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Planning Sustainable Health Services in Afghanistan: An Approach

The Afghanistan Cross Border Assistance Project

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This report and the computer-assisted planning method on which it is based reflects the contributions of the following Peshawar-based and Boston-based staff of Management Sciences for Health: Dick Blakney, Len Chang, Catherine Crone Coburn, Peter Huff-Rouselle, Paul Ickx, Dick Johnson, Laurence Laumonier, Jack LeSar, Anibal Mejia, Ron O'Connor, Bill Oldham, Jonathan Quick, Peter Shipp, Steve Solter, Suzanne Stinson, and Linda Tawfik.

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EXECUTIVE SUMMARY

CURRENT HEALTH SITUATION

As of 1987 figures, Afghanistan had the highest under five mortality rate, the highest infant mortality, and the lowest life expectancy rate of the countries surveyed by UNICEF.

INTRODUCTION TO THE PLANNING PROCESS

PRINCIPLES

While conditions are currently uncertain in Afghanistan, there is an opportunity and a need to plan now for a sustainable health system. Several principles appear to be important during this planning period:

- The ongoing costs of the future health system should be at a level that Afghanistan can sustain, given the funds available.
- Existing facilities and resources should be utilized and/or renovated where possible, rather than spending capital on new facilities.
- Emphasis should be placed on those health problems which cause the greatest morbidity, disability, and mortality. given affordability
- In general, priority should be given to preventive health care.
- Plans need to be province-specific, based on prevailing pathology and population density.
- Resources should be allocated on the basis of population and the cost of health interventions needed in that province.
- Health service delivery mechanisms should be based on local conditions and values.
- Health care approaches must reflect the educational level of the specific area. This applies to recruitment and training of health workers as well as planning for public health education activities.

USE OF MODEL FOR DECISION-MAKING

As part of the health planning process we have developed an approach and a computer-assisted planning tool that may be useful in making a managerially feasible, technically sound, and financially feasible health plan for Afghanistan. Currently called "SUS-PLAN," it provides a tool to assist Afghan

health officials, donors, and technical advisors to organize health planning information, to identify strategic alternatives for health service development, and to compare these alternatives with respect to their sustainablilty and potential health impact.

FRAMEWORK FOR HEALTH PLANNING

ACHIEVING IMPACT

The goal of this model and this report is to create a framework for health planning. Integral to this framework is the ability to have an impact on health status, and to achieve the maximum possible impact with a given level of resources. To do this requires determining:

1. the most important and frequent health problems;
2. the location, level and type of health facility or service that the population will utilize;
3. productivity of health workers at different levels;
4. interventions at different levels, and the type of impact they will have on mortality and morbidity; and
5. impact of "vertical" programs on mortality.

BUILDING A SUSTAINABLE DELIVERY SYSTEM

Equally integral to the framework is planning for a sustainable health delivery system -- one which can be maintained and supported by the Afghan government in the long term. Although there are reconstruction funds from donors available now to Afghanistan, in the future these may be considerably reduced if not exhausted. Thus Afghanistan will have to support the ongoing operating expenses of the health care system designed now, without the resources available now. It is possible that without this perspective, facilities could be planned that will drain financial and manpower resources that are needed elsewhere in the health system.

In anticipation of future scarce financial resources, sustainability includes the concepts of cost recovery and appropriate utilization of government facilities. The planning model therefore provides for the specification of user fees for different health services, and for different levels to motivate appropriate facility utilization.

REVENUE PROJECTIONS

Although health care services provided by the Afghan government have traditionally been free of charge, the government's resources will be limited for some time to come as the basic economy rebuilds. The model includes revenue from three sources: the government budget, donor aid, and user fees, all of which can be varied to a planner's specifications.

PLANNING IN AN UNCERTAIN ENVIRONMENT

Given the uncertain environment in Afghanistan, it will be difficult to make informed planning decisions. However, there are data that can be estimated and assumptions that can be tested. Hopefully this computerized planning tool and this report will aid in the planning process by providing a framework for it.

SUMMARY OF SUS-PLAN METHODOLOGY

WHAT DOES IT DO?

SUS-PLAN is a computer-assisted planning tool to assist Afghan health planners to (1) systematically organize the various data required for long-term health planning, (2) relate health needs, health service resources, costs, and impact, and (3) compare and choose among various strategic alternatives.

WHAT ARE THE STEPS?

There are six basic components, which require a variety of data, estimates and assumptions:

1. health care needs of the population;
2. required health workers and facilities to meet these needs;
3. costs per unit of health workers and health facilities;
4. total costs based on unit costs and volume of health services provided;
5. funding sources for paying the costs of the health system;and
6. coverage and impact of the health services provided.

WHAT DATA CAN BE ADJUSTED?

Almost all the cost, utilization, and epidemiological data can easily be changed. Assumptions regarding the type and location of particular health services can be changed to reflect alternative delivery scenarios.

WHAT ALTERNATIVES CAN BE TESTED?

In addition to many minor changes, major alternatives can be tested by shifting the location of services, say from large hospitals to small clinics. The resulting revenue stream from user fees can be calculated, and recirculated in the health system. The model can estimate the different cost and impact effects of different alternatives.

ILLUSTRATIVE ALTERNATIVES FOR THE FUTURE

BASIC DELIVERY ALTERNATIVES

There are three basic alternatives that can be used illustrate the type of key decisions that a health planner can make, although many more can be modelled:

1. "Full service" alternative, determined by the epidemiological needs of the population, without regard to cost;

2. "Basic PHC" (Primary Health Care) alternative, in which health services are community-based and thus delivered primarily through basic health workers and clinics, while constrained by the available government budget; and

3. "Hospital care" alternative, in which health services are hospital and clinic based, also constrained by the available government budget.

IMPLEMENTING THE PLANNING PROCESS

There are additional steps to be taken over the next several months, including the following:

(a) Complete revisions of SUS-PLAN computer model.

(b) Verify and complete the information base needed for health service planning.

(c) Conduct regular health planning sessions to further develop the concepts discussed here and in earlier workshops.

(d) Participate in discussions of health provider and health facility categories.

(e) Undertake a comprehensive survey of health care resources, including health care providers and health care facilities.

(f) Community survey of prevailing health conditions, morbidity rates, disability, and mortality rates.

PLANNING SUSTAINABLE HEALTH SERVICES IN AFGHANISTAN: AN APPROACH

EXECUTIVE SUMMARY

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4. SUMMARY OF SUS-PLAN METHODOLOGY

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1. CURRENT HEALTH SITUATION

According to **UNICEF's 1989 State of the World's Children report, Afghanistan has the lowest child survival rate in the developing world -- only 69.6% of the children born in Afghanistan will survive to the age of five.** For comparison, Bangladesh, not noted for optimistic health statistics, has a rate of 80.9% and Afghanistan's neighbor Pakistan has a rate of 83.1%.

As of **1987 figures, Afghanistan had the highest under five mortality rate (304 per 1,000 live births), the highest infant (under one year) mortality rate (173 per 1,000 live births), and the lowest life expectancy rate (42 years).** The UN set an under five mortality rate target for the developing world of 70 deaths per 1,000 live births by the year 2000 (or halving of the 1980 rate, whichever is less). Afghanistan would have to reduce its under five mortality rate by more than 10.6% annually to reach this target. Halving the 1980 rate would require meeting a target of 160, which is still at the high end of the developing world's under five mortality rates.

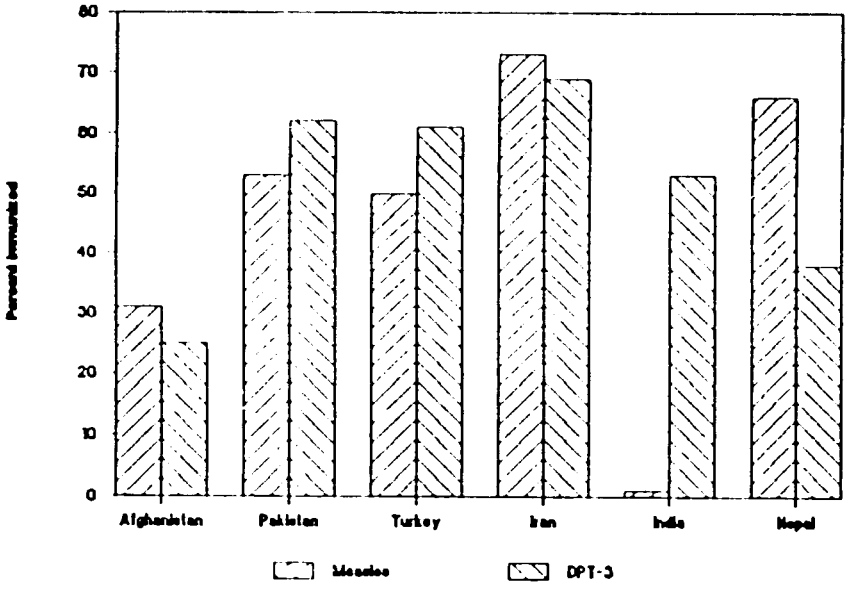
COMPARISON STATISTICS fig.- 1

	Afghanistan	**Pakistan**	Turkey	**Iran**	India	**Nepal**
BASIC STATISTICS						
Population (millions, 1987)	14.7	111.0	52.5	49.9	772.7	16.9
Per Capita Income (a) (in 1985)	NA	380	1080	NA	270	160
Per Capita Gov't Health	NA	0.88	5.18	NA	0.93	1.58
IMMUNIZATION COVERAGE -- Percent Immunized						
Measles	31	53	50	73	1	66
DPT-3	25	62	61	69	53	38
MORTALITY RATES						
Child Survival (% who survive)	**69.6%**	83.1%	90.3%	90.6%	84.4%	80.0%
Infant Mortality Rate (dealths/1000 live births)	**173**	**110**	79	65	100	129
Under 5 Mortality Rate (deaths/1000 under fives)	**304**	**169**	97	94	152	200
Maternal Mortality Rate (deaths/100,000 live births)	640	600	210	NA	500	**850**
Crude Death Rate (deaths /1000 population)	**25**	14	9	11	11	17

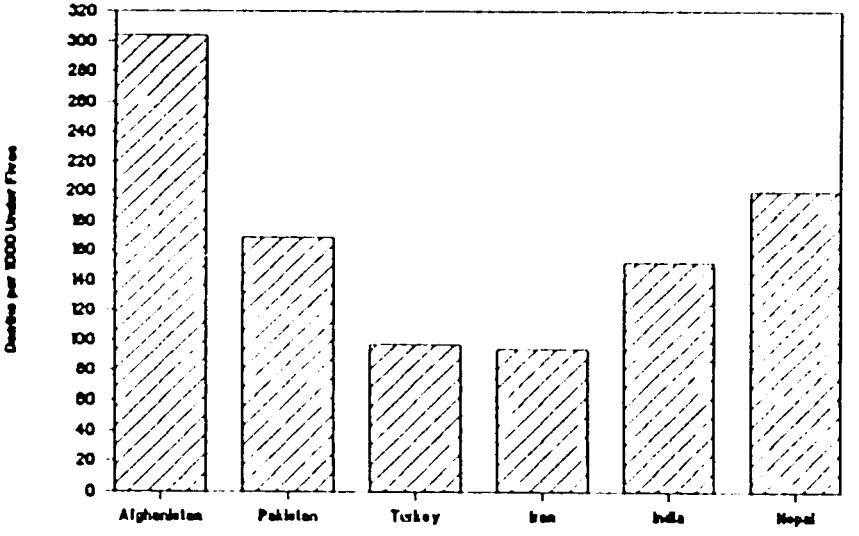
(a) Per Capita Gross National Product (GNP)

fig.- 2

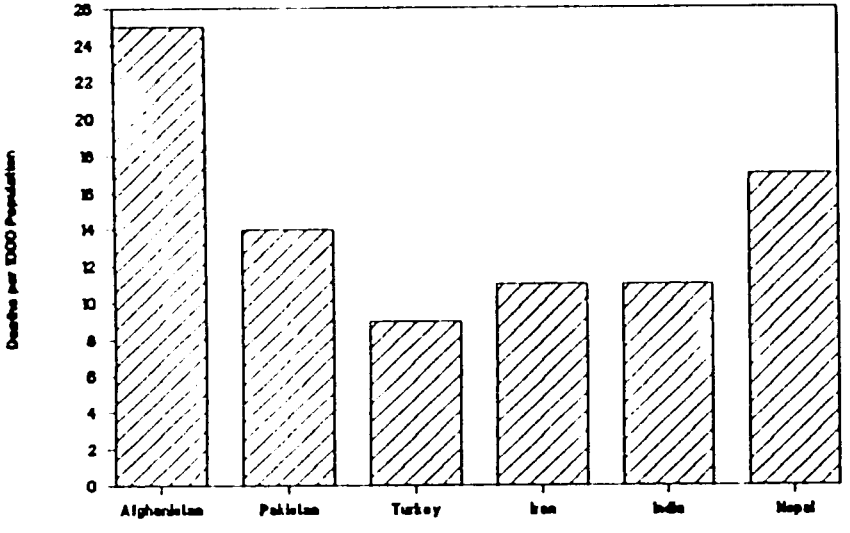
Immunization Coverage



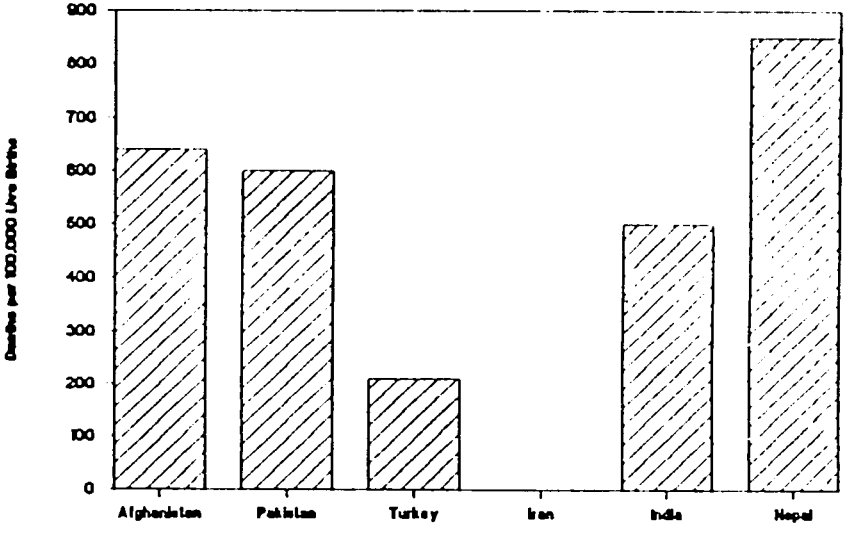
Under Five Mortality Rate



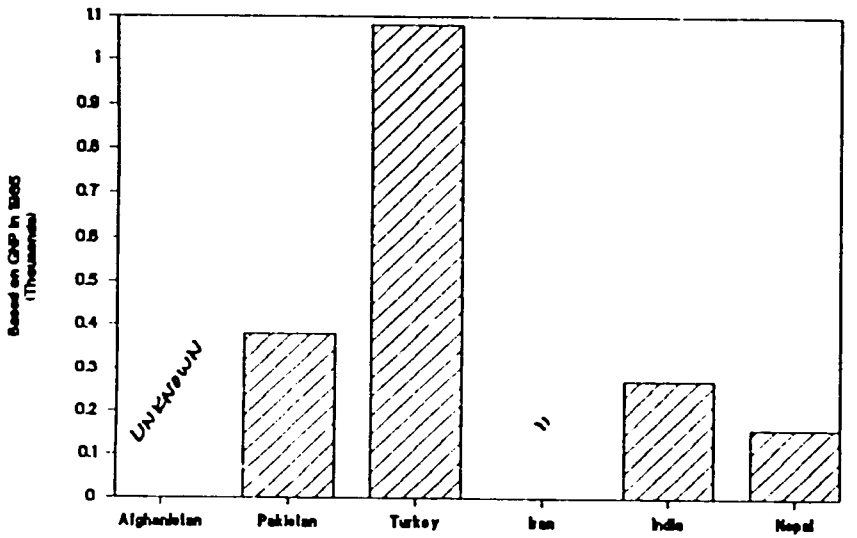
Crude Death Rate



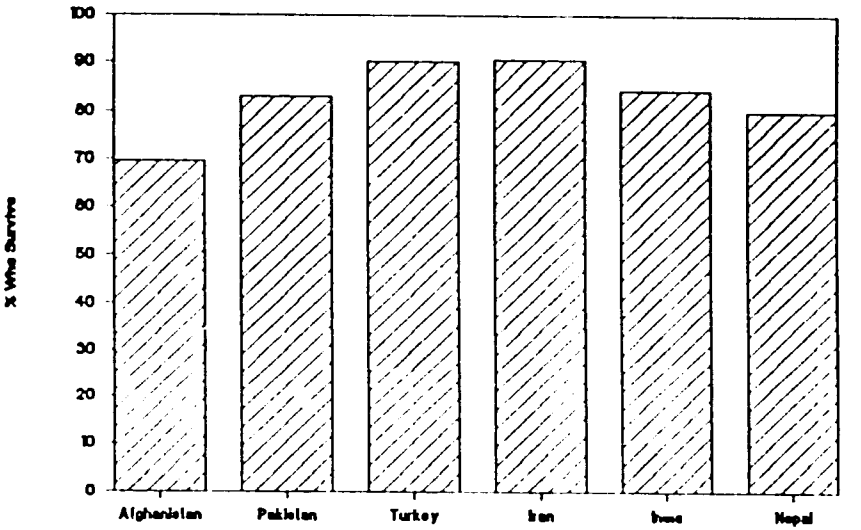
Maternal Mortality Rate



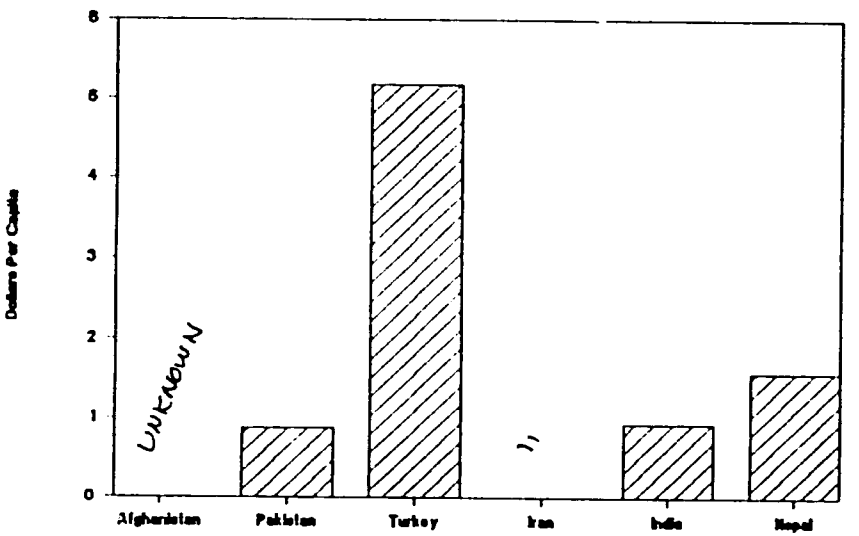
Per Capita Income, in Dollars



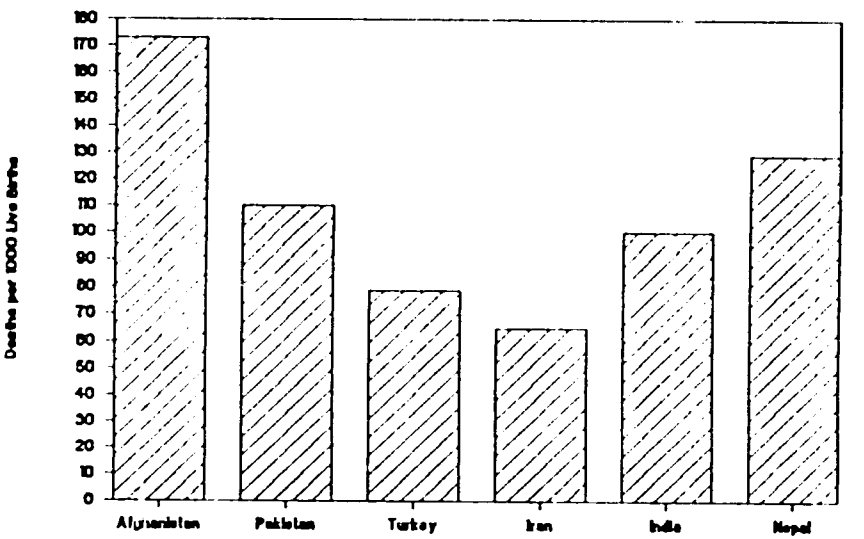
Child Survival Rate



Gov't Health Expenditures



Infant Mortality Rate



2. INTRODUCTION TO THE PLANNING PROCESS

Although no one knows what conditions will prevail in Afghanistan now that the Soviets have w thdrawn and fighting continues between the Kabul regime and the mujahadeen, it is essential that the Afghans and the donor community begin to plan now for a sustainable health services system that can provide basic health and appropriate hospital services for the great majority of the population, be they returning refugees, internally displaced persons, or Afghans who have remained in their towns and villages throughout the war.

This report describes an approach to planning such a system and the roles interested parties might play in the approach described here. Since the system needs to be sustainable, this approach involves analyzing the ongoing costs associated with different health planning decisions, while still maintaining certain equity principles in the delivery of health care.

A. GOALS & OBJECTIVES

At this time the goal of the process is to develop a health plan for Afghanistan that meets the basic demands and needs of the Afghan population and will be managerially and financially sustainable over the long term. There are many strategic, organizational and operational decisions and concerns that can be addressed in the planning process. An illustrative list for each of these areas is on the following page.

The approach suggested here is based on several principles which, we feel, should not be overlooked or shunted aside in the desire to provide assistance quickly. These are highlighted below.

B. PRINCIPLES

The following principles have emerged as very important in the process of planning for Afghanistan's future health system. Some of these principles were developed during a workshop with Afghan health officials. Others were raised during discussions with donor and private voluntary organizations.

- The ongoing costs of the future health system should be at a level that Afghanistan can sustain, given the funds available.

- Existing facilities and resources should be utilized and/or renovated where possible, rather than spending capital on new facilities.

- Emphasis should be placed on those health problems which cause the greatest morbidity, disability, and mortality.

- In general, priority should be given to preventive health care.

- Plans need to be province-specific, based on prevailing pathology and population density.

get estimated dates to achieve...

HEALTH PLANNING DECISIONS, ISSUES AND CONCERNS fig.- 4

STRATEGIC DECISIONS & CONCERNS	ORGANIZATIONAL DECISIONS & CONCERNS	OPERATIONAL DECISIONS & CONCERNS
Set priorities for health service development	Establish MOPH departments done ✓	**Estimate population at specific sites, population shift**
Determine the balance of preventive and curative health services	Appoint provincial health officers done ✓	Survey location, condition, and equipment of existing health facilities
Determine the balance of PHC, hospital, and other major health programs	**Develop supervisory structure, esp. for clinics and BHW**	Inventory skills, training, location of existing health personnel
Estimate funds available for health service operation	Develop area health administrations	Sources and methods for procurement of drugs & medical supplies
Develop a plan for support from specific donors	Source, types, flow of health information	Where, when, how to set up facilities
Determine the degree of centralization vs. decentralization	Determine responsibility for health staff training, retraining, certification	Drug types and quantities
Define health facility types (clinics, hospitals)	Establish job descriptions, responsibilities, quality standards for levels of health personnel	Equipment needs for health facilities
Define health personnel categories	Establish career ladders	Set salary levels
Define linkages with agriculture & other sectors	Coordinate health resources from different PVOs, parties	Determine specific curricula and content
Base plans on the practical, not the ideal	Organize referral patterns	Assign health staff to specific locations
		Recruit & train additional health personnel
		Obtain transport
		Provide logistic support for health facilities

NOTES

BHW = Basic Health Worker
MOPH = Ministry of Public Health
PHC = Primary Health Care

- Resources should be allocated on the basis of population and the cost of health interventions needed in that province.

- Health service delivery mechanisms should be based on local conditions and values.

- Health care approaches must reflect the educational level of the specific area. This applies to recruitment and training of health workers as well as planning for public health education activities.

C. USE OF MODEL FOR DECISION-MAKING

As part of the health planning process we have developed an approach or computer-assisted planning tool that we feel can be useful in making a managerially feasible, technically sound, and financially sustainable health plan for Afghanistan.

The SUS-PLAN methodology does not prescribe a specific approach to health service development. Instead, it provides a tool to assist Afghan health officials, donors, and technical advisors to organize health planning information, to identify strategic alternatives for health service development, and to compare these alternatives with respect to their sustainability and potential health impact.

With SUS-PLAN, the user can alter input data and assumptions to compare the effect of different strategies on the cost, coverage, and health impact of Afghan health services in individual planning areas.

The main features of this approach include the following:

1. Information has been collected about Afghanistan's demographic situation and its existing rural health system, including location of facilities, types of facilities, health manpower, and costs (including operation and maintenance of facilities, manpower costs, drugs and supplies, and transport). In addition, estimates have been made of the potential impact on mortality of different health interventions.

2. Estimates have also been made of the "disease burden" in Afghanistan (that is, the frequency of different health problems within the Afghan population) based on whatever epidemiological information exists.

3. By putting together all this information it is possible to determine the probable cost and impact of different health delivery strategies. For example, a "full service" delivery model for the year 2000 would provide health services at village level, at health centers, and at hospitals, with adequate access to health care nationwide. Since this turns out to be very expensive, alternative health delivery scenarios can be explored through the model, with different mixes of services provided.

4. The Afghan decision-maker can use this health planning approach to decide on priorities (short-term, medium-term, and long-term) as well as decide on what health investments now can lead to sustainable effective health services for Afghans in the future when donor resources will be more limited.

3. FRAMEWORK FOR HEALTH PLANNING

A. ACHIEVING IMPACT

The most important objective of any health system is to have an impact on health status -- to reduce mortality and morbidity to the maximum extent possible. A health plan for Afghanistan must have the same objective. To achieve the maximum possible impact with a given level of resources, the following questions are important:

1. What are the most important and most frequent health problems; what are the most important causes of death, according to age and sex?

2. To what extent will Afghans go to government health facilities when they are sick and to what level (village level, health center level, or hospital level)? To what extent will Afghans use private sector services, traditional healers, self-care, or do nothing at all when they are sick?

3. Government health workers, at different levels, will be able to see what number of patients in a day (that is, what will be their "productivity")?

4. Given particular health problems (such as malaria, pneumonia, or diarrhea), what kinds of interventions at what levels will have what sort of impact on mortality and morbidity?

5. To what extent will "vertical" programs (such as immunization or malaria-spraying) have an impact on mortality?

To answer these questions one must make a number of assumptions based on the best available information and, to some extent, on guesswork. With experience, and with better information, the assumptions can be modified and improved. These assumptions are very important since health planning priorities heavily depend on them.

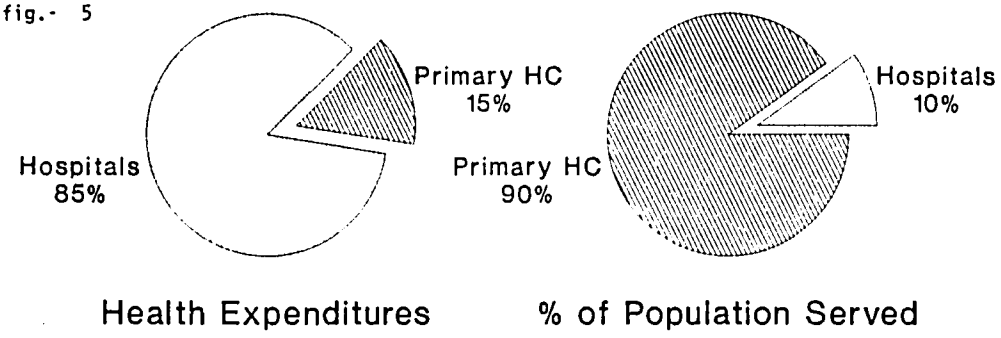
B. BUILDING A SUSTAINABLE DELIVERY SYSTEM

Whatever health system is developed inside Afghanistan over the next five years must be sustainable by the Afghans in the long term without substantial donor assistance. This is because of the likelihood that donor support will be considerably reduced as the world's political interest in Afghanistan is reduced. With this consideration in mind it is essential that Afghans use donor resources wisely so that they will not be stuck with a health system ten years from now which they cannot afford to maintain. The decisions that are made now and over the next one to two years about how donor funds are spent will determine whether Afghans can sustain their health system ten years from now.

A sustainable health system in Afghanistan in the year 2000 is one in which the recurrent costs are affordable by Afghans (including government and private sectors). In order for this to happen there must be some combination of cost reduction and revenue generation applied to the present system. Large hospitals are very costly to maintain and their health impact is very small when one considers the total population.

For example, in Ghana in 1978, hospital care received a very disproportionate amount of national health funds, compared to primary health care, for the portion of the population served by hospitals.

fig.- 5



If this kind of imbalance is to be avoided in Afghanistan's future, there must be careful planning now which considers the various options for investing in health care and which rejects those which lead to high long-term recurrent costs without a corresponding benefit in terms of health impact.

What are some of the options for cost reduction and revenue generation for Afghanistan's future?

1. Cost Reduction and Control fee for service?

   - o Reduce and/or eliminate salaries for village-level health workers.
   - o renovate ~~Build~~ only the minimum number of hospitals necessary and use the least expensive technology required for a major health impact.
   - o Use only drugs which are generic, have a high impact, are therapeutically necessary, and which are rationally prescribed. pharmacies role? social marketing?

2. Revenue Generation

   - o Consider having patients pay for curative services and for drugs (revolving drug funds).
   - o Consider cross-subsidies (wealthier patients subsidizing the cost of poorer patients).

C. REVENUE PROJECTIONS

Traditionally, health care services provided by the Afghan government have been free of charge. Funds to pay for these services have come from different government revenue sources such as taxes and sale of state owned resources. Both of these sources depend on the nation's levels of total production and income. In the past these have been modest resources, and in the near and medium term it is unlikely that they will even reach these historic levels.

The government can consider the various levels of funding it may be able to provide, but there will be obvious constraints above certain levels. While donor funds can be encouraged, they are rarely available for covering general ongoing recurrent costs. It is possible that the health planner can target certain health problem areas that are of more interest and importance to the donors (such as immunization and rehabilitation), and receive discrete support for these. These will probably still result in a shortfall of funds in providing the level of coverage and health impact desired by the health planner.

POTENTIAL FUNDING SOURCES fig.- 6

	CAPITAL DEVELOPMENT (a)		RECURRENT OPERATING COSTS (b)		COMMENT
	1989	1999	1989	1999	
Government of Afghanistan	--	++	--	++	Tax base over next decade uncertain.
Donors					
UNICEF	++	-	++	++	Training, vehicles, commodities, tech. assist.
WHO/UNDP	?	++	?	?	Funds currently through PVOs & Kabul.
UN Operation Salam	?	++	?	--	Potential large capital support in reconstruct.
U.S.A.I.D.	++	?	++	?	Mostly development & commodities long-term.
European Donors (c)	?	?	?	?	Interests uncertain.
Japanese	?	?	?	?	Interests uncertain.
Arab Countries (d)	++	?	++	?	
Soviet Union	++	?	++	?	Current assistance is through Kabul.
PVOs	++	?	++	?	Long term involvement uncertain.
Patient Charges	--	--	--	?	Charges for drugs, curative services possible.
Community Contribution	--	?	--	?	Community participation possible.

(a)Renovation, construction, start-up training, major equipment, vehicles
(b)Drugs, supplies, salaries, transport costs
(c)Includes Sweden, W. Germany, Britain, EEC and other current and potential European donors.
(d)O.I.C., Saudia Arabia, Kuwait, Sudan, and other bilateral programs.

In the model we have looked at three approaches to funds to pay for health services: government sources, limited by the economic growth of the country; donor aid, which is likely to reduce sharply over time; and fees from patients/"users", which are subject to the users' economic health.

As an alternative to reducing health services, it is possible to try to recover some of the costs of providing health services and drugs from those who directly benefit from them. **A variety of user fees can be tested in the model, ranging from a flat per visit fee, to drug costs, to charges covering costs only for curative visits.** In fact any or all of these can be considered, and in varying proportions.

D. PLANNING IN AN UNCERTAIN ENVIRONMENT

Given the uncertain environment in Afghanistan, it will be difficult to make informed decisions. However, there are data that can be estimated and assumptions that can be tested.

Some proportion of existing resources will be used for hospitals, for health centers, for manpower development, for drugs, for vertical programs... but whether the particular mix chosen will be in Afghanistan's best long-term interests, whether the greatest possible health impact will be achieved or not, whether Afghanistan will be able to afford the system is creates without massive and unending foreign assistance... only health planning, despite all its imperfections, will increase the likelihood that the answer to all of these questions will be "yes".

The temptation to say, "The future in Afghanistan is so unpredictable that it makes no sense to go through a health planning exercise" must be rejected. Assumptions will have to be made about future health care costs and hew the health system will function. As better information becomes available, these assumptions can be revised and new assumptions put in their place. Better data on epidemiological patterns, or disease incidence and prevalence, will improve the validity of assumptions. No matter how crude the planning process is when it begins, new data, new information coming in will gradually, over time, make the process more refined, more realistic, and a better predictor of the future.

4. SUMMARY OF SUS-PLAN METHODOLOGY

A. WHAT DOES IT DO?

SUS-PLAN is a computer-assisted planning tool to help Afghan health planners to (1) systematically organize the various data required for long-term health planning; (2) relate health needs, health service human and physical resources, costs, and impact; and (3) compare and choose among various strategic alternatives. This tool is designed to show the "ongoing" or recurrent costs of alternative plans for health services in a province in Afghanistan.

The model takes a mixture of actual and estimated data for several factors that affect the cost and distribution of health care. For example, there are salary figures for a wide range of workers, gathered from surveys of current health care projects operating in Afghanistan. These are presented in a table which is part of the model, but can be changed to reflect expectations of future salary levels, or regional variations.

Other factors at work in the model include: population estimates at the district level, incidence of health problems that the government health services can address, productivity of different types of workers, location of workers at different facility types, assumptions regarding which health problems will be treated at different facility types, and the cost of drugs and consumable medical supplies required for different health problems. There are a lot of estimates and assumptions used in the model to depict the environment, almost all of which can easily be changed to reflect the planner's beliefs and expectations.

Through this flexibility, the model helps decision makers determine the resulting recurrent costs of a health services plan of their own design and assess the implications of their assumptions.

B. WHAT ARE THE STEPS?

The model is divided into six basic components:

1. Health care needs of the population.

2. Health worker and health facility needs.

3. Unit costs.

4. Total recurrent costs.

5. Funding sources for paying the costs of the health system.

6. Coverage and impact.

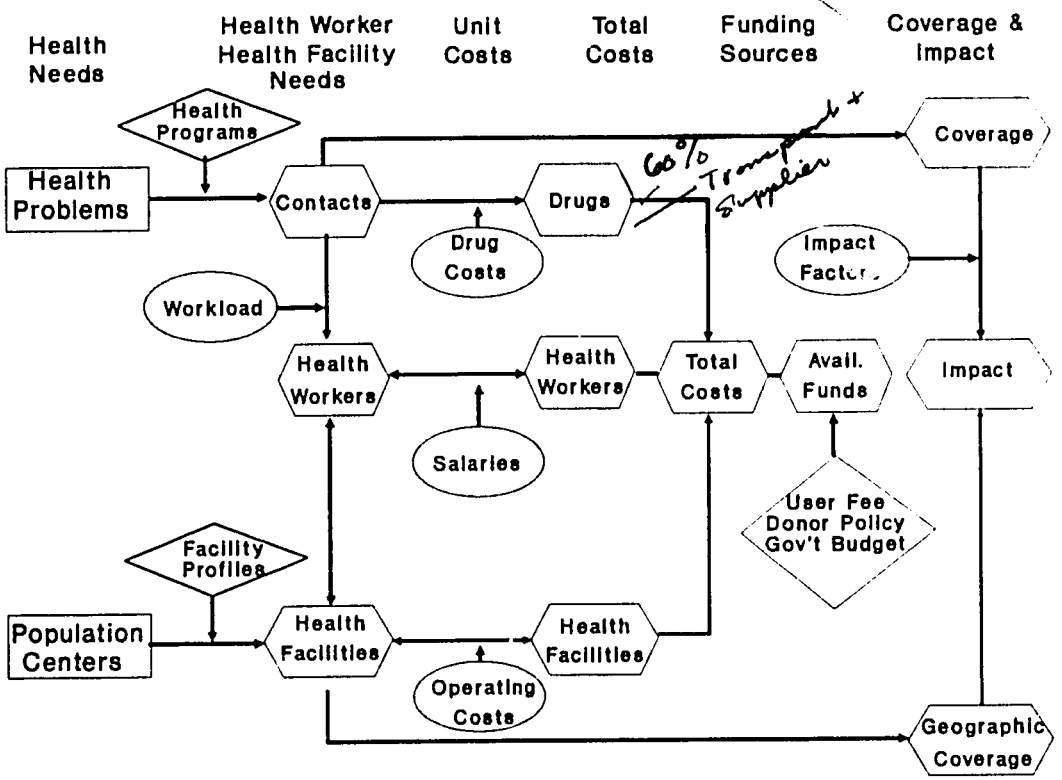
Below is a schematic of the SUS-PLAN model. The above six basic components can

be seen across the top of the schematic, going from "Health Needs" to "Coverage & Impact." Although complex, the schematic shows the major variables and data that can influence outcomes from different alternatives.

for PHC system
not so...

fig.- 7

Framework for Sustainable Health Care



1. Health care needs of the population:

   A "raw" health problems incidence estimate is modified by assumptions regarding the utilization of, and need for, government services.

   Given the above estimated incidence, the model requires an estimation of the percentage of cases which would be seen by each type of health worker, at each type of facility. This results in an allocation of health needs across a spectrum of health workers and the facilities they are located at. By combining the incidence, allocation, and population estimates, the model calculates a theoretical volume of need for the province, in terms of contacts (for each health problem or need) with different types of health workers at different facilities.

2. Health worker and health facility needs:

   The next step in the model is to determine the number of health workers and

Drugs - standardization
unit costs down

health facilities required to service the population's health problems and needs. Based on the estimated number of contacts and worker productivity, the model calculates the number of health workers needed. Unlike the health worker calculation, facilities are based on population centers which can be specified by the health planner.

done?

The model will indicate the number of health workers and facilities required for the province, but will not specify the allocation of the health workers at the different facilities in different locations. This requires more subtle planning judgement than the model can or should provide.

3. **Unit Costs:**

Unit costs are those costs which vary with the volume of resources used. There are three main categories of unit cost utilized in the model:

- **worker-based costs:** Unit costs for workers currently consists only of salaries, though other unit costs might be identified, such as training costs. These vary by level of health worker.

- **health problem-based costs:** These unit costs are drugs, vaccines, and expendable supplies. These are all specified by health problem contact so that a variation in the number of contacts will result in a different total drug and expendable supply cost.

- **facility-based costs:** For a given level of facility, certain non-primary provider staffing patterns cause unit costs per facility of a particular type. There are also assumptions about total facility costs for food and transportation.

4. Total recurrent costs:

Based on the unit costs and the number of health workers and facilities appropriate for the province, the model multiplies out the total recurrent cost for the planned health services.

5. **Funding sources** for paying the costs of the health system:

The three major funding sources for health services provided by the government are:

- **the government budget:** This is expressed in terms of per capita expenditure for health services, and the health system's costs should not exceed this unless there are other sources of funds.

- **donor funds:** Donor funds may be available for certain health services, such as immunizations. Thus, in the model these costs can be isolated and covered, in part or in whole, by an assumed amount from donors.

- o **user fees:** Additional revenue may be generated from charging user fees for health services or drugs.

6. Coverage and impact:

   Given the health plan's number of health workers and facilities, the model attempts to measure the impact of the health plan. The model uses estimates of the effect that can be expected from particular aspects of the health plan on certain indicators of public health such as infant mortality. These are impossible to predict accurately, but do highlight trade-offs in health impacts as a result of different allocations of resources.

other countries or provinces.

C. WHAT DATA CAN BE ADJUSTED?

Almost all the cost, utilization, and epidemiological data can easily be adjusted or modified. In addition, the planned services and location of facilities are expected to be changed to reflect alternative health plans. Further, there is a revenue generation section in which user fees can be charged to patients.

D. WHAT ALTERNATIVES CAN BE TESTED?

Once the model has provided a "full service" scenario for a provincial or national health plan, the planner has a base case to begin with. This incorporates the planner's review of the data relating to cost, utilization and epidemiology, and results in a plan for services in the absence of financial constraints.

The planner can compare the costs of this plan with the available government funds and make changes to the plan, either with respect to alternative sources of revenue, or reduction of services. Services can be altered by reducing either staff or facilities.

The facilities can be reduced or downgraded directly in the location table, or the planner can change the model's method of allocating facilities on population size by increasing or decreasing the population levels and the type of facility that a particular population size is assigned by the model. At the facility level, the planner can also adjust the services and staffing pattern at different facility types.

At the worker level, the planner can change the number and level of workers that deal with health needs and problems. The result of reduced staff will be lowered cost, and lowered health coverage or impact.

The major alternatives can be tested by shifting the location of health services, say from large hospitals to small clinics. The alternatives can reflect the difference in cost and impact of community-based health plan versus a hospital-based health plan.

5. ILLUSTRATIVE ALTERNATIVES FOR THE FUTURE

A. BASIC DELIVERY ALTERNATIVES

1. **"Full Service"** Alternative: Resources required to provide for maximum expected need.

   This alternative consists of the full range of health services that generally appear to meet the epidemiological "needs" of the population. No cost constraint is imposed on the health system, and thus it is unsustainable and unrealistic in the long run.

   Although this is "full service" it only applies to government-provided services, and some services are still delivered through private care, traditional care, and self-care. It also assumes that some portion of the population still opts for "no care" due to lack of information, regarding either health services or need for treatment, or other reasons.

   Services for different health problems are distributed between different categories: vertical programs, primary health care, and hospitals, and between subsets of each of the latter two categories. At the primary health care level, service can be provided either by community health workers or at clinics. At the hospital level, services can be provided on an inpatient or outpatient basis. In a "full service" alternative each health problem is treated at the medically "appropriate" level and facility.

   This alternative also assumes that sufficient quantities of health workers and facilities at each level are available to meet the volume of health problems estimated to seek government health services.

2. **"Basic PHC"** (Primary Health Care) Alternative: Community-based health care based on available government budget.

   This alternative consists of services delivered primarily at the community level: community health workers and clinics. It is also constrained to not exceed the available financial resource for health services. Like the full service alternative, it only applies to government services.

   Services are not delivered exclusively at the community level, but the bias is towards delivering them there. To meet budget constraints, services at hospitals are reduced, and greater portions of the populations are assumed to be forced out of the government system. These are distributed across the other service alternatives as well as "no care."

   To the extent that additional revenue is added to the health budget, additional health services can be provided. Thus any cost recovery for drugs or services results in expanded health services. The model provides opportunities for charging different fees for different services at different levels.

3. **"Hospital Care"** Alternative: Hospital and clinic-based care with available government budget.

   This alternative consists of services delivered primarily at the hospital level: both inpatient and outpatient, at a variety of hospital sizes (small hospital, area hospital, and referral hospital). Like the community alternative, it is constrained to not exceed financial resources, and it is not exclusively hospital based health care. Also, like the prior two alternatives, it applies only to government services.

   The method of meeting the financial constraints is the same as for the community alternative, except that services are cut at the community level to keep the hospitals operating.

These three basic alternatives are compared in the table on the following page, and in the graphs after it.

B. COMPARATIVE ANALYSIS fig.- 8

	CURRENT	FULL SERVICE OPTION	PHC OPTION (3)	HOSPITAL OPTION
COST PER CAPITA PER YEAR (US $)		3.10	2.00	2.00
Total Cost, Takhar Province (millions US $)		1.8	1.2	1.2
Total Cost, Entire Country (millions US $)		46.5	30.0	30.0
NUMBER OF HEALTH CARE PROVIDERS (Partial List)				
Basic Health Workers		154	120	47
Mid-Level (Nurses, Technicians, etc.) ?		55	42	24
Doctors		41	27	29
NUMBER OF HEALTH FACILITIES — Takhar				
Health Posts		154	120	47
Clinics		31	20	30
Hospitals		3	2	9
COVERAGE				
% Fully Immunized (1)		90%	75%	30%
% Maternal Care		40%	30%	10%
% Acute Illness Treated by Gov't Services		30.1%	22.5%	12.7%
HEALTH WORKER RATIOS				
Population/ Doctor		14,103	21,738	19,989
Population/ BHW		3,770	4,848	12,370
HEALTH FACILITY RATIOS				
Population/Clinic		18,725	29,023	19,349
Clinic Beds/1000 Pop.		0.11	0.07	0.10
Hospital Beds/1000 Pop.		0.10	0.03	0.21
MORTALITY				
Child Survival Rate (% who survive)	69.6%	79.8%	78.0%	73.3%
Infant Mortality Rate (deaths/1000 live births)	173	125	134	156
Maternal Mortality Rate (2)	640	574	590	622
Crude Death Rate (deaths/1000 population)	26.3	18.9	20.4	23.5

vrs 173 in 10 yrs?

(1) Percentage of 1 year olds immunized, except for TT2, which is the percentage of pregnant women who received the required two tetanus toxoid shots to protect mother and new-born.

(2) Annual deaths of women from pregnancy related causes per 100,000 live births.

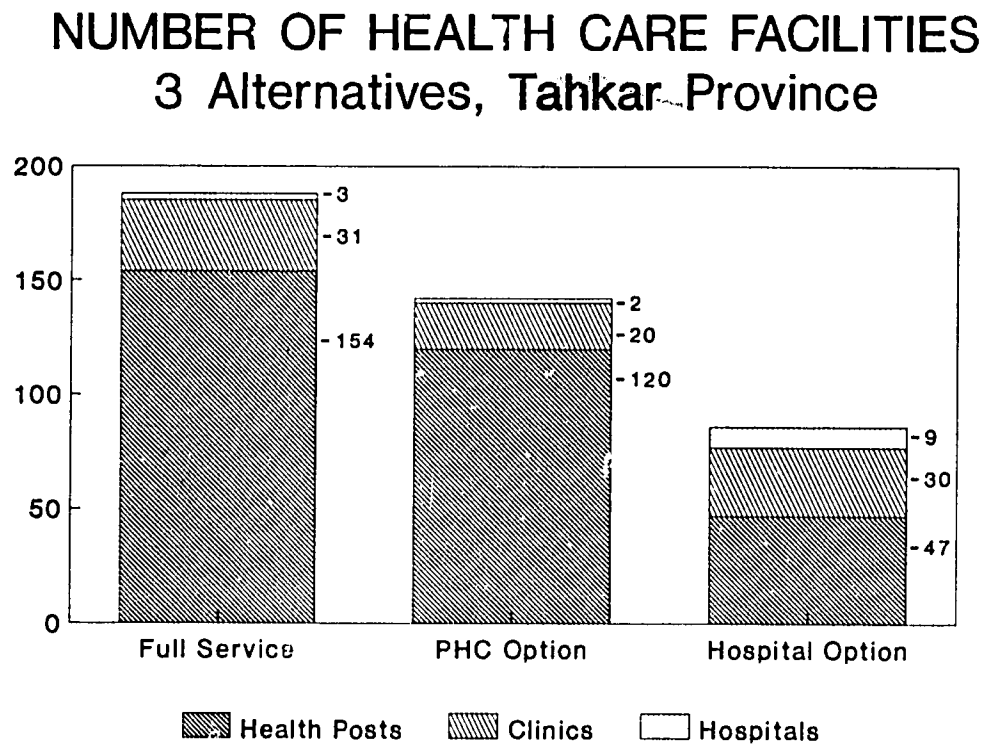
(3) PHC = Primary Health Care

Graph 1: Number of Health Care Facilities

The first graph shows the number of "facilities" (health posts, clinics, and hospitals) which would result under the three basic alternatives. Naturally the "full service" alternative, which has no financial constraints, has the largest number of facilities in total as well as each level.

Comparing the other two alternatives, the PHC option has 7 fewer hospitals and 10 fewer clinics, but 73 additional health posts.

fig.- 9

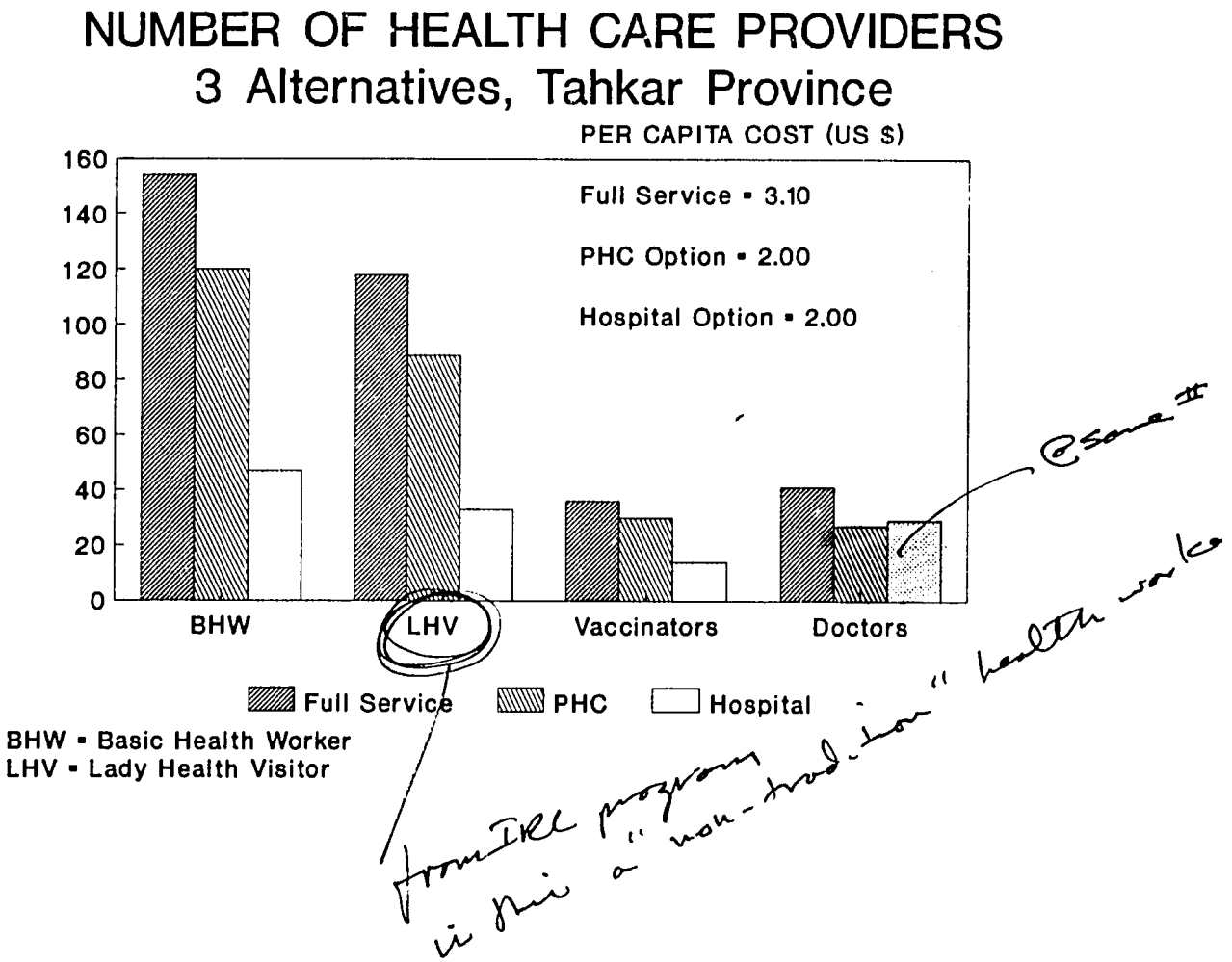


Graph 2: Number of Health Care Providers

The second graph shows the number of health care providers of each category (Basic Health Workers, **Lady Health Visitors**, Vaccinators, and Doctors) which would result under the three basic alternatives. Again, the "full service" alternative shows the largest number of resources.

While the PHC alternative has more than twice as many BHWs, LHVs, and Vaccinators, the Hospital alternative compensates with only slightly more doctors.

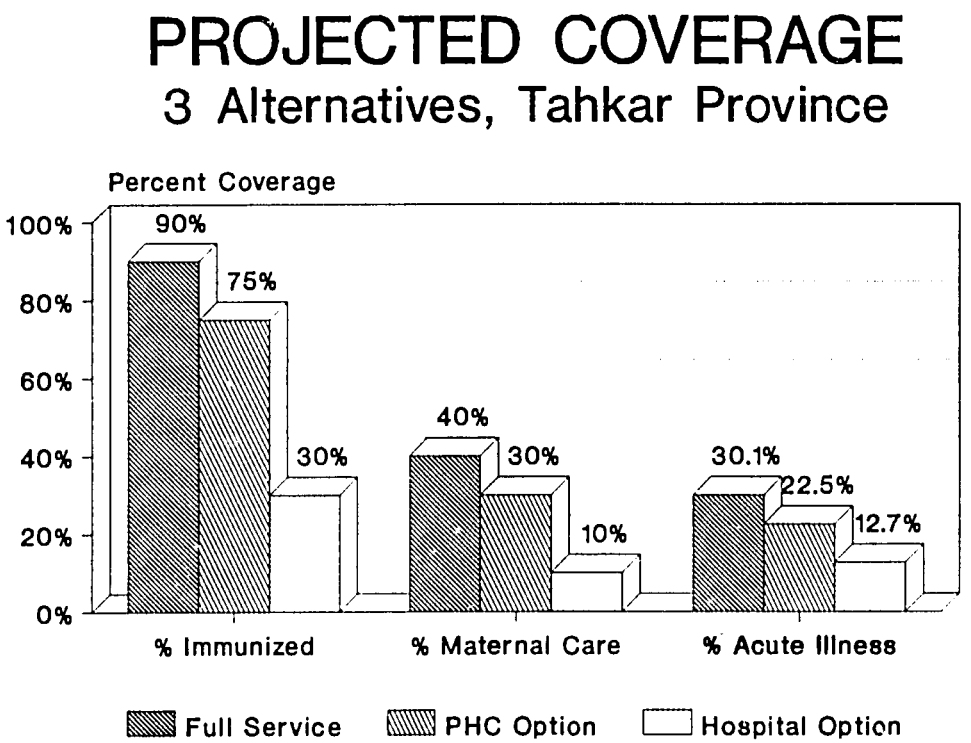
fig.-10



Graph 3: Projected Coverage

The third graph shows the projected coverage of the population under each of the basic alternatives. Coverage is measured in three areas of health problems: immunizations, maternal care, and acute illness. Interestingly, each of the three coverage measures indicate that the hospital option would provide the least coverage compared to the other alternatives.

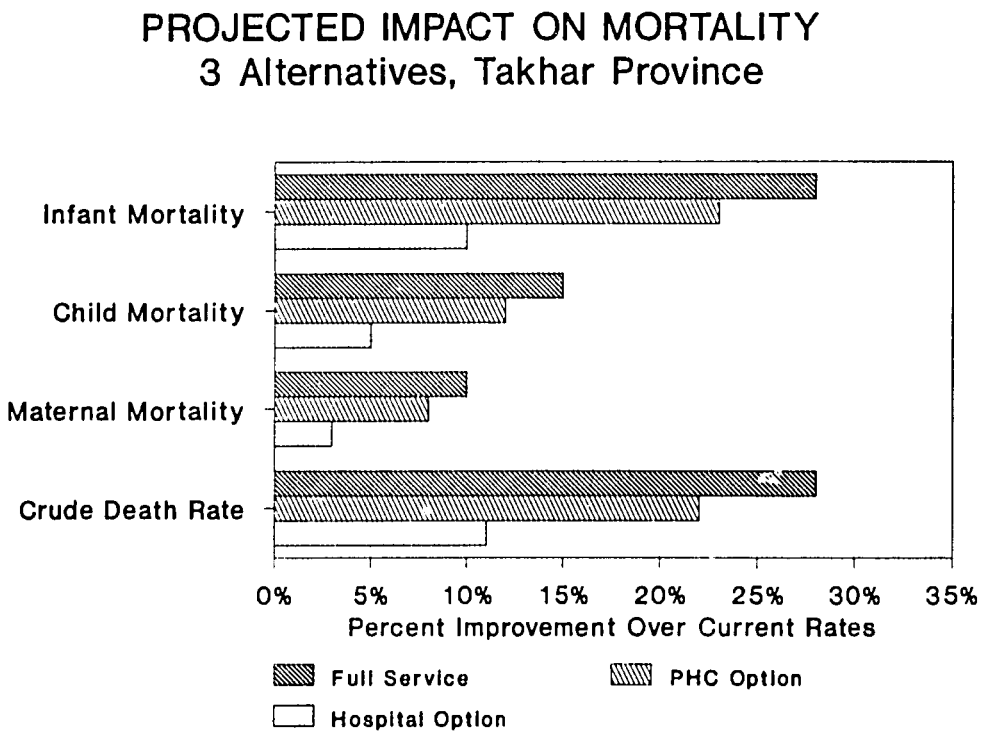
fig.-11



Graph 4: Projected Impact on Mortality

The fourth graph shows the projected impact on four major mortality indicators: infant mortality, child mortality, maternal mortality, and the crude death rate. Section 1, Current Health Situation, compares these indicators for Afghanistan to other developing countries. Given current rates, this graph shows the projected percent improvement in each of the rates. While the "full service" alternative still prevails, the "PHC" alternative reflects significantly greater impact than the "Hospital" alternative.

fig.-12



C. ISSUES IN REVENUE GENERATION

The government relies on taxes and income from state enterprises to provide funds to run the health system. The state of the national's economy for the near future does not indicate that this traditional source will be available in any quantity. Even when relatively strong, there will be other pressures on the overall government budget.

Donor funds may meet some of this shortfall in the short run, but it is unlikely to be sustained support. Alternative sources of revenue are fees charged for services and for supplies such as drugs. It is possible to direct these fees so that certain traditional public health programs and target service populations still receive free or significantly subsidized care, but that curative care can be somewhat self-supporting or can subsidize other services.

c/ other donor xxs?

Fees can also help in motivating appropriate utilization of facilities, and encouraging compliance with referral patterns.

6. IMPLEMENTING THE PLANNING PROCESS

There are additional steps to be undertaken over the next several months, including the following:

(a) Complete revisions of SUS-PLAN computer model, including consolidation of summary report contents and incorporation of formats for capital development costs (clinics, hospitals, training programs, etc.).

(b) Verify and complete the information base needed for health service planning. Information has been collected and estimated to generate preliminary reports from SUS-PLAN, but the data needs to be verified and customized for specific provinces and districts. It is particularly important to work with Afghan health officials, donors, and PVOs to complete the picture of potential donor sources. Cost information for capital development requirements also should be collected over the next few months.

decisions actions/ dates need to be set

(c) Conduct regular health planning sessions with Afghan health officials, technical advisors and other appropriate participants to further develop the concepts discussed here and in earlier workshops, to establish priorities for health service development, and to review the implementation process.

(d) Participate in discussions of health provider and health facility categories. With the diversity of health care providers who have been trained during the last decade and the variety of health care facilities in existence, there is considerable debate regarding appropriate levels and categories for health care providers and health facilities. In a continuation of CMC and ACBAR activities, WHO is currently coordinating an effort to develop health worker qualification examinations and retraining centers. This activity needs to be brought into the context of the interim government MOPH and area health development activities.

(e) Undertake a comprehensive survey of health care resources, including health care providers and health care facilities. This would be a major effort involving Afghan health institutions and all organizations currently participating in cross-border assistance. Such a survey would provide an essential health planning database. It would be particularly important for donors considering support for rehabilitating existing facilities, for building new facilities (clinics, health centers, hospitals), or for health worker training programs.

not enough time for all of this!

(f) Community survey of prevailing health conditions, morbidity rates, disability, and mortality rates. Although such a survey will probably not be possible in the near future, the need for this information should be kept in mind. Conditions vary considerably throughout the country, but a province-by-province survey of health conditions is probably not feasible in the foreseeable future. It should be possible, however, to identify regionally representative provinces for preliminary health surveys.

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ANNEXES

A. INTERVENTIONS
B. SAMPLE REPORTS FROM SUS-PLAN
C. DETAILED TECHNICAL NOTES
D. HEALTH IMPACT CONSIDERATIONS
E. CURRENT DATA

HEALTH PROBLEM PRIORITIES & HEALTH SERVICE INTERVENTIONS

HEALTH PROBLEMS	CASES PER 1000 POPULATION PER YEAR *	PERCENT OF DEATHS **	HEALTH SERVICE INTERVENTIONS (Prevention & Treatment)	HEALTH CARE DELIVERY MECHANISMS WHERE ? Vert.	Comm.	Clinic	Hosp.	Educ.(d)
MATERNAL & CHILD HEALTH SERVICES								
Maternal Care (Pre- & postnatal)	45 pregnancies	9.00%	(1) Risk assessment & high risk referral (2) Folate, iron (3) Tetanus toxoid (4) HE: diet, danger signs		+++	++	+	++
Deliveries (intrapartum)	45 deliveries	6.00%	(1) Risk assessment & high risk referral (2) Good delivery practice		+++	++	+	
Child Spacing	200 fertile couples		(1) HE: benefits of child spacing (2) Spacing methods: modern, traditional		+++	++	+	?
Immunization/Well Child	45 infants & children	17.00%	(1) Immunization (a) (2) Growth monitoring	+++	+++	+++	+/-	++
Malnutrition	20 cases	2.00%	(1) HE: diet (2) Supplemental foods (3) Vitamins & minerals-specific deficiencies					
DISABILITY SERVICES								
Prostheses, reconstruction	20 cases		(1) Assessment of need (2) Reconstructive surgery (3) Prosthesis design & construction				+++	
Rehabilitation	40 cases		(1) Physical therapy (2) Occupational & vocational therapy		POV(c)	POV(c)		
GENERAL HEALTH SERVICES								
Acute & Chronic Medical Problems								
Diarrhea/Dysentery	600 episodes	17.00%	(1) HE: water, food practices, sanitation breast feeding, available home fluids (2) ORS (3) Selective antimicrobials		++++	+	+	++
Malaria cases (See prevention below)	100 episodes	10.00%	(1) Presumptive chemotherapy (2) Surveillance	+++	+++	+	+	
Acute respiratory infections	1100 episodes	22.00%	(1) HE: signs of severe infection (2) Diagnosis, treatment, referral as needed (3) Antibiotics for moderate & severe		+++	+	+	+
Tuberculosis (BCG included in immunization)	50 new cases	2.00%	(1) Microscopic diagnosis (2) Early isolation & chemotherapy (3) TB register (4) Chemotherapy	??	++	++	++	

NOTES:
(a) Vaccines used: DPT, OPV, Measles, BCG
(b) Conjunctivitis, skin disease, urinary tract infection, typhoid, worm
(c) Leishmaniasis, leprosy, goiter, Brucellosis, Trachoma
(d) Headache, psychological problems, aches, pains, arthritis
(e) Falls, fires, farms, horses

HE = Health Education

* Estimated from MSH and PVO Greenbook data, comparative data from the Asia region.

** MSH estimates.

HEALTH PROBLEM PRIORITIES & HEALTH SERVICE INTERVENTIONS

HEALTH PROBLEMS	CASES PER 1000 POPULATION PER YEAR *	PERCENT OF DEATHS **	HEALTH SERVICE INTERVENTIONS (Prevention & Treatment)	HEALTH CARE DELIVERY MECHANISMS WHERE ? Vert.Comm.	Clinic	Hosp.	Educ.(d)
GENERAL HEALTH SERVICES							
Trachoma	75 episodes		(1) Diagnosis (2) Early, complete antiobiotic treatment				
Other infectious disease (b)	250 episodes	1.00%	(1) Diagnosis & drug treatment (2) HE: prevention where possible	? +++	+	+	
Locally prevalent disease (c)	75 episodes	1.00%	(1) Diagnosis & drug treatment (2) HE: prevention where possible	++++	+	+	++
Other acute complaints (d)	150 episodes		(1) Diagnosis & treatment	+++	+	+	
Malignancy, hypertension, COPD	20 episodes	4.00%	(1) Diagnosis & treatment (2) Supportive care	++++	+	+	++
Gynecological Problems	100 episodes	1.00%	(1) Female clinics for proper evaluation (2) Medical therapy (3) Surgical therapy	FHM	F-Clin	+	
Surgical/Operative Problems							
War Wounds	20 cases	2.00%	(1) First aid (2) Assessment & referral (3) Definitive medical & surgical care	+++	++	++	+++
Accidents/Trauma (e)	200 cases	4.00%	(1) First aid (2) Assessment & referral (3) Definitive medical & surgical care	+	++	++	
Operative cases	20 cases	2.00%	(1) Surgical assessment & surgery		++	++	
Dental Problems	300 cases		(1) Assessment & referral (2) Drug treatment as appropriate (3) Extraction (4) Dental procedures	+	++	++	
SPECIAL SERVICES							
Malaria prevention (for passive detection & treatment, see above)	200 households		(1) HE: bed nets for children (2) Active case detection & treatment (3) Vector control: spraying	+++ +++	+	+	
Water & Santitation	1000 recipients		(1) HE: hygiene, water, defecation, refuse (2) Provision of wells (3) Latrines (esp. urban populations)				

NOTES:
(a) Vaccines used: DPT, OPV, Measles, BCG
(b) Conjunctivitis, skin disease, urinary tract infection, typhoid, worm
(c) Leishmaniasis, leprosy, goiter, Brucellosis, Trachoma
(d) Headache, psychological problems, aches, pains, arthritis
(e) Falls, fires, farms, horses

HE = Health Education

* Estimated from MSH and PVO Greenbook data, comparative data from the Asia region.

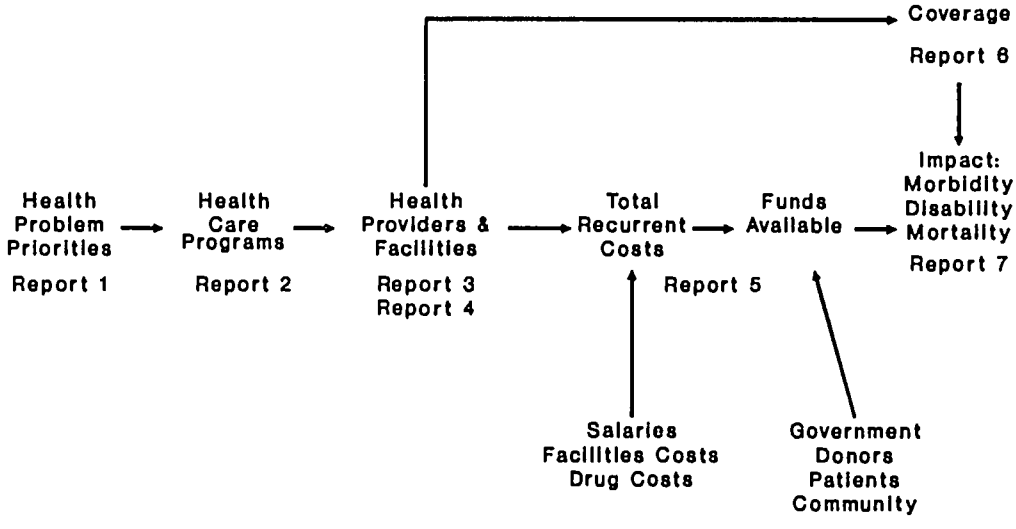
** MSH estimates.

ANNEX B: SAMPLE REPORTS FROM SUS-PLAN

The following pages are sample reports generated by SUS-PLAN for Takhar Province. They depict a "full service" alternative, based on an estimated population for the year 2000. Some funds are assumed to be raised from user fees for certain curative services. All revenue and expense amounts are in U.S. dollars.

Below is a schematic of the SUS-PLAN model, showing the nature of the reports within the overall context of the model.

FRAMEWORK FOR SUSTAINABLE HEALTH SERVICES IN AFGHANISTAN



ANNEX B: SUS-PLAN REPORTS

Report 1. Summary of Total Cases per Year & Source of Care
Report 2. Location of Government-Provided Care
Report 3. Summary Facility Plan by Population Center
Report 4. Summary of Health Worker Requirements
Report 5. Summary of Expenses and Revenue by Health Problem
Report 6. Health Service Coverage
Report 7. Project Health Impact

ANNEX C

REPORT 1. SUMMARY OF TOTAL CASES PER YEAR & SOURCE OF CARE

TYPE OF HEALTH SERVICE Individual Health Problem	CASES/ 1000 POP/ YEAR	DEFINITION OF "CASES"	SOURCE OF CARE (% OF ALL "CASES") NO CARE	SELF CARE	TRAD'L HEALER	PRIVATE CARE	GOV'T SERVICES	TOTAL
MATERNAL & CHILD HEALTH SERVICES								
Maternal Care (Pre- & postnatal)	135	visits: 45 pregnancies, 3 each	10%	20%	20%	10%	40%	100%
Deliveries	45	cases		30%	60%	5%	5%	100%
Child Spacing	160	visits: 40 couples, 4 visits	50%			20%	30%	100%
Immunization/Well Child	225	contacts: 5 visits/child cover	10%				90%	100%
Malnutrition	20	cases	70%	10%	5%	5%	10%	100%
DISABILITY SERVICES								
Prostheses, reconstruction	20	cases	25%			25%	50%	100%
Rehabilitation	40	cases	20%	10%	10%	10%	50%	100%
GENERAL HEALTH SERVICES								
Acute & Chronic Medical Problems								
Diarrhea/Dysentery	600	episodes	30%	20%	10%	5%	35%	100%
Malaria cases	100	episodes	30%	10%	10%	5%	45%	100%
Acute respiratory infections	1100	episodes	30%	20%	10%	5%	35%	100%
Tuberculosis	50	new cases	30%	10%	10%	5%	45%	100%
Trachoma	75	episodes	50%		10%	20%	20%	100%
Other infectious disease (a)	250	episodes	30%	20%		10%	40%	100%
Locally prevalent disease (b)	75	episodes	30%	20%		10%	40%	100%
Other acute complaints (c)	150	episodes	30%	20%		10%	40%	100%
Malignancy, hypertension, COPD	20	episodes	30%	20%		10%	40%	100%
Gynecological Problems	100	episodes	20%	10%	10%	20%	40%	100%
Surgical/Operative Problems								
War Wounds	20	cases		30%	10%	20%	40%	100%
Accidents/Trauma	200	cases	20%	30%	10%		40%	100%
Operative cases	20	cases				20%	80%	100%
Dental Problems	300	cases	30%	10%		30%	30%	100%
SPECIAL SERVICES								
Malaria prevention	300	areas for spraying	50%				50%	100%
Water & Santitation	1000	recipients	50%				50%	100%
TOTAL	5005							

(a) Conjunctivitis, skin disease, UTI, typhoid, worms,etc.
(b) Leishmaniasis, leprosy, brucellosis, goiter
(c) Heachache, aches, pains, psychological problems

Planning Area:	TAKHAR PROV.	File Name:	SUS-PLAN
Strategic Alternative:	FULL SERVICE	Area Pop:	580,462
Planning Year:	2000	Currency:	US $
		Run Date:	10-Jun-89

ANNEX C REPORT 2 LOCATION OF GOVERNMENT-PROVIDED CARE

TYPE OF HEALTH SERVICE Individual Health Problem	GOV'T CONTACTS/ 1000 POP/ YEAR	LOCATION OF GOVERNMENT-PROVIDED CARE (% Gov't Health Service Encounters by Level) VERTICAL	PRIMARY HEALTH CARE Community	Clinic	HOSPITAL Outpt.	Inpt.	TOTAL
MATERNAL & CHILD HEALTH SERVICES							
Maternal Care (Pre- & postnatal)	54		60%	30%	10%		100%
Deliveries	2			25%	5%	70%	100%
Child Spacing	48		30%	60%	10%		100%
Immunization/Well Child	203	50%	30%	18%	2%		100%
Malnutrition	2		60%	30%	10%		100%
DISABILITY SERVICES							
Prostheses, reconstruction	10				40%	60%	100%
Rehabilitation	20				40%	60%	100%
GENERAL HEALTH SERVICES							
Acute & Chronic Medical Problems							
Diarrhea/Dysentery	210		75%	20%	4%	1%	100%
Malaria cases	45		70%	20%	4%	1%	95%
Acute respiratory infections	385		50%	40%	8%	2%	100%
Tuberculosis	23		10%	60%	20%	10%	100%
Trachoma	15		10%	60%	20%	10%	100%
Other infectious disease (a)	100		50%	40%	8%	2%	100%
Locally prevalent disease (b)	30		50%	40%	8%	2%	100%
Other acute complaints (c)	60		75%	20%	4%	1%	100%
Malignancy, hypertension, COPD	8		10%	60%	20%	10%	100%
Gynecological Problems	40		40%	55%	4%	1%	100%
Surgical/Operative Problems							
War Wounds	8		40%	40%	15%	5%	100%
Accidents/Trauma	80		80%	15%	4%	1%	100%
Operative cases	16			20%	30%	50%	100%
Dental Problems	90		20%	50%	30%		100%
SPECIAL SERVICES							
Malaria prevention	150	100%					100%
Water & Santitation	500	100%					100%
TOTAL	2,098						

(a) Conjunctivitis, skin disease, UTI, typhoid, worms,etc.
(b) Leishmaniasis, leprosy,

Planning Area:TAKHAR PROV.
Strategic Alternative:FULL SERVICE
Planning Year: 2000

File Name:SUS-PLAN
Area Pop: 580,462
Currency:US $
Run Date:10-Jun-89

ANNEX C

REPORT 3. SUMMARY FACILITY PLAN BY POPULATION CENTER

ADMIN LEVEL			POPULATION 1974	PROJECTED POPULATION 2000	HEALTH FACILITIES Health Post	Nurse-Led Clinic	Doc.-Led Clinic	Small Hospital	Area Hospital	Referral Hospital
	CURRENT FACILITIES		369,725	580,462		8	3	1	1	
W2	Rustaq	District (Woluswali-2)	66,100	103,776						
P2	Taloqan	Area City (P2)(P3)	85,338	133,979						
A	Kalafgan	Sub-District (Alaqadari)	18,805	29,524						
W4	Khwajaghar	District (Woluswali-4)	23,992	37,667						
A	Chal	Sub-District (Alaqadari)	12,574	19,741						
W4	Eshkamesh	District (Woluswali-4)	19,022	29,864						
W4	Chah Ab	District (Woluswali-4)	45,727	71,791						
A	Bangi	Sub-District (Alaqadari)	11,712	18,388						
W4	Farkhar	District (Woluswali-4)	19,868	31,192						
W4	Yangi Qala	District (Woluswali-4)	33,595	52,744						
A	Warsaj	Sub-District (Alaqadari)	23,941	37,587						
A	Darqad	Sub-District (Alaqadari)	9,051	14,210						
	NEEDED FACILITIES	Number Fac.				7	3	1	1	
		Total Cost				35,518	28,787	28,713	85,917	
		% Fac. Cost				20%	16%	16%	48%	
W2	Rustaq	District (Woluswali-2)	66,100	103,776		2	1	1		
P2	Taloqan	Area City (P2)(P3)	85,338	133,979			2		1	
A	Kalafgan	Sub-District (Alaqadari)	18,805	29,524	1					
W4	Khwajaghar	District (Woluswali-4)	23,992	37,667	1	1				
A	Chal	Sub-District (Alaqadari)	12,574	19,741	1					
W4	Eshkamesh	District (Woluswali-4)	19,022	29,864	1	1				
W4	Chah Ab	District (Woluswali-4)	45,727	71,791	1	1				
A	Bangi	Sub-District (Alaqadari)	11,712	18,388	1					
W4	Farkhar	District (Woluswali-4)	19,868	31,192	1	1				
W4	Yangi Qala	District (Woluswali-4)	33,595	52,744	1	1				
A	Warsaj	Sub-District (Alaqadari)	23,941	37,587	1					
A	Darqad	Sub-District (Alaqadari)	9,051	14,210	1					
	PLANNED FACILITIES									
W2	Rustaq	District (Woluswali-2)	66,100	103,776						
P2	Taloqan	Area City (P2)(P3)	85,338	133,979						
A	Kalafgan	Sub-District (Alaqadari)	18,805	29,524						
W4	Khwajaghar	District (Woluswali-4)	23,992	37,667						
A	Chal	Sub-District (Alaqadari)	12,574	19,741						
W4	Eshkamesh	District (Woluswali-4)	19,022	29,864						
W4	Chah Ab	District (Woluswali-4)	45,727	71,791						
A	Bangi	Sub-District (Alaqadari)	11,712	18,388						
W4	Farkhar	District (Woluswali-4)	19,868	31,192						
W4	Yangi Qala	District (Woluswali-4)	33,595	52,744						
A	Warsaj	Sub-District (Alaqadari)	23,941	37,587						
A	Darqad	Sub-District (Alaqadari)	9,051	14,210						

Planning Area:	TAKHAR PROV.	File Name:	SUS-PLAN
Strategic Alternative:	FULL SERVICE	Area Pop:	580,462
Planning Year:	2000	Currency:	US $
		Run Date:	10-Jun-89

ANNEX C

REPORT 4. SUMMARY OF HEALTH WORKER REQUIREMENTS BY TYPE
CURRENT, NEEDED, PLANNED

TYPE OF HEALTH SERVICE HEALTH PROVIDER	ANNUAL COST/ PROVIDER	WORKERS/FACILITIES (#) CURRENT	NEEDED	PLANNED	ANNUAL RECURRENT COST CURRENT	NEEDED	PLANNED	PERCENT OF TOTAL COST
VERTICAL		NA	121			109,018		23.1%
Vaccinator	900	NA	16		NA	14,693		3.1%
Outreach	900	NA	105		NA	94,325		20.0%
PRIMARY HEALTH CARE			334			288,115		61.1%
COMMUNITY								
FHW	450	NA	75		NA	33,642		7.1%
BHW	450	NA	147		NA	66,198		14.0%
HEALTH CENTER								
Doctor	2,880	NA	31		NA	88,359		18.7%
Midlevel	1,320	NA	53		NA	69,993		14.8%
Female Midlevel	1,320	NA	10		NA	12,997		2.8%
Other	900	NA			NA			
Vaccinator	900	NA	19		NA	16,926		3.6%
HOSPITAL			26			74,776		15.8%
OUTPATIENT								
Medical Doc	2,880	NA	7		NA	21,441		4.5%
Surgical Doc	3,456	NA	3		NA	9,961		2.1%
Midlevel	1,320	NA	2		NA	3,197		0.7%
Female Midlevel	900	NA	1		NA	451		0.1%
Other	900	NA	0		NA	387		0.1%
INPATIENT								
Medical Doc	2,880	NA	3		NA	9,455		2.0%
Surgical Doc	3,456	NA	9		NA	29,885		6.3%
Other	900	NA			NA			
TOTAL			481		NA	471,910		100.0%

File Name: SUS-PLAN
Area Pop: 580,462
Currency: US $
Run Date: 10-Jun-89

ANNEX C

REPORT 5. SUMMARY OF EXPENSES AND REVENUE BY HEALTH PROBLEM

	EXPENSES Total Expenses	Percent of Total	REVENUE Government Budget	User Fees	Donors	Total Revenue	SURPLUS (SHORTFALL)
MATERNAL & CHILD HEALTH SERVICES							
Maternal Care, Deliveries	93,158	5.6%	65,102		28,056	93,158	
Child Spacing	36,178	2.2%	25,283		10,896	36,178	
Immunization/Well Child	212,709	12.8%	148,648		64,061	212,709	
Malnutrition	1,268	0.1%	886		382	1,268	
DISABILITY SERVICES	119,331	7.2%	83,392		35,938	119,331	
GENERAL HEALTH SERVICES							
Acute & Chronic Medical Problems	690,320	41.6%	482,419	402,091		884,510	194,190
Gynecological Problems	52,604	3.2%	36,761	37,670		74,431	21,827
Surgical/Operative Problems	311,421	18.7%	217,631	364,637		582,268	270,848
Dental Problems	81,086	4.9%	56,665	31,345		88,010	6,925
SPECIAL SERVICES							
Malaria prevention	14,574	0.9%	10,185		4,389	14,574	
Water & Santitation	48,581	2.9%	33,950		14,631	48,581	
TOTAL OR AVERAGE	1,661,230	100.0%	1,160,924	835,743	158,353	2,155,020	493,790
PER CAPITA COST		3.00					

SUMMARY BY EXPENSE CATEGORY:		
Health Care Providers:	471,910	27.11%
Health Care Facilities:	178,935	10.28%
Drugs & Medical Supplies:	1,090,017	62.61%
TOTAL	1,740,862	100.00%

PER CAPITA GOV'T BUDGET:	2.00	File Name:	SUS-PLAN
Planning Area:	TAKHAR PROV.	Area Pop:	580,462
Strategy:	FULL SERVICE	Currency:	US $
Planning Year:	2000	Run Date:	10-Jun-89

ANNEX C

REPORT 6.

SUMMARY OF HEALTH SERVICE COVERAGE

	CURRENT LEVEL	NEEDED LEVEL	PLANNED LEVEL
PREVENTIVE CARE COVERAGE			
% Fully Immunized		90%	
% Maternal Care		40%	
CURATIVE CARE COVERAGE			
Total Acute Ill./Person/Yr		3.06	
% Treated by Gov't Services		36%	
HEALTH SERVICE UTILIZATION			
Gov't Contacts/Person/Yr		2.08	
Curative Contacts/Person/Yr		1.09	
Hospital Adm./1000/Yr		47	
HEALTH WORKER RATIOS			
Population/ Doctor	NA	10,965	
Population/ Midlevel	NA	10,469	
Population/ Female Midlevel	NA	56,100	
Population/ BHW	NA	3,946	
Population/ FHW	NA	7,764	
HEALTH FACILITY RATIOS			
Population/Clinic	NA	58,046	
Clinic Beds/1000 Pop.	NA	0.03	
Hospital Beds/1000 Pop.	NA	0.09	

		File Name:	SUS-PLAN
Planning Area:	TAKHAR PROV.	Area Pop:	580,462
Strategic Alternative:	FULL SERVICE	Currency:	US $
Planning Year:	2000	Run Date:	10-Jun-89

ANNEX C
REPORT 7.
SUMMARY OF PROJECTED IMPACT

	CURRENT LEVEL	PROJECTED LEVEL
Percent Immunized (1)		
BCG	27%	90%
DPT (3 doses)	25%	90%
Polio 3 (3 vaccines)	25%	90%
Measles	31%	90%
TT2 (2 injections)	6%	90%
Child Survival Rate (% who survive)	69.6%	79.5%
Infant Mortality Rate (deaths/1000 live births)	173	126
Under 5 Mortality Rate (deaths per 1,000 under fives)	304	205
Maternal Mortality Rate (2)	640	574
Crude Birth Rate (births/1000 population)	48	36
Fertility Rate (3)	6.9	5.2
Crude Death Rate (deaths/1000 population	26.3	20.1
Life Expectancy at Birth	42	NA

(1) Percentage of 1 year olds immunized, except for TT2, which is the percentage of pregnant women who received the required two tetanus toxoid shots to protect mother and new-born.
(2) Annual deaths of women from pregnancy related causes per 100,000 live births.
(3) Number of children that would be born per woman, if she were to live to the end of her child-bearing years.

Source: The State of the World's Children 1989, UNICEF

		File Name:	SUS-PLAN
Planning Area:	TAKHAR PROV.	Area Pop:	580,462
Strategic Alternative:	FULL SERVICE	Currency:	US $
Planning Year:	2000	Run Date:	10-Jun-89

ANNEX C: DETAILED TECHNICAL NOTES

1. Health care needs of the population:

   The first portion requires the estimation of the incidence of different health care problems and needs in the population. This "raw" incidence figure is modified by estimates of the alternatives to government health services which would reduce the utilization of, and need for, government services.

   Given the above estimated incidence, the model requires an estimation of the percentage of cases which would be seen by each type of health worker, at each type of facility. This results in an allocation of health needs across a spectrum of health workers and the facilities they are located at. By combining the incidence, allocation, and population estimates, the model calculates a theoretical volume of need for the province, in terms of contacts (for each health problem or need) with different types of health workers at different facilities.

   For example, there might be a total of 600 diarrhea/dysentery visits per 1,000 population per year, of which 35% would utilize government health services. In a population of 369,725 people, 210 contacts would be expected at government facilities. Of these 210 contacts, 95% are expected to show up at the community level (basic health workers and health clinics) and 5% at the hospital level (4% at outpatient clinics and 1% at inpatient services). Within each of these levels we have further estimated which of the health care providers at the different facilities would have these contacts, and in what proportion. This results in a total number of ontacts per health worker per year, such as 14,558 diarrhea/dysentery contacts for a female basic health worker per year, and 206,285 contacts for all types of health problems or needs.

2. Health worker and health facility needs:

   The next step in the model is to determine the number of health workers and health facilities required to service the population's health problems and needs. To calculate this from the number of contacts, the model uses estimates of worker productivity with respect to contacts. For example, a female basic health worker might be able to see 5 patients per day and work 200 days a year. At this level of productivity, one female basic health worker can meet the need of 1,000 contacts per year. Given the estimate of 206,285 contacts per year with a female basic health worker, this province would require 206 female basic health workers at the community level to meet this need.

   The model also determines the number and type of health facilities needed in the province. Unlike health workers, this is a function of population centers. Based on a list of population centers supplied by the planner, and the population estimates for these centers, appropriate facilities are

assigned to each center. We currently have district level population estimates, but would like to use actual village, town and city level populations to plan facility location.

The model will indicate the number of health workers and facilities required for the province, but will not specify the allocation of the health workers at the different facilities in different locations. This requires more subtle planning judgement than the model can or should provide.

3. Unit Costs:

There are three main categories of cost utilized in the model: worker-based costs, health problem-based costs, and facility-based costs. These are identified as unit costs since the model is able to generate "volume" figures for: health workers employed by the government, contacts for health problems or needs, and different facility types.

The model currently includes existing data for salaries as the main worker-based cost, but there is room for additional costs associated with workers, such as refresher training or other allowances. While initially provided in the model, these are very easily changed.

Health problem-based costs are drugs, vaccines, and expendable supplies. However, other costs can be added. These are all specified by health problem contact so that a variation in incidence of health problem or change in health service provided by the government will result in a different total drug and expendable supply cost (or other health problem-based cost).

The model makes assumptions about the services provided at different levels of health facilities, and the resulting staffing patterns. For example, x-ray technicians are only available at hospital level facilities, not clinics, whereas lab technicians are also at clinics. However, these are to be reviewed by the planner, and are easily changed, as are their salaries.

Maintenance and transportation are currently percentages of total cost for a facility, but can be changed to reflect other estimates. Food cost for a facility is currently based on a cost per meal of 5 Pakistani rupees ($0.25) times the number of meals provided at a facility (number of staff plus bed times three meals a day, times 365 days a year for hospitals, and 312 days a year for clinics). Any of these variables can be changed, or the calculation can also be done as a percentage of total cost.

4. Total recurrent costs:

Based on the unit costs and the number of health workers and facilities appropriate for the province, the model multiplies out the total recurrent cost for the planned health services.

The resulting costs can be examined from a variety of perspectives, including costs by facility, costs by health problem, or cost per contact. Of primary interest is a comparison of costs per capita with the government's budgeted funds for health care services on a per capita basis. If the cost of the province's health plan is greater than the anticipated funds available from the government, some modification to the health plan must be made. The modification can be either a reduction in health services, or the institution of fees for certain contacts or services.

5. Funding sources for paying the costs of the health system:

   The three major funding sources for health services provided by the government are:

   a. the government budget,

   b. donor funds, and

   c. revenue generated from health services or drugs.

   Each of these can be included in the model to constrain or increase the amount of health services provided by the government. The government budget is expressed in terms of per capita expenditure for health services, and the health system's costs should not exceed this unless there are other sources of funds.

   Donor funds may be available for certain health services, such as immunizations. Thus, in the model these costs can be isolated and covered, in part or in whole, by an assumed amount from donors.

   Revenue can be generated from user fees for different health services. The model indicates the costs associated with different services at different levels, and shows the drug costs as well. Based on these the health planner can differentially charge user fees by health problem and location, for all or part of the cost. The model calculates the revenue that would be raised by these fees, and thus the health system can afford to provide that much more in health services.

6. Coverage and impact:

   Given the health plan's number of health workers and facilities, the model attempts to measure the impact of the health plan. The model uses estimates of the effect that can be expected from particular aspects of the health plan on certain indicators of public health such as infant mortality. These are impossible to predict accurately, but do highlight trade-offs in health impacts as a result of different allocations of resources.

ANNEX D: HEALTH IMPACT CONSIDERATIONS

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1. IMPACT THEORY
2. MODELLING IMPACT
3. DEFINITIONS OF CALCULATIONS
4. DATA AND DEFINITIONS OF HEALTH PROBLEMS

1. IMPACT THEORY

The goal of most public health efforts is to affect the mortality rate in a given community. What are the factors that dictate whether health care efforts undertaken for or with that community will prove successful?

There are three fundamental factors that define how many lives are saved by a health care entity: (1) the number of people needing assistance who actually receive it, and (2) the utility of that assistance to those who get it. The third factor is more difficult to assess: (3) the actual long-term impact of health care services.

The number of people who receive needed care (factor 1) is determined by two things. The first is the ability to identify those in need of care. If only 50% of children with life-threatening bacterial pneumonia are identified as appropriate candidates for antibiotic therapy, then only 50% of deaths that could have been averted would be. The second component relates to the number of people identified as at risk who can or who want to partake of the treatment. This would be a scenario in which the health provider only had enough antibiotic to treat some proportion of those identified as having bacterial pneumonia. It could also be a situation where children identified with pneumonia and with access to antibiotics are taken to an alternate health care provider or are treated at home. This is a realistic possibility, as was shown by Malison et al who studied health care delivery in a Ugandan district. There they found surprisingly low utilization of a health care center by those living around it. Moreover, mortality rates for the surrounding population were similar to those found in more remote areas of the district. (Note: By providing this example I do not wish to imply that all forms of alternate health care are inferior).

The utility of the health care that is administered (factor 2) is influenced by three things. The first is the actual medical benefit of a treatment. Is the antibiotic effective? Is it effective against the most common respiratory pathogens? As Walsh points out, this determination is best made in an environment with ideal conditions for administration of, and compliance with, the given treatment. A second consideration is the patient's compliance with the treatment administered by the health provider. Compliance is influenced by a number of factors such as a patient's understanding of why a treatment is important, the complexity of the treatment, its cost, the relationship of the patient with the health care provider, etc. Finally, the compliance of the health provider with currently practiced standards of therapy plays a role in determining the utility of health services. Practitioner compliance is influenced by the training, intelligence, motivation, and logistical capabilities of the health care provider. These issues are explored in a comprehensive article about community health workers by Walt.

Some authors have stepped back from this logical assessment of health impact and questioned to relevance of the process (factor 3). Some argue that the same child whose life is threatened by a respiratory infection and who

desperately needs an antibiotic is still vulnerable; he might only survive until his enfeebled immune system is assaulted by a P. falciparum-bearing

mosquito. Indeed, most conditions responsible for childhood deaths are profoundly affected by socio-economic status, sanitation, clean water, and nutritional status.

A study done in Zaire attempted to clarify the issue by studying long-term survival trends of two groups of children from 7-36 months of age: one that received measles vaccination and one that did not. They hypothesized that if all children who were saved from measles were going to die from other causes, then as time progressed the initially decreased mortality rate exhibited by the immunized cohort would begin to approach that of the control group. In fact it was found that between 22 and 36 months of age (when the risk of dying from measles had declined) this portion of the immunized group (22 to 36 months of age) had a death rate 43% greater than their unimmunized counterparts. Still, the death rate for the entire immunized group was substantially lower than in their unimmunized counterparts.

There is something else that affects long-term survival: herd immunity. The theory behind herd immunity is that if one reduces the incidence of an immunizable disease there are not only fewer people with the disease but fewer people to catch the disease. At a certain level of immunization the line of transmission will be stopped, or at least there will be so few infectious people that even those not immunized will be at a relatively low risk. The level of immunization needed to achieve herd immunity is dependent on several factors, including the existing prevalence of the disease in the community and the attack rate (i.e. infectiousness) of the disease in question. Another concept similar to herd immunity is as follows: if you decrease the prevalence of a communicable disease with a medical intervention, there will be fewer people with the disease and also fewer people to spread the disease to others, thus further limiting future prevalence.

In any event, the ideal way to assess the relationship between health care and its ultimate impact would be to develop an Impact Measure (IM) that incorporated the above:

IM = factor 1 * factor 2 * factor 3
= use index * utility index * long-term index
= coverage * utilization by covered * efficacy of treatment * patient compliance * health provider compliance *
futility factor * herd immunity factor * spreading factor.

The parameters used to determine health impact in Afghanistan are considerably fewer than the number contained in the above list; coverage (i.e. the portion of the population to which an intervention is available) and efficacy (the proportion of the population that survives or gets better that would not have had they not received the intervention) are the only two factors that I consider. Thus, in this model IM = coverage * efficacy. To determine

mortality levels based on a given IM one must keep in mind that mortality is not proportional to the number of people who are impacted by treatment but rather to the number of people who are not impacted. Thus, mortality measure (MM) is proportional to 1 - IM.

2. INTRODUCTION TO AFGHANISTAN AND THE MODEL

Understanding the relationship between government health service and its impact on mortality and morbidity is the only way to know many Afghan lives can be saved by the year 2000. To help better define this critical relationship, another computer-assisted model has been designed that will utilize coverage estimates from SUS-PLAN to help calculate mortality estimates for several age groups from a variety of medical conditions. Hopefully, this model relating coverage and impact will be useful. That is not to suggest, however, that there are not flaws. Four of the more troubling ones are discussed below.

1) The statistics that go into the model are crude estimates. In order to accurately calculate future mortality, one must know current mortality, current coverage and current efficacy (current mortality is unquestionably a function of current mortality and efficacy; that function must be defined so it can be applied to figures at some other point in time). In addition, one must know future coverage and future efficacy. With five of the six variables known, one can solve for the unknown variable, namely future mortality. Unfortunately, all "known" variables are only approximations. I feel particularly uncomfortable with the figures for current coverage as well as current mortality for various diseases in Afghanistan.

2) In discussing coverage we are only considering coverage by governmental health services. In Afghanistan, the government is actually a relatively minor contributor to total health care. However, this model assumes implicitly that the only way mortality will be reduced is by altering government health service. Clearly other forms of non-government care, some of which involve traditional Afghan remedies and others which involve Western medical treatments, will also play a role in changing mortality rates in the future.

3) Efficacy is a key input in this model. In this model, I consider each disease, then choose an intervention and base the estimate of efficacy both on knowledge of that disease and that intervention. However, one could also determine efficacy by determining the decrease in mortality rate that could be achieved at each "level" of the health care system (i.e. at the health worker level, the health post level, the regional hospital level, etc.).

Let us consider the example of diarrheal disease. Mortality could be reduced 50% at the primary health care level (by ORT), by 85% in a district hospital (with intravenous rehydration and possibly medication) and by 40% through a clean water program. Looking at efficacy in this manner (as was done by Steve Solter and Jono Quick previously) would enable one to adjust efficacy figures based on the amount of each "level" of health care coverage selected by the Afghan AHC. However, my efficacy figures are for only one fixed intervention and thus cannot adapt. Ultimately, however, my method is simpler and probably more realistic (at least until better data is available with regards to

reductions in mortality derived from different levels of the health care system).

4) The model does not adequately assess the effects of improved sanitation and nutrition, two factors which underlie almost all medical illness. It is very difficult to predict what the coverage, cost and impact will be, and thus I have largely ignored these factors.

3. THE AFGHAN CARE-IMPACT MODEL

In this portion of the report the columns in the model will be discussed and mathematical relationships between the columns will be explained.

Note: Column headings that are [bracketed] have been "hidden" in the Lotus 1-2-3 model because they have not yet had data put into them.

"DISEASE"

This column lists specific disease categories and diseases. This particular disease breakdown, while not ideal, is chosen to be consistent with the rest of the SUS-PLAN model.

"MORTALITY NOW"

1) All mortality figures and incidence figures have been broken into four age categories: zero to one year (infants), one to four years (children), females aged 15 to 45 (females of childbearing age), and all (entire population).

2) All mortality and incidence figures are per 1000 general Afghan population. This means that all figures have been standardized. For infants, deaths per 1000 live births is converted to crude death rates (CDR) by multiplying by 45/1000, since the crude birth rate (births per 1000 population per year) is 45 according to UNICEF's 1989 report. Deaths per 1000 children 1-4 yrs. is converted to CDR by multiplying by 13.5/100 since this group comprises roughly 13.5% of the Afghan population (in accordance with demographics of other DCs and a survey of three Afghan provinces by MSH). Figures from the 1989 UNICEF report confirm that under-5s (children + infants) total 17-18% of the total population. Deaths per 1000 females 15-44 is converted by multiplying by 22/100 since this group comprises some 22% of the Afghan Population (similar reasoning as above).

3) Current mortality figures are approximate; little was known about the true incidence and prevalence of disease in Afghanistan before the war, and even less is known now. Therefore, one must rely on several methods when trying to estimate current mortality figures for various diseases. Some data is available from surveys of health within Afghanistan, including from Greenbooks (GB) compiled by basic health workers inside of Afghanistan. While these surveys should theoretically provide a good sample of Afghan health problems, they are limited by their relatively small sample size and by the fact that they were collected at one point in time. Therefore, one must also rely on

comparative data from other DCs as a basis for determining the incidence and prevalence of certain diseases in Afghanistan. As a final check, one can ensure that final mortality statistics fit into demographic patterns for Afghanistan and for other developing countries (e.g. that the infant mortality rate (IMR) in Afghanistan is estimated to be 183 by UNICEF's 1989 report, and that deaths unde five account for greater than half all deaths in most developing nations, etc).

["INCIDENCE NOW"]

Similar assumptions and methods as with "MORTALITY NOW" category. Incidence is harder to assess than mortality because cases are more likely to be unnoticed than are deaths.
["CASE. FAT.RAT"]

Case fatality ratios (CFR) can be found for common diseases from several sources. Theoretically, incidence multiplied by case fatality ratio should yield "baseline" (i.e. without medical intervention) mortality estimates. If one were to calculate the baseline mortality rates for Afghanistan and compare then to the actual observed mortality rates, one would have a way to estimate the impact of the current health care system. I have chosen not to pursue this interesting option because I feel that the figures for both incidence and CFR in Afghanistan are questionable.

"COVERAGE NOW"

1) Coverage refers to the proportion of the population treated for a given disease by government health services. Current coverage is difficult to assess; in most cases my figures are guestimates.

2) Coverage figures are presented as decimal proportions. For example, if 50% of the people with a given disease are treated by government services then coverage would be 0.5.

"EFFICACY NOW"

1) Efficacy refers to the proportion of people who survived a given disease who otherwise would have died had there been no intervention.

2) These figures, as with coverage, are presented as decimal proportions.

"COVERAGE 2000"

These figures are taken from SUS-PLAN projections, which are in turn derived from assumptions made about the type of health care system put in place by the Afghan government, how much is spent on that system, etc.

"EFFICACY 2000"

Generally, I have assumed that the efficacy of the selected interventions I am examining will not change much between now and the year 2000. This assumption is debatable, and I have made exceptions to it. For instance, vaccinations my improve slightly through improvements in the vaccines themselves, improvements in the cold chain, improved technique of the vaccinators etc.

"MORTALITY 2000"

Coverage * efficacy represents the impact measure (IM, see part I of this paper).

Mortality future = Mortality (f) = Mortality Now * (1 - IM(f)).

However, mortality now is a function of an existing impact fraction (assuming there are already some health services in place). Therefore one must to find the <u>difference</u> between the current and future impact measures to accurately assess future mortality. Thus the equation used to obtain figures is:

Mortality (f) = Mortality(Now) * (1 - (IM(f) - IM(now))).

Thus:

Mortality 2000= Mortality Now * (1 - ((coverage 2000 * efficacy 2000) - (coverage now * efficacy now))).

["INCIDENCE 2000"]

This category is problematic. Some disease interventions that are preventative (e.g. vaccinations) decrease mortality primarily by decreasing incidence of the disease. Other therapeutic interventions have no impact on incidence, however. Clean water and good sanitation would have a large effect on the incidence of almost all diseases. Unfortunately, however, improvements in these areas are extremely difficult to predict.

"INTERVENTION"

This column merely contains the name of the medical modality that is employed to alter mortality for a given disease. In general I have tried to chose the most effective, inexpensive and available interventions available. For example, for tuberculosis I consider BCG vaccine instead of chemotherapy because chemotherapy is expensive and must be administered for a minimum of six months.

["COST/INT"]

There are two ways to find out the cost of each medical intervention. One way is to use SUS-PLAN figures relating to the cost of a medical encounter for any given disease entity. Another way is to look at comparative data (i.e. from other countries) about how much is spent on a given medical intervention. This is often variable, and is influenced by the number of people receiving the intervention (more people dilutes the fixed administrative, personnel and capital costs of the project).

["COST/CAPITA"]

This figure is derived by dividing total cost by total population:

= (% Coverage 2000 * Population * Cost/int) / Population.

Population of Afghanistan is estimated at 15,000,000 for the model.

"DEATHS AVERTED"

Deaths averted represents the number of deaths avoided due to a particular health care intervention for the entire population of Afghanistan for one year. The equation that represents this is:

Deaths Averted = (Mortality Now - Mortality 2000) * (Population / 1000)

The reason that the difference in mortality is multiplied by Population/1000 is that mortality, which is deaths per 1000 population, must be converted to deaths per 15,000,000 population.

["COST/DEATH.AVERT"]

The cost per death averted is calculated by dividing the total cost for any disease by the total number of deaths averted for that same disease (found in the "ALL" subcolumn of the "DEATHS AVERTED column). The equation representing this relationship is:

(% Coverage 2000 * Population * Cost/Int) / Deaths Averted.

["CASES AVERTED"]

This is derived with logic similar to that for "DEATHS AVERTED." The equation is:

(Incidence Now - Incidence 2000) * Population / 1000.

["COST/CASE.AVERT"]

Similar logic as with "COST/DEATH.AVERT." The equation is:

(Incidence Now - Incidence 2000) * Population / 1000.

"DEATH AGE"

This represents the average age of death for each disease. Most of these figures come from article by the Ghana Health Assessment Team.

"DEATH.AV/DEATH NOW"

The figures that appear in this column shows the fraction of deaths that can be averted divided by the total number of current deaths from a given disease. The formula is:

Deaths Averted [all] / (Mortality Now [all] * Population / 1000).

"YRS. LOST UNTIL 45"

This column represents the theoretical number of years of life lost per person per disease without benefit of the medical interventions projected for the year

2000. To find the number of years lost per death from a given disease one subtracts the average age of death from 45. 45 represents the life expectancy of someone who has survived birth. The actual life expectancy in Afghanistan is presently 42. Some might argue that if one survives past the age of one that life expectancy goes up dramatically, say to 55. However, people that die of a given disease are often in poor health to begin with (from malnutrition, etc.) and so might well have died from something else. Therefore I will assume that life expectancy after surviving birth is roughly 45 years. The equation is total years of life lost divided by the total population ;

Years of Life Lost = Deaths Averted[ALL] * (45 - Death Age) / Population.

Since this gives the theoretical number of years lost from a disease per person per year, I multiply by 42 (the life expectancy) to determine the years of life lost per person per disease for an entire lifetime.

["COST/YR.LIFE"]

This is simply the total cost spent on a given disease divided by the total number of years of life saved:

(% Coverage 2000 * Population * Cost/Int) / Yrs. Lost Until 45.

4. HEALTH PROBLEMS DISCUSSIONS

The following is a discussion of the health problems as they appear in the left hand column of the model. Specifically, I will explain the importance of each disease and how I determined the statistics for the disease.

"MATERNAL CARE"

1) Maternal care refers to maternal health problems that arise during pregnancy. Most deaths result from hemorrhage, infection, toxemia of pregnancy, and arrest of labor. Complications of abortion and injuries are also significant causes of maternal mortality.

2) Hakulinen reported that in DCs upwards of one percent of all deaths are from complications of pregnancy. However, in Afghanistan the maternal mortality rate is much higher than average and also the fertility rate is extraordinarily high. In Afghanistan the average woman has between seven and nine pregnancies in her 30 year reproductive life. Thus, a woman is pregnant every three to four years; each time she is pregnant she must again face the risks of pregnancy. Deaths due to pregnancy probably account for close to a third of all deaths for women in of childbearing age in Afghanistan. In Afghanistan the maternal mortality rate is somewhere between 650 (UNICEF estimate) and 1000 per 100,000 pregnant women per pregnancy; each year the risk from pregnancy for females of childbearing age would be approximately 250 per 100,000.

"DELIVERIES"

1) This refers to all infant deaths that take place at the time of delivery due to prematurity.

2) Greenbook (GB) figures indicate that roughly 35 to 40 per 1000 live births end in death due to prematurity. Hakulinen et al. estimates that 8.5% of all deaths are perinatal(not including maternal deaths. If one assumes that perinatal infant deaths are due mostly to prematurity and neonatal tetanus then GB figures for peri-delivery deaths approach Hakulinen's figure.

"CHILD SPACING"

1) Child spacing is not listed with any associated mortality figures, but alterations in fertility rate do in fact have profound implications. First, lowered fertility rates lead to decreased infant mortality rates; fewer siblings means more attention from mother and more food to eat. Child spacing also leads to a decline in the total number of deaths due to complications of pregnancy.

TETANUS"

1) Neonatal tetanus, caused by the ubiquitous pathogen Clostridium tetani, is a major infant killer. It can be effectively combatted in two ways: with a TT2 vaccine and by improved umbilical cord care. I will consider only the vaccine.
2) The CFR for neonatal tetanus is 85-100%. Greenbook (GB) estimates from Afghanistan put the death toll from this problem at 20 per 1000 live births, which is similar to rates found in other DCs. A 1985 CDC survey of Afghan refugees in Pakistan claims that neonatal tetanus causes 9% of all childhood deaths (childhood deaths probably account for roughly 60% of all deaths in Afghanistan currently); the three province survey done by MSH indicates that neonatal tetanus causes upwards of 20% of all infant deaths. I used the GB estimate to arrive at a CMR.

Current coverage with TT2 toxin in Afghanistan is listed at 6% by UNICEF; since there figures probably came from urban areas near Kabul the figure for coverage is probably even lower than that. Immunization with TT2 is over 90% effective.

"PERTUSSIS"

1) Prevention of pertussis, commonly known as "whooping cough," is achieved with three administrations of the DPT vaccine beginning early in life (one to two months).

2) Even though pertussis has a relatively low CFR (1%), it is estimated that roughly 85% of children will contract this disease if they are left unimmunized. Three administrations of the vaccine should protect against the disease with 80% certainty. Since the average age of pertussis deaths is 1 year, I attributed half of pertussis deaths to infants and half to the children. UNICEF claims that 25% of Afghan children are currently covered by vaccination.

"MEASLES"

1) Measles is one of the world's biggest child killers, often via its respiratory effects but through other mechanisms (e.g. diarrhea) as well.

2) In many DCs, close to 100% of unimmunized children contract measles. The peak age for the disease is from 7 months (maternal antibodies protect the infant for the first six months) to 36 months of age. Case fatality rates in DCs range from 3-6%. GB estimates claim that 15 of every 1000 children die from measles each year; Walsh believes measles causes some 20% of all childhood deaths. The CDC feels that 24% of childhood deaths are caused by this highly contagious disease, but that estimate is probably high since it was measured in a refugee population. A study in Zaire showed that roughly 80% of measles deaths were in the 1-4 age group. Thus, even though younger age groups tend to have higher measles CFRs, I may have overestimated the proportion of the measles deaths among infants.

UNICEF claims that 31% of Afghan children are immunized against measles; the vaccine has a 90% efficacy and costs only 10 cents.

"POLIO"

1) Poliomyelitis is prevented by vaccine which is given three times in the first year of life.

2) In general polio causes more morbidity (i.e. disability) than it does mortality. GB figures estimate the attack rate is 5 per 1000 children; CFR is close to 1%. The efficacy of the vaccine is 85% at three doses. When the live vaccine is used, as it usually is in DCs, protection rates can be even higher than coverage rates. One study in Camaroon by Heymann et al. showed that a 35% coverage of children corresponded with an 85% decrease in the incidence of paralytic polio.

"IMMUNIZATION ALL"

1) These figures are derived by summing figures for tetanus, pertussis, measles and polio.

"MALNUTRITION"

1) Malnutrition is rampant throughout Afghanistan and most other DCs. Children (and less commonly adults) can die directly from malnutrition. More often, however, malnutrition is the underlying cause of many of the deaths from other causes by virtue of its weakening of the body's immune system and ability to cope with external stresses. One author estimated that over 70% of all dying children are malnourished. Kielmann showed that among a cohort 1 to 36 months of age, child mortality doubled with each 10% drop below the 80th percentile of the Harvard Weight Median. Chen found that there was a two to fourfold increase in overall mortality among those who are severely malnourished. The Kasongo Project Team in Zaire artfully confirmed that those dying of measles tend to be the feeblest children in that society.

Combatting malnutrition requires tremendous resources since malnutrition is closely tied to the social and economic status of those it afflicts. Even though a primary health care effort by the Albert Schweitzer Hospital in Haiti

managed to reduce malnutrition by 60%, other efforts have been less rewarding.

2) GB figures suggest that 2% of all deaths are due solely to malnutrition.

"DIARRHEA/DYSENTERY"

1) This refers essentially to all deaths from gastrointestinal illness also with diarrhea. There are several levels of intervention that could avert deaths from diarrheal disease, including ORT, medication, and hospitalization for intravenous fluids and vigorous medical and supportive therapy. I consider only the effect of ORT in this model.

2) GB and MSH figures agree that just under 20% of all deaths in Afghanistan are due to diarrheal disease. Most of the mortality figures for the different age groups are from GB analysis. The MSH three province survey indicates that roughly 20% of all under-5 deaths are diarrheal in origin. Children under 5 average slightly more than two cases of diarrhea per year. The CFR is 0.5% and can be cut by at least 50% with ORT.

"MALARIA"

1) Malaria is controlled in many different ways. The one I consider in the model is chemotherapy, presumably with chloroquine. Even though resistance to chloroquine is high among the deadly plasmodium falciparum, it has been shown that treatment with the newly recommended doses of chloroquine is at least 90% effective in producing clinical remission.

Spraying is another effective way of reducing malaria deaths. A study by Payne in 1976 showed that malaria-related deaths decreased by 90% in areas that were sprayed four times a year with fenitrothion. However, parasite resistanceto sprays is increasing, and spraying is a relatively expensive proposition (about $2.00 per person at 1980 prices). In addition, efficacy of spraying is dependent on the frequency of spraying, the area covered, and the amount of spraying in surrounding communities. Even though malaria spraying programs appear under the "Special Programs" heading in this model I feel uncomfortable making any guesses about coverage or impact at this time.

2) It is difficult to know the true incidence and prevalence of malaria inside Afghanistan, and comparative data is less helpful with this health problem than is with many others. Since the war, however, it is feared that the incidence of the disease has skyrocketed. In 1978 the USAID Mission in Afghanistan estimated that there was a 1-2% prevalence of malaria in Afghanistan at altitudes below 2000 meters. The MSH three sector survey showed that infection/fever + malaria accounted for roughly 10% of all deaths and 10% of under-5 deaths. GB figures agree with MSH numbers. I have decided to assign 8% of all deaths to malaria and 2% of all deaths to "other infections." Breakdown of deaths in the various age groups is in accordance with GB data. I am unsure of the average age of death for malaria.

"RESPIRATORY INFECTION"

1) Along with diarrheal disease respiratory infections are the biggest killers in the developing world. It is almost invariably bacterial pneumonia that

causes death, even though the bacterial invasion is commonly preceded by a viral infection. Thus, antibiotics (penicillin is the most widely available) are used with considerable success in combatting severe respiratory infections. However, health intervention for acute respiratory infection (ARI) is more involved than antibiotics; potentially life-threatening cases must be identified at the community level, and often supportive care is needed in addition to antibiotics.

2) Respiratory infection kills both young and old alike. The MSH three province survey found that respiratory infections (apparently including tuberculosis) account for 20% of all deaths. GB figures indicate that 22% of all deaths are attributable to respiratory infection.

ARI is responsible for some 15,000,000 under-5 deaths around the world. The MSH survey implicates ARI in at least 15% of under-5 deaths. The case fatality rate is believed to be from 10 to 25%; level of nutrition affects the CFR dramatically. It has been reported that one penicillin injection can decrease the CFR by 80%, despite the fact that penicillin covers Hemophilus influenza relatively poorly. Other inexpensive antibiotics such as chloramphenicol may be even more effective.

"TUBERCULOSIS"

1) Since the war started in Afghanistan it is feared that deaths from tuberculosis have gone up. There are two prominent interventions for TB: the BCG vaccine and chemotherapy. Chemotherapy has been refined in recent years: now only a six month regimen consisting of INH, Rifampin, and Pyrazinamide (for two months) is recommended for active cases. Still, this therapeutic regimen is requires extraordinary patient compliance and is extremely expensive.

The efficacy of BCG vaccine has long been controversial. However, a review of the eight major US trials of the vaccine by Clemens et al. revealed that the three methodologically acceptable studies all showed an efficacy of 70-80%. This is confirmed by studies in Hungary and Thailand. In addition, the study in Thailand showed that vaccinated children who did get TB had a lower incidence of the disseminated form of the disease. In the model only BCG vaccine is considered.

2) GB figures suggest that TB accounts for roughly 2% of all deaths. The USAID Mission in Afghanistan estimated that the incidence of tuberculosis was between 2 and 4% in 1978. The CFR is approximately . The breakdown of deaths among various age groups is based on best available information.

"OTHER INFECTION"

1) I assume that this category refers to any infection (febrile illness) that does not come under another heading. A possible example might be typhus, although this might get lumped in with diarrheal disease.

2) The three province survey indicated that malaria + other infection caused roughly 10% of deaths. GB figures suggest about 2% of deaths are due to infection; this is the estimation that is used for the model. I am not sure of the age breakdown for this category.

"LOCAL DISEASE"

1) Apparently this refers to things such as Leishmania and conjunctivitis.

2) GB estimates are that this causes 1% of all Afghan deaths. I have no idea of age breakdowns for this nebulous category.

"MALIG./HTN./COPD"

1) I considered this category to be general medical problems such as cancer, cardiovascular and pulmonary disease, diabetes, etc.

2) Figures from Afghanistan about the incidence of this type of problem are tenuous. Some of the data: the MSH three province survey reports that "heart" problems cause 3% of all deaths and that "stomach ache" causes another 3% of all deaths. GB figures indicate that 5 infants per 1000 live births die of "abdominal pain" and that 0.5 per 1000 women aged 15-44 die of "anemia." Overall, GB analysis suggests that 4% of all deaths are due to these general problems.

The review by Hakulinen et al. of mortality trends worldwide indicates that general medical problems in Southern Asia cause considerably more mortality than described above. Neoplasm accounted for 4% of deaths, and "circulatory" for 15% of deaths. These figures are probably to high for Afghanistan, which has significantly higher crude death rate (25 vs. 16) and a lower life expectancy than does the rest of Southern Asia. Because of these factors fewer Afghans livelong enough to die of chronic diseases.

"GYNECOLOGIC"

2) GB figures suggest that .5 per 1000 females 15-44 die each year from gynecologic problems and that they account for roughly 1% of all deaths. I have no other information for this category of disease.

"WAR WOUNDS"

2) Mortality figures are from GB estimates that 2% of Afghan deaths are from war wounds.

"ACCIDENTS/TRAUMA"

1) Accidents and trauma are an increasingly recognized as an important cause of death in all age groups.

2) Good statistics are not available for Afghanistan. GB figures suggest that they account for 2% of all deaths, 15 deaths per 1000 live births, 10 deaths per 1000 children per year, and 2 deaths per 1000 females of childbearing age per year. Unfortunately, the total of the age sub-categories exceeds the CMR one would expect if accidents really did account for only 2% of Afghan deaths. Either the subgroup estimates are too high or the estimate for the entire population is to low. A chilean study cited in the Walsh book Establishing Health Priorities for the Developing World puts child (1-4 yrs of age) death at only 0.5 per 1000 per year. Hakulinen reports that 4.3% of all deaths in

Southern Asia result from accidents. I feel this is probably the most accurate estimate. There are several articles from World Health Statistics Quarterly that would also be useful in assessing this problem; I have not yet been able to locate this journal.

"OPERATIVE"

1) This category refers to medical problems that require operative intervention. Perhaps some of the abdominal pain mentioned in the "malig./htn./COPD" section should actually be in the operative category.

2) Mortality estimates are based on GB data which is not internally consistent.

"WATER/SANITATION"

1) Even though I have not included any mortality statistics under this category, poor sanitation and dirty water underlie a variety of illnesses, particularly diarrheal disease. In one paper Victora et al. studied diarrheal deaths in Brazil and found that those infants without water piped into their house were almost five times as likely to die from diarrheal disease as were those with access to piped water. Baltazar reported that in one DC residences with "adequate environmental sanitary practices had 20% fewer child visits to a health care clinic and a 40% lower incidence of pathogen-positive diarrhea than did their unsanitary counterparts.

TABLE 1

Disease	MORTALITY NOW [1]				COV. NOW[2]	EFF. NOW[3]	COV. 2000[4]	EFF. 2000	MORTALITY 2000			
	0-1 yr.	1-4 yrs.	F 15-44	All					0-1	1-4	F 15-44	All
MATERNAL/CHILD												
maternal care	0.00	0.00	0.66	0.66	0.00	0.75	0.40	0.75	0.00	0.00	0.46	0.46
deliveries	1.80	0.00	0.00	1.80	0.00	0.10	0.05	0.20	1.78	0.00	0.00	1.78
child spacing	0.00	0.00	0.00	0.00	0.05	?	0.30	?	0.00	0.00	0.00	0.00
tetanus	0.90	0.00	0.00	0.90	0.06	0.90	0.90	0.90	0.22	0.00	0.00	0.22
measles	1.25	1.28	0.00	2.53	0.31	0.90	0.90	0.90	0.59	0.60	0.00	1.19
pertussis	0.72	0.72	0.00	1.44	0.25	0.80	0.90	0.80	0.35	0.35	0.00	0.69
polio	0.00	0.01	0.00	0.01	0.25	0.85	0.90	0.85	0.00	0.00	0.00	0.00
Immunization-all	2.87	2.01	0.00	4.88	0.20	0.85	0.90	0.90	1.15	0.95	0.00	2.10
Malnutrition	?	?	?	0.50	0.05	0.25	0.10	0.25	0.00	0.00	0.00	0.49
DISABILITY SERVICES									0.00	0.00	0.00	0.00
prostheses	0.00	0.00	0.00	0.00	0.00		0.50		0.00	0.00	0.00	0.00
rehabilitation	0.00	0.00	0.00	0.00	0.00		0.50		0.00	0.00	0.00	0.00
GENERAL HEALTH									0.00	0.00	0.00	0.00
diarrhea/dysentery	1.35	2.36	0.09	4.50	0.10	0.50	0.35	0.65	1.11	1.94	0.07	3.70
malaria	0.45	1.35	0.11	2.00	0.10	0.90	0.45	0.90	0.31	0.92	0.08	1.37
respiratory infect.	1.13	2.36	0.33	5.00	0.10	0.80	0.35	0.85	0.88	1.85	0.26	3.91
tuberculosis	0.00	?	0.07	0.50	0.10	0.60	0.45	0.60	0.00	0.00	0.06	0.40
trachoma	0.00	0.00	0.00	0.00			0.20		0.00	0.00	0.00	0.00
other infection	?	?	?	0.50	0.10	0.60	0.40	0.70	0.00	0.00	0.00	0.39
local disease	?	?	?	0.25	0.10	0.50	0.40	0.50	0.00	0.00	0.00	0.21
acute complaints	?	?	?	0.25	0.05	0.50	0.40	0.50	0.00	0.00	0.00	0.21
malig./htn./copd	0.23	?	0.66	2.00	0.05	0.50	0.40	0.50	0.19	0.00	0.54	1.65
GYNECOLOGIC	0.00	0.00	0.11	0.25	0.05	0.50	0.40	0.50	0.00	0.00	0.00	0.00
SURGICAL/OP									0.00	0.00	0.09	0.21
war wounds	0.00	0.00	0.00	0.50	0.20	0.45	0.40	0.55	0.00	0.00	0.00	0.44
accident/trauma	0.10	0.07	0.44	1.00	0.15	0.45	0.40	0.55	0.08	0.06	0.37	0.85
operative	0.01	0.01	0.22	0.25	0.20	0.75	0.80	0.85	0.00	0.00	0.10	0.12
DENTAL	0.00	0.00	0.00	0.00					0.00	0.00	0.00	0.00
SPECIAL												
malaria	-	-	-	-	0.00	-	0.50	-	-	-	-	-
water/sanitation	-	-	-	-	0.10	-	0.50	-	-	-	-	-
TOTAL	7.94	8.16	2.69	24.84					5.52	5.73	2.04	18.29

[1] All mortality is measured as deaths per 1000 Afghan general population per year.
[2] Coverage refers to the fraction of people being treated with a given intervention by government services.
[3] Efficiency denotes the fraction of people who are treated and live that otherwise would have died.
[4] Coverage 2000 has been supplied by the SUSPLAN model.

TABLE 2

Disease	INTERVENTION	DEATHS AVERTED[5] 0-1 yr.	1-4 yr.	F 15-44	All	DEATH.AV/ DEATH.NOW[6]	DEATH AGE[7]	YRS.LOST UNTIL 45[8]
MATERNAL/CHILD								
maternal care		0.00	0.00	2970.00	2970.00	0.30	30.00	0.12
deliveries		270.00	0.00	0.00	270.00	0.01	0.00	0.03
child spacing		0.00	0.00	0.00	0.00	-		0.00
tetanus	TT2	10206.00	0.00	0.00	10206.00	0.76	0.00	1.29
measles	Vaccine	9956.25	10195.20	0.00	20151.45	0.53	2.00	2.43
pertussis	Vaccine	5616.00	5616.00	0.00	11232.00	0.52	1.00	1.38
polio	Vaccine	0.00	82.88	0.00	82.88	0.55	3.00	0.01
Immunization-all	Vaccines	25778.25	15894.08	0.00	41672.33	0.57	1.00	5.13
Malnutrition	Food	0.00	0.00	0.00	93.75	0.01	2.00	0.01
DISABILITY SERVICES								
prostheses		0.00	0.00	0.00	0.00	-		0.00
rehabilitation		0.00	0.00	0.00	0.00	-		0.00
GENERAL HEALTH								
diarrhea/dysentery	ORT	3594.38	6283.50	239.63	11981.25	0.18	15.00	1.01
malaria	Chemo	2126.25	6378.75	519.75	9450.00	0.32	3.00	1.11
respiratory infect.	Antibiotic	3686.63	7699.50	1076.62	16312.50	0.22	15.00	1.37
tuberculosis	BCG	0.00	0.00	220.50	1575.00	0.21	20.00	0.11
trachoma		0.00	0.00	0.00	0.00	-		0.00
other infection	Antibiotic	0.00	0.00	0.00	1650.00	0.22	10.00	0.16
local disease	Variable	0.00	0.00	0.00	562.50	0.15	5.00	0.06
acute complaints	Variable	0.00	0.00	0.00	656.25	0.18	20.00	0.05
malig./htn./copd	Variable	603.75	0.00	1732.50	5250.00	0.18	35.00	0.15
GYNECOLOGIC	Variable	0.00	0.00	288.75	656.25	0.18	25.00	0.04
SURGICAL/OP								
war wounds	First Aid	0.00	0.00	0.00	975.00	0.13	20.00	0.07
accident/trauma	First Aid	228.75	160.13	1006.50	2287.50	0.15	15.00	0.19
operative	Surgery	79.50	79.50	1749.00	1987.50	0.53	20.00	0.14
DENTAL						-		
SPECIAL								
malaria	Spray	-	-	-	-	-	-	0.00
water/sanitation	-	-	-	-	-	-	-	0.00
TOTAL		36367.50	36495.45	9803.25	98349.83			12.39

[5] Deaths averted figures are estimated for a population of 15 million.
[6] This is the ratio of avertable deaths to total current deaths for a given disease.
[7] Refers to average age of death for a given disease.
[8] This is the number of years of life lost per person for a given disease.

ANNEX E: CURRENT DATA

The following pages contain rough data on health worker costs and the location of facilities by level. These are representative in nature as they reflect only a portion of the organizations working in Afghanistan. In addition, there are government facilities in most of the major cities which are not part of this survey.

The first page contains salary figures in Pakistani rupees, paid on a monthly basis. Most are estimates from actual facilities in operation, although two organizations provided data based on proposed salary levels for anticipated projects or facilities.

WORKER LEVELS

File: WORKER

	A	B	C	D	E	F	G	H	I	J	* K	L	M	AVG	No.	Prop. J	Prop. M	AVG	No	MIN	MAX(2)
HEALTH PROVIDERS:																					
Doctor	4,500		4,500	7,000		4,750	3,000	5,000			4,000	5,600		4,794	8	5,000	5,500	4,885	10	3,000	7,000
Anesthetist												3,521		0	1	5,000		2,500	2	3,521	3,521
Nurse	2,000		2,000	2,000	2,000	1,750	2,000	2,500			2,500	2,800		2,172	9	3,000	2,000	2,232	11	1,750	2,800
Paramedic A	1,500			1,500	1,500	1,500			2,000	2,000		1,800		1,686	7	3,000		1,850	8	1,500	2,000
Paramedic B	1,000	1,500		1,200			1,500	1,625			1,500	942		1,324	7	1,800		1,383	8	942	1,625
First Aider	1,000											749		875	2	1,250		1,000	3	749	1,000
Nurse-Midwife														0	0		3,500	3,500	1	ERR	ERR
ANCILLARY STAFF:																					
X-ray Tech	1,500					1,700		2,500				2,536		2,059	4	3,000		2,247	5	1,500	2,536
Lab Tech	1,500				1,800	1,500						2,536		1,834	4	3,000	3,000	2,223	6	1,500	2,536
Pharmacist							1,667					4,100		2,883	2	3,000	3,000	2,942	4	1,667	4,100
Vaccinator					1,500	1,500		1,500			1,500	1,200	1,500	1,450	6	3,500		1,743	7	1,200	1,500
(1)Dentist												3,146		3,146	1		5,000	4,073	2	3,146	3,146
Nurse Anesthetist												3,521		3,521	1		3,000	3,261	2	3,521	3,521
ADMINISTRATION:																					
Adminstrator			7,000									2,996		4,998	2	2,250		4,082	3	2,996	7,000
Accountant			3,000									2,996		2,998	2	2,000		2,665	3	2,996	3,000
Translator			3,000											3,000	1			3,000	1	3,000	3,000
Secretary			3,000											3,000	1			3,000	1	3,000	3,000
Monitor		3,500								3,000				3,250	2			3,250	2	3,000	3,500
Clerks							1,000							1,000	1	1,750		1,375	2	1,000	1,000
SUPPORT STAFF:																					
Driver			2,000	2,000										2,000	2	1,500		1,833	3	2,000	2,000
Cook			2,000	500	700	800	750			500		749		857	7	1,500	1,000	944	9	500	2,000
Cleaner			1,200	500	700		750					535		737	5	1,500	1,000	884	7	500	1,200
Guard			1,200		600	800	450					535		717	5	1,500	1,000	869	7	450	1,200

Notes:
* Not visited. Data from CMC forms.
(1) Most Paramedics do some dental work, including extractions.
(2) MIN & MAX reflect average salaries at individual organizations, which may themselves exhibit considerable variation.

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PROVINCE NAME / DISTRICT	ALT.DISTRICT NAME	AREA	RURAL DEN-SITY	'74 POP. EST.	CLINICS NON-DOCTOR	CLINICS DOCTOR	HOSPITALS SMALL	HOSPITALS FULL	HOSPITALS SURGICAL	HOSPITALS OTHER	BHWs
BADAKSHAN											
Baharak		2,851.8	11.8	35,988	1 FM	1 GAF	2 MSF-F				
Darwaz	(Nesay)	4,074.8	10.1	44,097	1 IMC						1
Eshkashem		1,257.1	5.0	6,696	1 IMC						3
Faizabad		3,203.6	27.6	106,365							
Jurm		3,575.9	11.2	42,907						1 GOVT	6
Keranomonjan		4,393.5	1.2	5,718	1 MSH			1 MSF-F			
Kesham		3,041.9	11.9	38,855							
Khwahan		776.6	10.3	8,535							7
Ragh		2,062.0	17.3	38,043							
Sahre Bozurg		890.4	26.6	25,366	1 MSH						
Sheghnan		3,661.4	3.8	14,997							2
Wakhan	(Khandud)	8,936.2	1.1	10,442							
Zebak		2,160.6	2.4	5,506							
PROVINCE TOTAL		40,885.8	8.5	383,516	5	1	2	1	0	1	19
BADGHIS											
Ghormach				0	1 FM						
Jawand		2,160.3	11.7	27,011							2
Khuske Kohna		6,467.6	5.2	36,043							2
Morghab		1,748.4	11.7	21,850	1 MSH						0
Qades		4,177.1	12.1	62,713	1 MSH						1
Qala Nau		3,354.1	12.2	43,813							7
		3,770.3	15.1	71,166							2
PROVINCE TOTAL		21,677.8	10.5	262,595	3	0	0	0	0	0	14
BAGHLAN											
Anderab	(Banu)	2,332.4	13.6	34,000	1 FM						
Baghlan		1,596.0	16.0	58,338	1 IMC		1 IMC				11
Burka		877.1	19.2	18,015							1
Dahanae Ghori		1,819.1	11.6	22,486							0
Doshi		1,742.8	13.1	24,367	2 IMC/MSH						0
Khenjan		1,003.8	8.4	9,072	1 IMC						4
Khost wa Freng		2,542.4	12.9	35,029	3 IMC/MSH						2
Nahrein		1,646.1	16.2	28,438	5 IMC/MSH						11
Puli Khumri		640.4	31.6	49,456							11
Tala wa Barfak		2,964.6	2.2	6,858							5
											1
PROVINCE TOTAL		17,164.7	12.4	286,058	13	0	1	0	0	0	46
BALKH (Reduced)											
Balkh				0	1 FM						
Chak Bolak		475.4	107.7	54,705							0
Charkant		517.1	62.1	34,321	1 MSH						9
Chemtal		1,438.4	15.9	24,384			2 IMC/MSF-B				0
Dehdadi		1,731.6	15.2	28,213							10
Dowlatabad		233.8	83.0	20,744	1 MSH						0
Keshende	(Aq Kapruk)	1,356.4	47.2	68,465							5
Mazar-i-Sharif		1,796.1	20.4	39,252							0
Nahre Shahi		48.0	0.0	81,959	2 MSH						11
Sholgera	(Boyna Qara)	1,707.2	11.2	20,520							9
Shortepa		1,663.6	19.8	35,272	1 IMC	1 MSH					14
		1,316.6	17.0	23,880							0

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PROVINCE NAME / DISTRICT	ALT.DISTRICT NAME	AREA	RURAL DEN-SITY	'74 POP. EST.	CLINICS NON-DOCTOR	CLINICS DOCTOR	HOSPITALS SMALL	HOSPITALS FULL	HOSPITALS SURGICAL	HOSPITALS OTHER	BHWs
PROVINCE TOTAL		12,284.2	26.6	431,714	6	1	2	0	0	0	58
BAMYAN				0	1 FM		2 GAF				
Bamyan		2,178.4	13.2	38,829	2 MSH						7
Kahmard		1,639.9	6.9	12,078	1 IMC						7
Panjab		1,526.3	18.2	29,699							0
Saighan		1,652.2	7.0	12,323							9
Shibar	(Shumbul)	1,075.9	18.2	20,891							2
Waras		2,845.4	19.6	59,725							2
Yawkowlang	(Naek/Morghi to	6,628.2	6.8	48,106							0
PROVINCE TOTAL		17,546.3	11.4	221,649	4	0	2	0	0	0	27
FARAH				0	1 FM						
Anar Dara		10,609.7	1.0	11,634	1 MSH						1
Bakwa	(Sultani Bakwa)	2,081.4	2.6	5,766							0
Bala Balouk		5,322.0	5.4	19,240							2
Farah		3,535.2	10.5	47,682							6
Farsi		2,500.2	8.2	21,813							0
Gulistan		6,602.1	2.5	17,960							0
Khake Safid		1,359.1	5.3	7,704							1
Lash Jaween	(ex Nimroz)	5,228.7	3.1	17,170							1
Purchaman		7,154.3	5.0	38,206	1 MSH						6
Qalae Koh		6,255.6	2.8	18,943							3
Shindand	(Sabzwar)	8,498.3	5.7	65,171							0
PROVINCE TOTAL		59,146.6	3.9	271,292	3	0	0	0	0	0	20
FARYAB (Reduced)				0	1 FM	2 MSH	2 MSF-F				
Almar		1,525.5	20.2	33,013							4
Andkroy		48.6	219.5	41,338			1 IMC				1
Belcheragh		2,344.9	19.3	48,372							0
Darzab		1,127.6	16.5	22,820							1
Dowlatabad		2,598.2	8.4	23,288							4
Khane Charbagh		1,055.6	11.8	13,301							0
Kohistan	(Lawlash)	2,270.9	6.5	15,739	1 MSH						2
Maymana		31.3	0.0	11,759							4
Pashtoon Kot		3,338.9	34.1	121,827							23
Qaramqul		1,560.7	6.8	11,365							0
Qarghan		787.3	22.6	18,996							0
Qaysawr		2,424.4	21.1	64,224							5
Shirin Tagab		2,192.4	22.6	58,959							5
PROVINCE TOTAL		21,306.3	18.7	485,001	2	2	3	0	0	0	49
GHAZNI (Reduced)				0	3 FM/IMC	5 NCA	1 MSF-F				
Ab Band		1,105.3	11.5	13,566							0
Andar	(Miri,Shelgar)	827.9	59.3	52,470							3
Deh Yak	(Ramak)	736.4	23.1	18,149							1
Gelan		1,041.2	22.8	25,383							0
Ghazni		328.4	65.6	49,257							8
Jaghatu/Waiz		1,265.0	46.3	62,639							6
Jaghori		1,854.6	51.0	101,132		1 MSH					2
Khwaja Omri		174.3	56.8	10,590	1 IMC						0

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PROVINCE NAME / DISTRICT	ALT.DISTRICT NAME	AREA	RURAL DEN-SITY	'74 POP. EST.	CLINICS NON-DOCTOR	CLINICS DOCTOR	HOSPITALS SMALL	HOSPITALS FULL	HOSPITALS SURGICAL	HOSPITALS OTHER	BHWs
Kiro	(Giru)	876.8	15.2	14,239							0
Malestan		1,930.3	25.1	51,700							4
Moqor		814.7	24.8	21,566	1 MSH						8
Nawa		2,553.8	5.5	14,964							0
Nawor		5,815.8	10.6	65,720							2
Qarabagh		1,799.2	35.6	69,597		2 MSH					10
Zerai Khan		257.6	19.3	5,316	1 MSH						1
PROVINCE TOTAL		21,381.3	24.0	576,286	6	8	1	0	0	0	45
GHOR				0	3 IMC/FM/GAF						
Chaghcharan		11,763.8	3.2	40,563		1 MSH					3
Ghore Taywara		2,921.2	8.1	25,375	1 IMC						10
Lal-wa-Sarjangal		5,115.2	8.3	45,120							3
Pasaband		4,724.3	4.0	19,986	2 IMC/MSH						8
Saghar		2,771.3	3.3	9,898	1 MSH						3
Shahrak		8,506.2	2.4	21,406	1 IMC	1 MSH					6
Toulak		2,955.9	4.6	14,438	1 IMC						2
PROVINCE TOTAL		38,757.8	4.3	176,786	9	2	0	0	0	0	35
HELMAND				0	1 FM						
Baghran		3,587.0	6.4	24,609							3
Bust	(Lashkargah)	2,022.4	8.4	34,160							0
Deshu		9,782.5	1.7	17,668							0
Garmser	(Darweshan)	20,256.5	1.0	22,124							0
Kajaki		1,939.4	17.1	35,491	1 MSH						1
Mosa Qala		1,362.0	19.5	28,337							2
Nadi-Ali		4,697.2	3.6	17,843							5
Nahre Saraj	(Greshk)	1,662.8	29.6	58,118							5
Nauzad		4,560.5	7.3	35,391							1
Nawae-Barakzae	(Hazaras)	1,657.0	39.2	27,501	1 IMC						0
Reg	(Khanneshin)	7,413.8	2.2	17,768							0
Sarbon Qala	(Sangin)	290.8	52.9	16,448							4
Washare		4,104.9	3.0	13,137							0
PROVINCE TOTAL		63,336.7	4.8	348,595	3	0	0	0	0	0	21
HERAT				0	2 FM/IMC		1 MSF-F				
Adreskan		10,439.7	4.4	48,830	1 IMC						2
Cheshte-Sharif		1,936.2	5.6	11,503							2
Enjeel		1,298.8	95.9	133,278							1
Ghoryan		5,529.9	4.8	28,366	2 IMC	1 MSH					1
Gozarah		1,596.9	49.6	84,630		1 MSH					8
Gulran		5,768.8	6.4	39,410							2
Herat		45.4	0.0	123,113	1 IMC						1
Karokh		2,050.2	19.1	41,743		1 MSH					0
Kohsan		1,405.5	8.0	12,038							0
Kushk		2,923.1	15.5	48,565							0
Obey		2,239.6	15.9	37,983		1 MSH	1 IMC				3
Pashtoon Zarghoon		1,736.9	27.9	51,832							2
Zendajan	(Fau Shang)	1,827.8	14.6	28,480					1 MSF-F		2
PROVINCE TOTAL		38,798.8	13.7	689,771	6	4	2	0	1	0	24

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PROVINCE NAME / DISTRICT	ALT.DISTRICT NAME	AREA	RURAL DEN-SITY	'74 POP. EST.	CLINICS NON-DOCTOR	CLINICS DOCTOR	HOSPITALS SMALL	HOSPITALS FULL	HOSPITALS SURGICAL	HOSPITALS OTHER	BHWs
JAWZJAN (Reduced)				0	1 FM						
Aqcha		74.9	333.8	41,690							4
Balkhab		2,474.4	7.6	20,189							0
Faizabad		828.7	25.6	22,631							0
Khamyab		1,008.2	6.1	6,618							0
Khanaqah		1,019.3	26.2	28,551							0
Kohistanat	(Mahtanat)	7,054.9	4.0	30,212	1 IMC						2
Mardyan		829.0	30.7	27,172							0
Mengajek		951.6	30.3	30,828							1
Sang Charak		2,687.1	29.2	98,833	1 IMC						7
Sari Pul		4,313.9	15.1	86,789	1 MSH						17
Qarqin		1,229.7	12.1	15,861							1
Sheberghan		3,754.6	14.1	76,184							6
PROVINCE TOTAL		26,226.3	14.9	485,560	4	0	0	0	0	0	38
KABUL					1 FM						
Bagrami		250.0	90.4	24,148	3 IMC/MSH	1 MSH					6
Charasyab		261.0	99.0	27,632							18
Chardehi		140.0	75.8	11,351							0
Deh Sabz		648.3	37.3	25,846							18
Istalef		204.1	127.2	27,748							0
Kabul		135.0	0.0	645,648				1 ICRC			1
Kalakan		41.6	367.9	16,362							0
Khake Jabar		875.5	9.1	8,514							0
Mir Bachakot	(Kohdamar)	63.3	197.2	46,465	1 MSH						3
Paghman		413.4	95.0	42,003	1 IMC	1 MSH					17
Qara Bagh		111.4	299.2	35,634			1 MSH				1
Sarobi		1,158.8	11.7	14,442		1 MSH					4
Shakar Dara		417.7	109.9	49,069	1 IMC						7
PROVINCE TOTAL		4,720.1	58.7	974,861	7	3	1	1	0	0	75
KANDAHAR				0	1 MSH				1 ?	1 ?	
Arghandab		586.6	85.3	53,457	4 IMC/GAN/	1 MSH			1 ?		20
Arghistan		4,308.3	3.9	18,049							2
Daman		1,373.5	13.5	19,807							0
Dand		531.3	136.0	77,223							9
Ghorak		1,617.5	2.2	3,827							0
Kandahar			38.8	171,042							5
Khakraiz		1,129.1	9.2	11,110							3
Maruf		345.2	3.3	11,522							4
Maywand	(Keshke Nakhud)	10,424.7	3.8	42,005	1 MSH						6
Nesh		1,744.0	4.0	7,401							0
Panjwai		3,989.3	17.0	72,522							7
Reg	(Karez)	5,134.8	0.0	139							0
Shah Wali Kot	(Dahla)	2,931.3	16.7	52,413							1
Shega		2,961.5	1.5	4,724							0
Shorabak	(Goaran)	4,964.4	0.7	3,592	1 GAN						0
Spin Boldak		4,391.2	4.5	23,085							1
PROVINCE TOTAL		46,432.5	8.0	571,917	7	1	0	0	2	1	58

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PROVINCE NAME / DISTRICT	ALT.DISTRICT NAME	AREA	RURAL DEN-SITY	'74 POP. EST.	CLINICS NON-DOCTOR	CLINICS DOCTOR	HOSPITALS SMALL	HOSPITALS FULL	HOSPITALS SURGICAL	HOSPITALS OTHER	BHWs
KAPISA											
Alasay				0	3 FM/IMC		2 SCA				
Kapisa	(Mahmood Raqi)	323.5	53.9	18,639							0
Kohband	(Durnama)	120.8	239.7	37,795							0
Kohistan		192.7	65.7	13,541							0
Nejrab		171.4	296.4	58,374							7
Panjshare	(Rokha)	585.2	92.7	58,020							0
Panjshare 1	(Zenya/Char Qarya)	705.5	71.4	53,870					1 SCA		3
Panjshare 2	(Dareh Hazara)	2,113.2	14.7	33,236							0
Tagab		706.6	19.2	14,503							0
		485.0	82.5	47,664							5
PROVINCE TOTAL		5,403.9	55.4	335,642	3	0	2	0	1	0	15
KONAR											
Bar Konar	(Asmar)	908.0	16.7	0	1 FM		1 NCA				
Bargey Metal		1,977.0	1.4	16,261	1 MSH						11
Chapa Dara		2,297.4	10.6	3,020							0
Chawki		249.2	64.9	25,924							0
Dongom		236.1	21.8	17,301	2 MSH	1 MSH					14
Kamdesh		1,743.6	3.9	5,504							0
Khas Konar		330.0	42.0	7,263		1 MSH					0
Konar	(Asadabad/Chaga Sara)	479.8	40.4	14,838							4
Naranj/Badil		163.8	75.3	24,132		1 MSH					8
Naray		376.8	13.7	13,188							0
Nour Gul	(Mazar)	369.8	42.7	5,496							0
Peche	(Dareh Peche)	1,121.4	42.2	16,898							0
Sirkanay		298.7	108.9	50,613	2 GAN/MSH						13
				34,794	1 GAN						5
PROVINCE TOTAL		10,551.6	20.6	235,232	7	3	1	0	0	0	55
KUNDUZ											
Aliabad				0	1 FM						
Archi	(Dashtarchi)	426.4	4.5	2,056							3
Char Dara		786.1	39.8	33,481							3
Hazarat Imam	(Emam Saheb)	968.6	33.0	34,137							11
Khanabad		1,545.2	49.0	89,290							10
Kunduz		1,083.4	45.1	71,521							9
Qalae Zal		701.1	74.0	104,652	2 MSH	1 MSH					12
		2,417.2	12.5	32,235	1 IMC						1
PROVINCE TOTAL		7,928.0	34.3	367,372	4	1	0	0	0	0	49
LAGHMAN											
Alingar				0	1 FM						
Alishing		703.0	57.4	43,145	1 MSH						1
Dawlatsha		838.2	34.8	31,165	1 MSH						2
Mehterlam		744.8	24.0	19,146							0
Nooristan		534.4	123.7	79,480							1
Qarghaie		3,636.6	8.0	31,149							2
		770.1	100.6	82,833		1 MSH					14
PROVINCE TOTAL		7,227.1	36.0	286,919	3	1					
LOGAR											
Azro				0	2 FM/MSH						
Baraki		769.6	9.9	8,146							8
		329.2	91.4	32,155	1 IMC	1 MSH					20

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PROVINCE NAME / DISTRICT	ALT.DISTRICT NAME	AREA	RURAL DEN-SITY	'74 POP. EST.	CLINICS NON-DOCTOR	CLINICS DOCTOR	HOSPITALS SMALL	HOSPITALS FULL	HOSPITALS SURGICAL	HOSPITALS OTHER	BHWs
Charkh		760.4	30.9	25,157		1 MSH					0
Khoshi		477.1	28.1	14,346							0
Mohammad Agha		1,017.1	68.6	74,605	2 IMC/MSH						27
Puli Alam/Kolangar		1,055.5	41.6	46,917	2 MSH						25
PROVINCE TOTAL		4,408.9	42.7	201,326	7	2					80
NANGARHAR				0	2 GAN/GAF						
Achin		462.6	105.8	52,299							0
Bati Kot	(Nader Shah Kot)	147.1	183.1	28,801							0
Behsud		219.6	197.2	46,288							0
Chaparhar	(Chopleyar)	184.5	173.0	34,123							0
Darae Noor	(Darae Kouz Konar)	331.2	70.8	25,076							1
Deh Bala		478.9	68.4	35,045							0
Dorbaba		427.2	27.8	12,706							0
Hesarak		642.2	25.3	17,393	2 MSH	1 MSH					5
Jalalabad		20.0	0.0	34,006							2
Kama		174.1	161.4	30,041							6
Khogiani	(Kaga, Kaza)	581.2	156.8	97,414	1 GAN	1 MSH					8
Kouz Konar	(Shewa)	326.5	73.5	26,687							4
Lalpur		530.3	50.6	28,701		1 MSH					0
Mohmand Dara	(Basa Wal)	281.1	276.4	83,045		1 MSH					4
Naziyan		91.4	206.1	20,144							0
Pachier/Agam	(Wagam)	357.8	63.8	24,398							0
Rodat	(Shahi Kot)	660.9	96.7	68,334							8
Sherzad	(Mama Khel)	583.1	70.9	44,237							0
Shinwar	(Ghankikhel)	179.0	59.2	11,319							3
Sorkh Rod		383.3	199.3	81,649							0
Goshta/Khwaja Zewar		545.4	35.8	20,892							4
PROVINCE TOTAL		7,607.4	97.0	822,599	5	4	0	0	0	0	45
NIMROZ				0							
Asle Chakhansur		9,673.2	2.4	25,176							2
Char Borjak		19,430.4	0.6	11,400							1
Kang/Kurki	(Miel Kurki)	1,236.6	29.3	39,629							5
Khosh Rod	(Lokhi, Khas)	10,342.6	0.7	8,175							0
Zaranj		1,041.4	23.0	25,652							0
PROVINCE TOTAL		41,724.0	2.4	110,032	0	0	0	0	0	0	8
ORUZGAN				0	1 FM						
Ajrestan		1,256.3	20.0	26,908	1 MSH						2
Chorah		3,318.9	5.3	18,879							0
Dai Kundi	(Khadir)	5,587.4	15.9	94,756							1
Deh Raud		3,444.9	11.8	43,529							4
Gezab		4,120.9	5.1	22,394							1
Kajran		2,364.2	9.3	23,469							3
Oruzgan	(Khosh)	2,525.5	11.1	138,199							3
Shahristan		4,694.6	12.3	61,760							2
Tirin kot		1,616.6	13.8	28,744		1 MSH					5
PROVINCE TOTAL		28,929.2	14.6	458,637	2	1					21

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PROVINCE NAME / DISTRICT	ALT.DISTRICT NAME	AREA	RURAL DEN-SITY	'74 POP. EST.	CLINICS NON-DOCTOR	CLINICS DOCTOR	HOSPITALS SMALL	HOSPITALS FULL	HOSPITALS SURGICAL	HOSPITALS OTHER	BHWs
PAKTYA (Reduced)				0	1 FM						
Bak	(Bargay)	175.0	18.0	3,374							0
Chamkani		264.3	51.9	14,550	1 MSH						5
Dand-wa-Patan		163.2	47.0	8,205							0
Dareh Darang		56.8	9.6	580							0
Gardaiz		652.8	23.8	26,361							3
Gurbuz	(Guriz)	384.7	22.7	9,337							0
Hasan Khel	(Ahmad Khel)	197.8	36.4	7,696							2
Jadran	(Waze)	427.4	18.6	8,488	1 IMC						9
Jaji	(Ali Khel)	617.2	53.4	35,236	1 GAN	1 MSH					5
Jaji Maidan		394.6	25.3	10,688							7
Jani Khel		294.0	37.0	11,643							0
Khost	(Matoon)	420.2	63.2	28,378	2 IMC/MSH	2 MSH					20
Lajmangal	(Laza)	257.7	26.4	7,275							0
Mandozi	(Dwul)	112.8	187.3	22,595							0
Mosa Khel	(Zorkot)	409.8	13.3	5,820	1 MSH	1 MSH					5
Nader Shah Kot	(Keray, Almara)	404.6	24.4	10,571							0
Qalandar		151.2	31.4	5,082							0
Saroti	(Sabari,Zambar)	312.6	54.4	18,166							0
Sayed Karam		938.0	23.4	23,463	1 IMC						20
Shamal	(Bargay)	155.6	32.6	5,431							0
Shawak		128.7	66.6	8,157							0
Sperah		513.0	13.5	7,422							0
Tani	(Tunni, Tayou)	438.6	48.1	22,537							0
Trayzai	(Alisher)	484.2	27.9	14,459							0
Wolma		507.1	20.8	11,271							0
Zormat		916.6	23.6	23,161							20
PROVINCE TOTAL		9,778.5	32.6	350,944	8	4	0	0	0	0	96
PAKTEKA	(New Province)			0	2 FM/IMC					1 MSF-B	
Barmal		1,084.5	25.2	29,188							0
Dila	(Khosamand)	1,344.2	8.7	12,470							0
Gayan		276.3	22.6	6,690							0
Gomal		4,072.2	1.6	6,959							2
Jani Khel		982.8	6.5	6,816							0
Katawaz	(Zargun Shar)	277.1	33.2	9,830	1 MSH						0
Mata Khel	(Mata Khan)	430.6	14.4	6,614							0
Neka		179.3	15.2	2,910							0
Omna		464.2	5.1	2,557							0
Sarhawza	(Sultani)	724.9	12.5	9,716				1 IMC			0
Sarobi		411.1	10.6	4,646							1
Sharan		579.5	10.1	6,234							0
Sultan Khel	(Yahya Khel)	394.3	18.9	7,958							0
Urgoun		574.0	30.6	18,761							8
Wazakhwa		3,550.6	2.5	9,340							1
Wol-Mamay		3,272.3	1.3	4,530							0
Yusuf Khel		550.4	9.0	5,289							0
Zelcok		241.0	24.7	6,361							0
PROVINCE TOTAL		19,409.3	7.6	156,870	3	0	0	1	0	1	12
PARWAN				0	5 IMC/FM/M	1 MSH	1 MSF-H				
Bagram		469.6	96.4	48,404	1 IMC						3

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PROVINCE NAME / DISTRICT	ALT.DISTRICT NAME	AREA	RURAL DEN-SITY	'74 POP. EST.	CLINICS NON-DOCTOR	CLINICS DOCTOR	HOSPITALS SMALL	HOSPITALS FULL	HOSPITALS SURGICAL	HOSPITALS OTHER	BHWs
Charikar		189.2	472.5	116,128	1 IMC						6
Ghorband	(Syaghard)	1,503.5	35.7	57,372	1 IMC	1 MSH					6
Jabul Saraj		194.0	338.0	74,694							3
Kohe Safi		700.7	16.5	12,346							1
Salang		687.8	39.6	29,152							0
Shekh Ali		907.5	21.8	21,192	1 IMC						0
Shenwari		358.8	54.9	21,082							0
Surkh Parsa		948.8	42.0	42,595							6
PROVINCE TOTAL		5,959.9	62.4	422,964	9	2	1	0	0	0	25
SAMANGAN				0	2 FM/MSH						
Darae Souf		4,456.3	13.7	69,713							4
Hazarate Sultan		1,140.8	14.5	17,672							1
Kaldar		764.1	9.1	7,439							0
Khulm	(Tashqurghan)	4,233.8	4.5	43,894							3
Roye Doab		2,907.2	6.8	20,993							2
Samangan	(Aibak)	3,137.5	18.8	63,181							7
PROVINCE TOTAL		16,639.7	11.0	222,892	2	0	0	0	0	0	17
TAKHAR				0	1 FM						
Bangi		507.6	21.6	11,712							0
Chah Ab		765.2	55.9	45,727							4
Chal		554.4	21.2	12,574							0
Darqad		421.6	20.1	9,051							0
Eshkamesh		727.5	24.5	19,022	3 MSH			1 MSH			4
Farkhar		1,459.1	12.7	19,868	1 IMC	1 MSH	1 SCA				3
Kalafgan		530.2	33.2	18,805	1 MSH	1 MSH					1
Khwajaghar		344.7	65.1	23,992							6
Rustaq		1,897.8	28.9	66,100	1 MSH						6
Taloqan		1,492.6	46.4	85,338	1 MSH	1 MSH					18
Warsaj		2,899.4	7.7	23,941							1
Yangi Qala		725.2	43.3	33,595							6
PROVINCE TOTAL		12,325.3	26.6	369,724	8	3	1	1	0	0	49
WARDAK				0	1 FM						
Behsud Part 1	(Gardandewal)	1,327.3	27.3	38,707							1
Chake Wardak		1,192.0	30.5	38,870							9
Day Mirdad		1,357.2	19.1	27,656							0
Jaghatu		621.8	26.8	17,839	4 MDM/IMC				1 MDM		11
Jalrez		1,138.8	20.3	24,759							2
Markaze Behsud	(Behsud)	2,198.1	34.2	80,328							1
Maydan Shar	(Kotae Ashro)	350.7	57.3	21,488	1 MSH	MSH					22
Nerkh		480.1	40.1	20,598							1
Sayed Abad		1,033.2	53.8	59,378	2 IMC/MSH						25
PROVINCE TOTAL		9,699.2	31.8	329,623	8	0	0	0	1	0	72
ZABUL				0	1 FM						
Arghandab		2,081.5	5.3	11,890							11
Atghar		693.3	4.2	3,111							0
Dai Chopan		3,240.0	7.1	24,652							4

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PROVINCE NAME / DISTRICT	ALT.DISTRICT NAME	AREA	RURAL DEN-SITY	'74 POP. EST.	CLINICS NON-DOCTOR	CLINICS DOCTOR	HOSPITALS SMALL	HOSPITALS FULL	HOSPITALS SURGICAL	HOSPITALS OTHER	BHWs
Jaldak	(Shahre Safa, Tarnak)	1,472.5	3.9	6,106							1
Mizan		1,077.7	3.5	4,005							1
Qalat		1,668.6	5.4	9,624							1
Shah Joy		1,518.1	16.6	26,856	1 MSH						2
Shemalzai		3,068.6	6.3	20,621							0
Shinkai		2,247.8	4.9	11,667							4
PROVINCE TOTAL		17,068.0	6.5	118,532	2	0	0	0	0	0	24
NATIONAL TOTAL		634,325.3	13.8	10,954,911	149	43	19	4	5	3	1,097