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# Pesticide Poisoning Database in SEAR Countries

*Report of a Regional Workshop  
New Delhi, 22-24 January 2001*

WHO Project: ICP PCS 001



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## 1. INTRODUCTION

Recognizing that pesticide poisoning is a major health problem in most countries of the South-East Asia Region and the need to strengthen the capability for prevention and management of toxic exposure cases in these countries, a Regional Consultation on Poison Control was organized in the WHO Regional Office, New Delhi, India, in December 1998. One of the four activities identified in the Action Plan prepared during the consultation was to initiate a study in selected countries in order to assess the impact of human pesticide poisoning (epidemiology), with a view to planning prevention, treatment, and education activities in cooperation with other partners. In 1999, the Regional Committee (resolution SEA/RC52/R6) requested the Regional Director to provide guidance on the methodology and epidemiological principles of data collection, analysis, diagnosis and treatment of pesticide poisoning. At the global level, WHO had also recognized the need for an epidemiological study of acute pesticide poisoning as part of strengthening the evidence base for health protection and was developing, through the International Programme for Chemical Safety (IPCS), a study for implementation in selected countries. Consequently, in collaboration with WHO/HQ and IPCS, a Regional Workshop on Pesticide Poisoning Database in SEAR Countries was held in WHO Regional Office, New Delhi, from 5-7 May 1999. During the workshop, an action plan was developed for implementation of the first trial phase of the establishment of a pesticide poisoning database in selected areas in India, Indonesia, Nepal and Thailand, during 1999. Financial support was provided by the Regional Office, from ICP 1998-1999, for trial phase implementation for collection of pesticide poisoning case data and reporting system for recording of data in the above four countries. It was considered that this would enable countries to initiate the development of a reliable estimate of pesticide poisoning case data and the monitoring of human pesticide poisoning regularly.

During the trial implementation phase, data collectors were trained on collection of data using a harmonized pesticide exposure record (PER) format; medical staff were instructed on the collection of information on diagnosis

and treatment of cases of pesticide exposure and guidance was given on developing a pesticide product register. Case data on acute poisoning was collected in selected areas. Reports of the studies were submitted to WHO/HQ and IPCS for review. Meanwhile, preparation of a training manual on diagnosis and treatment of pesticide poisoning at the primary health care level was started. This work has been contracted to Dr Winai Wananukul of Ramathibodi Poison Centre at Bangkok, Thailand.

A workshop was held in the WHO Regional Office, New Delhi, from 22-24 January 2001 to review these reports and to refine tools, mechanism, guidelines for pesticide exposure case data, training of data collectors and health personnel for supporting evidence-based, regularly updated, reliable, surveillance systems in the countries of SEAR. Based on the refined approach developed at the workshop, participants will be assisted in the development of a regional project on establishment of a pesticide poisoning database for India, Indonesia, Nepal and Thailand and also projects for initiation of implementation of database activity in Bangladesh, Myanmar and Sri Lanka. Donor support will be sought for implementation of the Plan of Action. Participants from seven countries of the Region, the Regional Coordinator, Regional Network of Pesticides for Asia and the Pacific (RENAP), WHO country office Environmental Health Advisers from Bangladesh and Indonesia and four resource persons took part in the workshop. The objectives of the workshop are given in Section 2. The List of Participants and Secretariat is at Annex 1 while the Programme of the workshop at Annex 2.

## **2. OBJECTIVES**

The objectives of the workshop were:

- (1) To review guidelines, tools and the mechanism used and reports prepared in the first trial phase of establishment of pesticide database in India, Indonesia, Nepal and Thailand by the health officials;
- (2) To share the experience in the implementation of the trial phase for the establishment of a pesticide poisoning database;
- (3) To develop a format or model country report so that information covered in the country reports is comparable;

- (4) To develop county projects for expansion of the database establishment activity in India, Indonesia, Nepal and Thailand and prepare a project for initiating implementation of database activity in Bangladesh, Myanmar and Sri Lanka, including identifying financial requirement for implementation of these projects, and
- (5) To formulate an action plan for implementation.

### **3. INAUGURAL SESSION**

The workshop was inaugurated by Dr Palitha Abeykoon, Acting Regional Director, on behalf of the Regional Director, Dr Uton Muchtar Rafei, who welcomed participants. Noting the importance of pesticide use for the agricultural economies of most countries of the Region, Dr Abeykoon drew attention to the adverse effects on health that had been observed through cases of pesticide poisoning seen at hospitals in the Region. Moreover, it was believed that there were under-reporting and misdiagnosis of cases, and, where reported, there was often lack of information about the circumstances and data were not collected in a harmonized manner to allow comparability. Similar concern about the impact on human health and the environment of these chemicals was shared by other Member Countries of WHO. In October 2000, the Intergovernmental Forum on Chemical Safety (IFCS) in Brazil issued the Bahia Declaration, which made a specific reference to pesticides and the need for their sound management. In order to assess the magnitude of the problem and to have a reliable scientific basis for sound decision making to control pesticide exposures, it was essential to establish a database using harmonized methodologies, strategies and terminology. A global study had been initiated by IPCS, in which the SEA Region was participating and playing a pivotal role in developing and testing the case data collection format and data analysis. This was one of a series of activities undertaken in the Region to promote sound management of chemicals, particularly to prevent and manage poisoning, thereby protecting human health and welfare throughout the Region.

Dr J Pronczuk, speaking on behalf of WHO/HQ and IPCS, drew attention to the growing number of reports linking the exposure of pesticides with a wide variety of diseases, from cancer to infertility and behavioural alterations. While the growing concern in developed countries was with low-

level chronic pesticide exposures, acute pesticide poisoning represented a public health problem in the developing countries requiring action. In these countries, over 50 million plantation workers were directly exposed to pesticides and many more millions were indirectly or seasonally exposed. The large proportion of those potentially exposed has neither training nor information about safe use of pesticides. There was a global concern about exposure to low levels of pesticides through food and water, as well as through their presence in the environment as persistent organic pollutants (POPs). Reference was made to new potential solutions and factors influencing exposure to pesticides, including multilateral agreements such as the Prior Informed Consent (PIC) and POPs Conventions, recommendations of IFCS, improved surveillance systems, globalization phenomena, new research and remote sensing techniques. The work on pesticides of the IPCS (WHO/ILO/UNEP) within the WHO Department for the Protection of the Human Environment was outlined, including risk assessment of specific pesticides and prevention and management of toxic exposures, with harmonized case data collection through the IPCS INTOX project. A specific project on the Epidemiology of Poisoning by Pesticides was established in 1997, with the objectives including the establishment of an evidence base for estimating the global incidence of pesticide poisoning, characterizing them and advising on appropriate preventive actions. In 2000, Dr Nida Besbelli was assigned as a new full-time professional to the global project. This Region continued to play a leading role in implementing the project from the pilot phase in 1997 and in the development and testing of the methodology for setting up a pesticide poisoning database. The project implemented in each country had raised awareness about the problem of pesticide poisoning, helping to characterize exposure, identify the chemicals involved and the population groups affected. Training on the diagnosis and management of specific pesticide poisonings had been promoted, and a publication on the subject was expected by end 2001. While the work had been difficult, and slow in some instances, the evidence collected will be the basis for setting up surveillance mechanisms; which would allow data to be compared and experiences to be shared with colleagues, both in the Region throughout and the world. Overall, it would enable the promotion of chemical safety and thus protect human health through sound and judicious use of pesticides.

## **4. BUSINESS SESSION**

Following the introduction of the participants Dr D. Kanungo (India) and Professor S. Gupta (Nepal) were nominated as Chairman and Co-chairman respectively. Ms P. Silkavute (Thailand) and Dr J. Haines (Resource Person) were nominated as Rapporteurs.

### **4.1 Expected Outcomes**

Mr. T. Thompson, Regional Adviser, WSH, SEARO, referred to the workshop held in May 1999 at which action plans were developed for trial implementation of pesticide poisoning database in four countries of the South-East Asia Region (India, Indonesia, Nepal, and Thailand) using tools and methodologies developed by IPCS. He stated that one of the main objectives of the workshop was to review the country reports of database establishment work undertaken in the above four countries, with a view to revising these tools and methodologies for application in a wider data collection for database establishment in seven countries of the Region, the original four plus Bangladesh, Myanmar and Sri Lanka. It was expected that, taking into consideration the experience of the previous data collection phase, the workshop would develop plans for implementing an epidemiological study of pesticide poisoning, using harmonized approaches, which would enable a better understanding of the situation in each country and be representative of local situations. Implementation of such a study would require resource mobilization in coordination with the global study.

### **4.2 Background of the Activities and Overview of Work at the Global Level**

Referring to press reports suggesting linkages of diseases such as polyneuropathies and Parkinsons to pesticide exposures, Dr. J. Pronczuk (IPCS) pointed to the growing global concern about potential effects on human health and the environment of pesticides and the need to strengthen the evidence base for control of these chemicals. The activities at the global level were presented. These cover: epidemiology of pesticide poisoning; poisoning prevention and treatment; strengthening analytical toxicology facilities; and multi-centre study of OP poisoning. The chemical safety activities proposed for SEARO include: preparation of national chemical safety

profiles; establishment of a pesticide poisoning database; plus: establishing and strengthening facilities for chemical information management; establishing and strengthening facilities for poisons prevention and treatment programmes; strengthening analytical toxicological facilities; chemical emergency preparedness and response; chemical risk reduction and sound management programmes; and human resource development.

Reference was made to emerging and controversial issues related to the health impact of pesticides, including: circumstances of exposure to pesticides; classes of pesticides and varieties of formulations, including inert substances; populations exposed (such as women, children and vulnerable population groups); human health endpoints; diagnosis and management; epidemiology and research.

In 1992, IPCS organized a consultation to develop a specific project for harmonized collection of data on pesticide poisoning. In 1996, a meeting on the methodology for collection of pesticide poisoning data was held. Then in Brussels, in 1997, a working group was organized on harmonized collection of pesticide poisoning data. The IPCS study was launched, with the overall objective: *to estimate the extent of human exposure and poisoning in selected regions/countries, with a view to implementing preventive and education strategies to reduce morbidity and mortality from pesticide poisoning*.

The IPCS project consists of establishing a harmonized format for the collection of case data, which was tested in India, Italy, Sri Lanka, and Uruguay in 1997. SEAR project with data collection in India, Indonesia, Nepal and Thailand, the results of which were examined by IPCS, made an important contribution to this activity. Subsequently, an advisory group has been established for the global project. Recommendations for a surveillance system will be made as well as proposals for prevention, education, and regulation. The results to date of the project were summarized and the lessons learned.

### **4.3 Towards an Estimate of the Global Burden of Disease**

Assistant Professor L Fragar (Resource Person), presented a paper prepared by Dr S. Corbett (NSW Health Department Australia), summarizing and reflecting on the results of the data collected in relation to occupational exposures in

the previous phase in India, Indonesia and Thailand, with a view to proposing how improved data collection in subsequent phases could contribute to an estimate of the burden of disease from pesticide exposure. It was observed that the surveillance programme was hospital and/or primary health care centre based with no defined denominator population. Further, data were collected both retrospectively and prospectively and, in some cases, supplemented by field surveys of levels of anti-cholinesterase. It was concluded that an enormous amount of effort had been made in each participating country to collect data in a standardized format. The surveillance system suffered from the limitations of a hospital-based system. There had been a uniform application of diagnostic standards, data collection and reporting. Reporting of all results in the future should be separated by circumstances of exposure as the public health implications for each of the main issues (intentional, accidental and occupational), differ. It was observed that the case definition had not been clearly articulated and the following definition was proposed: "A case is someone who attends a selected hospital or health centre with symptoms and/or clinical signs of pesticide poisoning with a suspected history of exposure to pesticides". Further, it was observed that denominators for hospital- based data would assist comparability. It was considered that further development of techniques for estimating the burden of morbidity would be justified, and the most promising would be the development of robust "multipliers" from surveys of exposed workers, but other techniques such as capture recapture warrant investigation. This technique involves the counting of overlap of cases from two intersecting prospective studies.

In the discussion, it was observed that "confirmation" criteria for a case needed to be agreed. Often physicians do not correctly diagnose pesticide poisoning. Data collected at hospitals deal with severe cases, resulting in many mild and moderate cases being missed. Further, for mild cases, peasant workers are reluctant to seek health care advice, and employers wish to minimize compensation claims. Indonesia observed that the diagnostic standard used in their cases was based on ICD-10.

#### **4.4 Epidemiological Considerations and Exposure Scenarios**

Dr. S Visentin (International Centre for Pesticide Safety, Italy) discussed the interpretation of data and its extrapolation. A hospital-based study measures

the number of cases notified to the hospital, but not those that are not notified. Factors affecting notification include: severity of poisoning, accessibility of health care services, catchment area/population served, training of medical officers and socioeconomic and cultural factors. For incidence estimates, it is necessary to have a numerator, denominator and to know the factors influencing the numerator and the characterization of the denominator. For hospital-based surveys, sampling criteria included catchment area/coverage, accessibility/ease of travel, co-operation of medical personnel and quality of records. A minimum set of indicators are required providing a relevant and meaningful description of the population, study area and characteristics that may affect pesticide exposure/poisoning. The role of scenarios was presented in relation to: sampling, data analysis and interpretation (extrapolation), incidence estimates/extrapolations, data reporting, data comparability, interventions. Examples were presented of various scenarios including: the demographic characteristics of the population, the agricultural and geographical characteristics, pesticides used, sources of various types of exposure, number and location of health care facilities for treating pesticide poisoning. Sources of information were discussed as well as indicators. Scenarios could be applied at different levels and scales e.g. national regional and local. Sources of exposure data were also discussed, including the use of GIS and remote sensing techniques. Examples were given from the Lombardi region in Italy and the use of the "presigis" decision supported system for the assessment of environmental impact of pesticides.

In the discussion, several countries reported that GIS was being used in their countries for agriculturally related activities.

#### **4.5 Regional Network of Pesticides for Asia and the Pacific**

Dr S P Dhua, Regional Coordinator for the Regional Network of Pesticides for Asia and the Pacific (RENAP), outlined the development of the network since its initiation in the early 1980s, including its objectives covering 15 countries of the Region with widely ranging levels of development. Development objective of RENAP is to promote environment and user-friendly crop protection agents and their formulations, including bio-pesticides and botanical pesticides, and encourage safe handling and disposal as well as effective application techniques, thereby making available more IPM

compatible products and techniques of safe handling and use in the field. The content of the databases established through the network and the organization of the collaboration among the participating countries through the coordinating centres in Delhi and Bangkok were outlined, as well as future work.

The potential for collaboration between WHO and RENPAP activities had been noted at earlier meetings and participants observed that exchange of information in relation to product data and poisoning should be explored.

After the meeting Dr Dhua and Dr Besbelli discussed in detail how to strengthen cooperation between WHO and RENPAP.

#### **4.6 Country Presentations**

India, Indonesia, Nepal and Thailand presented their reports of the trial implementation of the pesticide data collection, using the harmonized pesticide exposure record (PER). Bangladesh, Myanmar and Sri Lanka reported on relevant recent work on surveying pesticide poisoning cases in their countries. These reports are summarized in Annex 3.

#### **4.7 Evaluation of the Trial Implementation**

Dr. N Besbelli (IPCS pesticide poisoning project leader) reviewed the objectives of the global project and its structure, noting the recent establishment of an IPCS advisory group. Recommendations of the group were noted (See Annex 4). A summary was given of the activities undertaken in the SEA Region, noting the extensive training to support the data collection and presenting a comparative overview of the results. It was reported that the manual of diagnosis and treatment of pesticide poisoning for primary health care workers would be available by the end of the year.

The recommendations of countries participating in the trial implementation were reviewed as follows:

- There was a need for more training of data collection staff at all levels.
- All districts in a country should be covered with data collection over at least one year and preferably three years.

- More emphasis needs to be given to general awareness about pesticide poisoning problems.
- Medical personnel in countries need to be trained in diagnosis and treatment of pesticide poisoning.
- Antidotes and other pharmaceuticals for treating poisoned patients should be more readily available throughout countries.
- Mechanisms are needed to control the use of non-approved pesticides.
- Measures should be promoted for judicious use of pesticides.
- Psychological aspects of intentional poisonings need attention at the local level.
- Field visits should be made to area of high potential for pesticide exposure.
- Bureaucratic procedures in relation to the project should be minimized.
- Entomologists should be consulted in relation to the use of specific pesticides in spraying operations.
- Primary health care centres should be involved appropriately in the project.

In the discussion, it was suggested that the WHO publication "Public Health Impact of Pesticides Used in Agriculture" should be updated. It was observed that the trial implementation phase had been valuable in identifying problems and bottlenecks at the country level in the collection of harmonized data, and was very useful for designing a proper epidemiological study. Some factors involved in designing such a study in relation to hospital data were reviewed. Note was taken of the medical legal system in a number of countries and the complexity of alternative health care through government and private systems, where it would be difficult to capture all relevant cases. There was also a discussion of approaches to obtain appropriate practical pesticide use data at the local level, and it was agreed that the IPCS secretariat would explore the applicability of the RENPAP database for this purpose. The value and modalities of collecting poisoning data at the primary health care level was debated. It was considered that some countries had a well-

established network of primary health centres, which could be used for collecting simplified data with training of staff. Other countries considered that it would not be practicable in obtaining medical data at the primary health care level but that undertaking of a selected community level survey would be feasible. It was observed that in other areas health data collection at the primary level had proved feasible, provided that the case definition is evident and simple to apply by primary health care workers. As there was not sufficient evidence from the trial phase to indicate that data collection at the primary level should be a priority, it was suggested that some specific studies should be undertaken, for example, assessment of possible exposure to pesticides.

#### **4.8 Revision of Tools and Guidance Materials and Development of Next Phase of the Project**

The workshop took note of the guidance material prepared in relation to previous pilot and trial phases of the project, namely, the Guidance Document for Project Participants; the Pesticide Exposure Record (PER) and its instructions and definitions, as revised earlier: the Poisoning Severity Score (PSS): Additional Information to be collected along with the data collection on poisoning by Pesticides; and the Model Project Proposal to assist in the preparation of country projects. The Harmonized Project Report format is at Annex 5. It was recognized that for the next phase of data collection, it would be necessary to revise this material. New countries entering the project would continue using the existing document for first stage studies, as suggested by the advisory group at its first meeting in November 2000.

A detailed review was made of PER on the basis of experience of data collection in countries. A number of sections (3, 4, 5, 6, 8, 10, 11, 12, and 13) were discussed and minor modifications made. The instructions and definitions would need to be adapted accordingly. The revised PER and Instructions are given in Annex 6. The e-mail discussion group ([pest@ccohts.ca](mailto:pest@ccohts.ca)) would be reactivated for the exchange of information concerning cases.

The importance was noted, in relation to developing an international epidemiological study for the next phase of the project, of having available appropriate indicator profiles on the certain parameters concerning the

situation in countries; particularly, demographic; agricultural and geographic, with pesticide use; pesticide exposure patterns; cultural aspects, such as religion; and health care services, with their coverage. It was also noted that these data might be required for different levels of aggregation within the country. There was a discussion of the various potential sources of this data, including sensor statistics offices, ministries, trade associations and WHO country offices. It was recognized that not all data desirable for the study may be readily available in all participating countries, but an effort would be needed to obtain as much as possible. A list of proposed descriptor and indicator data required for the next phase of the study is at Annex 7.

Concerning product data, each country may need to collect its own information from appropriate sources, and note was taken of the database management tool for creating product records available in the IPCS INTOX software system, as well as the INTOX product database on some almost 100 000 products available in Canada. The RENPAP database may also be a useful source of information on pesticide products and their use locally in countries. It was observed that in most countries of the Region there were illegal importation of pesticides as well as the use of unregistered products, and that this part of pesticide use would be difficult to identify and quantify.

Possible approaches to designing a community-based study in countries were discussed and it was recognized that there are many alternatives depending on local situations and the feasibility of undertaking such studies. It was agreed that for the project there should be developed harmonized approaches to ensure both representativeness within countries and comparability of similar situations among countries.

As guidance to countries in developing national work plans and budgets a model approach had been developed by the secretariat during the initiation phase of the project. While this provided useful guidance, the document itself would now require revision. Further, it was recognized that the Regional Office did not have funding from the regional budget for further implementation of the project in countries, and resources would be required from country and/or external funding. The IPCS secretariat indicated their intention to develop a global project proposal for development assistance financing that would include a component for the SEA Region.

## **5. WORKING GROUPS**

Each country undertook the task of drafting plans for implementing the next phase of the project over a two- to three- year period and of making budget estimates for local costs. For each country, these proposals covered both hospital-based data collection of pesticide poisoning cases and a population/community-based study. These draft plans and budgets are given in Annex 8.

The participants divided themselves into two working groups to discuss proposals for organizational arrangements in countries for implementing the project, as follows: Group 1, under the chairmanship of Professor Gupta, with participants from Bangladesh, India, Nepal and Sri Lanka; and Group 2, under the chairmanship of Dr Sudung Nainggolan, with participants from Indonesia, Myanmar and Thailand. From the work of the groups, it was proposed that all countries should establish a steering committee of about 5 to 7 persons to oversee implementation and provide coordination. The national coordinator of the project would act as the secretary of the committee. The committee would be responsible for co-opting the necessary statistical, epidemiological and other expertise required for designing specific studies and their field implementation. The training component was considered crucial and it was suggested that there should be an initial one-month trial pilot data collection after a first training of data collectors, followed by a second round of training after which the data collected would be reported every three months. The national coordinator would be responsible for checking the returned PER forms and for ensuring correct computer data entry. Data collection in the hospital studies should cover a full year and preferably two. Intensive effort should be made also to train medical staff involved in patient management.

The workshop reviewed the outcomes of the group discussions and conclusions and action plans for the next phase of the project were drafted, and after discussion and amendment adopted.

## **6. CONCLUSIONS AND ACTION PLANS**

The workshop reviewed reports from India, Indonesia, Myanmar, Nepal and Thailand in trial implementation of pesticide poisoning data collection at

selected hospitals, using a harmonized pesticide exposure record (PER) and instructions which aimed at determining the occurrence of pesticide poisoning. The various difficulties and constraints encountered during the trial implementation phase have been identified. This trial phase has confirmed that pesticide poisoning is a public health problem of importance in the Region. The data particularly indicate the problem of intentional poisoning, but do not appear to reflect the situation concerning occupational and accidental exposure. Country reports from Bangladesh, Myanmar and Sri Lanka broadly confirm these findings.

Results of this phase indicated a number of modifications that need to be made to the data collection system to validate and increase the usefulness of the data. With these changes, the data collection system will provide the basis of a wider programme in each country.

Further, it is recognized that a number of population-based studies could provide information about cases not included in the hospital data collection, and each country would undertake such studies. It is recognized, however, that there are a variety of approaches to community-based studies of pesticide poisoning. Countries will determine the most relevant methods and approaches for such surveys, taking care to ensure that standardized definitions will allow extrapolation of findings to other areas, where appropriate, and that local situations chosen for study are representative for the country.

Based on the experience of the trial implementation phase the data collection format (PER) and the guideline material have been revised, with a view to using them in the next implementation phase in seven SEAR countries. Countries prepared initial drafts of action plans and budgets for expanded hospital-based case data collection and community-based studies for implementation during the period through 2003. In order to design improved hospitalized-based and community-based studies, it is recognized that data on certain descriptors and indicators in relation to population characteristics, exposure to pesticides, existence and distribution of health care services and health status are required. Further specific community-based studies need to be designed, with due consideration to harmonization and representativeness.

It was agreed that:

- (a) available descriptor and indicator data will be provided to WHO by the end February 2001, for use in designing a regional project proposal for funding country studies (a more detailed questionnaire will be sent by IPCS to participants as soon as possible);
- (b) in consultation with epidemiological and bio -statistical services in countries, proposals for hospital-based and community-based studies will be submitted to WHO by the end of March 2001, with a view to their examination and finalization proposals for community-based studies will be reviewed at a workshop in mid-2001 where international experience will be provided and harmonization among country studies ensured. WHO/HQ will seek funding for this workshop to be held in the Region;
- (c) further descriptor and indicator data will subsequently be provided for the detailed project design of the next phase, for which each country will need to develop specific work plans, based on resources to be made available from the Regional Project through external funds. The time-table will depend on when such resources become available; tentatively for the biennium 2002-2003. Meanwhile, several countries will continue hospital data collection using local resources, according to their initial draft action plans, and
- (d) IPCS will develop a global project proposal, incorporating the regional component for submission to funding agencies. Country inputs need to be provided in a timely manner for this purpose.

## **7. CLOSING SESSION**

Dr Pronczuk offered some observations about the project and the lessons learned since its inception almost a decade ago. While it had been more difficult to initiate than foreseen and there had been a number of delays and bottlenecks, the difficulties had not been insurmountable. Further, new study techniques were now available to enhance the results of data collection and analysis. She emphasized the need for strict harmonization and careful definition of terms. The data generated from the project will be of crucial value not only to WHO but also the Intergovernmental Forum on Chemical Safety, when it meets in Thailand in 2003 and to the UN Conference

“RIO + 10” in 2002, as well as in the implementing of a number of multilateral agreements such as PIC and POPs Conventions.

Dr Besbelli, referring to the workshop as her first meeting of the project as project leader, thanked the countries for their inputs, again noted a number of actions that need to be taken and also indicated the significance of the project in relation to other international activities relating to pesticides. She noted the importance of this project for the inputs to the Asia Pacific Regional Group of the IFCS and its preparations for FORUM IV in Thailand.

At the closing session, Dr Abdul Sattar Yoosuf, Director Environmental Health, speaking on behalf of the Acting Regional Director, expressed satisfaction at the outcome of the workshop and the decision to undertake the next phase of the project in seven SEAR countries. This would require further designing of a hospital-based study as well as the development of harmonized evaluation of the situation at the community level, for which descriptor and indicator data were first required from countries. He also expressed satisfaction that WHO/HQ would be seeking resources for the regional component of the project and for holding a workshop to finalize plans for the community-based studies. The Regional Office would be pleased to participate in the global project and continue to provide pioneering experience in its implementation. He congratulated the countries for their support of WHO's efforts to strengthen the evidence base to improve prevention of exposures to pesticides, not only in the Region, but also throughout the world.

A vote of thanks was proposed by the Chairman of the Workshop, Dr. Kanungo, who thanked the participants, the WHO staff in the Regional Office and HQ levels and the resource persons for their input to, make the workshop a success.

The workshop was then declared closed.

## Annex 1

### LIST OF PARTICIPANTS

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## **Annex 2**

### **PROGRAMME**

#### **Monday, 22 January 2001**

0830-0900            Registration

0900-0930            Inauguration

- Address by Regional Director
- Statement by *Dr J. Pronczuk, WHO/HQ(IPCS)*
- Introduction of participants – *Mr Terrence Thompson*
- Nomination of Chairperson and Rapporteur
- Announcement – *Mr Terrence Thompson*

#### **First Plenary Session – Committee Room**

1000-1020            Objectives of the Regional Workshop and expected outcome  
- *Mr Terrence Thompson*

1020-1040            Background of the activities, broad review of work at the global level  
- *Dr J Pronczuk*

1040-1100            Work done since last May 1999 in India, Indonesia, Nepal and Thailand  
and presentation on guidance for estimating the global burden of  
disease associated with pesticide exposure  
- *Dr Lyn Fragar*

1100-1120            Epidemiological considerations and scenarios  
- *Dr S Visentin*

1120-1230            Presentations by other agencies  
- RENPAP  
- GCPF  
- Others

- 1330-1500 Presentation of experiences, problems and constraints in case data collection, analysis, reporting, documentation for database establishment on pesticide poisoning, and discussions.
- India
  - Indonesia
  - Nepal
  - Thailand
- 1515-1630 Presentation of data and information collected, problems observed, in relation to pesticide poisoning, pesticide use, reporting and documentation of case data etc. and discussions.
- Bangladesh
  - Myanmar
  - Sri Lanka

**Tuesday, 23 January 2001**

**Second Plenary Session – Committee Room**

- 0830-0945 Evaluation of trial implementation case data collection, analysis, reporting, documentation based on reports from India, Indonesia, Nepal and Thailand
- *Dr N Besbelli*
- 1000-1230 Observations and comments of IPCS Advisory Group
- Review of guidelines, tools used, guidance material used in the first phase of database activity
  - Presentation and discussions of format for harmonized reporting
  - Discussions on pesticide product database
- 1400-1500 Guidance document on preparation of country projects on establishment of pesticide poisoning database by-
- *Dr N Besbelli*
- 
- Orientation to working groups for development and starting group work to prepare country project proposals, activities, outputs and budget
- *Dr John A. Haines*

**Group Work:**

1515–1630 Group work on preparation of country project proposals (contd...)

**Wednesday, 24 January 2001**

0830– 0930 Group work preparation of country project proposals (contd...)

**Third Plenary Session – Committee Room**

1000–1230 Presentation of country project proposals (contd...)

1330–1500 Regional Plan of Action for mobilizing support for the implementation of pesticide poisoning database establishment in SEAR countries

1515–1530 **CLOSING**

15.15 Closing remarks by Regional Director, SEARO

15.30 Closing of the Workshop

### Annex 3

#### SUMMARY OF COUNTRY REPORTS

##### Regional activities – SEARO

###### Participation:

- India – 10 hospitals from 5 regions (10 districts)
- Indonesia – 7 hospitals, 1 health office
- Nepal – 4 hospitals, 1 health institute
- Thailand – 10 hospitals from 1 province

###### Selection criteria:

- number of patients treated/managed
- accessibility/ease of travel
- cooperation of the medical personnel
- quality of medical records

###### Training given:

- Diagnosis and management of pesticide poisoning
- Filling up of proforma for collection of data

###### Results and conclusions of stage 1

##### India

Period covered : July 1999 - June 2000

Number of cases: 1531

###### Circumstances of poisoning :

- Intentional 1304 (85.17 %)
- Accidental 72 (4.7 %)
- Occupational 83 (5.42 %)

Outcome :	
- Recovery	953 (62.26 %)
- Death related	347 (22.66 %)
- Unknown	213 (13.91 %)

### Indonesia

Period covered :	October 1999 - April 2000
Number of cases :	126
Circumstances of poisoning :	
- Intentional	54 (44.4 %)
- Accidental	20 (15.9 %)
- Occupational	47 (31.7 %)

Outcome :	
- Recovery	122 (97.6 %)
- Death related	3 (2.4 %)
- Unknown	1 (0.8 %)

### Nepal

Period covered :	November 1999 - May 2000
Number of cases:	258
Circumstances of poisoning :	
- Intentional	236 (91.5 %)
- Accidental	3 (1.2 %)
- Occupational	-
- Uncertain	16 (6.2%)
- Unknown	1 (0.4%)

Outcome :	
- Recovery	195 (75.6 %)
- Death related	41 (15.9 %)
- Unknown	19 (7.4 %)

## Thailand

Period covered :	September 1999 – November 1999
Number of cases :	130
Circumstances of poisoning :	
– Intentional	80 (61.5 %)
– Accidental	10 (7.7 %)
– Occupational	37 (28.5 %)
Outcome :	
– Recovery	90 (69.2 %)
– Death related	14 (10.7 %)
– Unknown	19 (14.6 %)

## Pesticide poisonings in other SEARO countries that plan to participate in the project

### Bangladesh

Period covered :	January 1996- December 1996
Number of cases	60 757
Death related	1 580
Pesticide usage	11 000 MT
– Insecticides (90%), fungicide, herbicide and rodenticide (10%)	
– Agricultural workers contribute to 63% of the labour force.	
– Increase in pesticide poisonings have increased by 60% in three years (1993 to 1996)	

### Myanmar

#### Study A

Period covered:	January 1999 December 1999
Institutions participated	8 hospitals
Number of cases	208
Outcome:	
– Recovery	184 (88.5 %)
– Death related	22 (10.6 %)
– Death unrelated	2 (0.96 %)



## **Annex 4**

### **RECOMMENDATIONS OF THE IPCS ADVISORY GROUP**

The following recommendations were made by the Advisory Group at its first meeting on 13-14 November 2000:

- (a) In order to estimate a global figure of pesticide poisonings the project should include all regions of WHO and the number of participating countries and regions should increase.
- (b) Tools developed during the pilot phase and first stage activities should continue to be used in the same manner with the new participating countries.
- (c) Second phase studies should include data collection at the tertiary, secondary and primary health care levels.
- (d) Results of the project should be compiled regionally on an interim and final basis. To achieve this, country reports should be prepared in a comparable manner.
- (e) The existing data from the first stage studies should be analysed in more detail for the purpose mentioned above.
- (f) Pilot community-based studies should be considered in some countries to focus more on accidental and occupational cases, and record cases that may not reach the hospital.
- (g) Scenarios of pesticide use considering geographical variations, crop pattern and other variables need to be identified. National profiles prepared by countries for pesticide use could be consulted. The identification of scenarios of pesticide use and exposure would prove useful to extrapolate sampled data to develop incidence estimates from hospital-based surveys, and also to assess the overall burden of less severe cases.
- (h) Possibility of using remote sensing to develop scenarios of pesticide use should be explored.

- (i) More funds are necessary for the continuation of activities and for the participation of new countries and regions. Possible donors should be identified and approached.
- (j) Prevention activities should be planned, including:
  - public awareness and training of farmers
  - training of doctors and other health care providers in prevention and treatment of poisoning
  - training of trainers
  - licencing of applicators
  - preparation of manual on pesticide poisonings on a regional basis
  - updating of WHO publication "Public Health Impact of Pesticides Used In Agriculture"

## Annex 5

### HARMONIZED REPORT FORMAT

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Executive Summary

- I. Introduction
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- II. Analysis of possible sources of data
- III. Background information
  - 3.1 Previous evaluations of pesticide poisonings in the country
  - 3.2 General population characteristics
    - 3.2.1 Population structure by age and gender
    - 3.2.2 Percentage of the population in rural/urban areas
    - 3.2.3 Education by gender
    - 3.2.4 Race by gender
    - 3.2.5 Religion by gender
  - 3.3 Exposure to pesticides
    - 3.3.1 Arable land (ha)
    - 3.3.2 Arable land by major crops
    - 3.3.3 Number of workers employed in agriculture by gender and age
    - 3.3.4 Number of farms
    - 3.3.5 Data on pesticides marketed/used
    - 3.3.6 Number of pesticide industrial plants
    - 3.3.7 Pesticide regulation
  - 3.4 Existence and distribution of health care services
    - 3.4.1 Characteristics of health care services
  - 3.5 Health indicators
    - 3.5.1 Main causes of mortality/morbidity

- IV. Information on study implementation
  - 4.1 Methodology for data collection
  - 4.2 Data collection procedure
  - 4.3 Training
  - 4.4 Modalities of operation
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    - 5.1.1 Time of data collection
    - 5.1.2 Number of cases recorded
    - 5.1.3 City/province covered
    - 5.1.4 Seasonal trends in pesticide poisoning
  - 5.2 Communication
    - 5.2.1 Sources of information (institution collecting information)
    - 5.2.2 Category of person supplying information
  - 5.3 Patient details
    - 5.3.1 Sex distribution
    - 5.3.2 Age category and gender
  - 5.4 Circumstances of exposure
    - 5.4.1 Circumstances of exposure (poisoning) versus sex distribution
    - 5.4.2 Circumstances of exposure (poisoning) versus age group
  - 5.5 Main activity at the time of exposure
    - 5.5.1 Main activity at the time of exposure versus sex distribution
    - 5.5.2 Main activity at the time of exposure versus age groups
  - 5.6 Location of exposure
  - 5.7 Routes of exposure
  - 5.8 Product identity
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  - 5.12.1 Outcome versus sex distribution
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- 5.13 Comments
  
- VI. Limitations and recommendations
  
- VII. Conclusions
  
- VIII. References

## Annex 6

### PESTICIDE EXPOSURE RECORD

#### Instructions and Definitions

**Pesticide** means any substance or mixture of substances intended for preventing, destroying or controlling any pest, including vectors of human or animal disease, unwanted species of plants or animals causing harm during or otherwise interfering with the production, processing, storage, transport, or marketing of food, agricultural commodities, wood and wood products or animal feedstuffs, or which may be administered to animals for the control of insects, arachnids or other pests in or on their bodies. The term includes substances intended for use as plant growth regulator, defoliant, desiccant, or agent for thinning fruit or preventing the premature fall of fruit, and substances applied to crops either before or after harvest to protect the commodity from deterioration during storage and transport (*Ref.FAO – International Code of Conduct on the Distribution and Use of Pesticides*).

**Exposure:** human contact with the agent (pesticide) at the boundary between the individual and the environment (*Ref.Modified from ILO Encyclopaedia of Occupational Health and Safety*)

#### 1. EXPOSURE TIME AND PLACE

**Type of data collection:** state in brackets if data collection is prospective (**P**) or retrospective (**R**). Although it is agreed that data will be collected in a prospective manner (starting on a given date, with participants informed on the project and instructed on the use of the PER), retrospective data collection could also be possible under some circumstances (*e.g. to assess quality of existing medical records on poisoning cases*).

**Record number:** number assigned by the co-ordinator and/or responsible officer for the identification of PER records. It consists of an eleven-digit number:

- *Three-digit* international telephone dialling code (which is unique) for the country. For the Western Pacific region country codes are 061 (Australia), 086 (China), 081 (Japan), 082 (Republic of Korea), 060 (Malaysia), 064 (New Zealand), 063 (Philippines), 065 (Singapore) and 084 (Viet Nam).
- *Two-digit* province number, allocated by the co-ordinator.
- *Two-digit* site number (District Hospital code), allocated by the co-ordinator.
- *Four-digit* sequential number (i.e. 0001, 0002, 0003,...), assigned to each case sequentially by the Responsible Officer.

For example: 084.03.02.0002 corresponds to the second case registered in Viet Nam, in province 03 at the district hospital 02.

Note: other reference and control numbering may be added inside or outside this field, if necessary. The hospital or social security registration number of the patient will be entered under "*Identity N°*" (section 2).

**Date of consultation:** day/month/year on which the patient comes for consultation at the health care facility (numeric, two-digit number for dd/mm/yy).

**Date of exposure:** (*if applicable only*): day/month/year on which the actual exposure to pesticide(s) took place (numeric, two-digit number for dd/mm/yy).

Note: in some cases this date is unknown as exposure may have been repetitive or chronic, in this case just write N/A (not applicable).

**Time elapsed since exposure:** state the number of hours (hs), days (dy) or months (ms) elapsed between exposure to the pesticide and consultation at the health facility. Circle the relevant units: hs, dy or ms. Write U/K, if unknown.

**Duration of exposure:** if applicable, state the number of hours (hs), days (dy) or months (ms) during which exposure to pesticide occurred. Circle the relevant units hs, dy or ms.

Note: This is known mainly in single or repeated short-term pesticide exposures (acute) which motivate most of the consultations to the health centre. If the patient has been chronically exposed during years, please state it under “*Comments*” (Section 13).

**City:** name of the city where the health centre is situated and data collection takes place.

**Province:** name of the state or province where data collection takes place.

## 2. COMMUNICATION

**Name:** name of the medical or paramedical professional supplying the information for filling-in the PER, e.g. professional treating or dealing with the cases (who has been informed about the study and has offered to collaborate supplying the information), or professional responsible for the medical record of the patient (e.g. *treating physician in the emergency room*).

**Institution:** name of the health care facility where the information on human exposure cases is being collected. State within brackets if the institution it is private (**P**) or governmental (**G**). Private institutions include privately or semi-privately owned clinics, and charitable health care facilities.

**Phone:** complete telephone number of the health care facility, including country and city code. It is preferable to list the telephone number of the professional providing the information, as this will enable to contact directly the professional who may complete or confirm data, or provide any supplementary information needed.

**Category of person supplying the information:** refers to the professional who provides the information that is recorded in the PER (see: “*Name*” above). It may be the treating physician, another health professional, or the professional responsible for filling in the medical record from where the

information is extracted. It does not refer to the "Responsible officer" nor to the *Project Co-ordinator*, unless they happen to be those supplying the information (this may occur in some countries).

**Medical professional:** person legally qualified to practice medicine (physician).

**Paramedical:** person who complements or supplements the work of doctors (*e.g. nurses, medical and nursing students, health technicians*).

**Data collection date:** day/month/year on which the PER was filled-in or initiated (numeric, two-digit number for dd/mm/yy). If the completion of the PER requires several days, state the first day of data collection.

**Officer's initials:** initials of the Responsible Officer, who is in charge of the completion of the PER. He/she will be the professional especially designated and trained for the task. If the professional providing the information, or the project Co-ordinator are filling in the PERs, they become responsible for those PERs and should state their initials.

### 3. PATIENT DETAILS

**Name (*initials only*):** initials of the patient exposed to pesticide(s). Although the complete name could be entered, it is recommended that only initials be used in order to preserve confidentiality. A separate confidential file with the corresponding full name and address could be created to facilitate locating the patient, in case it becomes necessary.

**Identity No.:** official identity card number or registration number at the health care facility. This will only serve for identifying the patient if it becomes necessary to contact him/her again (*e.g. for medical follow-up, request for specific information through the treating physician,...*)

**Sex:** check the appropriate box for male or female.

**Age:** state one- or two-digit number and circle the relevant units: days (dy), months (ms) or years (ys). Leave blank if the age is not known.

**If Unknown:** check in this box, plus the corresponding box if the patient is considered:

**Child** - under 14 years

**Adolescent** - 15 to 19 years

**Adult** - 20 years and above

#### 4. CIRCUMSTANCES OF EXPOSURE

*(check the relevant response with [x] plus "uncertain", if relevant).*

**Intentional:** exposure resulting from an intention to cause harm. It includes self-harm (*e.g. suicide, abortion and other malicious exposures*). Includes parasuicide, which is an intentional self-exposure where the purpose is only to induce disease or call the attention (and not to produce death).

**Accidental:** unintentional exposure, unexpected, or not foreseen (excludes those related to work practice). It includes, for example, human and veterinary therapy overuse or misuse, and also exposures due to environmental contamination.

Note: If the case is due to environmental contamination (*e.g. contaminated water, drift from a nearby field, air application over an inhabited area, leak from an industrial process*) state **(E)** at the extreme right of the field and provide further information under comments (Section 13).

**Occupational:** exposure occurring during work, where the pesticide was being used in the context of the work process, or the exposure resulted from the work process, including application, transportation, storage, disposal and other work circumstances

**Uncertain:** refers to those circumstances mentioned above when doubt exists about the validity of the information. It will be completed in addition to "intentional", "accidental" or "occupational", whenever relevant (*e.g. suspected suicide attempt denied by the patient...*)

**Unknown:** if there are no details concerning the circumstances of exposure, and information on this cannot be found.

## 5. MAIN ACTIVITY AT TIME OF EXPOSURE

*(check the appropriate box(es) with [x])*

Refers to the main activity undertaken by the patient when the exposure occurred. This field is relevant in case of accidental (adult) and occupational exposures only (including those affecting working children). It is not applicable in cases of intentional exposures and/or children's accidental exposures, where the option is "Not relevant". In some instances, several activities are undertaken at the same time or in immediate succession (*e.g. application in field and field re-entry, or mixing/loading and equipment care*). If so, check "Multiple" plus the relevant activities and state under "Specify" any activity which is not listed as an option. State "Other" activities as needed, and under "Specify" those activities which are not listed as options.

**Manufacturing/Formulation:** preparation of the active ingredient (of technical quality) and/or preparation of the pesticide formulation for distribution and sale. Includes exposure occurring through the care and/or maintenance of the installations and machinery used for manufacturing and formulating pesticides.

**Application in field:** application of a pesticide prepared for use (*e.g. diluted*) on plant or soil, or its release into air, water or other media by different means with the purpose of pest control. It includes "extermination" but excludes application on or administration to animals, which should be stated under "Veterinary Therapy" (see below).

**Public health campaign:** application of a pesticide prepared for use in vector control, for the protection of human health, in the context of a public health campaign.

**Household application:** application or releasing of a pesticide inside the home or human dwelling, by individuals, and not in the context of public health campaigns. Includes application in the garden of houses.

**Field re-entry:** entrance of a worker into crop fields or areas where pesticides were applied recently.

**By-standing:** observing or accompanying pesticide users during their work. It implies coming into contact with pesticides used in operations or processes carried out by pesticide applicators.

**Transportation:** movement of pesticides to and from different sites, by various means of transport.

**Mixing/Loading:** includes both the preparation of solutions and mixtures using the concentrated products and the transfer of the prepared (diluted) pesticides into containers, spraying equipment (includes aircraft for spraying pesticides).

**Equipment care:** cleaning, maintenance, storage and transportation of equipment used for the application and storage of pesticides. It excludes the care of machinery used in manufacturing and formulation (see above "*Manufacturing/Formulation*").

**Human Therapy:** use of pesticides for treatment of human parasitism. It includes both the appropriate and inappropriate use (*e.g. when pesticides of agronomic or veterinary use are applied to humans, for treating lice infestations...*).

**Veterinary Therapy:** use of pesticides for treatment of parasitism in animals. It includes both the appropriate and inappropriate use.

**Multiple:** check this box only if several activities were undertaken at the same time or successively. In this case, several activity boxes may be checked. If eventual activities are not listed as options, state them after "*Specify*"

**Not relevant:** activity not relevant at the time of exposure (*e.g. intentional exposure, children's accidental exposure*).

**Other:** check this box if the activity is not listed above (*e.g. pesticide disposal, flagging*), and state the specific activity under "*Specify*".

**Unknown:** if activity is not known, and information on it cannot be obtained.

## 6. LOCATION OF EXPOSURE

(check one with [x])

Refers to the place where the exposure to the pesticide has occurred.

**Home (urban/periurban):** human dwelling in a city or town, used as a domestic abode. It need not be the patient's home. It includes a house, flat, caravan, or permanent and voluntary institutions such as homes for the elderly and student halls.

**Garden (urban/periurban):** includes the garden, yard, driveway, path, steps and boundaries in an urban or periurban area.

**Home (rural):** same as "Home" above, but situated in the countryside, bush or forest, outside of towns and cities.

**Garden (rural):** same as "Garden" above, but situated in a rural area.

**Farm/Field:** land areas, and small or large-scale agricultural, horticultural or silvicultural establishments.

**Public Area:** uncovered or enclosed area open for public circulation, entertainment, relaxation or socialising (e.g. shop, hotel, sports facility, parking lot, park...).

**Greenhouse:** building with glass or plastic walls and/or roof for the cultivation of plants under controlled conditions. Includes both the commercial large-scale structures and the domestic greenhouses.

**Storage site:** place or area reserved for storing pesticides, chemicals, agronomic products or other.

**Unknown:** if place is not known, and information on it cannot be found.

**Other:** check this box if the location is not listed above and state the specific location under "Specify". These locations include:

- Formulation/packaging plant
- Store

- Industrial setting
- Ship
- Fire
- Prison
- [other, to be added]

## 7. ROUTE OF EXPOSURE

*(One or more routes to be checked [x] as appropriate)*

Refers to the main route (s) of entry of the pesticide into the body, which may be one or several

**Oral:** intake by mouth (or nose) and subsequent swallowing of a liquid, solid or dust.

**Dermal:** exposure of the skin.

**Respiratory:** intake of vapours, sprays or dust through the mouth or nose and breathing them in.

**Ocular:** exposure of the eyes.

**Unknown:** if exposure route is not known, and the information cannot be obtained.

**Other:** check this box if the route of exposure is not listed above (*e.g. parental, injection*), and state route under "Specify".

## 8. PRODUCT IDENTITY

Refers to the identification of the pesticide involved in the exposure case. It is foreseen that the study co-ordinator will prepare and/or provide a list of the pesticides currently used in the area and, eventually, those banned or severely restricted.

Note: If more than one pesticide formulation was involved in the case, attach another PER paper format where only the record number and sections 8 and 9 are completed (attach the PERs).

**Product Names(s):** brand name, commercial and/or common or generic name of the pesticide. Any name(s), especially that of the active ingredient provided will facilitate the identification of the pesticide formulation involved (to be done and/or confirmed by the Co-ordinator).

**Unknown:** if name of the pesticide is not stated in the medical record or known by the person reporting or collecting the data. Note: every effort should be taken to identify the product involved (*e.g. contacting the exposed person or agronomists in the area*).

**Concentration:** if available, state the concentration of the main active ingredient (note that in some cases it may be part of the commercial name of the product).

**Active Ingredient:** means the biologically active part of the pesticide present in a formulation.

**Physical form:** select the relevant, according to the physical state of the pesticide at the time of exposure.

**Gas:** volatilized, vaporized in gaseous form (*e.g. fumigants*).

**Liquid:** in fluid form, includes emulsion, suspension, solution, gels and "pour-on".

**Solid:** in solid form, includes dust, granules, baits, pellets, pills, briquettes, tablets (includes waxes and pastes).

**Unknown:** if physical state is not known, and information on this cannot be obtained.

**Actual use:** refers to the purpose for which the pesticide was being used. In some cases it may differ from the normal, current use indicated by the manufacturer (this information will be completed by the Co-ordinator in the shaded section 8).

Note: This field should also be completed in cases of intentional exposure, as all pesticides have a certain use, independently from the fact that they are utilised for suicide, malicious or other purposes.

**Insecticide:** control of insects (e.g. flies, mosquitoes, midges, ants, wasps, cockroaches, beetles, moths, bed bugs,...).

**Rodenticide:** control of rodents (e.g. rats, mice, moles).

**Herbicide:** control of weeds or unwanted plants.

**Fungicide:** control of fungi (mildew, moulds). It may include many seed treatment products.

**Tick control:** control of ixodes acarids (ticks).

**Unknown:** if use of the pesticide is not known, and information cannot be found at the time of data collection.

**Other:** check this box if the use of the pesticide is not listed above and state under "Specify" either the use (e.g. repellent, larvicide, molluscicide, nematocide,...), or the pest intended to kill or control (e.g. rabbits, bats, birds, fish, others).

**Use intended** (shaded area, to be filled-in by Co-ordinator only): refers to the use the pesticide is designed for, according to the pest to be killed, controlled or repelled. The intended use of the product is the one recommended by the distributor and/or approved by authorities, which may not necessarily be the same given by the workers or applicators (e.g. popular use of carbamates as rodenticides).

**Registered** (use): pesticide officially registered in the country, either by the agriculture, health or other official sector (meaning that the use is formally approved)

**Not approved** (use): pesticide is not officially registered, or is withdrawn or banned in the state or country (e.g. pesticides smuggled into the country).

## 9. CHEMICAL TYPE

(check one or more, if relevant)

Refers to the identification of the chemical class of the active ingredient involved. Check more than one option if the pesticide consists of a mixture of active ingredients. Consult the list of pesticides (commercial name,

composition, concentration, use) provided by the Co-ordinator. If the appropriate class is not listed, check "Other" and state under "Specify" the chemical class. If the specific chemical is known, check "Specific chemical" and write the name of the chemical. For example: if exposure is due to an organophosphorus product, and the product is known to be "Diazinon" check both "Organophosphorous" and under "Specific chemical", state "Diazinon"

## 10. MANAGEMENT

(check [x] against the relevant responses)

Refers to the medical actions taken for the treatment or surveillance of the patient exposed to pesticides.

**Treatment given:** any type of treatment, either specific and/or symptomatic given to the patient. Check "Yes", "No" or "Unknown", as required. All types of treatment are included. Brief clinical observation and reassurance only are not considered as treatment.

**Referred to other hospital:** check if the patient is transferred to a different health care facility after being seen and/or treated at the health centre where the study is undertaken.

**Hospitalisation:** state if patient was admitted to hospital for more than 24 hours. Check "Yes", "No" or "Unknown", as required.

**If yes, days in hospital:** state the *total* number of days the patient remained hospitalised, either for treatment or clinical surveillance, including intensive or specialised care. Note: provide under "Comments" the estimated average cost (in US dollars) of a day in hospital.

**Days in ICU:** specify only the number of days the patient remained hospitalised in an Intensive Care Unit. Note: provide under "Comments" the estimated average cost (in US dollars) of a day in the ICU. Refers to the type of effects and severity of the clinical effects observed in the patient, according to the Poisoning Severity Score (PSS) chart attached (*Annex III*).

## 11. SEVERITY GRADING

**Effects:** refers to the clinical features the patient presented upon admission or during the evolution of the case. NB: Leave blank if there are no clinical effects.

**Local:** clinical effects limited to the body part exposed (*e.g. skin, eyes*).

**Systemic:** clinical effects resulting from the systemic absorption of the pesticide and affecting several body organs and functions (poisoning).

**Both:** when the patient suffers localised and systemic effects (*e.g. skin lesions and systemic poisoning*).

**PSS** (Poisoning Severity Score) (*see Annex III*).

**None:** neither symptoms nor signs related to pesticide exposure.

**Minor:** mild, transient and spontaneously resolving symptoms.

**Moderate:** pronounced or prolonged symptoms.

**Severe:** life-threatening symptoms.

## 12. OUTCOME

Refers to the clinical evolution and health consequences of the patient's pesticide exposure.

**Recovery:** return to previous health status.

**Recovery with sequelae:** return to an acceptable health status with recovery of vital and other functions, but with sequelae (*e.g. polyneuritis, altered respiratory function, neuropsychological impairment, altered respiratory functionality, skin lesion,...*).

**Death related:** death resulting from the toxic effect of the pesticide. It includes directly related deaths, and those resulting from clinical complications of poisoning (*e.g. respiratory infection, CNS depression*).

**Death unrelated:** death not connected in any way with the exposure to the pesticide (*e.g. accident*).

**Unknown:** if outcome of the case is not stated in the medical record or known by the person reporting or collecting the data. Note: every effort should be taken to learn about the evolution of the case (*e.g. contacting the exposed patient or relatives, if possible*).

### 13. COMMENTS

Provide any relevant comments or observations, stating the section they refer to in the PER. For example,

- estimated costs (in US dollars) of hospitalization (per day) and, more specifically, the daily cost of ICU admission
- description of circumstances in case of environmental exposure
- chronic long-term exposure
- type of pesticide being treated
- if there was laboratory confirmation of exposure
- further comments or observations, if necessary use the back of the page.

Questions, observations and suggestions for improving, clarifying or amending the "PER Instruction and Definitions" should be faxed to the IPCS (Fax: +41 22 791 4848) or submitted to the E-mail Group (mail to: [pest@ccohs.ca](mailto:pest@ccohs.ca)) Thank you!

**PESTICIDE EXPOSURE RECORD (Confidential)**

<b>1. EXPOSURE TIME AND PLACE</b>		Record number: / / /	
Date of consultation: / /	Time elapsed since exp: ..... hs dy ms	City .....	
Date of exposure: / /	Duration of exposure : ..... hs dy ms	Province .....	
<b>2. COMMUNICATION (Source of information)</b>			
Name: .....	Institution: ( )	Phone: .....	Data collection date: / /
Category of person supplying information: <input type="checkbox"/> Medical <input type="checkbox"/> Paramedical		Officer's initials: .....	
<b>3. PATIENT DETAILS</b>			
Name (Initials): .....		Identity N° .....	
Sex: <input type="checkbox"/> M <input type="checkbox"/> F	Age: ..... dy ms yr <input type="checkbox"/> Unknown	If unknown: <input type="checkbox"/> Child <input type="checkbox"/> Adolescent <input type="checkbox"/> Adult	
<b>4. CIRCUMSTANCES OF EXPOSURE (check one, plus "uncertain", if relevant)</b>			
<input type="checkbox"/> Intentional <input type="checkbox"/> Accidental <input type="checkbox"/> Occupational <input type="checkbox"/> Uncertain <input type="checkbox"/> Unknown ( )			
<b>5. MAIN ACTIVITY AT TIME OF EXPOSURE (check one, or more than one if "Multiple")</b>			
<input type="checkbox"/> Manufacturing/formulation	<input type="checkbox"/> By-standing	<input type="checkbox"/> Veterinary therapy	
<input type="checkbox"/> Application in field	<input type="checkbox"/> Transportation	<input type="checkbox"/> Multiple (specify) .....	
<input type="checkbox"/> Public health campaign	<input type="checkbox"/> Mixing/Loading	<input type="checkbox"/> Not relevant	
<input type="checkbox"/> Household application	<input type="checkbox"/> Equipment care	<input type="checkbox"/> Other (specify) .....	
<input type="checkbox"/> Field re-entry	<input type="checkbox"/> Human therapy	<input type="checkbox"/> Unknown	
<b>6. LOCATION OF EXPOSURE (check one)</b>			
<input type="checkbox"/> Home (urban/periurban)	<input type="checkbox"/> Home (rural)	<input type="checkbox"/> Farm/field	<input type="checkbox"/> Greenhouse <input type="checkbox"/> Unknown
<input type="checkbox"/> Garden (urban/periurban)	<input type="checkbox"/> Garden (rural)	<input type="checkbox"/> Public area	<input type="checkbox"/> Storage site <input type="checkbox"/> Other (specify) .....
<b>7. ROUTE OF EXPOSURE (check main route or more than one, if applicable)</b>			
<input type="checkbox"/> Oral <input type="checkbox"/> Dermal <input type="checkbox"/> Respiratory <input type="checkbox"/> Ocular <input type="checkbox"/> Unknown <input type="checkbox"/> Other (specify) .....			
<b>8. PRODUCT IDENTITY (add other page(s), if necessary, for each product)</b>			
Product name(s): .....		<input type="checkbox"/> Unknown	(Co-ordinator to fill-in) Use intended: .....
Active Ingredient: .....		<input type="checkbox"/> Concentration (if available) ..... %	
Physical form: <input type="checkbox"/> Gas <input type="checkbox"/> Liquid <input type="checkbox"/> Solid <input type="checkbox"/> Unknown		Registered <input type="checkbox"/>	
Actual use: <input type="checkbox"/> Insecticide <input type="checkbox"/> Herbicide <input type="checkbox"/> Tick control <input type="checkbox"/> Unknown		Not approved <input type="checkbox"/>	
<input type="checkbox"/> Rodenticide <input type="checkbox"/> Fungicide <input type="checkbox"/> Other (specify) .....			
<b>9. CHEMICAL TYPE (check one or more if relevant)</b>			
<input type="checkbox"/> Organophosphorus	<input type="checkbox"/> Thiocarbamate	<input type="checkbox"/> Dinitrophenol deriv.	<input type="checkbox"/> Fluoroacetate <input type="checkbox"/> Unknown
<input type="checkbox"/> Carbamate	<input type="checkbox"/> Coumarin	<input type="checkbox"/> Organomercurial	<input type="checkbox"/> Other (specify) .....
<input type="checkbox"/> Organochlorine	<input type="checkbox"/> Dipyrldyl	<input type="checkbox"/> Phosphide	<input type="checkbox"/> Specific chemical: .....
<input type="checkbox"/> Pyrethroid	<input type="checkbox"/> Phenoxyacid	<input type="checkbox"/> Arsenical	
<b>10. MANAGEMENT</b>			
Treatment given: <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Referred to other hospital			
Hospitalisation: <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown If yes, days in hospital ..... Days in ICU .....			
<b>11. SEVERITY GRADING</b>			
Effects: <input type="checkbox"/> Local <input type="checkbox"/> Systemic <input type="checkbox"/> Both PSS: <input type="checkbox"/> None <input type="checkbox"/> Minor <input type="checkbox"/> Moderate <input type="checkbox"/> Severe			
<b>12. OUTCOME</b>			
<input type="checkbox"/> Recovery <input type="checkbox"/> Recovery with sequelae <input type="checkbox"/> Death related <input type="checkbox"/> Death unrelated <input type="checkbox"/> Unknown			
<b>13. COMMENTS (stating section; continue overleaf if necessary)</b>			
.....			

## Annex 7

### LIST OF DESCRIPTORS OF THE POPULATION AND INDICATORS OF PESTICIDE EXPOSURE

#### Remarks:

- (1) The preparation of the present document was agreed upon at the WHO/SEARO Workshop on the Epidemiology of acute pesticide poisoning, held in New Delhi – India (22-24 January, 2001).
- (2) This document is meant to serve as a tool to assist in the design and interpretation of epidemiological studies on the impact of acute pesticide poisoning. In order to drive sampling procedures and for a proper interpretation of results, it is important to identify “scenarios” that characterise the study area. A scenario is defined by a set of descriptors and indicators which provide relevant information to describe the population, the study area and characteristics related to pesticide exposure and poisonings.
- (3) The information collected may serve several scopes: a) to guide sampling procedures and evaluate to which extent the sampled population is representative of the target population; b) to guide in the interpretation and analysis of data; c) to improve comparability of data collected in different areas; d) to perform statistical extrapolations of incidence data over time and over geographic regions; e) to improve data reporting and communication.
- (4) A proposed list of descriptors/indicators is provided in this document, together with sample tables to illustrate a possible format of data. It is remarked that this list should not be intended as an exhaustive list of “essential” information, but only as a tool illustrating some examples of how data might be recorded. Some of the proposed descriptors might not always be available, while others not mentioned here might be more easily collected in a specific country.

- (5) Three types of data should be collected, to help characterising factors which may affect the likelihood of i) exposure to pesticides and occurrence of poisoning, and ii) access/notification to a health care service:
  - (a) general characteristics of the population (demography, residence, education, occupation, health status, etc.)
  - (b) possible sources/patterns/determinants of pesticide exposure (land use, climate, use of pesticides, etc.)
  - (c) characteristics of the health care services.
- (6) For each identified indicator, a preliminary inventory of possible sources of data should be prepared, and each source should be carefully evaluated in terms of reliability, constraints, and cost of data (table1).
- (7) The data might be collected and used at varying geographic *scales* (f.i. province, district, country, etc.). The choice of the scale is obviously dependent on the objective of the study, the type of data, and on the specific use that will be made of the data collected (see point 3). For example, a larger scale may be sufficient for international comparison, while more disaggregated data may be needed to select denominators of incidence estimates. In any case the choice of the scale will also be forced by the actual availability of data. In the sample tables illustrated in the following it is proposed to collect information related both to the "study area" (f.i. two provinces) and to the whole country.
- (8) The use of GIS (Geographical Information Systems) is highly recommended to develop *MAPS* illustrating the spatial variation of collected data.
- (9) The categories to be assigned to each indicator (and the corresponding *MAPS*' labelling systems) may deeply vary between different countries. The tables proposed in the following should be adapted accordingly in each country.

We will welcome and consider any suggestions for improving the proposed list.

## 1. ANALYSIS OF POSSIBLE SOURCES OF DATA

Descriptor/ Indicator	Sources of data (f.i. population census, census of agriculture, national surveys, monitoring programmes, remote sensing, etc).	Scale (f.i. country, province, district, etc)	Reliability (f.i. high, medium, low)	Constraints (comments)	Cost of data
2. GENERAL POPULATION CHARACTERISTICS					
2.1 Population structure by age and gender					
2.2 Percentage of the population in rural/urban areas					
2.3 Education by gender					
2.4 Race by gender					
2.5 Religion by gender					
3. EXPOSURE TO PESTICIDES					
3.1 Arable land (ha)					
3.2 Arable land by major crops					
3.3 Number of workers employed in agriculture by gender and age					
3.4 Number of farms					
3.5 Data on pesticides marketed/used.					
3.6 Number of pesticide industrial plants.					
3.7 Pesticides regulation					
4 EXISTENCE AND DISTRIBUTION OF HEALTH CARE SERVICES					
4.1 Characteristics of Health Care Services					
5. HEALTH INDICATORS					
5.1 Main causes of mortality/morbidity					

## 2. GENERAL POPULATION CHARACTERISTICS

### 2.1 Population structure by age and gender

Age class	Study Area						Country					
	Males		Females		Total		Males		Females		Total	
	N	%	N	%	N	%	N	%	N	%	N	%
0-5												
6-10												
.....												
>80												
Total		100		100		100		100		100		100

### 2.2 Percentage of the population in rural/urban areas

	Study Area						Country					
	Males		Females		Total		Males		Females		Total	
	N	%	N	%	N	%	N	%	N	%	N	%
Rural population												
Urban population												
Total		100		100		100		100		100		100

### 2.3 Education by gender

	Study Area						Country					
	Males		Females		Total		Males		Females		Total	
	N	%	N	%	N	%	N	%	N	%	N	%
Illiterate												
Primary school												
Secondary school												
University degree												
Total		100		100		100		100		100		100

## 2.4 Race by gender

List of major categories	Study Area						Country					
	Males		Females		Total		Males		Females		Total	
	N	%	N	%	N	%	N	%	N	%	N	%
Total		100		100		100		100		100		100

## 2.5 Religion by gender

List of major categories	Study Area						Country					
	Males		Females		Total		Males		Females		Total	
	N	%	N	%	N	%	N	%	N	%	N	%
Total		100		100		100		100		100		100

## 3. EXPOSURE TO PESTICIDES

### 3.1 Arable land (ha)

### 3.2 Arable land by major crops (ha)

(f.i. Orchard, Greenhouse crops, Tea, Hops, Cereals, Rice, Tobacco)

### 3.3 Number of workers employed in agriculture by gender and age

### 3.4 Number and size of farms

Information on the size of farms may be collected in terms of hectares. Farms can also be described in terms of number of employed workers.

### 3.5 Data on pesticides marketed/used.

Information should be collected on the amount and type of pesticide "used". However, in many countries these data are not available, while data on pesticides marketed can be more easily available and may be used as

“proxies” of the actual pesticide use. All of these data should be collected at least at the national level, but information at lower level would be of higher value for a proper interpretation of results. Three sample tables are reported below.

**(a) Sales by functional class**

Functional class	Sales (tons or market value)
Herbicides	
Insecticides	
<b>Fungicides</b>	
.....	
.....	

**(b) Sales by chemical class**

Chemical class	Sales (tons or market value)
Organophosphorus	
Carbamate	
Organochlorine	
Pyrethroid	
.....	
.....	

**(c) Amount of acutely toxic pesticides sold (f.i. top 20 a.s.)**

Name of acutely toxic a.s.	Amount
1.	
2.	
3.	
4.	
.....	
.....	

**3.6 Number and location of pesticide industrial plants.**

**3.7 Pesticide regulations**

**3.7.1 Does the country have a system for the authorisation and marketing of pesticides?**

Yes             No

Brief description/reference:.....  
.....  
.....

**3.7.2 Does the country have a specific legislation on storage, transport, disposal of pesticides?**

Yes             No

Brief description/reference:.....  
.....  
.....

**3.7.3 Does the country have a national programme for occupational health surveillance?**

Yes             No

Brief description/reference:.....  
.....  
.....

**3.7.4 Does the country have a programme for monitoring pesticide poisonings?**

Yes             No

Brief description/reference:.....  
.....  
.....

## 4. ACCESS TO HEALTH CARE

### 4.1 Characteristics of Health Care Services

Name of the health care service where cases of pesticide poisoning are collected:.....

- Type* : hospital, poison control centre, primary care, etc.
- Location* : Full address
- Coverage* : population served by the medical facility
- Area served* : describe the borders of the area served by the medical facility
- Ease of travel* : yes/no
- Total poisonings* : All poisonings, including pesticides, in the study period
- Total admissions* : number of patients admitted in the study period
- MR* : Quality of medical records (good, poor)
- Training* : Training of medical officers in the recognition and treatment of pesticide illness (good, poor, none).

### 4.2 Other Health Care Services

It would be important to collect some information on other health care services located in the study area, and on the existence of occupational health programmes in the study area (f.i. on farms).

## 5. HEALTH INDICATORS OF THE POPULATION

### 5.1 Main causes of mortality/morbidity

Main causes	Study Area		Country	
	Occurrence	Year	Occurrence	Year

*Occurrence*: prevalence, incidence, etc.

## Annex 8

### COUNTRY PROPOSALS

#### Hospital/Community Based Database Establishment for Pesticide Poisoning

##### 1. BANGLADESH

**Project period:** 24 months.

**Components:**

**Awareness Raising:** The reported pesticide poisoning cases are mainly intentional. Only few cases of accidental and occupational exposures are reported. A seminar is therefore, planned to bring together the focal representatives of Health, Agriculture, Environment, Trade and Industry Departments, to discuss the problems, introduce the concept of the project and to seek their cooperation and support.

**Data Base Development:**

Director-General Health Services, Directorate of Planning and Research, will be the implementing agency.

**Participating Centres:**

Fifteen hospitals covering primary, secondary and tertiary level health facilities.

**Orientation of staff:**

Medical doctor and medical record staff will be trained to enable them to fill PER forms correctly, Existing training material of IPCS will be translated into Bangla language, as required.

Period of Data Collection: 12-15 months.

**Community Risk Survey:**

Two agricultural areas with high pesticide use and risk of exposure to pesticide residue, both in field and homes, will be identified and broad risk assessment will be carried out.

**Project Activity Schedule:**

Mobilization Phase	6 months
Hospital-Based Studies	6 -18 months
Community-Based Studies	9 -15 months
Report	18 -24 months
TOTAL PERIOD	24 months

**Proposed Budget Requirement**

	First year US\$	Second Year US\$
Launching seminar	2000	
Training meeting	6000	
Training material/translation printing	2500	
Support to participating hospitals	7500	
Community survey - 2 sites		
Surveyors training	4000	
Surveyors - 8	9600	19200
Subsistence/Transport	5000	10000
Senior consultant	1000	1500
Data processor	1000	1500
Reporting	1000	3000
Miscellaneous	2000	2000
International travel	<u>2000</u>	<u>2000</u>
<b>TOTAL:</b>	<b>41600</b>	<b>39200</b>

**2. INDIA**

**Study Period:** 3 years; preparation 6 months, data collection 2 years, final report 6 months.

**Steering Committee:** 5-7 members with National Coordinator as Secretary.

Criteria for selection of hospitals for hospital-based and a health centre for community-based studies, in each of the five provinces.

- Accessibility.
- High pesticide use in the area.
- Interest and cooperative attitude of the selected hospital authorities.
- Availability of a good number of different levels of hospitals, (hospital for the study to be selected by random sampling. Additional hospital will be added to make data more representative).

Selection of responsible officers from the Regional Hospitals as trainers, supervisors and regional coordinators will be made by the National Coordinator in consultation with the concerned health authorities.

**Training:**

- Training of Regional Coordinators at the national level to work as trainers.
- On-site training of medical officers, paramedics, and medical record keepers.

**Remote Sensing:** Maps to identify crops and their distribution to be collected from National Geo-Physical Research Institute.

**Pesticide Consumption:** Information will be collected from various sources and marked in the maps.

**Cultural Practices:** Information will be collected.

**Seminar/Workshop:** A seminar will be organized for responsible officers.

**On-site training:**

- Health centre and other doctors.
- Midwife, Health Assistant, Village Health Workers and other paramedical staff.
- Private medical Officer, ICU hospital in-charge.

Review meeting will be organized quarterly.

Collection and recording of data in computer will be carried out monthly. Analysis and reporting six-monthly.

**Bilateral visits:** The cost of a visit to a similar project under implementation in other SEAR countries will be included in the project proposal, for information sharing.

**International Travel:** The cost of a visit to WHO/HQ or some other place for experience sharing between the National Coordinators will be included in the project.

**Budget:** India is a large country, the cost of implementation of the project in each of the five provinces will be worked out later.

### 3. INDONESIA

**Study Period:** Two Years; 2001-2002

**Background:** Previous study, during 1999-2000, was hospital-based, the information was found to be under-reported and the results did not reflect the actual field situation.

**Planned Study:**

Year 2001

- Hospital Based (10 hospitals + private hospitals) in four provinces.
- One district (hospital and health centre-based).

Year 2002

- Hospital and health centre-based studies will be continued.
- One new district (population-based).

**Composition of the Steering Committee:**

- Ministry of Health (CDC & Medical Care).
- Ministry of Agriculture.
- Central Bureau of Statistics.

- Poison Centres.
- University of Indonesia, (Faukities of Medicine and Public Health).
- Agriculture Institute of Bogor.

**Budget Estimate:**

2001	:	US\$ 30000
2002	:	US\$.40-50000
Total	:	US\$ 70000 to 80000.

**4. MYANMAR**

**National Coordinator:** Prof. Dr. Paing Soe, Director-General, Department of Medical Research, will be the National Coordinator.

**Steering Committee:** It will comprise of the following participating Departments:

Epidemiology Research Division	Epidemiologists
Statistics Division	Chief Statistician
Clinical Research Division	Two clinicians
Pharmacological Research Division	Pharmacologist
Entomology Division	Entomologist
Deputy Director, Occupational Health	
Medical Superintendents of Yangon and Mandalay Hospitals	
Physicians and Township Medical Officers	
Entomologists from vector borne disease control	

The cooperation/coordination will be established with the Department of Agriculture and their Deputy General Manager will be involved.

Budget:

2001:	US\$ 20000
2002:	US\$ 25000
TOTAL:	US\$ 45000

**Study Area:** In addition to seven hospitals where data collection activity was carried out 1999-2000, using government resources, study will be extended in seven more hospitals. Study will include community-based study in a

selected group of villages, owners of crops, spray crews and village authorities will also be involved.

Proposal will include computer hard and soft-ware.

## **5. NEPAL**

The proposal drawn by Dr S. K. Gupta is for hospital-based and community-based studies separately as below:

- (1) The National Coordinator (Dr Gupta) will first brief the Institute of Medicine and the Ministry of Health, to obtain the government approval for the study.
- (2) Steering Committee:
  - Dean, Institute of Medicine.
  - Director General, Ministry of Health.
  - Representative from the Ministry of Agriculture.
  - Chairman, Nepal Health Research Council.
  - Community Medicine Faculty.
  - Country Representative of WHO.
  - Prof S. K. Gupta, Member-Secretary.

Steering Committee will meet three times in a year and whenever needed.

### **(a) Hospital-based Study**

**Selection of the Hospitals:** Nepal has 5 development Regions. Three hospitals from each of these five regions and five hospitals in Kathmandu city are proposed to be included in the study. In all, about 20 hospitals are proposed to be included in the study.

**Training of Trainers:** One trainer from each Region, total 5 nos., will be trained. Training of trainers will be carried out in Kathmandu. Their work will be evaluated and further training will be given till they become fully conversant with PER and the guidance material.

**Training of Data Collectors:** Training will be carried out at their respective institutions. Their work will be evaluated, and they will be retrained before they are assigned to do data collection. This is to ensure that PER is filled in correctly.

**Data Collection:** Data will be collected mostly by medical personnel and occasionally by para-medical personnel, for full 12 months.

**PER Checking:** All the collected PER will be checked by the coordinator before the data are entered in the computer. The data collectors will collect data, and submit at the end of the month regularly. The work of data collectors, including data, will be checked at the end of the first month period, and at the end of 3, 6, 9 and one year to ensure that the data are collected regularly and properly.

**Data Entry:** All data will be entered in the computer. Assistance of a computer expert will be taken for systemic compilation of data and data analysis. He will be hired for this purpose. Data entry will however, be done by a faculty member.

**Rechecking of Data:** The National Coordinator will carry out rechecking of data.

**Data Analysis:** The analysis will be carried out by the Coordinator with the help of the computer expert hired, as mentioned above.

**Report:** Report will be prepared and submitted by the coordinator.

#### **(b) Community-based Study**

- (1) Steering Committee will discuss the plan and the proposal prepared by the Coordinator to provide directions, if any.
- (2) Study will be formulated after a thorough discussion with the Faculty of Community Medicine and Clinical Epidemiology.
- (3) Selection of Area of Study: One or more villages will be selected and the local manpower will be trained.
- (4) Training of other supervisory manpower will also be trained.

- (5) As the data have to be collected by paramedical persons and general practitioners, they have to be trained to ensure that information is collected correctly.
- (6) After collecting information the data will be analysed by the Coordinator for the study.
- (7) The Coordinator will prepare and submit the report of the study.

#### **Budget for the Study**

	<b>First year</b>	<b>Second Year</b>
Hospital-based study covering selection of hospitals, personnel, training, travel, stationery, and Miscellaneous etc.	US\$ 30000	US\$ 20000
Community-based study for a year		US\$ 25000
Total cost of the study		US\$ 75000

#### **6. SRI LANKA**

Participant from Sri Lanka informed that she will submit the country plan for the study later.

#### **7. THAILAND**

Methodology: Hospital and community-based

Study Areas: Twelve provinces

Regions:

Central	2 Districts
North	2 Districts
North East	3 Districts
East	2 Districts
South	3 Districts
Total	12 Districts

Provincial Health Office will have Coordinators at the provincial level.

**Participating Institution:**

- Epidemiology Division.
- Agriculture Extension Division.

**Study Phase:**

- Phase I already implemented in 1999 with WHO SEARO support.
- Phase II (2000-2001) is already under implementation using government budget.
- Phase III (2002-2003) Components: Planning, training, data collection, data entry and analysis, site visits, evaluation and discussions, recommendation, study for integration.

**Budget for implementation:**

2002 - 2003:	
Hospital-based studies	US\$ 52000
Community-based studies	US\$ 28000
Total:	US\$ 80000

*Note: Participation in International meetings extra.*