DEVELOPING HOSPITAL EFFICIENCY-COST CONTROL MEASURES

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The purpose of this paper is to provide hospital managers with important knowledge and skills in developing efficiency measures that hospital can use as guidelines in monitoring and controlling operational costs. Efficiency measures are judgmental and comparative. Cost and quantity are the variables in the computation of efficiency measures but it is very important to integrate these variables with quality. A hospital is efficient if it can render quality service at the most cost effective manner.

INTRODUCTION:

The paper is organized into three parts. Part A explains the general concepts of efficiency measures and its relationship with other areas of financial management such as cost effectiveness analysis, operational and capital budgeting, cost accounting, and performance auditing. The understanding of these concepts will lead to the effective development of efficiency measures, also known as cost control measures. Part B presents a discussion on the nature of efficiency measures and the methods for determining levels of efficiency in hospital operation. Some of the methods for determining levels of efficiency in hospitals include comparison with standard cost, comparison with average cost, and open comparison between hospitals. This portion also explains the importance of measuring efficiency through time, the importance of uniformity in selecting efficiency measures, the concept of service cost components and cost centers, unit costs as efficiency measures, and measuring efficiency measures in different levels of hospital management. Part C introduces the concept of quality in health care and combine it with cost oriented measures to finally assess the efficiency of hospital operation.

A: GENERAL CONCEPTS:

A.1: EFFICIENCY MEASURES

Efficiency can be narrowly defined as the optimum utilization of inputs at a lower cost. This definition implies avoiding or minimizing waste of valuable economic resources as a result of under-utilization of fixed assets and ineffective combination of material and services. Although a production unit is concerned with both inputs and output, the concept of efficiency normally refers to the utilization of inputs. As such, efficiency is almost synonymous with cost containment. In business, an efficient organization will have a lower production and administrative cost and would be more profitable and competitive. In the not-for-profit sector, organizations performance is judged by their ability to “contain” the operational costs within a fixed budget.

Efficiency measures, also known as cost control measures, serve many important purposes: a) as a measure of performance of one unit relative to other units of the same organization; b) as a measure of performance between similar organizations; c) it facilitates performance auditing, d) as a tool for analyzing and controlling the cost of inputs, and e) as an evaluation criterion for accrediting agencies and regulatory bodies.

The development of efficiency measures depends on the effectiveness of an organization’s financial system. The process of determining efficiency measures needs information from different parts of the financial system such as financial and cost accounting, budgeting, and auditing. Once efficiency measures are developed, they serve as important ingredients in managerial decision making in budgeting and may also serve as important benchmarks in both financial and performance auditing. The feedback mechanism between budgeting and auditing follows the accounting cycle.

Although the development of efficiency measures encompasses the whole financial system, we will mention just a few areas in financial management that have a direct relationship with the process.

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A.1.1: COST EFFECTIVENESS ANALYSIS:

Cost Effectiveness Analysis is the process of determining the most efficient and effective allocation of economic resources. There are two approaches to cost effectiveness analysis. One is Lesser Cost Method (LCM) and the other is benefit cost ratio (BCR).

In LCM, an alternative is cost effective if it can achieve specific objectives at a lesser cost. This approach to cost effectiveness analysis is based on the assumption that the objectives are clear and specific and all cost elements are known. LCM is input-oriented and is very useful for analyzing investments whose output is difficult to quantify. LCM measures are used for analyzing operational efficiency, which is an integral part of operational budgeting.

Another approach to cost effectiveness analysis is known as the benefit cost ratio (BCR). In BCR, an alternative is considered cost effective if it can generate more units of benefits (value of output) per unit of cost (value of inputs). This format assumes that the values for both output and inputs (benefits and costs) are quantifiable. The comparison is based, not solely on the value of inputs but on the ratio between benefits and cost. In an array of feasible alternatives, the alternative that has the highest benefit cost ratio (BCR) is considered the most cost effective. BCR is mostly applicable to analyzing new investments and it is an integral part of the capital budgeting process.

Cost effectiveness analysis, most notably the LCM, is being used to develop efficiency measures. Putting it another way, LCM values are commonly used as efficiency measures.

A.1.2: OPERATIONAL BUDGETING:

Operational Budgeting is the process of allocating financial resources to a list of cost items (in line item budgeting) or to a list of activities (in performance budgeting). In operational budgeting the management should be cognizant of cost levels in different cost centers and how cost items are combined to produce specific products and services. The process of identifying cost elements needed for the production of products and services is called cost accounting. The methods and ways in combining these cost elements determine the efficiency of an organization or the efficiency of cost centers within the organization.

Efficiency measures are used as multipliers in estimating the allocation for a number of items in the operational budget. Example, the allocation for janitorial services can be estimated by multiplying the "janitorial cost per square foot" with the total floor area of the building. The janitorial cost per square foot is an efficiency measure or cost control measure.

A.1.3: CAPITAL BUDGETING:

Capital Budgeting is the process of allocating capital funds to alternative investment opportunities. The capital fund allocated to an investment is known is initial investment cost. Once the project is implemented, there is a need for allocating money for periodic cost consisting mainly of operational and maintenance costs. These two categories of costs (initial investment and periodic cost), taken together, are then equated against the potential benefits of the project over the economic life of the investment.

In the point of view of an investor, if the value of net benefit, discounted over time, is greater than the opportunity cost of applied capital, the investment is considered economically feasible. Only feasible projects are considered in a capital budget. Construction of new facilities, procurement of major equipment and services, establishment of new operational units, and other projects requiring significant investments are known as capital projects.

Variable costs and fixed costs enter the calculation of efficiency measures. Mistakes in capital budgeting will translate to unnecessary burden of high depreciation cost (a form of fixed cost), and higher maintenance cost (a form of semi-variable cost).

A.1.4: COST ACCOUNTING:

Cost Accounting is the process of determining the cost elements (fixed and variable costs) that comprise the production of goods and services. Without cost accounting, the producer will not be able to accurately price its product and/or services. The manager of the Radiology Department, for example, would not be able to determine the price of X-Ray services if he/she does not have the breakdown of cost elements that goes into the service. Extending the concept further, the manager would not be able to make the service "more efficient" if he/she does not know the proportion of each cost element to the total costs and if such costs are variable or fixed. Fixed cost can no longer be "controlled" during the operation of the project since it was already "sunked". The determination of fixed cost was during the capital budgeting and the control for fixed cost was during the implementation period. On the other hand, variable costs are controlled during the operation period.

In Radiology Department for instance, the price to be charged to the patient for extending the X-Ray service would consist of: direct cost of doing the service, the overhead of the Radiology Department, and the allocated cost from other hospital departments (mostly non-revenue departments). Depreciation expense charges should be included in the overhead or treated as a separate cost element. In private-for-profit hospitals, the pricing would also include a profit margin. This pricing procedure is impossible without a good cost accounting system.

In a production unit (including hospitals) cost accounting is necessary to determine the "cost of goods sold" or services being sold. In a manufacturing entity, the accounting for cost of goods produced...
sold is done at the plant producing the product. Adding the costs from administrative and other non-product departments as well as applicable depreciation charges and profit margins does the final pricing. In hospitals the “cost of services sold” would come from revenue centers. Revenue centers are the units that charge payments for their services. Adding the costs from non-revenue departments plus applicable depreciation expenses and surplus margins will determine the final pricing.

A.1.5: PERFORMANCE BUDGETING:
Performance Budgeting is the process of evaluating the performance of management through the use of financial related indicators. Compared to financial auditing, which is mainly focused on the authenticity of accounting records, verification of receipts and disbursements, and the legality of financial transactions, performance auditing focuses on the performance of management.

Efficiency measures or cost control measures are important performance indicators in performance auditing. Examples include: number of claims and cost due to work related accidents in a year indicates performance in managing worker’s safety; cost of X-Ray service per patient is an efficiency measure indicating the ability of Radiology Department in controlling or containing the cost of this service; etc.

B: DEVELOPMENT OF EFFICIENCY MEASURES

B.1: NATURE OF EFFICIENCY MEASURES:
If you were asked the question “Is your hospital efficient?” what would be your answer? The simple “yes” answer is easier, but justifying it is a little problematic. Most probably, the justification will mention the following: 1. The hospital is still here, 2) Our cost is lower than the other hospitals, 3) Our costs are within the average in the industry, 4) Our cost is within the standard cost set by the government, 5) Our cost is the lowest in the region, and 6) We have not faced any public demonstration, yet.

Those probable answers indicate that the measure of efficiency is judgmental and comparative. It is judgmental because it is based on the perception of the hospital management by the public it serves. The mere fact that the hospital is still operating means that it is not yet bankrupt, still being tolerated by its financier, or the public still demand its services. This entire scenario implies that the hospital is being operated within tolerable cost limits. This is the boundary of hospital efficiency. Once it is crossed the hospital could be bankrupt, closed by the financier, or could face a negative public demonstration. However, this notion of efficiency is very simplistic. It may not even be applicable to government hospitals that do not compete and the patients it serves does not pay the bills.

The better notion of efficiency is comparative. If the cost of Hospital A is lower than that of Hospital B, then Hospital A is “more efficient” than Hospital B. Please take note of the comparison. Hospital B could be efficient, but Hospital A is more efficient. Hospital B is efficient because its cost is within the standard cost of the government or within the range of efficiency limits set by an accrediting agency.

However, Hospital A is more efficient than Hospital B because its cost is not only within the standards set by the government or accrediting agencies but is lower that Hospital B.

There are two sets of comparison is this case, 1) the cost of one hospital is compared to a set of standards or expectations, and 2) the cost of one hospital is being compared with other hospitals. The first set of comparison is applicable to all hospitals. The second set of comparison is important in a competitive setting and business atmosphere of private-for-profit hospitals.

B.2: METHODS FOR DETERMINING LEVELS OF EFFICIENCY:

There are a number of methods for determining levels of efficiency. Some of the most common are: Comparison with Standard Cost, Comparison with Average Cost, and Open Comparison between Organizations. The first two methods determine a fixed level of efficiency while the last one determines relative efficiency. This was illustrated in the examples above. It is good to be “efficient” as determined by first two methods, but nicer to be “more efficient” as determined by an Open Comparison Method.

B.2.1: COMPARISON WITH STANDARD COST:

Standard Costs are being used by government and corporations as guideposts for estimating the total cost of production, provision of services, and construction of infrastructures. As such, it is useful in the evaluation of bidding proposals and contracts. Standard costs are developed based on previous experiences or through cost effectiveness analysis. These methods consider among other things time and socio-economic environment. Prices could be higher now compared to previous time because of inflation and other factors, and cost of labor in rural areas could be lower than in urban areas.

Governments use standard cost as policy instruments in controlling prices and containing expenses. Examples of price controls include minimum wage law, cost of staple products, cost of gasoline, cost of electric energy per kilowatt/hour, cost of medical consultation in public hospitals, etc. An example for containing government expenditures includes standard cost of rendering consulting services to government agencies. In some cases, the actual cost of producing specific products and services falling under price regulations might be higher than the standard cost. The government remedies the situation by giving subsidy.

Standard costs are also being used as benchmarks for determining the level of operational efficiency of organizations and agencies. In a public hospital that operates on a fixed government allocated budget, standard costs serve as the measures by which to gauge the operational efficiency of the hospital. If the standard costs are mandated by the government, the hospital has to continuously examine the utilization of its personnel and other assets to conform with the mandate. It is considered “efficient” if it does not produce a deficit and the services did not deteriorate. Revenue producing hospitals use standard costs for pricing their services. These hospitals are considered efficient if they are able to sell their services within
or less than the standard costs.

B.2.2: COMPARISON WITH AVERAGE COST:
Average Cost is another evaluation criterion for determining the level of efficiency of organizations. Average cost may take a form of 1) average cost for the industry, i.e. hospitals, 2) average cost in the region, 3) average cost in urban areas, i.e. hospital located in cities, 4) average cost in rural areas, i.e. hospital located in rural areas, 5) average cost in public hospitals, i.e. hospitals owned and operated by the government, 6) average cost in private for profit hospitals, i.e. private hospitals own and operated as businesses, etc. Aver stes can be computed for the whole hospital (example: cost per patient per day for in-patients or cost per bed per day for in-patients) or for specific type of service (example: cost of X-Ray service per iteration).

Hospitals whose average cost is equal or below the average are considered efficient.

Average Costs are normally computed from an array of costs reported to professional associations such as Philippine Hospital Association, Private Hospital Association of Thailand, and similar groups. Average costs are also determined from an array of costs reported on survey and research activities by the government or civic organizations.

The use of average cost is more tenuous than the other criteria because of the nature of its determination. It is computed “after the fact”. The average among 20 inefficient hospitals is still an average. The only comforting side of using the average cost is the assumption that everybody is trying to be efficient. To remedy this situation, professional associations would further compare their averages with the averages in similar organizations or similar geographic regions. This is to synthesize the actual costs with some sense of expectations. Example, the average cost in hospital industry in Malaysia can be compared with the cost of hospital industry in Thailand. The average cost in rural hospitals in Region A can be compared with the average cost in rural hospitals in Region B.

B.2.3: OPEN COMPARISON BETWEEN ORGANIZATIONS:
Otherwise known as “Second Tier” comparison, this method appears to be the most useful. In the illustration above, Hospital B cost is compared with either standard cost or average cost to determine whether it is “efficient”. This is the first tier comparison. When Hospital A is compared with Hospital B, it is considered “more efficient” because its cost is lower that Hospital B. This is the second tier comparison. In this method, only efficient hospitals are being compared with one another. Little can be gained by comparing inefficient hospitals. The comparison will continue until the “most efficient” comes up. Obviously, the most efficient hospital has the lowest cost among the group.

This method of comparison leads to ranking of hospitals.

B.3: DETERMINING EFFICIENCY THROUGH TIME:
Efficiency is time sensitive. Efficiency measures can be used as monitoring and evaluation instruments. A hospital may be efficient now but may not be efficient in the future. Efficiency levels can be measured at a certain point in time, usually towards the end of the accounting cycle and through time, normally through the previous five years. The first one is call stock analysis and the second is known as trend analysis. The stock analysis describes one condition while the trend analysis describes the changes through time. While it is useful to know if the hospital is “efficient” now, it is more useful to know if the hospital is becoming “more and more efficient” through time. Such information would indicate if cost control interventions were successful.

In comparing two or more hospitals at a certain point of time, it is important to consider the time when assets were acquired because depreciation expense enters into the calculation of cost. For example, the physical plant of two hospitals could be exactly the same in terms of capacity and facilities, but there could be a significant difference in the period when each was constructed. Most likely, the newer hospital was built at a higher cost because of inflation and other cost related factors. On the other hand, the older hospital may have a higher maintenance cost than the newer hospital.

B.4: SELECTING AND DEVELOPING EFFICIENCY MEASURES OR COST CONTROL MEASURES

B.4.1: THE IMPORTANCE OF UNIFORMITY:
To facilitate comparison, cost units that enter into the calculation of total cost for specific service should be uniform. This concept requires two things: 1) each service should be defined from it’s beginning to its end, and 2) the cost units within the spectrum of rendering the service should be identified. Example: what are the cost components for rendering an X-Ray examination? Does it start from the time the patient is ushered to the X-Ray room up to the production of negatives? Does it include the subsequent report of the radiologist? This “direct cost components” should be uniform among hospitals to be compared. A hospital should use the same definition consistently if it wants to compare its own performance through time.

Illustration: the “Cost of X-Ray Service per Iteration “ can be computed by using the following variables: 1) direct cost components, 2) indirect cost components and 3) number of iterations. The numerator will be the total cost consisting of direct and indirect charges and the denominator will be the total number of iterations. The period is normally a year. In the case of the numerator, direct cost is more controllable than the indirect costs. The indirect cost includes the depreciation cost which is a sunk cost. Theoretically, if the total depreciation cost and maintenance cost of the X-Ray machine is charged to

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4 This type of comparison should consider the impact of differences in price levels, levels of economic development, and other applicable socio-economic factors. For example, the cost per bed per day in a public hospital in Japan could be much higher than the same cost in Indonesia. It does not necessarily mean that public hospitals in Japan are less efficient than those in Indone sia. Meaningful comparison could only be done after considering the differences in price levels and other socio-economic conditions between these two countries.
a fewer number of patients (or iterations), the cost per unit would be too high compared to when there is large number of patients served. Over-capacity reflects inefficiency in planning the physical plant of the hospital including the subsequent procurement of other fixed assets.

B.4.2: SERVICE COST COMPONENTS:

The hospital should identify, describe, and cost its products. This will facilitate the pricing of these products if these are for sale. For a public hospital whose clients are not able to pay the full price, such cost calculations will facilitate the determination of subsidy to be charged to the government. Needless to say, medical insurance companies and health care organizations (HMO) require such calculations before the hospital could collect.

There are two general components for hospital service cost: the direct cost and the indirect cost. The direct costs are the cost of inputs that are combined directly into a service mix that is normally provided by “revenue departments” or “client service departments”. An example of client service department is the Radiology Department. The indirect cost is the cost of inputs provided by support departments (such as the Janitorial Service Department). The depreciation and maintenance expense of applicable assets are also included in the indirect costs.

Please note the sources of services cost components in the example above. The cost components of X-Ray service come from the following sources: the information for direct and departmental indirect cost will come from the Radiology Department, and the additional applicable overhead will come from other departments (mostly non-revenue departments). In some cases, the depreciation expense charge for the whole hospital plant is a separate item that is being apportioned to all departments.

B.4.3: COST CENTERS:

Cost centers embrace many forms with one unifying concept: It is a place for controlling and containing costs. In other words, it is the place where efficiency battles are being fought. Cost containment can be done through major cost items or through departmental units or both.

Major cost items: These items can be identified in the operational budget of the hospital. This is done by computing the proportional percentage of each item from the total budget. For example, if salaries and wages contribute a significant portion of the total budget (say 50% of the total), then it is clearly a major item to watch. Similar analysis will apply to other items like cost of energy and utilities, travel, supplies, cost laundry, cost of medicines, etc.

Departmental Units: Organizational units can also be cost centers. By following the established organizational chart, the hospital can identify cost centers and their hierarchical relationships. For example, the Professional Care-General Unit, Professional Care-Special Unit, and Outpatient Services Unit are individual cost centers. If these units report directly to the Department of Professional Medical Services, then this department is a major cost center. The same hospital could have a Department for Housekeeping Management overseeing the Dietary Service Unit, Laundry Unit, and Household and Property Maintenance Unit. Further, the same hospital may have an Administrative Department overseeing the Personnel Unit, Accounting Unit, Training Unit, and Vendors and Contract Unit. In this organizational chart, the major cost centers are the three departments and the sub-cost centers are the different units under each department.

In some hospitals, only the revenue units are considered cost centers. This is mostly true in private hospitals. The idea is to focus cost containment and efficiency measures in the production of services “for sale” which has a direct relationship with profitability and ability to compete. In this form, cost accounting will concentrate on the allocation of “overhead” charges from non-revenue departments in pricing of hospital services. The cost of operating the revenue departments (which consists of their own costs plus allocation from non-revenue departments) will then be allocated to the individual services of that department.

B.4.4: EFFICIENCY MEASURES AS UNIT COSTS:

To facilitate comparison, efficiency measures should be expressed as unit cost. Unit cost is a ratio between total costs and number of service units. For example, it would be very difficult to compare the total air conditioning cost of two hospitals if the hospitals have different floor area. A better measure is to express the relationship into a ratio between the total cost and the total floor space to get the “cost of air conditioning per square foot”. This concept is applicable to all efficiency measures.

One problem in “total cost/quantity” equation for computing unit costs is the difficulty of determining a uniform quantity. For example, if would be difficult to compare the “cost of X-Ray service per Patient” to the “cost of X-Ray service per Iteration”. Although very similar, the cost of X-Ray service per patient could include multiple iteration for a patient, which is not possible for the cost of X-Ray service per Iteration. Iteration means a one-time rendering of the service regardless of whether it is done to the same or different patient. Another example is the “cost per bed/day” and “cost per patient/day”. Although the assumption is for one patient to occupy only one bed, the cost per patient/day may not consider the cost of maintaining idle beds. If the computation of cost per patient/day includes the “overhead” of idle beds, then these two measures are the same. It is just a matter of ensuring that the definition of quantity is uniform.

B.4.5: COST EFFICIENTY MEASURES FOR DIFFERENT LEVELS OF MANAGEMENT:

Following the discussion of cost centers, efficiency measures should be developed in different levels of management. For example, there should be efficiency measures for the hospital wide management and for different departments and sub-units.

“Cost per patient per day -inpatient” and “cost per patient per day-outpatient” could be used as efficiency measures for the whole hospital. The cost of X-Ray service per iteration could be used as efficiency measures for hospital wide operation as well as an
efficiency measure for the Radiology Department. The cost per EKG iteration could be used as efficiency measures for hospital wide operation, for the Diagnostic Department, and for the EKG unit. The cost of air-conditioning per square foot can be used as an efficiency measure only for the Hospital Plant Maintenance Department and the cost per 100 kilograms of laundry can be traced to the Laundry Unit.

If the hospital includes the operation of medical schools and community outreach services, efficiency measures should be developed for the whole department and units in these departments. The cost per student in different grade levels and library cost per student can be computed for the medical school. The efficiency measures for the outreach department can be developed based on per person served or cost per information drive or seminar.

**B.4.6: FEW AND MANAGEABLE:**

Developing so many efficiency measures might be cumbersome and unmanageable Going “overboard” on details would only confuse management and reduce its usefulness. Remember that efficiency measures are management tools to contain costs and to facilitate comparison of achievement between hospitals and different units of the same hospital. It is better to develop few sharp and focused tools than having numerous dull and useless ones. In addition to confusion, the development of so many measures will add to the administrative cost of the hospital. It will also decrease the concentration of managers to more important areas of cost containment.

There is a joke that the number of efficiency measures for a hospital should be confined to the number of members in the Board of Trustees. There is some truth in this joke since each member could have his/her own focus of interest regarding the operation of the hospital. As a rule of thumb, the number of efficiency measures should conform to the requirements of its external environment such as government regulators, accrediting agencies, professional associations, and major partners such as medical insurance companies and health care organizations. These external agencies are assumed to represent the public that the hospital serves.

**C: QUALITY: THE THIRD VARIABLE IN EFFICIENCY MEASURES:**

So far, our discussion is confined to two variables: Cost and Quantity. This is deliberately done since these two concepts are easier to understand. The concept of quality is much more difficult to grasp specially in the production of social services such as health care.

There are numerous notions of quality in health care. Some are explicit and some are implicit. Explicit criteria of quality are those that are written down and formalize by individual hospitals, accrediting agencies, hospital associations, and government agencies. Implicit criteria exist only in the minds of clients.

Examples of explicit notion of quality include: hospital associations may establish awards for hospitals that satisfy its criteria of quality. Accrediting agencies require that hospitals render a minimum level of quality service before it is accredited. Regulatory agencies may require hospitals to abide by certain quality standard set by the government.

An example of implicit notion of quality is when a patient is impressed with the qualifications of medical staff and the level of technology in the hospital. In his/her mind, these level of hospital resources means high quality of medical service. This is the notion that implies that private hospitals are better than public hospitals, larger hospitals are better than smaller ones, urban hospitals are better than those in rural areas, and so on and so forth. This notion presumes that private hospitals, larger hospitals, and urban hospitals are staffed with more qualified medical personnel and are better equipped, which may or may not be true.

Both notions of quality appear to focus on the following: physical facilities of the hospital, qualification and experience of medical staff, the level of technology employed by the hospital, and the management of the hospital. In a very academic dissertation of quality it appears that the above characteristics of a hospital are mere inputs to produce quality medical service and are not by themselves definitions of quality. That quality should be measured in terms of outcomes of medical service.

**C.1: A DEFINITION OF QUALITY IN HEALTH CARE:**

In health care, quality is measured against the optimal level of medical care given available resources such as medical knowledge and technology. There are other definitions of quality of health care but this definition would be typical.

The above definition mentions two important elements: optimal care and available resources. Optimal care simply means that the hospital is doing its very best to serve their clients up to limit of their physical and non-physical asset. It implies that more quality can be attained by simply using the available resources to its optimum without necessarily increasing its assets. This definition invalidates the implicit notion that quality is somehow related to level of resources at the hospital’s disposal. That public hospitals, smaller hospitals, and rural hospitals are rendering quality service provided they optimally use whatever resources are available to them. Private hospitals, larger hospitals, and urban hospitals are not necessarily rendering more quality service if they are not using their state of the art facilities to the optimum.

**C.2: QUALITY AS OUTCOMES OF HEALTH CARE SERVICES:**

The previous definition of quality focuses on the optimum use of hospital resources. This is an inward looking definition although it could be argued that the concept of "optimum use" also includes the opinion of

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5 An example is the Baldridge National Quality Program in Health Care by the U.S. Department of Commerce. For the listing and explanation of quality criteria, you may contact: Baldridge National Quality Program, National Institute of Standards and Technology, Technology Administration, U.S. Department of Commerce, 100 Bureau Drive, Stop 1020, Gaithersburg, Maryland, USA 20899-1020.

outside clients. That the outside clients, as the final arbiter of quality, are saying that the hospital is trying its best to the limit of its available resources.

If we add the notion of medical outcomes to the definition of quality, the analysis and measurement will drastically change. By defining quality in terms of medical outcome, the optimum use of available resources will be relegated as inputs for the production of medical service. It implies that "capability" (available resources) does not necessarily translate to "ability" to produce successful medical outcome. One can argue however that nobody could guarantee a desired medical outcome even with the application of the highest level of resources. At most, we are just talking of "probable outcomes".

Casting probability aside for the meantime, there appears to be a consensus that outcomes in health care intervention should be measured in terms of the following:

1) Changes in health status during and after the intervention
2) Level of patient satisfaction regarding the intervention

The first measurement is very definitive. It measures the condition from the time the patient starts the medical intervention and compares it with the changes overtime throughout the duration of the intervention, and finally with the condition after the intervention is terminated. From "bad" to "better" suggests quality, and from "being sick to being cured" is even better quality. Since there is no guarantee that everybody will be cured, we could now inject the notion of probability. If 90 out of 100 patients that entered Hospital A were cured, we can say that Hospital A renders more quality service than hospital B that cured only 70. If the average recovery rate for hospitals that are members of an association is 60%, hospitals that have recovery rates of 60% and above are good quality hospitals and those below are poor quality hospitals as far as that association is concerned. If the two hospitals are members of the same association, Hospital B is still a good quality hospital, but Hospital A is of higher quality compared to Hospital B.

The second measurement is more subjective and broader that the first one. It is subjective because different patients would indicate different levels of satisfaction on the same process of medical intervention. It is broader, because the level of satisfaction of the patient would include not only the changes in his/her medical condition but also other factors surrounding the medical intervention. Such other factors may include the behavior of medical personnel, hospital facilities (good air-conditioning for example and wider beds), and the technology that was employed. The measurement can be done either through the "exit interview" (if the patient is still alive) or by formal questionnaires to be completed by the patient or relatives. The questionnaire will include the factors to be evaluated by the patient according to predetermined scales. A scale of 1-10 can measure the level of satisfaction, 1 being low satisfaction and 10 being the highest level of satisfaction.

If by using he above scale, Hospital A got an average of 9 from the patients it serves, we can say that Hospital A is a good quality hospital. Compared to Hospital B whose average level of satisfaction is only 7, we can say that Hospital A is of higher quality than Hospital B.

C:3: INTEGRATING COST, QUANTITY AND QUALITY:

In the economics of health care, value is determined by the utility of expected health improvement divided by the utility of money. Translation: the value of health care depends on your willingness to spend. The concept of value in this case includes quality.

The above concept also implies that more quantity and quality of health care can be had by spending more money. For example, if you only have $300 and is indifferent (undecided) whether to use it for the college tuition of your son or having some form of medical intervention, then the value of either products depends on their utility (usefulness) to you. If you think that your health is more important, you will ask your son to skip the semester. If you value the education of your son more than your health, then you will sacrifice your health in favor of your son's education. If you have the alternative of enrolling your son to a college with lower tuition and spend some of the money for your health care, you can have a quantity of health and education but it is probable that the quality of both products is reduced.

The application of this theory is more difficult in health care than in other products. The concept assumes that the consumption of both products (education and health care) is postponable and one can be traded-off in favor of another. Experience shows that most health care interventions are not or less postponable compared to other products like education. There are "emergencies" in health care. Similar to education however, there is a level of health care that is considered basic to any society. That level of health care becomes a "public good" to be provided by the government. In this case, the benefits of health care are not equated to the utility of money on the part of the individual patient. The sacrifice is borne by society. In the long run however, society has to decide if the social utility of certain levels of health care is more valuable than the utility of other social goods. This social decision is reflected in the fluctuating budget appropriations of public hospitals. It also explains why richer countries could provide higher level of public health care than poorer countries.

These illustrations give some ideas on how to approach the definition and measurement of quality in health care. But these are still very simplistic and very academic. There are many other factors that do not enter these measurements. Few examples include the environment where the hospital is located, income of probable patients, educational levels of probable patients, and even cultural values regarding health care.

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