



different logical orders by several independent users and for different applications and has each data item logically stored only once. Wherever possible the construction of data banks should take into account the use of existing files, procedures and organizations as this will reduce the real cost of data collection.

4. In designing health information systems it is necessary to take into account recent technical developments and to consider the cost/effectiveness of the system's architecture in relation to available resources and the objectives of the project.
5. Great care has to be taken to see that the accuracy, reliability and validity of the data is understood in the context of the questions asked, particularly when the information is being used for multiple purposes. It should be remembered that it may be both easier and much cheaper to use data already stored than to collect data for a specific study, sometimes ab initio.
6. Health data banks which contain data relating to persons should, if possible, be related to the total population of the region or country or to other well-defined population groups under review in order to provide denominator data. Population-oriented health data are needed at the regional and national levels of administration in order to give guidelines for the allocation of resources and in the planning of health systems. These data are of great importance for epidemiological studies.
7. Many other types of data banks relate, for example, to drugs or the environment, which may not depend on person- or population-based information. The data of other, equally relevant, data banks relating to the social or economic status of persons should be compatible with health data banks.
8. The Working Group considered data protection, e.g., confidentiality, security and privacy on several occasions throughout its deliberations. It considered that data accumulated in data banks are often more protected against misuse than data filed in a traditional way. All the members were concerned to ensure that the restrictions placed on the use of computerized data banks should not unduly restrict the use of patient data for patient care and research purposes.  
  
The situation existing in different countries prevents the formulation of detailed recommendations. The Working Group nevertheless recommends that when legislative authorities are drafting privacy laws they take into account the needs of patient care and medical research, realizing that for this purpose the use of personal information about the patient, including personal identification, is often necessary.
- It was the view of the Group that health data banks should remain as separate entities, i.e., person-related information should not be transferred to other non-health data banks.
9. It was recognized that, whereas in several countries there are hospital inpatient information systems operational, the same cannot be said of information systems covering either outpatient departments or general practice. The Group recommended that every encouragement should be given to the collection of data on ambulatory care. For example, data should be collected on primary care in order to provide information which would be of value in policy making, research, management and education.
10. Although there has been a tendency to try to distinguish different types of health data banks, it was appreciated that these distinctions are very difficult to draw clearly and indeed that there should be encouragement given towards the linking of health data banks for which data should be compatible. In order to obtain more efficient health care and health information systems the same data can often be collected by clinicians and used by them as well as by other health professionals.  
  
It is recommended that, wherever it is feasible, data should be collected once and used for as many relevant purposes as possible. The compatibility and linkage of primary care registrations; hospital data; preventive, social and health-environmental information systems; and health care delivery systems is recommended.
11. There was general agreement that when data is transmitted from peripheral to more central data banks it should be in a non-aggregated form, as this allows for greater flexibility in programming, processing and analysis.
12. There was considerable discussion on the meaning of terms such as data bank, information system, data base, files, because there is no standardized terminology available. Such standardization is desirable and the Working Group therefore recommends that:

(a) in discussions on the general topic of health information systems clear definitions, together with descriptions and criteria of the terms used, should always be given;

(b) WHO/IFIP and other organizations should consider in more detail whether a standard terminology is possible, taking into account the views of health personnel, management staff and computer specialists.

13. The Group also felt that standardization of definitions, classifications and possibly coding of data used in health information systems should at least be attempted within each Member State, and the Group recommended that WHO should direct its standardization efforts in this direction.

14. General information and elementary training on significant aspects of information science should be included in the curricula of undergraduate training in health matters with the objective of providing education on the importance, uses and impact of these topics in relation to the various fields of health.

Postgraduate training should be given to ensure that there is appropriate cross fertilization between the different professions involved in health information systems, both as users and providers.

15. The Group appreciated WHO's efforts towards making the 9th Revision of the International Classification of Diseases more applicable to general practice and primary care, but felt that further attention to this problem would be necessary in the future. It also recognized that no adequate problem-oriented classifications exist in several fields, and recommended that WHO should take steps towards the further development of such classifications, taking into account known experience.

16. The Group considered how WHO, its Member States and IFIP could assist in disseminating information on the experience of different countries in the design, implementation and use of health data banks. It is recommended that the exchange of such information should be encouraged by all means possible, e.g., through publications, meetings, conferences, fellowships and professional societies.