NATIONAL PRIORITY AND AGENDA FOR HEALTH RESEARCH 2002 – 2005

by Application of

Essential National Health Research Approaches (ENHR)

MINISTRY OF HEALTH, REPUBLIC OF INDONESIA
NATIONAL INSTITUTE OF HEALTH RESEARCH AND DEVELOPMENT AND WORLD HEALTH ORGANIZATION AND COUNCIL ON HEALTH RESEARCH FOR DEVELOPMENT

HEAD
NATIONAL INSTITUTE OF HEALTH RESEARCH AND DEVELOPMENT
MINISTRY OF HEALTH, REPUBLIC OF INDONESIA

Foreword

Let us first send up our prayers to the presence of the Almighty and thank God for His blessings that grant us to finish setting down the National Priority and Agenda of Health Research 2002-2005.

The National Priority and Agenda of Health Research is composed based on Republic of Indonesia Law No. 23/1992 on Health, Republic of Indonesia Government Regulation No. 39/1995 on Health Research and Development and Minister of Health's Decision No. 791/1999 on Health Research and Development Coordination. Its objective is the directed, effective and efficient implementation of health research and development. The Agenda of Health Research and Development has also been regulated in Minister of Health's Decision No. 1179A/1999 on the National Policy of Health Research and Development for the purpose of efficient and effective implementation, advantageous use of results and systematic development of health. The agenda is prepared by the National Institutes of Health and Development, the RI Ministry of Health in cooperation with the Echelon I Unit of the Ministry of Health, Central and Regional Health Program Managers, the National Research Board, Universities, Government/Department and Private Research Institutions, Self-supporting Organizations/Professional Organizations, World Health Organization, Council on Health Research for Development and Donor Agencies.

Thus the National Priority and Agenda of Health Research 2002-2005 does not just constitute the priority and agenda of the National Institutes of Health Research and Development, but the priority and agenda of other health research and development institutions as well, including universities, Self-supporting Organizations and other elements. As regards the funding, it is the responsibility of the executing institution to secure funds from both its budget, collaboration with private associates and foreign aid.

Based on RI Law No. 22/1999 on Regional Administration and RI Law No. 25/1999 on Monetary Balance between the Central Government and Regional Administrations as regulated by Government Regulation No. 25/2000 on Government Authority and Province Authority as an Autonomous Region, the respective research and development institutions must heed a balanced authority. Coordination in the regions can be maintained by optimalizing the Regional Health Research and Development Network.
In order to disseminate the National Priority and Agenda of Health Research 2002-2005, and to coordinate its implementation, summarize and transform results into policy input

and eventually utilize the policy, it is imperative to further develop the National Health Research and Development Network.

The National Priority and Agenda of Health Research 2002-2005 is always responsive to improvement and should be reviewed from time to time in accordance with the dynamics of change due to the development and progress of science and technology. This has been asserted by Minister of Health's Decision No. 1179A.1999 that also regulates the review of the Health Research and Development Agenda.

To WHO and COHRED, our regards and thanks for the technical assistance and funds in setting down the National Priority and Agenda of Health Research 2002-2005. Our appreciation and thanks to the Team for their hard work assembling and analyzing input from the various parties and then formulating the National Priority and Agenda of Health Research 2002-2005, also to all parties who had assisted in the writing up of this document, our sincere thanks and appreciation.

May the Almighty shower us with His blessings always and guide and give us strength to implement this Health Research and Development Program.

Amen.

Jakarta, 5 December 2001

Head of NIHRD,

Dr. Sri Astuti S. Suparmanto, MSc (PH)

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EXECUTIVE SUMMARY

NATIONAL PRIORITY AND AGENDA FOR HEALTH RESEARCH 2002-2005

Far-reaching demographic and epidemiologic transitions are currently underway in Indonesia. As fertility and mortality have declined and industrialization and urbanization have increased, chronic and degenerative diseases associated with an aging population have increase as have diseases and disabilities associated with degradation of the environment and hazards in the workplace. Common infectious diseases and malnutrition, however, still continued to be important factors in the overall health problems.

These changes in health care needs among a changing population have been accompanied in Indonesia during the recent past by an economic downturn of multidimensional crisis proportions. Very limited resources make it even more difficult for policy makers and program planners to meet the continuing and emerging health care challenges effectively.

Despite these difficulties, the aim of the Indonesian health system is to improve the quality of human resources, the quality of life and life expectancy, the welfare of the family and community, and the awareness on the benefits of a healthy lifestyle. The Ministry of Health's **Healthy Indonesia 2010** plan and **Health Paradigm** both focused on prevention of disease through promotion of healthy behaviors as a means to achieve these goals.

To achieve the health status goals expressed in Healthy Indonesia 2010 and the Health Paradigm during this period of economic crisis and in the future, it becomes especially important that health care needs and the delivery of health services be prioritized in a systematic and rational way so that limited resources are utilized with maximum positive impact. Priorities and other program/policy decisions cannot, however, be effectively made unless they are informed by relevant information generated by high quality health research. The development of a national health research and development agenda for policy makers that reflects the priority health-related needs of the community and of the health system is, therefore, essential.

The NIHRD of the MoH has undertaken the leadership in creating a prioritized health research and development agenda for policy makers in Indonesia. To ensure that such an agenda accurately reflects national health care priorities and incorporates the knowledge and expertise of a full range of Indonesian health professionals, NIHRD implemented during late 1998 and early 1999 the ENHR process as it is promoted by the COHRED.

To facilitate the establishment of an essential national health research agenda for policy makers, COHRED promotes through its technical assistance a process for developing consensus and making prioritization decisions. The NIHRD implemented this COHRED process in creating the essential national health research agenda for Indonesia.

The primary purposes of the ENHR process are as follows:
1. To promote social accountability, ownership, and shared responsibility for implementation of the research agenda
2. To enhance the national contribution to global research priority setting and action
3. To help correct imbalances in North-South partnerships/interactions.

The ENHR process assists countries in organizing and managing health research in the light of limited health resources, fragmentation, duplication, and information asymmetry. The ENHR process also informs resource allocation at the national and sub-national levels and identifies areas where research capacity strengthening is needed.

Health research and development priorities for Indonesia were developed through consensus building exercises at a national stakeholders meeting at Anyer, 2-4 February 1999. Stakeholders included representatives from the following groups: producers/researchers; policy makers; health care providers; the community; and providers of funding, both national and international.

Priorities were set in relation to eight primary health -related areas:
1. Health Behavior
2. Health Services System
3. Communicable Diseases
4. Non-Communicable Diseases
5. Demography
6. Pharmacy
7. Environmental Health and Occupational Health
8. Food and Nutrition.

Within these overall research areas, sub areas and sub-sub areas of research (increasing specificity) were also identified and prioritized. Priorities for research were based on a background or problem statement in each area and the conceptual framework defined by each working group.

Since the primary purpose of the national health research agenda is to provide the information necessary for policy and decision makers to plan and manage effectively, each group at the Anyer stakeholders meeting also identified the categories of policy and decision makers who will use the information generated by the research. Further, the need/impact of the research was clearly demonstrated through the identification of its expected uses or outputs.

CHAPTER I

BACKGROUND

A. The Role of Health Research in Health Development

In Indonesia today an epidemiological and demographic transition is in progress. This is indicated by the decline in birth and mortality rates and the increase in chronic diseases occurring simultaneously with an increase in the number of sick and handicapped elderly people, as well as environmental degradation and danger to work safety due to urbanization and industrialization. Meanwhile, infectious diseases and malnutrition still constitute serious threat to public health.

To date, the Infant Mortality Rate has been reduced to the rate of 4.1% on an average each year. If the IMR in 1967 still revolved around 145 per 1000 live births, in 1991 the IMR has reached 51 per 1000 live births (Supas 1995). The Mortality Rate of Children Under Five (0-4 years) too has declined quite significantly. If the Mortality Rate of Children Under Five in 1986 was still 111 per 1000 live births, it has declined to 81 per 1000 live births in 1993. However the inter-province difference between Infant Mortality Rate and the Mortality Rate of Children Under Five is still widely varied. The Mother Mortality Rate has also declined from 540 per 100,000 live births in 1986 to 390 per 100,000 live births in 1994. In accordance with this development, the life expectancy rate at birth has gone up from 45.7 years on the average in 1967 to 64.4 years in 1991 (Supas 1995).

The Prevalent Rate of mild and severe Protein Energy Deficiency in children under five has declined from 18.9% in 1978 to 14.6% in 1995 according to Susenas 1995. The total prevalence of Protein Energy Deficiency (light, mild, severe) has dropped from 48.2% in 1978 to 35.0% in 1995. This is also the case with other nutrient problems such as blindness due to Vitamin A, iron nutrient anemia, and iodine deficiency. The xeropthalmia survey in 1992 concluded that blindness due to vitamin A deficiency no longer constitutes a public health problem. A Household Health Survey found that the prevalence of pregnant mothers who suffer from iron nutrient anemia has dropped from 63.5% in 1992 to 50.5% in 1995. In the pre-school age group the rate dropped from 55.5% to 40.5%. The prevalence of disturbances due to iodine deficiency has also shown a declining rate. The Total Goiter Rate of 37.2% in endemic areas in 1982 has dropped to 27.7% in 1990. The national mapping of disturbances due to iodine deficiency during 1966-1999 indicates that at the national level the Total Goiter Rate in school-age children is 9.8%.

WHO in 1974 has declared Indonesia free of smallpox. Besides that, the morbidity rate of several other infectious diseases i.e. framboesia, leprosy, poliomyelitis, tetanus neonatorum and schistosomiasis has been reduced successfully. If in 1995 laboratory examination has still confirmed 4 cases of poliomyelitis, no poliomyelitis cases have been confirmed positive in 1997. Tetanus neonatorum has declined from 3.77 per 10,000 live births in 1990 to 1.56 per 10,000 live births in 1995. Schistosomiasis in endemic areas has declined from 3.48% to 1.64%.

Several infectious diseases that have been observed are showing an inclination to an increase in morbidity, such as malaria, hemorrhagic fever and HIV/AIDS. The *Annual Parasite Incidence* of malaria declined from 0.21 per 1,000 of the population in 1989 to

0.09 per 1,000 of the population in 1996 on Java-Bali, increased to 0.12 per 1,000 in 1997, and increased again to 0.20 per 1,000 of the population in 1998 and to 0.38 per 1,000 of the population in 1999. Where as outside Java-Bali, malaria cases increased from 16 per 1000 of the population in 1997 to 25 per 1000 of the population in 1999. A malaria outbreak occurred between 1998-1999 in 92 villages of 12 Regencies in 10 provinces. The *Parasite Rate* of malaria outside Java-Bali, initially 3.97%, increased to 4.78% in 1997. The *Incidence Rate* of hemorrhagic fever, 23.22 per 100,000 of the population in 1996, in 1998 have increased to 35.19 per 100,000 of the population. Lung tuberculosis still constitutes a disease requiring attention, because even though within the time frame of 1979-1982 the prevalence has been reduced from 2.9 per 1000 of the population to around 2.4 per 1000 at the end of Pelita VI (VIth Five Year Plan), yet this is not the case throughout all the provinces. In certain regions, like West Java, Aceh and Bali the prevalence of lung tuberculosis still ranges in 6.5–9.6 per 1000 of the population.

At the end of 1999, HIV findings were reported in 23 provinces, 14 provinces among them reported the presence of AIDS. Nationally, AIDS prevalence in Indonesia is 0.11 per 100,000 of the population with a glaring inter-province disparity. The AIDS prevalence in the Special Capital District of Jakarta is 10 times higher than the national rate, i.e. 1.0 per 100,000 of the population in Papua, the prevalence of AIDS is 40 times higher than the national rate, namely 4.4 per 100,000 of the population.

Degenerative and non-communicable diseases also show an inclination to increase. The result of a Household Health Survey conducted in 1995 found that 83 per 1000 of the population suffer from hypertension, and ischemic lung disease and stroke are suffered by 3 and 2 individuals respectively per 1000 of the population. Emotional mental disturbances observed in the 5-14 years and above 15 years age group are 104 and 140 per 1000 of the population respectively. Problems of sight (blindness) have also increased significantly from 1.2% in 1982 to 1.47% in 1995. Victims of traffic accidents in Indonesia have increased from 34,407 in 1994 to 49,098 in 1997. The mortality rate due to traffic accidents has increased from 3.2 per 100,000 of the population in 1994 to 4.1 per 100,000 of the population in 1997.

Since the economic crisis that continues to become a multidimensional crisis, there has been a change in public health service requirements. However, because of limited health resources, health policymakers and programmers are finding it more difficult to continue the health programs. It is therefore necessary to enhance the effectively and efficiency of the health services. Effective

The objective of health development toward Indonesia Healthy 2010 is to raise the awareness, will and ability to live a healthy life in order to realize an optimal degree of public health through the creation of an Indonesian society, nation and state that is marked by a population who are conducting themselves and are living in a healthy environment, capable of achieving an optimal degree of health throughout the territories of the Republic of Indonesia.

To achieve the objective of health development during the economic crisis and in the future, it is very important to prioritize the need for an even distribution of health services by means of a rational and systematic method in order that the limited health resources can be utilized to produce the upper limit of positive impact. Regardless of the priority of the health program, other programs and policies/decisions cannot be effective or efficient if not

supported by relevant information obtained from high quality research studies. It is crucial to develop and prioritize a national health research agenda that reflexes a close relationship with public health requirements and the health system. Priority and agenda are necessary for being able to make optimal use of the health study resources.

Based on the Government of the Republic of Indonesia Regulation No. 39 of 1995 on Health Research and Development, the Minister of Health has the duty to advance and supervise health research and development activities. The National Institutes of Health Research and Development, as the principal unit of the Department of Health responsible for health research and development, is given authority to carry out these responsibilities on behalf of the Minister of Health.

Based on Law No. 22 of 1999 on Regional Administration and RI Law No. 25 of 1999 on Monetary Balance between the Central and Regional Administrations that has been regulated as well in Government Regulation No. 25 of 2000 on Government Authority and the Authority of a Province as an Autonomous Region, the Region has the authority to regulate and manage the interests of the local communities according to its own initiative, based on aspirations that are in conformity with the Laws. As regards the problem of health research, this is conducted by the local health service under direction of the National Institutes of Health Research and Development.

The Department of Health through the National Institutes of Health Research and Development has taken the initiative to determine the priorities and national agenda of health research for the decision makers in Indonesia. In order to ascertain that these priorities and agenda truly reflex the national health service priorities and supported by the knowledge of experts who are active in the field of health, the National Institutes of Health Research and Development in 1998 became the facilitator in determining the priority and national agenda of health research with ENHR and COHRED providing technical assistance in the process.

B. The Formulation of The National Priority and Agenda for Health Research 2002-2005

The National Priority and Agenda for Health Research would become the reference on the health research activities, which are prioritized for the period of to 2002 - 2005, for the decision makers, research scientists, research institutions as well as financing agencies.

Health Development should be supported by evidence based information which are obtained among others through research and development as illustrated in this following Figure 1:

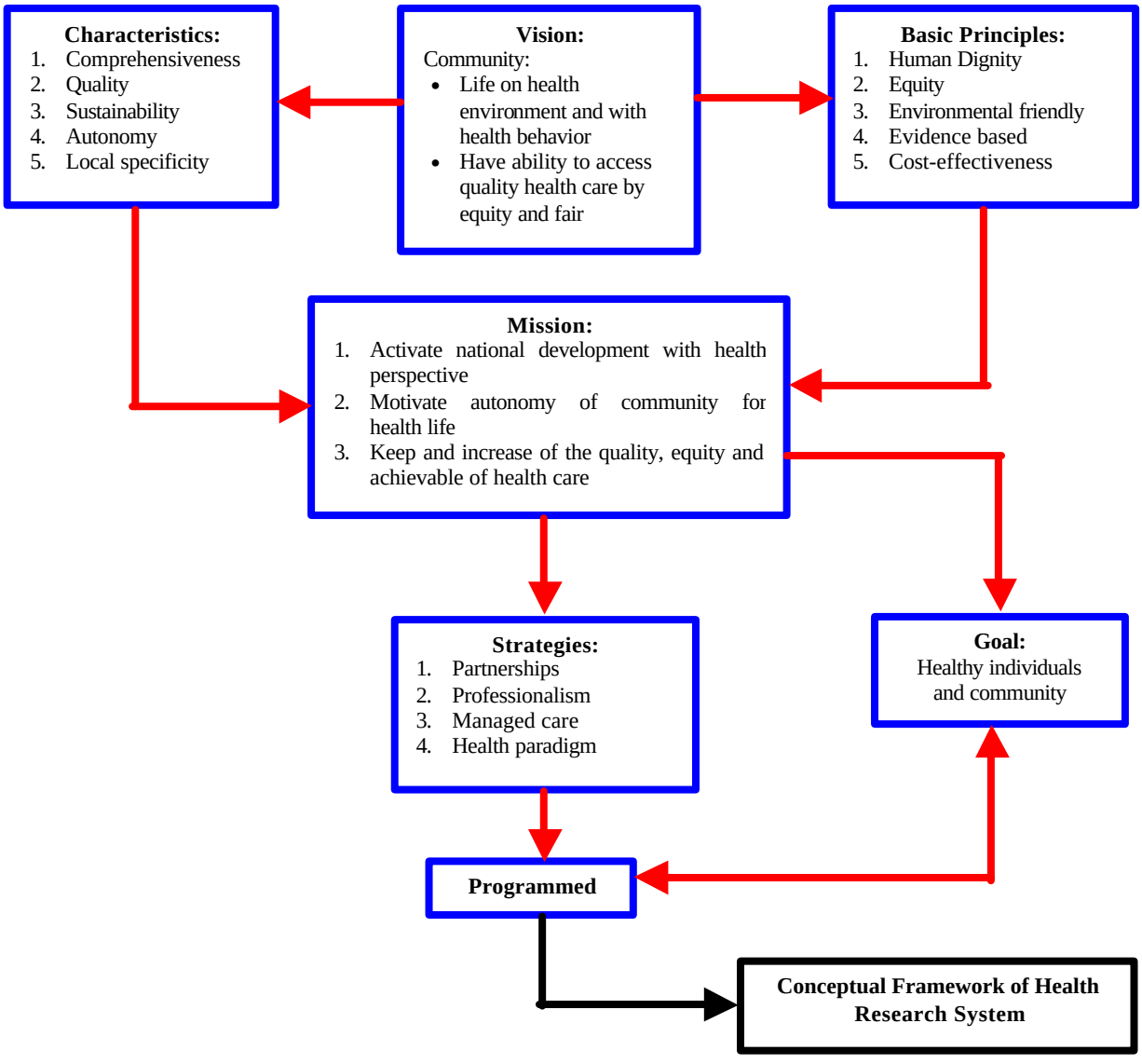


Figure 1. Health Development Framework

The Conceptual Framework of Health Research System which includes Values, Institution, Functions, Organization and Output are shown in the following Figure 2:

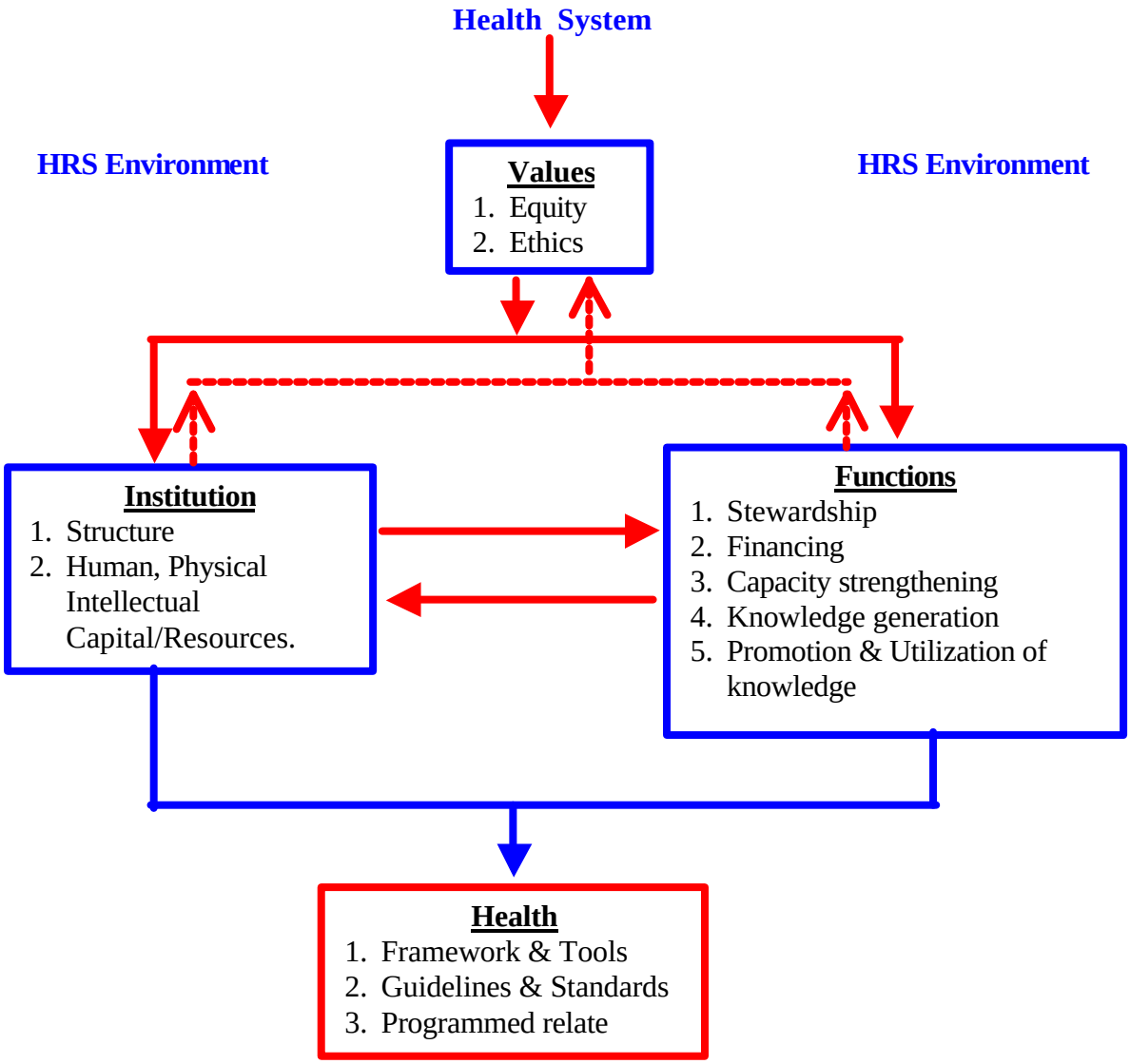


Figure 2. Conceptual Framework of Health Research System

CHAPTER II

OBJECTIVES AND CONCEPTUAL FRAMEWORK

A. Objectives

General Objective

Optimize health research and development to support the health development.

Special Objectives

1. To improve the efficiency in the utilization of resources of health research and development
2. To improve the coordination of health research and development activities
3. To provide information relevant to the need of the decision makers
4. To provide information for research scientists, research institutions as well as the financing agencies.

B. Conceptual Framework

To reach the goal of the Healthy Indonesia 2010 we realize that there are a number of problems outside as well as inside the health sector which could only be solved by placing the health in the main stream of the national development. This is shown in the following figure.

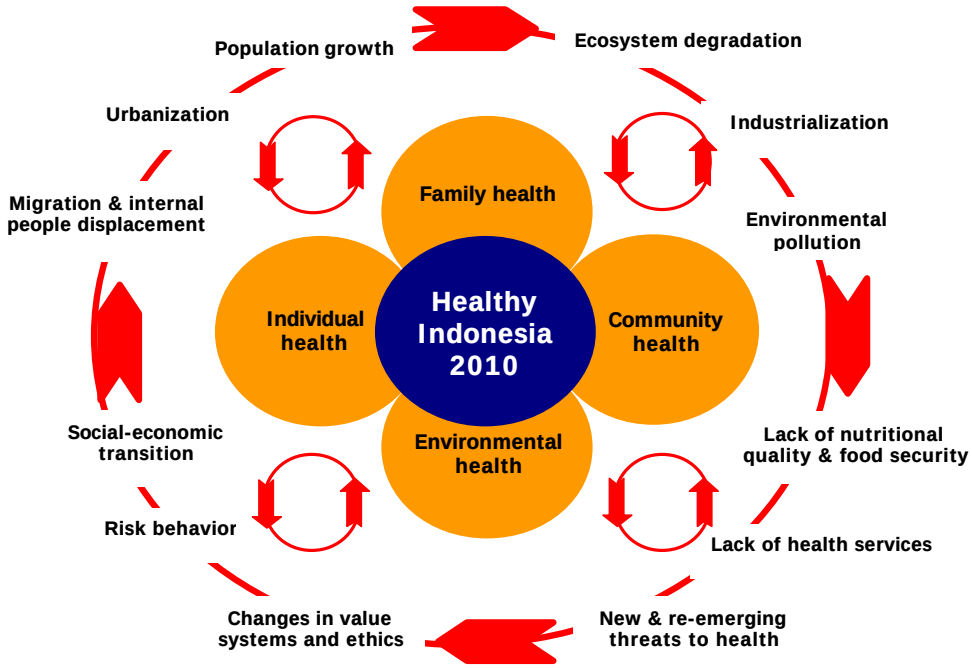


Figure 3. Changing Problems of Critical Significance of Healthy Indonesia 2010

The changing problems can be separate on 4 group. They are:

1. Demography
    a. Population growth
    b. Urbanization
    c. Migration and internal people displacement
2. Environmental
    a. Ecosystem degradation
    b. Industrialization
    c. Environmental pollution
3. Social-economic
    a. Social-economic transition
    b. Risk behavior
    c. Changes in value systems and ethics
4. Health
    a. Lack of nutritional quality and security food
    b. Lack of health services
    c. New and re-emerging threats to health

That groups influencing individual health, family health, community health and environmental health by direct or indirect.

CHAPTER III

PROCESS IN THE FORMULATION OF NATIONAL PRIORITY AND AGENDA FOR HEALTH RESEARCH 2002-2005

To facilitate the establishment of an essential national health research agenda for policy makers, COHRED promotes through its technical assistance a process for developing consensus and making prioritization decisions. The NIHRD implemented this COHRED process in creating the essential national health research agenda for Indonesia.

The primary purposes of the ENHR process are as follows:

1. To promote social accountability, ownership, and shared responsibility for implementation of the research agenda
2. To enhance the national contribution to global research priority setting and action
3. To help correct imbalances in North-South partnerships/interactions.

The ENHR process assists countries in organizing and managing health research in the light of limited health resources, fragmentation, duplication, and information asymmetry. The ENHR process also informs resource allocation at the national and sub-national levels and identifies areas where research capacity strengthening is needed.

In order to develop the consensus necessary to set national health research priorities for policy makers, the NIHRD involved a variety of stakeholders in the ENHR process. These stakeholders included representatives from the following groups:

1. Producers/researchers
2. Policy makers
3. Health care providers
4. Community
5. Providers of funding, both national and international.

The foundation of the ENHR priority setting process is information. Consequently, the first step undertaken by the NIHRD was to identify and collect existing data relevant to the national health status and health care system. A team consisting of the NIHRD/ENHR coordinator and senior researchers was established to review the following documents:

1. The situation analysis of the Seventh Five-Year Development Plan or Pelita VII (1999/2000 - 2004/2005)
2. The National Socio-Economic Survey (1997)
3. The National Health Household Survey (1995/1996)
4. The National Health Sector Reform (1998)
5. Selected related documents.

From the review of these documents an ENHR situation analysis was developed. This analysis addressed such issues in 1) health status as type, distribution, and trends in disease as well as risk factors/determinants of health and disease and in 2) the health care system as health personal, health programs, and health facilities. The situation analysis also addressed the health research system as it relates to these two areas.
What research is being undertaken and by whom and where? From where does the funding for such research come?

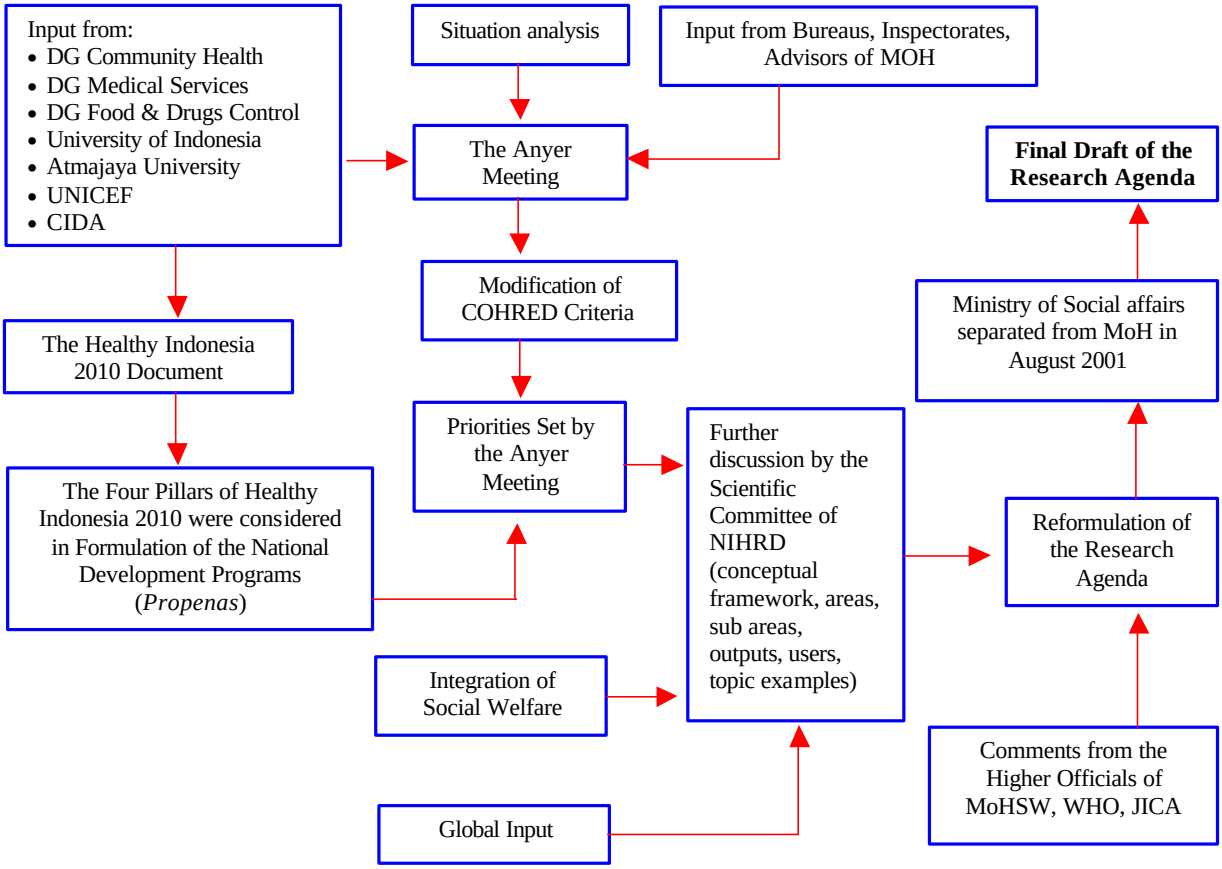


Figure 4. Process in the Formulation of Research Agenda

A summary of the situation analysis was sent to all participating stakeholder representatives approximately two weeks prior to a series of preliminary round table discussions. These round table discussions were organized around eight primary health-related areas:

1. Health Behavior
2. Health Services System
3. Communicable Diseases
4. Non-Communicable Diseases
5. Demography
6. Pharmacy
7. Environmental Health and Occupational Health
8. Food and Nutrition.

Based on discussion of the recently prepared situation analysis and their own experiences and research needs, participants in each round table discussion group developed a list of proposed research needs, in the opinion of the participants, to inform the decisions of policy makers in regard to each technical area.

Criteria for Prioritizing

The priorities are determined by using the following criteria (either one or more criteria).

1. To support the Healthy Indonesia 2010
2. To support the health programs
3. A national problems or covering a wide area or large number of population
4. Urgent problems
5. As a global commitment
6. A very useful result
7. Acceptable in terms of politic, economic, social and ethic
8. Feasible for the implementation.

Each group at Anyer developed for its technical area, background and a conceptual framework of the problem. Given the problem statement and conceptual framework identified, each group then worked to answer the following questions:

- What needs to be investigated? What are the questions for research?
- What will be the users of the information generated by the research?
- What will be the outputs of the research? That is, what are the implications for prevention, promotion, curative, and rehabilitative actions of the research?

Research priority scale also determine by the nominal group technique (NGT) furnished the mechanism for applying the criteria/rating scale to the proposed research areas within each technical group. In this technique, each group member was given a limited number of cards (e.g. four) on which to make their selections from the list of proposed research areas: one item/research area to be listed on each card. A point value (using the rating scale described above) assigned by each member to each item listed on a card. Then, cards collected by the technical group leader and points were tallied. The group reviewed the results and, if necessary, voted again until the number of proposed research areas was reduced to those of highest priority.

CHAPTER IV

NATIONAL PRIORITY AND AGENDA FOR HEALTH RESEARCH

As the result of above the mentioned in Chapter III process 8 priority areas were determined as follows:

1. Health Behavior
2. Health Services System
3. Communicable Diseases
4. Non-Communicable Diseases
5. Demography
6. Pharmacy
7. Environmental Health and Occupational Health
8. Food and Nutrition.

The eight priority areas mentioned above could be placed under the five health domains of WHO (disease & impairment, environmental, food & nutrition, socio-cultural characteristics and health care system) as follows:

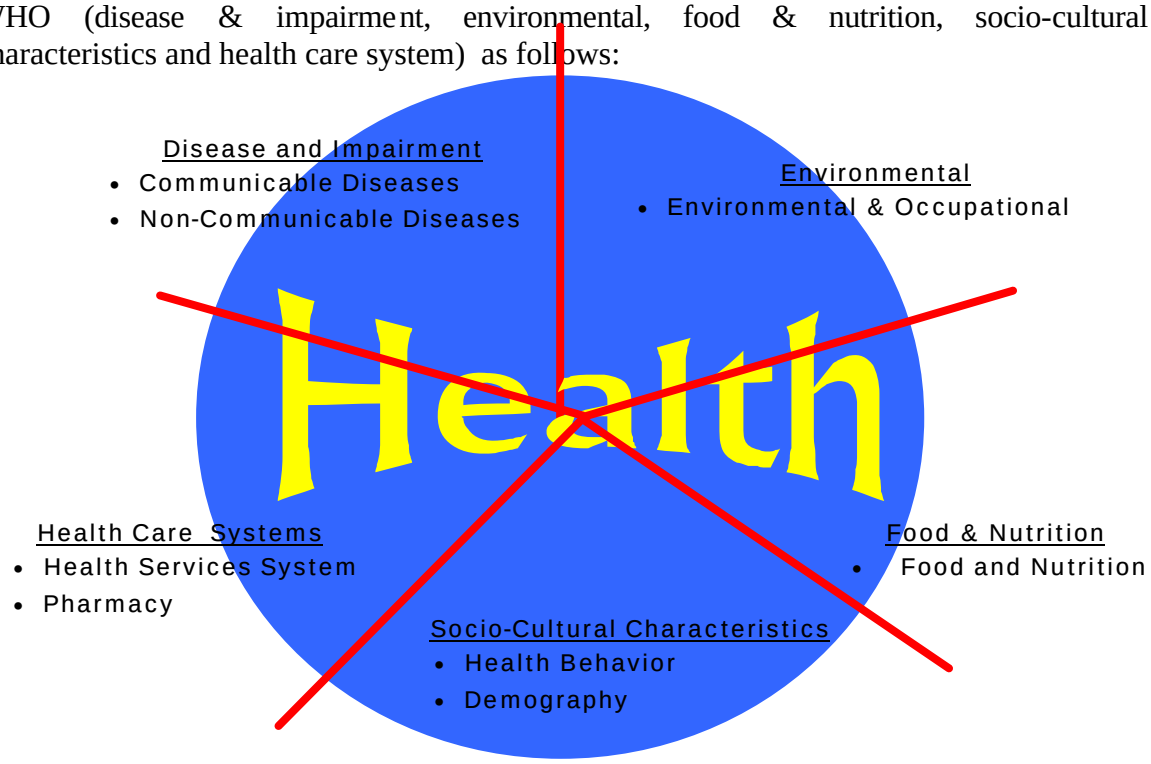


Figure 5. Relationship of the Eight Priority Areas of Health Research and the Five Health Domains of WHO

Since the primary purpose of the national health research agenda is to provide the information necessary for policy, and decision makers to plan and manage effectively, each group at the Anyer stakeholders meeting identified those policy and decision makers who will use the information generated by the research. Further, the need/impact of the research was clearly demonstrated through the identification of its expected uses or outputs.

Each areas explain afterward, consists of:
1. Background
2. Conceptual framework
3. Research question
4. Matrix (sub-area, sub-sub area, output, user and topic example).

1. Health Behavior Research Agenda

Background

The perceived importance of prevention of disease and promotion of wellness is growing dramatically in countries throughout the world. Health care economics alone dictate that growing priority be placed on increasing healthy behavior among all segments of the population.

A thorough understanding of the current environment, influencing health behavior in Indonesia is necessary in order to set appropriate priorities for the health behavior research agenda. Not only the areas of greatest behavior risk, but also the factors that influence adoption of healthy behaviors in these areas, must be identified and their relationships clearly defined.

There are, however, a number of special factors within the overall environment for health in Indonesia that have significant impact on the current prioritization of the health behavior research agenda. These special factors include:
- The goals and requirements of the Ministry of Health's plan Healthy Indonesia 2010
- The goals and requirements of the Ministry of Health's Health Paradigm that seeks to shift the balance of health care services delivery from curative toward prevention and promotion
- Existing social norms regulations (regarded by many as weak and insufficiently enforced)
- The balance between supply and demand for health services
- Several special considerations within the current political and economic environment in Indonesia such as:
  i. behavior changes caused by the impact of the present economic crisis
  ii. decentralization of governmental responsibilities and authority
  iii. globalization (the impact of worldwide communication)
  iv. locally specific problems in each of Indonesia
  v. gender issues related to risky behaviors.

Conceptual Framework for Setting Research Priorities Related to Health Behavior in Indonesia

Health behavior is one of many factors that determine the health status of the community. In Indonesia, health behavior priorities are currently defined as they relate to

- level of exercise
- eating and nutritional habits
- smoking
- alcohol consumption
- drug abuse
- automobile/driving safety
- safe sexual practices
- early detection practice
- hygienic and sanitary practice
- mother and child health care practice.

Factors that determine community health status, including health behaviors, are in turn affected by two major determinants: 1) the health care infrastructure and 2) the community health system.

The health care infrastructure, or legal and regulatory aspect of the health care environment, consists of the following components that influence health behaviors:

- policy and regulations;
- socio-economic factors;
- cultural and psycho-anthropology; and
- standards for risk factors.

In the Indonesian context, the health care infrastructure is thought to account for approximately 80% of the influencing environment for health behavior.

The community health system, on the other hand, also has impact on health behaviors. The components of the community health system, or operational aspect of the health care environment, that influence health behaviors include the following:

- the epidemiologist of behavior;
- IEC (information/education/communication) message content;
- the technology of communication for behavior change; and
- supply and demand factors for health information.

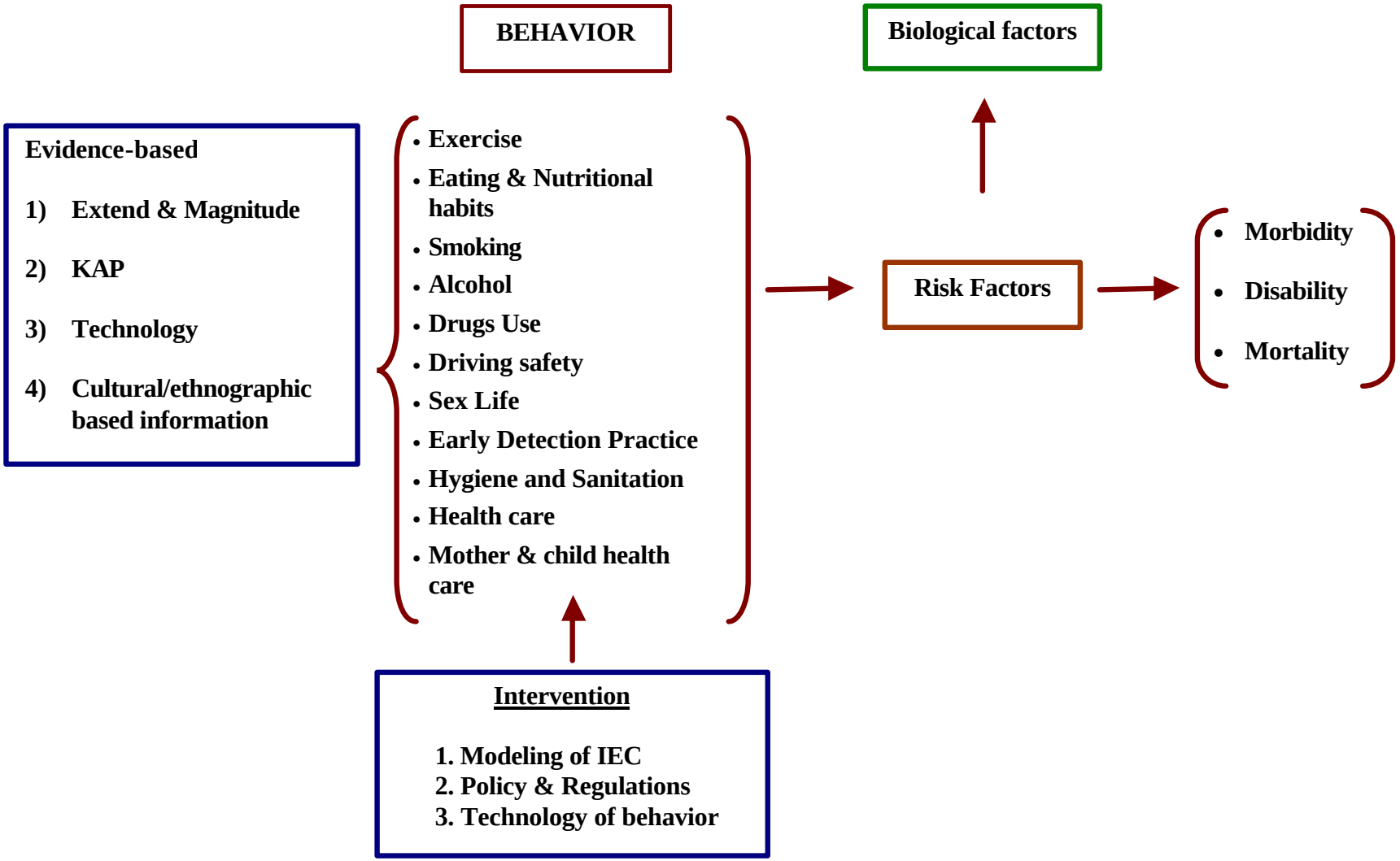


Figure 6. Conceptual Framework of the Relationship between Behavior and Its Risk Factors

Research Questions

Within the conceptual framework described above, the important questions related to health behavior, that should be addressed through research have been identified and prioritized through the consensus-building process of the ENHR. These priorities for the health behavior research agenda have also been influenced by the reality of existing policies, current direction of the Ministry of Health (i.e. Healthy Indonesia 2010 and the Health Paradigm), the broader realities of the current economic crisis and Government of Indonesia-mandated movement toward governmental decentralization.

Since factors within the infrastructure have been judged to have greatest impact on health behavior, questions related to legal and regulatory issues are of highest priority in the health behavior research agenda.

Legal aspect

Policy and regulation

- What is the perception and knowledge of relevant social norms regulations among providers and the community?
- How can health-related social norms regulations be appropriately enforced?
- How can risky health behaviors be appropriately evaluated within the Indonesian environment?
- What is the role of advertising in promoting unhealthy behaviors and how should it be regulated?

Socio-economics

- What is the potential for taxation of tobacco and other hazardous substances to finance health subsidies?
- What are the financial and productivity costs of unhealthy behaviors?

Culture and psycho-anthropology

- What are the health behavior-related aspects of the Indonesian culture?
- What health-related taboos exist?
- What is the knowledge/attitudes/practice related to gender-based issues in health?

Standards for risk factors

- What are the appropriate standards for exposure/protection from exposure to hazardous substances?

The community health system, or operational aspect of the health care environment, also has impact on health behavior. Since its impact is judged to be considerably less than that of the health care infrastructure, or aspect of the environment, however, research issues related to operations have been given secondary priority in the health behavior research agenda.

Operational aspect

Epidemiological

- What are the extent and magnitude of unhealthy lifestyles?
- What is the role of risky behavior in disease?
- What is the impact of the economic crisis and globalization on health behaviors in Indonesia?

Communication and messages

- Who are the high risk groups to whom health behavior messages should be targeted, and what are those messages?
- To which locally specific groups should health behavior messages be targeted, and what are those messages?
- What messages should be communicated to decision makers and health care providers?
- How should communication campaigns/messages be evaluated?

Technology of communication for behavior change

- How best can modern media be used to communicate health messages to targeted risk groups?
- How best can traditional media be used to communicate health messages to targeted risk groups?

Supply and demand factors for health information

- How successfully can information be disseminated to high risk groups?
- How equitable is the dissemination of health information both through media and through providers?
- Is adequate funding available for needed IEC campaigns?
- How can community resources be empowered to the health information task?

Outputs: How the information generated by the Health Behavior Research Agenda will be used by Decision Makers

Implementation of the research prioritized here will serve to inform decisions, that must be made by policy makers and program managers, within the next ten years to meet the health care challenges faced by Indonesia.

It is expected that the information generated by this research will contribute to development and implementation of the following elements of the health behavior program:

- system of social norms and regulations that minimize health risk factors to the community (including regulation of advertising related to health)
- standards for risk factors
- institution structure and regulations from central to local levels
- system of tax regulation and other regulations that minimize health risk factors to the community
- policy for government resources in promotion of healthy behaviors
- scientific and culture-based strategies for promoting health behaviors
- policies and regulations establishing standards/acceptable limits for dangerous substances
- production of locally specific materials promoting healthy behaviors and minimized

exposure to risk factors

- strategy for promotion of healthy behaviors and prevention of risky behaviors
- effective IEC campaign targeted to identified high risk groups and selected local groups
- advocacy campaign targeted to decision makers and health care providers
- standards for evaluation of communications campaign effectiveness
- selection of appropriate media to reach selected IEC target groups
- innovative strategy for use of modern and traditional media to reach selected target groups
- adequate budget for dissemination of IEC campaigns
- improved messages for reaching target groups
- enhanced media strategies for reaching target groups
- strengthened strategies for mobilization of both national and local resources
- system for monitoring health-related behaviors among target groups.

2. Health Services System Research Agenda

Background

The National Household Surveys of 1992 and 1995 demonstrated a growing **double burden** of disease in Indonesia: 1) existing common infectious diseases and malnutrition and 2) emerging threats of chronic and degenerative diseases, accidents, mental disorders, as well as parasitic and infectious diseases such as opportunistic tuberculosis, malaria, and HIV/AIDS. The major causes of death among all ages in 1995 including cardiovascular diseases, respiratory diseases, tuberculosis, diarrhea diseases, prenatal disorders, neoplasm, and trauma.

Within this changing context of morbidity and mortality, the aims of the Indonesian health care delivery system are to improve the quality of human resources and the quality of life and life expectancy, to improve family and community welfare, and to increase awareness of the importance of a healthy life style.

To accomplish these goals, the national health care delivery system relies on the following public sector infrastructure resources:

- Primary care : integrated health posts, village maternity clinics, village drug posts, community health centers, and sub-community health centers
- Secondary care : district general hospitals
- Tertiary care : provincial general hospitals and national referral hospitals.

There are, additionally, many private hospitals, private clinics, and private health care practitioners throughout the country.

Conceptual Framework for Setting Research Priorities Related to the Health Services System in Indonesia

The conceptual framework for setting research priorities related to the health services system is based on several important current realities in the Indonesian environment. The first defining reality is the "health transition" apparently now in progress. A demographic transition within the Indonesian population -- evidenced by an increasing proportion of older age groups -- has been followed by an epidemiological transition within the health care environment. The transition in the population's age structure has, in other words, led to a transition in causes of morbidity and mortality. Secondary determinants of this epidemiological transition are global social and economic trends that transform risk factors (for example, urbanization, industrialization, and accidents) for ill health. There is, consequently, a widening gap in health problems and health needs across social and economic classes.

The second defining reality in the Indonesian health care environment that has major impact on health services system research priorities is the Ministry of Health and Social Welfare's commitment to the Healthy Indonesia 2010 plan and the Ministry's Health Paradigm. In the Healthy Indonesia 2010 plan, the Minister has stated that there are four equal pillars for the health care system: decentralization, professionalism, the health paradigm (a health services approach designed to take care of the 80% of the population that is healthy through increased emphasis on prevention of disease and promotion of healthy behavior rather than reliance solely on curative services), and managed care. These

four pillars are expected to support effectively a health services system that must serve the changing needs of the population during Indonesia's health transition and the current economic crisis.

The broad political and Ministry of Health commitment to the "four pillars" is so great that the consensus developed through the ENHR process is that these four areas should be the equal priority areas of the health services system research agenda.

Research Questions

The questions related to the health services system that should be answered by research are solidly based on the four pillars of the Healthy Indonesia 2010 plan.

Decentralization

- How should a health care administrative system be structured in order to operate effectively at all levels: national, provincial, district, and sub-district?
- How can the decentralization policy be institutionalized most effectively?
- How should a system be designed that will facilitate and support local contribution to the health services budget at each administrative level: central, provincial, and district?
- What laws and regulations need to be developed to support health reform and crisis response?
- How should an information system be structured to most effectively support the Health Information System, the National Research and Development Information System, and the National Health Research and Development Network?

Professionalism

- What is the appropriate expert-based typology for HHR under decentralization and how can it be created for the central, provincial, district, and sub-district levels?
- How can a recruitment system based on capacity building and career development be most effectively created?

Health Paradigm

- What is the most effective health services delivery approach for a system based on prevention and promotion?
- How can the Health Paradigm be most effectively institutionalized at each administrative level?
- How can community participation be most effectively facilitated and supported in this health services delivery approach?

Managed care

- What are the most appropriate guidelines for a managed care delivery system within the current Indonesian context?
- What are the necessary management guidelines for such a system?
- What are the appropriate strategies for mobilization of resources and development of typology to operate an effective managed care system in Indonesia?

Outputs: How the information generated by the Health Services System Research Agenda will be used by Decision-Makers

Implementation of the research prioritized here will serve to inform decisions that must be made by policy makers and program managers within the next ten years to meet the health care challenges faced by Indonesia.

It is expected that the information generated by this research will contribute to development and implementation of the following elements of the health services system:

- administrative structure for health services at each level of decentralization
- technique for institutionalization of decentralization policy
- system for local contribution to health services budget for each administrative level
- laws and regulations related to health reform and crisis impact
- Health Information System
- National Research and Development Information System
- National Health Research and Development Network
- expert-based typology for HHR under decentralization
- recruitment system based on capacity building and career development
- health services system based on prevention and promotion
- institutionalization of the Health Paradigm
- locally specific strategies for development of community participation in the Health Paradigm
- managed care service delivery system that includes infra-structure and guidelines
- management strategy for managed care
- strategy for mobilization of resources for managed care.

3. Communicable Diseases Research Agenda

Background

Communicable diseases include those that are directly transmitted (contagious, air-borne, and water-borne) as well as those that are vector-borne and zoonotic. Factors that influence disease transmission are hosts, agents, vectors, behaviors of individuals and communities, the environment, and the health service system.

Infectious or communicable diseases continue to be a major public health problems worldwide, especially in developing countries. Human civilization has achieved important successes -- for example in the discovery of antibiotics and vaccines and the eradication of smallpox. Human civilization has also had, however, negative impact -- for example in the emergence of new diseases, the re-emergence of some diseases once thought controlled, and the continuing spread of some diseases. Population growth, war, industrialization, urbanization, tourism, agriculture, transportation, and migration have adversely changed the environment, hosts, vectors, and agents of disease so that communicable diseases are still the major cause of human death in the world.

The 1995 National Household Survey in Indonesia showed that morbidity and mortality caused by communicable diseases were still high among susceptible populations (infants, children, and women), especially in rural areas, and among populations outside Java/Bali. The most important diseases in Indonesia, since they cause the highest mortality, are pneumonia, tuberculosis, and diarrhea.

Conceptual Framework for Setting Research Priorities Related to Communicable Diseases in Indonesia

Full-scale communicable disease control programs include a number of important components:

- early diagnosis and prompt treatment
- prevention and control of risk factors such as immunization, improvement of nutrition and hygiene
- vector control
- surveillance
- improvement of settlement sanitation and provision of clean water
- IEC and enhancement of community participation
- research and development related to the foregoing program elements.

The research agenda in the area of communicable diseases, therefore, will relate to one or more of these areas for each priority disease category identified during the ENHR process. In line with the priorities of the Ministry of Health's Health Paradigm that focuses on prevention of disease and promotion of healthy behaviors rather than relying solely on curative services, the communicable diseases research agenda includes topics related to prevention and health promotion aspects of the targeted disease categories but does not neglect curative and rehabilitative aspects.

The priorities for the communicable disease research agenda developed through the ENHR process were based on evaluation of several criteria:

- extent and magnitude of the disease in terms of mortality, morbidity, and

disability/serious complications
- the effect of the disease on selected populations such as infants, children, and those in their productive years as well as on susceptible populations such as women and the aging
- the urgency of the disease problem, that is the epidemic potential of the disease
- the potential for social unrest caused by the disease, for example food poisoning
- global research priorities (for example, HIV/AIDS, diseases included in the WHO eradication/elimination program such as polio and measles).

Based on analysis of these criteria, the following disease categories have been identified as research priorities:
- respiratory tract infections (acute respiratory infection/pneumonia and lung tuberculosis);
- gastro-intestinal and liver infections (cholera, typhoid fever and other salmonellas, *entero* toxic *Escherechia coli* and *entero* hemorrhagic *E. coli*, viral hepatitis, and soil-transmitted *helminthiasis*)
- vector-borne diseases (malaria, dengue hemorrhagic fever)
- sexually transmitted and reproductive tract infections (HIV/AIDS and gonorrhea, chlamydeous, syphilis, and other STDs)
- emerging infectious diseases (bacterial, viral, parasitic diseases and food poisoning)
- immunizable diseases and WHO programs (polio, measles, diphtheria/pertussis/ tetanus, and tetanus neonatorum).

According to law No. 22/1999 the responsibility for health services are decentralized to districts, including health research. But as communicable disease do not respect administrative boundaries. There is still a role for the central and provincial governments, including in research and control of communicable disease.

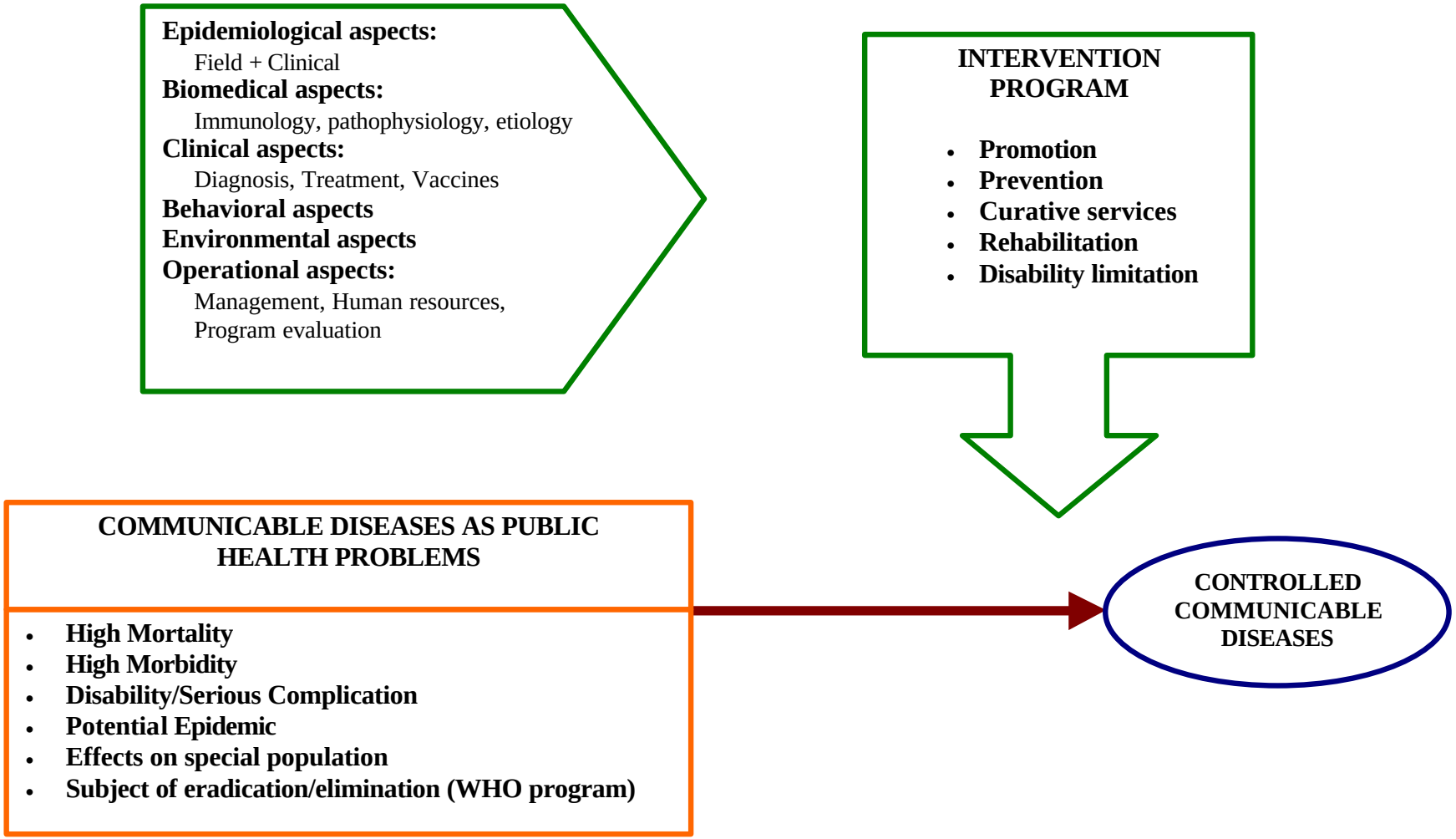


Figure 7. The Conceptual Framework for the Relationship of Research and Development to the Development of Intervention Programs that can Lead to Control of Targeted Communicable Diseases

Research Questions

The research questions that will provide support for the information-based decision making necessary for communicable disease control in Indonesia include the following:

Epidemiological aspects of priority disease categories
- What is the extent and magnitude of the disease?
- What is the incidence, prevalence, and distribution of the disease?
- What are the segments of the population affected by the disease?
- What are the geographical areas in which the disease occurs?
- What is the seasonality of the disease?

Biomedical aspects of priority disease categories
- What is the etiology of the disease?
- What are the relevant vectors?
- What is the pathophysiology of the disease?
- Can vaccine protection be developed?

Clinical aspects of priority disease categories
- What is the appropriate case management for this disease?
- What is the drug resistance of this disease?
- What is the appropriate drug regimen for this disease?
- What is the effective diagnostic method for this disease?

Operational aspects of control programs
- What are the abstracts and constraints to control this diseases?
- What measures are needed to overcome them?

Outputs: How the information generated by the Communicable Diseases Research Agenda will be used by Decision-Makers

Implementation of the research prioritized here will serve to inform decisions that must be made by policy makers and program managers within the next ten years to meet the health care challenges facing Indonesia.

It is expected that the information generated by this research will contribute to development and implementation of the following elements of the communicable diseases control program:
- innovative communicable disease control program that includes promotion, prevention, cure, and rehabilitation for selected priority communicable disease
- early warning and surveillance systems, including for times of crisis, for selected priority communicable diseases
- new diagnostic methods for selected priority communicable diseases
- system for outbreak response to selected priority communicable diseases
- model for effective case management for selected priority communicable diseases
- new and/or improved vaccines and schedules of immunization for selected priority communicable diseases.

4. Non-Communicable Diseases Research Agenda

Background

Health conditions in Indonesia are rapidly changing and becoming more complex due to the demographic and epidemiological transitions now occurring. These transitions have been hastened by the pace of national development and globalization and the accompanying changes in socio-economic conditions, educational levels, and environmental status.

The national household health surveys of 1992 and 1995 indicate that Indonesia now carries a triple burden of disease. Classical as well as new emerging infectious diseases require serious attention. Degenerative and modern diseases -- such as cardio-cerebrovascular disease, cancer, diabetes mellitus, and accident -- are steadily increasing as average life span increases and require an increasing share of health care resources available to the nation.

Added to the consequences posed by demographic and epidemiological transitions to the consequences disease control have been challenges specific to the research:

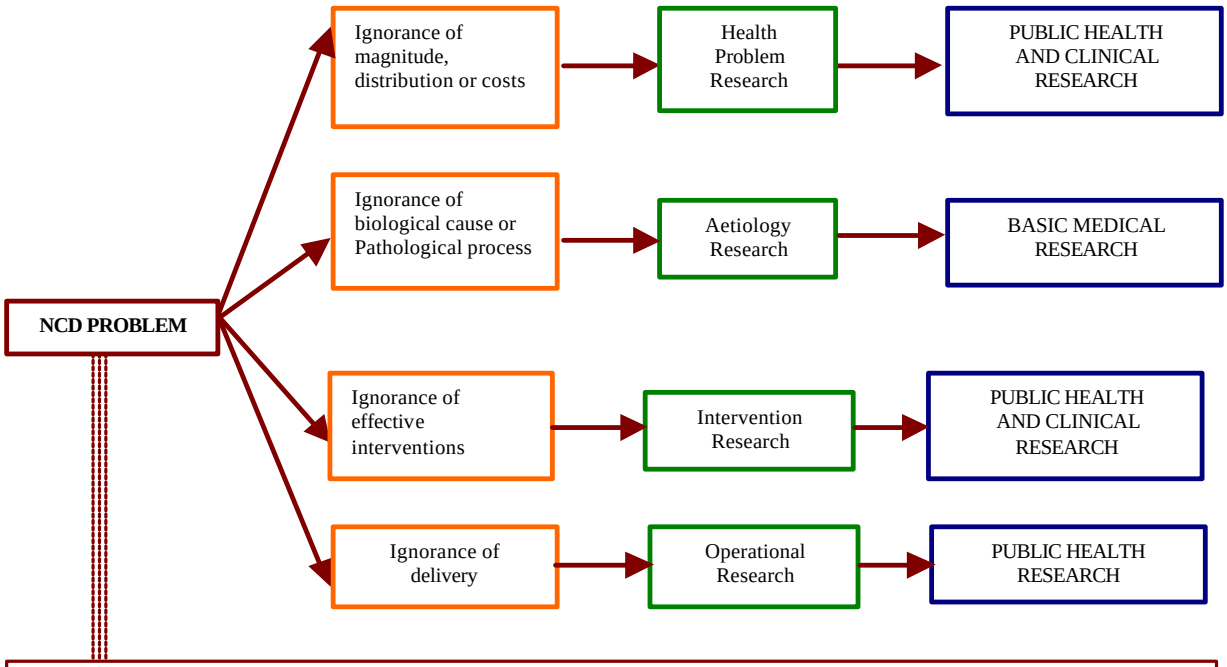
- Indonesia consists of many diverse ethnic groups living in a variety of geo-climatic conditions. Local specific rather than general research aimed at resolving non-communicable disease health problems may be required.
- Previous small-scale research efforts have produced conflicting results, and their data are questionable.
- Interest in research among health professionals has sometimes been diminished by lack of necessary resources, uncertain job security, research approval procedures, and disjunction between research and its application.
- Donor interests and local research needs have not always coincided.
- Previous health care priority has been given to treatment rather than to prevention and promotion.
- Necessary human resources for research have not always been adequately available.
- Information gathered from research in the past was not effectively disseminated through a systematic information network.

Conceptual Framework for Setting Research Priorities Related to Non-Communicable Diseases in Indonesia

The priorities for the non-communicable disease research agenda were developed through the ENHR consensus-building process. The following non-communicable disease categories have been identified as priorities for future research:

- cardiovascular diseases: ischemic heart disease, hypertension, stroke, and rheumatic heart disease
- neoplasm's: breast, cervical, lung, prostate, colo-rectal, nasopharyngeal, liver, ovary, and pancreatic cancers
- accidents: traffic, poisoning, and violence against women and children
- endocrine diseases: diabetes mellitus
- mental disorders: schizophrenia, dementia, drug abuse including smoking and alcohol, depression, neuroses, and minor mental disturbances
- neuralgic diseases: cephalic, epilepsy
- chronic obstructive lung diseases: bronchial asthma, chronic bronchitis, bronchiectasis

- musculoskeletal diseases: rheumatism, gout, osteoporosis, low back pain; ostearthritis
- sense disorders: cataract; deafness
- gastrointestinal diseases: gastritis/dyspepsia and liver cirrhosis
- genitourinary diseases: chronic renal failure.



1.	**Cardiovascular diseases**	:	Ischemic Heart Disease, Hypertension, Stroke, Rheumatic Heart Disease.
2.	**Neoplasm**	:	Breast, Cervical, Lung, Prostate, Colo-rectal, Nasopharyngeal, Liver, Ovary Skin and Pancreatic cancer.
3.	**Accident**	:	Traffic accident, Poisoning, Violence against children and women.
4.	**Endocrine Disease**	:	Diabetes mellitus.
5.	**Mental disorders**	:	Schizophrenia, Dementia, Drug Abuse (including smoking and alcoholism), Depression, Neurosis, Minor Mental Disturbances.
6.	**Neurological Disease**	:	Cephalic, Epilepsy.
7.	**Chronic Obstructive Lung Disease**	:	Bronchial asthma, Chronic Bronchitis, Bronchiectasis.
8.	**Skeletal-Skeletal Disease**	:	Rheumatic, Gout, Osteoporosis, Low Back Pain, osteoarthritis
9.	**Sense organ**	:	Cataract, Deafness
10.	**Gastrointestinal Disease**	:	Gastritis/Dyspepsia, Liver Cirrhosis.
11.	**Genitourinary Disease**	:	Chronic Renal Failure.

Figure 8. The Role of Research in the Overall Efforts to Prevent and Control Non-Communicable Diseases in Indonesia

Research Questions

The research questions that will provide support for the information-based decision making necessary for control of non-communicable diseases in Indonesia include the following for each of the eleven priority disease categories listed above:

Epidemiology

- What is the extent and magnitude for each of the priority disease groups?
- What is the specificity of each priority disease group?
- What are the related risk behaviors, survival, morbidity and mortality rate for each priority disease group?
- How can cluster detection system in relation the environmental pollution be developed?

Risk factors

- What are the environmental, behavioral, and socio-economic risk factors for each of the priority disease groups?

Technology

- What are appropriate promotion interventions for each of the priority disease groups?
- What are appropriate primary and secondary prevention strategies for each priority disease group?
- What are the most effective treatment strategies for each priority disease group?
- What is appropriate rehabilitation strategy for each priority disease group?
- What are appropriate standards for enforcement of laws and regulations related to prevention for each of the priority disease groups?

Outputs: How the information generated by the Non-Communicable Diseases Research Agenda will be used by Decision-Makers

Implementation of the research prioritized here will serve to inform decisions that must be made by policy makers and program managers within the next ten years to meet the health care challenges facing Indonesia.

It is expected that the information generated by research will contribute to development and implementation of the following elements in the non-communicable diseases control program:

- improved strategies for prevention and early detection of each of the priority
- disease categories
- indicators for health technologies in each priority disease group
- appropriate health technology for each priority disease group
- new and/or improved health technologies for each priority disease group
- improved basic and applied sciences
- standards for new technologies
- guidance for application of health technologies
- guidance for accreditation
- guidance for standardization.

5. Demography Research Agenda

Background

Indonesia is in a period of significant transition and change. Like some other developing countries, Indonesia has made considerable progress in reducing fertility and mortality, expanding health care coverage, and training human resources. Other changes in the overall development environment have also occurred:

However in general in terms of social welfare since 1997 the condition is worsening due to multidimensional crisis. The heterogenicity of the population is vulnerable to social conflicts.

- Demographic changes have occurred as older age groups increase at a faster rate than younger age groups.
- Disease profiles have become more complex as epidemiological changes have taken place.
- Improvements in education have created changes in demand for health care services.
- Technological development has created changes in access to resources and services and in the distribution of wealth.
- Cultural changes have occurred in response to increased urbanization and industrialization with both positive as well as negative impacts.
- Economic changes due to the current crisis have affected health care choices and access to service delivery and increasing social pathology due to poverty.

The possible impacts of decentralization would be changes in population migration (in-as well as out-migration)

Conceptual Framework for Setting Research Priorities Related to Demography in Indonesia

Historic patterns of fertility, morbidity and mortality, urbanization, and migration have been disrupted in Indonesia by both positive and negative forces in the development process. Changes in previous norms mean that there are new demands for service delivery as well as demand for new services among shifting segments of the overall population. Such a period of transition requires the availability of accurate and readily accessible data for policy and program decision makers so that the health care system can respond in an effective way to the changing needs of a changing population.

The priorities for the demographic research agenda have been developed within this conceptual framework of transition to fulfill the most pressing informational needs of policy and health and social welfare program planners. The areas of greatest need within the context of the demographic research agenda were identified during the ENHR process as follows:

- a managed system for reporting of mortality and its causes
- the demographic and epidemiological transitions occurring within the Indonesian population
- changes in the causes of morbidity and mortality
- changes effected by increased mobility within the population.

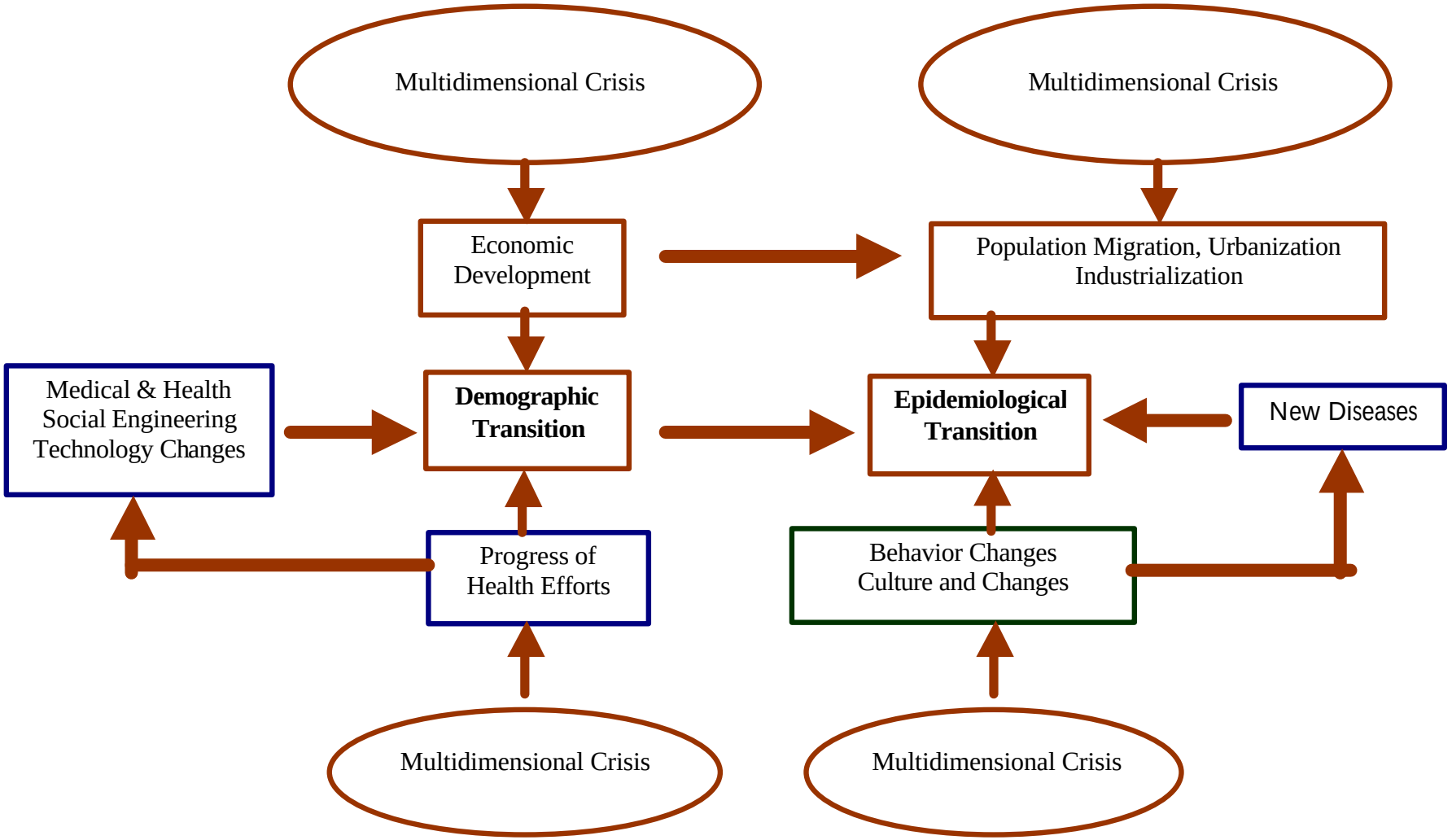


Figure 9. Conceptual Framework of Demographic and Epidemiological Transitions in Indonesia

Research Questions

The questions which the demographic research agenda has been designed to answer are directly linked to each of the four priority areas of informational need identified above.

Management

- What are the resources available for development of an effective vital statistics registration (deaths) system?
- How can vital statistics (deaths) data be effectively reported and recorded?
- How can a vital statistics registration (deaths) system be most effectively monitored and evaluated?
- How can vital statistics (deaths) data be utilized most effectively in decision making and health planning?

Demographic and Epidemiological Transitions

- What is the status of fertility in Indonesia in regard to reproductive age/fertility among locally specific segments of the population?
- What is the level of use of contraceptive methods among the population?
- What is the availability/accessibility of contraceptive methods among the population?
- What is the impact of the current multidimensional crisis on fertility and contraception?
- What is the magnitude of current levels of morbidity, mortality, and disability?
- What are the most important risk factors for morbidity, mortality, and disability?
- What is the impact of the multidimensional crisis on levels of morbidity, mortality, and disability?
- What are the social conditions of the elderly?
- What is the impact of the multidimensional crisis on the health and mortality of the aged?

Changes in Morbidity and Mortality

- What is the role of reproductive health in the changing causes of morbidity and mortality?
- What is the level of infertility among Indonesian women of reproductive age and how is infertility defined?
- What are the primary risk factors for infertility among specific segments of the Indonesian population?
- What is the impact of the multidimensional crisis on reproductive health?

Mobility

- What are the epidemiological patterns in industrial and urban areas?
- What is the prevalence of accident as a cause of morbidity and mortality?
- To what extent and how have health behaviors changed due to increased urbanization?
- What is the accessibility of health care services to refugee populations?
- What is the impact of the multidimensional crisis on population mobility?

Outputs: How the information generated by the Demography Research Agenda will be used by Decision-Makers

Implementation of the research prioritized here will serve to inform decisions that must be made by policy makers and program managers within the next ten years to meet the health care challenges faced by Indonesia. It is expected that the information generated by this

research will contribute to development and implementation of the following elements of the national health strategy:

- effective vital statistics registration (deaths) system that includes staffing, software, and facilities
- system for reporting and recording vital statistics (deaths)
- utilization of vital statistics registration information for policy decision making, health planning, and projections
- national demographic and family planning policy
- family planning and reproductive health policy
- family planning and reproductive health service delivery programs
- new and traditional contraceptive methods
- policy for service delivery to diminish rates of morbidity, mortality, and disability
- appropriate health and social welfare programs for the elderly
- policy for service delivery and treatment of risk factors for infertility
- policy for urban health, especially in pockets of poverty
- policy for service delivery during crisis situation.

6. Pharmacy Research Agenda

Background

Indonesian Law Number 23 (1992) provides the basis for the authority and responsibilities of the pharmacy sector. In this law, the pharmacy sector is defined to include

- development of pharmaceutical products; their production/manufacture;
- control of pharmaceutical quality;
- assurance of safe and effective pharmaceuticals;
- storage and distribution of pharmaceuticals;
- provision of information on pharmaceuticals and medical devices; and
- fulfillment of prescriptions for pharmaceutical products and medical devices.

Pharmaceuticals are further defined by Law Number 23 to include

- drugs and their ingredients,
- traditional medicines,
- medical devices,
- hazardous materials, and
- cosmetics.

The Indonesian pharmacy sector is divided into three sub areas: production, management, and services.

Conceptual Framework for Setting Research Priorities Related to Pharmacy in Indonesia

Each of the three sub areas of the Indonesian pharmacy sector -- production, management, and services -- plays an important and inter-related role in the ultimate delivery of effective pharmaceutical services to the population. While each contributes to the sector as a whole, each area has its own special responsibilities and needs for information through research.

The Research Agenda for Pharmacy area will be prioritized on:

1. Prevention, health promotion, curative and rehabilitative aspects on targetted disease categories which have been identified in communicable diseases/ non-communicable research areas.
    1.1. Communicable diseases caused by:
        a. Bacteria including accute respiratory infection / pneumonia, lung tuberculosis and cholera.
        b. Parasites including malaria, filariasis, dengue haemorrhagic fever, soil transmitted helminthiasis.
        c. Virus including hepatitis, typhoid, HIV/ AIDS, measles, polio, tetanus, diphtheria and pertusis.
    1.2. Non-communicable diseases such as:
        a. Cardiovascular (ischemic heart disease, hypertension, stroke, heart dislipidemia, rheumatism)
        b. Neoplasm (breast, cervical, lung, prostate, colorectal, nasopharyngeal, liver, ovary, and pancreatic cancers)
        c. Endocrine diseases (diabetes mellitus)

d. Mental disorders (schizophrenia, dementia, drug abuse including alcohol and cigarettes, depression, neurosis, and minor mental disorders)
e. Neuralgic diseases (cephalic, epilepsy)
f. Chronic lung disorders (bronchial asthma, chronic bronchitis, bronchiectacsis)
g. Musculoskeletal (rheumatism, gout, osteoporoses, lower back pain)
h. Osteoarthritis
i. Sense disorders (cataract, deafness)
j. Gastrointestinal diseases (gastritis/dyspepsia, liver disease)
k. Genitourinary diseases: (chronic renal failure).

2. Public protection
3. Reinforcing Pharmacy Management.

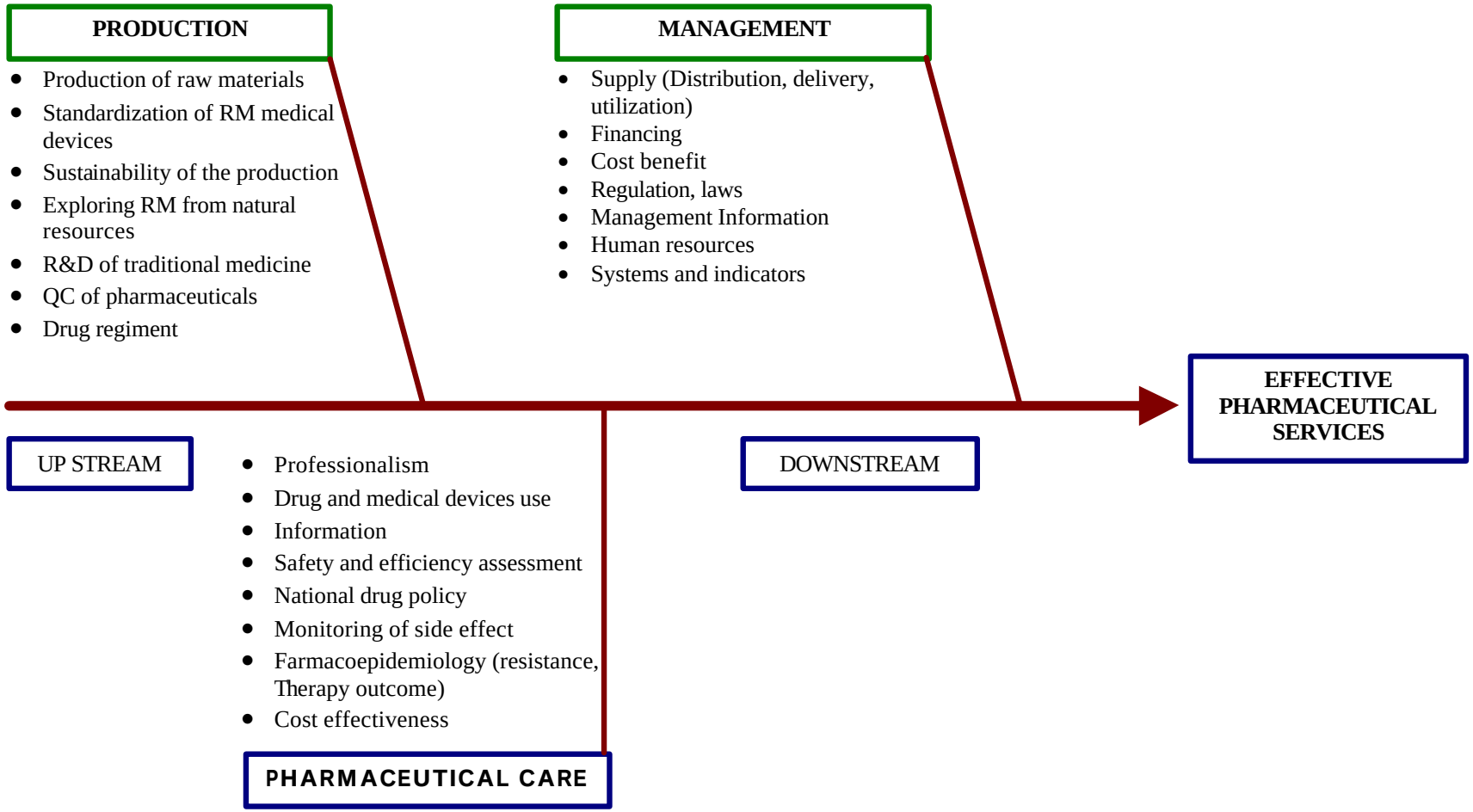


Figure 10. Illustration of the Conceptual Framework for Effective Pharmaceutical Services

Production

Indonesian pharmaceutical technology and production capabilities face the challenges of an increasingly global market and the advent in 2003 of the full implementation of General Agreement on Trade and Tariffs (GATT). Technology development, however, must be undertaken carefully and rationally with full regard for national resources and the needs of the population. Indonesia's self-reliance in the pharmaceutical sector must be strengthened; consequently, technology development should be focused on local production, quality control, safety of raw materials, standardization of raw materials, exploration for raw materials, and the development of traditional medicines.

Management

Management of the pharmaceutical sector also faces challenges created by increasing globalization as well as the GoI's commitment to increasing decentralization. Laws and regulations must be reviewed and revised to facilitate the safe and effective operation of the pharmaceutical sector under these new economic and political conditions. Balance between supply, demand and equity for pharmaceutical products must be ensured throughout the population even though the current demographic and epidemiological transitions mean changing needs for drug therapy, changing distribution channels, and changing access to dispensing providers. Evaluation of the utility and use of medications as well as their treatment-related cost benefits are especially important now as the impact of the economic crisis is felt by the government and also consumers.

Services

Achieving the goals set forth in the MoH's Healthy Indonesia 2010 plan will require that all available health care resources be brought to bear. Pharmacy profession represent a valuable, and until now underutilized, resource for meeting the changing health care needs of a changing population. As physician services under the Healthy Indonesia 2010 plan are shifted toward a total health care approach, pharmacists will need to reposition themselves -- from prescription fulfillment only to provision of consumer advisory and counseling services as well. Such a shift in the professional responsibilities of pharmacists will require development of a standardized service model and a protocol for interaction between pharmacy professionals and other medical/health care professionals.

Provision of effective pharmaceutical services must also include contributing to rational drug use, development of essential drug lists, and monitoring drug use (such as side effects, drug resistance, and therapy regimens).

Research Questions

To meet the health care and related pharmaceutical challenges facing Indonesia, policy and other decision makers will need accurate information generated by reliable research for each of the three operational segments of the pharmaceutical sector.

Production

- What is the availability of necessary pharmaceutical raw materials in Indonesia?
- What is the sustainability of raw materials supply?
- What are appropriate formulations, quality control standards, safety and efficacy norms, and cost/benefit ratios for raw materials?
- What is the availability of traditional medicines in Indonesia?
- What are appropriate formulations, quality control standards, safety and efficacy norms, and cost/benefit ratios for traditional medicines?
- What is the availability of manufactured pharmaceutical products in Indonesia?
- What are appropriate formulations, quality control standards, safety and efficacy norms, and cost/benefit ratios for manufactured pharmaceutical products?

Management

What are the professional requirements necessary to ensure provision of effective pharmaceutical services in Indonesia?
What procurement practices will ensure a consistent, affordable supply of necessary pharmaceutical products?
How can a drug distribution system be designed and operated to ensure equitable distribution of drugs?
What is the appropriate segmentation of the pharmaceutical market between public and private sectors?
How can the cost effectiveness of drug use be improved?
How can rational utilization of drugs be enhanced?
What is the most effective design for a pharmaceutical management information system?

Pharmaceutical services/care

What are appropriate drug regimens for selected diseases such as lung tuberculosis and malaria?
What are appropriate evaluative standards for therapy outcome, risk/benefit of drug treatment?
What is the most effective method/system for surveillance of drug use and safety?
How can pharmaceutical-related information be most efficiently and effectively delivered to both physicians/providers and consumers?

Outputs: How the information generated by the Pharmacy Research Agenda will be used by Decision-Makers

Implementation of the research prioritized here will serve to inform decisions that must be made by policy makers and program managers within the next ten years to meet the health care challenges facing Indonesia.

It is expected that the information generated by this research will contribute to development and implementation of the following elements in the pharmacy sector:

- improved raw materials technology;
- new raw material products;
- methods for quality control of raw materials production;
- improved technology for traditional medicines;
- new traditional medicine products;
- methods for quality control of traditional medicines production;
- improved technology for pharmaceuticals;

- new pharmaceutical products;
- methods for quality control of pharmaceutical products production;
- national drug policy;
- availability of cost effective drugs;
- strategy for equitable drug distribution;
- system for rational drug and equipment use;
- policy for drug safety and efficiency; and
- strategy for delivery of information to physicians and consumers (including
- advertising, labeling, and point of purchase materials).

7. Environmental and Occupational Health Research Agenda

Background

Environmental and occupational health depend on the status of two primary components: 1) the physical environment and 2) the biological environment beside social environment that will be discussed in other chapter of this book. The physical environment includes water (quantity, quality, accessibility, continuity), air (quality), and soil (quality). The biological environment includes fauna (agents, vectors, hosts, natural enemies), and flora (biodiversity, forest management and land clearing).

Indonesia currently faces a double challenges in the area of environmental and occupational health: poor basic sanitation and environmental pollution and degradation due to industrialization and urbanization. Additionally, other environmental conditions that have impacts on human health have emerged during the recent past. These conditions include changes in climate, depletion of the ozone layer, increasing use of toxic and hazardous substances, increasing natural and man-made disasters, and emerging infectious diseases.

The responsibility for environmental and occupational health in Indonesia is cross-sectoral. Coordination and implementation of interventions are therefore multi-layered. In addition to the Ministry of Health, other Ministries which have the responsibility in this area are: the Ministry of Human Settlement and Infrastructure, the Ministry of Industry and Trade, the Ministry of Mining and Mineral Resources, the Ministry of Manpower, the Ministry of Communications, Post and Telecommunication, the Ministry of Home Affairs, the State Ministry of Environment etc. Private sector corporations and commercial interests as well as the community also share responsibility for the status of environmental and occupational health.

Following the process of decentralization, water resources and waste management should be the responsibility of the Central and Provincial Government, so that certain water resources can be utilized by a number of neighboring districts. Certain dumping areas can also be benefited by a number of neighboring districts to dump their waste.
The same rule should also be applied in environmental pollution control which are mostly cross-boundaries in nature.
Biological environment could not be managed based on administrate boundaries; it should be a cross-border collaboration to solve the problem.

Conceptual Framework for Setting Research Priorities Related to Environmental and Occupational Health in Indonesia

The physical environment (water, air, soil) is affected by three major factors:

- patterns of human settlement;
- practices in public places sanitation;
- conditions of the workplace; occupational hazards pollution and environmental changes

Existing laws and regulations, levels of enforcement, traditional practices, and economic forces all contribute to the extent to which each of these factors has a positive or negative impact on the quality of air, water, and soil.

The quality of the biological environment depends both on natural elements (disease agents, vectors, hosts, natural enemies) and on elements related to human activities (land clearing, depletion of biodiversity). Issues related to the quality of the biological environment in Indonesia are complex due to variations in local specific conditions.

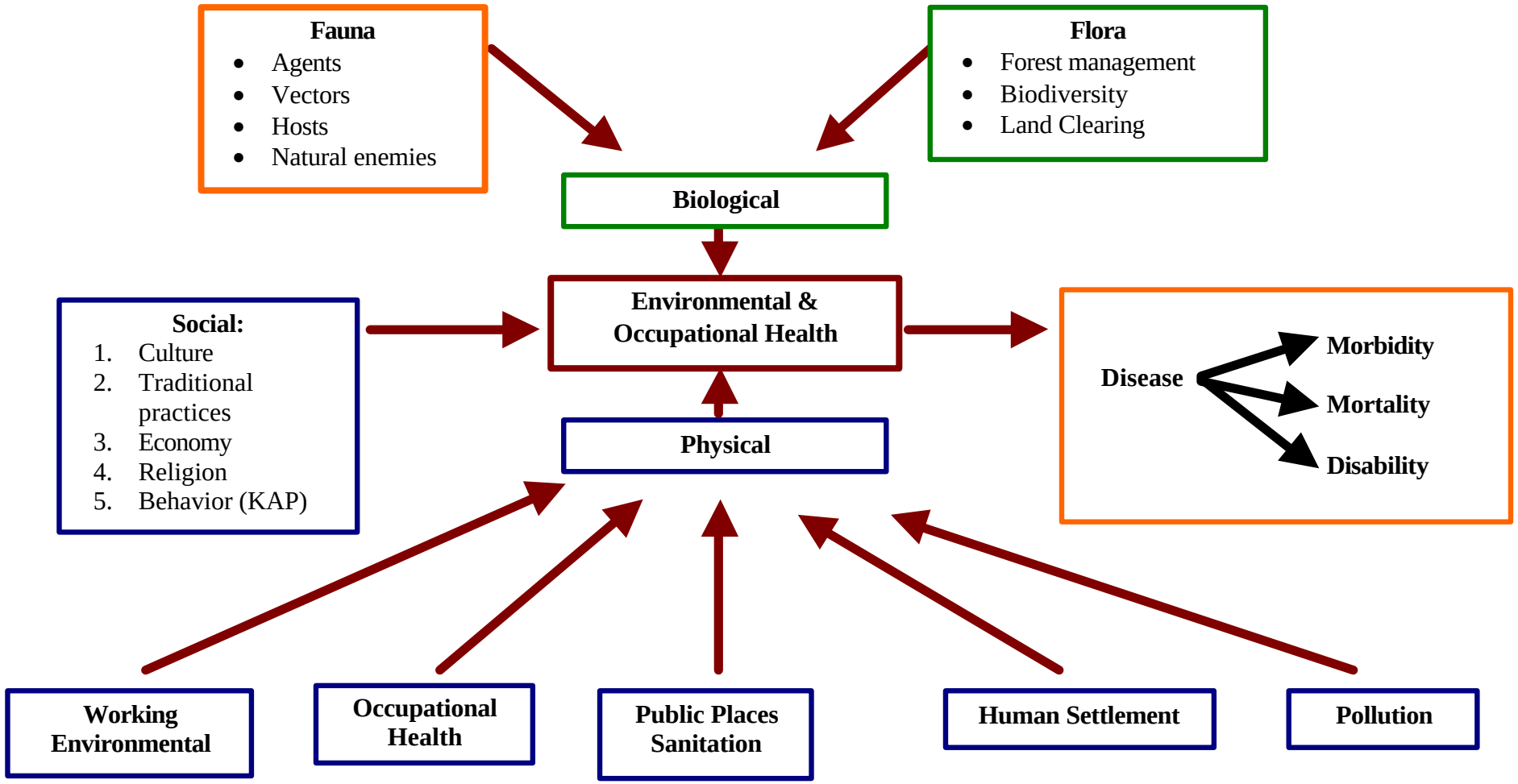


Figure 11. Illustration of the Impacts of Physical, Biological and Social factors on Environmental Health and Occupational Health

Research Questions

The questions that must be answered for safeguarding environmental and occupational health in Indonesia among others are:

Human settlement
- What is the appropriate model for low-cost healthy housing?
- How can basic sanitation be maintained especially in times of crisis?
- What are the appropriate standards for water, air and soil quality?
- What are the appropriate models for solid waste management especially in congested urban areas?
- How can a safe water supply be consistently provided especially in targeted problem areas such as among the urban poor, in coastal and ebb/tidal areas, and in areas of transmigration?

Public places sanitation
- What are the appropriate models for waste management in different public places (hospitals, hotels, restaurants, recreational areas, etc)?

Working environment
- What is an appropriate model for improvement of the working environment for targeted groups of the underserved such as fishermen, farmers, small/home industries?

Occupational health
- What are appropriate safety standards for prevention of accidents in the workplace?
- Which groups of workers are most exposed to occupational risk factors?

Fauna
- What are the locally specific agents, vectors, hosts and natural enemies in relation to disease transmission?
- What are the appropriate strategies for vector and reservoir control?

Flora
- What is the appropriate model for conservation of biodiversity?
- What are locally appropriate strategies for prevention of indiscriminate land clearing and forest management?

Outputs: How the information generated by the Environmental and Occupational Health Research Agenda will be used by Decision-Makers

Implementation of the research prioritized here will serve to inform policy makers and program managers within the next ten years to meet the environmental and occupational health challenges faced by Indonesia.

It is expected that the information generated by this research will contribute to development and implementation of the following elements in the cross-sectoral strategy for environmental and occupational health:
- system for management and surveillance of human settlement;
- new and improved technologies for healthy human settlement;
- effective policy and law governing human settlement;

- system for management and surveillance of public places sanitation;
- new and improved technologies for public places sanitation;
- effective policy and law governing public places sanitation;
- system for management and surveillance of the working environment;
- new and improved technologies for creation and maintenance of healthy working
- environments;
- effective policy and law governing working environments;
- system for management and surveillance of occupational health;
- new and improved technologies for occupational health;
- effective policy and law governing occupational health;
- effective policy and law in regard to agents, vectors, hosts, and natural enemies in the
- biological environment;
- system for management of plant resources (included national parks and others natural conservation);
- system for surveillance of plant resources (included national parks and others natural conservation);
- system for management and surveillance of fauna;
- effective law and policy in regard to land clearing, forest management and biodiversity; and
- new and improved technologies for maintenance of biodiversity.

8. Food and Nutrition Research Agenda

Background

The aggregate data of the National Socio-Economic Survey (Susenas) indicate that the prevalence of underweight (below -2 Z score weight-for-age) did not change significantly from 1995 to 1998. The proportion of underweight children did, however, decline from 35.7% in 1995 to 29.7% in 1998. Prevalence of severe underweight (below -3 Z score weight-for-age), on the other hand, increased from 6% in 1989/1992 to 10.5% in 1998. Children, aged 6 to 23 months, living in rural areas were more likely to be weight-disadvantaged than their urban counterparts.

According to the Household Health Survey (1995), 51% of pregnant women suffered from nutritional anemia. Forty percent of preschool children, 30 % of school children, 30-40% of female workers, and 20% of male workers also suffered from nutritional anemia.

The prevalence and magnitude of deficiency of micro-nutrients such as zinc and selenium are unknown at present. The 1999 NRDC, however, indicated a total goiter rate (TGR) in Indonesia of 9.8%. Although vitamin A deficiency is not now considered a public health problem, the proportion of Indonesian people with low serum vitamin A levels (< 20 ug/dl) is relatively high.

While most Indonesians suffer from some level of under-nutrition, in some areas and among some socio-economic classes over-nutrition/obesity has become a health problem of some part of population.

Conceptual Framework for Setting Research Priorities Related to Food and Nutrition in Indonesia

Nutritional status in Indonesia has a very complex etiology. It is not only directly affected by the level of nutrient intake and the health status of the individual but is also strongly associated with socio-economic, socio-cultural, and political conditions.

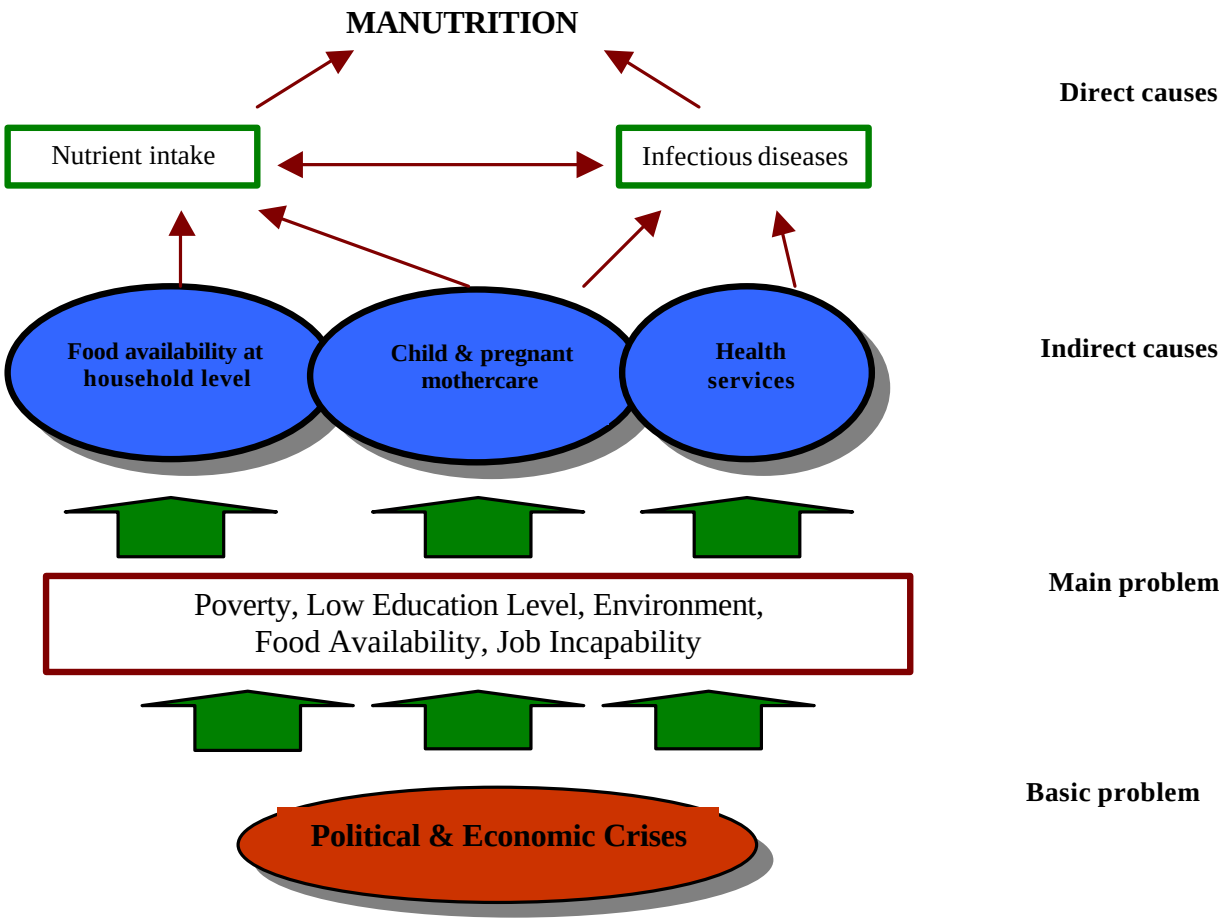


Figure 12. Illustration of the Various Factors that Influence Nutritional Health

Research Questions

There are four primary aspects of the food and nutrition research agenda developed through the ENHR process: epidemiology of nutritional deficiency, biomedical aspects of nutritional deficiency, nutrition technology, and food technology.

Epidemiology of nutritional deficiency

- What are the prevalence, consequences, and lifestyle factors affecting protein energy malnutrition, micronutrients, obesity, and cataract?

Biomedical aspects of nutritional deficiency

- What are the etiology and consequences of protein energy malnutrition, micronutrients, obesity, and cataract?

Nutrition technology

- What is the bioavailability of micronutrients?
- How can micronutrient fortification be most effectively achieved?
- How can quality control for micronutrients be assured?
- What is appropriate food formulation for prevention of protein energy malnutrition?
- What is appropriate food supplementation for prevention of protein energy malnutrition?
- What are effective, local specific interventions for prevention of protein energy malnutrition?
- What is appropriate food formulation for prevention/treatment of obesity?
- What are appropriate food supplements for prevention/treatment of obesity/over nutrition?
- What are effective interventions for prevention/treatment of obesity?

Food technology

- What is the availability of food security?
- How can toxic substances be controlled to ensure food safety?
- How can hazardous doses be controlled to ensure food safety?
- What is appropriate surveillance to ensure food safety?
- What are appropriate standards for special-needs diets?
- What are appropriate standard recipes for special-needs diets?

Outputs: How the information generated by the Food and Nutrition Research Agenda will be used by Decision-Makers

Implementation of the research prioritized here will serve to inform decisions that must be made by policy makers and program managers within the next ten years to meet the health care challenges facing Indonesia.

It is expected that the information generated by this research will contribute to development and implementation of the following elements in the food and nutrition program:

- evidence-based policy for prevention of PEM, micronutrient deficiency, obesity, and cataract;
- strategy for overcoming consequences of PEM, micronutrient deficiency, obesity, and cataract;

- strategy for appropriate prevention interventions;
- improved therapy regimens;
- technologies for nutrient fortification;
- technologies for food supplementation;
- methods for screening;
- improved bioavailability of nutrients in foods through equitable distribution system;
- improved food quality;
- formulation of new or improved foods;
- development of intervention programs for remote areas;
- improved quality of human resources;
- improved technology in food formulation for the obese;
- standards for health diet (food guidance);
- improved methods for preservation of nutrient values in food;
- improved methods of distribution to secure equitable accessibility of food;
- improved technology for food processing at factory and household levels;
- strategy for community education;
- standards for special-needs diets; and
- standard recipes for special-needs diets.

CHAPTER V

FOLLOW-UP

To strengthen the results of policies that will serve as reference/basis for the implementation of health research and development programs, it is imperative to take further action in conformity with the role and function of the respective agent/organizer of health development:

1. In drawing up a health program, each institution must optimalize the inter relatedness between task and function and the priority and national agenda of the 2002-2005 health studies.
2. The fact that our research and development resources are still very limited. Therefore, in order to optimally benefit from the existing resources, efforts should be made to establish partnerships between the program organizers, Research and Development institutions, universities, businesses and donor agencies.
3. Optimalizing the National Health Research and Development Network. Imperative to secure the commitment of all health research and development agents to support communication, coordination and synchronization of the development of health science and technology in the process of decision making and implementation. Also, to avoid duplication and overlapping.
4. In accordance with its role and function as regulated in the Decision of the Minister of Health No. 1179A/1999 on the National Policy of Health Research and Development, the National Institutes of Health Research and Development, Ministry of Health is acting as the focal point in the national health research and development activities, the development of partnership in particular.

The following short-term steps should be taken to follow-up on several of the a fore stated crucial aspects:

1. Socialize Priority and the 2002-2005 National Health Research Agenda to all health research and development institutions in Indonesia, the decision-makers in the field of health and related matters, the Indonesian Institute of Sciences (LIPI), the National Research Board, the Consortium of Health Sciences, the Indonesian Public Health Faculty Collaborative Body, the State Ministry for Research & Technology, the State Ministry for Women Empowerment, professional organizations, donor agencies, private and international health agencies, City, Regency and Provincial Health Office. Socialization is conducted by organizing meetings and workshops, physical dissemination of documents or via the internet and other possible ways and means.
2. Assist research development institutions at National, Province and Regency/City level in describing the National Priority and Health Research Agenda (2002-2005) in their short-range or middle-range health research plans.
3. Engage in discussions to encourage partnership in conducting the priority studies of certain health research and development institutions that has been described as being in accordance with the task and function of those respective institutions.

4. Enhance the physical and managerial capability of the National Health Research and Development Network with the Institutes of Health Research and Development as he focal point, in order to facilitate the optimal implementation of its function.
5. Discuss the priority and national agenda of these health studies or those that have been brought into line with the Health Research and Development institutions, for possible funding and to avoid duplication.

The following middle-range steps should be taken:

1. Review the method and mechanism in determining the priority and agenda of health studies. The objective is to increase the validity and reliability of method and mechanism, to simplify and facilitate the determining process at national, province and regency/city level or at the level of the health research and development institution itself.
2. Conduct an annual review and mid-term review of the priority and national agenda of health studies. Review is crucial in view of the rapid changes and development of health requirements in Indonesia.
3. Develop a national and sub-national health research system that can serve as an umbrella sheltering and unifying the health research priorities and agenda with other important components systematically. These components cover augmentation of capacity, funding, management, dissemination and utilization of results, performance evaluation and health research network.
4. Conduct resource flows activities of health studies in Indonesia. These activities are expected to be able to depict the general, specific and overall situation against the funding of health research in Indonesia. Besides, resource flows activities are expected to provide efficiency and efficacy analysis for the overall funding of health research in Indonesia.
5. Discuss the national priority and agenda for health research with decision makers at national province, regency/city level, donor agencies and other important elements to get their commitment and to realize the availability of funding for national/province and regency/city health research studies.

CHAPTER VI

FUNDING

Funding will be based on the type of study being planned. The type of study can be divided into 3 groups:

1. Laboratory studies
2. Field surveys
3. A combination of 1 and 2

Funding for laboratory studies are easier to estimate. Unit fees for laboratory tests can be standardized, whereas field studies depend on the local condition (difficult location, lack of facilities and the revenues of the area concerned). This of course is a rough estimate and is not binding, depending on the availability of funds, so any study that cannot be finished in the scheduled year can be continued in the following year.

Planning the estimated funding for the 2002-2005 research studies throughout Indonesia is no easy matter, for the respective topics might be detailed into a number of study titles of different locations. Presenting an estimation of funding is required in order for the organizers and donors to get the full picture of both in-country funding and foreign grants. For example, if it has been estimated that within a 4 year period of time, 10 research titles can be completed for one topic, the estimated amount will be 10 times per title. It is actually more important to point out at what year the planned study will be conducted.

The respective research and development institutions are responsible for securing the funding for conducting research studies, both from the budget of the respective institutions, collaboration with private partners and from foreign aid. That's why the estimated funding is stated in US$ in order to facilitate donor agencies interested in aiding the study of topics. See Appendix 2 for details of the funding estimate.

CHAPTER VII

CONCLUSION

The National Priority and Agenda for Health Research serve as reference or implementery basis for the research and development activities of the organizing institutions, both in-country and abroad, in order to carry out the National Institutes of Health Research and Development activities effectively, efficiently and systematically and to benefit from the results. They may also help private enterprises and self-supporting social institutions understand the direction and objective of health science and technology conducted by the government and the prioritized fields and areas focused on. It is hoped that the Priority and National Agenda of Health Research may serve as the basis for all Health Research and Development subjects to establish synergy that is beneficial to the overall development of health.

The range of topics spelled out in the Priority and National Agenda of Health Research of 2002-2005, gives room to health programs and research and development institutions for actions related to endeavors toward Indonesia Healthy 2010. Research studies covered by the range of topics will be given high priority. This does not mean that the studies that are not included in the range of topics cannot be funded and conducted as well. Research studies that are not related to these topics will be considered according to their significance to the development and implementation of health science and technology.

The National Priority and Agenda of Health Research 2002-2005 is expected to lead toward integrated and directed endeavors to escalate national health research and development activities. The success of these endeavors is determined by the partnership of all related elements to execute the national health research and development program consistently. In conformity with its role and function, the Institute of Health Research and Development of the RI Ministry of Health, shall act as the focal point in the national health research and development activities, and in partnership-building in particular.

Commitment to inter- health research and development organizers ' collaboration in the National Health Research and Development Network is considered crucial as this can determine the degree of success in achieving the optimal rate of health for the Indonesian people.

Health Behavior Research Area

Sub Area	Sub-Sub Area	Out Put	Users	Topic Examples
Legal Aspect:				
Policy and Regulation	• Perception and knowledge of social norms among officials and community • Risk factors	• System of social norms and regulations that minimize risk factors to the community (incl. advertising) • Institutionalization of social norms and regulations	• Government stakeholders • Community	• Mapping of related problems • Analysis of standard values for hazardous substances • Models for institutionalization of health policies • Community KAP on risks of smoking
Socio-Economics	• Advertising • Taxation of tobacco and other hazardous substances • Costs of unhealthy behavior	• Tax • Regulations that minimize risk factors to community • Policy of government resources in promotion of healthy behaviors	• Producers • Government stakeholders • Consumers	• Model methods for assessing tobacco taxes • Assessment of impacts of smoking on productivity • Assessment of influence of advertising on smoking among youth
Cultural-Based Health Resilience	• Health behavior related aspects of culture • Impacts of crisis and globalization	• Scientific and culture-based strategy for promoting healthy behaviors	• Community groups • Health care providers • Public	• Assessment of cultural heritage on breast feeding and its impacts on infant growth • Patterns of food consumption among pregnant women during crisis in selected areas • Retrospective study of physical exercise, and eating behavior patterns among ageing population in urban areas
Messages	• High risk groups • Locally specific groups • Decision makers and healthcare providers evaluation	• Effective IEC campaign targeted to identified high risk groups and selected local groups • Assessment of IEC campaign for selected target groups • Advocacy campaign targeted to decision makers and health care providers	• Health care providers • Public	• Model of IEC interventions for high risk groups • Analysis of correlation between financial rewards, and performance of Carders • Effective performance indications for IEC

Sub Area	Sub-Sub Area	Out Put	Users	Topic Examples
Technology	• Modern media • Traditional media	• Selection of appropriate media to reach selected IEC target groups • Innovative strategy for use of modern, and traditional media to reach selected target groups	• Health policy makers • Policy makers in related areas • Health care providers • Public	• Assessment of health communication methods used in both modern and traditional media • Model for family empowerment in decreasing MMR • Assessment of parental behaviors in areas of highest and lower IMR
Resources	• Dissemination • Funding • Accessibility	• Adequate budget for dissemination of IEC campaigns • Strategy for equity and outreach in information dissemination	• Health policy makers • Policy makers in related areas • Health care providers • Public	• Model for using ethno medicine finding as basis for appropriate technology in MCH care • Analysis of outreach of health information through mass media • Model for optimization of resources in delivering health information • Model for rapid assessment of mass media in delivering health and disease-related information
Monitoring and Evaluation	• Messages • Media • Resources • Behavior change	• Improved messages for target groups • Enhanced media • Strategies for reaching target groups • Strengthened strategies for mobilization of both national and local resources • System for monitoring health related behaviors among target groups	• Health policy makers • Policy makers in related areas • Health care provider • Public	• Evaluation of utilization of research findings in health behaviors • Analysis of the impacts of technology on behavior changes • Model for collaboration between MOH and Ministry of Information in delivery of health messages • Inventory of research needs from perspective of providers producers, and community

Health System Research Area

Sub Area	Sub-Sub Area	Out Put	Users	Topic Examples
Decentralization	Organizational	Development of an administrative structure for health services at each level of decentralization	• Ministry of Home Affairs • Ministry of Health	Model of health services system for decentralization
	Structure and Institutionalization	• Development of technique for institutionalization of decentralization policy • Law and Regulation related to health reform & implementation of decentralization	• Ministry of Health • National Development Planning Agency • District Development Planning Agency • Local Government • National Institute of Administration • National Institute of Employee Affairs • Central for Health & Training Education • Central for Health Personnel Education • Ministry of Justice & Human Rights	• Trial of health services decentralization model • Model of institutionalization of health services • Inventory and development of laws & regulations related to health reform and decentralization
	Health Services Delivery	• Development of health services delivery • Standard for programs of each type of health services unit • Health Services quality standard for each type of health services unit	• Ministry of Home Affairs • Ministry of Health • National Development Planning Agency • District Development Planning Agency • Local Government • National Institute of Administration • National Institute of Employee Affairs • Central for Health & Training Education • Central for Health Personnel Education	• Model of health services delivery in implementation of decentralization • Quality assurance for health services in each type of health services unit • Hospital and Health Center Accreditation

	Human Resources	• Creation of expert-based typology for HHR under decentralization • Standard for competency of HHR • Development of recruitment system based on capacity building on career development • Development of capacity building and career development • Development of reward system and career development	• Ministry of Health • Ministry of Home Affairs	• Model of expert-based typology for HHR under decentralization • Model of recruitment system • HHR needs assessment for each level of administration • Model for HHR in provinces where human resources are limited • Training needs assessment and capacity building in each level of administration • Job analysis and performance indicators of HHR • Model of reward system & continuing education for HHR

Sub Area	Sub-Sub Area	Out Put	Users	Topic Examples
	Budget and other resources	• Development of system for local contribution to health services budget for each administration level • Standard for facilities and equipment at each type of health unit	• Ministry of Health • Ministry of Home Affairs • National Development Planning Agency • District Development Planning Agency • Local Government • National Institute of Administration • National Institute of Employee Affairs	• Assessment of local capacity to contribute to national health budget • Demand, costing and pricing • Analysis of each type of health Services • Need assessment and development of facilities & equipment model for each type of health services unit • Facilities based survey
	Community Participation	Local specific strategies for development of community participation in health programs	• Ministry of Health • Ministry of Home Affairs	• Model for community participation in health programs • Methods and techniques in community empowerment in health programs
	Information System	• Development of Health information system • Development of National research & development information system • Development of National health research & development network	Ministry of Health	• Information needs assessment • Model of health information system & national research & development information system • Model of health research & development network at central and provincial level
Managed Care	Service delivery system	• Development of service delivery system • Management strategy of managed care	• Ministry of Health • Ministry of Home Affairs • Local Government • Ministry of Social Affairs	• Model of health services delivery in managed care • Model of service delivery management in managed care
	Resources	• Strategy for mobilization of resources • Unit cost of health services in managed care	• Ministry of Health • Ministry of Home Affairs • Local Government • Ministry of Social Affairs	• Model of cost recovery • Unit cost and cost effectiveness analysis for each type of services

Sub Area	Sub-Sub Area	Out Put	Users	Topic Examples
Professionalism	Education and training of HHR	• Curriculum standard for education and training institutions of HHR • Competencies standard for each type of HHR	• Ministry of Health • Ministry of Social Affairs • Central for Health & Training Education	Expert based typology for HRR model
	Recruitment, performance and utilization of HHR	• Recruitment System for HHR • Performance standard for HHR	• Central for Health Personnel Education Local government • Local Government • NGO	• Model for recruitment system based on capacity and competency of HHR • Needs assessment and quality assurance for health services
	Information system	Evidence based data planning	• National Development Planning Agency • District Development Planning Agency	Model for information system of HHR
Health Paradigm	Health services delivery approach	• Formulation of health services system that is based on prevention and promotion • Development of positive, negative and new indicators for district health system	• Ministry of Health • Ministry of Home Affairs • Local government • NGO	• Analysis of impact of shitting health services from curative to promotion and prevention • Performance measurement of district health system • Health Services responsiveness among providers and consumers
	Institutionalization community participation	• Institutionalization of Health paradigm • Local specific strategies for development of community participation in health paradigm		• Model for institutionalization of health paradigm • Model for community participation in health paradigm
Others	Health technology	• High technologies in health services delivery • Appropriate technologies in health services delivery	• Ministry of Health • Ministry of Home Affairs • Local Government • Ministry of Justice & Human Rights	• Safety and efficiency of high technology in health services delivery • Model of appropriate technologies in health services delivery
	Traditional medicine	Inventory of traditional healers and their type of services Development of standard for traditional healer's competency		• Inventory of traditional healers and type of services • Standard for traditional healer's competence

Communicable Disease Research Area

Sub Area	Sub-Sub Area	Out Put	Users	Topic Examples
Acute Respiratory infection (ARI)/pneumonia	• Etiology • Prevalence • Mortality • Surveillance • Antimicrobial resistance • Early Diagnosis	• Development of innovative communicable disease control program for promotion, prevention, cure, and rehabilitation • Development of early warning and surveillance systems including for times of crisis • Development of new diagnostic methods • Development of system for outbreak response • Development of model for effective case management	• MOH program managers • Health service providers • Pharmaceutical and medical equipment companies • Researchers • Legislators • NGO's • International donors	• Epidemiology of pneumonia among under-5s • Surveillance system of ARI and pneumonia • Development of early diagnosis method for pneumonia • Antimicrobial resistance
Lung Tuberculosis	• Prevalence diagnostic method • Multi-Drug Resistance (MDR) • Vaccine • Drug Regimen • Management of control program	• Development of innovative communicable disease control program for promotion, prevention, cure, and rehabilitation • Development of early warning and surveillance system including for times of crisis • Development of new diagnostic methods • Development and improvement of vaccines and schedule of immunization • Development of model for effective case management	• MOH program managers • Health service providers • Pharmaceutical and medical equipment companies • Researchers • Legislators • NGO's • International donors	• Family participation in DOTS (direct observed treatment short course) implementation • Early diagnosis of meningitis tuberculosis among children • Improvement of internal and external quality assurance of step-wise gram-strained test of tuberculosis • Mapping of primary MDR of tuberculosis • Improvement of coverage and treatment of lung tuberculosis in health centre maximizing cadres participation • Institutionalization of TB control program at schools
Cholera	• Outbreak • Drug resistance	• Development of innovative communicable disease control program for promotion, prevention, cure, and rehabilitation • Development of early warning and surveillance systems including for times of crisis • Development of system for outbreak response • Development of model for effective case management	• MOH program managers • Health service providers • Pharmaceutical and medical equipment companies • Researchers • Legislators • NGO's • International donors	• Study on cholera outbreak in areas of poor water resources • Study on antibiotic resistance

Sub Area	Sub-Sub Area	Out Put	Users	Topic Examples
Typhoid Fever and other salmonellas	• Prevalence • Diagnosis • Resistance • Carrier • Mortality • Vaccine	• Development of innovative communicable disease control program for promotion, prevention, cure, and rehabilitation • Development of early warning and surveillance system including for times of crisis • Development of new diagnostic methods • Development and improvement of vaccines and schedule of immunization • Development of model for effective case management	• MOH program managers • Health service providers • Pharmaceutical and medical equipment companies • Researchers • Legislators • NGO's • International donors	• Epidemiology of typhoid fever in new transmigration areas • Improvement of laboratory diagnostic of typhoid fever with monazite separation • Immunity and side-effects of VICPS conjugate typhoid • Efficacy vaccine among children and adults
ETEC (Entero toxic E*scherechia coli*), EHEC (Entero hemorrhagic *E. coli*)	• Prevalence • Outbreak • Resistance • Diagnosis • Mortality • Vaccine	• Development of innovative communicable disease control program for promotion, prevention, cure, and rehabilitation • Development of early warning and surveillance system including for times of crisis • Development of new diagnostic methods • Development and improvement of vaccines and schedule of immunization • Development of system for outbreak response • Development of model for effective case management	• MOH program managers • Health service providers • Pharmaceutical and medical equipment companies • Researchers • Legislators • NGO's • International donors	• Prevalence of ETEC/EHEC among domestic and foreign tourists and other population • Epidemiology of ETEC/EHEC outbreak • Efficacy of ETEC/EHEC vaccine among children vaccine among children children
Viral Hepatitis	• Etiology • Prevalence • Surveillance • Mortality • Outbreak • Transmission method • Vaccine • Diagnosis • Case management	• Development of innovative communicable disease control program for promotion, prevention, cure, and rehabilitation • Development of early warning and surveillance systems including for times of crisis • Development of new diagnostic methods • Development and improvement of vaccines and schedule of immunization • Development of system for outbreak response • Development of model for effective case management	• MOH program managers • Health service providers • Pharmaceutical and medical equipment companies • Researchers	• Epidemiology of hepatitis E in transmigration areas and the control program • Impact of the health provider's behaviors on the transmission of hepatitis • Cellular response of hepatitis B among individuals lacking anti HBs protection after 3 times of vaccination

Sub Area	Sub-Sub Area	Out Put	Users	Topic Examples
Soil Transmitted Helminthiasis	• Prevalence • Treatment • Control program	• Development of innovative communicable disease control program for promotion, prevention, cure, and rehabilitation • Development of early warning and surveillance systems including for times of crisis • Development of model for effective case management	• MOH program managers • Health service providers • Pharmaceutical and medical equipment companies • Researchers • Legislators • NGO's • International donors	• Comprehensive worm control program in school environment • Improvement of school capability in diagnosing worm infection
Malaria	• Prevalence • Drug resistance • Diagnosis • Drug regimen • Management of control program • Mortality • Outbreak • Vaccine	• Development of innovative communicable disease control program for promotion, prevention, cure, and rehabilitation • Development of early warning and surveillance systems including for times of crisis • Development of new diagnostic methods • Development and improvement of vaccines and schedule of immunization • Development of system for outbreak response • Development of model for effective case management	• MOH program managers • Health service providers • Pharmaceutical and medical equipment companies • Researchers • Legislators • NGO's • International donors	• Geographical distribution of *P. falciparum* and *P. vivax* resistance to standard program drugs • Cost analysis of early diagnosis method of *P. falciparum* • Guidelines on self diagnosis and self-treatment for tourists • Trials of the efficacy of combination therapy

Sub Area	Sub-Sub Area	Out Put	Users	Topic Examples
Dengue Hemorrhagic fever	• Etiology • Prevalence • Surveillance • Diagnosis • Vaccine • Mortality • Vector • Pathogenesis • Control Program • Outbreak • Case Management	• Development of innovative communicable disease control program for promotion, prevention, cure, and rehabilitation • Development of early warning and surveillance systems including for times of crisis • Development of new diagnostic methods • Development and improvement of vaccines and schedule of immunization • Development of system for outbreak response • Development of model for effective case management	• MOH program managers • Health service providers • Pharmaceutical and medical equipment companies • Researchers • Legislators • NGO's • International donors	• Development of early warning system for dengue hemorrhagic fever • Monitoring of dengue sub types • Development of DHF prevention and control program in endemic areas • Case management model for DHF in health centre • The benefit of early diagnostic in case management of DHF
HIV/AIDS	• Prevalence • Surveillance • Mortality • Diagnosis • Treatment • Vaccine • Case management • Race immunology	• Development of innovative communication disease control program for promotion, prevention, cure, and rehabilitation • Development of early warning and surveillance systems including for times of crisis • Development of new diagnostic methods • Development of model for effective case management	• MOH program managers • Health service providers • Pharmaceutical and medical equipment companies • Researchers • Legislators • NGO's • International donors	• HIV prevalence among TB patients • The impact of IEC intervention on condom use in among target populations • Pattern of opportunistic infection among AIDS patients in Indonesia • The impact of anti-viral treatment of pregnant women with HIV on the HIV status of the newborn

Sub Area	Sub-Sub Area	Out Put	Users	Topic Examples
Gonorrhea, chlamydeous, syphilis and other STDs	• Prevalence • Surveillance • Resistance • Treatment • Microbiocide	• Development of innovative communicable control program for promotion, prevention, cure, and rehabilitation • Development of early warning and surveillance systems including for times of crisis • Development of model for effective case management	• MOH program managers • Health service providers • Pharmaceutical and medical equipment companies • Researchers • Legislators • NGO's • International donors	• Pattern of gonorrheal resistance in Indonesia • The impact of comprehensive management of STDs on the prevalence of gonorrhea and chlamydeous in localization • Development of early diagnosis methods for chlamydeous • Development of eradication method for syphilis • The impact of bacterial vagueness treatment on reproductive health • Study of STD's among street children
Prevention of emerging infectious & outbreak • Bacterial • Viral • Parasitic	• Etiology • Prevalence • Case management • Prevention and control	• Development of innovative communicable disease control program for promotion, prevention, cure, and rehabilitation • Development of early warning system including for times of crisis • Development of new diagnostic methods • Development of system for outbreak response • Development of model for effective case management	• MOH program managers • Health service providers • Pharmaceutical and medical equipment companies • Researchers • Legislators • NGO's • International donors	• Epidemiology of diarrhea and respiratory tract infection outbreaks • Epidemiology of hepatitis and encephalitis outbreaks

Food Poisoning	• Etiology • Prevalence • Case management	• Development of innovative communicable disease control program for promotion, prevention, cure, and rehabilitation • Development of early warning and surveillance systems including for times of crisis • Development of system for outbreak response • Development of model for effective case management	• MOH program managers • Health service providers • Pharmaceutical and medical equipment companies • Researchers • Legislators • NGO's • International donors	

Sub Area	Sub-Sub Area	Out Put	Users	Topic Examples
• Polio • Measles • Diphtheria /Pertussis/Tetanus • Tetanus neonatorum	• Eradication program • Vaccine schedule • Vaccine schedule • Vaccine schedule	• Development of innovative communicable disease control program for promotion, prevention, cure, and rehabilitation • Development of early warning and surveillance systems including for times of crisis • Development and improvement of vaccines and schedule of immunization • Development of system for outbreak response	• MOH program managers • Health service providers • Pharmaceutical and medical equipment companies • Researchers • Legislators • NGO's • International donors	• Trials of combination vaccines/ improved vaccine schedules

Non-Communicable Disease Research Area

No.	Sub Area	Sub-Sub Area	Out Put	Users	Topic Examples
1	Cardiovascular Disease (hypertension, stroke, ischemic, heart disease, rheumatic)	• Extend and magnitude • Specificity • Survival • Morbidity • Mortality • Environment • Behavior • Socio-economic and culture • Promotion • Prevention • Treatment • Rehabilitation • Law enforcement	• Improved strategies for prevention and early detection and surveillance system as well • Indicators for health technology • Typology of health technology • New and/or improved health technologies • Improved basic and applied sciences • Standard for new technology • Guidance for application of health technologies • Guidance for Accreditation • Guidance for standardization	• Health policy and other decision makers • Health providers • Scientists • Health Service Units • Health industry • Educational Units • Research Units • Community • NGO • Donors	• Model of surveillance system for behaviors and diseases • Evaluation of mistral valve replacement • Analysis of quality of life in myocardial infarction survivors • Ethnic characteristics of coronary heart disease in Indonesia • The role of lifestyle on cardiovascular status • Inventory of health promotion, disease prevention, treatment and rehabilitation technologies • Analysis of cost effectiveness of PTCA in management of coronary artery stenosis • Health education model • Model for integrated prevention, diagnosis, early detection, and treatment of disease

2	Neoplasm's (breast, uterine, cervix, lung, nasopharyingeal, colo-rectal, prostate, liver, pancreatic, cancers	• Extend and magnitude • Specificity • Survival • Morbidity • Mortality • Environment • Behavior • Socio-economic and cultural • Promotion • Prevention • Treatment • Rehabilitation • Law enforcement	• Improved strategies for prevention and early detection and surveillance system as well • Indicators for health technology • Typology of health technology • New and/or improved health technologies • Improved basic and applied sciences • Standard for new technology • Guidance for application of health technologies • Guidance for accreditation standards • Guidance for standardization	• Health policy and other decision makers • Health providers • Health industry • Scientists • Health Service Units • Educational Units • Research Units • Community • NGO • Donors	• Model of surveillance system for behavioral diseases • Ethnic characteristics of cancer in Indonesia • Food habit as risk factors for cancer • Cost-effectiveness analysis of early cancer detection • Model of community development in integrated disease control • Evaluation of hepatitis B vaccination • Model of carcinogenic control

No.	Sub Area	Sub-Sub Area	Out Put	Users	Topic Examples
3	Accident (traffic, poisoning, violence against women and children)	• Extend and magnitude • Specificity • Morbidity • Disability • Case fatality • Environment • Behavior • Socio-economic and cultural • Promotion • Prevention • Treatment • Rehabilitation • Law enforcement	• Improved strategies for prevention and early detection • Indicators for health technology • Typology of health technology • New and/or improved health technologies • Improved basic and applied sciences • Standard for new technology • Guidance for application of health technologies • Guidance for accreditation standards • Guidance for standardization	• Health policy and other decision makers • Health providers • Scientists • Health Service Units • Educational Units • Research Units • Community • NGOs • Donors	• Model of surveillance/system for behavior and diseases
4	Endocrine Disease (diabetes mellitus)	• Extend and magnitude • Specificity • complication • Survival • Morbidity • Mortality • Environment • Behavior • Socio-economic and cultural • Promotion • Prevention • Treatment • Rehabilitation • Law enforcement	• Improved strategies for prevention and early detection and surveillance as well • Indicators for health technology • Typology of health technology • New and/or improved health technologies • Improved basic and applied sciences • Standard for new technology • Guidance for application of health technologies • Guidance for accreditation standards • Guidance for standardization	• Health policy and other decision makers • Health providers • Health industry • Scientists • Health Service Units • Educational Units • Research Units • Community • NGO • Donors	• Model of surveillance/system for behaviors and diseases

No.	Sub Area	Sub-Sub Area	Out Put	Users	Topic Examples
5	Mental Disorders (schizophrenia, depression, dementia, neurosis, drug abuse including alcoholism, smoking, minor mental disturbances)	• Extend and magnitude • Specificity • Life expect nary • Morbidity • Mortality • Environment • Behavior • Socio-economic and cultural • Promotion • Prevention • Treatment • Rehabilitation • Law enforcement	• Improved strategies for prevention and early detection and surveillance system as well • Indicators for health technology • Typology of health technology • New and/or improved health technologies • Improved basic and applied sciences • Standard for new technology • Guidance for application of health technologies • Guidance for accreditation standards • Guidance for standardization	• Health policy and other decision makers • Health providers • Health industry • Scientists • Health Service Units • Educational Units • Research Units • Community • NGO • Donor	• Model of surveillance/system for behaviors and diseases
6	Neurological Diseases (cephalic, epilepsy	• Extend and magnitude • Specificity • Survival • Morbidity • Mortality • Environment • Behavior • Socio-economic and cultural • Promotion • Prevention • Treatment • Rehabilitation • Law enforcement	• Improved strategies for prevention and early detection and surveillance system as well • Indicators for health technology • Typology of health technology • New and/or improved health technologies • Improved basic and applied sciences • Standard for new technology • Guidance for application of health technologies • Guidance for accreditation standards • Guidance for standardization	• Health policy and other decision makers • Health providers • Health industry • Scientists • Health Service Units • Educational Units • Research Units • Community • NGO • Donor	• Model of surveillance/system for behavior and diseases

No.	Sub Area	Sub-Sub Area	Out Put	Users	Topic Examples
7	• Chronic • Obstructive • Lung Disease • Bronchial asthma • Chronic bronchitis • Bronchiections	• Extend and magnitude • Specificity • Survival • Morbidity • Mortality • Environment • Behavior • Socio-economic and cultural • Biological • Promotion • Prevention • Treatment • Rehabilitation • Law enforcement	• Improved strategies for prevention and early detection and surveillance system as well • Indicators for health technology • Typology of health technology • New and/or improved health technologies • Improved basic and applied sciences • Standard for new technology • Guidance for application of health technologies • Guidance for accreditation standards • Guidance for standardization	• Health policy and other decision makers • Health providers • Health industry • Scientists • Health Service Units • Educational Units • Research Units • Community • NGO • Donor	• Model of surveillance/system for behaviors and diseases
8	Muscular-Skeletal Disease (rheumatic, gout, osteoporosis, low back pain, osteoarthritis)	• Extend and magnitude • Specificity complication • Morbidity • Mortality • Environment • Behavior • Socio-economic and cultural • Biological • Promotion • Prevention • Treatment • Rehabilitation • Law enforcement	• Improved strategies for prevention and early detection and surveillance system as well • Indicators for health technology • Typology of health technology • New and/or improved health technologies • Improved basic and applied sciences • Standard for new technology • Guidance for application of health technologies • Guidance for accreditation standards • Guidance for standardization	• Health policy and other decision makers • Health providers • Health industry • Scientists • Health Service Units • Educational Units • Research Units • Community • NGO • Donors	• Model of surveillance/system for behavior and diseases

No.	Sub Area	Sub-Sub Area	Out Put	Users	Topic Examples
9	Sense organ (cataract, deafness)	• Extend and magnitude • Specificity • Disability • Morbidity • Environment • Behavior • Socio-economic and cultural • Biological • Promotion • Prevention • Treatment • Rehabilitation • Law enforcement	• Improved strategies for prevention and early detection and surveillance system as well • Indicators for health technology • Typology of health technology • New and/or improved health technologies • Improved basic and applied sciences • Standard for new technology • Guidance for application of health technologies • Guidance for accreditation standards • Guidance for standardization	• Health policy and other decision makers • Health providers • Health industry • Scientists • Health Service Units • Educational Units • Research Units • Community • NGO • Donors	• Model of surveillance/system for behaviors and diseases
10	Digestive Disease (gastritis, liver ciihosis, oral and dental health)	• Extend and magnitude • Specificity • Survival • Morbidity • Mortality • Environment • Behavior • Socio-economic and cultural • Biological • Promotion • Prevention • Treatment • Rehabilitation • Law enforcement	• Improved strategies for prevention and early detection and surveillance system as well • Indicators for health technology • Typology of health technology • New and/or improved health technologies • Improved basic and applied sciences • Standard for new technology • Guidance for application of health technologies • Guidance for accreditation standards • Guidance for standardization	• Health policy and other decision makers • Health providers • Health industry • Scientists • Health Service Units • Educational Units • Research Units • Community • NGOs • Donors	• Model o f surveillance/system for behaviors and diseases

No.	Sub Area	Sub-Sub Area	Out Put	Users	Topic Examples
11	Genital-urinary Disease (chronic renal failure)	• Extend and magnitude • Specificity • Survival • Morbidity • Mortality • Environment • Behavior • Socio-economic and cultural • Biological • Promotion • Prevention • Treatment • Rehabilitation • Law enforcement	• Improved strategies for prevention and early detection and surveillance system as well • Indicators for health technology • Typology of health technology • New and/or improved health technologies • Improved basic and applied sciences • Standard for new technology • Guidance for application of health technologies • Guidance for accreditation standards • Guidance for standardization	• Health policy and other decision makers • Health providers • Health industry • Scientists • Health Service Units • Educational Units • Research Units • Community • NGO • Donor	• Model of surveillance/system for behaviors and diseases

Demografi Research Area

Sub Area	Sub-Sub Area	Out Put	Users	Topic Examples
Management				
Vital Statistics (VS) Registration System (death)	• Resources • Reporting and Recording • Monitoring and Evaluation • Utilization	• Development of effective vital registration (VR) system that includes staffing, software, and facilities • Development of system for reporting and recording • Utilization of VR information for policy decision making, health planning, and development of projections	• Ministry of Home Affairs • Ministry of Health • National Development Planning Agency • District Development Planning Agency • Researchers • Local government • Universities • International agencies	• Needs assessment of VS • Model vital statistics instruments • Model for organization and management of VR system • Analysis of health policy • Assessment of policy options
Demographic & Epidemiology Transition				
Fertility	• Reproductive Age • Contraceptive prevalence • Contraceptive methods • Impact of Crisis	• Development of national demographic and family planning policy • Development of family planning/RH policy • Development of FP / RH service delivery programs • Development of new /traditional methods	• National Family Planning Agency • Ministry of Health • National Development Planning Agency	• Analysis of local specific demographic and family planning policy • Analysis of effectiveness of family planning/reproductive health service delivery • Assessment of impact of the economic crisis on availability and use of contraceptives • Assessment of impact of crisis on fertility patterns • Assessment of impact of crisis on FP/RH service delivery
Morbidity, Mortality, and Disability	• Magnitude of problem • Risk factors • Impact of crisis	Policy for service delivery to diminish rates of morbidity, mortality, disability	• Ministry of Health • Ministry of Social Affairs • National Family Planning Agency	• Assessment of impact of economic crisis on demographic transition model • Assessment of impact of economic crisis on epidemiological transition model
Ageing	• Social conditions of elderly • Impact of crisis	Development of health programs for elderly	• Ministry of Health • Ministry of Social Affairs	• Assessment of health needs and demand for services among elderly

Sub Area	Sub-Sub Area	Out Put	Users	Topic Examples
Morbidity & Mortality				
Reproductive Health	• Infertility & its risk factors • Impact of crisis	Policy for service delivery and treatment of risk factors for infertility	• Ministry of Health • National Family Planning Agency • Schools of Medicine	• Analysis of prevalence of infertility and its causes • Assessment of impact of economic crisis on mother and child
Mobility				
• Urbanization • Migration • Refugees	• Epidemiological patterns urban and industrial areas • Prevalence of accident • Behavior charge • Health and Social Welfare services delivery	• Development of policy for urban health especially in pockets of poverty • Policy for service delivery during crisis situation	• Ministry of Health • Ministry of Social Affairs • National Family Planning Agency • Local government	Assessment of impacts of industrialization, urbanization, and migration on causes of death and social problems

Pharmacy Research Area

No.	Sub area		Output	Users	Topic example
1	Production	**1..1. Traditional /Herbal medicines**			
		a. Cultivation	• Prime cultivate • Superior seed	• MoH • Program Managers • Pharmaceutical and traditional-medicine industries • Communities • Universities	• Cultivation to improve antimalarial or antiviral medicinal plants and other antiparasite medicinal plants • Cultivation of medicinal plants for raw material sources • Cultivation of antiviral plants and other antiparasite plants • Cultivation of malarial vector control plants
		b. Cultivation through tissue culture technique	• Cultivate with higher content of active component • Cultivate wich is resistant to pests and plant diseases	Idem	• Cultivation technology development of higher artemisinin content of cultivate *Artemisia cina* • Study on the influence of growth hormone and medium on secondary metabolites of medicinal plants • Development of antiviral and antimalarial cultivates which resistant to pest and plant diseases
		c. Conservation	• Conservation data of exotic and endanger medicinal plants • Conservation technology	Idem	• Method development on conservation of exotic and endanger antiinfective plants • Technology development on conservation of anti degeneratif plants

		d. Post harvest technology	• Processing technology of plant marerials • Storage technology • High quality of plant materials	Idem	• Technology development on processing , storing, of *radix and herbal simplicia* of medicinal plants containing volatile oil • Post harvest technology development on maintaining good quality of plant materials

No.	Sub area		Output	Users	Topic example
		e. Identification, standardization, and control of quality and quantity	• Plants identities data • Extracts identities data (phytochemical and chromatogram) • Standard characterization data • Quantity of active entity data • Drug identification methods • Drug quantitative methods • Standardization method	• MoH • Program Managers • Pharmaceutical and traditional-medicine industries • Communities • Universities	• Identification and standardization of antimalarial plants • Identification of alcoholic exstract of antimalarial plants • Standardization technology of extraction • Quantification method development of total alkaloid in alcoholic extract of *C.siamiea* Lamk

		f. Safety and efficacy • activity (preclinic) • effectivity (preclinic and clinic) • efficacy	• Acute, chronic, sub-chronic, and special toxicity data • Activity data (preclinic in animal study) • Doses • Formulation (jamu) • Development of method for toxicity and activity studies • Effectivity data • Pharmaceutical product • Phytopharmaceutical products • Eficacy data (clinical trial fase I, II, III) Effectivenes data (clinical trial fase IV)	Idem	• Toxicity tests development of acute, chronic, sub-chronic, mutagenic, and special of several antibacterial medicinal plants • Hepatoxicity test of mecinal plants and *jamus* • Activity and effectivity tests of antiparasites and antiviral phytopharmaceuticals • Activity and effectivity tests of anticancer phytopharmaceuticals • Clinical trial of antiparasites, antiviral, and antituberculosis phytopharmaceuticals • Preparation of dosage form of antiparasites, antiviral, and antituberculosis phytopharmaceuticals • Development of method for DHF activities

No.	Sub area		Output	Users	Topic example
		1..2. Raw material for pharmaceuticals			
		a. Identification and standardi- zation	• Physical-chemical identity data • Standards characteristics data • Purity and potential data • Identification method • Characterization test method • Purity test method • Standardized raw materials	• Pharmaceutical industries • Communities • Universities	• Production method of high bioavailability antianaemia • Fermentation technology development of glucose from carbohydrates • Purification technology development of pharmaceutical grade tapioca for tablets exepient • Searching for replacement of formalin on food preservative
		b. Control of quality and quantity	• Qualitative analysis method • Quantititative analysis method • Quality data	Idem	• Identity test method development of raw pharmaceutical tapioca • Development of characterization, qualitative and quantitative analysis of drug raw materials for monograph in Pharmacopoeia • Development of rapid quantitative test using Thin Layer Chromatography-densitometer method of drug content in pharmaceutical products
		c. Cost-benefit ratio	• Cost-benefit data • Economic value data	Idem	• *Cost-benefit ratio* study of antibacterial raw materials • *Cost-benefit ratio* study of antihypertention

		d. Safety, activity, effectivity, and efficacy	• Toxicity, activity, effectivity, and efficacy data • Toxicity, effectivity, and efficacy test method • Safe and effective raw materials (products)	Idem	• Antianemia raw materials development • Safety method development using PCR technique • Minimum Inhibition Concentration determination of antiTB drugs

No.	Sub area		Output	Users	Topic example
		1.3. Pharmaceutical dosage form design			
		a. Preformulation	• Raw materials data • Additive materials data • Stability and degredation poducts data • Preparation methods	• Pharmaceutical industries • Communities • Uuniversities	• Study on external environment influence (storage and transportation, etc) on drug raw material stability • Study on internal environment influence (body fluids, gastric fluids, etc) on raw materials stability.
		b. Dosage form rationalisation	• Rational dosage form of pharmaceuticals • Rational composition of pharmaceuticals • Safe, effective, stable, convenient dosage form	Idem	• Dosage form development of chloroquin in an effort to enhance *compliance* and reduce side effects • Dosage form development of stable combination of antiTB rifampicin, ethambutol and INH.
		c. Pharmaceutical production	• Good manufacture production • Accurate and precise method of production	Idem	• Development of method in prevention cross contamination antiincetive production • Antioxidant use study in pharmaceutical products • Stable formulation development of antiTB ethambutol

No.	Sub area		Output	Users	Topic example
		d. Quality control system	• Stability test method • Qualitative, Quantitative, and potency test methods • Bioavailability data • Bioequivalence data • Method of bioavalibility test • Method of bioequivalence test • Pharmaceutical equivalence data • Generic pharmaceutical product with bioavailability, or bioequivalent/ pharmaceutical-equivalent to the innovators products,	• Pharmaceutical industries • Communities • Universities	• Qualitative and quantitative testing method development of certain generic products • Bioequivalence testing of antihypertention generic products • Bioequivalence testing of generic products • Stability testing of pharmaceutical dosage form in body fluids • Stability testing of pharmaceutical dosage form on certain temperatures and pHs
		e. Responsible personnel	• Guidance • Standards • Methods	Idem	• Development of clinical testing guidance • Validation method development • Guidance development of good pharmaceutical production • Guidance development of *total quality management*

		f. Clinical trial fase I, II, and III	• Clinical data • Adverse reactions data • Pharmacokinetics data • Pharmacodynamics data	Idem	• Antimalarial effectivity testing of *C. siamea* Lamk on subjects with acute *falciparum* malaria. • Anthelmintics effectivity testing of *Artemisia. siamea* on ascaris infected schoolchildren • Pharmacokinetics profile investigation of antimalarial on healthy subjects of certain population

No.	Sub area		Output	Users	Topic example
2	**Management**				
		2.1. Laws and regulations	• Model • Draft • Data • Indicator	• Central/local government	• Generic drug price-list domestic and international • Rapid assessment of pharmaceutical management: based upon indicators
		2. 2. Production	• Standard	• Pharmaceutical industries • Central/local government	• Pharmaceutical production standards
		2. 3. Distribution	• System • Model	• Central/local government • Private	• Development of pharmaceutical and medical device distribution systems from central to kabupaten • Development of medical device management in DDW storage at distric level
		2. 4. Utilization	• National Essential drug Data • Baseline data	• Central/local government • Health services • Hospital	• Usage of essential drugs in public health service facilities • Baseline data on usage of drugs in rehabilitation center for narcotics and psychotropics • Baseline data on usage of traditional medicine in ethnic groups • Surveilence system din Indonesia
		2.5. Quality assurance	• Pharmaceutical care equity	• Health services	• Pharmaceutical care equity
		2. 6. Professionality	• Data • Model	• Professional organization • Central/local government	• Development of pharmaceutical human resources

No.	Sub area		Output	Users	Topic example
		2.7. Farmaco-economics	• Cost effectiveness analysis system • Cost benefit analysis system • Method of cost effectiveness analysis	• Hospital • Public health services	• Cost effectiveness analysis of TB drugs • Antibiotics cost benefit ratio • Development of financing models of medical devices in central and district level • Development of cost effectiveness analysis models of medical devices usage in hospitals
		2.8. Information System	• System	• Central/local government • Hospitals	• Drug and traditional drug information system.
3	**Pharmacy care**				
		3.1. Safety and efficacy			
		a. Drug regimen	• Drug regimen for special population (elderly, children, certain ethnic, and geographics)	• MoH • Drug companies • Communities • Universities • Institutions • BPOM	• Efficacy evaluation of antimalarial and TB drugs for mass treatment • Efficacy evaluation of alternative drugs (traditional drugs) • Drug efficacy study on special population (elderly, children, ethnical and geographical groups)
		b. Drug Resistency	• Antiinfection recycling	Idem	• Multiple resitance surveilence for kabupaten level • Antimicrobial resistance pattern (mostly used) in public health services • Usage of antibiotics in animal health

		c. Safety	• Monitoring system • Unwanted adverse reaction data/ side effects of marketed drug • Safety data of medical device • Drug interaction data	Idem	• Reinforcing monitoring systems on drug side effects in the distric level • Side effects that is related with cardiovascular effects • Side effects of antiepileptics • Drug interaction • Safety exploration of critical medical devices usage in hospitals

No.	Sub area		Output	Users	Topic example
		d. Rational use of drug, traditional medicine, and cosmetics	• Rational compotition of traditional drugs • Rational therapy in health services, health insurances and hospitals • Guidace in rational medical devices use	• MoH • BPOM	• Drug usage study in kabupaten levels • Transfer of knowledge of rational drug use assessment method • Analysis method development of rational medical devices use in hospitals
		e. Drug information	• KAP • Rational self medication	• MoH • BPOM	• Safety information assessment of raw materials of traditional drugs and food suplements/healthy foods • Communication method development of drug information for community and parametric measurements of communication effectivenes • Exploration of drug information sources
		3.2. Communicty protection			
		a. Analysis of residue in food, and pharmaceutical products	• Residue data of pesticides, antibiotics, hormon, heavy metals, bacteria, mold, fungi, aflatoxin, in foods , cosmetics, and other pharmaceutical products • Contamination monitoring systems in food and other pharmaceutical products • Analysis contamination method	• MoH • BPOM • Communities • Ministry of Trade & Industry	• Residue analysis and assessment method on pesticides, antibiotics in food and drinks. • Analysis and assessment of growth hormones in chicken products • Analysis and assessment method on heavy metals in food and pharmaceutical products • Analysis and assessment method development on contamination of bacteria (*Pseudomonas, Staphylococcus,. E. coli, Salmonella*) in cosmetics • Analysis and assessment method development on mold and aflatoxin in traditional medicines and cosmetics

No.	Sub area		Output	Users	Topic example
		b. Analysis of additive in food and pharmaceutical products	• Food and pharmaceutical additive data • Monitoring System • Method of analysis	• MoH • BPOM • Communities • Ministry of Trade & Industry	• Assessment and analyisis method development additives that is not allowed in food and pharmaceutical products
		c. Analysis of pork components and other haram materials in pharmaceuticals	• Data of pharmaceuticals and • Food containing pork component and other haram materials • Method of analyisis of pork component and other haram materials	• MoH • BPOM • Communities • Ministry of Trade & Industry • Ministry of Religion	• Analysis method of pork components in drugs, cosmetics, foods and beverages
		d. Detection method of pharmaceutical products adulteration	• Data base for adulterated pharmaceutical • products • Data base of adulteration materials • Monitoring system	• MoH • BPOM	• Product exploration on counterfeit and counterfeiting material in food supplement or traditional medicines
		e. Analyisis of hazardous substances, cigarettes and alcohol	• Data base of cigarettes and alcohol usage in certain populations • Biological effects on active and passive smokers • Interaction data of drugs on smokers or alcoholics	• MoH • BPOM	• Exploration of cigarettes and alcohol use in special population such as students and women. • Metabolistic studies, disposition, and efficacy of drugs on active and passive smokers or alcoholics.

Environmental & Occupational Health Research Area

No.	Sub Area	Sub-Sub Area	Out Put	Users	Topic Examples
1	**Physical Environment**				
	Human Settlement	Management and surveillance	System for management and surveillance of human settlement	• Ministry of Health • Intersectoral planners and managers • National Development Planning Agency • District Development Planning Agency • Universities • Health services • Research and development • Industry • NGO's • Environmental Impact agency • Community	• Model of surveillance system
		Policy and Law	Development of effective policy and law governing settlement		• Analysis of policy
		Technology	Development of new and improved technologies for healthy settlements		• Model of development of healthy housing and settlement
	Public Places	Management and surveillance	System for management and surveillance of public places	• Ministry of Health • Planners and Managers • Across sectors • National Development Planning Agency • Local Planning Boards • Universities • Health services • Research and development • Industry • NGO's • Environmental Impact agency • Community	Model of surveillance system
		Policy and law	Development of effective policy and law governing public places		Analysis of policy
		Technology	Development of new and improved technologies for healthy public places		Model development of healthy public places

No.	Sub Area	Sub-Sub Area	Out Put	Users	Topic Examples
	Working Environment	Management and surveillance	System for management and surveillance of working environment	• Ministry of Health and Social Welfare • Planners and managers • Across sectors • National Development Planning Agency • District Development Planning Agency • Universities • Health services • Research and development • Industry • NGO's • Environmental Impact Agency • Community	• Model surveillance system
		Policy and law	Development of effective policy and law governing working environment		• Analysis of policy • Testing technologies for industrial waste treatment
		Technology	Development of new and improved technologies for healthy working environment		
	Occupational Health	Management and surveillance	System for management and surveillance of occupational health	• Ministry of Health • Intersectoral planners and managers • National Development Planning Agency • Local Planning Boards • Universities • Health services • Research and development • Industry • NGO's • Environmental Impact Agency	• Models of surveillance system • Analysis of policy • Model for occupational health • Model for community participation and partnerships in occupational health
		Policy and law	Development of effective policy and law governing occupational health		
		Technology	Development of new and improved technologies for occupational health		

No.	Sub Area	Sub-Sub Area	Out Put	Users	Topic Examples
2	**Biological Environmental**				
	Fauna	Vectors	• Identification of vectors species. • Incrimination of vectors. • Determination of vectors distribution. • Information of bioecology and genetic of vectors.	• MoH programmers • Districts Health Offices • Health Services • Research and Development • Industry • NGO's • Environmental impact agency • Community	• Analysis of policy on vector biology & control
		Hosts and Reservoirs	• Determination of hosts species and reservoirs • Determination of hosts distributions and reservoirs • Information of bioecology and genetic of hosts and reservoirs	• MoH programmers • Health Services • Research and Development • Industry • NGO's • Environmental impact agency • Community	• Emerging diseases assessment (vectors & reservoirs)
		Biological agents (predators, parasites: virus, rickettsia, bacteria, protozoa, helminths, etc)	• Determination of biological agents for vectors control • Determination of parasitoid		• Control program assessment • Transmission reduction risk • Population genetic of vectors
		Policy and law enforcement	• Formulation of policy and law in regard to vectors, hosts and reservoirs	• Districts Health Offices • National Planning Board • Local Planning Board • Health services • Environmental impact agency	
		Management & Surveillance	• System for management and surveillance of fauna as vectors, hosts and reservoirs		

No.	Sub Area	Sub-Sub Area	Out Put	Users	Topic Examples
		Technology	• Development of new and improved technology for: vector/reservoir control, host management and biological agents identification	• Universities • Research & development • Industry • NGO'S • Community	
	Flora	Land clearing	• Conservation of specific habitat to avoid increasing vectors population.	• MoH • District Health Offices • Intersectoral planners and managers • National Development Planning Agency • District Development Planning Agency • Community • NGO's	• Analysis of policy on conservation of vegetation. • Analysis of policy on biodiversity of vegetation.
		Biodiversity	• Identification of plant species useful for biological control. • Identification of vegetation related to breeding places of vectors.		
		Policy and law	• Formulation of law and policy with regard to land clearing and biodiversity		
		Management & Surveillance	• System for management of resources • System for surveillance		
		Technology	• Development of new and improved technology for biological control • Development of new and improved technology to manipulate environment		

Food and Nutrition Research Area

Sub Area	Sub-sub Area	Output	Users	Topics Example
A. Nutrition	1. Protein Energy Malnutrition (PEM)	Strategy and management: Model or combating PEM	Local government, health program, managers, MoH	Development of strategy and management for combating PEM suitable with local condition
		Associated nutrition problems	Health program managers, academicians, NGOs, policy makers, MoH	Assessment of associated nutritional problems through biochemical examination
		Main PEM determinants in high prevalence areas	Local government, health program managers, policy makers, academicians, MoH	Assessment of main determinants of PEM in high prevalence areas
		Micronutrients for effective PEM alleviation	Local government, health programs managers, policy makers, academicians, MoH	Efficacy of micronutrient supplementation on growth and development of children with PEM
		Factors related to exclusive breastfeeding practises	Local government, health programs managers, policy makers, academicians, MoH	Assessment of exclusive breastfeeding practise and its related factors in areas with high prevalence of PEM

Sub Area	Sub-sub Area	Output	Users	Topics Example
	2. Vitamin A Deficiency (VAD)	Main determinants of VAD in high prevalence areas	Local government, health program managers, policy makers, academicians, MoH	Assessment of main determinants of VAD in high prevalence areas
		Strategy and management of Vit. A capsule distribution	Local government, health program managers, policy makers, MoH	Exploration of community potency for effective and efficient Vit. A capsule distribution
	3. Iodine Deficiency Disorder (IDD)	Type of pollutants related to IDD	Local government, health program managers, policy makers, academicians, MoH	The effect of pollutants on Iodine deficiency in endemic areas
		Strategy and management of Iodized salt distribution and quality control	Local government, health program managers, policy makers, MoH, Ministry of Trade and Industry	Exploration of community potency for controlling the quality of iodized salt at different level of distribution sites
		Factors related to new born cretins	Local government, health program managers, policy makers, MoH, academicians	Identification of factors related to the new born babies with sign of iodine deficiency and cretins

Sub Area	Sub-sub Area	Output	Users	Topics Example
	4. Anemia	Main factors related to anemia in vulnerable groups	Local government, health program managers, policy makers, MoH, academicians	Assessment of anemia and its main underlying factors in rural and urban poors, among: 1. Children U5Y 2. Teenager girls 3. Pregnant women 4. Working productivity
		Effective dose of iron supplementation	Local government, health program makers, policy makers, MoH, academicians	Dose response effect of iron supplementation on the improvement of iron status among different vulnerable groups
	5. Other micronutrients	Amount of micronutrients required for food fortification	Health program managers, policy makers, MoH, academicians	Absorption, bioavailability and quality control of micronutrients in fortified foods
		Micronutrient requirements for different age-sex groups	Health program managers, policy makers, MoH, academicians	Assessment of micronutrients intake, and evaluation of its bioavailability among healthy individuals at different age-sex groups
		Magnitude of the Vit. B2, B12 and folic acid deficiency	Health program managers, policy makers, MoH, academicians	Assessment of Vit.B2, Vit. B12 and folate status among anemia vulnerable groups
		Effective intervention for anemia	Health program managers, policy makers, MoH, academicians	The effect of Vit. B2, Vit. B12 and folate supplementation in addition to iron on the improvement of iron status

Sub Area	Sub-sub Area	Output	Users	Topics Example
	6. Obesity	Etiology of obesity prevalence of thalasemia	Health program managers, policy makers, MoH, academicians	Food consumption pattern and lifestyle among obese people at different age-sex groups
			Government/local government., health program managers, academicians	Assessment of the magnitude of thalasemia and its associated factors
	7. Degenerative diseases	Etiology of degenerative diseases	Health program managers, policy makers, MoH, academicians	Assessment of the etiology and lifestyle among people with degenerative diseases
		Micronutrients for the prevention of cataract	Health program managers, policy makers, MoH, academicians	Effect of micronutrients supplementation on the prevention of cataract
	8. Nutrition services	Strategy for nutritional status improvement of the refugees and people in emergency situation	Local government, health program managers, policy makers, MoH	Nutrition status and associated factors of the people in the refugee camps and emergency situation
		Model for nutrition services in the different institutions	Local government, health program managers, policy makers, MoH	Assessment of nutrition problems and nutrition services of the people in the different institutions
		Recommendation for policy formulation and planning	Government/local government., policy makers	Nutrition program and policy analysis

Sub Area	Sub-sub Area	Output	Users	Topics Example
		Model for nutrition clinic services	Local government, health program managers, policy makers, MoH	Development and standardization of nutrition clinic services (nutrition counseling, dietetics, intervention)
		Model for the im-provement of physical fitness	Local government, health program managers, policy makers, MoH, NGOs	Physical fitness of productive ages, school age and elderly and its related factors
	9. Aging/elderly	Nutrition services for elderly	Local government, health program managers, policy makers, MoH, NGOs	Nutrition factors related to elderly and ageing
B. Food	10. Food safety	Guidelines for food safety monitoring	Local government, health program managers, policy makers, MoH, NGOs	Standardization for food monitoring, evaluation, safety and food quality monitoring
	11. Dietetics	Diet for alleviating nutria problem in elderly	Health program managers, policy makers, MoH, NGOs	Assessment of appropriate diets related to nutritional problems in elderly
		Diets for athletes	Government/local government, sport organization, health program managers, NGOs	Assessment of appropriate diets for athletes in the different types of sports

Sub Area	Sub-sub Area	Output	Users	Topics Example
	12. Food technology	Complementary food based on local potency	Government/local government, sport organization, health program managers, NGOs	Development of complementary foods based on local potency and community empowerment
		Food formula for the prevention and treatment of obesity	Government/local government, sport organization, health program managers, NGOs	Development of effective food formula for the prevention and treatment of obesity
		Guidelines for food fortification	Government/local government, sport organizationm health program managers, food industry	Standardization of food fortification for home, small, and mediun scale food industries
C. Food and Nutrition Information	13.Mapping	Map of main nutriation problem in routing base	Government/local government, sport organization, health program managers, NGOs	Mapping survey for main nutrition problems (PEM, VAD, IDD and anemia) at district and sub district levels every 5 years
		Map of micronutrient deficiency problems on routine base	Government/local government, health program managers, NGOs, academicians	Mapping survey for other micro nutrition problems (Zn, Se,vitamins) at the district/sub-district levels every 10 years
		Map of energy, protein, and other nutrients deficit	Government/local government, health program managers, NGOs, academicians	Households and specific groups food consumption survey representatives for district/sub-district levels every 5 years

Sub Area	Sub-sub Area	Output	Users	Topics Example
		Map of other types of nutrition problems (obesity, degeneratif disease)	Government/local government, health program managers, NGOs, academicians	Mapping survey for obesity and degeratif diseases at district and sub-district levels every 10 years
	14. Database	Indonesia Food and Nutrient Composition Table (DKBM)	Government/local government, health managers, NGOs, community, academicians, dieticians	Completing nutrient content analysis based on food items and food menus from all parts of Indonesia
		Data bank of food menus from all over Indonesia	Government/local government, health managers, NGOs, community, academicians, dieticians	Assessment of food menus consumed in all over Indonesia (multi years activity) to be stores in computer as an information database
		Recommended Dietary Allowance (RDA) for macro and micro nutrients	Government/local government, health managers, NGOs, community, academicians, dieticians	Development of RDA for macro and micro nutrients for different age-sex groups

Sub Area	Sub-sub Area	Output	Users	Topics Example
	15. Nutrition Surveillance	Indicators of food and nutrition problems suitable for local conditions	Government/local government, health managers, NGOs, community, academicians, policy makers	Exploration of simple indicators for monitoring of food and nutrition problems suitable for local conditions (district level)
		Manual for the assessment nutrition status, the analysis, and presentation of the results	Government/local government, health managers, NGOs, community, academicians	Development of manual fot the assessment of nutrition problems, the analysis, and the presentation of results
		Nutritional status indicator for socio-economic status of the community	Government/local government, health managers, NGOs, community, academicians, policy makers	Evaluation of growth faltering pattern of children below 2 years of age as an indicator for socio-economic status of the people
	16. Nutrition Education		Government/local government, health managers, NGOs, community, academicians, dieticians	Development and standardization of methods of nutrition counseling in the community
			Government/local government, health managers, NGOs, community, academicians, dieticians	Development of nutrition guidance for specific nutritional problems in the community (PUGS)

Sub Area	Sub-sub Area	Output	Users	Topics Example
			Government/local government, health managers, NGOs, community, academicians, dieticians	Development of media appropriate for local uses in the effort for alleviating nutrition problems and the improvement of better lifestyle
	17. Nutrition Education	Strategy for solving nutrition problems	Government/local government, health managers, NGOs, community, academicians	Empowerment of community to solve their own nutrition programs
D. Health System Nutrition	18. Nutrition Program	Improvent of the performance of nutrition programs	Government/local government, health managers, NGOs, community, academicians	Operational research to improve the performance of nutrition program that fit with local condition

Research Topics for Health Behavior (including estimated cost)

Research Topics	US $	2002	2003	2004	2005
1. Community Development Approach Toward Healthy City	200,000				
2. Model of Behavior Changes to Prevent Cardiovascular Disease	200,000				
3. Community Health Campaigns to Overcome: Drug and Alcohol Abuse, Unwanted Teenage Pregnancy, HIV/AIDS, TBC, Malaria, DHF, ARI, and Smoking Habit	950,000				
4. Socio-Cultural Factors to be Considered in the Control of Vector-Borne Diseases	100,000				
5. Community Development Model to Prevent Environmental Pollution	150,000				
6. Community Development Model to Minimized Health Impacts of Social Disorder	150,000				
7. System for Monitoring Health Related Behavior Change	150,000				
8. Local Specific Strategies for Development of Community Participation in the Health Paradigm	200,000				
9. Models for Family Empowerment in Decreasing MMR	100,000				
10. Model for Community Participation and Partnership in Occupational Health	50,000				

Research Topics for Health System (including estimated cost)

Research Topics	US $	2002	2003	2004	2005
Health System and Decentralization:					
1. Model of institution for health service	150,000		50,000	50,000	50,000
2. Quality assurance for health services in each type of health service center	150,000		50,000	50,000	50,000
3. Accreditation system for health school	400,000	100,000	100,000	100,000	100,000
4. Standard for human resources for health need	200,000	100,000	100,000		
5. Training need assessment and capacity building of district health system's stakeholder in implementation of decentralization	200,000		100,000		100,000
6. Regulation system for recruitment of foreign health workers	100,000	100,000			
7. Model of health services system for decentralization	250,000	125,000	125,000		
8. Inventory and development of law and regulation related to health reform and decentralization	100,000		100,000		
9. Model of health services delivery in implementation of decentralization (model development, trial and evaluation)	250,000	125,000	125,000		
10. Hospital and health center accreditation	150,000			75,000	75,000
11. Model of expert base typology for HHR under decentralization	200,000		100,000	100,000	
12. HHR needs assessment for each level of administration	100,000		100,000		
13. Model for HHR in provinces where human resources are limited	200,000			100,000	100,000
14. Job analysis and performance indicators of HHR	125,000		125,000		
15. Model of reward system & continuing education for HHR	125,000			125,000	
16. Assessment of local capacity to contribute national health budget	100,000		100,000		
17. Need assessment and development of facilities & equipment model for each type of health services unit	150,000			150,000	
18. Facilities based survey	175,000			175,000	
19. Model for community participation in health programs	200,000			100,000	100,000
20. Methods and techniques in community empowering in health programs	125,000				125,000
21. Information needs assessment	100,000		100,000		
22. Model of health information system & national research & development information system	225,000			125,000	100,000
23. Model of health research & development network at central and provincial levels	150,000				150,000
MANAGED CARE:					

1. Implementation of managed care at universities	200,000	50,000	90,000	60,000	
Research Topics	**US $**	**2002**	**2003**	**2004**	**2005**
2. Implementation of managed care at religius groups (closed communities)	200,000	50,000	90,000	60,000	
3. Health care management improvement	150,000		40,000	70,000	40,000
4. Model of health services delivery in managed care	150,000		50,000	50,000	50,000
5. Model of service delivery management in managed care	100,000		50,000	50,000	
6. Model of cost recovery	50,000		50,000		
7. Unit cost and cost effectiveness analysis for each type of services	50,000			50,000	
PROFESSIONALISM:					
1. Competency standard for human resources for health	250,000		125,000	125,000	
2. Development of recruitment system based on capacity building and career development	300,000	100,000	100,000	100,000	
3. Career development system for health workers	100,000		100,000		
4. Model for information system of HHR	200,000	100,000	100,000		
HEALTH PARADIGM:					
1. Analysis of impact of shifting health services from curative to promotion and prevention	150,000			150,000	
2. Performance measurement of district health system	100,000				100,000
3. Health services responsiveness among providers and consumers	150,000			150,000	
4. Model for institutionalisation of health paradigm	150,000				150,000
5. Model for community participation in health paradigm	100,000		50,000	50,000	
6. Health promoting school implementation at urban slums	100,000	25,000	25,000	25,000	25,000
OTHERS:					
1. Empowering local government and NGO in detecting pockets of endemic goiter for the management and monitoring of IDD control program	200,000	100,000	50,000	25,000	25,000
2. Simple technology application in clinical laboratory services	150,000		50,000	50,000	50,000
3. Clinical experimental phase II for diabetes mellitus using *Andrographis paniculata* and *Eugenia polyantha*	75,000		75,000		
4. Factors influencing healthy condition in senior citizen (>60 Years Old)	50,000			50,000	
5. Acupuncture effects for smoking youth groups	50,000			50,000	
6. Safety and efficiency of high technology in health services delivery	150,000				150,000
7. Model of appropriate technologies in health services delivery	200,000				200,000
8. Inventory of traditional healers and type of services	150,000			150,000	

9. Standard for traditional healer's competence	200,000			100,000	100,000
10. Health services system during disasters	750,000		250,000	250,000	250,000

Research Topics for Communicable Diseases (including estimated cost)

Research Topics	US $	2002	2003	2004	2005
1. Food poison technology for reduce the risk	30,000		10,000	10,000	10,000
2. Epidemiology of *Meningococcus meningitis* on haj pilgrims returning to Indonesia	15,000				
3. Efficacy of *Meningococcus meningitis* quadrivalent vaccine	20,000				
4. Field trial of new DPT-HB/DPT-HB-Hib vaccine produce by Biofarma, phase 2	Donor				
5. Field trial of new DPT-HB/DPT-HB-Hib vaccine produce by Biofarma, phase 3	Donor				
6. Field trial of new DPT-HB/DPT-HB-Hib vaccine produce by Biofarma, phase 4	Donor				
7. Combination vaccine in uniject	20,000				
8. IC test for tetanus	Donor				
9. Prevalence and transmission of Hep B among street children	15,000				
10. Effectivity of "worm capsule" treatment to typhoid fever	10,000				
11. Enteroviruses studies in Indonesia (polliomyelitis, AFP, etc)	140,000	30,000	30,000	40,000	40,000
12. Epidemiological studies of measles virus in Indonesia (genotyping, acquired immunity, vaccine immune response)	130,000	30,000	30,000	35,000	35,000
13. Epidemiological studies of dengue and related viruses in Indonesia (genotyping, seroepidemiology of JEV, chikungunya, vector control, immunopathology DHF)	175,000	40,000	40,000	45,000	50,000
14. Surveillance of HIV and related viruses in specific community in (correlation of MTB and HIV, military recruit, outpatients, HIV control program trial)	200,000	50,000	50,000	50,000	50,000
15. Community based studies of hepatitis viruses infection in Indonesia (epidemiology of HEV, immune response HB vaccine, prevalence of HCV)	120,000	30,000	30,000	30,000	30,000
16. Emerging infectious diseases studies in Indonesia (hantavirus, herpesvirus, rabies, JEV, HFMD)	130,000	30,000	30,000	35,000	35,000
17. Surveillance of influenza viruses in Indonesia (virus isolation, genotyping, immune response)	125,000	30,000	30,000	30,000	35,000
18. Antimicrobial susceptibility studies on bacterial infection (MDR-MTB; gonorrhea, MRSA, etc)	135,000	30,000	30,000	35,000	40,000
19. Validation studies of viral and bacterial infection diagnostic methods (PCR; DNA probe, elisa, etc)	100,000	25,000	25,000	25,000	25,000
20. Biotechnology and molecular biology approach to develop diagnostic methods (epidemiology approach – *meningitis* Tb)	15,000		15,000		

21. Biotechnology and molecular biology approach to develop diagnostic methods (epidemiology approach – MDR Tb)	75,000		25,000	25,000	25,000
22. Biotechnology and molecular biology approach to develop diagnostic methods (epidemiology approach – atypical Tb)	85,000		35,000	25,000	25,000
23. Biotechnology and molecular biology approach to develop diagnostic methods (epidemiology approach – DHF)	85,000		35,000	25,000	25,000
24. Biotechnology and molecular biology approach to develop diagnostic methods (epidemiology approach – malaria)	40,000		15,000	15,000	10,000

Research Topics	US $	2002	2003	2004	2005
25. Biomedical immunology and phatofisiology (approach to develop diagnostic methods – DHF)	30,000		10,000	10,000	10,000
Topic: Improving the diagnosis, treatment, prevention and promotion of malaria					
Sub topic: validity study on malaria diagnosis, treatment, prevention and promotion					
26. Validity study on clinical and laboratory diagnosis	30,000	30,000			
27. Evaluation of drugs efficacy	30,000	30,000			
28. Study on drug alternative/s	35,000		35,000		
29. Study on the prevention of transmission of the disease	50,000	25,000	25,000		
30. Study on malaria (health) promotion	30,000	30,000			
31. Patient management and services	50,000	25,000	25,000		
Sub topic:Intervention study uUsing valid clinical and laboratory diagnostic, drug alternative/s, prevention and promotion method					
32. Large scale trials on the impact of drug combination on transmission potential and on delaying emergence of resistance: probable combinations of CQ + S/P + PQ	50,000		25,000	25,000	
33. Cost-effectiveness and the impact of malaria monotherapy versus combined therapy	25,000		25,000		
34. Operational use of more sensitive tools for monitoring of *P. falciparum* drug resistance	30,000			30,000	
Sub topic:evaluation of the intervention	*300,000*		*100,000*	*100,000*	*100,000*
35. Surveillance for and analysis of drug resistant parasite strains	50,000		25,000	25,000	
36. Cost analysis of early diagnosis method of *P. falciparum* and *P. vivax*	40,000		20,000	20,000	
37. Guideline on self-diagosis and self-treatment for tourists	50,000			50,000	
38. Mapping of primary MDR of Tb in Java	20,800		20,800		
39. Study on cholera outbreak in areas of poor water	16,700			16,700	
40. Epidemiology of typhoid fever in urban area	25,000				
41. Improvement of laboratory diagnosis of typhoid fever with monosite separation	12,500				
42. Prevalence of ETEC/EHEC among domestic and foreign tourism	14,583				

Research Topics for Demography (including estimated cost)

Research Topics	US $	2002	2003	2004	2005
1. Disemination of results analysis of Surkesnas 2001 (report, seminar/workshop)	25,000				
2. Further analysis of: Surkesnas 2001 (National Health Survey) and Indonesia Demographic and Health Survey 2002 (IDHS)	100,000				
3. Improvement of the capacity of core team (consultancy training)	300,000				
4. Susarkes (Health Facility Survey) 2003	300,000				
5. Surkesda (Local Health Survey) development packages	170,000				
6. National Health Survey 2004	500,000				
7. Developing appropriate health indicators	80,000				

Research Topics for Pharmacy (including estimated cost)

Sub area	Research Topic	US$	2002	2003	2004	2005
Production	**1.1 Traditional medicine / medicinal plants**					
	a. Cultivation					
	• Cultivation of medicinal plants of antimalarial, antiTB, antiviral, antihypertension, antidiabetes and antidegenerative diseases (5 plants/year/disease)	90,000.00		30,000.00	30,000.00	30,000.00
	b. Tissue culture cultivation					
	• Increase secondary metabolism (10 metabolites/year)	90,000.00		30,000.00	30,000.00	30,000.00
	· Cultivate development method (10 cultivatesr/year)	30,000.00		10,000.00	10,000.00	10,000.00
	c. Conservation					
	•Development method to conservate rare medicinal plants (5 plants/year)	15,000.00		5,000.00	5,000.00	5,000.00
	· Conservation method of near extinct medicinal plants (5 plants/year)	15,000.00		5,000.00	5,000.00	5,000.00
	d. Identification, standardization and quality control					
	• Identification and standardization of active component of medicinal plants for antimalarial, antifertility, antiviral, antiTB, and antibacterial (5 plants/year/deseases)	89,000.00	14,000.00	25,000.00	25,000.00	25,000.00
	•Sequencing analysis of active component in medicinal plants	30,000.00		10,000.00	10,000.00	10,000.00
	· Medicinal plants standardization (10 plants/year)	90,000.00		30,000.00	30,000.00	30,000.00
	· Identification and standardization of extracts (10 extracts /year/desease)	90,000.00		30,000.00	30,000.00	30,000.00
	e. Safety, activity, effectivity and efficacy					
	· Acute, subchronic, and chronic toxicity testing of medicinal plants (10 plants/year)	60,000.00		20,000.00	20,000.00	20,000.00
	•Mutagenesis testing of medicinal plants using bacteria, and PCR technique (10 plants/year)	60,000.00		20,000.00	20,000.00	20,000.00
	•Hepatotoxicity testing in medicinal plants and jamus (10 plants/year)	42,000.00		14,000.00	14,000.00	14,000.00
	•Activity testing of medicinal plants (10 plants/year)	63,000.00		21,000.00	21,000.00	21,000.00
	· Effectivity testing of medicinal plants (Clinical trial phase I, II, and III) (10 plants/year)	150,000.00		50,000.00	50,000.00	50,000.00
	•Efficacy testing of medicinal plants (10 plants/year)	90,000.00		30,000.00	30,000.00	30,000.00

Sub area	Research Topic	US$	2002	2003	2004	2005
	1.2 Pharmaceutical raw materials					
	a. Production					
	•Biotechnological development of producing pharmaceutical raw materials and excipients (5 prms/year)	90,000.00		30,000.00	30,000.00	30,000.00
	· Recombinant engineering to produce enzymes, vaccines and hormones	12,000.00		4,000.00	4,000.00	4,000.00
	•Explore methods of purifying excipients from natural resources (5 prms/year)	12,000.00		4,000.00	4,000.00	4,000.00
	•Extraction, isolation, and structure elucidation of pharmaceutical raw materials from plants (5 prms/year)	51,000.00		17,000.00	17,000.00	17,000.00
	a. Identification and standardization					
	· Development identity of pharmaceutical raw materials and excipients (5 prms/year) for pharmacopoeia	75,000.00		25,000.00	25,000.00	25,000.00
	•Pharmaceutical raw materials standardization	75,000.00		25,000.00	25,000.00	25,000.00
	b. Quality and quantity control					
	•Method development of quality and quantity analysis of pharmaceutical raw materials and excipients (5 prms/year)	75,000.00		25,000.00	25,000.00	25,000.00
	c. Cost benefit ratio					
	· Cost-benefit ratio from pharmaceutical raw materials (5 prms/tahun)	12,000.00		4,000.00	4,000.00	4,000.00
	· Cost-benefit ratio from excipients (5 excps/year)	12,000.00		4,000.00	4,000.00	4,000.00
	d. safety, activity, effectivity and efficacy					
	•Acute, suchronic, chronic testing of pharmaceutical raw materials and excipients (5 prms and excps/year)	75,000.00		25,000.00	25,000.00	25,000.00
	•Mutagenicity testing of pharmaceutical raw materials (5 prms and /year)	51,000.00		17,000.00	17,000.00	17,000.00
	•Hepatotoxicity testing of pharmaceutical raw materials (prms and excps/year)	12,000.00		4,000.00	4,000.00	4,00.00
	•Safety testing of cosmetic raw materials (5 crms/year)	10,000.00		5,000.00	5,000.00	25,000.00
	•Activity testing of pharmaceutical raw materials and excipients (5 prm and excps/year)	75,000.00		25,000.00	25,000.00	25,000.00
	· Effectivity testing of pharmaceutical raw materials and excipients (clinical trial phase I, II, and III) (5 prms or excps/year)	75,000.00		25,000.00	25,000.00	25,000.00
	•Efficacy testing of pharmaceutical raw materials and excipients (5 prms and excps/year)	75,000.00		25,000.00	25,000.00	25,000.00

Sub area	Research Topic	US$	2002	2003	2004	2005
	1.3 Pharmaceutical dosageform design					
	a. Preformulation					
	•External environments influence (space, physical , transportation, storage) on stability of pharmaceutical dosage forms	30,000.00		10,000.00	10,000.00	10,000.00
	•Internal environments influence (body fluids incl. Plasma, gastric fluids, etc) on pharmaceutical dosage forms	30,000.00		10,000.00	10,000.00	10,000.00
	b. Rationalization of dosage form					
	•Dosage form development to decrease side effects and increase compliance.	15,000.00		5,000.00	5,000.00	5,000.00
	•Dosage form development of antiTB towards stabilizing combinations	15,000.00		10,000.00	5,000.00	
	c. Dosage form production					
	•Development of production methods of pharmaceutical dosage forms to avoid cross-contamination	15,000.00		5,000.00	5,000.00	5,000.00
	•Usage of antioxidants in pharmaceutical dosage forms	15,000.00		5,000.00	5,000.00	5,000.00
	· Development of production methods for special pharmaceutical dosage forms	10,000.00 10,000.00		5,000.00 5,000.00	5,000.00 5,000.00	
	•Development of drug delivery system to increase bioavailability and compliance	10,000.00		5,000.00	5,000.00	
	d. Quality control					
	•Methods development of qualitative and quantitative testing of branded generic drugs	12,000.00		4,000.00	4,000.00	4,000.00
	· Bioavailability testing of generic drugs (5 gds/year)	15,000.00		5,000.00	5,000.00	5,000.00
	· Bioequivalence testing of generic drugs (5 gds/year)	15,000.00		5,000.00	5,000.00	5,000.00
	•Assay method development of drugs in dosage forms (5 drugs/year)	10,000.00		5,000.00	5,000.00	5,000.00
	e. Personell responsible					
	•Developmen t of Good Clinical trial guidelines	5,000.00		5,000.00		
	•Development of validation method in pharmaceutical productions	5,000.00			5,000.00	
	•Development of total quality management methods	6,000.00		2,000.00	2,000.00	2,000.00

Sub area	Research Topic	US$	2002	2003	2004	2005
	f. Safety, activity, effectivity, and efficacy					
	•Safety testing of dosage forms (5 dfs /year)	60,000.00		20,000.00	20,000.00	20,000.00
	· Mutagenecity testing of dosage forms (5 dfs /year)	60,000.00		20,000.00	20,000.00	20,000.00
	•Hepatotoxicity testing of dosage forms (5 dfs /year)	15,000.00		7,500.00	7,500.00	
	•Activity testing of dosage forms (5 dfs /year)	75,000.00		25,000.00	25,000.00	25,000.00
	· Effectivity testing of dosage forms (clinical trial phase I, II, and III) (5 dfs /year)	75,000.00		25,000.00	25,000.00	25,000.00
	•Efficacy testing of dosage forms (5 dfs /year)	15,000.00		10,000.00	5,000.00	
	•Pharmacokinetics profiles development of antimalarial on healthy subjects and certain populations	75,000.00		25,000.00	25,000.00	25,000.00
	•Pharmacokinetics data base profiling of antimalarial and antiTB	30,000.00		10,000.00	10,000.00	10,000.00
	1.4 Medical devices					
	a. Safety of usage	6,000.00		2,000.00	2,000.00	2,000.00
	· Safety using critical medical devices					
	b. Distribution					
	•Distribution method of medical devices in district levels	3,000.00		3,000.00		
	•The role of District Pharmaceutical Storage (Gudang farmasi kabupaten) in managing of medical devices	3,000.00		3,000.00		
	•Funding methods of medical devices in central and disticts levels	5,000.00		5,000.00		
2. Management						
	2.1 Rules and laws:					
	•Price listings of generic drugs in central and district levels	12,000.00		6,000.00	6,000.00	
	•Rapid assessment of pharmaceutical management: based on indicators	11,000.00		5,500.00	5,500.00	
	2. 2. Production:					
	• Pharmaceutical standard of production	9,000.00		9,000.00	9,000.00	
	2. 3. Distribution :					
	•Development of distribution systems on pharmaceuticals	5,500.00				5,500.00
	2. 4. Utilization:					
	•Essential drug utilization in health facilities	6,000.00			6,000.00	
	•Baseline data development on the usage of narcotics and psychotropics in the goverments and communities rehabilitation centers	6,500.00		6,500.00		
	•Baseline data development on the usage of traditional medicines on ethnic groups	22,500.00		7,500.00	7,500.00	7,500.00
	•Drug surveillance system	7,000.00		7,000.00		

Sub area	Research Topic	US$	2002	2003	2004	2005
	2. 5. Quality assurance:					
	•Development of pharmaceutical care equity	15,000.00		5,000.00	5,000.00	5,000.00
	2. 6. Professionalism:					
	•Pharmacy human resources development	6,500.00		3,000.00	1,500.00	3,500.00
	2. 7. Farmacoeconomy:					
	•Cost-effectiveness analysis of antiTB drugs	12,000,00		6,000.00	6,000.00	
	•Cost benefit ratio analysis of antibiotics	11,000.00		5,500.00	5,500.00	
	2.8. Drug information:					
	•Information assessment on the safety of traditional medicine, food suplements / healthy foods usage (informing the materials and substances)	7,000.00		7,000.00		
	•Development of drug information communication methods and parametric measurement of effectiveness of communications	7,500.00		5,000.00	2,500.00	
	•Exploring drug information sources	6,000.00		6,000.00		
	•Development of information systems for traditional medicines	6,000.00		2,000.00	2,000.00	2,000.00
3. Pharmaceutical care						
	3.1 Safety and efficacy					
	a. Drug regimen:					
	•Efficacy evaluation of antimalarial and anti TB drugs for mass treatment	8,000.00		4,000.00	4,000.00	
	· Alternative drug effication evaluation (traditional drugs)	8,000.00		4,000.00	4,000.00	
	· Efficacy of drugs on special population (elderly, children, ethnical and geographical groups)	6,000.00		2,000.00	2,000.00	2,000.00
	b. Drug resitence:					
	•Development of surveillance of drug multiple resistence for district levels	15,000.00		5,000.00	5,000.00	5,00.00
	•Antimicrobes resistence paterns (mostly used) in health care and communities	18,000.00		6,000.00	6,000.00	6,000.00
	•Usage of antibiotics in veterinarians	3,000.00		3,000.00		

	c. Farmacovigillance:					
	•Strengthening monitoring systems on drug side effects on a district levels	5,000.00		2,500.00	2,500.00	
	•Cardiovascular side effects due to drugs	6,000.00		3,000.00	3,000.00	
	•Antiepileptics side effects	6,000.00		4,000.00	2,000.00	
	•Drug interactions	9,000.00		3,000.00	3,000.00	3,000.00

Sub area	Research Topic	US$	2002	2003	2004	2005
	d. Rational drug use:					
	•Drug usage studies in the ditrict level	6,000.00		6,000.00		
	· Transfer of knowledge on how to judge rational usage of drugs	7,500.00		7,500.00		
	3.2. Public protection					
	a. Residual analysis:					
	•Assessment and analysis method of pesticide and antibiotics residus on food, milk and drink	15,000.00		5,000.00	5,000.00	5,000.00
	•Assessment of analysis method on growth hormon in chickens	15,000.00		5,000.00	5,000.00	5,000.00
	•Assessment of analysis method of heavy metals in food and pharmaceuticals	15,000.00		5,000.00	5,000.00	5,000.00
	· Assessment of analysis method of bacterial contamination (*Pseudomonas, Staphylococcus,. E. coli, Salmonella*) in cosmetics especially for eyes	18,000.00		6,000.00	6,000.00	6,000.00
	· Asesment and analysis on mold and aflatoxins in traditional medicines and cosmetics	18,000.00		6,000.00	6,000.00	6,000.00
	b. Additives analysis in food and pharmaceutical products					
	•Assessment of analysis method of prohibited additives in food and pharmaceutical products	6,000.00		6,000.00		
	c.Analysis method development of food and pharmaceuticals content of pork component and other haram materials					
	•Method of analysis of pork components in pharmaceuticals, cosmetics and foods	6,000.00		6,000.00		
	d. Detection method of pharmaceutical products adulterations					
	•Exploration of adulteration in pharmaceuticals, foods, food supplements, and jamus and the adulterants	6,000.00		6,00.00		
	e. Analysis of toxic substances:					
	· Exploration of cigarettes and alcohol usage on certain populations (students, women, etc.)	5,000.00		2,500.00	2,500.00	
	•Metabolisme, disposition, and efficacy studies of certain drugs on active and passive smokers	50,000.00		20,000.00	20,000.00	10,000.00
	•Metabolisme, disposition, and efficacy studies of certain drugs on alcoholics	50,00.00		20,000.00	15,000.00	15,000.00

Research Topics for Environmental and Occupational Health (including estimated cost)

Research Topics	US $	2002	2003	2004	2005
Physical Environment Human Settlement:					
1. Appropriate technology for domestic water supply and waste disposal/treatment	100,000				
2. Model of healthy low cost housing	50,000				
3. Model of safe housing for the elderly	50,000				
4. Mapping of environmental health problems	100,000				
5. Recycling of domestic waste	50,000				
Public Places Sanitation:					
1. Hospital waste management	100,000				
2. Improvement of food sanitation in various public places	100,000				
3. Development of appropriate and suitable protective devices/clothing for the farmers, fishermen, construction and industrial workers, etc	200,000				
Working Environment:					
1. Environmental pollution control	200,000				
2. Health impacts of environmental pollution	200,000				
3. Health impacts of environmental changes	200,000				
4. Health impacts of electromagnetic fields and other non-ionizing radiation	100,000				
5. Development of model of healthy mining practices	100,000				
6. Appropriate technology for industrial waste treatment	200,000				

7. Development of model of healthy agriculture practices	100,000				

Research Topics	Estimated Cost (US $)	2002	2003	2004	2005
General Environment:					
1. Ecological system for comprehensive integrated vector controlontrol, including economic aspect	100,000				
2. Integrated environmental health improvement in coastal areas	100,000				
3. Development of environmental health indicators	100,000				
4. Development of sanitation clinic approach	100,000				
Biological Environment					
Fauna:					
1. Biology and control of vectors	450,000				
2. The impact of environmental conditions on vectors, hosts and reservoirs of emerging diseases	450,000				
3. Control programme assessment of emerging diseases	450,000				
4. Transmission reduction risk of vectors borne diseases	400,000				
5. Molecular biology of vectors	450,000				
Flora:					
1. The biodeversity of plant for biological control	200,000				
2. The biodiversity of vegetation related to breeding places of vectors	200,000				

Research Topics for Food and Nutrition (including estimated cost)

No.	Topic	Estimated cost	2002	2003	2004	2005
1.		200.000	70.000	40.000	50.000	40.000
2.		600.000	100.000	200.000	200.000	100.000
3.		120.000	20.000	40.000	30.000	30.000
4.		70.000	10.000	20.000	20.000	20.000
5.		70.000	10.000	20.000	20.000	20.000
6.		200.000	40.000	50.000	60.000	50.000
7.		400.000	100.000	100.000	100.000	100.000
8.		200.000	50.000	50.000	50.000	50.000
9.		100.000	20.000	20.000	30.000	30.000
10.		200.000	40.000	50.000	55.000	55.000
11.		400.000	100.000	100.000	100.000	100.000
12.		200.000	50.000	50.000	50.000	50.000
13.		400.000	100.000	100.000	100.000	100.000
14.		700.000	100.000	200.000	200.000	200.000
15.		600.000	150.000	150.000	150.000	150.000

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