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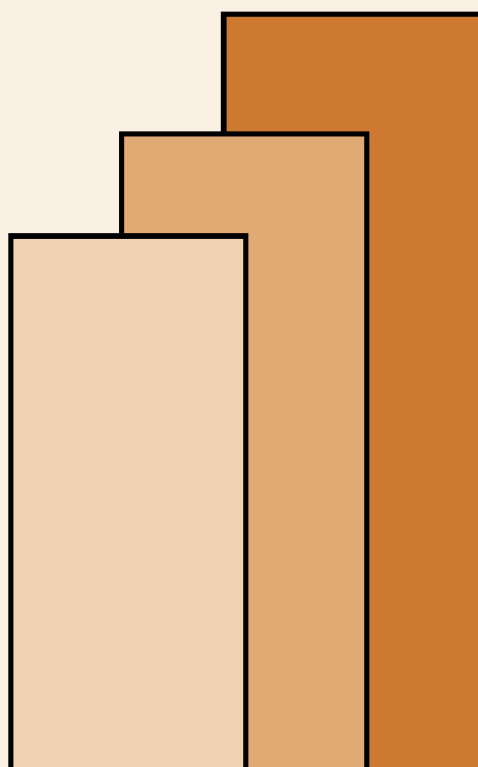
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A STUDY ON PRIMARY HEALTH CARE SERVICES
IN THE PHILIPPINES.

PART I. *Review of Research on the Cost of
Providing Health Services in the Philippines*

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April 30, 1995

Abstract:

10-YEAR REVIEW OF ECONOMIC EVALUATIONS AND THEIR IMPACT ON HEALTH POLICY IN THE PHILIPPINES. T Tan-Torres, Clinical Epidemiology Unit, University of the Philippines College of Medicine Manila.

OBJECTIVES: To inventory, critically appraise and describe the impact on health policy of economic evaluations in the country.

METHODS: 1. Electronic and manual search for relevant studies, mail survey of researchers and interview of key informants. Inclusion criteria: comparison of two or more alternatives in terms of costs and outcomes and completed/published from September 1984 to March 1994. 2. Critical appraisal using guidelines published by Drummond, et.al. 3. mail survey of investigators re: source of funding, dissemination of results and impact on policy.

RESULTS: There were a total of 20 economic evaluations, of which 2 were cost-outcome descriptions, 14 cost-effectiveness analysis, and 4, cost-benefit analysis. 60% were on public health issues and the remaining 40% were on hospital concerns. The median quality score was 8 out of a perfect score of 10. All evaluations were investigator initiated, with a single unit carrying out 60% of the evaluations. 80% received funding, half from local sources. Seven were published with five appearing in international journals. All were presented in scientific conferences. Only 5 influenced health policy, 2 influenced the research agenda 5 supported pre-existing policy and 8 had no impact.

CONCLUSIONS: There is limited expertise in the country regarding economic evaluations. The few studies done were methodologically sound. Despite good dissemination, only 25% had impact on policy.

RECOMMENDATIONS: 1. Capacity building for expertise in economic evaluations 2. Dissemination of standards for carrying out and reporting of economic evaluations to enhance comparability and generalizability 3. Awareness-raising among policy makers re: value of economic evaluations 4. More interaction with other disciplines, including economics, social sciences and media to enhance impact on policy.

INTRODUCTION:

Need for Economic Evaluations:

Health care expenditures constituted not more than 2% of the gross national product of the Philippines in 1991. This was lower than the 3-5% spent by the other countries in Asia and the 5% recommended by the World Health Organization for middle income countries (1). There may be a case for increasing investments in health locally but the World Development Report 1993 shows that this will not automatically guarantee a directly proportional increase in health status as manifested by a longer life expectancy (2). The essential requirement, at whatever level of funding in health care, is efficiency. "Are limited resources used in the best ways possible? Is value for money achieved in their use (3)?"

Economic evaluations have been used as a guide for attaining technical efficiency in the health care sector. A sound economic evaluation systematically identifies relevant alternatives, measures and values inputs and outputs (costs and consequences) from a specific perspective and determines the cost-effective choice (4). The comparison of alternatives and the inclusion of both costs and consequences in the analysis define a full economic evaluation. Other studies may limit themselves to costs (costing studies) or consequences (clinical trials) or simply describe both the costs and consequences of a single program (see Annex 1). Although they provide valuable information, the absence of any of the two characteristics precludes the ability to recommend the more cost-effective option.

Types of Economic Evaluations:

Full economic evaluations may be classified into four types: cost-minimization, cost-effectiveness, cost-utility and cost-benefit analysis (5). All of them consider costs in the inputs but express the outcomes differently. Cost-minimization analysis provides evidence that the alternatives attain equal outcomes or consequences, and in the process, justifies a pure costing study. The rational choice would simply be the less expensive option. In the medical field, there are few interventions which can produce equal outcomes. Therefore, there is limited scope for cost-minimization analysis.

Cost-effectiveness analysis expresses outcomes in natural units like cost/death prevented (impact measure) or cost/child immunized (process measure). As such, this is the analysis to which clinicians can easily relate. The incremental cost-effectiveness ratio describes the extra cost per extra outcome achieved. This type of analysis is excellent for comparison of interventions which have a single dominating effect. Cost-utility analysis is a special form of cost-effectiveness analysis where the unit of outcome, quality-adjusted life years, combines both morbidity and mortality. This measure also incorporates patient's preference or utility as a weight. The presence of a single global measure of outcome, QALYs, enables comparison across different programs.

Lastly, cost-benefit analysis expresses outputs in monetary terms. It is the only one among the types of economic evaluations which can explicitly determine the worth of a program, e.g. a program with a net benefit or that which gives more output than the input received. All the other types of analysis assume implicitly that the outcomes are worth achieving. Cost-benefit analysis, having a single measure expressed in monetary terms, also allows comparison of programs with different outcomes. However, conceptual difficulties may arise when putting a monetary value to outcomes like a death or disability prevented (see Annex 2).

Current Uses of Economic Evaluations:

The different types of economic evaluations provide useful data which can aid decision-makers in prioritizing, financing and implementing programs. Specifically, economic evaluations can inform policy issues on:

1. planning of specialist facilities or specific technologies;
2. excluding technologies from public reimbursement;
3. reforming payment schemes for health care institutions (especially hospitals);
4. encouraging budgetary reform within institutions;
5. changing payment systems for health care professionals;
6. developing medical audit and utilization review schemes;
7. introducing co-payment for service users; and
8. encouraging competitive arrangements in the health care system (6).

The Health Care Financing Administration considers cost-effectiveness in approving coverage of medical technologies (7). The 1991 Oregon Medicaid Plan (8) and the World Development Report 1993 (2) used economic evaluations extensively to define a basic set of services to be made available to everyone and to rank medical interventions for financing purposes.

The Australian Pharmaceutical Benefits Advisory Committee has required economic evaluations for new drugs to be considered for reimbursement since January 1993. Several health maintenance organizations in the United States also require economic data before putting a drug on their formulary (from Economic Assessment and New Technologies: Focusing on Pharmaceuticals; presented at INCLIN meeting in Cairo, January 1993 by H. Glick, U. of Pennsylvania, unpublished).

OBJECTIVES:

The demand for economic evaluations has led to an increase in published economic literature (9,10). However, most of these studies were carried out in industrialized countries with different health care delivery systems. A critical appraisal of these studies also shows that there was only fair adherence to methodological standards and that there is a need to ensure more appropriate use of methods of economic analysis (11,12).

Economic evaluations have also been carried out in the Philippines. This study seeks to inventory the body of literature on economic evaluations in health care available locally and critically appraise them with the end in view of providing recommendations for future studies.

In addition, this study aims to examine the research process which has generated the economic evaluations, from the funding, conduct, dissemination to implementation as health policy.

MATERIALS AND METHODS:

I. Search Strategy:

Four possible sources of studies were investigated - the funders, the researchers, the users (Department of Health, DOH) and the archivists. The following methods were used to

access them: electronic and manual searches, mail survey, key informant interview.

Electronic Database:

Two major electronic databases on health, MEDLINE and HERDIN, were searched for economic evaluations in the health sector in the Philippines. MEDLINE is an international database housed in the National Library of Medicine in the United States. It includes complete references to articles from more than 3,200 biomedical journals. The CD-ROM version searched includes citations back to 1982.

HERDIN (Health Research and Development Information Network) is the local database of studies in health. It is operated by the Philippine Council for Health Research and Development (PCHRD) and there are two other nodes located in the DOH and the University of the Philippines Manila. The specific HERDIN databases searched were the Philippine Health Projects and the Bibliographic Database. The Philippine Health Projects include reports (published or unpublished) of studies carried out in the Philippines. The Bibliographic Database includes articles from Philippine publications on health, including local studies published in international journals. It includes over 65 journal titles and over 1500 issues. The search strategy used was:

1. Cost* (to capture cost, costs, cost-effectiveness, cost-benefit, cost-utility)
2. AND Philippines (for Medline).

Print Database:

The files of the Essential National Health Research Program (ENHRP) of the DOH containing the researches carried out by the different services were manually searched.

Mail Survey:

* Researchers:

Names of university-based researchers were obtained from the Inventory of Health Researches, 1990-91 of PCHRD (annex 3). All entries under "traditional areas of concern" classification were reviewed and their primary authors were sent a questionnaire (annex 4). Excluded were authors of entries which were clearly basic science in orientation.

* Funders:

A list of funding agencies was obtained from the ENHRP of DOH (annex 5). The questionnaire was sent to the heads of the agencies. Information was also obtained from the heads of the regional committees of the Philippine Council for Health Research and Development.

* Librarians:

A list of the academic members of the inter-library network in health was obtained from the library of the University of the Philippines College of Medicine (annex 6). A copy of the questionnaire used in the mail survey was sent to them and to the library of the University of the Philippines School of Economics which offers an M.Sc. Health Economics.

Upon receipt of responses, an additional round of letters was sent to people who were recommended and had not been surveyed in the first round. If a number was available, non-responders were followed up on the phone.

Key Informant Interview (annex 7):

The different services of the vertical programs in the Department of Health were visited and the personnel were interviewed as to the possible existence of economic evaluations in their services. Health economists from the University of the Philippines and the De La Salle University and health experts in the Asian Development Bank and the College of Public Health were also interviewed.

II. Selection of Articles:

Of the citations retrieved, abstracts were reviewed and only full economic evaluations, defined as those studies which include a comparison of two or more alternatives, based on both their costs and outcomes, were included. The economic evaluation should be the main focus of the article (operationally: both quantification of peso costs as absolute value or percentage and reporting of outcomes for the alternatives being compared are present in the abstract). These articles were retrieved, if available and readily accessible. Only those studies published or reported during the past ten years, September 1984 to March 1994, were included in the inventory.

Exclusion criteria:

1. standard financial reports/budgets of health projects
2. any study with incidental cost data (operationalized to mean that the cost data and/or its implications on the interventions is/are not discussed in the report).

III. Collection of Data on the Research Process:

Once the article was retrieved and assessed as meeting the inclusion criteria, another questionnaire (annex 8) was sent to the author. These data were requested:

- * person/agency commissioning/conceiving the research (researcher, decision-maker or funding agency)
- * person/agency funding the research
- * person/agency performing the research (include curriculum vitae if possible);
- * resources expended in performing the research (duration of the study and amount of funding)
- * results of the study presented to whom (beneficiaries, press, academe, medical community, DOH, other decision-makers, international community) and how (briefing, scientific conference, letter, etc.)
- * influence on policy.

A hard copy of their complete paper was obtained. As for non-responders, they were followed up at least three times through telephone calls or visits.

IV. Critical Appraisal:

The manuscripts were critically appraised using reader's guides on methodological standards for sound economic evaluations (13). The 10 questions can be grouped into the following parameters (see Appendix 9):

1. research question, including perspective of the evaluation and description of alternatives being compared;
- The perspective of the analysis should be stated explicitly as this defines the scope of the costs and consequences to be included in the analysis. Ideally, the societal viewpoint, composed of the provider, payer and patient, should be adopted in the analysis. The relevant alternatives to be included as choices in the analysis should include the alternatives which can address the problem. It should also include the current standard of medical practice or if this is an entirely new program, a "do-nothing" alternative. Alternatives should be adequately described (who did what to whom, when, where and

how) to allow readers to decide on the feasibility of the intervention in their own setting and if feasible, to replicate the intervention. Readers can also determine if some costs or consequences have been missed.

2. evidence on effectiveness;

Economic evaluations are based on data on effectiveness. The data should be valid and for medical interventions, randomized controlled trials present the most bias-free results. Prospective cohort, case-control, before and after studies provide evidence in decreasing order of rigor.

3. identification, measurement and valuation of costs and consequences;

Once the perspective has been defined, all relevant costs should be identified, measured and valued. Examples of different categories of costs and consequences which can be included in the analysis are direct medical and non-medical, indirect (productivity losses or gains), intangible or psychic costs and consequences (see Annex 10). In measurement and valuation, care should be taken to input costs of actual resource consumption rather than charges (14). Charges may reflect, in addition to the profit motive, presence of cross-subsidies, replacements, expansion, bad debts, inaccuracies in allocation and annuitization and the current list prices in the area (charging by consensus).

4. adjustment for differential timing or discounting;

The future stream of costs and consequences of the programs being compared should be discounted to the present year. This method enables costs used in the analysis to incorporate the time preference of individuals or society who prefer to postpone costs to the future and enjoy benefits immediately. Discounting is particularly important for prevention programs where the expected benefits may occur far into the future, e.g. hepatitis B immunization.

5. incremental analysis;

Incremental analysis is very important as it gives the extra cost needed to pay for the extra benefit. The guaiac stool test for detecting colon cancer dramatically showed that the extra cost for a routine sixth test to detect an extra case of colon cancer as compared to 5 tests is \$47 million (15).

6. sensitivity analysis;

In economic analysis, assumptions are made or some of the figures used may be imprecise. Sensitivity analysis or varying the figures, then reanalyzing and reassessing the impact of the new numbers on the conclusion of the study can be used to test the robustness of the conclusion. If the results are sensitive to a change in numbers used, the analysis will have delineated areas where more effort has to be exerted to obtain precise estimates.

7. discussion on major issues of concern including generalizability of findings to other settings:

The results of an economic analysis are not intended to be mechanically applied. There may be flaws or weaknesses in the analysis which will limit its usefulness. An economic analysis also does not routinely address equity issues, e.g. 20 life years gained may be 20 years of one young person or 2 life years of 10 elderly people.

IV. *Abstracting and Indexing (annex 11):*

Papers which were not previously indexed in the HERDIN data base were abstracted to conform to its technical requirements (16) and submitted for indexing with the primary author's consent.

ANALYSIS:

Each study is classified as follows:

* type of intervention being studied hospital or community-based (including primary health care)

* type of economic evaluation: The proportion of studies satisfying each of the criteria and the median number of criteria fulfilled are reported. The research process is qualitatively described.

RESULTS:

Yield of Search Strategies (Table 1):

Of the 65 citations retrieved in the search on MEDLINE, only five articles (17-21) satisfied the criteria. Of the 30 citations in the Philippine Health Projects Database and 72 citations in the Bibliographic Database, 14 (17-22, 1A-8A in appendix 5) satisfied the criteria. These include the five picked up in the MEDLINE search.

The manual search of the files of the ENHRP yielded one study (9A). The survey was sent to 161 researchers, of whom 19 were dead or had moved to a different address. Response rate was 49.3%. Seventeen responded positively in that they had a study or knew a person with a study. However, further inquiry revealed that only one of these papers (13A) could fulfill the criteria.

Of the 21 representatives of funding agencies sent questionnaires, nine (43%) responded. Similarly, 52% of the 23 librarians responded. Both these search strategies did not yield a study fulfilling the inclusion criteria. Search of the UP School of Economics library yielded two undergraduate thesis which were economic evaluations (11A and 12A). The interview of 21 key informants yielded two studies (23,10A).

Thus, there were 20 studies found (abstracts in appendix 12).

Critical Appraisal of the Studies (See Table 2):

Subject Areas:

Of the 20 studies, 11 dealt with public health concerns, i.e., vitamin A supplementation (17), hepatitis B screening (18), canine rabies eradication through immunization (19), expanded programme on immunization (21,12A), breast cancer screening (23), WHO algorithm for management of acute respiratory infections (3A), triple versus quadruple chemotherapy in pulmonary tuberculosis (5A), control of schistosomiasis through chemotherapy (9A), HIV screening with pooled blood (10A), and family planning (11A).

The remaining nine were hospital-based studies dealing with antibiotic prophylaxis of meconium-stained newborns (1A), establishment of a perinatal center (22), modes of delivery for pregnant women infected with the human papilloma or herpes viruses (6A), different regimens of immunosuppression in kidney transplant patients (20), management in diarrhea treatment units (7A, 8A), rooming-in (13A), different modes of ventilatory support (2A) and x-ray diagnosis of sinusitis (4A). There were four diagnostic test studies (18,23,4A,10A).

Types of Economic Evaluations:

Twelve studies were undertaken for the primary purpose of economic analysis. The eight remaining studies (17,18,1A-4A,9A,10A) sought to establish the effectiveness of the interventions and included an economic analysis as well. Only four studies were cost-benefit analysis (17,19,9A,12A). Three studies -- Vitamin A deficiency eradication, rabies elimination, and schistosomiasis control -- adopted the societal perspective and used the human capital approach to value the human lives saved. The other study on National Immunization Day used a process measure as its outcome. Economists were the lead investigators in three of these cost benefit analyses.

The rest of the studies used cost-effectiveness analysis or stopped at cost-outcome descriptions. They had doctors as the main authors except for one undergraduate economics thesis (11A).

Perspective and Alternatives Considered in the Research Question:

The perspective adopted in these studies was the provider of services (Department of Health) or the payer and thus, the costs covered in the analysis included only the direct medical and in only two studies, (6A, 23), non-medical costs.

The studies which covered the public health area tackled problems typical of a developing country, e.g., acute respiratory infections, rabies, vitamin A deficiency. The hospital-based studies covered problems which could be encountered in developing or developed countries but in some of the studies, specifically, immunosuppression in kidney transplant patients (16), ventilatory support in critically ill patients (2A) and radiographic diagnosis of sinusitis (4A), the alternatives considered were novel and in response to the acute lack of resources in the country.

Efficacy Research Design and Choice of Outcomes:

The data on efficacy of the alternatives or interventions being considered came from predominantly local studies. However, only one of the studies used a randomized controlled trial to generate efficacy estimates (1A) and this study had a sample size with inadequate power to show a significant difference. The study on radiographic diagnosis

also used a rigorous study design, validity study, but also suffered from small sample size. This was not an issue with the HIV screening.

The other studies used epidemiological designs of lower rigor. Majority of the local designs on efficacy had small sample sizes and limited follow-up. Exceptions to this are two foreign-funded, community-based studies on vitamin A deficiency (17) and on acute respiratory infections (3A). Three of the studies employed decision tree analysis (18,6A,23) to determine efficacy, using local and foreign sources of data.

The consequences considered were final outcomes like mortality or infections which directly showed the impact on the patients. Three studies used intermediate outcomes, i.e., hepatitis B Ag carrier state (18), arterial blood gases (2A). Four studies (7A,8A,11A,12A) used process measures like family planning acceptors; fully immunized child and % correctly hydrated.

Costing:

As delimited by the perspective taken, most of the costs included only direct medical costs. Measurement was based on actual resource use and market prices were used in valuation except for a few (17, 2A, 23) where charges were exclusively used. Due to the nature of the interventions studied and the short follow-up to determine outcomes, no discounting was done except for the three cost-benefit analyses (17,19, 12A) which included deaths prevented as part of their outcomes. Discount rates used ranged from 2-19%.

Methods of Economic Analysis:

Seven studies (17-19,23,4A,5A,9A) extensively used sensitivity analysis and the studies on rabies elimination (15) and chemotherapy of tuberculosis (5A) showed robustness of the conclusions derived from the analysis despite changes in assumptions. Only three studies did not employ incremental analysis (18,1A, 13A)

Summary of Critical Appraisal:

An appraisal based on a liberal application of the nine methodological criteria (discounting was dropped because of applicability only to three of the studies) gave a median

score of 8 for the studies (see table 3). The deficiencies were mostly in valid evidence of efficacy (67%), valuation (67%), sensitivity (44%) and incremental analysis (78%).

Description of the Research Process (Table 4):

Development of Proposal:

All of the studies were investigator-initiated except for the study on acute respiratory infections (3A) which was commissioned by the funder.

Conduct of Study:

Eleven studies (18,20,22,23,1A,3A-8A) were done by or with the technical assistance of the Clinical Epidemiology Unit of the University of the Philippines Manila. Two studies were undergraduate economics theses (11A, 12A). Four studies (17,19,21,10A) had foreign experts providing technical input.

Funding:

Six studies (20,22,4A-7A) were locally funded by the Philippine Council for Health Research and Development while eight were funded by foreign agencies, i.e., two by United States Agency for International Development (17,8A), two by Rockefeller Foundation (23, 1A) and one each by the Australian International Development Assistance Bureau (3A), BOSTID (18) and Centers for Disease Control (19). Depending on the comprehensiveness of the study, the time and funds expended varied from 1-12 months and from nil to \$150,000-200,000 (1975 pesos), respectively.

Dissemination of Results:

Five were published in international journals (17-21) and two in local journals (22,23) not indexed in MEDLINE. The other 13 are unpublished. All of the studies except two (17,21) were reported in literature in the latter years between 1989 and the present. Except for one thesis report, the most popular forum for dissemination was a scientific conference with an academic and/or international scientific audience. Twelve of the studies also had people from the Department of Health in the audience when results were presented.

Influence on Policy:

There were no responses on the survey from two authors (21, 2A). Only five of the authors claimed that their study had an influence on health policy. These studies were on Vitamin A supplementation (17), hepatitis B screening (18), rabies control (19), schistosomiasis control (9A) and antimicrobial prophylaxis in meconium stained babies (1A). An additional two studies on tuberculosis (5A) and breast cancer screening (23) influenced the research agenda and definitive studies are now being undertaken to answer issues raised by the economic evaluation. Five of the studies provided data in support of a pre-existing policy. These were the studies on algorithm for the management of acute respiratory infections (3A), establishment of a perinatal unit (22) and of diarrhea treatment units (7A,8A), and rooming in of newborn babies (13A).

DISCUSSION:

Doctors as Analysts.

Most of the studies were cost-effectiveness analysis or cost-outcome descriptions which were initiated and carried out by doctors interested in economic analysis in their clinical areas of expertise. Therefore, the choice of the topics reflects more the interest of the investigator rather than the urgent need to craft policy in a certain area.

The clinical bias of the investigators is revealed not only in their choice of topics but also in the type of analysis being done, the perspective adopted and the scope of costs considered. As previously mentioned, the main type of economic analysis done is the cost-effectiveness analysis probably because doctors are more comfortable with the outcomes expressed in natural units than monetary terms.

Secondly, cost-effectiveness analysis is the natural choice for many of the problems in the hospital area because the policy-making setting frequently involves crafting policy for a specific group of patients. It rarely involves making choices between different interventions for different patients; e.g. oral rehydration therapy for diarrhea patients versus immunosuppression for kidney transplant patients. The interest of the doctors is more on technical efficiency rather than on allocative efficiency.

The perspective adopted usually is the hospital or the payer and the scope of costs and effects considered are restricted to the direct medical costs, again reflecting the clinical expertise of the doctor-analyst.

There is however, a need to expand choices of types of analysis, perspectives and costs beyond strictly medical considerations because decisions are in actuality being made in terms of allocation between programs, even in hospitals. For example, when the decision is being made whether to buy ventilators for the intensive care unit, any purchase will affect the ability of the hospital to make available a fourth drug for tuberculosis patients. However, the discussion regarding the purchasing decision rarely goes beyond the specific need for ventilators and does not explicitly include a consideration of the opportunity cost or that which will have to be waived in place of the ventilators.

For decisions involving choices between different programs, cost-effectiveness analysis may be inadequate and cost-benefit or cost-utility analysis will have to be done to allow comparison using a common unit of outcome. This also needs a wider perspective, preferably societal, as it involves different sectors of people. This will in turn necessitate a wider consideration of costs. In these cases, interaction with economists may enrich the analysis.

Adherence to Methodological Criteria:

The median score of 8 out of a possible 9 in terms of adherence to methodological standards may be misleading as not all the standards should be assigned equal weights. For example, the validity of evidence on efficacy used in the analysis should be a minimum requirement and if not fulfilled, must bring into question the validity of any conclusion of the economic analysis. Economic evaluations build on information derived from epidemiological studies and the credibility of the numbers coming out of the analysis will depend on the quality of the information used. In this inventory, eight studies had insufficient basis for efficacy of the interventions being compared.

Most of the methodological standards on costing were fulfilled because the investigators had to carry out de novo collection of cost data. There is no easily accessible database on costs unlike in industrialized countries where databases on reimbursements for specific diseases abound. However, unlike the big databases with millions of data bits, the de novo collection usually includes only a small sample with probably a wide variance. The imprecision of cost data may affect the results of the analysis.

Because of the paucity of available data, both on efficacy and costs, one would expect that sensitivity analysis would be extensively employed to find out if different assumptions or figures will affect the final conclusion. This technical tool was not maximized in all of the studies.

Finally, a few studies did not do incremental analysis and in doing so, failed to exploit the true value of an economic analysis which is to determine the benefit at the margin or the extra cost needed to pay for the extra effect.

Lack of Technical Manpower

The summary of the 20 studies provides a glimpse of the state of literature on economic analysis locally. The large number of citations included numerous references to cost-effectiveness. However, on further examination of the list, this reflects more the prevalent use of the term cost-effective in literature in a non-technical sense (24) rather than a bonanza of economic evaluations.

This survey of literature on economic evaluations show that the exponential growth in economic evaluations in industrialized countries (8,9) has not occurred in the local setting. There is an absolute paucity of studies, although the recent burst of production of economic analysis in the early 90's possibly heralds a more productive future.

One of the main reasons for this is the scarce availability of local technical expertise. A major finding is that majority of the studies were done with the technical input provided by one academic unit. It is clear that if more studies will be carried out, capacity building has to be undertaken systematically with a careful plan to locate and

sustain foci of technical expertise in key geographic areas.

The few studies available have shown the applicability of economic evaluations in the public health and the hospital settings. Consumption of resources are considerable in both areas. In the public health field, although relatively inexpensive on an individual basis compared to hospital-based interventions, the sheer number of recipients of the interventions requires large outlay of resources. The policy decision frequently facing authorities is: to what extent should the service be offered? How can the most affected be targeted for the service? With the available budget, how can we best use the resources?

In the hospital setting, at the individual patient level, clinical policy is more often concerned about choices between different alternatives for the same condition. Because of the intensive use of resources, even a few patients can consume a major part of the budget of a hospital. For example, a graft rejection in a kidney transplant patient because of inadequate blood levels of an immunosuppressive agent is a tremendous waste of resources. The question in the hospital setting frequently is which clinical policy is more cost-effective? Because the patient in need of assistance is actually physically present (an identified person), clinical policy cannot ethically deny an intervention to a patient (as compared to public health where one deals with faceless numbers and the decision can be made to supply limited amounts of vaccines to certain areas or certain age groups). It can only recommend which is the more efficient option.

The 20 studies cover important areas in public health and hospital-based medicine. However, there are still many areas where an economic evaluation is needed and will be useful in decision making. In general, economic evaluations should be carried out when:

- * sizable amounts of scarce resources are at stake;
- * responsibility is fragmented;
- * the objectives of the respective parties are at variance or are unclear;
- * there exist alternatives of a radically different kind;
- * the technology underlying each alternative is well understood;

the results of the analysis are not wanted in an impossibly short time (25)

The first criteria will ensure that carrying out the evaluation is worthwhile doing. The second criteria emphasizes the importance of adopting a societal perspective in doing an analysis as it is able to determine the net benefit or cost to society as a whole. An example of this is the rabies elimination program where responsibility of animal rabies lies with the Department of Agriculture and human rabies with the Department of Health. Eradication of dog rabies will lead to eradication of rabies in humans.

The third criteria is usually illustrated by home care versus hospital care for terminally ill patients. Hospital care might be easier for the family but a greater burden to the hospital and vice versa. The fourth criteria implies that radically different alternatives may entail different use of resources and costs. The fifth criteria will allow a sound economic analysis to be undertaken as efficacy data and use of resources are clear for each alternative. The final criteria emphasizes the importance of economic evaluations in decision-making and at the same time, implies that a well-done economic analysis cannot be carried out easily and requires time and effort and resources too.

The six criteria can be summarized by the first three ensuring that the potential benefits from the study would be considerable and the last three ensuring that the individual would have something worthwhile analyzing.

In the Philippine setting, economic evaluations should be commissioned before decisions, especially on new programs, are made by the Department of Health. A case in point is the preventive nephrology program. Sensationalized reports of epidemics of hepatitis A have created an artificial demand for non-selective immunization. Efficacy of cholesterol screening for the general adult population is controversial but is being inadvertently promoted by offers to do free blood examinations during heart month. Preventive programs are not necessarily more cost-effective (26).

In the hospital setting, numerous opportunities for carrying out economic evaluations exist. Because of the high prevalence of hepatitis B S antigen carrier state in our country, should one screen the hospital personnel suffering a needle stick injury first or give immunoglobulin directly or do one-time mass immunization? Should pre-operative screening be carried out for all patients undergoing surgery? Should all pregnant women be tested for diabetes? Many of the entrenched practices in the hospital should be re-examined for its effectiveness and efficiency.

Generalizability of Studies Done in Other Countries:

Because of the need to undertake economic evaluations in many areas, the lack of local technical expertise, coupled with the availability of studies done in other countries, (albeit industrialized), the question arises whether an economic evaluation done for one country should still be replicated in the other countries facing the same problem? Are the results of that one study generalizable to other countries?

When answering this question, one can picture an economic analysis as consisting of two data sets: efficacy and costs. Guidelines on generalizability of efficacy data are relatively straightforward (27,28) and if the same set of patients are to be used and technology is faithfully imported, one can reasonably expect that the performance of the technology will not vary significantly.

However, cost data will depend on the country's economy and exchange rate, the use of internationally traded goods, and more importantly, the health care delivery structure. There have been attempts to standardize methodologies of economic analysis (29,30,31) primarily to ensure sound recommendations but also to facilitate ranking of interventions and geographical comparisons. One approach which has been tried is to calculate purchasing power parities which reflect the real resources available to countries (3); however, experience with this has been very limited.

If there are gross differences between the alternatives being compared, e.g., heart transplant versus measles immunization, then minor differences in methodologies,

efficacy or costs will not change conclusions. This is the basis for the recommendations of the World Development Report (WDR) 1993 (2) on the recommended package of essential services to be offered in countries. The WDR drew heavily on the Health Sector Priorities Review (32) which attempted to summarize existing economic literature on varied interventions for different diseases.

However, beyond the essential package, there still remains the need to undertake economic evaluations to guide decision-makers in other areas. The World Development Report 1993 (2) and the Essential National Health Research Program of the Department of Health (from ENHR Program 5 year plan document, unpublished) recognize this need as they list cost-effectiveness and cost-benefit analysis on different interventions as priorities for research.

The Research Process and Influence on Policy:

The need for economic analysis is premised on the assumption that the information will guide decision-makers. This was achieved only in five studies or 25%. Characteristics of the research process could not be associated with the probability of influence of health policy because of the small number of studies.

An analysis with similar objectives carried out in Europe suggested that method of dissemination, source of funding and purpose of the study may be important determinants. The use of media, government and research organization funding and an explicit objective to inform government policy favored the adoption of results by policy makers. In particular, government or public research organization funding for studies with the explicit purpose of informing policy achieved a 100% success rate. This means that a demand for economic evaluations from the policy makers who provide the funding for these studies will lead to a high likelihood of the results being used. More importantly, 87% of their 66 respondents were able to identify instances in policy-making where an economic evaluations would have been useful input(33).

This study did not explore if the researchers opted for an "advocate" role regarding their results. A researcher-

advocate will have better chances of getting results into policy if he/she is cognizant of the following:

- "1. it must be recognized that decision-makers have a number of objectives and efficient use of resources being just one of these;
2. the degree of impact of a study will be greater if the relevant decision makers are involved in conducting and/or commissioning the study;
3. a study will only be one of the various pieces of information available to decision makers;
4. a study will only have an impact if the results can be produced before the decision it concerns needs to be taken;
5. the greater the number of relevant decision-makers who are aware of the study, the greater the possibility of impact (33)."

Aside from close contact with decision-makers and producing results in a timely fashion, maintaining methodological standards, increasing the local validity of the results, improving dissemination, and taking note of the availability of policy instruments while recognizing the myriad objectives of the decision-maker have been suggested to improve the relevance of economic analysis (6).

RECOMMENDATIONS:

The following are recommended for action:

1. Develop and sustain through a network, foci of technical expertise in economic evaluations in selected geographic areas in the country;
2. Create opportunities for sustained interaction between economists, clinicians and decision-makers through fora, research, policy meetings;
3. Build an on-line database on costs for easy access.
4. Create a demand for economic evaluations among decision makers and commission studies on interventions for areas, especially new programs, considered as priority by the Department of Health (e.g., More in '94); and
5. Disseminate standards to enhance comparability in the implementation and reporting stages of the economic evaluations.

LIMITATIONS:

Despite "best efforts," original copies of two of the evaluations (2A, 13A) were not available for examination. Appraisal was based on the abstracts provided in the database. A description of the research process was not available for the EPI study (21). The Philippine author had retired and could not be reached.

In addition, the author's familiarity with 11 of the studies may have potentially clouded her critical appraisal skills. However, the complete manuscripts of these studies are available from the author and can be obtained by anyone wishing to do an independent appraisal.

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10A Gomes M, Monzon OT, Paladin FJ, Mitchell S. Cost-Effectiveness of Human Immunodeficiency Virus Testing Using Pooled Sera 1990.

11A Dimalanta PF. A Cost-effectiveness Analysis of the Family Planning Program 1993 (thesis).

12A Mangahas MAP, Rosete J. A Cost-Benefit Analysis of the National Immunization Day: OPLAN Alis Disease 1993 (thesis)

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Table 1. Yield of Search Methods

Search Method	Number	Positive Yield
<i>Electronic Search</i>		
Medline	65	5
HERDIN	102	14
<i>Manual Search</i>		
ENHRP Files		0
<i>Mail Survey (response rate of 50%)</i>		
Researchers	142	1
Funders	21	0
Librarians	24	2
<i>Interview</i>		
Key Informants	19	2
TOTAL YIELD		20*

* The 5 studies in the Medline search also found in the HERDIN search.

TABLE 2. DESCRIPTION OF STUDIES

STUDY NO.	TOPIC	PERSPECTIVES	ALTERNATIVES	EFFICACY RESEARCH DESIGN	OUTCOMES	IDENTIFY	COSTS MEASURE	VALUE	DISCOUNTING	SENSITIVITY ANALYSIS	INCREMENTAL ANALYSIS	RESULTS	COMMENTS
17 CEA	Elimination of xerophthalmia or Vitamin A deficiency	exploit 1. society 2. private individual	1. vitamin capsule every 6 months 2. MGG fortified with Vit. A 3. public health/fortification intervention	Before and after survey	morbidity and mortality in both xerophthalmia and non-xerophthalmia population	direct medical indirect costs	actual resource use	market prices	3 & 15%	discount rate	net benefit	capsule & MGG fortification equal	most sophisticated economic analysis done; particularly calculation of foregone earnings of those whose deaths were prevented
18 CEA	Hepatitis B screening	provider or DOH	1. finger prick of mother & if + HBS Ag, immunize infant 2. venous blood of mother & if + HBS Ag, immunize infant 3. venous blood of mother & if + HBS Ag, immunize infant 4. no screening, mass immunization	decision tree analysis using data from multiple sources predominantly local	HBS Ag carrier state	direct medical for tests / vaccines only, no overhead cost	actual resource use	market prices		cost of vaccine, vaccine efficacy	not done	finger prick screening but if cost of vaccine drops, mass immunization	use of decision analysis clearly outlines the choices, outcomes, probabilities and costs
19 CEA	Elimination of human and animal rabies	society	1. vaccination of all dogs, quarantine of animal imports, post-exposure tx of humans 2. post exposure treatment of humans	used multiple sources of data, predominantly local	assume 100% vaccine efficacy rate for dogs	direct medical indirect costs	actual resource use	charges and market prices	8.94%	cost of vaccination/dog canines/ caprio % dogs vaccinated discount rate	net benefit	canine immunization	very optimistic projections of efficacy of program - may have hidden costs. Only study which looked at budgetary implications of the program and the need to find external sources of funding for the program
20 Cost/ outcome description	Post-kidney transplant immunosuppressive therapy	payer	1. Ketoconazole with half dose cyclosporine 2. full dose cyclosporine (standard)	retrospective research design (not sample size)	graft rejection death	direct medical w/ overhead cost	actual resource use	market prices		not done		Ketoconazole + 1/2 dose cyclosporine may be less costly and as effective as full dose cyclosporine	small sample size but promising study need to do randomized controlled trial first
21 CEA	Expanded program on immunization	DOH	1. EPI programs at different centers	used multiple sources of data	fully immunized child	direct medical costs	resource use	expenditures		none		\$ 0.53 - 5.76 / RC Higher population density, more cost-effective because >50% of costs fixed	multinational field test of instrument to do simple cost-effectiveness analysis
22 Cost outcome description	Establishment of perinatal center	payer	1. High risk pregnancy delivered in perinatal center 2. High risk newborn referred to neonatal intensive care unit	retrospective cohort	28-day mortality	direct medical with overhead cost	actual resource use (chart-based)	charges		not done		Inborn patients with better outcomes and lower costs than outborn babies	study done after establishment of perinatal center, not used in decisionmaking except if new perinatal centers will be built.

STUDY NO.	TOPIC	PERSPECTIVES	ALTERNATIVES	EFFICACY RESEARCH DESIGN	OUTCOMES	IDENTIFY	COSTS MEASURE	VALUE	DISCOUNTING	SENSITIVITY ANALYSIS	INCREMENTAL ANALYSIS	RESULTS	COMMENTS
23 CEA	Breast cancer screening	payer	<ol style="list-style-type: none"> 1. no screening 2. breast self examination (BSE) 3. breast self examination by a health provider yearly (HPE) 4. BSE and HPE in series, both tests (+), BSE first 5. BSE and HPE, either test + with only BSE (-) proceeding to the health provider 6. BSE and HPE, either test (+) with both BSE (-) or BSE (+) proceeding to the health provider <p>plus:</p> <ol style="list-style-type: none"> 1. aspiration biopsy alone (AsBx) 2. open biopsy (OpBx) 3. AsBx and OpBx in series, both test (+), AsBx first 4. AsBx and OpBx, either test (+) 	decision tree using multiple sources of data	early cancers detected number of patients alive after 5 years	direct / indirect medical and non-medical	resource use	charges		sensitivity of different examination incidence of breast cancer		BSE AsBx and OpBx either test (+) best strategy Savings of P3,532,777 (1988) per 100,000 women screened. Gain of 2.1 early breast Ca vs. no screening	not much detail on costs provided
1A CEA	Prophylactic antibiotic coverage for meconium stained infants	hospital	<ol style="list-style-type: none"> 1. prophylactic ampicillin and nistatin x 3 days for meconium stained infants 2. antibiotics administered only if with signs and symptoms of infection 	randomized controlled trial	Infas prevented in first 10 days of life	direct medical costs	actual resource use (chart-based)	market prices for drugs and charges for others		efficacy ratio	yes	no difference in effects but with cost savings if antibiotics administered only to infants with infections	a study which led to the junking of a long-held
2A CEA	Modes of ventilatory support in orotracheal patients	payer	<ol style="list-style-type: none"> 1. mechanical ventilation for intubated patients 2. ambu-bag 	cohort	arterial blood gas within 24 hour % with barotrauma	direct medical costs	actual resource use	charges		not done	not done	ambu-bag is safe, cost-effective	example of a study which will never be done in industrialized countries because of availability of mechanical ventilation
2A CEA	Management of acute respiratory infections in children	Department of Health	<ol style="list-style-type: none"> 1. WHO-ARI algorithm 2. provider dependent standard practice 	community-based cohort	ARI mortality	direct medical costs	actual resource use (sampling done)	market prices		not done	yes	WHO-ARI algorithm more cost-effective than provider dependent standard practice	because of the perspective adopted (DOH), the study fails to capture one important cost component of the alternative being studied i.e. volunteer or BHW time
4A CEA	Radiographic diagnosis of sinusitis	payer	different numbers of radiographic views to diagnose sinusitis	diagnostic test study with gold standard comparison	diagnosis of sinusitis	direct medical costs	actual resource use	market prices		% diagnostic accuracy	yes	use of 2 views is more cost-effectiveness vs. other combinations	the only study looking at efficient use of a diagnostic test

STUDY NO.	TOPIC	PERSPECTIVES	ALTERNATIVES	EFFICACY RESEARCH DESIGN	OUTCOMES	IDENTIFY	COSTS MEASURE	VALUE	DISCOUNTING	SENSITIVITY ANALYSIS	INCREMENTAL ANALYSIS	RESULTS	COMMENTS
5A Cost-minimization analysis	Chemotherapy of tuberculosis	Department of Health	1. Three drugs in tx of PTB (standard tx) 2. Four drugs in tx of PTB	efficacy data from RCTs in literature (foreign & local)	% cure	direct medical costs	actual resource use	market prices		% failure rate % relapse rate for 3 and 4 drugs		4 drugs cheaper than 3 drugs	using data from literature, does extensive sensitivity analysis showing robust conclusions
6A Cost outcome description	Management of pregnant patients with herpes simplex virus	payer	1. screening for viral shedding 2. physical examination	decision analysis using various sources of data (local & foreign)	congenital herpes virus infection	direct medical and non-medical costs	actual resource use	charges and market prices		not done	not done	physical examination attains same outcomes and saves money	this study provides cost data to further provide evidence in support of a clinical policy.
7A CEA	Hospital-based treatments of acute diarrhea	Department of Health	1. treatment in diarrhea management unit 2. standard practice	before and after study	process outcomes, e.g. correct assessment, correct hydration	direct medical including overhead costs	actual resource use	market prices		not done		DMU with better outcomes and resulted in savings of 50%	a study which used process measures, study also intended to provide additional evidence of one alternative versus another to convince administration.
8A CEA	-DO-	-DO-	-DO-	-DO-	-DO-	-DO-	-DO-	-DO-	-DO-	-DO-	-DO-	DMU with better outcomes and savings	study undertaken due to success of first study (7A). because of use of process measures, the study was able to give concrete recommendations on further improvements of the service.
9A CBA	Control of schistosomiasis japonica through chemotherapy	society	1. screening and treatment of positive cases with praziquantel	before and after trial	reduction in prevalence		no detail given		none done but needed to be done	none	net benefit	P 233M gained in 5 years	not primarily written as CBA, paper not detailed enough to allow critical assessment, modeling was the primary approach to predict future outcomes
10A CEA	HIV testing using pooled sera	provider	1. screening blood for HIV using ELISA and particle agglutination tests	validity study	sensitivity specificity	direct medical costs including equipment other overhead costs not included	actual resource use	market prices	not done	prevalence rate pool size	not done	pool size of 5 with particle agglutination less costly than ELISA up to HIV prevalence of 10%	appears to be more of a cost-minimization analysis, assuming 100% detection of HIV after testing/confirming
11A CEA	Family planning program	government	1. family planning program as practised in the different years	assumed efficacy operational measure used	# of conception couple of years of protection, years of effective protection, future births averted	direct medical costs, including overhead	from accounts of the program	expenditures	not done	none	not done	improved cost-effectiveness of program in recent years	exclusively analysis of secondary data
12A CBA	National immunization day	society	National Immunization Day alone	assumed efficacy	average waiting days lost due to acute illness translated to monetary unit	includes direct and indirect costs	from accounts of program	expenditures	2-19%	none	net cost	net cost with NID	exclusively analysis of secondary data
13A CBA	Rooming-in						no detail						

TABLE 2. SUMMARY OF STUDIES BASED ON METHODOLOGIC STANDARDS

	CLEARLY DEFINED QUESTION	COMPREHENSIVE DESCRIPTION OF ALTERNATIVES	EFFECTIVENESS ESTABLISHED	RELEVANT COSTS IDENTIFIED	COSTS APPRO- PRIATELY MEASU	COSTS VALUED CREDIBLY	DISCOUNTING	INCREMENTAL ANALYSIS	SENSITIVITY ANALYSIS	DISCUSSION AND RECOMMENDATION	TOTAL
17. Vit. A deficiency	/	/	/	/	/	/	/	/	/	/	10
18. Hepatitis B screening	/	/	/	/	/	/		X	/	/	8
19. Rabies elimination	/	/	X	/	/	/	/	/	/	/	9
20. Immunosuppression in Kidney transplant	/	/	X	/	/	/		/	X	/	7
21. EPI	/	X	/	/	/	/		/	X	/	7
22. Perinatal center	/	/	X	/	/	X		/	X	/	6
23. Breast Ca	/	/	/	/	/	X		/	/	/	8
1A. Antibiotic prophylaxis in meconium-stained newborns	/	/	/	/	/	/		/	/	/	9
2A. Ventilatory support	/	/	X	/	/	X		X	X	/	5
3A. Acute Respiratory infection	/	/	/	/	/	/		/	X	/	8
4A. Radiographic diagnosis of sinusitis	/	/	/	/	/	/		/	/	/	9
5A. Chemotherapy in Tuberculosis	/	/	/	/	/	/		/	/	/	9
6A. Pregnancy and Herpes Simplex II virus	/	/	/	/	/	/		/	X	/	8
7A. Diarrhea Management in RITM	/	/	/	/	/	/		/	X	/	8
8A. Diarrhea Management in DOH hospitals	/	/	/	/	/	/		/	X	/	8
9A. Schisto control	/	X	X	?	?	?	X	/	X	/	3
10A. HIV screening with pooled blood	/	/	/	/	?	?		X	/	/	6
11A. Family planning	/	X	X	/	X	X		X	X	/	3
12A. National immunization day	/	X	X	/	X	X	/	/	X	/	5
TOTAL	19 (100%)	15 (79%)	12 (63%)	18 (94%)	15 (79%)	12 (63%)		15 (78%)	8 (42%)	19 (100%)	8 MEDIAN

Table 4. DESCRIPTION OF RESEARCH PROCESS OF ECONOMIC EVALUATIONS

STUDY NUMBER	RESEARCH TITLES	RESEARCH INITIATOR	SOURCES OF FUNDING	PEOPLE PERFORMING THE RESEARCH	RESOURCES EXPENDED IN THE STUDY	PRESENTATION OF RESULTS:		HEALTH POLICY INFLUENCE
						TO WHOM:	HOW:	
17	Benefit-Cost Analysis in the Nutrition Area: A Pilot Project in the Philippines	Investigator	NSDB - (Philippine government ; Cornell University ; USAID)	Dr. B. Popkin - handled the economic evaluation Dr. F. Salon Dr. T. Fernandez Dr. M. Latham	money - @ \$150,000 to \$200,000 (1973)	gov't, health policy personnel DOH International scientific community administrations/funders	special briefings conferences	Yes. It was followed by regional projects, but for complex set of reasons Dr. Salon could explain, it was ultimately not made national policy and only now is being implemented at the national level.
18	CEA of Simple Micromethod for Hepatitis B	Investigator	BOSTID National Academy of Sciences, USA	Dr. M.A. Lansang	money - NIL for CEA time - < 6 months	academe Dept. of Health International scientific community medical community/ other health professionals who implements	scientific conference publications	Yes. Hepatitis B mass immunization, which was most cost-effective eventually adopted by DOH.
19	Rabies Control in the Republic of the Philippines: Benefits and Costs of Elimination	Investigator	personal funds of Dr. Dan Fishbein and some support from the CDC, Atlanta, GA.	Dr. D. Fishbein Dr. N. Miranda Dr. P. Merrill	money - P10,000.00 (1988) excluding Dr. Fishbein's travel to the Philis. time - 6 months	academe administration/funders beneficiaries Dept. of Health International scientific community local medical community/other health professionals who implement	briefings letters scientific conference conventions	Yes, the efforts now being placed on rabies eradication and control are partly in response to the data generated by the study.
20	Ketoconazole in Post-Transplant Triple Therapy: Comparison of Costs and Outcomes	Investigator	PCHRD	Dr. I. Gucco Dr. T. Tan-Torres	money - P15,000 + (1990) time - 2 months	academe International scientific community medical community/ other health professionals who implements	scientific conference	No. Results very difficult to implement as it goes against standard practice.
22	Clinical Outcomes and Costs of Hospitalization of Inborn and Outborn Infants in a Perinatal Unit	Investigator	PCHRD	Dr. A. Soyao Dr. T. Tan-Torres Dr. S. Sarcia	money - P15,000 (1990) time - 4 months	academe Dept. of Health medical community/ other health professionals who implements	scientific conference	No. It only provided supporting evidence for pre-existing policy.
23	Cost-Effectiveness of Breast Exam as a CA Screening	Investigator	Rockefeller Foundation	Dr. C. Ngelangel	money - @ \$5,000 (1989) time - 12 months	academe administration/funders Dept. of Health, PCCP International scientific community medical community/ other health professionals who implements	briefings conventions scientific conference publications	Yes. The Philippine Cancer Control Program has for its Breast Screening Program annual breast exam by health providers and BSE. Currently we are approved and funded to do a randomized field trial on PE +/- BSE vs. no active screening in Metro Manila to start 1995.

STUDY NUMBER	RESEARCH TITLE	RESEARCH INITIATOR	SOURCES OF FUNDING	PEOPLE PERFORMING THE RESEARCH	RESOURCES EXPENDED IN THE STUDY	PRESENTATION OF RESULTS: TO WHOM:	PRESENTATION OF RESULTS: HOW:	HEALTH POLICY INFLUENCE
1A	Anti-Microbial Prophylaxis Among Meconium-Stained Newborns	Investigator	Rockefeller Foundation University of the Phils. College of Medicine Committee on Research Implementation and Development	Dr. G. Gonzales with consultant, Dr. David Evans	money - \$5,000 + P25,000 [1987] time - 3 months	medical community/ other health professionals who implements	scientific conference	Yes, rescinded policy on prophylactic antibiotics.
3A	Cost-Effectiveness Analysis of the Acute Respiratory Infection Algorithm in Bohol	commissioned by funder	AIDAB	Dr. T. Tan-Torres	money time	Department of Health International scientific community	scientific conference	Difficult to say as this just provided additional evidence in favor of a practice for which there was already strong political will.
4A	Determining the Optimum Number of Views in Radiographic Diagnosis of Paranasal Sinusitis	Investigator	PCHRD	Dr. G. Vicente Dr. T. Tan-Torres	money - P15,000 [1990] time - 1 month	academe Department of Health International scientific community medical community/ other health professionals who implements	scientific conference	No.
5A	Cost-Minimization Analysis of Triple Versus Quadruple Regimens in Short Course Chemotherapy for Pulmonary TB	Investigator	PCHRD	Dr. A. Alera Dr. A. Cabanban Dr. T. Tan-Torres	money - P15,000 [1990] time - 1 month	academe Department of Health medical community/ other health professionals who implements	scientific conference	No but it influenced the research agenda.
6A	Management of Pregnant Patients with Herpes Simplex II or Papilloma Virus Infections: Probable Outcomes and Costs 1991	Investigator	PCHRD	Dr. R. Manalastas Dr. T. Tan-Torres	money - P15,000 [1990] time - 1 month	academe medical community/ other health professionals who implements	scientific conference	No.
7A	Comparing Costs of Hospital-Based Treatments of Diarrhea at the Research Institute for Tropical Medicine	Investigator	PCHRD	Dr. I. Lintag Dr. T. Tan-Torres Dr. R. Aplasca	money - P15,000 [1990] time - 1 month	academe medical community/ other health professionals who implements	scientific conference	No. It only provided supporting evidence for a policy already promulgated but needing a push for effective implementation.
8A	Cost-Effectiveness Analysis of Diarrhea Case Management in the Department of Health Hospitals	Investigator	Child Survival Project, Department of Health	Dr. R. Aplasca Dr. T. Tan-Torres Dr. C. Carlos	money - P861,740 [1992] time - 4 months	academe Department of Health International scientific community medical community/ other health professionals who implements World Health Organization	scientific conference	No. It only provided supporting evidence for pre-existing policy.
9A	Model on Expectations in the Control of Schistosomiasis Japonica through Chemotherapy	Investigator	GOP - Department of Health Schistosomiasis Control Service	Dr. A. Santos, Jr. Dr. B. Blas Dr. P. Velasco Dr. O. Alfaly Mr. E. Erce Mr. J. Basos	money - difficult to quantify; all are working part-time in this study time - about 12 months	Department of Health International scientific community	briefings	Yes, policy on coverage. Before PDHP II, 50% coverage; under WS-PDHP II assistance - 100%
11A	A Cost-Effectiveness Analysis of the Family Planning Program	Investigator	from investigator	Ms. P. Dimalanta	time - 4 months	academe	thesis report	No.
12A	A Cost-Benefit Analysis of the National Immunization Day OPLAN: Aids Disease	Investigator	partner's personal funding	Ms. M.A.P. Mongahas Mr. J.B. Rosele	money time - 3 months	academe undergraduate students	briefings	No. As of the moment.
13A	Health Economic Studies at the Dr. Jose Fabella Memorial Hospital	Investigator	personal	Dr. R. Gonzales	time - 1 month	administration/funders Dept. of Health press	briefings	No.

Appendix

1 Distinguishing characteristics of health care evaluations

Are both costs (inputs) and consequences (outputs) of the alternatives examined?

Are there comparisons of two or more alternatives?

		NO		YES
		Examines only consequences	Examines only costs	
NO	1A PARTIAL EVALUATION	Outcome description	1B Cost description	2 PARTIAL EVALUATION Cost-outcome description
YES	3A PARTIAL EVALUATION	Efficacy or effectiveness evaluation	3B Cost analysis	4 FULL ECONOMIC EVALUATION Cost-minimization analysis Cost-effectiveness analysis Cost-utility analysis Cost-benefit analysis

Appendix 2. Measurement of costs and consequences in economic evaluations

Type of study	Measurement/valuation of costs in both alternatives	Identification of consequences	Measurement/valuation of consequences
Cost-minimization analysis	Dollars	Identical in all relevant respects	None
Cost-effectiveness analysis	Dollars	Single effect of interest, common to both alternatives, but achieved to different degrees	Natural units (e.g., life-years gained, disability-days saved, points of blood pressure reduction, etc.)
Cost-benefit analysis	Dollars	Single or multiple effects, not necessarily common to both alternatives, and common effects may be achieved to different degrees by the alternatives	Dollars
Cost-utility analysis	Dollars	Single or multiple effects, not necessarily common to both alternatives, and common effects may be achieved to different degrees by the alternatives	Healthy days or (more often) quality-adjusted life-years

Annex 3: LIST OF MAIL SURVEY:
PCHRD Directory - University Based Researches

	UNIVERSITY
1. ABAGUIN, Carmencita M.	UPM C Nurs
2. ACEVEDO, Eustaquia T., M.D.	PLM CM
3. ALBA, Milagros O.	UPM C Nurs
4. ALFILER, Ma. Concepcion, Ph.D.	UPD C Pub Adm
5. ALMEDA, Leonardo A., M.D.	UERMMMC
6. ANASTACIO, Antonio L., M.D.	UERMMMC
7. ANDANAR, Agnes C., M.D.	Chong Hua CM Cebu
8. ANGELO, Priscilla Felipe, M.D.	PLM CM
9. ANONUEVO, Susan P.	Im Con Col Cebu
10. AQUINO, Rommel M., M.D.	UERMMMC
11. ARCELLA, Crisostomo A., M.D.	UERMMMC
12. AVENTURA, Avenilo P., M.D.	UST STUH
13. BACLAYON, Melvina T. M.D.	CHH Cebu-Pedia
14. BAJA-PANLILIO, Herminia, M.D.	UERMMMC
15. BARBA, Corazon V.C.	UPLB CHE IHNF
16. BASA, Antonia Cruz, M.D.	MCU FDTSM
17. BASA, Generoso F., M.D.	UST Med & Surg
18. BAUTISTA, Victoria A., Ph.D.	UPD Pub Adm
19. BEATO, Napoleon Enrico T., M.D.	UERMMMC
20. BERINGUELA, Adela, Ph.D.	UPM CAS
21. BONGALA, Domingo, Jr., M.D.	UERMMMC
22. BONGGA, Demetria C., Ph.D.	UPD C Home Econ
23. BUENVIAJE, Mirriam B., M.D.	UST STUH
24. CABUGUIT, Vicente S., M.D.	UERMMMC
25. CAJA, Teresita R., M.D.	PLM
26. CAMACHO, Angelita C., M.D.	FEU NRMF
27. CANELA, Ma. Delta A., M.D.	UERMMMC
28. CANTORIA, Magdalena C., Ph.D.	UPM Pharm
29. CARPIO, Ramon E., M.D.	UST Med & Surg
30. CASILLAN-GARCIA, Fe, Ph.D.	UPD C Ed
31. CATILLO, Amorita V.	UPM C Pharm
32. CASTILLO, Fatima A., Ph.D.	UPM CAS
33. CASTRO, Troadio B., M.D.	UST Med & Surg
34. CLAVERIA, Florencia G.	DLSU Bio/ Reseach
35. CO, Leonardo L., M.D.	UST STUH
36. CONCEPCION, Mercedes B., Ph.D.	UPD
37. CONSIGNADO, Godiosa O., M.D.	UERMMMC
38. CORCEGA, Thelma F.	UPM C Nurs
39. CORDERO, Rosa R.	UPD C Pub Adm
40. CUYEGKENG, Trinidad C., Ph.D.	PWU UNICOR
41. DE CASTRO-BERNAS, Gloria, Ph.D.	UST RCNS Biochem
42. DE GUZMAN, Eliseo A.	UPD Pop'n Inst
43. DE GUZMAN, Ludivino G., M.D.	UERMMMC
44. DE LEON, Agnes Rosario A.	UPM C Nurs
45. DE LEON-PORRAS, Elizabeth, M.D.	FEU NRMF
46. DE LA LLANA, Ma. Reina Paz A.	UPD CSSP Psyc
47. DE LA PENA, Marisa Rhodora O.	PWU
48. DE LOS REYES, Josefina J.	UPM CAS
49. DE LOS REYES, Rey H., M.D.	FEU NRMF OG-Gyn

50. DE LOS SANTOS, Maribeth T., M.D.	UERMMMC
51. DOMINGO, Lita J.	UPD Pop'n Inst
52. DOMINGO, Ma. Fe A.	UPD CSSP
53. DORIA, Alfonso L., M.D.	UST STUH
54. ENRIQUEZ, Ma. Luisa D.	DLSU CS
55. ESTRADA, John Vincent O., M.D.	UERMMMC
56. ESTRADA, Sarah Luisa T.S., M.D.	UERMMMC
57. FLORENCIO, Cecilia A., Ph.D.	UPD DFoodSci&Nutn
58. FONTANILLA, Ma. Alodia, Ph.D.	UPD C Ed
59. GALVEZ-SANCHEZ, Ma. Fe, D.D.M.	UPD C Ed
60. GARCIA, Rolando G., Ph.D.	UPD CS
61. GASTARDO-CONACO, Ma. Cecilia, Ph.D.	UPD CSSP Psyc
62. GAVINO, Ma. Irma B.	UST C Nurs
63. GEALOGO, Rufino A.	UPD Pop'n Inst
64. GERVASIO, Natividad C., D.D.M.	UPM C Dent
65. GONZAGA, Norman Clemente, M.D.	UST Med & Surg
66. GRECIA, Amelia N., M.D.	Wt Vis Stt U Ilo.
67. GUTIERREZ, Evelyn G., M.D.	PLM C Med
68. HERNANDEZ, Cristina B., M.D.	Perp Help CM Binan
69. HERNANDEZ, Emilio A. Jr., M.D.	UST STUH
70. HERRIN, Alejandro N., Ph.D.	Ma'am UPD Econ
71. ISAAC, Cynthia V.	UPM CAMP
72. JOCSON, Raquel C., M.D.	PLM
73. JOVES, Policarpio B. Jr., M.D.	FEU NRMF
74. KARGANILLA, Bernard Leo M.	UPM Dept Soc Sci
75. KHO, Stanley U., M.D.	UERMMMC
76. KUAN, Letty G.	UPM C Nurs
77. LACHICA, Robert R., M.D.	UPD Health Service
78. LAGO, Leonor C., D.D.M.	UPM C Dent
79. LANTO, Ma. Emma Alesna, M.D.	CHH Cebu
80. LAO, Luis Mayo, M.D.	UST Med & Surg
81. LAO-NARIO, Ma. Brigitte T.	UPM C Nurs
82. LARAYA, Lournia T., M.D.	St. Paul Col. Mia
83. LAURENTE, Cecilia M.	UPM C Nurs
84. LAYO-DANAO, Leda, Ph.D.	UPM C Nurs
85. LERMA, Norma V.	UST Pharm
86. LIM, Victoriano Y., M.D.	UST STUH
87. LLAMAS, Eusebio E., M.D.	UST Med & Surg
88. LLAMAS, Lourdes, M.D.	UST Med & Surg
89. MAGLAYA, Araceli S.	UPM C Nurs
90. MAGPILI, Policarpia	UPM CAMP
91. MANANSALA, Ma. Elena J.	UST Med & Surg
92. MASLANG, Edith V., Ph.D.	UPD CSWCD
93. MEJILLANO, Evelina A.	UPD C Ed
94. MOJICA, Ma. Georgina D.	UPM CAMP
95. MONSALUD, Ma. Elena M., M.D.	FEU NRMF
96. MONTE, Rebecca M., M.D.	FEU NRMF
97. MONZON, Orestes F., M.D.	UST STUH
98. NATIVIDAD, Josefina N.	UPD CSSP
99. NAVAL, Cosme Ildelfonso N., M.D.	Ust Med & Surg
100. NAVARRA, Sandra V., M.D.*	UST STUH
101. OCONER, Jose T., M.D.	UST STUH
102. ONG, Helen, M.D.	FEU NRMF
103. ORDINARIO, Artemio T., M.D.	UST STUH

104.PABLO, Ignacio S., Sc.D.	PWU
105.FACIFICO, Jaime L.	DLSU EACM Cavite
106.PAHL, George	DLSU CS
107.PAJE-VILLAR, Estrella, M.D.	UST Med & Surg
108.PALACIOS, Concordia G., D.D.M.	CEU Mia C Dent
109.PEREZ, Aurora E., Ph.D.	UPD Pop'n Inst
110.PEREZ, Jesus Y., M.D.	UST Med & Surg
111.PEREZ, Esmeralda, Ph.D.	UPM CAS
112.FOLLOSO, Tomas M. Jr., M.D.	CHM Cebu
113.PRODIGALIDAD, Abelardo M., M.D.	UERMMMC
114.FUNZALAN, Rene, M.D.	UERMMMC
115.PURUGGANAN, Hermogenes B., M.D.	UST Med & Surg
116.FAMIREZ, Jose S., M.D.	UERMMMC
117.RAHIRO, Laurie S., Ph.D.	UPM CAS D Soc Sci
118.RAMOS, Manuel M., Jr., M.D.	UERMMMC
119.RAYMUNDO, Corazon H., Ph.D.	UPD Pop'n Inst
120.REBULLIDA, Ma. Lourdes	UPM CAS
121.REGAL, Hermogenes R., Jr., M.D.	UST STUH
122.REYES, Ofelia L., M.D.	UST STUH
123.RIGOR, Eustacia, M.D.	UST STUH
124.RIVERA, Esperanza F., M.D.	MCU FDTSHFCH
125.ROMERO, Roel A.P., M.D.	UERMMMC
126.ROHO, Ramon Edgardo, M.D.	FEU NRMF
127.RUBIO, Corazon A., M.D.	Div World Tac
128.RUBITE, Rosario R., Ph.D.	UPM CAS Bio
129.SAMONTE, Elena L., Ph.D.	UPD CSSP Psyc
130.SANSON, Josephine C., M.D.	UERMMMC
131.SANTOS, Carmen Enverga, M.D.	UST Med & Surg
132.SENO, Vivien A.	Col Imm Conc Cebu
133.SI, Arlene S.	UPM C Pharm
134.SIASOCO, Ruben E., M.D.	UERMMMC
135.SIBAYAN Renato Q., M.D.	UST Med & Surg
136.SOLEVILLA, Rosalinda C., Ph.D.	UST RCNS
137.SOLLANO Jose D., M.D.	Med & Surg
138.SY, Dalisay C., Ph.D.	Med & Surg
139.SYCIP, Ly, Ph.D.	UPD CSSP Psyc
140.SYLIANCO, Clara Y.L., Ph.D.	NSRI Chem
141.TAN, Truman N., M.D.	Help MC Binan
142.TANTENGCO, Angelina T., M.D.	UPM
143.TAYAG, Josefina G., D.F.A.	CAS
144.TOMULTO, Cecilia D., M.D.	Perp Help MC Binan
145.TORRALBA Tito P., M.D.	UST Med & Surg
146.TORRES, Leonardo A., M.D.	PLM
147.TUNGPALAN, Luz B., Ph.D.	UPM Registrar
148.UY, Karl Fabian L., M.D.	MCU FDTM Hosp
149.VALDELLON, Erlinda V., M.D.	UERMMMC
150.VARELA, Amelia F., Ph.D.	UPD Pub Adm
151.VELES, Jo E., M.D.	Slmn Unv M C Dumag
152.VENTURA, Elizabeth R., Ph.D.	UPD CSSP Psyc
153.VICTORIO, Sandra T.G., M.D.*	UST STUH
154.VILLARAZA, Cynthia O.	UPM Dept Spch Path
155.VILLARICA, Umil, M.D.	Perp Help MC Binan
156.YAP, Grace V.	PWU C Pharm
157.ZABLAN, Zelda C., Ph.D.	UPD Pop'n Inst

PCHRD REGIONAL OFFICE

1. Dr. Charito Awiten
RHRDC XI, RHO, Davao City
2. Dr. Conrado Gaslim Jr.
NLHRDC, RHO, San Fernando, La Union
3. Dr. Jaime Manila
RHRDC VI, WVSU, Iloilo City
4. Dr. Josefina Poblete
RHRDF, CIM, Cebu City

FOLLOW UP LETTERS SUGGESTED IN SURVEY

1. Dr. Eduardo Gonzalez
Policy Research Unit D.A.P.
2. Engr. Elpidio Nerona
DOH Field Ut #1, San Fernando, La Union
3. Ms. Trinidad Osteria
De La Salle University
4. Mrs. Costancia P. Pitpitan
Phil Womens University
5. Dr. Fortunato Sevilla III
UST Research Center for Natural Sciences
6. Dr. Grace Valerio
MCU FDTMF Hospital

Dear _____,

The Philippine Institute for Developmental Studies has commissioned 24 baseline studies to provide information to assist in developing policy on health financing reform. Among these studies is a review of research on the cost of providing health services in the Philippines for the period October 1984 - September 93. This review seeks to identify, critically appraise and summarize available data on the costs of health interventions done in the country. All reports on the data should have been completed during the period October 1, 1984 to September 30, 1993. The inclusion criteria are the following:

1. economic evaluation (cost-minimization, cost-effectiveness, cost-utility or cost-benefit analysis) as a primary focus or as a major component of a bigger study; OR
2. studies that include collection of costs for a health intervention in the objectives and/or methodology of collecting costs is explicitly stated.

The study will exclude standard financial reports of health projects or studies where the cost data and/or its implications on the intervention are not discussed at all in the report.

Part of the process of identifying the studies is a mail survey of the researchers in the field of health who are based in universities. May we request you to spend a few minutes answering the following:

1. Have you or anyone you know/heard about carried out any of the studies which can be included in the review (see above inclusion criteria)?

_____ YES _____ NO

2. If yes, please write the name of the contact person with his address and telephone numbers:

NAME: _____

Address: _____

Tel. No. _____ Fax No. _____

Thank you very much for your cooperation. A copy of the report will be sent to anyone contributing a study in the review.

Please send back this sheet as soon as possible.

CEU Fax # (632) 522-32-35

Respectfully yours,

Lessa L. Tan-Torres, M.D., M.Sc.

Annex 5 :

LOCAL REPRESENTATIVES

1. Mr. Harry Abrillo
Meralco Foundation
2. Mr. Thomas Allen
World Bank
3. Mr. Hirokazu Arai
Embassy of Japan
4. Mr. Johan Ballegeer
Embassy of Belgium
5. Mr. William M. Fraser
Asian Development Bank
6. Mr. Harle Freeman Greene
Embassy of New Zealand
7. Mr. Christopher Gyellenstierna
Embassy of Sweden
8. Mr. Stephen Heeny
Canadian Embassy
9. Ms. Jannicke Jaeger
Royal Norwegian Embassy
10. Mr. Mogens Jensen
Royal Danish Embassy
11. Ms. Nicola Jones
The Ford Foundation
12. Mr. Angelo King
Angelo King Foundation, Inc.
13. Mr. Keshhab Mathima
UNICEF
14. Mr. Alan Montgomery
British Embassy
15. Dr. Hans Peterstrauch
Embassy of Switzerland
16. Mr. Pedro Picornell
Andres Soriano Corporation

Annex 6 :

LIST OF LIBRARIES WITH LETTER SURVEY

1. Ms. Loretta G. Bautista
UERMMMC Medical Library
2. Ms. Natividad R. Caballero
MCU-Filemon D. Tanchoco Medical Foundation Library
3. Ms. Helen M. Canizares
West Visayas State University College of Medicine Library
4. Ms. Consuelo Cariaga
Mindanao State University Library
5. Ms. Sylvia M. Catalla
Remedios T. Romualdez Medical Foundation
College of Medicine Library
6. Ms. Sarah de Jesus
University of the East Library
7. Ms. Catalina Dela Riarte
Cebu Institute of Medicine Medical Library
8. Ms. Anabella T. Diapera
Cebu Doctors' College of Medicine Medical Library
9. Ms. Nida G. Estrella
Fatima College of Medicine Library
10. Ms. Violeta Feliciano
Lyceum-Northwestern Colleges Central Library
11. Ms. Cecilia S. Go
University of Sto. Tomas Medical Library
12. Ms. Emily S. Gumingan
Saint Louis University College of Medicine Library
13. Ms. Sarah Belen D. Jacalan
Xavier University Dr. Jose P. Rizal College of Medicine
Library
14. Mrs. Rebecca M. Jocson
PLM-Celso Al Carunungan Memorial Library
15. Mr. Rogelio Malili
Ateneo de Manila Rizal Library

16. Ms. Susan C. Muñoz
Virgen Milagros Educational Institute
Institute of Medicine Foundation Library
17. Ms. Felisa J. Padere
Gullas College of Medicine Library
18. Ms. Rosemarie Rosali
UP Dil, Sch of Economics
19. Ms. Aurora S. Salvador
FEU-Dr. Nicanor Reyes Jr. Memorial Medical Library
20. Ms. Imelda B. Sinco
Manila Doctors College
21. Ms. Julieta P. Soriano
Angeles University Foundation Health Sciences Library
22. Ms. Susan A. Tapulado
University of San Carlos Nursing Library
23. Ms. Emiliana L. Vicente
DLSU-EACM Library

Annex 7. List of Key Informants Approached

A12

1. Prof. Orville Solon
University of the Philippines School of Economics
2. Prof. Alejandro Herrin
University of the Philippines School of Economics
3. Mr. Mario Taguiwalo
Health Policy Development Program
4. Mr. Rhais Gamboa
Health Finance Development Project
5. Dr. Benjamin Loewinsolm
Asian Development Bank
6. Ms. Jane Thomason
Asian Development Bank
7. Ms. Cristella Gose-Dakila
De la Salle University Department of Economics
8. Dr. Jovita Quilala
Malaria Control Service, DOH
9. Dr. Corazon Teoxen
Tuberculosis Control Service
10. Dr. Jesus Abella
Communicable Disease Control Service
11. Dr. Ponciano Aberin
Non-Communicable Disease Service
2. Dr. Caspillian (OIC)
Maternal and Child Health Service
3. Dr. Manuel Dayrit
Field Epidemiology Training Program
4. Dr. Wilfredo Asoy
Environmental Service
5. Dr. Bayani Blas
Schistosomiasis Control Service
6. Dr. Delfel Schwefel
Health Information and Management Information System
7. Ms. Cathy Soller
Family Planning Service
18. Dr. Marieta Baccay
Bureau of Research Laboratory
- Dr. Divina Hey-Gonzales
Essential National Health Research Program
- Dr. Ruben Caragay
College of Public Health, UPM
- Dr. Ninda Melba
College of Public Health, UPM



CLINICAL EPIDEMIOLOGY UNIT
PHILIPPINE GENERAL HOSPITAL
COLLEGE OF MEDICINE
UNIVERSITY OF THE PHILIPPINES MANILA



Dear _____,

The Philippine Institute for Developmental Studies has commissioned 24 baseline studies to provide information to assist in developing policy on health financing reform. Among these studies is a review of research on the cost of providing health services in the Philippines for the period October 1984 - September 1993. This review seeks to identify, critically appraise and summarize available data on the costs of health interventions done in the country. Part of the process of identifying the studies is a survey of researchers in the field of health. We came across your study entitled "_____". In connection with this, may we request you to spend a few minutes answering our questionnaire:

1. Who thought about doing/initiating the research?
 _____ investigator (personal interest)
 _____ commissioned by funder
 _____ on demand by users
 _____ Others, please specify _____
2. What was/were the sources of funding of the research?

3. Who were the people performing this research?
 (specifically the technical part on costing/economic evaluation) _____
 _____ (send curriculum vitae if possible)
4. What resources were expended on the study?
 _____ money, specify amount in pesos at the time of the study _____
 _____ time, specify duration of the study (economic evaluation/costing part) in months _____
5. To whom were the results presented to? (check as many are applicable)
 _____ academe
 _____ beneficiaries
 _____ international scientific community
 _____ medical community/ other health professionals who implements
 _____ Others, please specify _____
 _____ administrator/funders
 _____ Department Of Health
 _____ press

Appendix 9 A SUGGESTED CHECKLIST FOR
ASSESSING ECONOMIC
EVALUATIONS

1. Was a well-defined question posed in answerable form?
 - 1.1 Did the study examine both costs and effects of the service(s) or programme(s)?
 - 1.2 Did the study involve a comparison of alternatives?
 - 1.3 Was a viewpoint for the analysis stated and was the study placed in any particular decision-making context?
2. Was a comprehensive description of the competing alternatives given? (i.e., can you tell who? did what? to whom? where? and how often?)
 - 2.1 Were any important alternatives omitted?
 - 2.2 Was (Should) a *do-nothing* alternative (be) considered?
3. Was there evidence that the programmes' effectiveness had been established?
 - 3.1 Has this been done through a randomized, controlled clinical trial? If not, how strong was the evidence of effectiveness?
4. Were all the important and relevant costs and consequences for each alternative identified?
 - 4.1 Was the range wide enough for the research question at hand?
 - 4.2 Did it cover all relevant viewpoints? (Possible viewpoints include the community or social viewpoint, and those of patients and third party payers. Other viewpoints may also be relevant depending upon the particular analysis.)
 - 4.3 Were capital costs, as well as operating costs, included?
5. Were costs and consequences measured accurately in appropriate physical units? (e.g., hours of nursing time, number of physician visits, lost workdays, gained life-years)
 - 5.1 Were any of the identified items omitted from measurement? If so, does this mean that they carried no weight in the subsequent analysis?
 - 5.2 Were there any special circumstances (e.g., joint use of resources) that made measurement difficult? Were these circumstances handled appropriately?
6. Were costs and consequences valued credibly?
 - 6.1 Were the sources of all values clearly identified? (Possible sources include market values, patient or client preferences and views, policy-makers' views and health professionals' judgements.)
 - 6.2 Were market values employed for changes involving resources gained or depleted?
 - 6.3 Where market values were absent (e.g., volunteer labour), or

market values did not reflect actual values, (such as clinic space donated at a reduced rate), were adjustments made to approximate market values?

- 6.4 Was the valuation of consequences appropriate for the question posed? (i.e., Has the appropriate type or types of analysis—cost-effectiveness, cost-benefit, cost-utility—been selected?)
7. Were costs and consequences adjusted for differential timing?
 - 7.1 Were costs and consequences which occur in the future 'discounted' to their present values?
 - 7.2 Was any justification given for the discount rate used?
8. Was an incremental analysis of costs and consequences of alternatives performed?
 - 8.1 Were the additional (incremental) costs generated by one alternative over another compared to the additional effects, benefits or utilities generated?
9. Was a sensitivity analysis performed?
 - 9.1 Was justification provided for the ranges of values (for key study parameters) employed in the sensitivity analysis?
 - 9.2 Were study results sensitive to changes in the values (within the assumed range)?
10. Did the presentation and discussion of study results include all issues of concern to users?
 - 10.1 Were the conclusions of the analysis based on some overall index or ratio of costs to consequences (e.g., cost-effectiveness ratio)? If so, was the index interpreted intelligently or in a mechanistic fashion?
 - 10.2 Were the results compared with those of others who have investigated the same question?
 - 10.3 Did the study discuss the generalizability of the results to other settings and patient/client groups?
 - 10.4 Did the study allude to, or take account of, other important factors in the choice or decision under consideration (e.g., distribution of costs and consequences, or relevant ethical issues)?
 - 10.5 Did the study discuss issues of implementation, such as the feasibility of adopting the 'preferred' programme given existing financial or other constraints, and whether any freed resources could be redeployed to other worthwhile programmes?

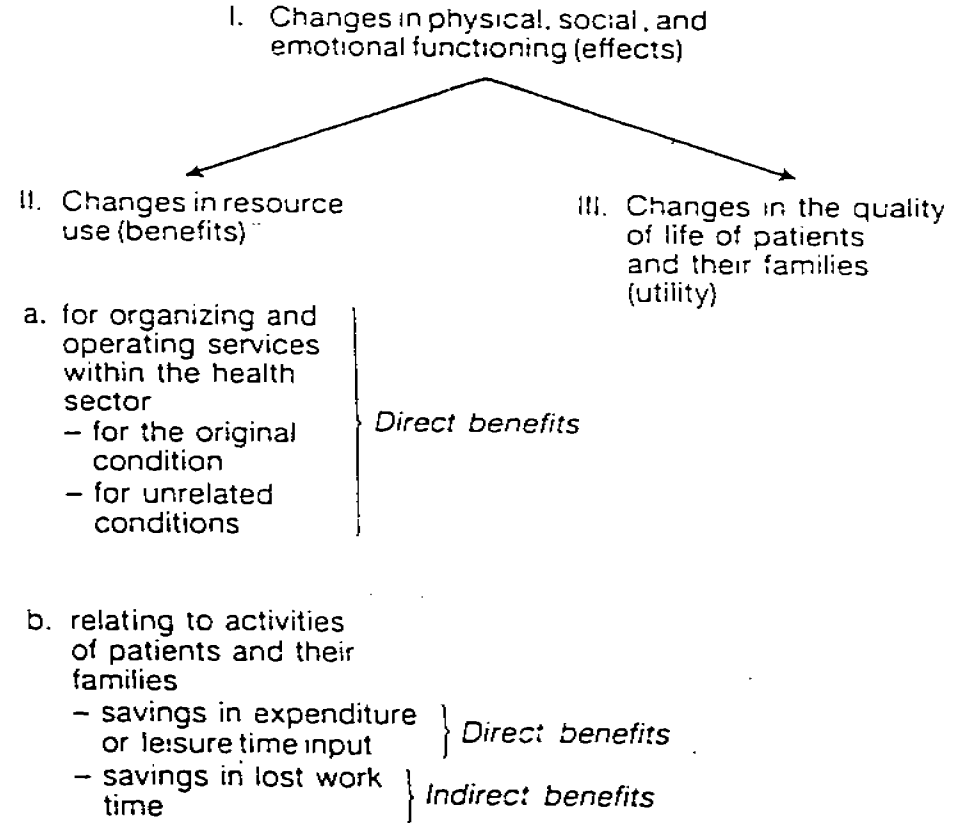
COSTS

- I. Organizing and operating costs within the health sector (e.g. health professionals' time, supplies, equipment, power, capital costs)
- II. Costs borne by patients and their families
 - out-of-pocket expenses
 - patient and family input into treatment
 - time lost from work
 - psychic costs
- III. Costs borne externally to the health sector, patients, and their families

Direct costs

Indirect costs

CONSEQUENCES



Direct benefits

Direct benefits

Indirect benefits

Appendix

40

Types of costs and consequences of health services and programmes.

**A Study on Primary Health Care Services
in the Philippines**

***Part II. Development of a Self-Instructional Manual
on Cost-Effectiveness Analysis for
Local Health Center Physicians.***

Prepared by:
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April 30, 1995

ABSTRACT:

DEVELOPMENT OF A SELF-INSTRUCTIONAL MANUAL ON COST-EFFECTIVENESS FOR HEALTH CENTER PHYSICIANS. T Tan-Torres, Clinical Epidemiology Unit, University of the Philippines College of Medicine

JUSTIFICATION: The passage of the Local Government Code of 1990 required devolved local government units to plan, monitor and evaluate services, including health care. For decision-makers, an assessment of the safety, effectiveness and in addition, efficiency of services to be provided is essential. Expertise in carrying out economic evaluations will provide the needed information.

OBJECTIVE: To develop a self-instructional manual (SIM) on cost-effectiveness analysis for health center physicians

METHODS: 1. Review and critique of existing manuals on economic evaluations; 2. Development of an SIM; 3. Review of SIM by experts; 3. pre-test of SIM on 3 health programs in different health centers with process documentation; 4. Revision of SIM based on comments from the experts, feedback from physicians who participated in the pre-test, process documentation report, critical appraisal of the cost-effectiveness analysis completed in the pre-test.

RESULTS: A total of 8 different manuals on cost-effectiveness analysis were published in the past 10 years. Based on the perceived needs of the target learners, a new manual for self-instruction was developed. This was pre-tested by health center physicians on 3 different programs: expanded programme on immunization, family planning and national tuberculosis control. The cost-effectiveness analyses were completed within 18-28 working man-hours. In terms of quality, the analyses were graded 6-7 out of a possible perfect grade of 9 points. The manual was subsequently revised.

RECOMMENDATIONS: The self-instructional manual on cost-effectiveness analysis, as pre-tested in urban health centers, was comprehensible and enabled the physicians to undertake analysis on their own. The SIM must also be pre-tested in the rural areas where the information needed may be difficult to obtain. More importantly, incentives and support must be given for health center physicians to undertake cost-effectiveness analysis which will allow for more informed decision-making.

INTRODUCTION:

Assessment of Learning Needs:

The Local Government Code of 1990 devolved government services, including health, to the local government units. With decentralization came an influx of new opportunities together with new responsibilities and roles. Among these are the planning, monitoring and evaluation of health services to be provided locally and the allocation of funds in budgets to cover these services.

A prerequisite skill to planning and decision-making is being able to assess the cost-effectiveness of the different services being provided and those being planned on being provided. Since cost-effectiveness data are best generated locally, the physicians will have to learn to carry out economic evaluations to generate data themselves.

Criteria for Evaluation of Learning Materials on Economic Evaluations:

There are several references available on the methods of economic evaluations. However, not all may be of help for local health center physicians. Preferably, the references should be:

1. readable (visually attractive and utilize non-technical language);
2. self-instructional (for user's independent study done at his or her own pace with built-in feedback to assess progress);
3. adapted to enable maximum use of locally available data; and
4. generic to allow comparison of costs and effects of different health programs.

Survey of Locally Available Learning Materials on Economic Evaluations:

A survey of locally available references on methods of economic evaluations revealed eight different manuals published in the last 10 years.

The World Health Organization manual on control of diarrheal disease and the Panel of Experts on Environmental Management for Vector Control manual are specific to programs on control

of their target diseases (1,2). Although these manuals are laid out in a self-instructional format, they modify formulae, offer examples and discuss issues specific to the disease and its interventions. This exclusive focus on the disease implies that the reader will have to take an extra step to extrapolate the techniques to other areas.

Two others are geared more for the academe, very rigorous in its data and analytic requirements and are probably not designed for use at the health center level (3,4). These are the Data for Decision Making Manual and Drummond's Methods for Economic Evaluation. Cost analysis is the main focus of the manuals by the Primary Health Care Management Advancement Program and the Asia-Near East Bureau of US Agency for International Aid (5,6). The PHCMAP manual is designed primarily for administrators and where computers are available. The ANEB of USAID is a very detailed presentation of costing methodology. Both manuals, however, do not discuss choice of measures of effectiveness. Although cost analysis per se can be used to improve planning and management (7,8) at the health center level, the evaluation function inherent in cost-effectiveness analysis is not emphasized.

The WHO and PRICOR have each produced two comprehensive manuals (9,10) on economic evaluations. These are generic, self-instructional, non-technical in language and intended for use in the health center level. However, because of an attempt to cover extensively the many different programs, the manuals are thick (138 and 94 pages, respectively) and may daunt a beginning reader. There is a need to develop an introductory text for beginners. The PRICOR and WHO manuals may serve as references, when needed.

OBJECTIVE OF THE STUDY:

This project was conceived to prepare an introductory text on cost-effectiveness analysis in a self-instructional format for local health center physicians. The focus of the project is on the acquisition of skills rather than the actual generation of data.

Assumptions of the Study:

The following are assumptions made in this study:

1. There is a need for health center physicians to acquire skills in undertaking economic evaluations.
2. The health center physician is capable of carrying out an economic evaluation, using a self-instructional manual.
3. The results of a cost-effectiveness analysis will be useful in deciding which recommendations to make in improving the efficiency of a program.
4. The health center physician will be able to apply the skills learned in this project to other programs in the future.

METHODOLOGY:

The self-instructional manual (SIM) was developed in several stages. First, a review of the references on the methods of economic evaluations in the primary health care setting was carried out. The first draft of the SIM was produced, attempting to incorporate the strong points and address the weak points uncovered in the review (11).

The SIM was critiqued by a content expert from the University of the Philippines School of Economics and a faculty member on development of self-instructional manuals from the National Teacher Training Center for the Health Professions, University of the Philippines Manila.

Three local health centers were selected to pilot test the SIMs on different programs. These were the Expanded Program on Immunization, the National Tuberculosis Control Program and the Family Planning Program. A questionnaire (Annex 1) was provided to the local health center physicians to assess their extent of participation in decision-making and their need for learning about undertaking economic evaluations.

With the self-instructional manual (Annex 2), the local health center physician carried out an economic evaluation with minimum of supervision from the project research associate. During the process, they were observed by the research associate who noted any questions they asked and who then provided answers/technical assistance as needed. A written report on the cost-effectiveness analysis was submitted by the health center physicians. They also gave feedback on the

process and their plans regarding the study they made carried out (see annex 3).

The accuracy of the data was verified by the research associate. The submissions were then evaluated using the criteria of Drummond (Annex 4).

The SIM was subsequently revised based on the following:

1. comments from the economist and the SIM expert;
1. feedback from the health center physicians;
2. process documentation report of the research associate
3. accuracy of the completed reports on cost-effectiveness analysis of the health programs.

RESULTS:

Pre-SIM Survey:

The participating physicians are medical officers IV who come from the Tatalon, Old Balara and Commonwealth health centers. The initial survey showed that the local government code has not radically affected their day-to-day functioning. The physicians expect decisions and policies to emanate from a higher authority and view themselves more as implementors. Current scope of the decisions they make is limited to division of labor, facilitating patient flow, use of CHWs and other similar "small" decisions. They realize the importance of considering costs in making decisions and view many decisions as requiring additional logistic support which, at present, is difficult to obtain (Annex 5).

Post-SIM Survey

The physicians carried out the evaluations in 12-20 working man-hours each. This estimate covers only the work done in the health center and excludes the time spent by the project research associate who collected data from the city health department and provided the data (Annex 6) upon request (another 6-8 hours). They were reasonably confident (78-90%) of the accuracy of their results and intended to apply the results in their health centers. The part the physicians found easy to understand was that on the decision whether to carry out a cost-effectiveness analysis. The step-by-step approach also was cited as helpful. What they considered difficult was the technical discussion on costing and they suggested making it simpler, outlining it and providing more examples of the computations.

Brief reviews or summaries in the text were also suggested (annex 7).

Observations of the Project Research Associate:

The physicians knew the community very well. Identification of the problems was easy due to the availability of statistics and data routinely collected by the health center. This is also what they chose as the outcome or measure of success for the alternatives to be considered.

Selection of the alternatives to be considered was difficult. They understood what efficacious, acceptable and feasible meant but the actual search for alternatives to be included in the cost-effectiveness analysis took time.

Most of the time was spent on costing. Although recurrent costs were easy to obtain, considerable amount of time had to be spent on treatment of capital costs, allocation of joint costs (e.g., personnel time) and discounting. The final analysis or putting the costs and effects together in an incremental cost-effectiveness ratio was accomplished with ease (Annex 8).

Comments from the Experts:

The economist suggested that:

1. the different levels of decision-making, e.g. day-to-day, annual and long-term, be detailed so that the contribution of economic evaluations in each level can be clearly delineated;
2. efficiency be added as another criterion in making decisions versus and not simply effectiveness (technical) as the main criterion;
3. a precautionary statement be made that the limitation of the analysis to the perspective of the Department of Health will make it unable to identify phenomenon like shifting of costs when shortening clinic hours;
4. a discussion on the typology of health center activities be included.

The SIM expert suggested that:

1. more exercises be provided with the correct answers being made available for feedback;
2. stated objectives match with the content;
3. some of the annex/tables be included in the text proper;
4. more examples be given;
5. a few editorial changes be made.

Critical Appraisal of Cost-Effectiveness Analysis:

The physicians' objective was to improve performance of their respective programs by increasing coverage. Thus, for the two programs on family planning and tuberculosis control, a number of community health volunteers would be trained to substitute for the standard personnel in the health center. For the immunization program, the question was whether to increase from two to three outreach activities in a week.

Efficacy was assumed based on current experience; i.e. substitution of personnel meant that the quality of work would be the same and that addition of one more outreach activity in a week would be able to catch the same number of children/activity as before.

Costing was based on current experience. Thus, for the two programs where CHVs would substitute for standard personnel, the cost of supervision was not identified and costed. In one of them, no incentives were provided to the CHVs which might jeopardize the sustainability of the program. Purchase prices were used to value the inputs.

Incremental cost-effectiveness analysis was carried out by all three projects but only one did sensitivity analysis (efficacy rate varied by 5%). As assumptions were the basis for the efficacy rates, sensitivity analysis should have been done.

The incremental cost-effectiveness ratios were extra 12/extra acceptor, extra P886.50/extra TB patient completed treatment and P486/extra fully immunized child. A major part of the extra costs in the tuberculosis and immunization programmes is due to the additional cost of drugs and vaccines consumed.

Not one of the papers did a full discussion of results. It is only in the post SIM interview where the physicians state that they will implement the alternatives, implying that they found the alternatives to be cost-effective or worth paying for to get the extra outcome.

The scores based on the application of methodological criteria are 6-7 out of a possible score of 9. See tables 1 and 2 for summaries and annexes 9-11 for the full reports of the projects.

DISCUSSION AND RECOMMENDATIONS:

Considering the amount of time spent on conducting the cost-effectiveness analysis and the absence of previous experience in conducting these studies, the physicians were able to produce reports which, though simple, are accurate and useful to them.

With modification, the self-instructional manual may be improved to enable the learner to acquire the skills by himself. The revised SIM must be tested on a wider scale, particularly with the participation of rural physicians who may not have as easy access to data and technical assistance compared to the urban doctors.

In this project, the physicians completed the projects because of externally imposed deadlines and the persistent follow-up of a research associate. Outside the research setting, it is important to create incentives for the health center physicians to start undertaking these types of studies so that they will fulfil their potential as direct planners for the health of their communities.

Incentives may include freeing up time for the physicians to engage in these types of efforts, providing technical assistance as needed, delegating authority and responsibility to make decisions, and disseminating results to other center physicians through newsletters/ communications. Unless these are done, physicians in the health centers will continue relying on national directives to provide guidance for new activities.

The ultimate test of success of the SIM is whether decisions are being made to offer new services or apply new strategies based on cost-effectiveness analysis.

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TABLE 1. Description of Cost-Effectiveness Analyses

	Family Planning	Tuberculosis	Immunization
Perspective	DOH	DOH	DOH
Alternatives	1. 6 community health volunteers to be trained as POPCOM-FP coordinator 2x/wk 2. Standard: midwife as POPCOM-FP coordinator 2x/wk	1. community health volunteers to monitor patients at 1:8 CHV:patient ratio 2. standard: defaulters visited at home by med techs and lab aides	1. 3x/week outreach activity 2. 2x/week outreach activity
Research Design	assumed 25% acceptance rate	assumed 100% efficacy for both alternatives	assumed 1 FIC per 100 immunizations
Outcomes	# new acceptors	patients who complete treatment	fully immunized child
Identify Costs	based on resource use and expert opinion	based on resource use and expert opinion	based on resource use and expert opinion
Measure Costs	based on resource use and expert opinion	based on resource use and expert opinion	based on resource use and expert opinion
Value Costs	purchase price	purchase price	purchase price
Discounting	none	none	none
Sensitivity Analysis	none	on efficacy rate	none
Incremental Analysis	yes	yes	yes
Results	Extra P12/extra acceptor	Extra P886.50/extra patient completed treatment	Extra P486/extra FIC

TABLE 2. SUMMARY OF STUDIES BASED ON METHODOLOGIC STANDARDS

	Family Planning	Tuberculosis Control	Expanded Program on Immunization
CLEARLY DEFINED QUESTION	/	/	/
COMPREHENSIVE DESCRIPTION OF ALTERNATIVES	/	/	/
EFFECTIVENESS ESTABLISHED	X	X	X
RELEVANT COSTS IDENTIFIED	/	/	/
COSTS APPRO- PRIATELY MEASURED	/	/	/
COSTS VALUED CREDIBLY	/	/	/
DISCOUNTING			
INCREMENTAL ANALYSIS	/	/	/
SENSITIVITY ANALYSIS	X	/	X
DISCUSSION AND RECOMMENDATION	X	X	X
TOTAL	6	7	6

SIM Project Annex 1: Start of Project Questionnaire for Health Center Physicians

1. Under the local government code, do you observe any differences in the way the health center operates? If none, do you expect any difference?

2. Let's look specifically at planning and decision-making at the health center level.

A. What types of decision-making or planning do you do? Give examples as needed.

B. If there are changes that you wish to institute in the services being provided by the local health center, at what level are these changes decided - health center or city health department or central Department of health level?

C. What kind of information do you need to study and present to the decision-maker?

D. What do you know about cost-effectiveness analysis?

E. Do you anticipate any difficulties if you carried out an economic evaluation with the aid of a self-instructional manual? If yes, please list the anticipated difficulties.

Thank you very much.

Name/Date

ANNEX 3
End of Project Questionnaire for Health Center Physicians

1. Overall, how much time did you spend in carrying out the economic evaluation (including reading the manual, collecting and analyzing the data, doing the write-up)?

2. From a scale of 0-100%, how confident do you feel about the accuracy of your economic evaluation? _____

3. What do you intend to do with your cost-effectiveness analysis?

4. What part/s did you find difficult to understand in the SIM?

5. What part/s did you find easy to understand in the SIM?

6. How can we revise the SIM to be better able to serve you?

Name/Date

ANNEX 4 A SUGGESTED CHECKLIST FOR ASSESSING ECONOMIC EVALUATIONS

- 1. Was a well-defined question posed in answerable form?
 - 1.1 Did the study examine both costs and effects of the service(s) or programme(s)?
 - 1.2 Did the study involve a comparison of alternatives?
 - 1.3 Was a viewpoint for the analysis stated and was the study placed in any particular decision-making context?
- 2. Was a comprehensive description of the competing alternatives given? (i.e., can you tell who? did what? to whom? where? and how often?)
 - 2.1 Were any important alternatives omitted?
 - 2.2 Was (Should) a *do-nothing* alternative (be) considered?
- 3. Was there evidence that the programmes' effectiveness had been established?
 - 3.1 Has this been done through a randomized, controlled clinical trial? If not, how strong was the evidence of effectiveness?
- 4. Were all the important and relevant costs and consequences for each alternative identified?
 - 4.1 Was the range wide enough for the research question at hand?
 - 4.2 Did it cover all relevant viewpoints? (Possible viewpoints include the community or social viewpoint, and those of patients and third party payers. Other viewpoints may also be relevant depending upon the particular analysis.)
 - 4.3 Were capital costs, as well as operating costs, included?
- 5. Were costs and consequences measured accurately in appropriate physical units? (e.g., hours of nursing time, number of physician visits, lost workdays, gained life-years)
 - 5.1 Were any of the identified items omitted from measurement? If so, does this mean that they carried no weight in the subsequent analysis?
 - 5.2 Were there any special circumstances (e.g., joint use of resources) that made measurement difficult? Were these circumstances handled appropriately?
- 6. Were costs and consequences valued credibly?
 - 6.1 Were the sources of all values clearly identified? (Possible sources include market values, patient or client preferences and views, policy-makers' views and health professionals' judgements.)
 - 6.2 Were market values employed for changes involving resources gained or depleted?
 - 6.3 Where market values were absent (e.g., volunteer labour), or

- market values did not reflect actual values. (such as clinic space donated at a reduced rate), were adjustments made to approximate market values?
- 6.4 Was the valuation of consequences appropriate for the question posed? (i.e., Has the appropriate type or types of analysis—cost-effectiveness, cost-benefit, cost-utility—been selected?)
7. Were costs and consequences adjusted for differential timing?
 - 7.1 Were costs and consequences which occur in the future 'discounted' to their present values?
 - 7.2 Was any justification given for the discount rate used?
 8. Was an incremental analysis of costs and consequences of alternatives performed?
 - 8.1 Were the additional (incremental) costs generated by one alternative over another compared to the additional effects, benefits or utilities generated?
 9. Was a sensitivity analysis performed?
 - 9.1 Was justification provided for the ranges of values (for key study parameters) employed in the sensitivity analysis?
 - 9.2 Were study results sensitive to changes in the values (within the assumed range)?
 10. Did the presentation and discussion of study results include all issues of concern to users?
 - 10.1 Were the conclusions of the analysis based on some overall index or ratio of costs to consequences (e.g., cost-effectiveness ratio)? If so, was the index interpreted intelligently or in a mechanistic fashion?
 - 10.2 Were the results compared with those of others who have investigated the same question?
 - 10.3 Did the study discuss the generalizability of the results to other settings and patient/client groups?
 - 10.4 Did the study allude to, or take account of, other important factors in the choice or decision under consideration (e.g., distribution of costs and consequences, or relevant ethical issues)?
 - 10.5 Did the study discuss issues of implementation, such as the feasibility of adopting the 'preferred' programme given existing financial or other constraints, and whether any freed resources could be redeployed to other worthwhile programmes?

Annex 5:

PRE-SIM SURVEY FOR LOCAL HEALTH CENTER PHYSICIANS

1. Under the Local Government Code, do you observe an difference/s in the way the health center operates? If none do you expect any difference?

RESPONSE A :

So far, only "perceived" changes are felt, though as former MHO under DOH (National) to QCHD then under MMC, observed a great difference in the implementation of services e.g. training for new programs takes almost two years or as much as four years (from DOH to MMC to QCHD to HC) to take effect; all programs and training have to pass through others (for training, too) before they can come down to us. Thus, provinces are far more advanced in implementation than cities are.

I perceived the same thing happening as all programs have to pass the local gov't. from which has no previous background in Health and Health Care Delivery. They will have to train first. Allocation of funds may be a subject of dispute. Non-political alignment between mayors and CHO's may become a problem. Add to this, "political appointees" who are non-civil services. And consequently delivery of services may be affected

RESPONSE B :

There were no differences in the programs and of course, we have achieved gains most especially in EPI, NTP, and leprosy. The only difference now is in logistics since funding is devolved now to local government. Health workers, most especially in the rural areas, don't receive their stipends on time and some of their compensation have not been given yet.

RESPONSE C :

I am not in a good position to answer this, as I joined the Health Department after passage of the devolution law. My team mates, however, agree that there hardly has been any change. Maybe in the future, there will be differences in the way health centers operate, depending on the policies and priorities of the local government.

2. Let's look specifically at planning and decision-making at the health center level.

a. What type of decision-making/planning do you do?
(Please give examples.)

RESPONSE A :

Health Center planning is confined to a one-year (short-term) Action Plan for Targets and Expected Accomplishments for each year based on population. Personnel has no say as to how-much, as percentages are already dictated.

Decision-making is confined to "small decisions" made at the health center e.g. flow of patients, compartmentalizing work due to so many patients (which is not done in other health centers), use of community health volunteers and sharing of daily workloads etc., etc. No shattering, landmark decisions as these are "pre-made" from up to down, though we can only recommend after stating problems of importance. Whether these affects final decisions from up, is rarely felt.

Strategies may, of course, be purely our own, as far as proper implementation may go.

RESPONSE B :

For example, I just encountered a diarrhea outbreak in my area. I went to verify the presence of epidemic, diagnose the health of the community and give health education. I reported to the QC Health Department and the epidemiologist came in to help us.

RESPONSE C :

1. Coordination with barangay officials.
2. Giving assignments to UHNP personnel.
3. Division of labor among personnel.

b. If there are changes that you wish to institute in the services being provided by the health center, how are these changes decided - health center or city health office or central DOH level?

RESPONSE A :

Changes, can't just be made outright at the health center level when it concerns policies, rules and regulations.

RESPONSE B :

Since I am only one month old in the City Health Department and I'm in the process of adjustments - I have not made any changes on the services we rendered. But as I observe in the community I would like that the nutrition program be prioritized especially the food supply and the micronutrients that we are giving. I saw a second degree malnourished child become third degree malnourished. There was no gain of weight inspite of feeding.

RESPONSE C :

Changes are decided at the city health office level. Health center personnel can only propose changes.

c. What kind of information do you need to study/present to make these decisions?

RESPONSE A :

"Great changes" can only be proposed UP. If accepted, great! But when it will become "final" is the question. Policies from UP center maybe based on our experiences and findings.

RESPONSE B :

It's thru papers after establishing the facts.

RESPONSE C :

Basically, we need to look at the effect of different alternatives, benefits and advantages vs. disadvantages.

d. What about costs? Do you need to know how much the changes will cost? If yes, how do you go about getting the costs?

RESPONSE A :

About costing, yes, we are interested to know the cost of everything- from paper to medicines, to whatever changes we would like to have, like additional personnel, modernization of equipments etc., can the gov't. afford them?

In costing, we get the smallest detail from materials to personnel, (how many cotton buds is used per patient in EPI) and then summarize cost, per day, per month, total/year.

RESPONSE B :

Any program you would like to implement may involve money, and we have to determine needs and requirements for logistic support and present this to the national level.

RESPONSE C :

It is also important to consider the costs of the proposed changes/projects since even excellent projects may not be approved due to budget limitations. Costs are usually estimated by canvassing and summing up the costs of all resources needed.

e. What difficulties do you anticipate?

RESPONSE A :

No funds available, or it takes several years before we get them, when prices are already higher.

RESPONSE B :

First, financial - programs like these would require priority allocations of budgeting resources.

Second, manpower - we need adequate manpower in health and health-related sectors in order to implement this program.

RESPONSE C :

Some items may be hard to cost. Information on prices of commodities may not be readily available.

Annex 6: QUEZON CITY HEALTH DEPARTMENT COSTS

Number of Health Districts in Quezon City:			
District	# of health centers		
1	13		
2	8		
2a	11		
3	9		
4	10		
Total health centers	51		

Number of Personnel in QCHD:				# Personnel/health center	
Type	#	Salary/month*	Type	#	
Doctors	92	P7,308	Doctor	1	
Nurses	66	P6,024	Nurse	1	
Midwives	98	P5,020	Midwife		
Dentists	52	P6,275	Dentist	1	
Nursing Aide	9	P3,263	Nursing Aide	(1)	
Dental Aide	25	P3,263	Dental Aide	(1)	
Utility Aide	54	P3,012	Utility Aide	(1)	
Med Technologist		P6,024	Med Technologist	(1)	

Data Sources: Dr. Domingo, Chief for Field Operations
Atty. Alex Abila, Chief for Administrative Department.

* Excluding 13 month pay, additional benefits under Magna Carta.

<p>Training: for QCHD, almost all training seminars are held at Bernardo Health Center. Rent for other venue is P400-500/day.</p> <p>Expenditures: P120 - food (lunch, 2 snacks) P 80 - materials, registration P200 - total expenses per trainee per day</p> <p>Data Source: Dr. Novera, Training Officer, QCHD</p>
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Supplies:

Expanded Programme on Immunization

Vaccines	Cost/vial	Doses/vial	Cost/Dose
BCG	P172.80	20	P8.64
DPT	P 28.50	10	P2.85
OPV	P 17.20	10	P1.72
Measles	P 56.20	10	P5.62
Hep B	P432.00	10	P43.20
Tetanus Toxoid	P552.00	20	P27.60

Family Planning

Condoms - P61.44/box of 100 = P0.60/condom

Oral Contraceptive Pills - P6.84/cycle

Intra-uterine Device - P48.38/IUD

Tuberculosis Control

Medicine	Cost/tab
INH 300 mg	P3.24
Rifampicin 450 mg	P44.00
300 mg	P29.00
Ethambutol 400 mg	P38.70
Pyrazinamide - not provided by DOH	
SCC Kit -	P39.00

Other Supplies:

Item	P Cost/Unit
Gloves at P284/doz	23.72/glove
Glass slides at P224/box of 72	3.12/slide
Vaginal antiseptic at P331.20/box of 10	33.10/bot
Lubricants	233.28/tube
Cotton Pledgets at P39.60/box of 10	0.40/pledget
Fixatives	100.80/tin
Povidone Iodine	1029.60/gal
Cotton roll	82.36/roll
Gauze pads at P237.60/box of 50	4.75/gauze pad
Pregnancy test kit at P633.60/box of 10	63.35/unit
Basal Body Temperature thermometer	108/piece
Albothyl	172/bot
Rubbing alcohol	230.40/gal

Data Source: Dr. Domingo, QCHD Field Operations

Infrastructure:

Cost of Construction per m² of a health center is P10,000-11,000.

Health Center	Area (m ²)
Balara	118.32
Tatalon	140
Commonwealth	48 (housed within the barangay center)

Data Source: Engr. Corpuz, Engineering Dept., Planning Section, QC Hall

Annex 7. End of Project questionnaire for Health Center
Physicians

1. Overall, how much time did you spend in carrying out the economic evaluation(including reading the manual, collecting and analyzing the data, doing the write-up?

BALARA: 20 HOURS

C'WEALTH: about 2 hours daily for more than 1 week

TATALON: Total of 14 hours

2. From a scale of 0-100% how confident do you feel about the accuracy of your economic evaluation?

BALARA: 90%

C'WEALTH: 78%

TATALON: 85%

3. What do you intend to do with your cost-effectiveness analysis?

BALARA: We will use it in our community. I have already met with the community health volunteers to discuss my proposal.

C'WEALTH: We can test it in our barangay.

TATALON: Apply it in the health center.

4. What parts did you find difficult to understand in the SIM?

BALARA: The details of the costing were hard to grasp at first but when tried even once were reasonably easy to understand.

C'WEALTH: The costing part was most difficult.

TATALON: Determine the effects of the alternatives

5. What parts did you find easy to understand in the SIM?

BALARA: Deciding whether to do or not to do a cost effectiveness analysis; choosing alternatives, the step-by-step approach

C'WEALTH: The other steps aside from the costing were relatively easy.

TATALON: Decision whether a cost effectiveness analysis should be undertaken.

6. How can we revise the SIM to able to serve you?

BALARA: If you can simplify it further, maybe by making it more outlined and by giving examples of the computations, reviews or summaries in the text. Include some appendices in text.

C'WEALTH: Honestly, I did not spend much quality time for the SIM. I don't think I'm in a good position to evaluate it as a whole.

TATALON: More examples may help specially in the computations.

ANNEX 8. OBSERVATIONS ON THE PERFORMANCE OF AND ON THE ANALYSES DONE BY HEALTH CENTER PERSONNEL

Step 1. "Decide whether or not a cost-effective analysis should be undertaken."

This step was easy for all 3 respondents as they were aware of problems in their health centers which need much attention. Efficiency (less input, more output) was always considered; hence, this portion seemed to have aroused interest in the manual among the respondents.

Step 2. "Determine alternatives ..."

Understanding the guidelines for choosing alternative was easy for the respondents. The words **efficacious, feasible, and acceptable** are very popular among public health care deliverers. The difficulty is in their actual search for alternatives which would fit these descriptions and for combinations of alternatives which would need/ fit a cost-effectiveness analysis. Much time was spent on this step: One respondent initially had alternatives which seemed efficacious but were very expensive to be feasible nor acceptable to higher officials. Another respondent had alternatives which would fit a cost minimization study (same effects but one obviously needed more input).

Step 3. "Determine the main outcome ..."

No problem was encountered in this step as it was clear to all respondents which statistics need improvement. Alternatives offered by each respondent had a common and easily measurable outcome sought.

Step 4. "Identify, measure and value inputs."

This is probably the most difficult portion as most time was spent on this. Detailed identification of inputs itself is time-consuming and requires one to be meticulous, imaginative and thorough. All respondents initially were at a loss on how and where to start identification of inputs alone. The step-by-step approach in this portion and the example identification of steps on page 12 helped them get going.

Determining the costs of inputs was more difficult for everybody. Recurrent inputs were easy to cost (except personnel). Costing capital inputs was quite a puzzle for all. One respondent did not attempt to read the portion more than once and instead opted to wait for his appointment with the observer whom he asked for

explanations and examples. Annualization and discounting were initially vague but were easily understood with examples. Personnel costing was also a common Waterloo; e.g. costs were not in proportion to the time spent by health personnel for a certain activity. At least 2 respondents also asked for differentiation between building and building operating cost and the like.

Step 5. "Data analysis"

ICER and its significance was easily understood.
"Sensitivity analysis" needed minimal clarification.

As a whole, the respondents' pre-occupation with other concerns probably also affected their performances. One respondent was almost always unavailable and hence ran out of time to complete the analysis unhurriedly. All three concentrated on the main text only and admittedly did not bother to read meticulously the several pages of appendices. The respondents also felt they needed more time to come up with better quality analyses.

ARNOLD V. AGAPITO, M.D.
Research Assistant

ANNEX 9

Project Title:

"ALTERNATIVE PERSONNEL FOR FAMILY PLANNING COUNSELLING"

PROPOSER : Old Balara Health Center, Tandang Sora,
Diliman, Quezon City
c/o Josephine N. Borreo, M.D.
Medical Officer IV - PIC

OBJECTIVE : To complement existing family planning delivery system by developing health workers through training and proper supervision.

OUTCOME : Acceptors

PROBLEMS IDENTIFIED :

- GENERAL :
1. Very low family planning acceptors. (Only 8 for first 6 months of 1994) mostly results of one-on-one counselling vs. mass education.
 2. Poor family planning counsellor ratio to potential targetted users. (Only 1 POPCOM personnel for 38,000 people of which 15% are women in the reproductive age.)
 3. Poor recording system for evaluation of acceptors (new and continuing) both at the health center and outreach outlets.

PARTICULAR SUB-PROBLEMS :

1. Lack of FP room or space for POPCOM workers in the health center or in sub-station which are conducive to counselling sessions.
2. Lack of record books for keeping statistics and other information.
3. Lack of incentives for BSPOS/community health volunteers to sustain their interest. Not even a sack of rice on Christmas, nor transportation allowance for better mobility. Lack of uniforms, even just a t-shirt or blazer to identify themselves in the community for recognition and respect by their neighbors.

ALTERNATIVES OFFERED :

1. Recruit 6 community health volunteers (CHV's) who will undergo a FP seminar workshop. Each CHV will act as the POPCOM-FP personnel/coordinator in each of the 6 areas of Old Balara. This will result in a ratio of 1 CHV: 950 women in child-bearing age. If each CHV is able to counsel to 8 clients per day and uses 2 days of the week for FP alone, the 6 FP's will be able to counsel to 4,608 clients or 81% of the 5,700 target clients in 1 year.

Advantage : more personnel/counselors

Disadvantage : cost of training, needs little training, incentives/allowances for 6 people already in the areas

2. Employ 1 midwife who will help in the FP program and conduct FP outreach activities 2x weekly in the different areas of Old Balara.

Advantage : lower personnel cost, needs little training (if any) in FP

Disadvantage : less number of target population reached; midwife, not a resident of the community

EXPECTED EFFECTS OF THE ALTERNATIVES:

> Increased FP Acceptors

--> high percentage of continuing users

In the past 3 years, an average of about 35% of clients counselled (one-on-one) to become acceptors and continuing users, very few target clients who attend mass education campaigns were motivated to practice family planning.

> Assuming 25% Efficacy Rate 1,150 of the 4,600 that can be reached by CHV's will become acceptors.

> Our POPCOM personnel counsells to an average of 12 clients per day for the past 3 years. If she uses a total of 2 days of the week for FP, she will counsell to 1,150 in a year, 288 of whom will probably be acceptors.

NOTE : Outreach activities are usually done for 1/2 day at a time.

INPUTS :

For CHV's, steps are :

1. Preparation of lesson plan (Note: QCHD has prepared lesson plans for different topics.)
2. Preparation of visual aids.
3. Training of CHV's includes,
 - different kinds of FP methods, their advantages and disadvantages
 - proper ways of counselling, includes a touch of psychology, respect on individual religions, beliefs and preferences
 - recording and reporting
4. Production of teaching materials
5. Delivery of actual FP counselling x 1 year
6. Provisions for recording materials and actual recording.
7. Monitoring.

For midwife - POPCOM outreach steps are :

1. Planning and scheduling activity with barangay officials.
2. Promotion of activity
3. Outreach activity
4. Recording and monitoring the results.

STEPS FOR CHV's DIRECT COSTS/INPUTS :

32

PHASE I.

<p>1. Preparation of lesson plan and visual aids/teaching materials.</p>	<p>Trainer Teaching materials manila paper hand-outs pentel pens 6 ballpens notebooks</p>
<p>2. Intensive training seminar workshop for 6 CHV's</p>	<p>Trainer and trainees: honoraria projector rent for venue x 2 days snacks and lunch certificates (6) blazers and t-shirts</p>

PHASE II.

<p>1. Provision of teaching materials and recording materials.</p>	<p>record books visual aids</p>
<p>2. Actual FP counselling</p>	<p>trained CHV's; allowances/incentives</p>

STEPS FOR POPCOM OUTREACH :

<p>1. Planning and scheduling</p>	<p>FP personnel</p>
	<p>transportation and allowances</p>
	<p>(very minimal, if any)</p>
	<p>teaching materials</p>
<p>2. Promotion of activity</p>	<p>leaflets and posters</p>
<p>3. Outreach activity</p>	<p>FP personnel</p>
	<p>visual aids</p>
	<p>FP materials</p>
<p>4. Recording</p>	<p>record books</p>

PHASE I. TRAINING

INPUTS:		COST:
Recurrents: Personnel	CHV's	training/meals P200 x 6 = P1,200.00 honoraria P100/day x 2 days x 6 = P1,200.00
	trainers	honoraria P500/day x 2 days x 2 = P2,000.00
	driver	P100 x 2 = P200.00
Supplies	notebooks, 6	P6.25 x 6 = P37.50
	pentel pens	P40.50 x 4 =
	whiteboard pens 2 red, 2 black	P162.00
	ball point pens, 6	P2.55 x 6 = P15.30
	bond papers 1 rim	P53.00
	yellow pad 1 pad	P16.50
	manila paper, 10	P2.25 x 10 = P22.50
	stapler, 1	P36.75
	staple wires	P4.25
	paste, 2 tubes	P2.00
	certificates, 20	P120.00
Equipment operating cost		
Building operating cost	venue rental	P400 x 2 days = P800.00
Vehicle operating cost	fuel of rented vehicle	P100.00 for 2 days

Capital: Building Vehicle Equipment	all rented	
--	------------	--

PHASE II. FP COUNSELLING

Personnel	CHV's Allowances	P1,000.00 x 6 x 12 mos = P72,000 since only 2 days in a week are for FP and the rest for other activities
Supplies	Pentel Pens (6) Record Books (6) Manila Paper (12) Blazers, 6 (sleeveless) T-Shirts	P28,800 6 x P25 = P150 6 x P16.75 = P100.50 12 x P2.25 = P27 P200 x 6 = P1200 P50 x 6 = 300
Building operating cost	-	
vehicle operating cost	-	
equipment operating costs	-	
capital costs	-	
		Total Cost P36,547
POPCOM OUTREACH FP Counselling Personnel	Midwife & Popcom	salary of P5020 x 12 = P60,240 since only a total of 2 days used for FP promotion P24,090 uniform allowance P1,000
Supplies	Manila Paper x 2 Pentel Pens x 2 Record Books x 6	P4.50 P50.00 P100.50

Building operating cost		
Vehicle operating cost	tricycle transport fare	P200.00
Equipment operating cost	--	
CAPITAL:		
Building	--	
Vehicle	--	
Equipment	--	
		<hr/> P25,451

TOTAL ADVANTAGES OF TRAINING ALTERNATIVE CHV'S VS. MIDWIFE ALONE

1. Better one-on-one counselling ratio by CHV's. They are always in contact with their neighbors/targets.
2. Salaries not subject to increases within 5 years unless congress enact a law similar to that of "housemaid law".
3. Those trained intensively can later act as trainers in "Re-echo" seminars or can informally train their "alalays" or companions in the community.

4. Unit cost CHV's	vs.	unit cost of Popcom alone
P36,547		P25,451
-----	= P32 per acceptor	-----
1152	wbn	288
		= P88 per acceptor

Data Analysis:

$$\begin{array}{rcl}
 \text{ICER} = \frac{P36,547 - 25,541}{1152 - 228} & = & \frac{11,096}{924} = P12 \text{ extra cost} \\
 & & \text{paid to achieve} \\
 & & \text{extra effect}
 \end{array}$$

Intangibles :

Reverberation to the communities - CHB's working in their own home area will be indirectly influencing their neighbors on FP and therefore train new community FP counsellors.

ANNEX 10
 Tatalon Health Center
 Dr. Castillo.
 Medical Officer-in- Charge

Problem Identified: Low percent of patients who complete anti-TB treatment.

1993 data: Total enrolled to SCC course = 133
 Total who completed treatment = 81 (61%)
 Drop-out rate = 52 (39%)

Problem is probably due to lack of motivation and education on importance of completion of treatment, periodic physical exam and sputum exam. Poverty also causes some to be dislocated, hence be lost to follow-up. Others are forced to sell some of their medicines to be able to buy food and other needs for the family. Supply of medicines are also sometimes delayed.

Objective: To increase the number and percentage of patients who would complete treatment course

Main Outcome: *completely treated patients*

Alternatives:

1. Home visits by med. techs and lab aides. This has been done for one year now. REcords are checked and defaulters are visited by health personnel.

Disadvantage: Some patients become lazier and depend more on home visits.

2. Sixteen (16) CHVs to monitor patients personally and ensure compliance. Target enrollees for 1994 is 128. Each CHV would have 8 patients to monitor in a year, until their completion of treatment and conversion of sputum exam to negative.

Steps

Home visit by Health Center personnel

1. Review of records
2. Home visits - 15 per week x 4 = 60 monthly
 (same patients);
 120 patients yearly
3. Monitoring

CHV Home Visit

1. Training of CHVs on TB education and monitoring
2. Assignment of patients to CHVs
3. Actual home visitation and monitoring
 - 8 clients per CHV per year

INPUTS	FUNCTIONS		
Health Center Personnel	Records	Visits	Monitoring
Personnel	Med. Tech	Med. Tech.	Lab. Aide and Med. Tech
Supplies book		Drugs	Record
Equip. O.C.			
Building O.C. of health center			12 hours use
Vehicle O.C.	Transport Allowance		
Building of health center			12 hours use
Vehicle			
Equipment			

COST BREAKDOWN FOR HOME VISITS

Personnel	P	2,227.60
Supplies		112,336.00
Equipment O.C.		
Vehicle O.C.		1,152.00
Building O.C.		84.25
Equipment		
Building		702.12
Vehicle		
Total Cost		116,502

INPUTS	F U N C T I O N S		
CHVs	Training	Visits	Monitoring
Personnel	CHVs Honoraria	CHVs	CHVs Med. Tech.
Supplies	Training Ma- terials	Drug	Record book Notebooks
Equip. O.C.			
Building O.C.			Electricity
Vehicle O.C.	T r a n s p o A l l o w a n c e		
Building			Health Center

COST BREAKDOWN FOR CHVs

Personnel	CHVs	P 1,600.00
	Speaker	500.00
	Med. tech.	452.00
Supplies	Training	150.00
	Drugs	119,808.00
	Record books/ notebooks	176.00
Equipment O.C.		
Vehicle O.C.		384.00
Building O.C.		56.00
Equipment		
Building		468.00
Vehicle		
Total Cost		P 123,594.

Incremental Cost Effective Ratio (ICER)

$$\frac{P 123,594 - P 116,502}{128 - 120} = P 886.50/\text{extra patient completed treatment}$$

Sensitivity Analysis

Assuming only 95% efficacy of alternative A

$$\frac{P \ 123,594 - P \ 116,502}{122 - 120} = P \ 3,546$$

Cost per completely treated patient

A. $P \ 116,502 / 120 = P \ 971$

B. $P \ 123,594 / 128 = P \ 966$

ANNEX 11
Brgy. Commonwealth, Quezon City
Dr. Ruth Alagano
Medical Officer-in-Charge

Problem Identified

1. EPI Fully Immunized child (FIC) of about 94% of target
2. Defaulters, drop-outs of about 6% on an average of 136 per year over the past 3 years.

Commonwealth is a relatively large barangay subdivided into 5 areas. There is only one health center serving it, and this health center is considered inaccessible by several inhabitants or at least hardly accessible.

Objective: To increase the FICs in a year

Main Outcome: FICs

Alternatives:

1. Additional outreach activities - increasing the number of outreach activities from 2 to 3 per week to be able to immunize more clients and hopefully include potential defaulters. Fifty clients per day (average) would result in 2400 immunizations per year and approximately 240 more FICs for the year (usual ratio of 1 FIC per 10 immunizations done).

Advantage: Higher absolute no. of FICs

Disadvantage: Expensive; does not address drop-out rate

2. Stick to the usual 2 outreach activities per week. Five CHVs can take care of the job of following up drop out. Some 140 drop-outs per year (actual rate 136) is equivalent to 11-12 per month. Records can be checked and meetings can be held monthly with the 5 CHVs, each of whom can visit 2-3 drop outs monthly and inform them of immunization schedules (homebase and outreach).

Advantage: Inexpensive; addresses drop-outs

Disadvantage - Lower absolute no. of FICs gained

Steps

Outreach

1. Coordination with barangay officials and area leaders regarding additional outreach schedule (Done during the usual 2 outreaches.)
2. Coordination with QCHD for additional supplies (vaccines, etc.)
3. Promotion of additional outreach
4. Actual outreach
5. Recording and monitoring results

CHV Follow-up

1. Monthly meeting with CHVs
2. Home visits conducted by CHVs
3. Monitoring of results

INPUTS	F U N C T I O N S				
OUTREACH	Brgy.	QCHD Meeting	Promo	Outreach	Monitoring
Personnel	MD	MD	Health Personnel	MD Nurse Nrs.Aide Midwife	Nurse
Supplies			3 Manila Paper 2 Pentel Pens	Vaccines Alcohol Syringes Cotton Ice	N'book
Equip. operating cost				Electricity	
Vehicle O.C.		Transpo fare		Transpo. fare	
Building O.C.					
Building					
Vehicle					
Equipment				Icebox refrigerator	

Cost Breakdown for Outreach

Personnel	MD	P	8,770	
	Nurse		7,229	P 25,939
				(4 personnel
	N.Aide		3,916	x 1 year)
	Midwife		6,024	
Supplies	BCG	P	2,073.60	
	DTP		2,325.60	
	OPV		1,403.50	
	Hepa B		11,404.80	
	Measles		1,483.70	
	Syringes		5,760.00	P 25,406.95
	Alcohol		115.00	
	Cottonballs		736.00	
	Ice		48.00	
	Manila paper		6.75	
	Pentel pen		50.00	
Vehicle O.C.	Transpo fare - 4 personnel			
	x P 4 (4 weeks x 12 months)			P 768.00
Building O.C.				
Building				
Equipment	Icebox			P 60.00
Vehicle				

P 52,174.00

Cost per FIC: P 52,174 / 240 = P 271.39

INPUTS	FUNCTIONS		
CHVs	Meeting	Home Visits	Monitoring
Personnel	Nurse CHVs	CHVs	Nurse
Supplies	5 notebooks 5 pens		Record book
Equip. O.C.			
Building O.C.	Total of 24 hours meeting and record reviews (use of Health Center facilities)		
Vehicle O.C.	Transport Allowance		
Building	Health Center		

COST BREAKDOWN FOR CHVs

Personnel P 75.30 (nurse only)

Supplies 75.00

Equipment O.C.

Vehicle O.C. 960.00

Building O.C. 5.81

Equipment

Building 481.45

Vehicle

Total Cost 1597.56

Cost per FIC = P 1597.56 / 136 = P 11.75

Incremental Cost Effective Ratio (ICER)

$$\frac{P 52,174 - P 1597.56}{240 - 136} = P 486$$

**A STUDY OF PRIMARY HEALTH CARE
IN THE PHILIPPINES**

*Part III. Comparison of the Effectiveness
and Efficiency of the Health Center and the
Referral Hospital in Delivering Primary Care
Services*

*Tessa L. Tan-Torres, M.D., M.Sc.
April 30, 1995*

ABSTRACT:

QUALITY AND COST OF PRIMARY CARE SERVICES IN THE HEALTH CENTER AND THE HOSPITAL. T Tan-Torres, Clinical Epidemiology Unit, University of the Philippines College of Medicine, Manila

OBJECTIVE: To compare the quality and costs of primary care services delivered at the health center and hospital

SAMPLE: consecutive patient-practitioner encounters under the following programs: Expanded Programme on Immunization (EPI), National Tuberculosis Control Program (NTP), Family Planning (FP) Program at the health centers and referral hospitals in an urban area

METHODS: For Quality of care: 1. Observation of 100 patient-practitioner encounters/ program/level 2. Patient feedback through in-depth interviews of 30 patients/program/ level and focus group discussions of 4 groups /program/level. For Cost: 1. health center - annual expenditures of the program including overhead and operating costs 2. hospital - provision by a clinician of estimates of units and costs of resources consumed by the programs.

RESULTS: Median score of 7 out of a possible 9 indicators observed for EPI. Median score of less than 50% attained in the FP and NTP programs. Patient satisfaction was high in all three programs. There was no difference in quality of care between the health center and the hospital based on the indicators observed and patient feedback. Costs in the health center and the hospital were P273 and P1689 / fully immunized child, P1,588 and P1890 / patient completed TB treatment and P135 and P772 per family planning acceptor respectively.

CONCLUSIONS: Based on the indicators observed, the quality of care was excellent in the EPI but needs improvement in the FP and NTP programs. However, patient satisfaction is uniformly high in the three programs. There is no difference in the quality of care delivered at the health center and hospital levels. The average cost per outcome in the 3 programs is lower in the health center than in the hospital.

RECOMMENDATIONS: 1. Specific feedback to be provided to the study sites 2. Training and supervision be in accordance with the quality of care indicators 3. Encourage delivery of services of the three programs at the health center 4. Require a referral letter or impose a user's fee in the absence of a referral letter for patients demanding primary care services from the hospital.

INTRODUCTION:

The Philippines was one of the first countries to adopt the philosophy of primary health care. Primary health care is defined as "essential health care based on practical, scientifically sound, and socially acceptable methods and technology, made universally available to individuals and families in the community, through their full participation, and at a cost that the community and the country can afford and maintain at every stage of their development in the spirit of self-reliance and self-determination (1)."

Primary health care is expected to be provided at the first level of contact, where the people live and work. In the Philippines, the first level of contact is at the health center where services, including medical care and patient education, are provided. Out-patient departments of secondary and tertiary care level facilities (hospitals) also provide the same services, intended specifically to address the needs of the people living in the hospital's immediate catchment area.

At present, there is no attempt to restrict access to higher level facilities by requiring either a referral letter from a lower level facility or payment of user's fees. The patient-client may choose to go to any facility providing the services and he/she can expect to receive some form of care. However, for the service provider and financier, it will be more efficient if the same service was availed of at a lower level facility.

In developed countries, there have been a few experiments to lower costs of the health care system by strengthening the primary health care units to attract patients and draw them away from hospitals. A successful example recently reported in scientific literature was the experiment in Almere, Netherlands which resulted in lower referral rates to medical specialists and lower prescription rates compared to the national average rates (2).

The initial choice of facility by the patient-client may be influenced by several factors including accessibility, reputation, etc. However, the most important factor

influencing continued patronage of a facility is the satisfaction of the patient with the care being received. Quality of care provided at the health center level can be assessed using a technical perspective, e.g., standards of care from the practitioner's point of view or using the patient's perspective (subjective assessment of patient satisfaction). Most of the quality assurance studies done locally have remained as internal reports with limited circulation in the Department of Health.

A systems analysis of the tuberculosis control program in Quezon carried out in 1990 by Valeza, et.al., showed that history-taking, sputum collection and analysis, and patient counselling to promote compliance could be improved. Drug and laboratory supplies were inadequate(3). In 1991, Solter, et. al., assessed the quality of care in family planning in four regions in the country. The study showed that if basic equipment, current IEC materials and contraceptives are in short supply, it is difficult to provide a full range of services. Other areas needing improvement were supervision, recording, sterilization procedures, follow-up and provision of other reproductive health services(4).

A systems analysis on services related to child survival was carried out by PRICOR in Bulacan in 1988. Results of the studies on the expanded program on immunization showed that the service delivery component was relatively trouble-free except for re-use of syringes and/or needles in 7% of immunizations provided. This was attributed to lack of supplies. Aside from lack of syringes and needles, 20% of the facilities reported vaccine shortages at some point in the previous year. Inventory logs were present and updated only in a third of the centers visited. Active supervision by the public health nurse during immunization activities was rarely observed (5).

OBJECTIVES:

This study compared three public health programs delivered at different levels of care in an urban area based on:

- a. effectiveness as measured by quality assurance scores and patient feedback; and
- b. efficiency as measured by average cost-effectiveness ratios.

METHODOLOGY:*Choice of Programs:*

Three programs of the Department of Health were chosen based on the different types of clientele being serviced. The three programs chosen were the expanded program on immunization (EPI), servicing infants and children; the family planning program (FP), servicing mostly women in the reproductive age; and the National Tuberculosis Control Program (NTP) , serving adults, majority of whom are men.

Choice of Facilities:

Three levels of care were chosen to be studied in the Quezon City area. These levels were: health center (primary), Quezon City General Hospital (district or city) and the East Avenue Medical Center or EAMC (referral). A letter addressed to the Quezon City Health Department asked for the participation of three health centers, namely Tatalon, Balara and Commonwealth.

These were purposively sampled because they were large and had a big enough clientele to allow fast recruitment of patients. In addition, letters were sent to the directors of the hospitals inviting them to participate in the study.

Recruitment of sample:

During the recruitment period, consecutive patients availing of the services chosen were observed in the designated centers/hospitals.

*Quality Assurance Indicators:*** Observation:*

The PRICOR thesaurus (6) was the source of checklists for the quality assurance evaluation of the three programs selected. The relevant checklists were provided to the heads of the different services to get their input in terms of local standards of care expected of Department of Health personnel. The checklists (annex 1) were subsequently revised based on the feedback received.

Through role-playing, research assistants were trained on the details to be observed. After training, one research assistant per program was assigned to each health center (total of nine observers). They were assigned to observe 100 patient-practitioner interactions per program per level.

* Interview:

Immediately after availing of the service, a third of the patients (n=first 30/program/level) were interviewed to obtain their subjective assessment of the quality of care received. They were asked to provide grades for specific parameters (e.g. length of time given by the practitioner, clarity of explanations, etc.) and to provide a global satisfaction score. A questionnaire (annex 2) was used to elicit the patients' feedback.

* Focus Group Discussion:

The research assistants practised as facilitators and rapporteurs for focus group discussions after reading an instructional manual on focus group discussions (7). Four focus groups of 3-5 individuals were constituted to discuss their perception of the quality of service received for the disease per level (see annex 3). A fan was given as an incentive for the patients to participate in the focus group discussions.

Collection of costs:

Refer to the self-instructional manual developed in another part of the study which gave details on collection of cost data in the health center. Average cost in the hospital was obtained from estimates provided by a clinician.

Revision of Protocol:

After one week of observation at the Quezon City General Hospital, recruitment was terminated because there were too few consultations. For the same reason, patients in the family planning clinic of the Philippine General Hospital (PGH) were observed instead of those in (EAMC). These revisions in protocol resulted in only two levels of care, health center and referral hospital, available for comparison.

ANALYSIS:

Descriptive statistics using means, medians and proportions were used to describe each task observed in the facility. Results were reported by program, by facility and by data collection method.

Reliability or internal consistency of patient/client's feedback was checked using the Spearman rank correlation. The sum of the grades given by a patient/client for each individual task was correlated with his global satisfaction rating expressed in percentage. To check validity, the patient's global satisfaction rating was also correlated with a figure [(number of tasks correctly accomplished/ number of tasks to be correctly accomplished) x 100] summarizing the technical assessment by the research assistant of the observed patient-practitioner encounter.

An average cost (1993 peso) per service provided (per fully immunized child, per family planning acceptor and per patient completing TB treatment) was obtained at each level of care.

RESULTS:

The number of practitioner-patient interactions observed per level of care is shown in Table 1. For EPI, all interactions at the health center level consisted of actual immunization sessions. At EAMC, 38 observations of practitioner-patient interactions were censored because immunization could not be accomplished due to lack of vaccines.

For NTP and FP, majority of the interactions observed were of the "case-holding type," i.e., patients come to the health facility primarily for replenishment of their stock of medications or supplies.

Table 2 shows the number of patients interviewed regarding their assessment of the service that they received from the center or hospital. There were eight focus group discussions for EPI, seven for tuberculosis control and five for family planning.

Reliability and Validity of Measures:

Patients' satisfaction ratings were inversely correlated with their global scores ($r=0.33$, $p=0.002$). A lower global score and a higher rating are both indicators of patients' perceptions of good service. Thus, there is internal consistency in the patients' expressed statements of satisfaction.

8

For validity, patients' satisfaction rating did not significantly correlate with the technical assessments of the research assistant.

Expanded Programme on Immunization:

The EPI performed very well in almost all observed indicators of quality assurance. However, approximately less than 50% of the practitioners took time to explain to the caregiver about the possibility of side-effects and what to do in case these occur. About 20-30% of the interactions observed did not satisfy the indicator for informing the caregiver about what vaccine had been given. This was true in all the facilities observed except for the Tatalon Health Center which performed well on this indicator.

There was no difference between centers or between levels in terms of quality of performance (table 3) except that the EAMC, during the period of observation, ran out of BCG vaccines.

During the in-depth interview, caregivers gave the service an average global rating of at least 85%. Only 0-2 caregivers per center gave a failing score for a specific parameter, e.g. time given by the doctor, clarity of explanation, bedside manners, etc. Again, no difference in quality was seen between centers and between levels (table 4).

In the focus group discussion, the most common complaint was the long waiting period. Some suggestions included adding more doctors and enforcing a "first come, first served" policy. The lack of vaccines in EAMC was mentioned (table 5).

The cost per fully immunized child in the health center level was P273 (annex 4) while in the hospital, it was P1,689 (annex 5).

National Tuberculosis Control Program:

In the health centers, 0-30% of patients observed were newly diagnosed cases of tuberculosis while in the EAMC, over 70% were newly diagnosed. At the health center level, low scores of 50% or less were obtained for history-taking. Less than 10% underwent an adequate physical examination. In both areas, physicians performed better at the hospital level.

For sputum AFB examination, the health center physician performed better (but still with low scores) in counselling on the importance and method of production of sputum sample than his hospital counterpart. At EAMC, sputum samples were not taken. The physicians relied on chest examination and x-rays to diagnose tuberculosis (table 6).

Follow-up patients came to the health center to be given their medications except for EAMC where they were issued prescriptions. In general, over 50% of the physicians emphasized the importance of maintaining contact and verifying that the patient knew his appointments. No one at the health center and a low 10% at EAMC inquired about adverse effects (table 7).

The in-depth interview with the patients revealed high ratings of 88% or higher for the service received at the health center versus an average score of 74% for EAMC. Very few patients, 0-2 per center, rated specific parameters of care as unsatisfactory (table 8).

The focus group discussion emphasized the importance of having the medicines readily available (table 9).

The cost per completely treated patient (annex 4-5) at the health center level was P1,587.80 (only P1,086 worth of medications provided versus expected retail cost of 6208.80) while in the hospital, the cost was P1,850 (no medications provided).

Family Planning:

Majority of the patients in the health center were follow-up cases versus the 70% new cases at the Philippine General Hospital. Among the new patients, history-taking was inadequate particularly the medical history. Much of the acceptable performance centered on reproductive and menstrual history-taking.

Very few patients underwent a physical examination in the health center and neither was a pap smear taken. The health centers and the PGH administered a family planning method in majority of the cases but only the PGH offered bilateral tubal ligation (table 10).

For follow-up patients, PGH physicians asked about occurrence of side effects whereas this was not frequently done in the health centers. Among the health centers, Tatalon provided exceptional counselling. Very few physicians in the health centers or in PGH asked the patient to echo the messages provided (table 11).

In the in-depth interview, Tatalon and PGH received high rating of over 90% compared to 80% for the two other health centers. Very few or none gave a failing score for individual parameters of patient care (table 12).

The focus group discussion suggested later cut-off times for receiving patients in the center (table 13).

The cost per acceptor in the health center was P135.40 compared to P772 in the hospital (annex 4-5).

Comparison of Programs by Level Based on Observation and Patients' Satisfaction Ratings:

Based on a strict interpretation of the indicators, only the expanded program of immunization achieved passing scores. The NTP program, specifically care extended to new patients, and the FP program, at both levels, need much improvement as shown by the median summary scores (Table 14).

The perception of good quality of care in the three programs was evident in the patients' ratings and global scores. There was no difference in patient satisfaction with services at the centers and the hospitals (Tables 15-16).

DISCUSSION:

Ideally, effectiveness of care provided should be reflected in patient outcomes. Although this was one of the stated objectives, a proximate measure, in terms of quality of care provided, was chosen as the outcome with the practitioner-patient interaction as the unit of analysis. The available time and budget allowed only for a cross-sectional research design with a one-time slice of observation. Thus, patient outcomes could not be determined as follow-up is necessary to determine if the patient's tuberculosis got cured or if the child got sick of measles or if the woman became pregnant.

A quality assurance (QA) study is an evaluation with findings specific to the area of concern. Rarely are results of an evaluation generalizable to other areas, unless the area studied is "representative" of other areas. A QA study looks at the process of implementation itself, including the performance of detailed steps. The PRICOR indicators used in this study are very detailed and their primary use is to provide feedback to the persons in the areas studied.

The process measures used are a combination of technical and subjective ratings. The same practitioner-patient interaction is evaluated using observations on technical parameters by a research assistant and the patient's expression of satisfaction with the service received. There was some correlation between the two but this was not statistically significant. A possible explanation for this is that the technical assessment may be made on parameters different from what the patient was evaluating (e.g., did the physician inquire about side-effects versus bedside manners of the physician). Supporting evidence is provided by the statistically significant consistency between what the patient said regarding individual parameters of quality (e.g. physician's bedside manners) and the global satisfaction rating.

In general, there was no difference in the services being provided by the hospital and the health centers in the three programs evaluated. Quality services as defined by PRICOR indicators are being provided by the EPI. However, failing scores were obtained in the other two programs of FP and NTP. This does not necessarily mean that the services being provided are substandard, only that they can be improved.

The costs of providing the services were much lower in the health center, primarily because the fixed costs of consultation are lower in the health center than in the hospital. The patient will also receive more benefits in the center where they can get a sputum examination and be provided medications/supplies. For health centres to attract and hold patients, they must be assured of continuous supplies and easy access to the hospital upon referral.

Because of their high fixed cost component, hospital out-patient departments may continue to provide services in these programs but should be encouraged to preferentially treat those who can benefit more from their specialized equipment and personnel (e.g., difficult to treat tuberculosis). This can be attempted by requiring patients to show referral letters from the lower level facility or, if they insist to be treated, to impose a user's fee in lieu of the referral letter.

CONCLUSIONS AND RECOMMENDATIONS:

This study demonstrates that in the health centres and hospitals studied, there is no marked difference in the quality of services provided and that it is more costly to provide such services from the hospital setting. It is recommended that:

1. results of this study be relayed back to the centers and hospitals studied;
2. trainers and supervisors be taught how to use the PRICOR indicators for primary health care in their work;
3. guidelines be circulated that all consultations for EPI, FP and NTP be initially handled at the local health center level and only referred to the hospital if there is a need for the use of higher technology or in the case of complications;
4. a system of incentives and disincentives be established to support the functioning of a referral network.

LIMITATIONS:

The process of observation may sometimes affect the persons being observed such that they will modify their performance. Therefore, what is being observed is not routine or usual but instead is better or improved (Hawthorne effect). The effect will wane with time as the observed individuals will get used to the presence of the observers. Unfortunately, the observation period was too short for the individuals being observed to revert to "usual" behavior. Thus, it is possible that the programs may actually be worse than what is reported here.

The second limitation is the use of different methods to collect costs. Ideally, one should undertake full costing as was done in the health centers. Unfortunately, this was not possible in the hospitals. Thus, the average costs obtained

in the health centers and the hospitals were merely contrasted and not subjected to an incremental cost analysis.

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**Table 1. Number of Practitioner-Patient Interactions Observed
N (New : Follow-Up)**

	Tuberculosis Program	Family Planning Program	Expanded Program of Immunization	TOTAL
Balara	32 (7 : 25)	30 (9 : 21)	60	122
Commonwealth	31 (10 : 21)	30 (10 : 20)	37	98
Tafalon	36 (0 : 36)	48 (14 : 34)	36	120
East Avenue Medical Center	100 (44 : 56)	100* (72 : 28)	59	259
TOTAL	199	208	192	599

* Philippine General Hospital

Table 2. Number of Patients for In-Depth Interviews

	Tuberculosis Program	Family Planning Program	Expanded Program of Immunization	TOTAL
Balara	13	21	27	61
Commonwealth	15	13	12	40
Tatalon	13	12	13	38
East Avenue Medical Center	34	35*	39	108
TOTAL	75	81	91	247

* Philippine General Hospital

Table 3. Quality Assurance Indicators for Patients in Expanded Program of Immunization

IMMUNIZATION SERVICE INDICATORS Actual Immunization Session Observations	Balara Commonwealth		Total n = 36	East Avenue Medical Center n = 59
	n = 60	n = 37		
Does the health worker				
1. examine vaccination cards or question mothers to determine immunizations needed	59	36	36	59
2. administer all vaccines with sterile needles.	59	37*	35	59
3. protect BCG, polio and measles vaccines from heat during use.	60	36	36	59
4. record required information on vaccines administered on vaccination cards?	58	35	36	57
5. tell the mother what vaccines were administered.	43	12	33	46
6. advise the mother regarding possible side effects.	5	20	13	22
7. advise the mother what to do in case of side effects.	5	20	12	19
8. tell the mother of the child(ren) about the next required immunizations.	47	32	34	48
9. immunize the child?	60	37	36	59

* virtually perfect score - child missing received oral polio vaccine

Table 4. Summary of In-Depth Interviews for Expanded Program of Immunization

	Balara n = 27	Commonwealth n = 12	Tatalon n = 13	East Avenue Medical Center n = 39
Mean Age	28.07		26.23	28.31
Paano kayo dito nagtungo?				
malapit		24		
malapit at libre ang gamot	20	8	10	29
reperal (referred from outside)	4	4	3	2
gumagaling ang pasyente	0	2	0	6
maganda and serbisyo	0	0	0	0
mga iba pang sagot	1	1	0	2
	2	0	0	1
Ano po ang ginawa sa inyo?				
wala				
binigyan ng gamot	0	12	10	25
inaksamin (PE, History)	26	0	2	13
niresetahan	0	0	1	0
	1	0	0	1
Ano po ang sinabi?				
wala				
inumit/tuloy ang gamot	4	2	1	3
kinaiialabasan/paydings (diagnosis)	0	3	3	6
magpe-lab eksam: (not applicable)	7	2	3	13
bumalik	0	0	0	0
pagbabago sa pamumuhay (not applicable)	12	5	5	15
mga iba pang sagot	0	0	0	0
	4	0	1	2
Sinabi ba kung kailan babalik				
Hindi	4	1	1	6
Oo	23	11	12	33
Kung bibigyan ng marka ang serbisyong binibigay sa inyo kung saan ang 0 ay hindi kayo nasistiyahan kahit konti at ang 100 ay masayang-masaya kayo, anong marka ang ibibigay ninyo?				
Average grade:	87.63	88.68	88.85	86.97
Oras na ibinigay ng doktor? (hindi kasali ang paghihintay)				
katamtaman ang bills	24	8	10	33
masyadong mabilis	3	2	2	6
masyadong matagal	0	2	0	0
Paidktungo ng doktor?				
maganda	15	8	13	30
katamtaman	11	4	0	9
hindi maganda	1	0	0	0
Serbisyo?				
magaling	22	8	10	30
katamtaman	5	3	3	9
hindi maayos	1	0	0	0
papaliwanag?				
nalintindihan	25	10	12	38
hindi nalintindihan	2	2	1	1
Rekomendasyon / Suhestyon:				
wala				
Palaging may gamot/tao/gamit	19	7	10	19
maayos na mga gamit/serbisyo	3	4	2	4
mga iba pang sagot	3	1	1	18
	2	0	0	

Table 5. Summary of Focus Group Discussions on Expanded Immunization Program

Center (# of FGD)	# of Previous Consultations	Grades (average)	Best Experience	Worst Experience	Suggestions
Balara (FGD = 1)	2,2,1	86.67	good reception, safe vaccination	waiting for a long time, masungit ang doktor,	walang singitan, more doctors, medicines
Commonwealth (FGD = 2)	1,1,1,2,2	89	outreach program of health center mothers need not go to the health centers	masungit ang health worker masyadong matagal dahil hindi nasusunod ang number, hirap, mahal ang singil ng donasyon, lacking in facilities, tardy health workers,	dapat sundan ang numero, huwag magpilit ng presyo ng donasyon have their own health center in their area
Patallon (FGD = 2)	3,1,1,6,3,4,	90.83	binigyan kaagad ng gamot, maasikaso	dati masungit	
East Avenue Medical Hospital (FGD = 3)	3,2,1,1,2,2, 3,3,3,5,2	74.09	OK lang, maganda ang pagtanggap, maayos palagi kung pupunta, marami siyang natutunan sa estudyanteng nag-asikaso sa baby inaasikaso kaagad	nauubusan ng bakuna, pinabalik-balik lalo na sa mga taong malalayo ang tirahan, hindi tinatanggap agad, matagal maghintay	sana palaging may bakuna, bigyan ng BCG kapag panganak, maging mas maasikaso ang mga health workers, poster na nagsasabi ng schedule ng bakuna

Table 6. Quality Assurance Indicators for New Patients in Tuberculosis Control Program

	Balara n = 7	Commonwealth n = 10	Tatalon n = 0	East Avenue Medical Centre n = 44
I. DIAGNOSIS				
A. History				
Does the health worker ask about:				
1. cough > x weeks	4	5		41
2. fever > x weeks	0	5		34
3. weight loss	4	3		23
4. dyspnea (difficulty breathing)	1	4		29
5. chest pain	0	2		29
6. hemoptysis (coughing blood)	2	2		24
7. family history	2	0		9
8. previous treatment for TB	4	5		18
B. PE				
Does the health worker examine for:				
9. lymphadenopathy (enlarged lymph nodes)	0	2		10
10. chest sign abnormalities	0	2		42
11. hepatosplenomegaly	0	0		5
II. COUNSELLING				
Does the health worker counsel about:				
12. importance of sputum exam	7	10		0
13. importance of returning for results	6	5		0
14. course of events if sputum is found positive	5	3		0

III. TAKING SPUTUM SAMPLE

A. Multi-Sample Approach Does the health worker

15. explain why	3	3	0
16. provide materials for overnight (take-home) sample	7	10	0
17. tell when to return with overnight sample	6	9	0

B. Instruct Re: Sputum Production Does the health worker

18. explain spitting vs. deep cough	1	6	0
19. describe differences between saliva and sputum (consistency, clarity)	0	3	0

Table 7. Quality Assurance Indicators for Follow-Up Patients in Tuberculosis Control Program

	Balara. n = 25	Commonwealth n = 21	Tatalon n = 36	East Avenue Medical Center n = 56
FOLLOW-UP FORM FOR TB				
A. Begin Therapy				
Does the health worker				
1. provide drugs	22	11	32	19 [†]
2. tell when to return, emphasizing importance of maintaining contact	16	5	29	39
B. Minimize Defaults				
Does the health worker				
3. complete active therapy register	25	14	34	37
4. set appointments, verify that patient understands	17	10	18	29
C. Continue Therapy				
Does the health worker				
5. ask adverse reactions, reassure patient (or change drugs)	0	0	0	5
6. repeat importance of completing regimen	3	0	3	22

* prescriptions

Table 8. Summary of In-Depth Interviews for Tuberculosis Control Program

	Balara n = 13	Commonwealth n = 15	Tatalon. n = 13	East Avenue Medical Center n = 34
Mean Age	41.3	41.4	49	42.875
Bakit kayo dito nagtungo?				
malapit	8	8	8	18
malapit at libre ang gamot	4	6	4	7
reperal (referred from outside)	0	1	1	6
gumagaling ang pasyente	1	0	0	0
maganda ang serbisyo	0	0	0	2
mga iba pang sagot	0	0	0	1
Ano po ang ginawa sa inyo?				
wala	0	1	0	0
binigyan ng gamot (vaccines, pills, injections, contraceptives)	5	7	8	7
ineksamin (PE, History, sputum, x-ray)	8	6	5	24
niresetahan	0	1	0	3
Ano po ang sinabi?				
0 wala	2	4	1	2
1 kumir/tuloy ang gamot	7	3	6	11
2 kinalalabasan/paydings (diagnosis)	0	0	1	6
3 magpa-lab eksam (sputum/x-ray/dugo, etc)	2	6	3	14
4 bumalik	1	2	2	2
5 pagbabago sa pamumuhay (lifestyle changes)	1	0	0	0
Sinabi ba kung kailan babalik?				
0 Hindi	2	3	1	2
1 Oo	11	12	12	32
Kung bibigyan ng marka ang serbisyong binibigay sa inyo kung saan ang 0 ay hindi kayo nasistuhan kahit konti at ang 100 ay masayang-masaya kayo, anong marka ang ibibigay niyo?				
Average Grade:	91.92	89.53	88.86	74.12
Oras na ibinigay ng doktor? (hindi kasali ang paghihintay)				
1 katamtaman ang bilis	10	10	10	25
2 masyadong mabilis	2	4	3	4
3 masyadong matagal	1	1	0	5
Pakitungo ng doktor?				
1 maganda	8	9	13	24
2 katamtaman	6	6	0	9
3 hindi maganda	0	1	0	1
Serbisyo?				
1 maayos	10	14	12	28
2 katamtaman	3	0	1	6
3 hindi maayos	0	1	0	1
Pagpapaliwanag?				
1 nalintndihan	10	1	12	32
2 nalintndihan ng kaunti	2	0	1	2
3 hindi nalintndihan	1	0	0	0
Rekomendasyon / Suhestiyon:				
0 wala	4	6	9	17
1 palaging may gamot/tac/gamit	7	2	3	3
2 maayos na mga gamit/serbisyo	1	7	0	11
3 mga iba pang sagot	0	0	1	3

Table 9. Summary of Focus Group Discussions on Tuberculosis Control Program

Center (# of FGD)	# of Previous Consultations	Grades (average)	Best Experience	Worst Experience	Suggestions
Balara (FGD = 2)	1,2,1,2,3	94	free medicines for TB, gumagaling kami, maayos ang serbisyo		kapag araw ng pagkuha ng gamot dapat meron agad other sources of free medicine not offered by health center (prescription drugs), libreng x-ray, have own laboratory
Commonwealth (FGD = 1)	2,1	100	free medicines for TB, gumagaling kami, maayos ang serbisyo, iniistima naman ng maayos at saka tinuturuan		
Tatalon (FGD = 2)	4,2,2,3,2,2	85.83	inaasikaso kaagad ang nais kumuha ng gamot mabilis ang serbisyo	pinabalik-balik kasi walang gamot, hindi nakakuha ng gamot dahil may Xmas party, walang doktor kasi nagkasakit ang kanyang pamangkin	dagdagan ang empleyado para dadami ang titingin at sana huwag magsasawa sa pagserbisyo
East Avenue Medical Hospital (FGD = 2)	1,2,4,4,3,2	83.33	maganda ang workmanship ng doktor, libre sa konsulta, mababait	kulang sa gamit katulad ng walang bakanteng wheel- chair, wala pang binibigay na reseta kahit ilang balik na	hindi pa nakikita ang kahulugan ng serbisyo, sana ang mga doktor ay talagang hasa na sa kanilang trabaho

Table 10. Quality Assurance Indicators for New Patients in Family Planning Program

	Balara n = 8	Commonwealth n = 10	Tatalon n = 14	Phil. Genera Hospital n = 72
FAMILY PLANNING SERVICE DELIVERY INDICATORS:				
A. History. Does the health worker				
1. ask women 15-44 about reproductive history and intentions ask appropriate reproductive history questions	8	8	12	50
2. about previous use of child spacing methods	5	7	13	50
3. about reasons for stopping or switching methods	2	2	3	30
4. about number, spacing and outcome of pregnancies ask appropriate questions regarding personal and family considerations of child spacing client	6	9	10	50
5. if and when client/partner would like to have children	5	2	2	29
6. about other personal and family factors affecting a method selection (personal preferences, partner/ family approval, privacy)	4	3	10	45
take adequate medical histories from child spacing patients				
7. about breast lumps, cancer	0	4	1	14
8. about history of heart disease, liver disease or high blood pressure	1	6	3	30
9. about history of pelvic inflammatory disease	0	0	0	17
10. about history of confirmed or suspected venereal disease	0	1	0	6
11. about history of blood clots or thromboemboli	1	1	3	8
12. about occurrence of severe headaches	0	1	1	8
13. about regularity of menstrual periods	2	6	5	35
14. about current breast feeding	2	3	2	18
15. current reproductive status (dates of last menses and most recent intercourse)	8	9	10	57

**B. Physical Examination. Does the health worker
conduct physical examination of child spacing client.**

16. take the blood pressure	6	0	3	48
17. examine breasts for lumps	0	1	1	14
18. perform pelvic exam	0	0	0	67
19. examine patient for signs of anemia	1	0	0	27

C. Laboratory Tests. Does the health worker

20. take pap smear	0	0	1	19
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D. Administering Child Spacing Methods

21. Does the health worker administer child spacing method. (if yes, choose one of the following)	5	9	13	44
Prescribe or distribute condom, pills or foam	4	7	9*	10
Insert IUD			3	7
Measure client and prescribe or distribute diaphragm				
Prescribe or distribute recommended supplies for natural child spacing	1	2	2*	1
Administer injectable contraceptive or implant			1	1
Schedule BTL				25
22. Does the health worker counsel client about how to use method	6	10	13	36

* 2 patients were administered 2 forms of contraception
simultaneously.

Table 11. Quality Assurance Indicators for Follow-Up Patients
In Family Planning Program

Follow Up. Does the health worker	Balara n = 22	Commonwealth n = 20	Tatalon n = 34	Phil. Genera n = 28
1. ask users about side effects	8	4	3	26
2. explain the correct use of spacing methods	8	7	29	6
3. explain the possible side effects of selected methods	3	2	2	13
4. explain when and where to go for resupplies and checkup	3	4	31	22
5. ask the patient to repeat key messages and/or demonstrate required skills	0	0	0	0
6. ask the patient to repeat common side effects of his/her selected child spacing method	1	0	1	1
7. ask patient to repeat when and where to return for supplies and checkups	0	0	5	3
8. ask the patient if there are questions on the use of child spacing method.	2	2	5	1

Table 12. Summary of In-Depth Interviews for Family Planning Program

	Belara n = 21	Commonwealth n = 13	Tatalon n=12	Philippine General Hospital n=35
Mean Age:	28.05	27	28.83	31.0:
Bakit kayo dito nagtungo?				
malapit	18	9	10	10
malapit at libre ang gamot	2	3	2	0
reperal (referred from outside)	3	1	0	13
gumagaling ang pasyente	0	0	0	0
maganda and serbisyo	0	0	0	11
Ano po ang ginawa sa inyo?				
wala	1	0	0	0
binigyan ng gamot (vaccines, pills, injections, contraceptives)	7	12	8	7
Ineksamin (PE, History, sputum, x-ray)	13	1	4	26
niresetahan	0	0	0	0
Ano po ang sinabi?				
wala	1	7	8	0
inumit/tuloy ang gamot	8	4	3	5
kinatalabas/psayndings (diagnosis)	8	2	0	26
magpa-lab eksam (sputum/x-ray/dugo, etc)	0	0	1	2
bumalik	1	0	0	2
pagbabago sa pamumuhay (lifestyle changes)	0	0	0	0
mga iba pang sagot	3	0	0	0
Sinabi ba kung kailan babalik?				
Hindi	13	9	3	4
Oo	8	4	9	31
Kung bibigyan ng marka ang serbisyong binibigay sa inyo kung saan ang 0 ay hindi kayo nasisiyahan kahit konti at ang 100 ay masayang-masaya kayo, anong marka ang ibibigay niyo?				
Average grade:	81.19	83.46	92.67	91.11
Oras na ibinigay ng doktor? (hindi kasali ang paghihintay)				
katamtaman ang bilis	17	8	12	32
masyadong mabilis	4	7	0	2
masyadong matagal	0	0	0	1
Pakikitungo ng doktor?				
maganda	18	10	11	32
katamtaman	3	3	1	3
hindi maganda	0	0	0	0
Serbisyo?				
maayos	18	11	12	33
katamtaman	2	1	0	1
hindi maayos	0	1	0	1
Pagpapaliwanag?				
naiintindihan	20	12	11	34
naiintindihan ng kaunti	1	0	1	1
hindi naiintindihan	0	1	0	0
Rekomendasyon / Suhestiyon:				
wala	12	6	8	28
palaging may gamot/tao/gamit	1	1	3	1
maayos na mga gamit/serbisyo	7	6	1	4
mga iba pang sagot	1	0	0	1

Table 13. Summary of Focus Group Discussions on Family Planning Program

Center (# of FGD)	# of Previous Consultations	Grades (average)	Best Experience	Worst Experience	Suggestions
Tatalon (FGD = 3)	1,1,3,1,3,3	97.67	OK, hindi nabuntis, maasikaso palagi	hindi madisiplina, matapang, pinapagalitan kapag maraming tao	sana ang cut-off time ay 11:00 at hindi 10:00
Philippine General Hospital (FGD = 2)	1,1,1,1,1	88.83	OK lang, maganda ang serbisyo, maganda mag- explain ang doktor, mabait, inaasikaso kaagad		

TABLE 14
 PERCENTILE DISTRIBUTION OF SUMMARY SCORES
 FOR QUALITY ASSURANCE PER PROGRAM PER CENTER

Expanded Program of Immunization	Balara	Commonwealth	Tatalon	East Avenue Medical Center
Min	4	3	6	5
25th %ile	6	6	7	6
50th %ile	7	7	7	7
75th %ile	7	8	9	8.5
Max	9	9	9	9
perfect score = 9				
Tuberculosis Control Program: New Patients				
Min	3	3	na	3
25th %ile	7	6	na	5
50th %ile	7	8.5	na	6
75th %ile	8	9	na	7
Max	12	14	na	9
perfect score = 19				
Tuberculosis Control Program: Follow-up Patients				
Min	2	0	0	0
25th %ile	2	0	3	1
50th %ile	3	1	4	2
75th %ile	4	3	4	4
Max	5	4	6	6
perfect score = 6				
Family Planning Program: New Patients				
Min	3	6	4	*5
25th %ile	6.75	6.25	7	7.5
50th %ile	7.5	8	7.5	10
75th %ile	9	9	8.75	12
Max	10	12	10	20
perfect score = 22				
Family Planning Program: Follow-up Patients				
Min	0	0	0	*0
25th %ile	0	0	2	1
50th %ile	1	0	2	2
75th %ile	2	1	2.75	3
Max	4	5	6	7
perfect score = 8				

*patients from Reproductive Health Center, UP-PGH

TABLE 15
 PERCENTILE DISTRIBUTION OF PATIENT RATINGS
 FOR IN-DEPTH INTERVIEW PER PROGRAM PER CENTER*

Expanded Program of Immunization	Balara	Commonwealth	Tatalon	East Avenue Medical Center
Minimum	50	50	50	10
25th %ile	80	80	85	80
50th %ile	90	89.5	100	90
75th %ile	100	100	100	100
Maximum	100	100	100	100
Tuberculosis Control Program				
Minimum	20	60	50	0
25th %ile	95	80	80	75
50th %ile	100	90	100	80
75th %ile	100	100	100	90
Maximum	100	100	100	100
Family Planning Program				
Minimum	50	0	80	80**
25th %ile	65	65	89	85
50th %ile	85	90	92.5	90
75th %ile	100	95	99	100
Maximum	100	100	100	100

* Possible scores range from 0 (worst) to 100 (best)

** Patients from Reproductive Health Center, UP-PGH

TABLE 16
 PERCENTILE DISTRIBUTION OF GLOBAL SCORES
 FOR IN-DEPTH INTERVIEW PER PROGRAM PER CENTER*

Expanded Program of Immunization	Balara	Commonwealth	Tatalon	East Avenue Medical Center
Best	4	4	4	4
25th %ile	4	4.75	4	4
50th %ile	5	5	4	4
75th %ile	5	6	5	5
Worst	7	6	7	7
Tuberculosis Control Program				
Best	4	4	4	4
25th %ile	4	4	4	4
50th %ile	5	5	4	4.5
75th %ile	6	5	5	5.75
Worst	7	8	5	8
Family Planning Program				
Best	4	4	4	4**
25th %ile	4	4	4	4
50th %ile	4	5	4	4
75th %ile	5	5	4	4
Worst	7	10	5	7

* Possible scores range from 4 (best) to 11 (worst)

** Patients from Reproductive Health Center, UP-PGH

ANNEX 1.

IMMUNIZATION SERVICE INDICATORS Actual Immunization Session Observations	1 for YES 0 for NO
1. Does the health worker examine vaccination cards or question mothers to determine immunizations needed?	
2. Does the health worker administer all vaccines with sterile needles. (for oral vaccines, place 9)	
3. Does the health worker protect BCG, polio and measles vaccines from heat during use.	
4. Does health workers record required information on vaccines administered on vaccination cards?	
5. Does the health worker tell the mother what vaccines were administered.	
6. Does the health worker advise the mother regarding possible side effects.	
7. Does the health worker advise the mother what to do in case of side effects.	
8. Does the health worker tell the mother of the child(ren) for the next required immunizations.	

Name of Health Care Provider:

Health Center:

Date:

Time:

Name of Data Collector:

ANNEX 1

H.

TUBERCULOSIS PROGRAM QUALITY ASSURANCE INDICATORS	
I. DIAGNOSIS	
A. History. Does the health worker	
1. cough > x weeks	
2. fever > x weeks	
3. weight loss	
4. dyspnea (difficulty breathing)	
5. chest pain	
6. hemoptysis (coughing blood)	
7. family history	
B. previous treatment for TB	
B. PE. Does the health worker examine for	
1. lymphadenopathy (enlarged lymph nodes)	
2. chest sign abnormalities	
3. hepatosplenomegaly	
II. COUNSELLING	
Does the health worker counsel about	
1. importance of sputum exam	
2. importance of returning for results	
3. course of events if sputum is found positive	
III. TAKING SPUTUM SAMPLE	
A. Multi-Sample Approach	
Does the health worker	
1. explain why	
2. provide materials for overnight (take-home) sample	
3. tell when to return with overnight sample	
B. Instruct Re: Sputum Production	
Does the health worker	
1. explain spitting vs. deep cough	
2. describe differences between saliva and sputum (consistency, clarity)	

FOLLOW-UP FORM FOR TB	1 for YES 0 for NO
A. Select Regimen	
1. Does the health worker select the treatment regimen according to patient category	
B. Counsel Patient Does the worker	
1. tell the patient he/she has TB	
2. explain infectious nature	
3. explain treatability	
4. describe treatment regimen, emphasizing the need to complete	
5. tell about possible side effects	
C. Begin Therapy Does the health worker	
1. provide drugs	
2. explain how to take	
3. tell when to return, emphasizing importance of maintaining contact	
D. Minimize Defaults Does the health worker	
1. complete active therapy register	
2. set appointments, verify that patient understands	
E. Continue Therapy Does the health worker	
1. ask adverse reactions, reassure patient (or change drugs)	
2. repeat importance of completing regimen	
3. perform smear examination	
a. at the end of initial phase	
b. at the end of continuation phase	
4. Follow policy on changing drugs if resistance is demonstrated or patient has adverse reaction	

Name of Health Care Provider:

Health Center:

Date:

Time:

Name of Data Collector:

ANNEX 1

FAMILY PLANNING SERVICE DELIVERY INDICATORS:	
A. History	
1. Does the health worker ask women 15-44 about reproductive history and intentions.	
2. Does the health worker direct the patient to sources of child spacing services.	
3. Does the health worker ask appropriate reproductive history questions	
a. about previous use of child spacing methods	
b. about reasons for stopping or switching methods	
c. about number, spacing and outcome of pregnancies	
4. Does the health worker ask appropriate questions regarding personal and family considerations of child spacing client	
a. if and when client/partner would like to have children	
b. about other personal and family factors affecting a method selection (personal preferences, partner/family approval, privacy)	
5. Does the health worker take adequate medical histories from child spacing patients?	
a. about breast lumps, cancer	
b. about history of heart disease, liver disease or high blood pressure	
c. about history of pelvic inflammatory disease	
d. about history of confirmed or suspected venereal disease	
e. about history of blood clots or thromboemboli	
f. about occurrence of severe headaches	
g. about regularity of menstrual periods	
h. about current breast feeding	
i. current reproductive status (dates of last menses and most recent intercourse)	
B. Physical Examination	
1. Does the health worker conduct physical examination of child spacing client. Does the health worker	

a. take the blood pressure	
b. examine breasts for lumps	
c. perform pelvic exam	
d. examine patient for signs of anemia	
C. Laboratory Tests	
1. Does the health worker	
a. take pap smear	
b. exam pap smear	
D. Administering Child Spacing Methods	
Does the health worker administer child spacing method. (If yes, choose one of the following)	
1. Prescribe or distribute condom, pills or foam	
2. Insert IUD	
3. Measure client and prescribe or distribute diaphragm	
4. Prescribe or distribute recommended supplies for natural child spacing	
5. Administer injectable contraceptive or implant	
E. Does the health worker counsel client about how to use method	
F. Follow Up	
1. Does the health worker schedule home or service delivery facility visits for new acceptors and method switchers (where applicable)	
2. Does the health worker ask users about side effects	
3. Does the health worker assists patients who wish to drop selected methods	
4. Does the health worker refer clients with severe side effects, ectopic pregnancies, pelvic inflammatory diseases, cases of infertility and sterilization candidates (where applicable)	
5. Does the health worker explain the correct use of spacing methods	
6. Does the health worker explain the possible side effects of selected methods	
7. Does the health worker explain when and where to go for resupplies and checkups	

8. Does the health worker demonstrate how to use child spacing methods	
a. how to correctly insert and remove diaphragm	
b. how to correctly place vaginal foam tablets	
c. how to check IUD strings to ensure proper position	
d. how to correctly use pill pockets	
9. Does the health worker ask the patient to repeat key messages and/or demonstrate required skills	
a. ask the patient to repeat common side effects of his/her selected child spacing method	
b. ask patient to repeat when and where to return for supplies and checkups	
10. Does the health worker ask the patient if there are questions on the use of child spacing method	

Name of Health Care Provider:

Health Center:

Date:

Time:

Name of Data Collector:

QUESTIONNAIRE FOR IN-DEPTH INTERVIEW

Q #1. Ano ang dahilan ng pagtungo ninyo dito?

Q #2. Bakit kayo dito nagtungo?

Q #3. Ano po ang ginawa sa inyo?

Q #4. Ano po ang sinabi?

Q #5. Sinabi ba kung kailan babalik?

Q #6. Kung bibigyan ng marka ang serbisyong binibigay sa inyo kung saan ang 0 ay hindi kayo nasisiyahan kahit konti at ang 100 ay masayang-masaya kayo, anong marka ang ibibigay ninyo?

grado: _____ %

Q #7. Oras na ibinigay ng doktor? (hindi kasali ang paghihintay)

1	katamtaman ang bilis
2	masyadong mabilis
2	masyadong matagal
9	walang sagot

Q #8. Pakikitungo ng doktor?

1	maganda
2	katamtaman
3	hindi maganda
9	walang sagot

Q #9. Serbisyo?

1	maayos
2	katamtaman
3	hindi maayos
9	walang sagot

Q #10. Pagpapaliwanag?

1	naiintindihan
---	---------------

2	naiintindihan ng kaunti
3	hindi naiintindihan
9	walang sagot

Q #11. Rekomendasyon / Suhestiyon:

0	wala
1	palaging may gamot/tao/gamit
2	maayos na mga gamit/serbisyo
3	mga iba pang sagot

ANNEX 3

FOCUS GROUP DISCUSSION:

1. Ilang beses na kayong pumunta dito sa huling tatlong buwan?
2. Kung 100% ang pinaka-maganda at 0 ang pinaka-pangit anong grado ang ibibigay ninyo sa serbisyong nakukuha ninyo dito?
3. Ano ang pinaka-magandang karanasan dito sa health center?
4. Ano ang pinaka-pangit na karanasan dito sa health center?
5. Bakit ninyo sinabi iyon?
6. Anu-ano ang mga suhestiyon para mapabuti ang serbisyo dito sa health center?

Maraming salamat po.

Name of Health Center: _____

Date: _____ Time: _____

Name of Data Collector: _____

1993 Data

Expanded Programme
on Immunization

FICs - 2131

Expenditures:

Personnel	= P	132,666.8
Supplies		
Vaccines		337,305.26
Syringes		62,570.90
Cotton		3,980.53
Alcohol		691.20

Building O.C.		4,622.00
---------------	--	----------

Vehicle O.C.		768.00
--------------	--	--------

Equip. O.C.		114.00
-------------	--	--------

Building		38,816.47
----------	--	-----------

Equipment		950.50
-----------	--	--------

Total	P	582,485.66 / 2131
-------	---	-------------------

P 273.

National Tuberculosis
Control Program:

Completely treated = 81

Expenditures:

Drugs dispensed =	P	87,984.00
-------------------	---	-----------

Examinations (Lab)

Slides		8,030.83
--------	--	----------

Reagents		101.00
----------	--	--------

Building O.C.		1,348.00
---------------	--	----------

Equip. O.C.		
-------------	--	--

Building		11,234.00
----------	--	-----------

Vehicle		
---------	--	--

Equipment		
-----------	--	--

Personnel		17,914.00
-----------	--	-----------

Total		128,611.88
-------	--	------------

Cost per completely treated patient :

P 1,587.80

Expenditures for FP 1993

Condom (27,792 units) P17,075

OCP's (5892 cycles) P40,301

FP personnel P24,096

Building & operating expenses	P18,989
----------------------------------	---------

Family
Planning:

=P100,461 / 742 acceptors in 1993

=P 135.40 per acceptor

Annex 5: Hospital Costs

Expanded Program on Immunization:

The average cost per immunized child was computed at an average outpatient consultation visit cost of P300 with 5 visits and a direct cost of P189 (from health center costs of consummables, e.g. vaccines, syringes, cotton balls and alcohol).

National Tuberculosis Control Program:

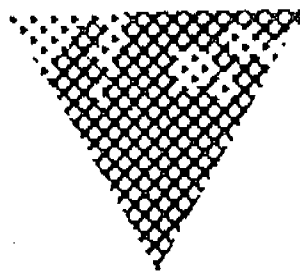
The average cost per patient completed treatment is P1890 computed at 6 visits at P300/visit and one chest x-ray costing P50. If the medications were included, one complete course would cost:

SCC kit (P39) x 60 days =	P2340
INH (P3.24) x 120 days =	P 388.80
Rifampicin 300 mg (P29) x 120 days =	P3480
TOTAL	P6208.80

Family Planning:

Average cost per acceptor is P772, computed at two visits for the year at P300/visit, P100 for one pap smear and P72 for FP method supplies (same as in health center).

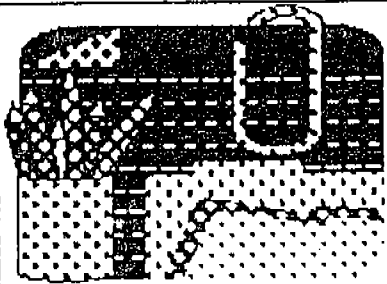
**Cost- Effectiveness
Analysis:
A Self-Instructional Manual**



For health center physicians

Prepared by:

*Tessa L. Tan-Torres, M.D.
Clinical Epidemiology Unit
April 30, 1995*



Scenario

The advent of decentralization has given you new and exciting responsibilities. You are now preparing your budget for the coming fiscal year. In anticipation of the local board meeting where you are expected to defend your budget proposal, you are reviewing the planned activities for the year.

* What is the better way to increase immunization coverage: outreach activities or an intensive promotion of the center's DAILY immunization services?

* Should standard treatment for tuberculosis patients (streptomycin and Isoniazid for a year) still be given or should all patients be shifted to triple drug chemotherapy?

* Depot injections of contraceptive agents will ensure better compliance. Is it better to reallocate part of the budget to purchase the depot medications or continue with just IUD and oral contraceptive pills?

To be able to answer these questions (and other questions on efficiency and resource allocation), you will have to know about the cost-effectiveness of the alternatives being considered before rational decisions can be taken.

What is the purpose of this self-instructional manual?

With the implementation of the local government code, local government officials are now responsible for planning and decision-making in response to the health needs and concerns of the people in the community. This self-instructional manual will assist you, the health center physician, to learn about

economic evaluations and, based on these evaluations, make more informed decisions.

An economic evaluation is a systematic consideration of costs and effects of proposed programs or activities. Traditionally, decisions on health interventions have been made based on the grounds of safety and effectiveness. In increasing recognition of the reality that the system cannot provide for all health needs, an additional criterion is the cost-effectiveness of the interventions being considered for implementation. This criterion answers the question, "given the resources available, where can these be spent which will give more benefits relative to the other interventions also being considered as possible choices?"

As an introductory text on economic evaluations, this manual will concentrate on helping you learn how to carry out a cost-effectiveness analysis. Other resources are available for the other methods (See References).

Specifically, this manual will help you:

1. identify when a cost-effectiveness analysis is needed in deciding between different alternatives;
2. determine the effects of the different alternatives;
3. define the range of costs to be identified, measured and valued per alternative;
4. perform an incremental cost-effectiveness analysis;
5. undertake a sensitivity analysis to determine the strength of the conclusions of the analysis;
6. incorporate the conclusions of the cost-effectiveness analysis into decision-making.

In addition, due to objective number 3, you can undertake a simple cost analysis which can provide you with data on distribution of expenditures among the major cost categories like personnel, supplies, utilities, transportation, etc. The same data can be used to determine the cost per service provided. Knowing the precise costs can help in monitoring, analyzing priorities and planning your health center's activities.

To ensure your best chances of achieving the stated objectives, it is suggested that you start from the beginning and complete each step before proceeding to the next.

STEP 1: DECIDE WHETHER A COST-EFFECTIVENESS ANALYSIS SHOULD BE UNDERTAKEN

Formulate the question

For purposes of a cost-effectiveness analysis, the question should be formulated in the way a decision-maker would ask it.

Therefore, in this case, the perspective being taken is that of the decision-maker. This will limit the alternatives to be considered, the effects and the costs to be collected to those that are relevant to the decision-maker.

The question may arise from three general areas:

Area 1: a problem (an objective of the center is not being achieved satisfactorily, e.g., target coverage, or a new problem crops up);

Area 2: fresh funds become available for spending and the decision has to be made on how to spend them, e.g., to expand or strengthen existing programs or invest in new programs;

Area 3: a new approach to a problem has been developed elsewhere and may be a better alternative to the current practice in your community, e.g., depot contraceptives vs. other methods.

Areas 1 and 3 will illustrate the most common type of questions faced by the decision-maker in the health center, that is, at the operational level of day-to-day activities. If the target immunization coverage is not being reached, then you can mount reach-out operations, immunization days, intensive health education or extension of clinic hours to include Saturdays. These decisions are usually made with the limitation of working within the resources available.

Area 2 illustrates the type of decisions that is done at the planning level. Such a decision point arises regularly, during the preparation of the budget or unexpectedly, if the center is made the beneficiary of a fund-raising activity or if a donor or non-governmental organization takes a sudden

interest in the area. In both levels of decision-making, you will have a pivotal role in advising or helping make the decision.

Suggestions to refine the question:

1. Spend time to talk directly with the concerned sectors, particularly the consumers. Approach them in the health center, the city hall or where people congregate to talk. Try talking to them individually and in groups. Both approaches may provide valuable insights. *TIP: Extend the discussions to uncover their proposed solutions to the question.* Use this time also to determine their reactions to your proposed solutions.
2. Go to available records and log books. Tabulate the data. Analyze trends and patterns. Do the figures vary across time or across different areas? Is there a trend? Talk to the staff about their reactions to the data you collected. Talk to personnel from the other health centers or from the province or the region. Seek technical assistance as needed.
3. Do a mini-survey. Someone from every third or fifth house along a street can be interviewed regarding the problem or situation.

The number of people to talk to will depend on how varied the responses you are getting. You will feel comfortable stopping once you are getting proportionately more confirmation than new information. At other times, a communication comes from the central department of health requesting for your participation in a program. Or your attention may be drawn to the problem by a local board member or a concerned citizen. Verification of the problem or the need identified is still an essential step to ensure that the resources of the community will be spent on the major health problems affecting a significant part of the community.

NOW, think about the problem you want to address and write it down in the space provided:

Identify alternatives to be considered:

After a clear delineation of the problem, alternatives which can provide solutions or improve the situation can be identified. The process for generating alternatives has been alluded to in the earlier step where discussions are held with the people concerned. Their proposed solutions can be solicited and their reactions to these can also be gauged. Other fruitful sources of potential solutions are reference materials including documents from the Department of Health or publications from the World Health Organization.

In narrowing the many choices to the few to be scrutinized closely, the following criteria can be used:

1. the alternative should have been proven to be efficacious or has been demonstrated in comparable areas to improve the situation;
2. the cost/technology of the alternative is within the magnitude/scope of available resources and is sustainable during the expected lifespan of the problem;
3. the alternative must be acceptable to the policymakers, the implementors and the consumers.

*Alternatives
should be:*

- *efficacious*
- *feasible and sustainable*
- *acceptable.*

In addition, you must make sure that the following alternatives are also included among those to be studied:

- * the standard approach or that which is currently practised by the majority (if there is such a standard)
- * the politically popular alternative (even if implausible because one has to carefully document the implausibility to use as evidence),
- * the "do nothing" approach (if this is ethically acceptable).

The "do nothing" alternative may also mean letting the current state of affairs with the existing level of service provision remain as is. In this case, the more appropriate term is "do nothing (new)" and usually this is the alternative to be considered together with a proposal to expand the scope or scale of the activities currently being provided, i.e., marginal changes.

An example would be increasing immunization coverage from 85 to 95% for measles (marginal change in scale) or adding hepatitis B immunization to the EPI program (marginal change in scope).

Remember also to eliminate those alternatives which are clearly less efficient than others based on a quick and informal weighing of costs and effects.

Now list the alternatives you will include in the analysis:

Alternative 1: _____

Alternative 2: _____

Consider: is an economic evaluation needed?

All decisions will entail expending resources and thus, at every decision-making point, a weighing of costs and effects/benefits is warranted. The actual economic evaluation can range from a quick mental weighing of "guesstimates" to a formal written report with documents cited as references and data sources. The validity and precision of the economic evaluation will depend on which method was used.

Formal economic evaluations are best carried out under the following conditions (1):

Evaluate each condition for your problem:

a. when sizeable amounts of scarce resources are at stake;

YES ___ NO ___

b. when responsibility for decision-making is fragmented (a very good example is the rabies control program where the post-exposure treatment to prevent rabies in a person bitten by a dog is the responsibility of the Department of Health and the prevention of spread of rabies among dogs is the responsibility of the Department of Agriculture. Which department should bear primary responsibility for the rabies problem?);

YES ___ NO ___

c. the objectives of the respective parties are at variance or unclear (an example would be home visits by paramedical personnel versus center-based dispensing of anti-tuberculosis drugs);

YES ___ NO ___

d. there exist acceptable alternatives of a radically different kind (alternatives very similar to each other will probably not differ very much in terms of effects and costs);

YES ___ NO ___

e. the technology underlying each alternative is well understood (you have to know what it is you will be studying and how well it performs);

YES ___ NO ___

f. the results of the analysis are not wanted in an impossibly short time.

YES ___ NO ___

If you answered yes to most of these conditions, then a formal economic evaluation is worth undertaking.

Consider: is a cost-effectiveness analysis the appropriate form of economic evaluation for the problem?

Cost-effectiveness analysis is a method of evaluating the costs and effects of different alternatives in achieving an objective or solving a problem. Aside from costs in pesos, the analysis measures in natural units the output or impact of each alternative. For example, if you were comparing different alternatives for measles immunization, the cost-effectiveness analysis would describe each alternative in terms of cost per case of measles infection prevented.

Cost-effectiveness analysis is only one of the different methods of economic evaluation. The other methods are cost-minimization, cost-utility and cost-benefit analysis. All of the analysis consider the peso costs of the alternatives. It is in the expression of effects that they differ.

A cost-minimization analysis will provide evidence that the alternatives are equally effective and thus, the rational choice would be simply the cheaper alternative. Both cost-effectiveness and cost-minimization analysis are best suited when comparing alternatives which have a common objective or a single major outcome. The two other methods, cost-utility analysis and cost-benefit analysis, can also be used for this purpose. However, their advantage is that they can also be used to compare alternatives which have different outcomes or to compare different programs.

For example, if you had extra resources, would you put it in an immunization outreach activity or purchase co-trimoxazole for the control of acute respiratory infections program? To answer this question, you can do a cost-benefit analysis and determine both the costs and effects of each program in monetary terms. You will then get a net benefit (final summing-up shows a net gain for you) or a net cost (the opposite). The appropriate valuation of benefits is difficult to accomplish especially if the outcome is lives saved (e.g., how much does a human life cost?).

A cost-utility analysis expresses outcomes in quality adjusted life years which represent a weighted gain in time due to averted morbidity and mortality. The weights used are the explicitly measured preferences (society's or the patients') for the averted morbidity and mortality. This analysis is particularly suited for alternatives producing effects which are important but traditionally acknowledged as being difficult to measure, e.g., suffering, anxiety, pain. Refer to Table 1 for summary.

If cost-effectiveness analysis will provide the information you need, please proceed to step 2. If a cost-benefit or cost-utility analysis is to be done, this manual is not intended to provide instruction for these types of analysis. Please go to the References.

STEP 2. DETERMINE THE EFFECTS OF THE ALTERNATIVES

Choose the main outcome

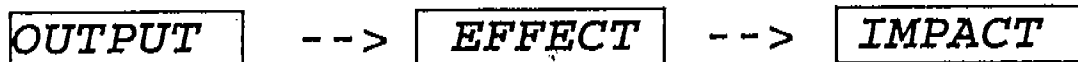
What single indicator would show that the problem has been solved or that the situation has improved? This is the main outcome to be selected for analysis. Such an outcome usually directly reflects the impact on the health of the population being served.

Another type of outcome is what is termed as an operational outcome. Examples of this would be the number of fully immunized children or the number of tuberculosis chemotherapy regimens dispensed or the number of family planning acceptors.

If you use operational outcomes, the assumption is that any improvement in the outcomes will directly and proportionately result in a change in the population's health status.

In another example, if you were comparing different health education programs for encouraging newly delivered mothers to practice contraception, a very proximal operational outcome would be the number of mothers who attended the health education sessions (OUTPUT). A more action-oriented operational outcome would be the number of family planning

acceptors (EFFECT). The IMPACT would be the number of women who have not become pregnant within two years of delivering their last baby. See table 2 for examples of commonly used outcomes.



Because of the relative ease in collecting operational outcomes, many health service researchers use these types of outcomes. To the extent possible, however, use impact outcomes which reflect directly the health status of the population or use the operational outcomes closest in sequence to the expected impact.

Now, identify your main outcome: _____

Measure the outcome produced by each alternative

The general approach is to imagine a hypothetical cohort of individuals to which the different alternatives would be applied. The number of individuals in that hypothetical cohort could be an arbitrary number like 1000 or 100 but for realism in costing (and for ease in determining feasibility budgetwise), it would be best to have the number approximate the expected people who will be utilizing or benefiting from the service for a period of one fiscal year.

Measures of efficacy can be obtained from:



- a. research studies (ideally randomized controlled trials of the alternatives to be studied in the cost-effectiveness analysis) published in journals or cited in reference materials;

However, as these interventions are carried out under very controlled conditions, their estimates of efficacy may not be achievable in the field. Because of the less-than-ideal conditions in the field, the effectiveness may be lower than the published estimate. If no randomized controlled trials are available, you can look for efficacy data from other types of studies including case reports, before and after studies, etc.

The important thing is to make sure that their settings are similar to yours. (See annex 1 for estimates of efficacy of different interventions published in literature)

b. the recorded experience of other centers which are already implementing the alternatives being studied. Again, you will have to carefully search for centers which are similar to your center. This is to help ensure that differences in costs or effects between the alternatives are real differences and are not due to differences in patient characteristics or service delivery patterns in the sites being compared.

c. your own center. Carefully document the existing practice in terms of effects (and costs). Then, carry out the alternative intervention on a pilot project basis in your center. Determine the effects (and costs) of the new alternative and compare with the old. To the extent that it is within your control, try to keep all other factors constant in the center except for the new intervention being piloted. This is essentially a before-and-after study.

It is easiest to use *proportion* as the primary measure of efficacy and apply this proportion to the hypothetical cohort to get the actual numbers of individuals benefited by the different alternatives being studied.

For example, the stated efficacy of a new intervention is 85%. If there is a pre-existing service, you can get the number of expected clients by reviewing the logbooks and noting down the number of patients who used the service in the past year (e.g., 3,500). Or you can use an arbitrary number like 1,000.

Just multiply the measure of effectiveness (in proportion) of each alternative with the number of expected patients. The answer would be 2,975 (if $N=3,500$) or 850 (if $N=1,000$).

Collecting efficacy data is the most difficult part in a cost-effectiveness analysis because you are looking for studies

which are preferably randomized controlled trials. There are only a few randomized controlled trials on primary health care level interventions. The next best choice is to collect data from other types of studies or from centers with experience or do a before and after study in your own center (which will take some time).

STEP 3. IDENTIFY, MEASURE AND VALUE THE INPUTS OF THE ALTERNATIVES (COSTING)

There are three main steps in costing: identification, measurement and valuation of inputs. You have already described the alternatives being compared in step 1. For each alternative, identify each step in the proper sequence. Then consider all the inputs for each step and the amount of the inputs used. A value (#pesos per unit of input) will then be multiplied with the number of units used. Simply stated, the total cost is the sum of all (# of units x cost/ unit of input) identified in each step.

Identify Steps

Example: Identifying steps and inputs in a health education campaign versus outreach activities to increase immunization coverage.

For a health education campaign, the following steps are usually taken:

1. identification of the audience, their characteristics and needs;
2. design of a training session "lesson plan;"
3. pilot testing of the "lesson plan;"
4. revision of the "lesson plan;"
5. training of trainers;
6. production of teaching materials;
7. announcing the scheduled activity on health education;
8. delivering the health education activity;
9. monitoring the impact of the intervention.

Similarly, an outreach activity will entail the following steps:

1. planning the activity including coordination with local barangay officials and procurement of supplies and other logistics (e.g., transportation);
2. publicizing and community organizing;
3. outreach activity (medical mission):
4. monitoring the impact of the activity.

If the types of steps vary every year, then it is good to list the steps also by the year it is carried out.

Identify direct costs or inputs/steps

For each of the steps listed in the two alternatives, you will have to visualize (or observe) how it actually occurs and list down the different types and amounts of inputs. To ensure that a comprehensive scope of costs will be considered, you can run through the different kinds of costs for each step.

The different types of costs are generally grouped as *direct, indirect and intangible costs*. *Direct costs* are, as the name implies, directly related to the intervention, whether medical or non-medical. Examples of direct costs are nurses' time, doctor's time, medicines/vaccines, transportation in an outreach program, health education materials, syringes, use of the center, etc.

Indirect costs are those due to losses of productivity. For example, to get anti-tuberculosis medications every week from the center, the patient would have to spend half a day (including travel and waiting time) which would constitute a loss of income if the patient was employed. Finally, the *intangible costs* are the pain, suffering, anxiety suffered by the patients and their relatives.

For purposes of the analysis which is being carried out from the perspective of the decision-maker, the costs to be considered are the direct costs. For those who intend to adopt a broader perspective which considers indirect and intangible costs, please go to the references.

Now fill in the table for alternative 1 (use additional forms for succeeding years if the steps will vary per year):

STEPS	Direct Costs or Inputs
1.	
2.	
3.	
4.	
5.	
6.	

Now fill in the table for alternative 2. Use additional forms for succeeding years if the steps will vary per year):

STEPS	Direct Costs or Inputs
1.	
2.	
3.	
4.	
5.	
6.	

Measure direct costs or inputs

After listing down all the steps and the inputs in each step, you will then measure the amount of inputs used. Different methods of measuring include:

1. direct observation (this is ideal);
2. If not feasible, interview of key informants (persons involved in the activity or trainers or experts) at the center (e.g., oral contraceptive pills dispensed in one month).
3. For supplies, perusal of the inventory lists of the health.

For example, to measure nurse's time in a health education campaign in family planning, you can choose to observe a sample of different sessions of family planning counselling and get the mean time (sum of number of minutes per session observed/number of sessions observed). The other option which is easier but may not be very precise would be to ask the nurse how much time it takes to counsel a patient on family planning.

The method to be used depends on the impact of the input being measured on the overall costs. In the previously cited example, nurse's time would be a major part of the inputs in a family planning counselling program and it would be important to get an accurate measure of the time spent. Thus, you would expend extra effort to observe several counselling sessions.

It is to be remembered that not all inputs are "consumables" or recurrent costs. There are other inputs like clinic space, use of vehicle and equipment (e.g., refrigerator for the cold chain in EPI). These are considered as *capital inputs*. In accounting convention, *capital goods* are those inputs with a life span of more than a year. Capital inputs should not only be included in the analysis and should be costed as well.

Now, refer to the previous step and list how you will measure the direct inputs per step and where you will get this information.

STEP 1 (use other sheets for succeeding steps)

INPUT	UNIT OF MEASURE	SOURCE OF INFO
1.		
2.		
3.		
4.		
5.		
6.		

A sample of inputs in a diarrheal disease control program is seen in annex 2.

Value the inputs

The concept of *opportunity cost* is the guiding principle in costing. *Opportunity cost is the value of the foregone benefits because the resource is not available for its best alternative use.* Thus, even when there is no expenditure (volunteer time), there is a cost (the volunteer could have worked in some other program, in his farm or helped his neighbor).

In practice, many of the values used for inputs are market prices. Market prices can be used for cost of medicine, vaccines, supplies.

The value for capital goods can be calculated in two ways:

1. Compute for the annualized, allocated present value.

The steps are:

* DETERMINATION OF PRESENT VALUE: Obtain the purchase (construction) cost and date of purchase (construction) of the

equipment (building). Apply the consumer price index (annex 3) to determine the present value.

For example, a 150 sq.m. health center was constructed at the cost of P4,000/sq. meter in 1988, giving a total of P600,000.

In 1990, the present value would be P747,681.

Note: CPIALL 1988 = 401
 CPIALL 1990 = 499.7
 Value in 1988 = P600,000
 Value in 1990 = ?

401	=	P600,000
499.7		?

? = P600,000 x 499.7

 401

? = P747,681

* ANNUALIZATION: Determine the useful life of the equipment. For a building - 20 years, for motorized equipment - 5 years and for electronic equipment - 7 years (as a guide). Select the annualization factor from Annex 4.

The building would last for 20 years and the annualization factor, at 5%, is 12.4622 (you can choose a higher or lower rate.)

Spread the present value of acquisition over the expected life span of the project. The cost has now been annualized.

P747,681/12.4622= P59,996

* ALLOCATION: Determine the number of users of the capital good in a year. For clinic space, how many services use the space and what would be the distribution of use. For example, family planning uses 20 square meters half day 5x a week. If the entire center was 150 square meters and operated 8 hours, 5 days a week, the share of family planning in clinic space

would be 6.6% (20 square meters x 4 hours x 5 days)/150 square meters x 8 hours x 5 days).

Multiply this proportion to the annualized cost of the space or equipment (allocated costs).

$$0.066 \times P59,996 = P3,960.$$

This amount represents the yearly cost of the family planning service in terms of clinic space.

NOTE: The other method is to use current rental rates for the equipment or the space as the value.

*** OBTAIN TOTAL COST AND AVERAGE COST**

To obtain the total cost of the program for the year, add the allocated costs of the capital inputs and the costs of the consumables (purchase price). For the unit cost of the program, divide the total cost with the number you obtained when measuring the outcome.

For example, if the total cost of the family planning program was P80,000 and there were 360 acceptors, the average cost would be $P80,000/360 = P222/\text{acceptor}$.

Finally, it is important to remember that costs which occur in the future will have to be discounted using a rate of 6% or higher depending on the time preference of society. The discount rate to use is the current NEDA discount rate. If not easily available, a rate of 6-8% can be used.

For more detail on costing, see annex 5.

STEP 4: PERFORM INCREMENTAL COST-EFFECTIVENESS ANALYSIS

This type of analysis will put together the data you collected on costs and effects of the alternatives being compared. Get the total cost of the alternative as obtained above. If there are more than two alternatives (A, B and C), designate one as the base alternative (usually the standard or existing practice) with which the others will be compared (e.g., if A

is the base alternative, the A vs. B, A vs. C). Compute the incremental cost-effectiveness ratio using this formula:

$$\frac{\text{Costs A} - \text{Cost B}}{\text{Effects A} - \text{Effects B}}$$



There can be four different kinds of ratios if there are two alternatives being compared, A and B. If the costs of A are less than B and the effects of A are more than B, then you will clearly choose A and vice versa. It becomes difficult to decide once an alternative is more expensive but, at the same time, provides more effect. The resulting cost-effectiveness ratio will tell you the extra cost to be paid to achieve the extra effect. The question to be answered by the decision maker then is: *Am I willing to pay the extra cost to get the extra effect?*

For example, the effectiveness of outreach programs in immunization is 75% (being able to reach 75% of all eligible subjects). With this effectiveness, compared to the 65% of waiting for walk-in patients at the center, a gain of 10% is expected and if the expected number of eligibles is 1,000, then an additional 100 would have been immunized. The difference in costs of the two programs is P24,000/year. Thus the ICER for the incremental cost-effectiveness analysis is:

P24,000	Extra	P240/ extra child immunized

E1-E2 (750-650)		

The question to be answered by the decision-maker is "am I willing to spend an extra P240 to get an extra child immunized?"

STEP 5: UNDERTAKE SENSITIVITY
ANALYSIS

As not all the figures used in the analysis are precise, you can substitute other figures which are also plausible in the analysis and recompute the ratio again. To do this, you will

have to identify the figures to be substituted (the costs or effects where you are not very certain about their precision), the actual number to be used as a substitute and then recompute.

An example would be, if in the base case analysis, alternative A was more effective and less costly, would substitution of a lower (by a tenth) efficacy rate for alternative A still not change the results?

If it does not, then the analysis is robust and you can have confidence in your conclusions. If the conclusions change in the sensitivity analysis, then, this means that you will have to exert more effort to make your figure more precise by gathering more data or using actual observation.

In sensitivity analysis, one would play with the range of figures provided. Using the previously cited example, what if the effectiveness of outreach is just 68% of the eligible population? What would be the new incremental cost effectiveness ratio?

P24,000

----- = Extra P800/ extra child immunized.

680-650

Would you still be willing to pay an extra P800 to get one extra child immunized? Or can the money be spent in a better way? What if it was an extra P2000 for the extra child immunized?

You should play around with a feasible range of figures and if the decision does not change, then you can be reasonably sure of your conclusion.

REMEMBER THAT SENSITIVITY ANALYSIS IS A VERY POWERFUL TOOL WHICH CAN DEMONSTRATE HOW STRONG OR HOW WEAK YOUR CONCLUSIONS ARE. IT SHOULD BE USED WHEN THE DATA IN THE ANALYSIS ARE NOT PRECISE (OR ARE GUESSTIMATES) AND THE CONCLUSION HINGES ON THE USE OF THESE DATA.

Now: Complete the following table:

Variable	Base Figure	Substitute Figure	New ICER
1.			
2.			
3.			
4.			
5.			

STEP 6: INCORPORATE THE CONCLUSIONS OF THE COST-EFFECTIVENESS ANALYSIS INTO DECISION-MAKING

Cost-effectiveness analysis is very important as it quantifies the costs and effects of alternatives you are considering and summarizes their relative value in a cost-effectiveness ratio.

However, the confidence that you can put on the results is directly proportional to the quality of the data collected. *Thus, exert every effort to collect good data.*



The information from a cost-effectiveness analysis is only one of the many pieces of information which enters into decision-making. Its influence on the decision will depend on how you can present and explain the figures so that the decision-makers can understand and appreciate the wealth of information contained in the ratio.

Also, to ensure that the cost-effectiveness analysis will have some impact on the decision, the results have to be ready in a timely manner. The information should be available when the decision is to be made.

Finally, it is important to remember that the perspective adopted is that of the decision-maker, in this case, the health officials. In certain instances, decisions made based on the cost-effectiveness analysis may be at variance with the perspective of other groups, e.g., the decision to shorten clinic hours for more in-service training. In these cases, one should also carefully consider the perspective of the other groups in making the final decision.

- END -

MANUALS ON METHODS OF ECONOMIC EVALUATION/COSTING:

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Basic types of economic evaluation

TABLE 1. Measurement of costs and consequences in economic evaluations

Type of study	Measurement/valuation of costs in both alternatives	Identification of consequences	Measurement/valuation of consequences
Cost-minimization analysis	Dollars	Identical in all relevant respects	None
Cost-effectiveness analysis	Dollars	Single effect of interest, common to both alternatives, but achieved to different degrees	Natural units (e.g., life-years gained, disability-days saved, points of blood pressure reduction, etc.)
Cost-benefit analysis	Dollars	Single or multiple effects, not necessarily common to both alternatives, and common effects may be achieved to different degrees by the alternatives	Dollars
Cost-utility analysis	Dollars	Single or multiple effects, not necessarily common to both alternatives, and common effects may be achieved to different degrees by the alternatives	Healthy days or (more often) quality-adjusted life-years

From Drummond et al.

TABLE 2: Suggested Measures of Primary Health Care Effectiveness
(From PRICOR manual)

OUTPUTS (Of goods and services)	EFFECTS (On knowledge, attitudes, behavior)	IMPACTS (On health)
<u>Contacts</u> Total number of contacts No., % individuals contacted No., % target population contacted	<u>Knowledge</u> No., % who can recognize symptoms of disease No., % who know treatment protocol for (therapy)	<u>Infant mortality</u> No. deaths under one year of age/1,000 live births
<u>Visits</u> Total number of visits No., % individuals visited No., % target population visited No., % initial (first time) visits No. initial visits/No. follow-up visits No., % follow-up visits	<u>Skills</u> No., % able to carry out (preventive, diagnostic, treatment) protocol	<u>Child mortality</u> No. deaths under 5 years of age/1,000 children under 5 years
<u>Referrals</u> Total number of referrals No., % individuals referred No., % target population referred	<u>Attitudes</u> No., % who are in favor of (PHC services, activity, policy)	<u>Neonatal mortality</u> No. infant deaths in first 28 days of life/1,000 live births
<u>Appointments</u> Total number of appointments kept No., % individuals appts. kept No., % target population appts. kept	<u>Motivation</u> No., % willing to support (PHC service, activity, policy)	<u>Perinatal mortality</u> No. late fetal and infant deaths in first 7 days of life/1,000 live births
<u>Households served</u> Total number of households served No., % target households served	<u>Behavior</u> Total number enrollee acceptors No., % individuals enrolled No., % target group enrolled	<u>Fetal Mortality</u> No. abortions/1,000 women aged 15-44 years
<u>Individuals served</u> Total number of individuals served No., % target population served	<u>Actives</u> Total number active cases No., % active households No., % target population active No., % using (PHC service, intervention)	<u>Weight at birth</u> Average weight (kg) at birth <u>Growth and development</u> Average weight by height and age (1-4 years) No., % children growing normally Average upper arm circumference (cm) by age (1-4 years)
<u>Commodities distributed</u> Total number of units distributed No., % individuals served No., % target population served	<u>Dropouts</u> Total number dropouts No., % household dropouts No., % target population dropouts	<u>Malnutrition</u> No. malnourished children by level of malnutrition (I, II, III)/1,000 children
<u>Examinations</u> Total number of examinations No., % individuals examined No., % target population examined		<u>Morbidity</u> No. cases of disease
<u>Treatments</u> Total number of treatments No., % individuals treated No., % target population treated		<u>Maternal mortality</u> No. maternal deaths/1,000 live births
<u>Prescriptions</u> Total number of prescriptions No., % individuals served No., % target population served		<u>Crude birth rate</u> No. live births/1,000 population
<u>Sessions</u> Total number sessions held No., % group sessions held No., % individuals reached No., % target population reached		<u>Excess parity</u> No. females aged 35-44 years of parity 5 or more/no. females aged 15-44 No. pregnancies among females 10-14 years/no. females 10-14 years of age
		<u>Total fertility rate</u> Total no. births to women in their lifetimes/1,000 women
		<u>Birth interval</u> Average no. months between pregnancy terminations

Measures of Behavioral Effects
of Primary Health Care Interventions

PHC INTERVENTION	BEHAVIORAL EFFECT
<u>NUTRITION</u>	
<u>Breastfeeding</u>	Total no. breastfeeding No., % mothers breastfeeding infants No., % target group breastfeeding infants
Malnourished children using feeding packets	Total no., % children using packets No., % households using packets No., % target population using packets
Diagnosed cases of malnutrition	Total no., % treated (by level of treated severity) No., % individuals treated No., % target group treated
Growth monitoring charts used	Total no., % children using charts regularly No., % households using charts No., % target population using charts
<u>IMMUNIZATION</u>	
<u>Children immunized</u>	Total no. children immunized against (disease) No., % children fully immunized No., % households with immunized children No., % target population immunized
<u>ORAL REHYDRATION THERAPY</u>	
<u>ORT use</u>	Total no. users of ORT No., % individuals using ORT No., % target population using ORT
Diagnosed cases of dehydration	Total no. treated No., % individuals treated No., % target group treated
<u>MALARIA</u>	
<u>Malaria prophylaxis</u>	Total no. using malaria prophylaxis No., % households using malaria prophylaxis No., % target group using malaria prophylaxis Average length of use (in days, weeks, or months)
Diagnosed cases treated	Total no. treated No., % individuals treated No., % target group treated

Measures of Behavioral Effects
of Primary Health Care Interventions (continued)

PHC INTERVENTION	BEHAVIORAL EFFECT
<u>INFANT ACUTE RESPIRATORY INFECTIONS</u>	
Diagnosed cases of acute respiratory infections treated	Total no. treated No., % individual treated No., % target group treated
<u>FAMILY PLANNING</u>	
New family planning acceptors	Total no. acceptors No., % target group acceptors
Current family planning users	Total no. users No., % target group users
Months of continuous use of family planning (Prevalence)	Average months of use all users Average months of use target population
<u>WATER AND SANITATION</u>	
Wells	Total no. wells by type (shallow, deep, protected, unprotected) No., % households with wells No., % households using wells
Latrines	Total no. latrines by type No., % households with latrines No., % households using latrines
<u>MATERNAL CARE</u>	
Pregnant women receiving prenatal care	Total no. women receiving care No., % target population receiving care Average no. antenatal visits/ pregnancy
Supervised deliveries	Total no. supervised deliveries No., % supervised deliveries in target group
Mothers receiving post-partum care	Total no. women receiving care No., % target population receiving care

ANNEX I ESTIMATES OF THE EFFECTIVENESS OF ALTERNATIVE
PREVENTIVE AND CURATIVE HEALTH INTERVENTIONS
FROM Brenzel, et al.

Disease Group	Interventions	Effectiveness/Impact
Acute Respiratory Infection	Pertussis Immunization	50% - 90% vaccine efficacy
	Pneumococcal Immunization	50% - 80% vaccine efficacy; 30% mortality reduction
	Measles Immunization	90% to 96% vaccine efficacy
	H. Influenzae Immunization	0% - 90% vaccine efficacy
	Nutrition Supplementation	unknown
	Vitamin A Supplementation	unknown
	Case Management	11.5% - 40%
Diarrheal Disease	Rotavirus Immunization	80% vaccine efficacy; 3% mortality reduction
	Cholera Immunization	70% vaccine efficacy; 2.8% mortality reduction
	Measles Immunization	90% - 95% vaccine efficacy
	Breastfeeding	
	Water and Sanitation	30%
	Personal Hygiene	14% - 48% incidence reduction
	Oral Rehydration Salts	70%
	Chemotherapy	limited
Tetanus	Tetanus Toxoid and DPT Immunization	91% - 95% vaccine efficacy
	Hospital Delivery	85%
	Trained TBA	33%
	Case Management	up to 10%
	Injury Control	unknown
Polio	Oral Polio Vaccine	79% - 85% vaccine efficacy
	Injectable Polio Vaccine (DTP)	90% - 96% vaccine efficacy
	Improved Sanitation	unknown
	Rehabilitation	unknown
Tuberculosis	BCG Immunization at birth	40% - 70% vaccine efficacy
	Chemoprophylaxis	less than 100% depending upon compliance rates
	Case Detection: sputum	90% sensitivity
	Case Detection: X-ray	87% sensitivity
	Treatment: standard course	less than 30%
	Treatment: short course	less than 60%
	Nutrition/Sanitation	unknown

Injury	Alteration of Product Design: roads vehicles	27% mortality reduction unknown
	Use of Seat-Belts	43% Mortality reduction: 40% - 70% injury reduction
	Taxation on alcohol	less than 75% reduction in deaths for a 50% tax
	Legislation	79% reduction in car accidents in Brazil
	Use of helmets	72% reduction in fatalities; 20% reduction in injuries
	Adequate emergency facilities and referral	33% reduction in deaths
	Education	unknown
Hepatitis B	Hepatitis B Immunization	75% - 95% vaccine efficiency
	Foat/Alcohol	01% - 70% reduction in cancers related to diet
	Reduction Occupational Exposure	less than 10%
	Smoking Cessation	high
Onchocerciasis	Vector control: insecticides	85%
	Improved Hygiene	unknown
	Nodulesctomy	66.7%
	Chemotherapy: ivermectin	unknown
Helminthic Infections	Chemotherapy: praziquantel for Schistosomiasis	58% - 85%
	Chemotherapy: ivermectin for Nematode infection	75%
	benzimidols for Nematode infection	75%
	Chemotherapy for Ascariis	100%
	Chemotherapy for Hookworm	20%
	Vector control: water filtering	30% for druncunculiasis
Maternal and Perinatal Health Problems	Hygiene and Sanitation	29% for Ascariis 78% for Guinea Worm 4% for Hookworm 77% for Schistosomiasis
	Training of birth attendants	less than 65% maternal mortality reduction; 30% - 40% reduction in perinatal mortality over a ten-year period
	Nutrition Supplementation	unknown
Leprosy	Family Planning Services	see below
	BCG Immunization	30% to 80% vaccine efficiency
	Treatment with dapsone	50%
	Treatment with rifampicin	50%
	Treatment with dally prednisolone	75%
Sanitation/Hygiene/socio-economic development	unknown	

	Rehabilitation	unknown
	Reconstructive surgery	unknown
HIV Infection and Sexually Transmitted Diseases	Condoms	less than 100%
	Eye prophylaxis for infants	93% - 97%
	Health education	unknown
	Screening of pregnant women for STDs	unknown
	Chemotherapy for STDs (except HIV)	approximately 100%
	Chemotherapy for AIDS	prolongs life for 2 years
	Improved blood supply	approximately 100% effective in preventing transmission
	AIDS patient care	unknown
Measles	Measles immunization	90% - 95% vaccine efficacy
	Improved hygiene and sanitation	unknown
Family Planning	Birth Control methods	Abortion = 100% Tubal ligation = 99% Vasectomy = 99% Injectable progestin = 99% Birth control pills = 97% - 99% IUD = 96% Condom = 90% Diaphragm = 87% Breastfeeding for 6 months = 98%
	Birth Spacing	60% ?
Micronutrient Deficiency	Supplementation	75%
	Fortification	75%
	Breastfeeding	unknown
	Nutrition Education	unknown
Cataract	Mx surgery	85% - 92%
	Sunglasses	Blocks 86% - 94% of UV light
	Nutrition Supplementation	unknown
Oral Health	Fluorination of water	unknown
	Education	unknown
	Nutrition	unknown
	Tooth brushing	34% reduction in dental caries

NOTES: Effectiveness of drug therapies depends upon the frequency of treatment, coverage of the population (whether a targeted or mass strategy is used), the type of drug, and the dosage level.

Vaccine efficacy figures represent those attained under ideal conditions. Coverage rates are likely to influence total health impact.

Unknown effectiveness measures refer to cases where there is an absence of quantitative information, though qualitatively, relationships between the intervention and health benefits are assumed to exist.

Sources: Jamison, D.T., and Mosley, W.H., eds. *Disease Control Priorities in Developing Countries*. Oxford University Press, New York, 1993; Esrey, S.A., Potash, J., Roberts, L., and Stiff, C., *Health Benefits from Improvements in Water Supply and Sanitation: Survey and Analysis of the Literature on Selected Diseases*. Technical Report Number 6, Water and Sanitation for Health (WASH) Project, Arlington, VA, 1991.

ANNEX 2

Inputs For Programme Functions

LEVEL - Health Centre

INPUTS	FUNCTIONS			
	Diarrhoea treatment	Diarrhoea education	Supervision/ Management	Maintenance
<i>Recurrent</i>				
Personnel	health staff	health staff	supervisors/ managers	cleaners
Supplies	ORS, cups, spoons, IV, antibiotics	teaching materials		housekeeping supplies
Equipment operating costs	-	-		-
Building operating costs	water & electricity			-
Vehicle operating costs			fuel	-
Other recurrent costs			telephone	-
<i>Capital</i>				
Equipment			office equipment	-
Buildings	space used for diarrhoea treatment & education		space used for support functions	-
Vehicles			vehicles	-

From Phillips M, Shepard D, et al

ANNEX 3 CONSUMER PRICE INDEX OR CPI OF PRIVATE MEDICAL SERVICES
(CPIMED), PHARMACEUTICAL AND MEDICAL SUPPLIES (CPIPMS)
AND ALL ITEMS (CPIALL), PHILIPPINES, 1981-1990 (1978=100)

33

YEAR	Private Medical Services	Pharmaceutical & Medical Supplies	All Items
1978		100.0	
1981	161.6	143.5	157.1
1982	186.0	158.2	173.2
1983	203.2	177.4	190.5
1984	264.7	263.5	286.3
1985	314.2	326.2	352.6
1986	335.4	365.3	355.3
1987	355.4	394.3	368.7
1988	376.8	420.2	401.0
1989	395.1	451.7	443.5
1990	440.4	492.1	499.7

Source: National Census and Statistics Office

ANNEX 4 DISCOUNT RATES

What 1 Case in Year t Would Be in the Present DISCOUNTING					What 1 Case Every Year from t to the Present Would Be (Present Worth of Annuity Factor) ANNUAL (1/1+r) ^t				
YEAR	3%	5%	10%	15%	YEAR	3%	5%	10%	15%
1	0.9709	0.9524	0.9091	0.8696	1	0.9709	0.9524	0.9091	0.8696
2	0.9426	0.9070	0.8264	0.7561	2	1.9135	1.8594	1.7355	1.6257
3	0.9151	0.8638	0.7513	0.6575	3	2.8286	2.7232	2.4869	2.2832
4	0.8885	0.8227	0.6830	0.5718	4	3.7171	3.5460	3.1699	2.8550
5	0.8626	0.7835	0.6209	0.4972	5	4.5797	4.3295	3.7908	3.3522
6	0.8375	0.7462	0.5645	0.4323	6	5.4172	5.0757	4.3553	3.7845
7	0.8131	0.7107	0.5132	0.3759	7	6.2303	5.7864	4.8684	4.1604
8	0.7894	0.6768	0.4665	0.3269	8	7.0197	6.4632	5.3349	4.4873
9	0.7664	0.6446	0.4241	0.2843	9	7.7861	7.1078	5.7590	4.7716
10	0.7441	0.6139	0.3855	0.2472	10	8.5302	7.7217	6.1446	5.0188
11	0.7224	0.5847	0.3505	0.2149	11	9.2526	8.3064	6.4951	5.2337
12	0.7014	0.5568	0.3186	0.1869	12	9.9540	8.8633	6.8137	5.4206
13	0.6810	0.5303	0.2897	0.1625	13	10.6350	9.3936	7.1034	5.5831
14	0.6611	0.5051	0.2633	0.1413	14	11.2961	9.8986	7.3667	5.7245
15	0.6419	0.4810	0.2394	0.1229	15	11.9379	10.3797	7.6061	5.8474
16	0.6232	0.4581	0.2176	0.1069	16	12.5611	10.8378	7.8237	5.9542
17	0.6050	0.4363	0.1978	0.0929	17	13.1661	11.2741	8.0216	6.0472
18	0.5874	0.4155	0.1799	0.0808	18	13.7535	11.6896	8.2014	6.1280
19	0.5703	0.3957	0.1635	0.0703	19	14.3238	12.0853	8.3649	6.1982
20	0.5537	0.3769	0.1486	0.0611	20	14.8775	12.4622	8.5136	6.2593
21	0.5375	0.3589	0.1351	0.0531	21	15.4150	12.8212	8.6487	6.3125
22	0.5219	0.3418	0.1228	0.0462	22	15.9369	13.1630	8.7715	6.3587
23	0.5067	0.3256	0.1117	0.0402	23	16.4436	13.4886	8.8832	6.3988
24	0.4919	0.3101	0.1015	0.0349	24	16.9355	13.7986	8.9847	6.4338
25	0.4776	0.2953	0.0923	0.0304	25	17.4131	14.0939	9.0770	6.4641
26	0.4637	0.2812	0.0839	0.0264	26	17.8768	14.3752	9.1609	6.4906
27	0.4502	0.2678	0.0763	0.0230	27	18.3270	14.6430	9.2372	6.5135
28	0.4371	0.2551	0.0693	0.0200	28	18.7641	14.8981	9.3066	6.5335
29	0.4243	0.2429	0.0630	0.0174	29	19.1885	15.1411	9.3696	6.5509
30	0.4120	0.2314	0.0573	0.0151	30	19.6004	15.3725	9.4269	6.5660
31	0.4000	0.2204	0.0521	0.0131	31	20.0004	15.5928	9.4790	6.5791
32	0.3883	0.2099	0.0474	0.0114	32	20.3888	15.8027	9.5264	6.5905
33	0.3770	0.1999	0.0431	0.0099	33	20.7658	16.0025	9.5694	6.6005
34	0.3660	0.1904	0.0391	0.0086	34	21.1318	16.1929	9.6086	6.6091
35	0.3554	0.1813	0.0356	0.0075	35	21.4872	16.3742	9.6442	6.6166
36	0.3450	0.1727	0.0323	0.0065	36	21.8323	16.5469	9.6765	6.6231
37	0.3350	0.1644	0.0294	0.0057	37	22.1672	16.7113	9.7059	6.6288
38	0.3252	0.1566	0.0267	0.0049	38	22.4925	16.8679	9.7327	6.6338
39	0.3158	0.1491	0.0243	0.0043	39	22.8082	17.0170	9.7570	6.6380
40	0.3066	0.1420	0.0221	0.0037	40	23.1148	17.1591	9.7791	6.6418

From Brenzel et al.

41	0.2976	0.1353	0.0201	0.0032	41	23.4124	17.2944	9.7991	6.6450
42	0.2890	0.1288	0.0183	0.0028	42	23.7014	17.4232	9.8174	6.6478
43	0.2805	0.1227	0.0166	0.0025	43	23.9819	17.5459	9.8340	6.6503
44	0.2724	0.1169	0.0151	0.0021	44	24.2543	17.6628	9.8491	6.6524
45	0.2644	0.1113	0.0137	0.0019	45	24.5187	17.7741	9.8628	6.6543
46	0.2567	0.1060	0.0125	0.0016	46	24.7754	17.8801	9.8753	6.6559
47	0.2493	0.1009	0.0113	0.0014	47	25.0247	17.9810	9.8866	6.6573
48	0.2420	0.0961	0.0103	0.0012	48	25.2667	18.0772	9.8969	6.6585
49	0.2350	0.0916	0.0094	0.0011	49	25.5017	18.1687	9.9063	6.6596
50	0.2281	0.0872	0.0085	0.0009	50	25.7298	18.2559	9.9148	6.6605
51	0.2215	0.0831	0.0077	0.0008	51	25.9512	18.3390	9.9226	6.6613
52	0.2150	0.0791	0.0070	0.0007	52	26.1662	18.4181	9.9296	6.6620
53	0.2088	0.0753	0.0064	0.0006	53	26.3750	18.4934	9.9360	6.6626
54	0.2027	0.0717	0.0058	0.0005	54	26.5777	18.5651	9.9418	6.6631
55	0.1968	0.0683	0.0053	0.0005	55	26.7744	18.6335	9.9471	6.6636
56	0.1910	0.0651	0.0048	0.0004	56	26.9655	18.6985	9.9519	6.6640
57	0.1855	0.0620	0.0044	0.0003	57	27.1509	18.7605	9.9563	6.6644
58	0.1801	0.0590	0.0040	0.0003	58	27.3310	18.8195	9.9603	6.6647
59	0.1748	0.0562	0.0036	0.0003	59	27.5058	18.8758	9.9639	6.6649
60	0.1697	0.0535	0.0033	0.0002	60	27.6756	18.9293	9.9672	6.6651
61	0.1648	0.0510	0.0030	0.0002	61	27.8404	18.9803	9.9701	6.6653
62	0.1600	0.0486	0.0027	0.0002	62	28.0003	19.0288	9.9729	6.6655
63	0.1553	0.0462	0.0025	0.0001	63	28.1557	19.0751	9.9753	6.6657
64	0.1508	0.0440	0.0022	0.0001	64	28.3065	19.1191	9.9776	6.6658
65	0.1464	0.0419	0.0020	0.0001	65	28.4529	19.1611	9.9796	6.6659
66	0.1421	0.0399	0.0019	0.0001	66	28.5950	19.2010	9.9815	6.6660
67	0.1380	0.0380	0.0017	0.0001	67	28.7330	19.2391	9.9831	6.6661
68	0.1340	0.0362	0.0015	0.0001	68	28.8670	19.2753	9.9847	6.6662
69	0.1301	0.0345	0.0014	0.0001	69	28.9971	19.3098	9.9861	6.6662
70	0.1263	0.0329	0.0013	0.0001	70	29.1234	19.3427	9.9873	6.6663
71	0.1226	0.0313	0.0012	0.0000	71	29.2460	19.3740	9.9885	6.6663
72	0.1190	0.0298	0.0010	0.0000	72	29.3651	19.4038	9.9895	6.6664
73	0.1156	0.0284	0.0010	0.0000	73	29.4807	19.4322	9.9905	6.6664
74	0.1122	0.0270	0.0009	0.0000	74	29.5929	19.4592	9.9914	6.6665
75	0.1089	0.0258	0.0008	0.0000	75	29.7018	19.4850	9.9921	6.6665
76	0.1058	0.0245	0.0007	0.0000	76	29.8076	19.5095	9.9929	6.6665
77	0.1027	0.0234	0.0006	0.0000	77	29.9103	19.5329	9.9935	6.6665
78	0.0997	0.0222	0.0006	0.0000	78	30.0100	19.5551	9.9941	6.6665
79	0.0968	0.0212	0.0005	0.0000	79	30.1068	19.5763	9.9946	6.6666
80	0.0940	0.0202	0.0005	0.0000	80	30.2008	19.5965	9.9951	6.6666

ANNEX 5 Detailed Methodology for Calculating Costs

This annex describes in some detail the procedure for estimating the costs of each major category of input. It does not deal with methods of allocating shared costs which will be different depending on the activity being costed. Section 3.3 and the case studies explain techniques for allocation.

The following input categories are discussed:

Recurrent

- Personnel
- Supplies
- Equipment operating costs
- Building operating costs
- Vehicle operating costs
- Other recurrent costs

Capital

- Equipment
- Buildings
- Vehicles

The general procedure for calculating the annual value of capital costs is explained in the section on capital costs.

RECURRENT COST - PERSONNEL

Salaries and wages are frequently the largest single cost item in health programmes. Care should be taken in calculating their value.

The cost to use

You need to know the full cost of personnel. The relevant figure is the gross salary (i.e., before tax and fringe benefits such as health insurance, social security, and pension plans have been deducted). You do not want the net or "take home" salary. Include any special incentive, overtime or hardship bonuses, holiday pay, sick leave, uniform, and housing allowances and the estimated value of any commodities, housing, or other non-monetary benefits that might be provided to the worker.

Fees or honoraria for short-term services of experts, advisers, and others involved in the activity who are not employees should also be included.

Voluntary labor (such as volunteer community health workers who distribute ORS and educate mothers on its use) should be valued. There are several possible ways to do this. For those who receive salaries or wages elsewhere (e.g., volunteer nurses), use that salary. For those who do not, use the wage rates paid to workers who do equivalent work (e.g., community health workers) or the national minimum wage or the average agricultural wage in the area.

Salary costs are usually given as annual rates, but may be expressed as monthly, weekly or even daily rates. To convert to a yearly figure, multiply a monthly figure by 12, a weekly figure by 52, a daily figure by 260 (5 day work week x 52 weeks per year = 260), and an hourly figure by 2,080 (8 hour work day x 260 work days per year = 2,080).

Per diems and public transport expenses will usually be recorded in expenditure records under "allowances" or "per diem". If travel allowances are grouped together with general allowances it may be easier to include all of these under the salary component, unless you need to separately identify transport costs for a specific reason. If you are focusing on training you may need to identify the transport costs associated with particular individuals. They should be interviewed to obtain details.

Source of cost data

Obtain salaries from payroll or expenditure records. If you wish to know the salary of individual staff, ask staff or their supervisor what salary *grade* they are on. This can later be converted to actual salaries using salary scales that are usually available centrally. In fact it is best to get a copy of these scales first so that you know how much detail to ask concerning particular positions. It is generally preferable to ask about the position rather than the salary of an individual for two reasons: first, individuals are usually more reticent to reveal earnings than positions; second, it may be unclear what the figure you are given refers to (gross or net, for example).

Sometimes fringe benefits are included in salaries or wages. Sometimes they are recorded separately. If you are measuring the cost of individual staff and are simply asking them the salary of their position, one way to estimate the extra allowances they are getting is to calculate the gross relationship between such salaries and allowances for the whole institution and apply this to the individual salary. For example, you may find from district level expenditure data that allowances are on an average about 12% of salaries. You therefore add an extra 12% to the individual salary you are measuring.

Example

The inventory of ORS packets was 12,500 at the beginning of the year and 7,500 at the end of the year. 10,000 packets were received during the year. Therefore, 15,000 packets of ORS were consumed during the year $(12,500 + 10,000 - 7,500 = 15,000)$.

It is important to study inventory records both as close to the original source as possible and at the point of use. For example, if you are studying the CDD programme in a district, it is best to measure both how much ORS is supplied from the district level and how much is used at the health centres, since there may be loss between the district office and the health centres.

With respect to treatment and the use of drugs, the total quantity of drugs is not necessarily the same as the quantity used by children with diarrhoea. They may be used by both adults and children and for clinical conditions other than diarrhoea. If the pharmacy maintains a dispensing log that specifies the age and illness of the patient, then the quantity used by children with diarrhoea may be determined relatively simply. If a detailed dispensing log is not available, ask a doctor, nurse, or pharmacist at the health centre who should be able to give you a reasonably accurate estimate.

Price. Find out the government purchase prices. Use supply invoices, order forms, price lists or catalogues. If purchases have been subsidised by donors or others, you need to determine the full price (including subsidy). If the costs of shipping and transporting these materials have not been included elsewhere (e.g., under "vehicle operating costs"), they should be included in the price.

Example

ORS and tetracycline syrup are the two drugs used to treat diarrhoea in children at a health centre. The doctor estimates that 213 of the 15,000 ORS packets and 80% of the 63 bottles of tetracycline syrup dispensed last year went to children with diarrhoea $(15,000 \times 213 = 10,000; 63 \times 0.80 = 50)$. There was a 20% loss of both drugs so that the government had to buy 12,500 ORS packets to supply 10,000 to children with diarrhoea $(10,000 \div (1 - 0.2) = 12,500)$ and 63 bottles of tetracycline to have 50 for treatment of children with diarrhoea $(50 \div (1 - 0.2) = 63)$. The ORS packets cost \$0.10 each and the tetracycline syrup cost \$1.00 per bottle, including shipping. Thus, the cost of ORS was \$1,250 per year $(\$0.10 \times 12,500 = \$1,250)$ and the cost of tetracycline syrup was \$63 per year $(\$1.00 \times 63 = \$63)$ for a total of \$1,313 per year $(\$1,250 + \$63 = \$1,313)$.

RECURRENT COST - SUPPLIES

This category is for materials used up in the course of the year and specifically used for the activity which you are costing. For the treatment of diarrhoea it would include ORS packets, intravenous fluids, infusion sets and needles, special spoons and cups, antibiotics, and drugs; for ORS production it would include chemical ingredients and packaging materials; and for teaching activities, teaching materials.

In most cases it will be quite clear what kinds of materials and supplies are used for the activity you are costing. One example where this may not be so is that of drugs used to treat diarrhoea. If you simply ask health staff about the drugs usually prescribed or given for cases of childhood diarrhoea, they may give answers which reflect what the staff think they should do rather than what they actually do. A better approach to identifying commonly used drugs is to consult the medical registration book of the health centre or hospital, identify 20 diarrhoea cases and note the treatment given to them. There is no need to do this strictly randomly but it is best to select cases throughout the year to make sure that there is a reasonable representation of the main health staff who provide treatment.

The cost to use

You need to find out the cost of the materials used including the amount that is wasted. Loss can take place due to misplaced shipments, damage from water and rodents, pilfering and materials becoming out-of-date. This loss has to be paid for out of the programme and has to be included in the estimates.

Source of cost data

Unless expenditure records are very detailed, they are unlikely to be useful for estimating the costs of most of the materials specific to the activity that you are costing. Instead you will probably need information on quantities used and prices.

Quantities. Inventory records are usually available in the store of the institution responsible for dispensing the materials. The quantity consumed during the year will be equal to:

$$\text{the inventory at the beginning of the year} + \text{quantity received during the year} - \text{the inventory at end of the year}$$

- If the vehicle log book is properly kept, an alternative is to calculate the annual mileage (AM) of the vehicle, find out from the driver the average petrol consumption per mile (APC) for that vehicle and calculate annual petrol consumption ($AM \times APC = PC$). This can then be used as in the previous example, to estimate running costs.
- If you know the annual mileage (AM), an alternative is to use the government vehicle allowance rate (say \$Z per mile) employed to calculate reimbursements for the use of private vehicles on government business. (Annual vehicle running costs = $AM \times Z$). It may, however, be out-of-date or inappropriate for the kinds of vehicles you are costing.

OTHER RECURRENT COSTS

This category of input may include any items not covered elsewhere, such as photocopying and printing, general stationery, or patients' supplies. Do not include items that are exclusively used for purposes other than the activity you are interested in (e.g., non-diarrhoea drugs if you are looking at diarrhoea treatment, or chemical ingredients which are not used for ORS if you are looking at ORS production). In some situations you may wish to classify "training" as a separate recurrent cost, unless it has been adequately considered under the categories of personnel, supplies, etc. Below is one way to measure the costs of training.

The cost to use

Strictly speaking, training is a capital cost because its effects last beyond one year. Regular in-service training is a recurrent cost. However, this distinction is often not easy to maintain, particularly as it is frequently difficult to determine the length of time trained people are likely to remain active in the area.

If training is done on a reasonably regular basis, one approach would be to look at the cost of training given over the lifetime of the programme or the previous three years (whichever is the shorter) and average it to obtain an annual estimate.

Tuition fees for any particular training course can serve as an approximation of the cost of the course per person. If no tuition is charged, or if tuition fees do not approximate true costs for the course, its cost must be estimated taking into account fees or honoraria for speakers, rental of the meeting rooms and audiovisual equipment, and the cost of producing a syllabus, slides or handouts. To the cost of providing the course must be added the cost of the individual's salary, food and lodging, or per diem allowance, and roundtrip transportation.

Although diarrhoea case management training courses may deal with treatment for adults as well as children, the main emphasis is likely to be on children. It would generally be appropriate to attribute the entire cost of the training to treatment of young children.

Source of cost data

It is usually easier to treat training as a cost incurred at the level where it is provided (e.g., district or regional) rather than the level it is provided for (e.g., health centres). Expenditure records of training institutions or units should be able to provide records at the district or regional level and then allocate these costs to lower levels.

CAPITAL COSTS

Because capital goods last longer than one year, a special procedure (annualisation) is required to estimate their annual costs. The general method is described below; further details are provided later for each category of capital good.

- 1) Estimate the current value of the capital item, i.e., the amount you would have to pay to purchase a similar item at the present time (or for the year for which the costing is being done if this is different). Do not use the original price.
- 2) Estimate the expected useful life of the item from interviews with staff who use it.
- 3) Find out the discount rate used for economic appraisals by the economic planning office or finance ministry. Otherwise calculate the real rate of interest (the average of the most favorable bank rates of interest that could be obtained by depositing money minus the rate of inflation). These rates can be obtained from the finance department. If the economy is unstable and inflation rates are very high, they may actually be greater than interest rates in the short term. In this situation, use 10% as the discount rate.
- 4) Derive the "annualisation factor." This factor takes into account the fact that if you invest in an item (such as a vehicle) then you are forfeiting the interest you would otherwise accumulate. It is a complicated concept but easy to calculate. Consult the table in Annex C and locate the number where the discount rate column and expected useful life row intersect. The annualisation factor is also available in many calculators and electronic spreadsheets. For example, in Lotus 1-2-3 the function is @PV(1|discount%, expected useful life), where "discount%" denotes the discount rate and percent sign (e.g. 10%).
- 5) Calculate the annual cost by dividing the item's current value by the annualisation factor.

EXAMPLE

A health centre cost \$8,000 when it was built 10 years ago, but a review of recent government contracts suggests that it would cost \$25,000 to build one like it today. The Planning Office uses a discount rate of 6% in its evaluations. The annualisation factor for 20 years and a discount rate of 6% is 11.470, according to the table in Annex C. The annual capital cost for the health centre is therefore \$2,180 ($\$25,000 \div 11.470 = \$2,180$).

It is usually not worth going through this procedure for capital items of small value (say less than \$100). Such items should be regarded as recurrent costs.

CAPITAL COST - BUILDINGS

Building space is required for most activities. You may feel reluctant to include estimates of building space costs in your overall estimates. However, even if you are not paying anything for the use of the building you should still estimate its value. Space for the CDD programme functions is usually at the expense of some other activity. Furthermore, you may in the future want to apply your results to a situation where space is not available and will have to be purchased.

Step 1 - Itemize the buildings you need to value

The kinds of buildings you need to value will depend on the kind of activity you are costing. They may include those used for diarrhoea treatment, education, and storage and distribution of drugs and supplies. These will probably take the form of health centres, hospitals, outpatient clinics, storage sheds, ORS production plants, or space within the village health worker's own house.

Step 2 - Estimate the building's total cost***The cost to use***

Use the current construction cost for a similar building, *not* the original construction price. If this total cost is not available, you may be able to obtain estimates of the cost of construction per unit area (e.g., per square metre) for different categories of building (e.g., single or double storey) from which you can estimate total construction costs for any particular building.

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It is best to find out about available cost information before you go into the field. Then you will know what details you need to collect in the field. For example, do you need to know just the category of building (such as health centre) or do you need to know its dimensions and type of construction?

Source of cost data

Recent government contracts for similar buildings are a useful source of building cost information. The planning or tendering section of the health department should have this information for health facilities. For other buildings, for example, a pharmaceutical production plant, the works department or equivalent should be able to supply the information.

Step 3 - Estimate the life of the building

Even though some buildings may last for a longer time, 20 years should be used as the expected useful life of most buildings unless they are very temporary structures with a much shorter expected life.

Step 4 - Calculate the annual cost of the building

The construction cost together with the expected life of the building and the discount rate are used to calculate the annual cost of the building.

Note: If construction costs are unavailable, rental charges per year are a satisfactory alternative. Expenditure records or budgets may have this information.

Step 5 - Calculate the cost of furnishings and add them to the building cost.

The cost of furnishing and equipping buildings should be added to the cost of construction of the building to obtain the capital cost of the facility. Listing and pricing all the pieces of furniture and equipment in a building can be a formidable task. Instead, take 8% of the cost of the building as a reasonable approximation of the cost of the furniture and equipment. Assume an average life of 10 years for the furnishings. Use these estimates of furnishing costs and average life together with the discount rate to calculate annual costs as described on page 75. Sometimes the building cost estimate will include furnishings in which case you do not need to add a separate estimate for furnishings.

EXAMPLE

The replacement cost of one health centre (\$25,000 x 1 = \$25,000) and four subcentres (\$7,500 x 4 = \$30,000) totals \$55,000. The cost of furniture and equipment is estimated at

and using expected lives of 20 years for buildings and 10 years for furniture and equipment, the respective annualisation factors are 11.470 and 7.360, according to the table in Annex C. The annualised cost of buildings is \$4,795 per year ($\$55,000 \div 11.470 = \$4,795$) and the annualised cost of furniture and equipment is \$598 per year ($\$4,400 \div 7.360 = \598). The total annualised cost of facilities is \$5,393, the sum of the two components ($\$4,795 + \$598 = \$5,393$).

CAPITAL COST - VEHICLES AND EQUIPMENT

Step 1 - Itemize the vehicles and equipment you need to value

Vehicles may include ambulances, vans, cars, motorcycles, and bicycles. Equipment refers to those items that are used specifically in the activities you are analysing (such as machinery involved in ORS production). Other general equipment and furnishings are estimated elsewhere and do not need to be included here. (See "Capital Cost-Buildings.")

Step 2 - Estimate the vehicle/equipment total cost

Use the *current* cost for a similar vehicle or piece of equipment, not the original purchase price. Recent government contracts, supply records or donors (who frequently donate vehicles and equipment) or local dealer estimates are useful sources of information.

Step 3 - Estimate the life of the vehicles/equipment

The expected useful life of a vehicle will vary considerably, depending on the type, terrain, use and maintenance. Consequently, you should determine the expected useful life of each type of vehicle by local consensus. Ask several people who use, drive or service the vehicles for an estimate of how long these type of vehicles have lasted in the past. (Three or five years is a common length of useful life for vehicles).

Similar comments apply to equipment. You may find that the supplier of equipment also provide some guidance on expected useful life; period of guarantee indicate a likely minimum period of useful life.

Step 4 - Calculate the annual cost of the vehicles/equipment

Use the current replacement cost together with the expected life of the vehicles/equipment and the discount rate to calculate the annual cost of the vehicle/equipment (as described in page 75).

EXAMPLE

A health centre has one ambulance (\$7,000), one four wheel drive vehicle (\$8,000) and twelve bicycles ($70 \times 12 = \$840$). The expected useful life, and the corresponding annualisation factor (assuming a discount rate of 6%) is ten years (7.360) for the ambulance, eight years (6.210) for the four wheel drive vehicle, and two years (1.833) for the bicycles. Divide the cost for vehicles of each type by the annualisation factor: ambulance ($\$7,000 \div 7.360 = \951 per year); four wheel drive vehicle ($\$8,000 \div 6.210 = \$1,288$ per year); and bicycles ($\$840 \div 1.833 = \458 per year). The total cost of health centre vehicles is \$2,697 per year ($\$951 + \$1,288 + \$458 = \$2,697$).