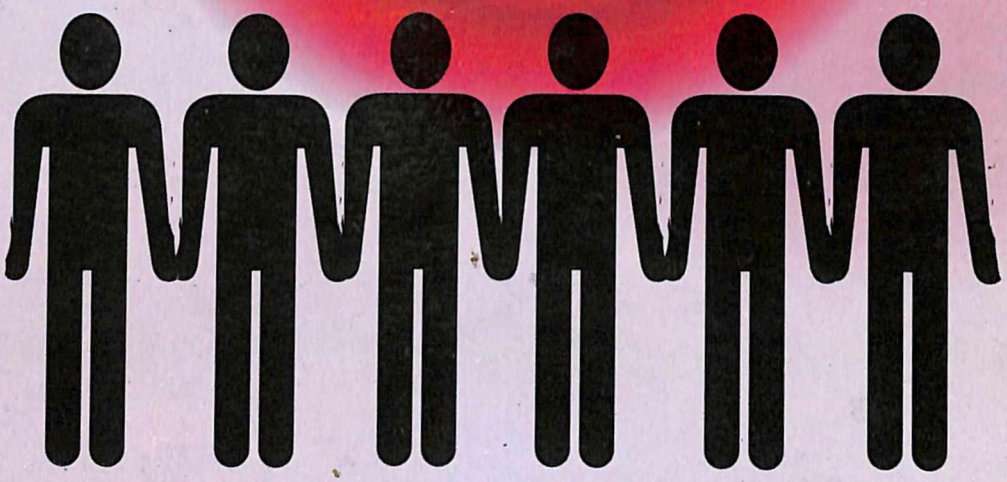
Health Information System in North East India



. Ibohal Singh

a BR Publication

Health Information System in North East India

Ch. Ibohal Singh

With a Foreword by

Prof. N. Bijoy Singh

Vice-Chancellor, Manipur University, Imphal

B.R. Publishing Corporation

[A Division of BRPC (India) Ltd.]

Delhi-110052

Health Information System in North East India

Ch. Ibohal Singh

First Published : 2005

ISBN 81-7646-515-1

Rs. 450

Printed & Published by :
B.R. Publishing Corporation
[A Division of BRPC (India) Ltd.]
425, Nimri Colony,
Ashok Vihar, Phase IV
Delhi – 110052
E-Mail : *brpcltd@del2.vsnl.net.in*

Printed In India

Dedicated
to
my beloved teacher
Dr. Ramansu Lahiri
former Head of the Department of Library and Information Science
Manipur University, Imphal.

Content

Foreword

The Constitution of the World Health Organisation states that "the enjoyment of the highest attainable standard of health is one of the fundamental right of every human being. Good health enables the individual to lead a productive life. Every nation aims at achieving 'health for all'.

To achieve health for all accurate information has to be made available to the professionals, planners and general public. Efficient health information keeps the health care professionals better informed of the diseases and treatments. With improved health information, the general public will be able to understand the causes of diseases and preventive measures. Former Director General of World Health Organisation, Dr Hiroshi Nakajima said that "an indispensable factor for equity in health is timely and accurate information". Every initiative for health care needs the support of information systems for effective implementation.

Dr. Ch. Ibohal Singh, based on his research work leading to doctoral degree, has published his work entitled **Health Information System in North East India.** This is the first publication available on Health Care Information in the Northeastern region. Dr Singh, through this book, aims at highlighting the importance of health and health information systems, and has assessed the health care scenario in Northeast India. He has also analysed the access to health information systems by different categories of users and suggested a model design of health information system to provide effective service.

I am sure that this book will serve the needs of the students, scholars, and teachers of Library and Information Science and also the health care professionals.

N. Bijoy Singh
Vice-Chancellor
Manipur University, Imphal

Acknowledgement

At the very outset I am very much grateful to my teacher and research supervisor Dr. Ramansu Lahiri, former Head of the Department of Library and Information Science, Manipur University, Imphal who inspired me for writing the present work. Thank you sir for your patient guidance and personal care ever since my student days that shall always be remained in the core of my heart. Sir, really you are my source of inspiration.

I am deeply indebted to Prof. N. Bijoy Singh, honourable Vice-Chancellor, Manipur University, Imphal (former Director, Regional Institute of Medical Sciences, Imphal) for writing the foreword of the book which certainly provides me a great confidence, encouragement and a moral boost as an author of a book.

I also would like to thank all the faculty and the staff members of the Department of Library and Information Science, Manipur University, Imphal for their continuous support and encouragement.

To all my family members I owe an immense debt for their love and support in countless ways throughout.

My sincere and special thanks are also due to Shri Praveen Mittal, Managing Director, Shri Neeraj Mittal, Director and all the staff members of BRPC (INDIA) LTD, New Delhi for their keen interest in bringing out this book neatly at their own cost.

Last, but not the least, I am deeply acknowledged to all the authors cited in this book.

Imphal, the 17th March 2005 **Ch. Ibohal Singh**

Abbreviations Used

ACP	:	Administrator cum Practitioner
ADM	:	Administrator
AIDS	:	Acquired Immune Deficiency Syndrome
ANW	:	Auxiliary Nurse Midwifery
ARIST	:	Annual Review of Information Science and Technology
ATNF	:	Apollo Telemedicine Networking Foundation
AWCS	:	Anganwadi Centres
BBCI	:	Dr. B. Baruah Cancer Institute
BHSLs	:	Basic Health Science Libraries
CDPO	:	Child Development Project Officer
CHC	:	Community Health Centre
CIC	:	Community Information Centre
CMO	:	Chief Medical Officer
CSSM	:	Child Survival and Safe Motherhood
DA	:	Diploma in Anesthesiology
DCP	:	Diploma in Clinical Pathology
DAE	:	Department of Atomic Energy
DDK	:	Door Darshan Kendra
DONER	:	Department of Development of North Eastern Region
G2C	:	Government to Citizen
HCDS	:	Health Care Delivery System
HEALINET	:	HEALth Information NETwork
HELLIS	:	Health Literature, Library and Information Service
HFA	:	Health for all
HIS	:	Health Information System
HRD	:	Human Resource Development
ICDS	:	Integrated Child Development Service
ICMR	:	Indian Council for Medical Research
ICPD	:	International Conference on Population and Development
IEC	:	Information Education and Communication
IIPS	:	International Institute of Population Sciences
IMA	:	Indian Medical Association
IMC	:	Indian Medlars Centre
INFLIBNET	:	Information and Library Network
INSDOC	:	Indian National Scientific Documentation Centre
IS	:	Information System

ISM	:	Indigenous System of Medicine
ISTV	:	Information Service Television Network
IT	:	Information Technology
MCW	:	Mother and Child Welfare
MEDLARS	:	Medical Literature Analysis and Retrieval System
NACP	:	National AIDS Control Programme
NATIS	:	National Information System
NDC	:	National Documentation Centre
NEC	:	North Eastern Council
NER	:	North Eastern Region
NFHS	:	National Family Health Survey
NFP	:	National Focal Point
NIC	:	National Informatics Centre
NIDCP	:	National Iodine Deficiency Disorder Control Programme
NIHWF	:	National Institute of Health and Family Welfare
NISSAT	:	National Information System in Science and Technology
NLEP	:	National Leprosy Eradication Programme
NLM	:	National Library of Medicine
NMEP	:	National Malaria Eradication Programme
NML	:	National Medical Library
NPCB	:	National Programme for Control of Blindness
NTCP	:	National TB Control Programme
PPF	:	Paraprofessional
PPPP	:	Post Partum Programme Centre
PTR	:	Practitioner
RIMS	:	Regional Institute of Medical Sciences
RMC	:	Regional Medical College
RML	:	Regional Medical Library
RMRC	:	Regional Medical Research Centre
RRRLF	:	Raja Rammohun Roy Library Foundation
SLO	:	State Leprosy Officer
SMAM	:	Singulate Mean Age at Marriage
SSN	:	Shri Sankardev Netralaya
STD	:	Sexually Transmitted Disease
TCP	:	Teacher cum Practitioner
UNISIST	:	United Nations Information System in Science and Technology
VHG	:	Village Health Guide
WHA	:	World Health Assembly
WHO	:	World Health Organization

Introduction

Dr. Hiroshi Nakajima, former Director General of WHO once said that **an indispensable factor for equity in health is timely and accurate information**. This accurate health information is needed not only by the health professionals but also by politicians, policy makers, planners and individuals and families in every work of life. The ultimate purpose for the same being overall improvement of the health care delivery system and healthy ways of living. As such access to the information resources is needed to get pin-pointed, relevant and timely information, because information has to play a vital role to make the much quoted slogan **Health For All** (HFA) into a reality. In fact, HFA is the goal of WHO.

Focus on World Summit

While presenting the plan **Natural Health for All by the Year 2020 is Possible**,[1] to the World Summit held in Johannesburg in August 2002, Dr. Matthias Rath had rightly emphasised the importance of health care and health information.

- Health is a basic human right. Every person is entitled to make use of this right without any restriction. Public institutions and private organisations are to be held accountable for providing life-saving health information to the people of the world. The obstruction of the right to essential health information for every one constitutes a crime against humanity.
- The eradication of today's most common health problems is dependent on one factor only: how fast the information about this breakthrough in natural health can be spread. Whilst the scientific knowledge to

combat these diseases effectively is available and the essential nutrients to prevent these health conditions can be produced at low costs, in any quantity, anywhere in the world, the dissemination of this life-saving information to the people of the world is being obstructed.

- The goal "Health for All by the Year 2020" is in sigh. What is needed immediately is a worldwide effort to promote the dissemination of natural health benefits in every country.

The strategic plan gives emphasis on the promotion of accurate and right health care information to every individual of the world. The dissemination of natural health on a worldwide scale would be possible only if the right kind of information is made available throughout the world.

Medical Science: A Historical Perspective

The history of medicine and health care has been considered as the account of man's efforts to deal with human sickness, injuries, illness, etc. from the primitive attempts of preliterate man to the present complex array of specialities and treatments. All known cultures of the past—Egyptian, Babylonian, Jewish, Greek, Indus-Valley, etc. have their own equally glorious and useful systems of medicine and health care.[2] The different medicine/health care system includes—Indigenous Systems of Medicine, Homeopathy, Non-Drug Therapy, Modern System/Allopathy, etc. As traced out by Dixit,[3] in the Orient, one could become a physician by intensive training such as— [i] learning theory and practice of medicine as an apprentice to a teacher by living and working with him in his house; [ii] joining a gurukula, a residential school situated in the forests, away from human habitations; [iii] joining one of the institutes of higher learning at Takshila, Kashi or Nalanda. The period 800 B.C. and 600 A.D. was the classical age of early Indian Medicine. The indigenous systems of medicine have been the part of the cultural heritage and have rendered cost effective and efficacious patient care through the centuries. India is also not an exception to this. The different indigenous systems include: (a) Ayurveda, which was fully developed between

700 B.C., and 1000 B.C.[4]; (b) Siddha; founded by Saints/ Maharishis like Pulastiar, Thirumovar, Chattamuni, Kapilar and Perinarkanar[5]; (c) Unani; (d) Amchi; (e) Tibetan; (f) Tibbi; etc. Homeopathy is the youngest medical science and it has been in the service of mankind for almost two centuries. The system was derived by the great German Physician, Christian Fraderick Samuel Hahnemann in late 18th Century. In this system, the main emphasis is on the remedial agents in illness and in health. There are also some systems of treatments in which no drugs are used for the ailment and curing of diseases. Naturopathy and Yoga are the major non-drug therapies, which are widely applied in many parts of the world. In India, the National Health Policy recognises the role of the Naturopathy and Yoga for promotion of health and prevention of diseases.

Modern system of medicine, also known as allopathy or western or scientific medicine of health care, which advocates therapy with remedies that produce effects differing from those of the disease treated. The origin of the modern allopathic system was found in the Vedic hymns written centuries before the Common Era by East India predecessors of today's Ayurvedic practitioners. Further growth of allopathy was occurred with the keen observations of a few giant figures, including Aretacus of Cappadocia, Hippocrates of Greece and Ibn Sina of Persia. These were aided by the establishment of the great universities at Padua and Paris and their offspring at Cambridge and Oxford. Much later, the universities patterned after these, which were established in the Colonies and in North America, particularly those in Pennsylvania and Massachusetts, aid the evolutionary process.[6] In India, modern allopathic system was first introduced by the Portuguese in the 16th century. According to a 17th century travel account, Albuquerque, founded the Royal Hospital in Goa after its conquest in 1510. In 1591, the hospital was handed over to the Jesuites. In 1703 a rudimentary form of medical training was introduced at the Royal Hospital with Cipriano Valadares as the Master. Well over a century later this resulted in the School of Medicine and Surgery in 1842.[7]

Development of Medical Science

Medical science is a diversified field of study and it has been developed through various stages. The development of medical science in various stages from 1850 to 2000, as depicted by W.L. Barton is being reproduced as in Table 1.1.

To quote Barton: "If this era is to have success there must be a move from the concept of health as being the responsibility of a professional service to a new emphasis on self-reliant health care ...."[8] But in this electronic information era of new millennium with the provision of **Telemedicine Service** healing by wire will certainly occupy a new scene in the health care delivery system (HCDS) breaking the geographical and communication barriers.

The health of a nation is considered as the sum total of the health of its citizens, communities and settlements as well as the overall climate within which the citizens and communities live. According to National Health Policy (NHP), 2002, "to increase utilisation of public health facilities from current level of less than 20 per cent to more than 75 per cent" is one of the goals to be achieved by 2010. Primary Health care is essential health care made universally accessible to individuals and acceptable to them, through their full participation and at a cost the community and the country can afford (The Alma Ata Declaration, 1978). **Any society will be judged by its ability to provide universal health care for its people. This does not merely entail the ability to treat diseases and aliments but also to prevent their onset by means of suitable systems and measures.**[9]

Sound health is a primary consideration for increasing the productivity of the individuals who are also the important contributors to the global development. To implement the much quoted slogan, HFA in reality, is therefore, a challenge to the health authorities, planners and professionals. The HFA programme cannot effectively be implemented unless information regarding health care is made available to every individual (*i.e.* authorities, planners, professionals and target groups) at the right time and at the right place.

Table 1.1: Development of Medical Science up to the year 2000 (From the empirical era to political health science)

Category	Empirical Health Era 1850	Basic Science Era 1900	Clinical Science Era 1950	Public Health Era 1975	Political Health Science Era 2000
Purpose & Philosophy	Symptom-Centred Empirical diagnoses & treatment of symptoms	Bacteria or Disease Centred Diagnoses and Treatment of disease.	Patient-centred diagnoses and treatment of the individual	Community centred diagnosis and treatment of the community	People-centred diagnosis and treatment of total body politic.
Education	Lectures Authoritarian Instruction	Laboratory instruction	Clinical instruction besides teaching	Clinical public health instruction, community side teaching	Social experience-learning social and economic understanding. Managerial acumen—political psychology and process. Country health programming, social and economic indices for health development. Subjective indices for quality of life.
Research	Historical	Basic Laboratory Development of new tools	Clinical development of clinical techniques	Community development of the community measurements and criteria planning techniques	Inter-sectoral activity process; Network process
Behavioural Science	Unknown	Not needed Individual activity	Ancillary Social Sciences—an adjunct to medicine speciality group necessary	Integrated social sciences sophisticated skill, Co-equal with public health science, Inter-disciplinary team	Inter-related social, health, economic and political sciences, Inter-sectoral team

Source: WHO: World Health, July 1979, p. 14.

The health system in India is centralised at the central government level. However, the state governments have been given autonomy in the 1919 Montague Chelmsford reforms. Each state has its own health care delivery policy. The public health investment in the country over the years has been comparatively low, and the percentage of GDP (Gross Domestic Product) has declined from 1.3 per cent in 1990 to 0.9 per cent in 1999. The aggregate expenditure in health sector is 5.2 per cent of GDP. Out of this, about 17 per cent of aggregate expenditure is public health spending, the balance being out of pocket expenditure. The current annual per capita public health expenditure in the country is not more than Rs. 200. Scarcity of funds affects all health care systems. India is currently spending about 3 per cent GNP on health care as compared to 6 to 12 per cent of developed countries. The annual cost of environmental degradation to the economy is nearly 5 per cent of GDP. Of this, 60 per cent is due to water pollution and nearly 15 per cent to air pollution.

The functioning of Primary Health Care System in the country is not doing well. Even the Ninth Five Year Plan (1997-2002) has admitted it and enlisted a number of factors responsible for inefficient function:

* Persistent gaps in manpower and infrastructure especially at the primary heal care level.
* Sub-optimal functioning of the infrastructure; poor referral services.
* Plethora of hospitals not having appropriate manpower, diagnostic and therapeutic services and drugs, in government voluntary and private sector.
* Massive interstate/interdistrict differences in performance as assessed by health and demography indices; availability and utilisation of services are poorest in the most needy states/districts.
* Sub-optimal inter-sectoral co-ordination.
* Increasing dual diseases because of ongoing demographic, lifestyle and environmental transitions.
* Technological advances which widen the spectrum of possible interventions.

* Increasing awareness and expectations of the population regarding health care services.
* Escalating costs of health care, ever widening gaps between what is possible and what the individual or the country can afford.

N.E. Region and Manipur

Considering the importance of health and its related information and the barriers for information and communication in the North Eastern Region (hereafter, NER) the present study has chosen the states of the region to have a thorough understanding. The region is comprised of eight states including Sikkim occupying nearly 2.56 lakhs sq. kms. areas of the country. It is located in between 90° E Longitude and 22°N-30°N Latitudes. There are about 4 crores of population in the region of which 3.50 crores people live in the rural areas. Manipur, the border state at the North Eastern corner has been taken into consideration to explore the detail about the existing health information system as a case study. Manipur having a long march in her process of nation building with two millennia of recorded history is a mountainous region lying in the eastern most part of India. It is isolated from the neighbouring state by chain of hill ranges. It is a composite state of blue mountains and green valleys. Historically Manipur is one of the oldest kingdoms in the South East Asia and has a recorded history of more than 2000 years supported by various documents and International treatises. Different multi-coloured groups of ethnic communities are inhabited in the state. It is the homeland of the Manipuris, which consist of Meities, Meitei Pangals (Muslims), 29 scheduled tribes, 7 scheduled castes and other unspecified tribes. A small percentage of other communities like Bengalis, Biharis, Jains, Nepalis, Sikhs, etc. are also residing in different pockets of the state. Thus, Manipur is often called a state of pluralistic society. Being the border and hilly state, Manipur has a number of communication and information barriers. The state has an area of 22,327 sq. km. with a small valley encircled by mountainous ranges. The hill area covers an area of 92 per cent of the total area of the state. As per 2001 census, the

total population of Manipur is 28,88,634 out of which 12,07,338 are male and 11,81,296 are female. The state lies between latitudes 23.83°N and 25.68°N and longitudes 93.03°E and 94.78°E. The hilly state of Manipur, being the north eastern corner of India having a number of communication and information barriers has been considered in the present work as a case study for the Health Information System (HIS). In this backdrop, the objectives of the present work are to examine the various health programmes/activities carried out by the Government/non-Government agencies and the requirements of the user communities (both professionals and general masses, the end users) and design a model of HIS, if the situation warrants.

Study on the health scenario of a particular state (as of the present one) is not found in any library and information science literature available. Earlier studies are mainly concentrated, as reviewed, on examining the services of libraries and information centres, information sources and services, collection development, users study, etc. related to health care. However, the investigators of almost all such studies have strongly felt the necessity for an effective HIS in respective field. At the present case study also, the preliminary investigation has directed to draw a hypothesis that the state badly needs the services of an efficient HIS.

Since it is very difficult to cover all the aspects of health information due to various factors, the scope of the present case study has been limited to the general health care information delivery system related to common people. However, an extensive survey has been carried out to ascertain about:

* how the policy makers, health professionals and paraprofessionals collect and use information for what purposes;
* how the information flow from different health care settings to the general masses; and
* how the masses have been benefited from the system.

The present work aims to cover the following aspects of HIS:

* General Health Care Scenario of the North Eastern States.
* Geographical area of the whole state of Manipur will be taken into consideration for the case study.
* The time period of collection of data covers from 1995 to 2003.

The present work mainly focuses on:

- health care scenario in N.E. India
- health information infrastructure in Manipur
- process of delivery of health care information
- access to HIS by various groups of user community
- the effectiveness of the present system to the health-care planners, policy makers, professionals, paraprofessionals and especially to the general masses (target groups).

Agencies Under Consideration

The various existing agencies of Manipur like health care settings and other fringe agencies of health and its related areas as detailed below are taken into consideration in the present work:

- Directorate of Health Services: Various health care institutions such as—hospitals, health centres, sub-centres, dispensaries, clinics, laboratories, societies, training centres, etc.
- Department of Family Welfare: Various institutions such as family welfare bureau, centres, post-partum programme centres and other units.
- Public Health Engineering Department: Various district level units, branches and centres.
- Social Welfare Department: ICDS schemes, Anganwadi centres, etc.
- Department of Youth Affairs and Sports: Areas related to sports medicine, physical education, etc.
- Directorate of Panchayati Raj and Rual Development: Role of different blocks, Panchayats in health and related areas.

- District Autonomous Councils: Activities undertaken on health and its related areas.
- Municipal Councils: Activities rendered on health care.
- RIMS: Services rendered, hospital, library, etc.
- Department of Education: Health programmes, department of physical and health education, pharmacy, etc. under different schools, colleges including Government Polytechnic.
- Nehru Yuva Kendra : Role in rendering health care and its related activities.
- Professional Association: Various associations of the health and related issues.
- NGOs/Voluntary Organisations: Role in health care services.
- Lions Clubs: Role in delivering health care services.
- Military organisation: Health care services rendered by such organisation.
- Indian Association of Medical Transcription (IAMT): Activities related to medical transcription.
- Others: Other institutions dedicated in health matters in different sectors like private hospitals/ nursing homes, centres, pharmaceutical sectors, etc.

Information Infrastructure

Different information support system and infrastructures for health care services are being extensively surveyed to understand the situation. The available infrastructure as support system under the consideration include the following:

- Health Care Institutions: Considering such existing institutions as sources of health information.
- Health Libraries and Information Centres: Different health libraries, information centres/units/cells, etc. attached in different health care sectors such as—RIMS, Directorate of Health Services, Training centres, Hospitals, Health Centres, CMO offices, etc.

- Academic Library: Libraries in the University, colleges, schools which open subjects on health education, physical education, yoga, games and sports, etc.
- Public Libraries: Different public libraries under the Directorate of Art and Culture, run by voluntary organisations, RRRLF beneficiary libraries, etc. which indirectly help the public in educating and promoting health care.
- Community Information Centres: 33 numbers of CIC which also provide G2C (Govt. to Citizen) electronic information service on health care.
- NIC District Centres: Such centres in all the 9 districts which disseminate health care and related information to the Government requirements.
- Directorate of Information and Public Relations: District Information Offices which also provide information service on health matter.
- Electronic Media: DDK and AIR Imphal, ISTV, a local cable network.
- Manuscript and Publication: Manuscripts on health related matters available and publications such as—journals, books, folders, booklets etc. in health and related areas.
- Print Media: Dailies which help in educating the masses.
- Traditional Media: Songs, drama, music, etc. performed in health and related matters.
- Theses and Dissertations: Such works on different areas of health care, etc.
- Other Media Units: Different media units such as Field Publicity, video, cinema, etc.

After examining the prevailing situations and on the basis of the major findings, the present study aims to suggest a model for Health Information System of the State. The goal of the model, if implemented, is to provide a free flow of health information to the users engaged at different health care service centres and also to the general masses. The proposed network of HIS is also expected to support the state as well as the whole NER in implementing the much-publicised concept **HFA**.

References

1. *The New York Times.* 2nd February 2003.
2. Planning and Evaluation Cell, Ministry of Health and Family Welfare, Govt. of India. *Indian Systems of Medicine and Homeopathy in India,* 1991, p.1.
3. Dixit, R.P. *Information Management in Indian Medical Libraries,* New Concepts, New Delhi, 1995, pp. 19-66.
4. Dwivedi, M.L. Historical Background and Introduction to Ayurveda. In Shiv Sharma (ed.) *Realms of Ayurveda: Scientific Excursions by Nineteen Scholars.* Arnold Heinemann Publishers, New Delhi, 1970, pp. 18-107.
5. Zimmer, H.R. *Hindu Medicine.* The John Hopkins Press, Baltimore, 1948, p. 67.
6. Canary, J.J. Modern Allopathic Medicine and Public Health. In R.B. Bennerman *et al.* (eds.) *Traditional Medicine and Health Administrators & Practitioners.* World Health Organisation, Geneva, 1983, pp. 90-91.
7. Neelameghan, A. The Royal Hospital at Goa as Described in Some Seventeenth Century Travel Accounts. *Indian History of Medicine* 6(2): 1961, pp. 52-66.
8. Barton, W.L. Alma-Ata: Sign Post to a New Health Era. *World Health,* July 1979, p. 14.
9. Abdul Kalam, A.P.J. and Rajan, Y.S. *India 2020: A Vision for the New Millennium.* Penguin Books. New Delhi, 2002, p. 217.

Chapter - II

Health and Health Information System

The joy of living is based on the sound health that embraces all the body, the mind as well as the soul. Health is the only keynote to success in life. As pointed out by Johnson, **To preserve health is the basis of all social virtues. We can no longer be useful when not well.** Health may not be everything but everything without health is nothing. Thus World Health Organisation's (WHO's) constitution proclaims, **the enjoyment of the highest attainable standard of health is one of the fundamental rights of every human being.** It means the attainment of the highest possible level of health by all.

In 1977, the Thirtieth World Health Assembly adopted a resolution (WHA 30.43) proclaiming that **the main social target of governments and WHO in the coming decades should be the attainments by all the citizens of the world by the year 2000 of a level of health that will permit them to lead a socially and economically productive life.**[1] Also, the ALMA-ATA Conference[2] on Primary Health Care held in 1978, declared that all people of the world should be able to attain health by 2000 AD. This declaration[3] identified primary health care as the key to attaining the target of Health For All (HFA). In 1981, the 34th Word Health Assembly adopted resolution (WHA 34.36) on a Global Strategy[4] for HFA by the year 2000, the main thrust being the development of health system infrastructures in the individual countries for the delivery of countrywide programmes that reach the whole population and are based on the primary health care approach. HFA strategies are being implemented in different parts of the world. However, **it is apparent in some countries that the primary health care approach to HFA by the year**

2000 is not well understood by the politicians and population at large, or even by the health workers . . . .[5] Being a signatory in the ALMA-ATA Declaration, the Planning Commission,[6] Government of India, constituted a Working Group on health to achieve the goal for HFA, which emphasised the fundamental objective of the state and national plan to organise and provide universal primary health care and medical services to all the sections of the society.[7]

To achieve the goal of WHO, concerted efforts are needed on several fronts. Among the foremost requirement is motivating the people to adopt healthier lifestyles. Health status cannot be achieved in isolation.[8] Every individual has to be educated to understand the various factors influencing health and disease in order to be able to practice healthful ways of living.[9] According to Halfden Mahler,[10] former Director General of WHO, HFA demands, ultimately literacy for all.... If health does not start with the individual, the home, the family, the working place and the school, we shall never get to the goal of HFA. In a sense, it is clear that the objective HFA cannot be effectively implemented unless health information is made available to health professionals engaged in different health care settings and the community at large. Not only to provide adequate and suitable facilities for prompt detection of illness, treatment, rehabilitation, etc. it is necessary to arrange for suitable preventive care and promotive facilities.[11] Facility regarding free access to health information is a must here. In this information society, all the activities of our life centre around information. The right to accurate health information and to make an enlightened choice is essential for health development. The Preamble to the WHO constitution may be pointed out here that **informed opinion and active co-operation on the part of the public are the utmost importance in the improvement of the health of the people**. As such a free flow of health information at all levels of the health team and the general masses is quite essential. Thus, it is necessary to know whether or not the health information is being effectively and efficiently collected, analysed, interpreted, disseminated and transmitted to the right users with the kind of

information which they really need to plan, execute, manage and appraise global, national, regional and local objectives for promoting health, preventing illness and ensuring prompt and appropriate treatment to the sick at various levels of health care settings and educating the general masses so as to achieve HFA. An effective health information system, which can be designed at various levels such as global, international, national, regional and local, has to play a crucial role in this regard.

Meaning of Health

The term 'health' is viewed differently by different people and authority all over the world. India's First Five Year Plan stated health as a **positive state of well being in which harmonious development of mental and physical capacities of the individuals lead to the enjoyment of a rich and full life.**[12] In the words of Berthet, Secretary General of the International Union for Health Education, Paris—**we no longer ought to define health only in terms of sickness, but rather in relation to the harmonious development of every individual's personality.**[13] In his presidential address to the 50th Science Congress, S.C. Seal defined health as **flexible state of body and mind which may be described in terms of a range within which a person sway from the condition wherein he is at the peak of enjoyment of physical, mental and emotional experiences . . . .**[14] Oxford dictionary lays the definition of health as the state of being free from sickness, injury or disease, bodily conditions, sometimes to give a direction towards the achievement of a robust, happy, active bodily and mental condition capable of continuous productive ability. The WHO defined health as **a state of complete physical, mental and social well-being and not merely an absence of disease or infirmity.** This definition is well accepted. Good health, being a synthesis of physical, mental and social well being, the definition of health has to extend not only to physical fitness but also to the simultaneous psychological and spiritual well being.

Health and Social Development

From the remote past, man in the advanced societies

has realised the importance of good health towards his duties to his family and towards the fulfilment of his obligations to the society in which he belongs. Promotion of health is basic to national development. Good health is a prerequisite to human productivity and the social development. According to K.S. Dadzie, former United Nations Director General for Development and International Economic Co-operation, **the final of development must be the constant increase of the well being of the entire population . . . .**[15] **Social development lays stress on provision of health services. It is a process that aims at the total development of people . . . .**[16] It greatly depends on the healthy quality of the people. A healthy community is the only basic infrastructure upon which an economically viable society can be built up. Stressing the vital importance of public health as fundamental to the national progress in any sphere. In terms of resources for economic development, nothing can be considered of higher importance than the health of the people. As such, good health for all must be the basic and fundamental objective of social development programmes. No society can be developed in any front if the health of the people of the same is not sound. Thus, **the promotion and protection of the health of the people is essential to sustain economic and social development and contributes to a better quality of life and the world peace.**[17]

Information

No two persons who have worked on information have arrived at similar definition of information. Some have even remained silent on definition part of it while saying that information can be gained by man through experience, observation and experiments. Hans Willisch,[18] while analysing thirty-nine definitions of information science it is found that only eight of them define, 'information' the rest remaining silent about definition of the term. Literally, it may be defined as the idea or new or intelligence of message communicated by words or in writing. **Information is complexion contents having more than one attributes.**[19]

Within the purview of Library and Information Science, the term information has been defined as the structure (or

has realised the importance of good health towards his duties to his family and towards the fulfilment of his obligations to the society in which he belongs. Promotion of health is basic to national development. Good health is a prerequisite to human productivity and the social development. According to K.S. Dadzie, former United Nations Director General for Development and International Economic Co-operation, **the final of development must be the constant increase of the well being of the entire population . . . .**[15] **Social development lays stress on provision of health services. It is a process that aims at the total development of people . . . .**[16] It greatly depends on the healthy quality of the people. A healthy community is the only basic infrastructure upon which an economically viable society can be built up. Stressing the vital importance of public health as fundamental to the national progress in any sphere. In terms of resources for economic development, nothing can be considered of higher importance than the health of the people. As such, good health for all must be the basic and fundamental objective of social development programmes. No society can be developed in any front if the health of the people of the same is not sound. Thus, **the promotion and protection of the health of the people is essential to sustain economic and social development and contributes to a better quality of life and the world peace.**[17]

Information

No two persons who have worked on information have arrived at similar definition of information. Some have even remained silent on definition part of it while saying that information can be gained by man through experience, observation and experiments. Hans Willisch,[18] while analysing thirty-nine definitions of information science it is found that only eight of them define, 'information' the rest remaining silent about definition of the term. Literally, it may be defined as the idea or new or intelligence of message communicated by words or in writing. **Information is complexion contents having more than one attributes.**[19]

Within the purview of Library and Information Science, the term information has been defined as the structure (or

order) of any text, which is capable of changing the image—structure of a recipient[20] or as any stimulus that reduces uncertainty.[21] In the context of Science, Technology and Social Development, UNISIST-II (Main Working Document) gives a restricted meaning of information as follows:

> Information is the symbolic element used for communicating scientific and technical knowledge, irrespective of their nature (commercial, textual, etc.), material carriers, form of presentation, etc. It refers to both substance or contents of documents and to physical existence, the term is used to designate both the message (substance and term) and its communication (act).[22]

The term has been widely accepted as the cognitive state of awareness (as being informed) given representation in physical form. This physical representation facilitates the process of knowing. Information can be found in a range of forms, from the written words (books, periodicals and other forms including microfilm) to audio-visual (TV, Radio, Movies, etc.) to purely oral communication (such as consultation, sessions, seminars, workshops, symposia, etc.)

Relationship between Data, Information, Knowledge and Wisdom

The relationship between **data, information, knowledge and wisdom** may be viewed as a part of a continuum in terms of decision-making process as shown below:

Wisdom
↑
Knowledge
↑
Information
↑
Data

We perceive data through our senses. Thus we became aware of the data about the event. At this juncture we

suppose to have acquired information. We can retain the information in our memory or record it on a piece of paper. This physical representation of data is information. When we present arguments, analyse the situation, interpret the information, *i.e.*, go beyond awareness, we say that we have knowledge. The transformation from data to information, from information to knowledge can be represented hierarchically. Each transformation represents a step upward in human cognition functioning.[23] The ultimate step in the continuum after knowledge is the wisdom, which always involves the inclusion of values in judgement.

Role of Information in Society

Information is considered as the very basis of our existence. It is a vital resource for all round development of the society. In every sphere of activity people are dependent on information. Indeed there is no field of human activity wherein information is not a component. In this post-industrial and information oriented society 'right information' has been considered as an indispensable vital component. The national development thus very much depends on the information potential and its organised services. The world of the new millennium is seen dividing into two distinct blocks— [i] the information rich and [ii] the information poor. Today, information has become all pervasive in the social, economic, industrial and political development of a nation.

Information and Health Care Services

One aspect of health education, though not in the conventional sense of the word, is the knowledge related to the services supposed to be available to the people. The vast majority of the people are not aware of the health and medical care services supposed to be available to them. Every community and preferably at each village be informed of the health services available to them locally. It is well understood that information has become an indispensable part of the fabric of our society and health care services are not an exception to this. Information, which is related to health, supports management of the different health care settings

to monitor progress, measure performance, detect trends, evaluate alternatives, make decisions and take corrective actions. Health care service needs decision making, which is a very complex process and it depends largely on the information available for the same. Health information, thus serves as a tool, which facilitates more information and better decision to be made, and it helps to identify problem areas and to take timely remedial measures. Seetharama,[24] identified two important roles of information in regard to hospitals such as one being in relation to patient management and the other in relation to facility management. While in regard to the former, information is required for decision making regarding diagnosis, prognosis, therapy and rehabilitation; in the latter, information is required for accountability in relation to finances received as well as for performance evaluation. The decisions taken in the practice of health care services can be as good as **the information—the decision-makers have access to and information, in its turn, is as good as the reliability and integrity of the source.**[25] Not only by the health professionals, policy makers, scientists, paraprofessionals, etc. reliable information is also needed by individuals in every work of life.

Health Information

The term **health information** has been defined in different ways. In many countries, the term is interpreted to mean health statistical, epidemiological and other health oriented data used in the planning and management of health services by the decision makers and administrators. It has also been interpreted to mean health science literature covering health information at various levels. Some authorities safely consider health information as a health literature. **Health information is information about people's health and what they, the government and others are doing about it. It describes the incidence, prevalence and causes of major diseases as well as the availability and effective of curative activities. In primary health care, it particularly concerns preventive health activities and the community to improve environmental conditions.**[26]

According to WHO,[27] health information is information that contributes to knowledge and understanding that, in turn, provides part of the basis for making decisions in developing and managing services to improve health and health care. It also recognises the three components of health information as [a] management and operational information; [b] health statistics and [c] health literature.

System

Knowledge of systems concepts is vital to a proper understanding of the development, technology, applications and management of information system. Literally, it is defined as a group of interrelated or interacting elements forming a unified whole. The generic concept of system, which is widely used in the information system discipline, is as follows:

> A system is a group of interrelated components working together toward a common goal by accepting inputs and producing outputs in an organised transformation process.

The terms system and network are used interchangeably in the vocabulary of most laymen and libraries.

Components/Functions of a System

A system has the following three basic components/ functions:

- Input: which involves capturing and assembling elements that entered the system to be processed.
- Processing: which involves transformation process that convert input into output.
- Output: which involves transforming elements that have been produced by the transformation process to their ultimate destination.

Information System (IS)

An information system (IS) can be viewed as a system that accepts data resources as input and processes them into information products as output. It may be defined as an

organised flow of information to users. IS, in the words of O'Brien,[28] is a **set of people, procedures and resources that collects, transfers and disseminates information in an organisation**. Today's organisation depends on different types of information systems, which **include simple manual (paper and pencil) information system and informal (word of mouth) information system**. Encyclopaedia of Computer Science[29] defines IS as **a collection of people, procedures and equipment designed, built, operated and maintained to collect, record, process, store, retrieve and display information**. In a broader sense, an IS is considered as a system for accepting data as raw material and through one or more transmutation process and decision making (in relation to its own existence) are among the functions performed by an IS. Thus, IS generally may be defined as a system which collects, processes, stores, retrieves, disseminates and transmits information to fulfil the information needs of a variety of users.

Structure of Information System

Gopinath[30] conceptualised the structure of IS under some criteria such as basic features and parameters.

Basic Features

Information systems have the following basic features:

1] They have a **control channel** and a **content channel**—that is information.

2] They are **historical or current**—that is time dimension of information.

3] They are **remote or local**—that is space dimension of information.

Parameters

The parameters of an IS are:

a] Users;

b] Information sources; and

c] Technologies.

a] Users

The user part calls for:

— identifying the information needs; and
— usage patterns and ease of use.

b] Information Sources

The information part calls for:

— information transfer mechanism (carrier media; paper or electronics or optical);
— information storage-memory;
— information retrieval techniques—classification/ cataloguing/search;
— information resources, documents, institutions, human being;
— communication-mode and media.

c] Technologies

The technology part includes:

— Computer systems;
— Telecommunication systems;
— Reprographics and micrographic equipment.

Role of Information System

The ultimate goal of every IS is to fulfil the information needs of the users. They are the individuals who either belong or not belong to an organisation exists in the society. O'Brien[31] stressed the need for IS in the successful management of the modern organisation. Information and IS are valuable organisation resources that must be properly managed for an organisation to succeed. We no longer live in an agricultural society, composed primarily of farmers or even an industrial society, where a majority of the workforce consists of factory workers. Instead, the workforce today consists mainly of workers in service occupations or knowledge workers, that is people, who spend most of their workday creating, using and distributing information.[32] The present society is generally termed as information society. A major challenge for the information society is to manage

its information resources to benefit all members of the society. This means, for example, using information systems to find more efficient ways of using the world's limited supplies of material, energy and other resources. For these resources, information systems play a vital role in our society, dependent as it is on the effective use and management of information resources.[33]

Health Information System

Health Information System (HIS) is interpreted in most countries as consisting of health statistical, epidemiological and other health-related information useful for health planning and management. It is generally recognised as necessary, fundamental and an integral element for the development of health services. According to WHO, **a national health information system is to constitute to assemble, analyse, interpret and transmit to the right users....**[34] This definition comprises any kind of information that is requested for, or generated by a country's health care services. WHO's Conference[35] on Health Information System, held in Copenhagen in 1973 defined HIS as:

> A mechanism for the collection, processing, analysis, and transmission of information required for organising and operating health services and also for research and training.

In a fully co-ordinated HIS all the **relevant data are collected, complied, stored, retrieved, and analysed and published.**[36] A HIS should be effective in organising storage, documentation services and communication of information (both in verbal and non-verbal *i.e.*, print form) to the users and at the same time should be adaptable enough to meet any other health information needed by the users of varied groups at present and in the future.

Components of Health Information System

In a HIS, there are interrelated and interdependent components, which are working together to achieve the goal of the system, *i.e.* to fulfil the information needs of the users. These components may be identified as follows:

— Information
— Users
— Information personnel and professionals
— Information Intermediaries
— Information Technologies

Information

It can be of health science or health care contained in different sources or documents. The documents also may be in book form or non-book form which are available in libraries, information centres, documentation centres, etc. attached in various health care settings *i.e.*, research institutions, academic organisations, health departments, professional associations, hospitals, health centres, nursing homes, pharmaceutical sectors, etc. Various health care setting, health professionals, workshops, seminars, symposia, conference, etc. are in a sense the sources of health information.

Users

Users form the focal point of all the IS. There are several groups of users in the HIS. The range of categories within this community is quite wide as may be gauged from the following:[37]

* Sectors development planning groups—policy-makers, planners programme administrators, technical and managerial staff assisting planners, project/ programme financiers, etc.
* Public health personnel.
* Research scholars and specialists in health sciences and biomedical subjects—basic, applied and developmental research.
* Teachers, training staff and students in health sciences.
* Paramedical and health personnel—nurses, laboratory technicians, pharmacists, etc.
* General medical practitioners.
* Community health workers, social workers, family planning corps, voluntary health agencies.

* Extension workers and other playing a link role in knowledge and technology transfer in the health sector.
* Personnel involved in data collection.
* Consultants and advisors.
* Mission/Project staff of international organisations operating in the country.
* Common people or lay public in their self-education efforts on health and clinical matters.
* Groups specialising in related areas—drugs and pharmaceuticals, public health engineering, architecture, human settlements, environment, biology, etc.

Information Personnels and Professionals

These groups comprise of information generators, gatherers, processors, recorders, disseminators, retrieves, preservers, measurers, etc.

* Generators include—researches inventors, innovators, discoverers, authors, planners, policy makers, etc.
* Reporters, correspondents, persons engaged in journalism in the field are the information gatherers.
* Editors and their spices, software specialists who write programmes for data processing, etc. may be put under information processors.
* Recorders are those who are engaged in health information activities such as—reporters, translators, printers, data entry operators, etc.
* Professionals belonging to disseminators may include—library personnel, documentalists, information officers, extension workers, compilers, consultants, broadcasters, etc.
* Information retrievers are those who retrieve information on demand by consulting reference and other sources—reference librarian, database searcher, classifiers, cataloguers, indexers, etc.
* Persons involved in information preservation include archivists, micropublishers, electronic publishers, reprographers, etc.

* Information measurers also known as information morticians are those who measure growth, propagation, use and decay of information and establish laws governing these factors.

Information Intermediaries

Information intermediaries are those organisations or persons who provide right and accurate information to the users. They are neither the producers nor the user/consumer but basically they work as middlemen to link the sources of information with the users. Two types of intermediaries are found [a] profit making and [b] non-profit making. Information brokers, consultants on-line vendors, technological gatekeepers, information filters come under the later group. There are also other informal types of information intermediaries such as—invisible colleges, extension workers, paraprofessionals, social workers, block development officers, Pradhans and members of the Panchayats, Health Workers, Village Health Guides, etc.

Information Technology

By information technology (IT) we mean the whole process of acquisition, storage, dissemination and use of vocal, pictorial, textual and numerical information by a micro-electronic-based combination of computing and communications. It includes:

* Computers, Terminals, Office Equipment, Printing and Graphic.
* Packet Switching, Modems, Switchboard and Digit Switching (*i.e.*, Ingratiating Technology).
* Radio, TV, Telephones and Transmission System (*i.e.*, Communication Technologies).
* Mail, Telephone, Telegraph, Satellites, (*i.e.*, Communication channel).
* Radio and TV networks, Multipoint distribution service (*i.e.*, Broadcast channel).

The current developments in the field of communications, computer technology and information technology have been rather spectacular.[38] It is time that

health science information professionals in India apply these technologies to effect information transfer to the target of utilisation. They should realise that these technologies have been put to good use in the biomedical field in other parts of the world.[39] Application of IT will foster in the activities of the HIS thereby meeting the basic goal of the same.

Importance of Health Information System

Societal or national development depends, to a large extent, on the productive contribution of every person in his/her assigned or chosen field of activity. But the productivity of an individual depends very much on the state of his/her health as well as that of every other individual in the community.[40] If the state of the public health is not sound, the social, economic and political system of the society also will be suffered.[41] So HFA (Health For All) is a must. To quote the Prime Minister of India **whatever development we want to do in the country depends upon the capacity of the people to do their work efficiently and to on increasing productive capacity in any field of work that can take up. And if this is to be done, health becomes a very primary consideration.**[42] The provision of HFA is a challenge to the planners, policy makers, professionals, paraprofessionals, as well as individuals and families in every walk of life. Mahler,[43] Director General of WHO said **If health does not start with the individual, the home, the family, the working place and the school, we shall never get to the goal of HFA.** If the challenge of HFA is to be dealt with, the public also should be fully and repeatedly informed about the healthy lifestyle. However, importance of health information and its dissemination and transmission not only to the people but also to the members of the health profession, has not been understood properly by the policy makers, administrators, professionals, para-professionals so that they in their turn can educate the people. According to Dr. Niroshi Nakajima,[44] Director General of WHO: **reliable health information is demanded not only by health professionals, politicians and business people who need it to meet the various responsibilities of their job, but by individuals and families in every work of life.** Ignorance on the part of physicians leads fatal to the public.

Misinformation, myths and unawareness, etc. make a lot of problem to the laymen. A larger section of the people still believe in all sorts of myths and are inclined to oppose anything western or modern. It is agreed that health and its related publications, documents and other literatures have a vital supportive role to play in building national health infrastructure and in providing valid, timely and relevant information about development in the health services, not only to professional health workers but also to a wider audience to the reading public.[45] But sometimes, some controversial and unsubstantial writings have done more damage than good to the people's psyche.[46] Moreover, it is impossible on the part of the user community to collect all the relevant publications in health, organise, store, retrieve, disseminate, etc. for use at the time of need. Therefore, an effective HIS has to shoulder for these activities, because .... though there is plenty of information available for comprehensive health planning, there is lack of structured system for handling it.[47] Study on HIS ascertains the information needs of the users, use pattern, gathering habit, seeking behaviour, channels used, resources accessed, etc. analyses existing information infrastructures and facilities, finds out problems encountered by the users and suggests solutions as well as enables to design an effective system to fulfil the needs of the users thereby supporting in achieving HFA.

References

1. World Health Organisation. *Handbook of Resolutions and Decisions of the World Health Assembly and the Executive Board.* Vo. II, 5th Edn. Geneva, 1983.1.
2. Report of the International Conference on *Primary Health Care,* Alma-Ata, USSR. Sept. 6-12, 1983, WHO, Geneva.
3. World Health Organisation. Alma-Ata, 1978. *Primary Health Care,* Geneva (Health For All Series, No. 1), 1978.3.
4. *Op. cit.* 1.5.
5. World Health Organisation. *Education and Training of Nurse Teachers and Managers with Special Regard to Primary Health Care,* B.R. Publishing Corporation, Delhi, 1984, 11-12.
6. *Report of the Working Group on Health For All by 2000 A.D.* Government of India, Ministry of Health and Family Welfare, New Delhi, March 26, 1981.

7. *Ibid.*
8. Anand, S.K. and Dixit, R.P. Delivery of Health Information: A Few Suggestions, *Proceedings of the National Seminar on Health Information for All by 1990, Jaipur,* MLAI Publication No. 2 Medical Library Association of India, New Delhi, 1986.7.
9. Ibohal Singh, Ch. Making the Public Health Conscious through Library. *Tokngа* (A Manipuri Local Daily) April 4-6, 1996.
10. Maher, H. The meaning of Health For All by 2000, *World Health Forum,* 2(1); 5-22.
11. Ibohal Singh, Ch. Need for Health Science Information. *Manipur Mail* (An English Daily of Manipur), March 26, 1995.
12. Government of India. *First Five Year Plan.* 488.
13. World Health Organisation. *World Health,* May, 1979.23.
14. Seal, S.C. *Presidential Address, 50th Science Congress,* Delhi, 1963.
15. Goel, S.L. *Public Health Administration.* Sterling Publishers Pvt. Ltd. New Delhi, 1984,6-7.
16. United Nations. Asian and Pacific Development Institute, *Proceedings of a Consultative Meeting.* Bangkok, April 1979.11.
17. Dodzie, K.S. The UN Answers the Challenge. *World Health,* November, 1979.
18. Wellisch, H. From Information to Informatics. A Terminological Investigation. *Jl. of Librarianship* 4(3); 1972, 172.
19. Chandel, A.S. and Saraf, Veena. Conceptual and Definitional Approach to Information and Information Science. *Herald of Lib.Sc.* 22(3-4); July-Oct. 1983. T5.
20. Ford, G. *User Studies: An Introductory Guide and Select Bibliography.* Centre for Research on User Studies. University of Sheffield, England, 1977.2.
21. Krikelas, J. Information Seeking Behaviour : Patterns and Concepts. *Drixel Library Quarterly,* 19; 1983.6
22. Unesco. Inter-Governmental Conference on Scientific and Technological Information for Development. *UNISIST-II,* Paris, May 28-June 1. 1979. Main Working documents PGI/UNISIST-II/4.
23. Dedon, A. *et al. Information Science: An Integrated View.* G.K. Hall, Boston, 1988.2.
24. Science Advisory Committee to the Prime Minister, *Perspective in Science and Technology: Technical Reports,* Har Anand, New Delhi, 1990. 447.
25. Neelameghan, A. Information Network for Health and Family Welfare Sector: Some Planning Considerations. *Lib. Sc.* 17; 1980, 34-35.
26. Dixit, R.P. *Information Management in Indian Medical Libraries.* New Concepts, New Delhi, 1995, 124.

27. Anon. *National Health Information Systems: Guiding Principles*, WHO, Geneva, (NIHS/80.1 Rev.1), 1980, 1-30.
28. O'Brien, J.A. *Management Information Systems: A Managerial End User Perspective.* Galgotia Publications, New Delhi, 1994.6.
29. Ralson, A and Meek Chester, L. (eds.). *Encyclopaedia of Computer Science*, New York : Petrocelli-Charter, 1976.
30. Gopinath, M.A. Management of Information Technology for Better Library and Information Services: An Analysis of the Trend. In: Vashishth, C.P. (ed) *Modernisation in Libraries. Seminar Papers. Thirty Third All India Library Conference.* Bharathidasan University, Tiruchirapalli, Dec. 28-31, 1987, ILA; Delhi, 1988.
31. O'Brien, J.A. *Op.cit*, 7-8.
32. Parat, M.U. *The Information Economy: Definition and Measurement.* U.S. Department of Commerce, Office of Telecommunications Policy, 1977.
33. O'Brien, J.A. *Op.cit*, 7.
34. Annon, *Op.cit.*
35. Anderson, M.R. Health Information System, *WHO Chronicle* 28; 1974, 52-54.
36. Forrest, E. Linder, Recent Trends in Health Statistics, *WHO Chronicle*, 30; 1976, 58-63.
37. Neelameghan, A. *Op.cit.* 35.
38. Neelameghan, A. and Seetharama, S. Information Transfer : The Next Twenty-five Years. *Lib.Sc.* 13; 1976, 1-15.
39. Seetharama, A.S. Towards a Health Information Centred Society. *Proceedings of the National Seminar on Health Information for All by 1990.* Jaipur, 1985. MLAI Publication, No. 2, MLAI, New Delhi 1980, P.II-120.
40. Ibohal Singh, Ch. and Lahiri, R. Health Care Information Network in Manipur : An Outline. *Seminar Papers. 5th Seminar of Manipur Library Association*, May 24-25, 1997.48.
41. Ibohal Singh, Ch. *Op.cit.* 11.
42. India, Conference of State Health Ministers and Health Secretaries, New Delhi, April 1977. Prime Minister's Address, *NIHAE Bulletin*, 10 : 1997. 134-43.
43. Mahler, H. *Op.cit.* 10.
44. WHO. *World Health*, March-April, 1995, 3 (Editorial).
45. Ibohal Singh, Ch. and Lahiri, R. *Op.cit.* p.49.
46. *Hindustan Times.* January 24, 1997, p.17 under the caption "A Doctor Speaks for Vaccination."
47. Darbal, C. and Bhatt, M.K. Towards Evolving a National Information System in Health and Medical Sciences. *Annals. Lib. Sc. Doc.* 23(1); March 1976, 123-128.

Chapter - III

Health Information Studies in India

Any research study takes the advantages of the knowledge, which has accumulated in the past as a result of constant human endeavour. It can never be undertaken in isolation of the work that has already been done on the problems, which are directly or indirectly related to a study proposed by a researcher. Thus, a careful review of the nascent literature published in various forms on the problem to be investigated is one of the important steps in the planning of any research study.

Until the mid 1960s there were only a few substantial studies on **information needs and uses**. However, from 1963 onwards, as observed, a number of publications on this area have been significantly increased. Since 1966, the ***Annual Review of Information Science and Technology*** **(ARIST)** has contained a yearly review on **information needs and uses** and provides a useful means of keeping up to date with major developments. Since 1976, the Medical Information Research Unit and Leeds Polytechnic School of Librarianship, UK, has also undertaken a number of studies on the use of information sources by various groups including general practitioners and pharmacists. Numerous user studies have also been undertaken not only in scientific and technological field but in the fields of social sciences and humanities too for designing effective information system in the concerned areas. Today the study on information system has been considered as an important area of research in the field of Library and Information Sciences.

During 1960s, some studies on citation pattern, information sources on health and its related areas were carried out. Kesharwani[1] conducted such studies in INSDOC,

Chapter - IV

Health Care Scenario in North East India

Under the Indian constitution, health is a state subject. Health planning in India has associated with health experts, economists, administrators and public representatives at Union and State levels. Implementation of the plan varies from state to state. India's Five-Year Plans bring about uniformity in policy formulation in programmes of national importance including health. The plan outlay for Central Sector health programme in the Annual Plan 1997-98 is Rs. 920.20 crore. A major portion of the same is for the national health programmes for the control/eradication of communicable diseases like—Malaria, TB, Leprosy, AIDS, STD, Filaria, Kala-Azar, Japanese Encephalitis, Blindness, etc. being implemented under the centrally sponsored schemes. Table 4.1 shows the health care infrastructures during four decades (1961-1991) in India.

Table 4.1: Health Care Services: All India

Particulars	Actual in Number				Per 100,000 population			
	1961	1971	1981	1991	1961	1971	1981	1991
Hospitals	3054	3862	6805	11174	00.70	00.70	00.99	01.32
Beds	229634	348655	504538	664135	52.28	63.60	73.64	78.70
Dispensaries	9406	12180	16754	27431	02.14	02.22	02.45	03.25
Allopathy Doctors	*	151129	268712	398238	*	27.57	39.22	47.19
Nurses	35584	80620	150399	311235	08.10	14.71	21.95	36.88
PHCs	2695	5131	5568	22243	00.75	01.17	01.06	03.55
Sub Centres	—	27929	51192	131098	—	06.36	09.74	20.90

Notes : Beds = Beds in Hospitals and Dispensaries; Nurses = Nurses and Midwives; PHCs = Primary Heath Centres; * = Not available; - = Not applicable

Source: Ravi Duggal, Sunil Nandraj and Asha Vadair. Health Expenditure Across States-Part I. Economic and Political Weekly 15 April 1995.

North East India

North East (N.E.) India consisting of eight states is characterised by poor development compared to other states of the country. In comparison with other states of India the N.E. states remain underdeveloped due to many reasons. One of the reasons for the underdevelopment may be, as considered, their joining the planning process of the country later than the other states. The government of India has initiated several innovative programmes in all the sectors to bridge the development gaps between the N.E. states and the rest of the country by opening Department of Development of North Eastern Region (DONER).

Demography and literacy

Of the eight N.E. states, Assam is the most highly populated states followed by Tripura, Manipur and Meghalaya. Sikkim is the least populated state in the region. The decadal growth rate of population is highest in Nagaland (64.4%), fifth in total population among the eight states while Tripura has the lowest (15.74%) population growth rate ranking second in the total population. N.E. states are mainly hilly, surrounded with mountains and the land area is covered with thick forests. Majority of the population belongs to scheduled caste and scheduled tribes. The occupation of most of the people is agriculture and animal husbandry. The literacy rate in the N.E. States has significantly improved over the last decade. As per 2001 census, Mizoram has recorded the highest literacy rate (88.49%) among the eight states of the region and is the second largest literate state in India next to Kerala. Some basic facts on N.E. states are given in Appendix-I.

Health Care Scenario

The medical facilities in NER are shown in appendix-II. Among the states of the region, Assam has maximum such facilities in comparison with other states. As on 1st January 1996 the state has 268 hospitals with 12661 bed components followed by Arunachal Pradesh having 262 hospitals and 2476 beds. Manipur in third rank has only 32 hospital with1614 beds. Of the seven states excluding Sikkim, Meghalaya has only 9 hospitals but its bed component is higher than that of

Manipur having 1867 ranking thirth next to Arunachal Pradesh, Most of the hospitals of Assam and Arunachal Pradesh are located in the rural areas of the states. All the hospitals of Arunachal Pradesh are run by government. In case of Assam, of the 268 hospitals, 47 are run by Local bodies and 80 by Private and Voluntary organisations respectively. The numbers of doctors engaged under government agencies is also highest in Assam followed by Manipur and Tripura. However population served per doctor is highest in Assam with 8750, followed by Nagaland with 5640 and Meghalaya 5357. The overall scenario in the region is not so encouraging.

Scenario in Assam

Assam has maximum facilities in health care in comparison with her sister states. The scenario of the state as on 31st March 2003 on health care is being highlighted here.

Health Care Institutions

The health care institutions of the state include:

1. Civil Hospital	24 (with 3191 bed components)
2. Community Health Centre	100
3. Primary Health Centre	610
4. Sub-Centre	5109
5. Subsidiary Health Centre	89
6. Malaria Clinic	189
7. Chest Hospital	03
8. Medical College Hospital	03
9. Private Nursing Home	150

The three medical college hospitals are (a) Gauhati Medical Hospital with 1288 beds, (b) Assam Medical College Hospital, Dibrugarh with 1084 beds and (c) Silchar Medical College Hospital with 700 beds.

Other Institutions

1. Ayurvedic college	–	1 (Guwahati)
2. Dental college	–	1 (Guwahati)
3. Mental Hospital	–	1 (Tezpur)

4. State Hospital – 1 (Mohendra Mohan Chaudhury Hospital, Guwahati)
5. ANM Training school – 18

Physiotherapy Clinic

1. Assam Yoga and Physiotherapy Centre, Amlapati, Naogaon
2. Purbanchal Yoga Niketan; Dhing,Nagaon
3. Debtina Physiotherapy Centre, Hospital Road, Cachar.
4. Physiotherapy Centre, Nasir Path, Cachar.
5. Silchar Physiotherapy Centre, Hospital Road, Cachar.

Private Clinical Laboratory/X-Ray Centre

The districtwise distribution of such settings is given below:

— Guwahati	58	— Barpeta	05
— Dibrugarh	33	— Nalbari	04
— Cachar	23	— Sonilpur	10
— Karbianglong	02	— Bongaigaon	03
— Tinsukia	09	— Dhemaji	01
— Goalpara	10	— Hailakandi	12
— Sibsagar	16	— Kokrajhar	16
— Dhubri	21	— Golaghat	08
— Darang	03	— Jorhat	12
— Nagaon	25	— Morigaon	05
— Lakhimpur	08	— North Cachar Hills	02
— Karimganj	14		

Schemes Under NEC

Under its social and community development schemes NEC[1] also has taken up a number of activities and programmes on the health care front of the N.E. states. Some of such activities are summed up here below:

Dr. B. Barooah Cancer Institute (BBCI), Guwahati

It was set up in 1974 as a private institute by voluntary organisation for the treatment of cancer patients. It was the

first and only institute of this kind in the entire NER. It was recognised by the central government as Regional Institute of Cancer Treatment and Research in 1980 and taken over by the government of Assam in 1986. In August 1989, the state government of Assam entered into a Tripartite Agreement with NEC and the Department of Atomic Energy (DAE) with the objective of the mobilising resources for the development of the institute. The agreement was further renewed on 9th October 1997. The sharing pattern of non-recurring expenditure is 45 per cent each by the NEC and DAE and 10 per cent by the government of Assam. Presently 85 beds are available in the Hospital which will be upgraded to 250.

Regional Para-medical and Nursing Training Institute, Aizawl

The availability of the Para-Medical manpower in the region is much below its demand. Keeping this in view, the establishment of a Regional Para-medical and Nursing Training Institute at Aizawl was proposed by NEC in 1992-93. This scheme was initially approved by the planning commission at a total estimated cost of Rs 475.00 lakhs and implemented during the last part of the 8th plan. The following courses have been started with effect from April 1996 by the institute:

— B.Sc. Nursing Degree	— 4 years
— Lab Technician Diploma	— 2 years
— X-Ray Technician Diploma	— 2½ years
— Opthalmic Asstt. Diploma	— 2 years
— ECG Technician	— 1 year
— Multipurpose Health Wisher	— 1½ year
— Medical Laboratory Certificate	— 1½ year

Regional Dental College, Guwahati

This college was established as a NEC project during 6th Five Year Plan. The council sanctioned financial assistance up to 8th Five Year Plan. The college is the only such institute of its kind in N.E.R which takes care for dental education and oral health services to the entire region.

Regional College of Nursing, Guwahati

This regional college established in 1977 is also the only institute of its kind in the region imparting nursing education to the NE states. This institute has been receiving financial assistance from NEC since 6th plan onwards for development and expansion. The institute is imparting nursing courses for B.Sc. Degree and has an intake capacity of 50. It is proposed to introduce P.G. course in nursing.

Guwahati Medical College and Hospital

It is one of the three Medical Colleges in Assam. With the support of the NEC, the college has been advancing fast at a greater speed in comparison to other Medical Colleges of Assam as well as of Manipur by virtue of its ideal location, proper atmosphere and bring the gateway of all the N.E. states. The main objectives under NEC's support to the College include:

— Setting up of Orthopaedic centre (should be renamed as Accident and Trauma centre) at a cost of Rs. 147.00 Lakhs.

— Neonatal centre at a cost of Rs 13.00 Lakhs.

— Establishment of Onchology centre at a cost of Rs. 20.00 Lakhs

— Establishment of modern Laboratory services of Rs.20.00 Lakhs.

Assam Medical College (AMC), Dibrugarh

It is one of the oldest colleges in the region and has been functioning as a referral centre from the beginning. Support of NEC to its institute of Communicable Diseases is remarkable. NEC's funding towards this institute include – building of hospital wards, classroom, seminar hall, library, laboratory, office and staff quarters, equipment and furniture, books and teaching aids and staff salary.

NEC also supports to the Medical Colleges and Hospitals of Assam towards construction of paying cabins to be used exceedingly for the six N.E. states except Assam. The number of cabins to be constructed are:

Guwahati Medical College Hospital - 100 nos. (Guwahati)
Assam Medical College Hospital - 60 nos. (Dibrugarh)
Silchar Medical College Hospital - 40 nos. (Silchar)

Upgradation of Centre for Orthopaedics & Rehabilitation in Meghalaya

The scheme aims at upgradation of the facilities for treatment of equipment including CT Scan and construction of new norms for these equipments in the civil Hospital, Shillong. This project after implementation shall render services to the people of Meghalaya and other nearby neighbouring states of NER.

Upgradation of K.J.P. Synod Hospital

Government of Meghalaya has proposed upgradation and equipping the KJP Synod Hospital, Shillong which is a very old medical institution in Shillong established long back during 1922.The hospital is proposed to be upgraded to cater the needs of poor suffering population of Meghalaya and other states of NER.

Support to J.K. Saikia Homeopathic College, Jorhat

Development in Homeopathy manpower is grossly lacking in the entire NER with only three recognised institutes situated at Jorhat, Nagaon and Guwahati that had been taken over by Assam Government during 1988-89. Dr. J.K. Saikia Homeopathy Medicine College is purposed to be developed as a Regional college of Homeopathy for which NEC will extend the financial support.

Development of Infrastructure of Government Ayurvedic College, Julukbari

The Government Ayurvedic College, Guwahati is the only recognised such college in the NER established in 1948. The college has been imparting BAMS degree and it has also attached 100 bedded hospital with different wings. The college needs financial support from NEC to open PG courses to make it an ideal institute which will be of great help to the entire region. The NEC's funding development is being considered in the number of seats in degree course.

Upgradation of Regional Pharmacy Institute, Agartala, Tripura

The Regional Pharmacy Institute, Agartala was established on 14th November, 1997 which is now renamed as "Regional Institute of Pharmaceutical Sciences and Technology". It was decided that NEC would provide the capital expenditure whereas the recurring expenditure would have to be borne by the participating States. This institute caters to the needs of the three States Tripura, Manipur and Mizoram. During the 6th Plan NEC sanctioned Rs.33.94 lakhs for starting the Institute. Its expansion scheme was also undertaken by NEC in the expansion the 7th Plan Period with provision for an estimated expenditure of Rs. 43.56 lakhs. Presently the total intake capacity of this institute has been increased from 50 to 60 with the inclusion of the shares of two more States—Nagaland and Arunachal Pradesh. This scheme of upgradation has been taken up during the 9th Plan with the following objectives:

— To help promote setting up of Small Scale Drug Industries in NER cultivate and utilise the valuable drug resources available in the North East.

— For setting up of drug testing laboratories in each State to ensure supply of quality medicines to patients.

— For strengthening drug enforcement wings in N.E. States.

— Encouragement & Development of Hospital Pharmacy sections in the Hospitals of N.E. states.

— To cater to the increasing need of pharmacy graduates in the field by pharmaceutical sales and marketing.

Sankardeva Netralaya Hospital, Guwahati

Shri Sankardeva Netralaya (SSN) located at Beltola, Guwahati is a high tech eye Hospital of the North East functioning from 14th October 1994. It operates with technical collaboration with the Sankar Netralaya & Medical Research Foundation, Chennai. The SSN is governed by a Board of Trustees. NEC decided to extend financial assistance to SSN during the 9th Plan Period to augment its equipment facilities.

Telemedicine Facility

In this high-tech electronic information era, specialists, singly or in a group can do virtual visit of a patient thousands of miles away, see him, talk to him, examine him virtually and prescribe the latest, the best and the most appropriate treatment through telemedicine. Through this technique, advanced telecommunication technologies are used to exchange health care information and provide health care services across geographic, time, social and cultural barriers. Telemedicine has the potential to improve the delivery of health care by bringing a wider range medical and paramedical service to understand the communities and individuals in both urban and remote rural areas.

The biggest health care service provider in Asia, **Apollo Hospital Group** is poised to make available free telemedicine consultation service in all the states of NER. According to Dr. Bikram Chawal, member of the Governing Council, Apollo Telemedicine Networking Foundation (ATNF), the project has to be taken up with the assistance from the NEC. If the project is taken up it will facilitate to provide quality health care service for the remote audience of the NE states. Shri P.L. Thanga, Secretary, NEC has recently reiterated that Manipur is going to have Multi-Channel Telemedicine System at all the district headquarters from March 2004 with funding from NEC.

Maternal and Child Health

Health Literature as one of the WHO recognized components of health information, displays the studies conducted on different aspects related to health. The ***survey report*** released frequently by the Ministry of Health & Family Welfare (GOI) is one of such literature which provides state level and national level information related to ***child survival and safe motherhood*** (CSSM), two of the very important components of National Health. Maternal and child health is the most crucial element of the health care system. The report[2] published in 2000 includes the studies conducted by the Ministry appointed International Institute of Population Sciences (IIPS), Mumbai during 1998-1999. The data/

information recorded in the volume are claimed to be able to assist policy makers in planning and implementing strategies for improving population, health and nutrition programme. It may be mentioned here that (i) the draft of a new 'National Population Policy' (Chairman: - Dr. M.S. Swaminathan) of GOI in February 2000; (ii) the International Conference on Population and Development (ICPD) of Cairo in 1994; and (iii) many other committees/ organisations/ conferences have given special emphasis on CSSM Programme in the context of the country's development. Considering the importance of CSSM issue and the barriers for information- communication in NER repackaginfg the information related to the region (recorded in the said volume) for the benefit of the different kind of users. The indicators selected for presentation include marriage age, housing characteristics, life style, and women's health, family planning method, death rate and morbidity.

An analysis of the report of the National Family Health Survey (NFHS-2) in regard to NER is being made in the following sections.

Singulate Mean Age at Marriage (SMAM)

The variations in SMAM in the N. E. States are found to be insignificant as per the report. The marriage age of the male as well as female is almost similar in all the states as Table 4.2 shows.

Table 4.2: Singulate Mean Age at Marriage

State	Male	Female
Arunachal Pradesh	25.1	21.6
Assam	27.8	21.7
Manipur	28.6	25.4
Meghalaya	27.0	23.0
Mizoram	27.0	24.1
Nagaland	27.6	23.0
Sikkim	26.1	21.9
Tripura	NA	NA
INDIA	24.9	19.7

In both cases Manipur is seen in higher position while Arunachal Pradesh is in lowest. The national level average is however much less in all the cases.

Housing Characteristics

The housing conditions and the standard of living of households are found to be varied as Table 4.3 indicates. The percentage of households with electricity is lowest in Assam and Meghalaya which other states have better percentage. The higher percentage of people living in Sikkim, Arunachal Pradesh,Mizoram and Assam have been getting drinking water facility than that of other states. The toilet facility is better in almost all the states of NE India. Similar finding is seen in using biomass fuel for cooking. But very low percentage of people under survey have pucca house in almost all the states except Sikkim.

Table 4.3: Housing Characteristics in NER

State	With Electricity	With Drinking Water	With Toilet Facility	Using Biomass Fuel for Cooking	Living in a Pucca House	Mean Number of Persons per Room
Arunachal Pradesh	68.9	80.1	73.0	80.8	14.2	2.2
Assam	26.4	60.1	63.0	87.1	10.9	2.1
Manipur	75.3	48.9	92.0	69.2	7.1	2.1
Meghalaya	41.2	42.1	52.0	83.5	14.5	2.0
Mizoram	84.1	63.2	97.7	57.4	16.2	2.6
Nagaland	56.3	40.5	74.3	86.1	18.1	1.6
Sikkim	80.7	84.6	72.7	63.2	50.6	2.0
Tripura	NA	NA	NA	NA	NA	NA
INDIA	60.7	77.9	35.9	71.7	32.0	2.7

Life Styles

An interstate comparison of lifestyle indicators is presented in Table 4.4. The table highlights that except Meghalaya the male percentage of tobacco chewing (including Pan Masalla) in NE States is quite higher and Mizoram is in the top. The Male group of Arunachal Pradesh (AP) drink more than their counterparts in other states. Male percentage of Meghalaya and Mizoram, again is higher in

smoking too. On the other side, female group of Mizoram, though chew tobacco and smoke more, a very low percentage of them drink alcohol. A very high percentage of female of Arunachal Pradesh drink alcohol (48.9) and chew tobacco (33.2). Percentage of drinking alcohol and of smoking, however, are not very high in other states of the NER, though national percentage is much less.

Table 4.4: Life Style Indicators

State	Male			Female		
	Chewing tobacco	Drink alcohol	Smoking	Chewing tobacco	Drink alcohol	Smoking
Arunachal Pradesh	52.0	64.5	25.1	32.2	48.9	5.4
Assam	48.2	24.9	31.7	24.9	11.1	2.7
Manipur	34.4	30.5	35.2	19.6	2.0	12.2
Meghalaya	16.7	28.1	55.2	27.6	3.1	6.8
Mizoram	60.3	16.8	59.4	60.7	0.4	22.1
Nagaland	45.3	26.8	38.2	16.5	2.6	2.5
Sikkim	39.6	31.9	19.5	18.9	17.1	8.3
Tripura	NA	NA	NA	NA	NA	NA
INDIA	28.3	16.7	29.4	12.4	2.2	2.5

Women's Health and their Knowledge about Health

Table 4.5 highlights some facts about women's health and their knowledge about health.

Exposure to Mass Media

A large majority of Indian women are illiterate or have little formal education. Informal channels like newspaper, radio, TV, etc. can play a big role in making them aware about their health. But in India, two-fifth of women are not regularly exposed to any mass media. The survey finds that more than three-quarters of women are regularly exposed to at least one form of media in Manipur, Mizoram and Sikkim in the region. As Table 4.5 shows a high percentage of women in Arunachal Pradesh (36.7), Assam (47.4), Meghalaya (37.3), Nagaland (35.7) are not exposed to any mass media at all. But fortunately, a very high percentage of women in all the NE states, as revealed, are exposed to

Table 4.5: Women's Health and Their Knowledge About Health

State	Non exposure to mass media	Decision making on own health care	Physically mistreated	Fertility Rate (Age 15-49)	Delivery assisted by health professional	Knowledge of contraceptive method	Exposed to family planning message	Anaemia message	Knowing about ORS use for child	Knowing about AIDS	Setting antenatal care
Arunachal Pradesh	36.7	70.0	26.4	2.52	31.9	98.1	67.9	62.5	77.1	60.4	17.3
Assam	97.4	65.1	15.5	2.31	21.4	98.3	60.8	69.7	42.9	33.7	15.8
Manipur	16.2	43.3	19.7	3.04	53.9	94.9	80.8	28.9	91.6	92.9	18.3
Meghalaya	37.3	78.9	31.1	4.57	20.6	87.9	62.8	63.3	51.9	44.2	10.4
Mizoram	16.9	73.2	20.1	2.89	67.5	97.8	77.7	48.0	96.0	93.2	13.5
Nagaland	35.7	69.4	19.0	3.77	32.8	87.5	64.4	38.4	58.6	72.4	08.9
Sikkim	21.5	60.2	11.4	2.75	35.1	99.4	88.0	61.1	63.8	53.6	15.3
Tripura	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
INDIA	40.3	51.6	21.0	2.85	42.3	98.9	59.9	51.8	62.4	40.3	20.0

family planning message through television, radio, wall hoarding, newspapers/magazines, and cinema/film shows and folk drama/songs.

Decision Making on Own Health

Autonomy of the women is likely to have a significant impact on the demographic and health seeking behaviour of couples by altering women's relative control over fertility and contraceptive use and by influencing their attributes and abilities. Table 4.5 indicates that there are only "three states" in which more than 70 per cent of women participate in decision making about their own health care (Meghalaya, Mizoram and Arunachal Pradesh). However, rates in other NE states also are not insignificant.

Physical Mistreatment

Violence against women in general and domestic violence in particular in both developed and developing countries have become a growing concern. Domestic violence against women has an increasing amount of research which highlights the health burdens and demographic consequences of such violence. The domestic violence invites the barriers to the empowerment of women with consequences for women's health, their health seeking behaviour, their adoption of a small family norm, and the health of their children. Table 4.5 reveals that in all the states of the NER, the physical mistreatment to the women by husband and other persons are not very uncommon, though percentage is less. The percentage of women in Meghalaya and Arunachal Pradesh is higher in getting mistreated than that of their counterparts in other states as survey report disclosed.

Fertility Level (Age group 15-49)

Three of the states in the region namely Meghalaya, Nagaland and Manipur have, as reported in the table, high levels of fertility.

Deliveries Assisted by Health Professionals

The percentage of deliveries with the assistance of the

health professionals among the women is highest in case of Mizoram and followed by Manipur maintaining 67.5 per cent and 53.9 per cent respectively. Such assistance in other states of the region, as Table 4.5 shows, is relatively low. However, the assistance of the health care professionals is very necessary at the time of the deliveries, the most critical moment in the life of a woman.

Knowledge of Contraceptive Method

Modern contraceptive methods play important roles in the family planning programmes of the country. It is very significant that in all the states of NER women are aware of contraceptive methods rating 87 per cent and above as the Table 4.5 recorded.

Exposure to Family Planning Message

The exposure of the women to family planning message is found to be rated highest in Sikkim with 88.0 per cent followed by Manipur 80.8 per cent. As the table shows their exposure to the message by the women of other states of NER is also higher than the national status of 59.9 per cent.

Anaemia Among Women

In India anaemia effects an estimated 50 per cent of the population. It may have detrimental effects on the health of women and children and may become an underlying cause of maternal mortality and prenatal mortality. Anaemia also results in an increased risk of premature delivery and low birth weight. In India, under the Government's Reproductive and Child Health Programme, iron and folic acid tablets are provided to pregnant women in order to prevent anaemia during pregnancy. Table 4.5 also shows problems of anaemia are highest among the women of Assam, Meghalaya, Arunachal Pradesh and Sikkim, which is also higher than the national figure of 51.8 per cent. The case is relatively lower in other remaining states of the region.

Knowledge on ORS Use

Knowledge on ORS use for child is essential on the part of the mothers. As the Table 4.5 reports such knowledge is

very common to almost of the women of Mizoram (96.0%) and Manipur (91.6%). Lack of the knowledge is found among the woman of Assam rating 42.9 per cent which is much lower than that of national percentage of 62.4 per cent. The rate is also high in case of women of Arunachal Pradesh (77.1%).

Knowing about AIDS

Except Assam (33.7%) awareness about AIDS among the women of NE States is higher in comparison with the national figure of 40.3 per cent. Almost of the women of Mizoram and Manipur are aware of the disease with 93.2 per cent and 92.9 per cent respectively. Maximum women of Meghalaya are found to be ignorant about AIDS rating only 44.2 per cent as the table shows.

Antenatal Care

Getting of antenatal care among the NE States is lower than the national position of 20.0 per cent. In this area the women of Nagaland are found to be more ignorant than that of the remaining states of the region. Antenatal care is mostly understood among the women of Manipur in the region with 18.3 per cent.

Nutritional Status of Children and Breastfeeding

Nutritional status is a major determinant of the health and well-being of children. Inadequate or imbalance diets and chronic illness are associated with poor nutrition among children. Breastfeeding improves the nutritional status of young children and reduces morbidity and mortality. It also protects the child against infection. The mothers who are not well nourished and who are in poor health themselves may not be able to provide adequate breast milk for their children. The recommended feeding indicators and actual feeding for young children are highlighted in Table 4.6.

Anaemia

It is characterised by a low level of haemoglobin in the blood. Haemoglobin is necessary for transporting oxygen from the lungs to other tissues and organs of the body. Anaemia

usually results from nutritional deficiency of iron, vitamin B or some other nutrients. Anaemia is a serious concern for young children because it can result in impaired cognitive performance, behaviour and motor development, co-ordination, language development and scholastic achievement as well as increased morbidity from infectious diseases. One of the most vulnerable groups is children age between 6-24 months. Table 4.6 shows that except in Sikkim, the percentage of children living with anaemia of other NE states is below the national percentage (74.3%). The problem is high in the states of Meghalaya (67.6%) and Assam (63.2%).

Table 4.6: Facts About Children's Health

State	With Anaemia	Breast Feeding (Actual)	Breast feeding (Recommended)	Acute Respiratory Infection (ARI)	Received all Vaccination	Received Vitamin A
Arunalchal Pradesh	54.5	30.8	33.9	25.4	20.5	20.9
Assam	63.2	36.0	42.5	17.8	17.0	15.4
Manipur	45.2	29.3	69.7	26.9	42.3	38.4
Meghalaya	67.6	22.6	16.1	28.8	14.3	24.7
Mizoram	57.2	21.8	40.7	11.2	59.6	71.6
Nagaland	43.7	23.1	43.9	18.4	14.1	6.8
Sikkim	76.5	27.3	16.3	30.1	47.4	45.8
Tripura	NA	NA	NA	NA	NA	NA
INDIA	74.3	25.4	55.2	19.3	42.0	29.7

Breastfeeding

Actual breastfeeding to the children of Arunachal Pradesh, Assam, Manipur and Sikkim are found to be higher comparatively than the national figure (25.4%). However in the remaining states of the region as the Table 4.6 reported it is lower than the national figure. On the other hand, in recommended breastfeeding Manipur (69.7%) tops other NE States and India (55.2%). The situation in Meghalaya (16.1%) and Sikkim (16.3%) are far below than their counterparts and India.

Acute Respiratory Infection (ARI)

ARI, primarily Pneumonia, is a major cause of illness among infants and children and the leading cause of childhood mortality throughout the world. Report says that 19 per cent of children under age three suffers from ARI in India. In NE states, the percentage is not insignificant, though in Mizoram, Assam and Nagaland the prevalence of ARI is less (Table 4.6).

Received All Vaccination (RAV)

The percentage of children who are fully vaccinated ranges from 14.1 per cent in Nagaland to 59.6 per cent in Mizoram. Except Mizoram, Manipur and Sikkim all other states of NE are below the national average as pointed out in Table 4.6.

Received Vitamin A

State variations in the percentage of children who received at least one dose of vitamin A are shown in Table 4.6. As it is shown that except Mizoram, Manipur and Sikkim all other states are below the national percentage. Vitamin A deficiency is one of the most common nutritional deficiency disorders in the world affecting more than 250 million children world wide The National Programme on Prevention of Blindness targets children under age five years and administers oral doses of Vitamin A every six months starting at age of nine months.

Use of Family Planning Method

Use of modern method for family planning is not encouraging for the country (42.8%). NE states except Mizoram (with 57.1%) in this regard has a bitter situation. The situation in the rural areas is again found to be more critical with national average of 39.9 per cent only as the Table 4.7 reports. The percentage maintained by Mizoram is higher than the national average as well as other NE states. Use of the method by the rural women of Meghalaya is more relatively lower than that of their counterparts in the region.

Table 4.7: Use of Family Planning (Modern Method)

Location	Arunachal Pradesh	Assam	Manipur	Meghalaya	Mizoram	Nagaland	Sikkim	Tripura	India
Urban	42.7	30.6	31.4	38.9	64.7	37.8	47.2	NA	51.2
Rural	31.0	26.3	23.1	9.5	48.7	20.9	40.4	NA	39.9
Total	32.8	26.6	25.9	15.5	57.1	24.2	41.4	NA	42.8

Death Rates

Table 4.8 provides comparisons between 1991-92 and1997-98 about the rates in the NE States. For India as a whole, the rate has remained at 9.7 per 1000. The rates in the NE states ranges from 1.9 per 1000 in Nagaland to 11.3 per 1000 in Assam (during 1991-92) and 6.2 in Sikkim to 12.4 in Arunachal Pradesh (during 1997-98). The NFHS, however has admitted that the "Sampling errors are relatively large in these states due to the small size of the samples". Infant Mortality Rates vary dramatically from one state to another ranging from 37.0 in Manipur and Mizoram to 89.0 in Meghalaya (during 1994-99).

Table 4.8: Comparison on Death Rates

State	1997-98			1997-98			Infant Mortality Rate (1994-98)
	Urban	Rural	Total	Urban	Rural	Total	
Arunalchal Pradesh	0.8	9.1	8.2	12.1	12.5	12.4	63.1
Assam	7.0	11.9	11.3	6.1	9.7	9.4	69.5
Manipur	5.3	6.1	5.8	9.8	8.7	9.0	37.0
Meghalaya	6.6	64.1	6.2	7.6	10.4	9.9	89.0
Mizoram	4.2	2.7	3.4	6.0	8.7	7.3	67.0
Nagaland	1.7	2.0	1.9	4.3	7.6	6.9	42.1
Sikkim	NA	NA	NA	3.3	6.8	6.3	43.9
Tripura	NA	NA	NA	NA	NA	NA	NA
INDIA	7.6	10.4	9.7	7.8	10.4	9.7	67.6

Morbidity

Prevalence rates of morbidity (1998-99) in the NE states are highlighted in Table 4.9 showing rates in urban and rural areas. The prevalence of asthma is very high in all the states. Rates in Manipur and Mizoram are however little less. But all the states except Assam have TB patients more than 1000 per 100000. Jaundice is most common in Nagaland. Malaria is also not very uncommon in Meghalaya, Nagaland and Arunachal Pradesh. Three out of eight states (*i.e.*, Arunachal Pradesh, Meghalaya and Nagaland) have a higher prevalence of all these diseases than the national average.

Table 4.9: Morbidity (1988-99) (Per one lakh)

State	Asthma			Tuberculosis			Jaundice			Malaria		
	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
Arunachal Pradesh	1451	3371	3117	1055	1302	1270	1451	1703	1669	11346	12814	12619
Assam	1931	3394	3278	583	721	710	2716	2773	2768	1910	3066	2974
Manipur	190	2108	2040	1086	1118	1107	1324	1924	1728	847	2551	1995
Meghalaya	279	6793	5995	580	167	1459	1306	2996	2658	5533	19433	16656
Mizoram	2112	2190	2149	1096	1027	1063	1837	4630	3155	4438	10623	7359
Nagaland	4343	6076	5729	1723	1637	1654	6972	4840	5348	14447	16597	16166
Sikkim	3197	4938	4711	1151	880	102	2046	2431	2382	1535	1044	1108
Tripura	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
INDIA	1966	2549	2468	390	600	544	1225	1410	1361	2156	4254	3697

Conclusion

NER requires to be improved upon in many fronts. Health care of the region is one of the most important areas in this regard. NEC and DONER should play a vital role for the same. Early implementation of Multi-Channel Telemedicine System at all the district headquarters of the N.E. States is essential to overcome the information communication barriers in the region in health care arena.

The important key areas of the health of children and women of the region the facilities available for their health-care and their living condition as highlighted above are expected to use by the people as well as appropriate authorities (who are well aware about these facts) while taking up necessary action to minimise the deficiencies in the region. The appropriate measure against the shortcoming only can change the health scenario of the region because sound health of women and children are the basis for healthy manpower in future for the development of the region.

References

1. http://httl//www.necouncil.nic.in
2. International Institute of Population Sciences (IIPS). *National Family Health Survey (NFHS-2), 1998-99*, Ministry of Health and Family Welfare, Govt. of India. IIPS, Mumbai, 2000.

Books of Similar Interest

- **Biosocial Aspects of Human Fertility: Models and Applications**/ *Arvind Pandey, K B Pathak*
- **Biostatistical Aspects of Health**/*K B Pathak, C P Prakasam, Arvind Pandey*
- **Epidemiology, Health and Population : Statistical Application** / *Anil Kumar*
- **Health Education For Quality of Life**/*Kuttan Mahadevan*
- **Health Education in Primary Health Care: A Perspective**/ *A B Hiramani*
- **Health Education-An Indian Perspective**/ *A.B Hiramani*
- **Health Promotion, Prevention of HIV/AIDS and Population Regulation**/*K. Mahadevan*
- **Poverty, Nutrition and Fertiligy: A Micro Study**/ *P. Arokiasamy*
- **Reproductive Health in Delhi Slums**/ *S.C.Gulati, R.P.Tyagi & Suresh Sharma*
- **Reproductive Health of Humankind in Asia and Africa: A Global Perspective in 2 vols**/ *K.Mahadevan (Eds)*
- **Reproductive Health,Gender and Development: An International Perspective A Festschrift for Prof.Kuttan Mahadevan**/ *GAO Ersheng (Ed)*

B. R. Publishing Corporation
[A Division of BRPC (India) Ltd.]
425, Nimri Colony, Ashok Vihar
Phase-IV, DELHI-110052

ISBN 81-76

Rs. 45