. using a standard (and hospital specific) set of prices, compare the mean costs of hospitalization for pneumonia (and acute myocardial infarction) between the different hospitals;
3. if there is a difference between the mean costs of hospitalization of pneumonia (and acute myocardial infarction), estimate the contribution of each descriptor (level of care, government ownership and teaching status) to the base cost of hospitalization in a private, primary, non-teaching hospital;
4. if the descriptor contributed an increase in the base cost, determine the extent of increase in each of the different cost categories (diagnostic, therapeutic, and length of stay or hotel).

METHODOLOGY:

Sampling:

Hospital Selection: Due to the short time available, selection of hospitals was limited to those in Metro Manila which already had participated in the hospital survey of the Philippine Institute of Development Studies baseline projects for health financing (annex 1). One hospital representing each of the different combinations of hospital descriptors (e.g. primary, private, non-teaching or tertiary, government, teaching) was enrolled into the study after the hospital administrator agreed to provide access to data from hospital charts and their charges.

Level of care was based on the classification provided by the Bureau of Licensing and Regulation. Teaching hospitals are

those with residency training programs in pediatrics and internal medicine accredited by their respective specialty boards.

Specifically, one hospital each was selected to fit the following descriptions:

- primary care level, private*
- primary care level, government*
- secondary care level, private*
- secondary care level, government*
- tertiary care level, private, teaching*
- tertiary care level, private, non-teaching*
- tertiary care level, government, teaching*
- tertiary care level, government, non-teaching.*

Patient Sampling:

A target of 200 patients per disease per hospital was set. The inclusion criteria for pneumonia were the following:

1. *age less than or equal to five years;*
2. *presence of cough;*
3. *x-ray reading of pneumonia on admission;*
4. *admission date after April 1, 1989.*

Patients who were attached to respirators or who died within 48 hours of admission were excluded from the study.

The inclusion criteria for acute myocardial infarction were the following:

1. *recent onset (<24 hours) of severe chest pain*
2. *electrocardiogram reading of acute myocardial infarction;*
3. *no hypotension (systolic blood pressure <90 mm Hg) or rales (fluid in the lungs) on admitting physical examination;*
4. *admission date after April 1, 1989.*

The inclusion and exclusion criteria were designed to assemble a sample of patients in each hospital comparable with each other, particularly with respect to severity of illness. The admission date cut-off (not to exceed 5 years ago) was instituted to ensure that temporal changes due to entry of new technology and changing standards of care were minimized.

Chart Abstracting:

Two teams of doctors and senior medical students (with clinical exposure) were trained to abstract data from the charts, using pre-tested guidelines and forms (annex 2). One

supervisor per team checked the accuracy of data abstraction. The research assistants recorded data on patient characteristics, length of stay, outcome on discharge, use of diagnostic tests, medications and special procedures.

Identifying, Measuring and Valuing Inputs:

The length of stay was computer generated, based on the date of admission and date of discharge. This was checked by comparing with the total number of days in admitting section or emergency room, intensive care and ward and the total number of meals served (diet orders). The cost of the length of stay (hotel cost) was derived using the costs of a day in the emergency room, intensive care unit and ward as determined in a Philippine General Hospital (PGH) study of resource use. A second set of prices came from the different hospitals' charges for ward patients.

The frequency of use of diagnostic tests was based from actual results attached in the chart and from the doctor's orders sheet. Recording was done as use per test. Costs were then generated through the computer, using two sets of prices: one set from the PGH study which determined the cost based on resource use and the second set using the charges of each hospital.

The medication and the fluids pages were used to determine the medical management of the patient. Medications were grouped (e.g. cardiovascular drugs, anti-infectives, etc) and recorded directly as costs. The first set of prices used, the pharmacy purchase price of the Philippines General Hospital, was applied to all hospitals (standard set). A second set of prices, charges of the respective pharmacies of the different hospitals, was used to generate another set of costs. The Philippines Index of Medical Specialties (first quarter, 1994) provided the manufacturer's list price when a price was not available through any of the two sources.

Procedures were obtained from the first page of the chart and by reviewing the doctor's orders pages. Costs were again obtained using two sets of prices, the standard PGH set and the respective hospital's charges. The total costs per patient were obtained by summing the diagnostic, therapeutic and hotel costs.

Inconsistencies and outliers were checked as to accuracy by determining fidelity of chart abstraction, recording and computer data entry.

ANALYSIS:

Descriptive statistics (means, medians, percentiles, standard deviations, skewness, kurtosis and distributions) were generated.

Analysis of variance with pairwise comparison was done to determine the comparability of groups of patients in the different hospitals with respect to age. Proportions of patients with other co-existing disease were also documented. Patient outcomes were reported in terms of proportions of dead, alive, with complications or discharged against medical advice.

Kruskal-Wallis test with pairwise comparison was also done to determine if there are differences in median costs of hospitalization among the hospitals.

Revision of Protocol:

After a survey of the hospitals concerned and an interview of the hospital administrators, it was evident that in Metro Manila, all tertiary care hospitals have accredited residency training programs in internal medicine and pediatrics. There are no tertiary care hospitals which are non-teaching in the metropolis. Also, government, primary care level hospitals are merely lying-in hospitals which do not admit patients for illnesses like pneumonia. Thus, for pneumonia, there were only 6 hospitals studied with the secondary care, private hospital category represented by two hospitals.

Patients with myocardial infarctions seen at lower level facilities are immediately referred to tertiary care level facilities. Thus, three hospitals were studied with one hospital contributing patients to both government and private categories or a total of two hospitals per category and two categories, private and government tertiary care, teaching hospitals.

RESULTS:*Pneumonia:*

The hospitals (descriptions from 1991 BLR hospital reports) included were:

1. Primary Care, Private

Bagbaguin Family Hospital (BFH) in Caloocan City is an 8-bed hospital with a 70% occupancy rate. Two of these beds are for Pediatrics and there were 230 admissions for pediatrics in 1991.

2. Secondary Care, Government

Pasay City General Hospital (PCGH) is a 100-bed hospital with a 100% occupancy rate. Twenty of these beds are for pediatrics and there were 392 admissions for pediatrics in 1991.

3. Secondary Care, Private I

Casaul General Hospital (CGH) in Novaliches, Quezon City is a 50-bed hospital with ten beds for pediatrics. There were 1839 admissions for pediatrics in 1991.

4. Secondary Care, Private II

Clinica Arellano General Hospital (CAGH) in Sta. Crux, Manila is a 50-bed hospital with 12 beds for pediatrics. There were 256 admissions for pediatrics in 1991.

5. Tertiary Care, Private

University of Santo Tomas (UST) is a 502-bed (private) hospital (no report submitted to BRL).

6. Tertiary Care, Government

The Philippine General Hospital (PGH) is a 936-bed hospital with a 93% occupancy rate. Eighty-nine of these beds are for pediatrics and there were 1,844 admissions in 1991.

Patients:

Pneumonia is a disease of very young children with a mean age ranging from 1.1 to 1.9 years. There is a statistically significant difference in the age between these two extremes. Death rates ranged from 0-7.9% with the highest rate is the PCGH (see table 1).

Resource Use (see table 2):

Length of stay varied from 2.5 to 6 days with PGH having the longest stay, followed by PCGH, another government hospital. The three private hospitals have shorter lengths of stay with BFH being just a third of the length of stay of PGH.

Again, diagnostic tests were used most frequently in PGH, followed by PCGH and then by the private hospitals. UST had 1/6 the number of diagnostic tests as PGH. The standardized median cost of medications was higher for the tertiary care hospitals, followed by lower levels of care.

The standardized median total cost of hospitalization was highest for tertiary care hospitals. For private hospitals, a higher level of care was associated with higher costs ($p < 0.000$). For the same level of care, the government counterpart was always more expensive ($p < 0.003$).

Within the same level of care, charges for total cost were higher in private hospitals.

Categories of Costs:

The biggest category of costs, therapeutic, accounted for 43-64% of the total costs. The smallest category of costs was the diagnostic costs and these accounted for 4-12% of the total costs. No discernible pattern could be determined regarding the influence of ownership or levels of care. (See table 3 and fig. 3)

Acute Myocardial Infarction:

The hospitals included in the study were the following:

1. Philippine General Hospital with 139 beds for medicine;
2. University of Santo Tomas with 502 beds for pay patients;
3. Philippine Heart Center with both private and charity sections treated separately.

All hospitals had coronary care units.

Patients:

Acute myocardial infarction struck people during their productive years with mean ages from 49 to 53 years. Death rates ranged from 2.6 in UST to 10.3% in PGH (table 4).

Resource Use (Table 5):

Length of stay ranged from 12.3 in PGH to 8.3 days in PHC (private). Highest number of diagnostic tests used was also in PGH with 33 and lowest in PHC (private) with 20. Median cost of medications was lowest for PGH at P522 with the highest seen in PHC (private) P729. Total median cost was still lowest for PHC (private) at P5,975 compared to the highest seen in PGH. The maximum reached up to over P100,000 in the PHC (private and charity) because of the occasional use of thrombolytic therapies. Charges were lowest in PGH, P5,696 and highest in PHC (private), P12,947.

Categories of Costs (figure 4 and Table 6):

Most of the costs (35-44%) were accounted for by therapeutic costs. Hotel costs accounted for the next major share in costs with (22-50%). Diagnostic costs were lowest but also contributed approximately 25% of the costs. There is no discernible pattern in the effect of the descriptors on the different categories of costs.

DISCUSSION AND RECOMMENDATIONS:

There was enough variation in the data set of pneumonia which was able to show that there were higher costs associated with higher level of care and that for the same level of care, government is more costly than private hospitals. The difference in costs is mostly seen in length of stay and diagnostic tests which are usually at the discretion of the attending physician and which is usually offered at a subsidized cost to patients in the government hospitals.

In the acute myocardial infarction data set, there was not enough variation seen between hospitals and the most consistent contrast was between the Philippine General Hospital and the Philippine Heart Center (private). Despite some of the patients receiving very expensive thrombolytic drugs, the PHC (private) had the lowest costs. The university hospital, PGH, was the most expensive, as in pneumonia.

The phenomenon of the highest costs being seen at the Philippine General Hospital may mean that it is not efficient or may also mean that, being a government tertiary care referral center, it is getting patients in a more severe state and that the inclusion/exclusion criteria were not stringent

enough to ensure a uniform cohort of patients to be admitted to the different hospitals.

There was also a huge variation in costs, even within hospitals, thus precluding the use of means. This may mean that again, the inclusion/exclusion criteria were insufficient or simply that patterns of care may vary within the hospital itself.

This dataset by itself does not allow a meaningful answer to objective 4. The specific data set on pneumonia appears to be consistent with the existing world literature but, by itself, cannot be used to provide the basis for a robust conclusion.

The following are recommended:

1. To decrease variance, more patients have to be entered into the study and more hospitals have to be added to gain adequate contrasts;
2. The use of validated algorithms (20,21) may be recommended to standardize care; This is particularly important with regard to the thrombolytic therapy which are expensive and are only effective within a small window of time in the natural history of an acute myocardial infarction;
3. Prospective collection of cost data may allow better standardization of patients with more detailed severity of illness scoring systems applied on entry to the hospital.
4. The role of university versus non-university teaching hospitals deserve closer study.

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REFERENCES:

1. Solon O, Gamboa R, Schwartz JB and Herrin A. Health Sector Financing in the Philippines. HFDP Monograph 2. March, 1992.
2. Reagan Md. Physicians as Gatekeepers: A Complex Challenge. New England Journal of Medicine 1987;317:1731-4.
3. Greer AL. The State of the Art Versus the State of the Science: The Diffusion of New Medical Technologies into Practice. International Journal of Technology Assessment in Health Care 1988;4:5-26.
4. Moller JT, Johannessen NW, Espersen K, et.al. Randomized Evaluation of Pulse Oximetry in 20,802 patients: II. Perioperative Events and Postoperative Complications. Anesthesiology 1993;78:445-53.
5. Mills A. The Economics of Hospitals in Developing Countries Part II. Costs and Sources of Income. Health Policy and Planning 1990;5:203-218.
6. Mitchell JM, Sunshine JH. Consequences of Physicians' Ownership of Health Care Facilities - Joint Ventures in Radiation Therapy. New England Journal of Medicine 1992; 327:1497-501.
7. Altman S, Brecher C, Henderson M, et.al. (eds). Competition and Compassion: Conflicting Roles for Public Hospitals. Michigan. Health Administration Press 1989, p. 19-21.
8. Jones K. The Influence of the Attending Physician on Indirect Graduate Medical Education Costs. Journal of Medical Education 1984; 59:789-98.
9. _____ Philippine Health Statistics, 1990. Health Intelligence Service, Department of Health.
10. Steinberg, EP, Topol EJ, Sakin JW, et.al. Cost and Procedure Implications of Thrombolytic Therapy for Acute Myocardial Infarction. Journal of American College of Cardiology 1988; 12:58a-68a.
11. Harrison DC. Cost Containment in Medicine: Why Cardiology. American Journal of Cardiology 1985; 56:10C-15C.
12. Anderson G, Grumbach K, Luft HS, et.al. Use of Coronary Artery Bypass Surgery in the United States and Canada. Journal of the American Medical Association 1993; 269:1661-6.
13. Blustein J. High Technology Cardiac Procedures: the Impact of Service Availability on Service Use in New York State. Journal of the American Medical Association 1993; 270:344-9.

14. Udharhelyi IS, Rosborough T, Lofgren RP, et.al. Teaching Status and Resource Use for Patients with Acute Myocardial Infarction: A New Look at the Indirect Costs of Graduate Medical Education. *American Journal of Public Health* 1990;80:1095-1100.
15. Bulla A, Hitze KL. Acute Respiratory Infections: A Review. *Bull WHO* 1978;56:481-98.
16. Tupasi T, de Leon L, Lupisan S, et. al. Patterns of Acute Respiratory Tract Infection in Children: A Longitudinal Study in a Depressed Community in Metro Manila. *Reviews of Infectious Diseases* 1990;12:940-949.
17. RITM ARI Study Group. Proceedings of a Workshop on Operational lesson from the Implementation of an ARI Control Program: The Bohol ARI Experience. 1990.
18. Stansfield SK and Shepard D. Acute Respiratory Infections. In Jamison DT and Mosley WH (Eds.) *Evolving Health Sector Priorities in Developing Countries*. 1990
19. The World Bank. *World Development Report 1993: Investing in Health*. Oxford. Oxford University Press, 1993.
20. WHO/ARI. *Technical Bases for the WHO Recommendations on the Management of Pneumonia in Children at First Level Health Facilities*, 1991.
21. Morales D. Algorithms for the Management of Common Medical Problems: Clinical Algorithms for Acute Myocardial Infarction. *Philippine Journal of Internal Medicine* 1994; 32:51-53.

Table 1. Mean Age and Outcomes of Admissions
with Pneumonia by Hospital

Hospital	N	Age + s.d.	% deaths
3G	164	1.55 + 1.15	4.3
3P	110	1.89 + 1.33	0.0
2G	165	1.07 + 1.02	7.9
2P	192	1.54 + 1.35	2.6
1P	85	1.73 + 1.38	0.0

TABLE 2. COMPARISON OF RESOURCE USE FOR PNEUMONIA BY HOSPITAL

	3G	3P	2G	2P	1P
N	160	110	165	192	85
Hotel (days)	6.3 ± 4.8	5.0 ± 2.4	5.5 ± 2.8	3.0 ± 1.4	2.5 ± 1.3
Dxtic (tests)	12.0 ± 12.1	2.4 ± 1.2	5.1 ± 1.8	4.5 ± 1.6	4.2 ± 1.1
Txic (P)	250	442	165	142	232
Range	0 - 5186	0 - 3861	0 - 2478	0 - 805	50 - 1096
Stand (P)	2959	2685	1818	1267	929
Range	340 - 58,734	604 - 21,050	238 - 10,638	423 - 10,524	478 - 2458
Charges (P)	2926	5310	769	1505	1591
Range	340 - 58,734	1895 - 28,380	233 - 6330	605 - 7920	557 - 5812

Table 3. Median Total Costs for Pneumonia by Category By Hospital

Hospital	Hotel (%)	Diagnostic (%)	Therapeutic (%)
3G	0.33 + 0.17	0.12 + 0.10	0.55 + 0.22
3p	0.32 + 0.14	0.04 + 0.03	0.64 + 0.16
2G	0.49 + 0.16	0.08 + 0.04	0.43 + 0.18
2P	0.37 + 0.12	0.09 + 0.06	0.53 + 0.15
1P	0.43 + 0.11	0.12 + 0.04	0.45 + 0.10

Table 4. Mean Age and Outcomes of Admissions with Myocardial Infarction by Hospital

Hospital	N	age + sd	% deaths
3G	107	48.6 + 10.6	10.3 %
3P	38	51.5 + 9.7	2.6 %
3G	111	53.4 + 10.2	6.3 %
3P	96	53.6 + 10.4	8.3 %

TABLE 5. COMPARISON OF RESOURCE USE FOR ACUTE MYOCARDIAL INFARCTION BY HOSPITAL

	3G	3G*	3P*	3P
N	107	111	96	38
Hotel (days)	12.3 ± 5.6	9.5 ± 3.9	8.3 ± 4.9	9.6 ± 5.0
Dxtic (tests)	33.7 ± 12.7	23 ± 12.2	20 ± 8.4	21.3 ± 8.8
Txtic (P)	522	564	729	873
Range	73 - 4782	0 - 4986	0 - 9122	0 - 4650
Stand (P)	7115	6238	5975	6538
Range	2104 - 15,388	983 - 117,718	825 - 133094.1	820 - 32,575
Charges (P)	5696	11,724	12,947	10,965
Range	1522 - 27,690	1578 - 117,576	2920 - 181,827	3971 - 40,084

Table 6. Median Total Costs for Acute Myocardial Infarction by Category by Hospital

Hospital	Hotel (%)	Diagnostic (%)	Therapeutic (%)
3G	.40 + .11	.25 + .11	.35 + .16
3G*	.28 + .11	.22 + .12	.50 + .19
3P*	.37 + .14	.25 + .13	.38 + .30
3P	.30 + .18	.26 + .19	.44 + .27

Figure 1. Mortality due to Acute Myocardial Infarction by Age and Sex (PHIL, 1990)

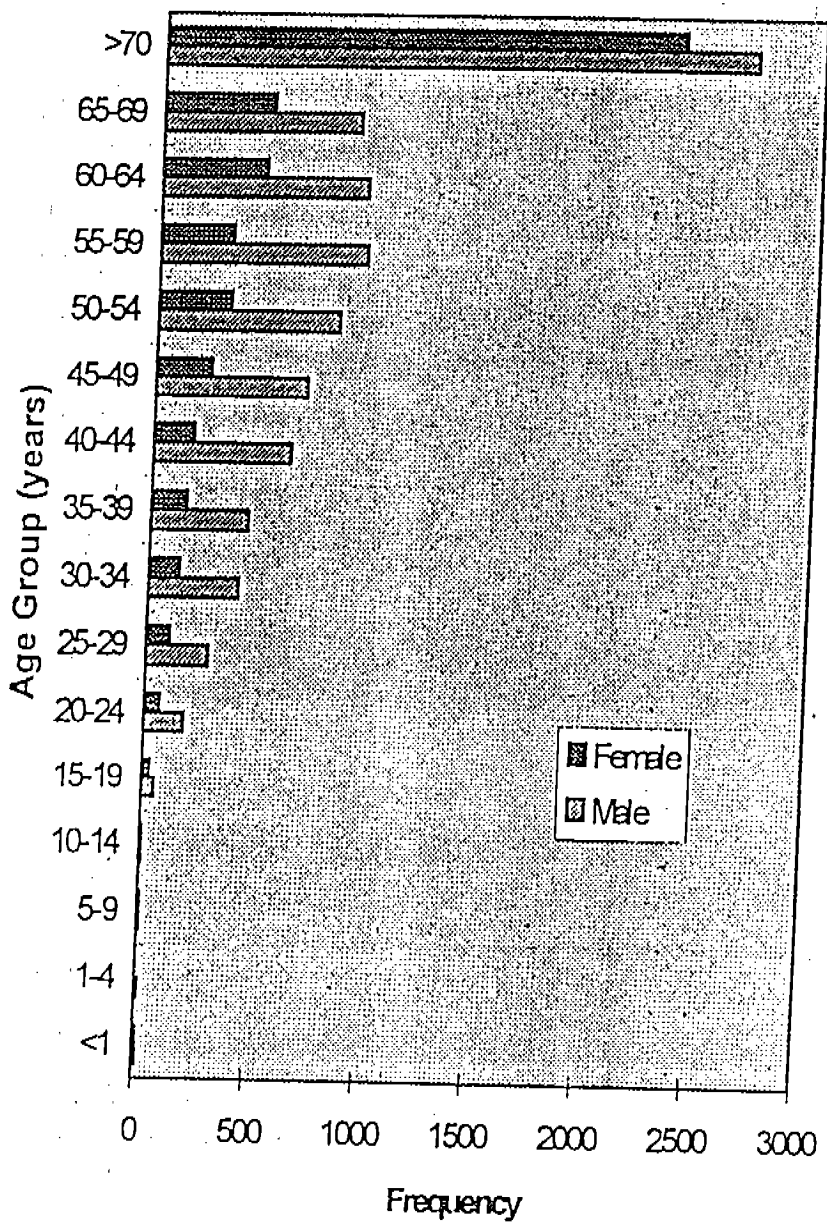


Fig. 3 Components of Total Cost: Pneumonia

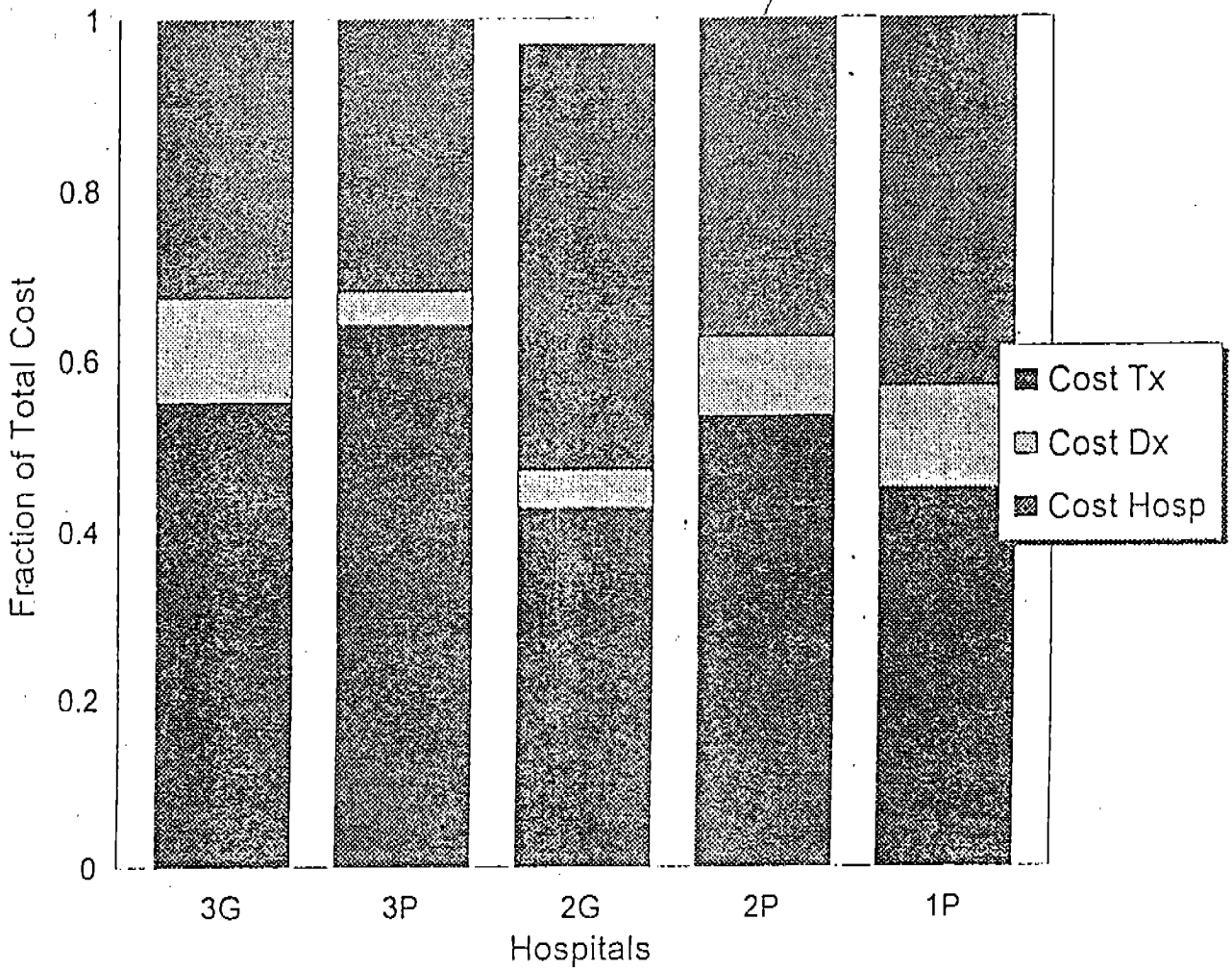
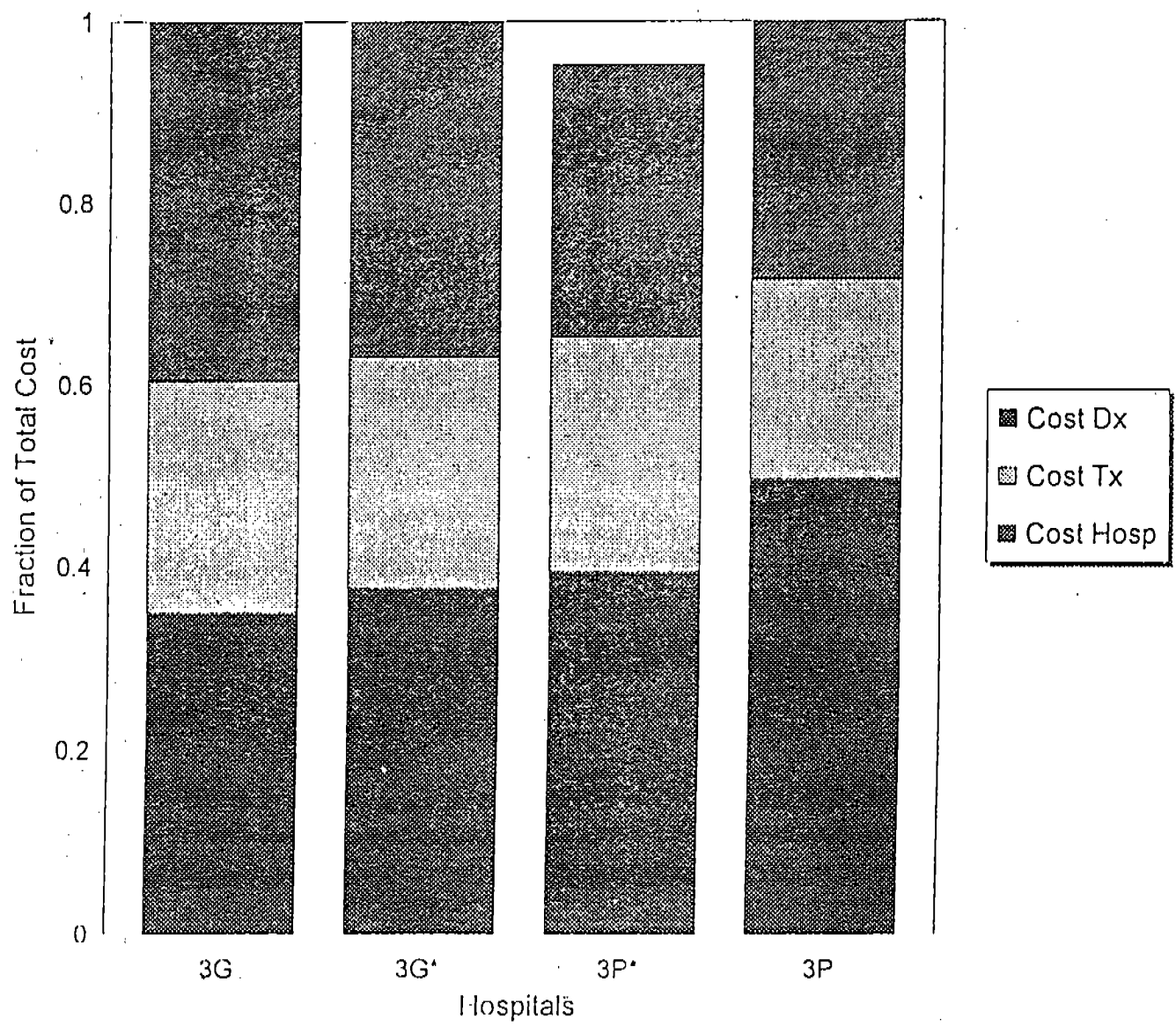


Fig 4 Components of Total Cost in AMI



Index 1.

OF HOSPITALS WITH 1991 BIR FORMS

HOSPITAL NAME	ADDRESS	CATEGORY	OWNERSHIP	TOTAL X-RAY	TOTAL ECG	TOTAL DXG
P. HEALTH SERVICE	Q.C.	PRIMARY	GOVT.	6007	-1	-1
MA MARTA LYING-IN	PASAY	PRIMARY	GOVT.	1	-1	-1
C. CRISTO MEDICAL CLINIC	Q.C.	PRIMARY	PRVT.	39	1	-1
ELLEJO M. A. CLINIC	LAS PINAS	PRIMARY	PRVT.	3	-1	-1
LIV Y. MAMA HOSPITAL PUER.	SAN JUAN	PRIMARY	PRVT.	1683	-1	-1
POER. MATERNITY & FAMILY						
MAIZ HOSPITAL	CALOOCAN	PRIMARY	PRVT.	498	-1	-1
ARULO MATERNITY CLINIC	VALENZUELA, H.M.	PRIMARY	PRVT.	-1	-1	-1
AGBAGUIN FAMILY HOSPITAL	CALOOCAN	PRIMARY	PRVT.	1200	-1	-1
ASIG MEDICAL MATERNITY CLINIC	PASIG	PRIMARY	PRVT.	-1	-1	-1
SA. TERESITA GENERAL HOSPITAL	Q.C.	PRIMARY	PRVT.	-1	-1	-1
SA ANA MEDICAL CLINIC	TAGUIG	PRIMARY	PRVT.	531	-1	-1
DR. JUAN'S HOSPITAL	VALENZUELA, H.M.	PRIMARY	PRVT.	1560	-1	-1
STRAH TTY CENTER SPECIAL						
PULMONARY HOSPITAL						
ANTIGS MEDICAL CLINIC	STA CRUZ, MANILA	PRIMARY	PRVT.	280	-1	-1
AND GENERAL HOSPITAL						
DR. ROQUE MEDICAL CLINIC	MUNTINLUPA	PRIMARY	PRVT.	1538	-1	-1
ARLOZ CLINIC	VALENZUELA, H.M.	PRIMARY	PRVT.	-1	-1	-1
STRELLAS HOME CARE CLINIC INC.	Q.C.	PRIMARY	PRVT.	-1	-1	-1
DR. LUCIA P. CRUZ	NAPINLEA	PRIMARY	PRVT.	-1	-1	-1
CLINICA ESTRERA	MAKATI	PRIMARY	PRVT.	-1	-1	-1
CLINICA BERENCIO & HOSPITAL	CALOOCAN	PRIMARY	PRVT.	340	-1	-1
FRANCO CLINIC	HALABON	PRIMARY	PRVT.	130	-1	-1
LAS PINAS MEDICAL CLINIC	LAS PINAS	PRIMARY	PRVT.	1271	-1	-1
CLINIC OF THE HOLY SPIRIT INC.	Q.C.	PRIMARY	PRVT.	-1	-1	-1
RAYNIGA COMMUNITY HOSPITAL	CALOOCAN	PRIMARY	PRVT.	-1	-1	-1
MUNTINLUPA LYING-IN CENTER	MUNTINLUPA	PRIMARY	PRVT.	-1	-1	-1
DR. ALESSANDRO MOTHER MATERNITY CLINIC	PASIG	PRIMARY	PRVT.	-1	-1	-1
DR. GONZALES MEMORIAL HOSPITAL	MARIKINA	PRIMARY	PRVT.	999	-1	-1
HOLY MARY FAMILY HOSPITAL	TAGUIG	PRIMARY	PRVT.	475	-1	-1
KEY BILIBID PRISON HOSPITAL	MUNTINLUPA	2NDARY	GOVT.	1296	-1	-1
LAS PINAS DISTRICT HOSPITAL	LAS PINAS	2NDARY	GOVT.	2812	-1	-1
PARANAQUE COMMUNITY HOSPITAL	PARANAQUE	2NDARY	GOVT.	6049	-1	-1
HOSPITAL NG MAKATI	MAKATI	2NDARY	GOVT.	6215	-1	-1
PASAY CITY GENERAL HOSPITAL	PASAY	2NDARY	GOVT.	-1	-1	-1
VALENZUELA DISTRICT HOSPITAL	VALENZUELA, H.M.	2NDARY	GOVT.	1859	1048	-1
MANDALUYONG MEDICAL CENTER	MANDALUYONG	2NDARY	GOVT.	2642	-1	-1
BONIFACIO NAVAL STATION HOSPITAL	FORT BONIFACIO	2NDARY	GOVT.	3198	-1	-1
HOSPITAL NG ZALOUAN	ZALOUAN	2NDARY	GOVT.	1710	-1	-1
ST. LOUIS GENERAL HOSPITAL	HOVALICHES	2NDARY	PRVT.	756	-1	-1
OLIVARZ GENERAL HOSPITAL	PARANAQUE	2NDARY	PRVT.	1060	-1	-1
MT. BAKAYE GENERAL HOSPITAL	Q.C.	2NDARY	PRVT.	2011	-1	-1
ST. RITA HOSPITAL	TUNDOK	2NDARY	PRVT.	138	-1	-1
HOME CARE HOSPITAL &	CALOOCAN	2NDARY	PRVT.	3	-1	-1
FERTILITY CONTROL CENTER						
MUNTINLUPA DOCTOR'S CLINIC	MUNTINLUPA	2NDARY	PRVT.	1258	1	1
ST. MARY'S GENERAL HOSPITAL	STA. CRUZ	2NDARY	PRVT.	-1	-1	-1
D.T. PROYALDO	PARANAQUE	2NDARY	PRVT.	-1	-1	-1
HILLSIDE GENERAL HOSPITAL INC.	MUNTINLUPA	2NDARY	PRVT.	7467	-1	-1
ST. CRUZ COMMUNITY HOSPITAL	HALABON	2NDARY	PRVT.	-1	-1	-1
ST. ANNA GENERAL HOSPITAL	Q.C.	2NDARY	PRVT.	7462	-1	-1
		2NDARY	PRVT.	1791	-1	-1

IMMACULATE CONCEPTION HOSPITAL-MARINA	MARINA	SECONDARY	PRIVATE	2555	-1	-1
PAMPLONA MEDICAL CLINIC	LAS PINAS	SECONDARY	PRIVATE	1617	1	-1
INACTISIMO ROSARIO GENERAL HOSPITAL	VALENZUELA, M.M.	SECONDARY	PRIVATE	2306	-1	-1
FAMILA CHILDREN'S AND LYING-IN HOSPITAL	MANILA	SECONDARY	PRIVATE	-1	-1	-1
CRUZ-RABE MATERNITY & GENERAL HOSPITAL	TAGUIG	SECONDARY	PRIVATE	3646	1	-1
OUR LADY OF GRACE HOSPITAL	PALOMKAN	SECONDARY	PRIVATE	-1	-1	-1
LAS PINAS DOCTORS' HOSPITAL	LAS PINAS	SECONDARY	PRIVATE	2379	-1	-1
BILARTA GENERAL HOSPITAL	MALATE	SECONDARY	PRIVATE	175	-1	-1
JEASPI CLINIC & HOSPITAL	Q.C.	SECONDARY	PRIVATE	587	-1	-1
CLINICA APOLLANO GENERAL HOSPITAL	STA. CRUZ, MANILA	SECONDARY	PRIVATE	481	1	-1
LABARRS MEDICAL CLINIC	MUNTINLUPA	SECONDARY	PRIVATE	3400	-1	-1
BEATO CAMILAN MATERNITY HOSPITAL HOSPITAL & CHILDREN'S CLINIC	MUNTINLUPA	SECONDARY	PRIVATE	48	1	-1
ITA, RITA DE BACILARAN HOSPITAL	PARANAQUE	SECONDARY	PRIVATE	772	-1	-1
MARIA LOURDES MATERNITY HOSPITAL	MARATI	SECONDARY	PRIVATE	321	-1	-1
ARJAYNE DOCTORS HOSPITAL INCORPORATED	MANILA	SECONDARY	PRIVATE	1416	-1	-1
R.N. LAZO HOSPITAL INCORPORATED	MANILA	SECONDARY	PRIVATE	1785	-1	-1
'HYBICIAV' DIAGNOSTIC SERVICES CENTER	MANILA	SECONDARY	PRIVATE	65	-1	-1
AYAY HOSPITAL	MANILA	SECONDARY	PRIVATE	1704	-1	-1
OUR IMMACULATE HOSPITAL	PASIG	SECONDARY	PRIVATE	-1	-1	-1
CARDINAL SANTOS MEDICAL CENTER	SAN JUAN	SECONDARY	PRIVATE	14746	1	-1
MARY'S INFANT GENERAL HOSPITAL	PASIG	SECONDARY	PRIVATE	574	-1	-1
MUNTINLUPA MEDICAL CLINIC	MUNTINLUPA	SECONDARY	PRIVATE	1476	-1	-1
AMORES GENERAL HOSPITAL	Q.C.	SECONDARY	PRIVATE	201	-1	-1
BERNARDES GENERAL HOSPITAL	CALOCAN	SECONDARY	PRIVATE	313	101	-1
TA. MONICA MEDICAL CLINIC	MARINA	SECONDARY	PRIVATE	-1	-1	-1
ALYVIER POLYCLINIC HOSPITAL	NOVALICHES	SECONDARY	PRIVATE	753	1	-1
ASAUL GENERAL HOSPITAL	NOVALICHES	SECONDARY	PRIVATE	4750	-1	-1
OUR VIRAY MEMORIAL HOSPITAL	MARATI	SECONDARY	PRIVATE	-1	-1	-1
ADAY- PARANAQUE HOSPITAL	PARANAQUE	SECONDARY	PRIVATE	7116	-1	-1
NOVALICHES GENERAL HOSPITAL	NOVALICHES	SECONDARY	PRIVATE	3042	-1	-1
ARIANNE DOCTORS HOSPITAL INC. Q.C.	Q.C.	SECONDARY	PRIVATE	178	-1	-1
DO. NINO DE SAN ANTONIO MAL. HOSP.	PASIG	SECONDARY	PRIVATE	2401	1	1
ASCUAL GENERAL HOSPITAL	Q.C.	SECONDARY	PRIVATE	156	827	-1
M.P. GENERAL HOSPITAL	Q.C.	TERTIARY	GOVT.	588	-1	-1
D. GENERAL HOSPITAL	Q.C.	TERTIARY	GOVT.	19832	-1	-1
R. JOSE N. RODRIGUEZ MEMORIAL HOSPITAL	CALOCAN	TERTIARY	GOVT.	869	365	-1
ATIHAL CHILDRENS HOSPITAL	Q.C.	TERTIARY	GOVT.	3435	-1	-1
ISAL MEDICAL CENTER	PASIG	TERTIARY	GOVT.	20217	-1	-1
AN LAZARO HOSPITAL	STA. CRUZ, MANILA	TERTIARY	GOVT.	5033	-1	-1
OUR MARIAL CENTER	TURBO	TERTIARY	GOVT.	10636	-1	-1
DR. SALVADOR T. VILLA MEMORIAL HOSPITAL	CALOCAN	TERTIARY	GOVT.	1544	-1	-1
PHILIPPINES CHILDREN'S MEDICAL CENTER	Q.C.	TERTIARY	GOVT.	18028	683	-1
OUR REYES MEMORIAL MEDICAL CENTER	MANILA	TERTIARY	GOVT.	21911	-1	-1
OLOGIO RODRIGUEZ SR. MEMORIAL HOSPITAL	MARINA	TERTIARY	GOVT.	8256	-1	-1
DR. JOSE FABELLA MEMORIAL HOSPITAL	STA. CRUZ, MANILA	TERTIARY	GOVT.	7861	-1	-1
PHILIPPINE ORTHOPEDIC CENTER	Q.C.	TERTIARY	GOVT.	-1	-1	-1
BERNARD MEMORIAL MEDICAL CENTER	Q.C.	TERTIARY	GOVT.	27020	-1	-1
ATIHAL FISKEY INSTITUTE	Q.C.	TERTIARY	GOVT.	-1	-1	-1
HOSPITAL OF MANILA	-1	TERTIARY	GOVT.	14226	-1	-1
PHILIPPINE HEART CENTER	Q.C.	TERTIARY	GOVT.	8885	-1	-1
PHILIPPINE GENERAL HOSPITAL	MANILA	TERTIARY	GOVT.	106424	17080	-1
RESEARCH INSTITUTE FOR TROPICAL MEDICINE	MUNTINLUPA	TERTIARY	GOVT.	3362	-1	-1
1ST AVE. MEDICAL CENTER	Q.C.	TERTIARY	GOVT.	27206	-1	-1
DR. BENEFICIO GENERAL HOSPITAL, PA	MARATI	TERTIARY	GOVT.	12115	-1	-1
ATIHAL CENTER FOR MENTAL HEALTH	MANALAYUNG	TERTIARY	GOVT.	-1	-1	-1

PAP GENERAL HOSPITAL	PASAY	TERTIARY	GOVT.	1527	-1	-1
APC MEDICAL CENTER	Q.C.	TERTIARY	GOVT.	20691	-1	-1
QUEZON INSTITUTE	Q.C.	TERTIARY	GOVT.	30137	-1	-1
SCAMEN HOSPITAL	SAN JOSE STS.	TERTIARY	PRVT.	17077	-1	-1
Q.C. ST. AGNES GENERAL HOSPITAL, INC.	Q.C.	TERTIARY	PRVT.	-1	-1	-1
HEALTHFORD HOSPITAL	KARATI	TERTIARY	PRVT.	-1	-1	-1
JOHN F. DUELL HOSPITAL KERALCO	PALJE	TERTIARY	PRVT.	-1	-1	-1
SALAM MEDICAL CENTER INC.	STA. CRUZ, MANILA	TERTIARY	PRVT.	-1	-1	-1
QUINSON MEMORIAL MEDICAL CENTER	Q.C.	TERTIARY	PRVT.	10090	-1	-1
DE LOS SANTOS MEDICAL CENTER	Q.C.	TERTIARY	PRVT.	10701	-1	-1
TRINITY GENERAL HOSPITAL	STA. ANA, MANILA	TERTIARY	PRVT.	-1	-1	-1
MARTINEZ MEMORIAL HOSPITAL	CALOOCAN	TERTIARY	PRVT.	-1	-1	-1
MARY CHILES GENERAL HOSPITAL	SAMPALOC, MANILA	TERTIARY	PRVT.	2193	-1	-1
EBU-KRNFH	SAMPALOC, MANILA	TERTIARY	PRVT.	8791	-1	-1
PAXON MASSAYSAY MEMORIAL MEDICAL CENTER	Q.C.	TERTIARY	PRVT.	10054	-1	-1
DE OLANO MEMORIAL MEDICAL CENTER	STA. RESSA, MANILA	TERTIARY	PRVT.	9818	-1	-1
ST. CLARE'S HOSPITAL & NURSERY	KARATI	TERTIARY	PRVT.	-1	-1	-1
STA. TERESITA GENERAL HOSPITAL (MAIN)	Q.C.	TERTIARY	PRVT.	1051	-1	-1
DR. JESUS C. DELGADO MEMORIAL HOSPITAL	Q.C.	TERTIARY	PRVT.	6432	-1	-1
PATINA MEDICAL CENTER	VALENZUELA N.H.	TERTIARY	PRVT.	7736	-1	-1
PERPETUAL HELP HOSPITAL	SAMPALOC, MANILA	TERTIARY	PRVT.	-1	-1	-1
ST. JUDE'S GENERAL HOSPITAL AND MEDICAL CENTER	SAMPALOC, MANILA	TERTIARY	PRVT.	1700	-1	-1
UNITED DOCTOR'S SERVICE CORPORATION	TONDU	TERTIARY	PRVT.	-1	-1	-1
THE FAMILY CLINIC INCORPORATED	STA. CRUZ, MANILA	TERTIARY	PRVT.	5132	-1	-1
MARY JOHNSON HOSPITAL	TONDU	TERTIARY	PRVT.	7857	-1	-1
THE MEDICAL CITY SANGRE HOSPITAL	MANDALUONG	TERTIARY	PRVT.	11111	-1	-1
UNITED DOCTORS MEDICAL CENTER	Q.C.	TERTIARY	PRVT.	1776	-1	-1
ST. MARTIN DE PORRES CHARITY HOSPITAL	SAN JUAN	TERTIARY	PRVT.	1761	-1	-1
MANILA DOCTORS HOSPITAL	MANILA	TERTIARY	PRVT.	12073	-1	-1
ST. LUYS MEDICAL CENTER	Q.C.	TERTIARY	PRVT.	91107	-1	-1
MEDICAL CENTER MANILA	MANILA	TERTIARY	PRVT.	11108	-1	-1
SUP LADY OF LOURDES HOSPITAL	STA. RESSA, MANILA	TERTIARY	PRVT.	11787	-1	-1
MCW-FUN MEDICAL FOUNDATION HOSPITAL	KALUOYAN	TERTIARY	PRVT.	15506	-1	-1
CHILDREN'S MEDICAL CENTER PHILS.	Q.C.	TERTIARY	PRVT.	9410	-1	-1
CAPITOL MEDICAL CENTER	Q.C.	TERTIARY	PRVT.	16250	-1	-1
PERPETUAL HELP MEDICAL CENTER	LAS PINAS	TERTIARY	PRVT.	11501	-1	-1
QUEZON CITY MEDICAL CENTER	Q.C.	TERTIARY	PRVT.	-1	-1	-1
MANILA SANITARIUM & HOSPITAL	PASAY	TERTIARY	PRVT.	11111	-1	-1
CHINESE GENERAL HOSPITAL	STA. CRUZ, MANILA	TERTIARY	PRVT.	11111	-1	-1
MEDICAL CENTER PARANAGUE	PARANAGUE	TERTIARY	PRVT.	-1	-1	-1
SAN JUAN DE DIOS EDUCATIONAL FOUNDATION, HOSPITAL	PASAY	TERTIARY	PRVT.	-1	-1	-1
EMEDIC GENERAL HOSPITAL, INCORPORATED	MARINA DELIC	TERTIARY	PRVT.	11754	-1	-1
PERPETUAL SUCCESS HOSPITAL & MEDICAL CENTER	SAMPALOC, MANILA	TERTIARY	PRVT.	-1	-1	-1
HOSPITAL OF THE INFANT JESUS	SAMPALOC, MANILA	TERTIARY	PRVT.	11111	-1	-1
KARATI MEDICAL CENTER	KARATI	TERTIARY	PRVT.	11111	-1	-1
WATERBURY HOSPITAL CORPORATION	SAN JUAN	TERTIARY	PRVT.	11111	-1	-1

Cost of Illness Form
Acute Myocardial Infarction

IDNO: _ _ _ _ _
 PTNAME: _____
 HOSPITAL _____
 CHARTNO: _____
 AGE (years): _____
 DATEADM: _____
 DATEDISCH: _____
 DIAGNOSIS: _____
 1. typical chest pain _____
 2. 2x increase in enzymes _____
 3. evolutionary ECG _____
 OTHERDX1: _____
 DEATH/HAA (Code: 1 = Yes, 0 = No) _____

DX1C	DX1		DX1
CBC	__		EKG
PLATELET	__		CXR
ESR	__		ABG
OCULT	__		FBS/RBS
URINALYSIS	__		URIC ACID
BUN	__		SGPT
CR	__		SGOT
CA	__		LDH
P	__		CPK-MB
HA	__		CPK
K	__		AlkPhos
CHOL	__		HDL
TG	__		LDL
AMYLASE	__		TYPING
2-D echo	__	w/o	HATCH
2-D echo	__	w/	Hg
Stress test	__		Thallium
Others1	__		Others2

TX1C	DIAGNOSIS1	OTHERDX
ANAL/PYRETICS	_____	_____
ALIMENTARY	_____	_____
CVS/DIURETICS	_____	_____
RESPIRATORY	_____	_____
NEUROMUSCULAR	_____	_____
HORMONES/OCF	_____	_____
ANTIBIOTICS	_____	_____
OTHER CHEMO	_____	_____
GENITOURINARY	_____	_____
METABOLISM	_____	_____
VIT/MIN	_____	_____
NUTRITION	_____	_____
EYE/EAR	_____	_____
MOUTH/THROAT	_____	_____
DERMA	_____	_____
VACCINES/SERA	_____	_____

IVF - - - - -
 FWD - - - - -
 PRBC - - - - -
 OTHERS - - - - -

SUPPLIES
 IVT - -
 NGT - -
 EC - -
 O2(1000 Liters) - - - - -

OTHERS Specify _____

Procedures:
 Angioplasty - -
 TPI - -
 PPI - -
 Streptokinase
 TPA - -
 CABG - -

HOSPITAL DAYS	DIETDAYS
ER	HYPERALDAYS
ICU	OFDAYS
WARD	RIEKDAYS
	REGDAYS
	SPECIALDAYS
	HPO ₂ clean liq D

OUTCOMES: Grade: 0 none, 1 if present, 2 not evaluable
 COMPLET
 Specify:

COMMENTS:

Cost of Illness Form
Pneumonia

IDNO: _ _ _ _ _
 PTNAME: _____
 HOSPITAL: _____
 CHARTNO: _ _ _ _ _
 AGE (years): _ . _ . _
 DATEADM: _ _ _ _ _
 DATEDISCH: _ _ _ _ _
 DIAGNOSIS: _____
 1. cough _____
 2. RR>50/min _____
 3. chest indrawing _____
 OTHERDX1: _____
 DEATH/HAA (Code: 1 = Yes, 0 = No) _____

DXTIC	DX1		
CBC	__	sputum G/S	__
HB/HCT	__	sputum C/S	__
PLATELET	__	ABG	__
ESR	__	CXR	__
FECALYSIS	__	F/RBS	__
OCCULT	__	blood c/s	__
URINALYSIS	__	aspirate g/s	__
BUN	__	aspirate c/s	__
CR	__	OTHERS1	__
NA	__	OTHERS2	__
K	__	OXIMETRY	__
CL	__		

TXTIC	DIAGNOSIS1	OTHERDX
ANAL/PYRETICS	__	__
ALIMENTARY	__	__
CVS/DIURETICS	__	__
RESPIRATORY	__	__
NEUROMUSCULAR	__	__
HORMONES/OCP	__	__
ANTIBIOTICS	__	__
OTHER CHEMO	__	__
GENITOURINARY	__	__
METABOLISM	__	__
VIT/MIN	__	__
NUTRITION	__	__
EYE/EAR	__	__
MOUTH/THROAT	__	__
DERMA	__	__
VACCINES/SERA	__	__
IVF	__	__
FWB	__	__
PRBC	__	__
OTHERS	__	__

SUPPLIES
 IVT _ _

NGT --
FC --

O2(1000 Liters) -----
OTHERS Specify _____

HOSPITAL DAYS

ER --
ICU ---
WARD ---

DIETDAYS

HYPERALDAYS ---
OFDAYS ---
MILKDAY ---
REGDAYS ---
SPECIALDAYS ---
NFO/clearliq D ---

RESPIRATOR

STEAM --
NEBULE --
PT --

PROCED1

PROCED2 -- --

OUTCOMES (code: 0=none, # if present, 9=not evaluable)

COMPLI --

Specify: _____

COMMENTS:

RA: _____

Date: __ / __ / __

GUIDELINES IN COSTING

* PUT ASTERISK AT UPPER LEFT HAND CORNER IF THERE ARE SOME QUESTIONS REGARDING DATA IN THE FORM.

* Costs will be expressed in 1994 pesos.

* Diagnosis of AMI depends on:
presence of 2 out of the following:

- crushing chest pain, retrosternal, >15 min, with diaphoresis
- CPK-MB elevated >2x normal within first 24 hours
- Evolutionary EKG changes (on at least 2 ECGs) - development of q wave, ST elevation, T wave inversion.

* Data to be collected:
diagnostic - units of use
therapeutic (including procedures) - cost of medicines/group
of drugs by diagnosis

* Use of 999 vs 0 as code. If definitely not done, code as 0. If you can't say, code as 999. Do not leave any blanks in the data collection form.

* for all OTHERS, code others in first two blanks and the number of times in the last two blanks.

* for all IV drugs and additives; consider shelf life of opened containers as 24 hours only. will have to include a new cost for each day.

* if amount consumed in terms of mg or ml is very small, the smallest preparation should be used but costed at its unit price, not a fraction thereof.

* for PT sessions, count number of sessions. If instruments are being used (not just exercises; e.g. ultrasound), note and put under others in therapeutics. This is also the case with steam inhalation, nebulization, etc.

* Code for procedure:

- 1 - CVP insertion
- 2 - tracheostomy
- 9 - others:specify _____

* For IVF:

USE I/O charting as first source of data

If no I/O charting:

use 1 liter/day if on regular diet/OFF/HYPERAL*

use 3 liters/day if on NPO

NOTE: if renal or cardiac patient: use order sheet.

NOTE: a lack of precision within the order of 250 ml is still acceptable.

* For FC,
check if present (FC) in vital signs sheet. assume 1 FC per 7 HDs.

* If with IVF, impute one set of IVT per 7 HDs.

* for O2:
impute only at 2-3 liters/min (unless specified in orders) for 4 hours.

* For hospital days:
Round off to lower number if < 12 hours and to higher number if > or equal to 12 hours.

* for diet:

clear liquids, code as NPO

soft diet, code as regular diet

low _____ diet, code as regular diet

high _____ diet, code as special diet

if out on pass, code as NPO

* for coding of meal days, should have at least 2 meals of the same kind to be coded as such.

* Check orders only for:

1. initial order for IVF
2. initial order for O2
3. orders for biopsies and procedures
4. PT sessions/radiotherapy and other ancillary procedures.