

**REPORT OF
THE WORKING GROUP ON
HEALTH INFORMATICS INCLUDING
TELEMEDICINE**

**FOR
THE ELEVENTH FIVE YEAR PLAN
(2007-2012)**



**GOVERNMENT OF INDIA
PLANNING COMMISSION
AUGUST 2006**

Content

Sl. No.	Subject	Page No.
1	Planning Commission Order forming the Working Group on Health Informatics including Telemedicine (WG-HITm) for the XI Five Year Plan (2007-12).	1-3
1.1	List of Members / Contributors of WG-HITm.	4-6
2	Proceedings of the Meetings of the WG-HITm held on: (a) 5 th July 2006 (b) 1 st August 2006	7-14
3	Formation of Two Sub-groups of WG-HITm and their TORs (a) Subgroup – I on Health informatics (b) Subgroup – II on Telemedicine	15-17
4	Report of Subgroup – I ▪ Introduction ▪ X Five Year Plan focus ▪ Initiatives undertaken during X Five Year Plan ▪ Major thrust areas suggested/recommended during XI Five Year Plan	18-35
5	Report of Subgroup – II ▪ Introduction ▪ X Five Year Plan focus ▪ Initiatives undertaken during X Five Year Plan ▪ Major thrust areas suggested/recommended during XI Five Year Plan	36-51
6	Financial Requirement - Outlay for XI Five Year Plan along with Annual Plans	52-55
Annexures:		
I	Brief on Integrated Disease Surveillance Project (IDSP)	56-63
II	Reports and Recommendations for Improving and Strengthening Health Information System August 2004, Dte. GHS/ MOHFW, Govt. of India.	64-71
III	Case study (2004-2005) Improving & Strengthening the use of ICD 10 and Medical Record System in India – Reports and Recommendations	72-78
IV	Brochure on Health Sector Policy Reform Options Database (HS-PROD)	79-82
V	MOHFW/GOI concept paper on Telemedicine including Statewise location & progress of telemedicine projects in India.	83-95

Annexures

- I. Brief on Integrated Disease Surveillance Project (IDSP).
- II. Major Reports and Recommendations for Improving and Strengthening Health Information System August 2004, Dte. GHS/ MOHFW, Govt. of India.
- III. Case study (2004-2005) Improving & Strengthening the use of ICD 10 and Medical Record System in India – Reports and Recommendations
- IV. Brochure on Health Sector Policy Reform Options Database (HS-PROD)
- V. MOHFW/GOI concept paper on Telemedicine including State wise location & progress of telemedicine projects in India.

Constitution of Working Group

On

Health Informatics including

Telemedicine

(WG-HITm)

WG 11

No. 2(19)/2006-H & F.W
Government of India
Planning Commission
(Health, Family Welfare & Nutrition)

Yojana Bhawan
Sansad marg
New Delhi
25th May 2006

ORDER

Subject: Constitution of Working Group on Health Informatics including Tele-Medicine for the Eleventh Five Year Plan (2007-2012)

In the context of formulation of the Eleventh Five Year Plan (2007-12) it has been decided to set up a Working Group on Health Informatics including Tele-Medicine under the Chairmanship of Director General of Health Services, Ministry of Health & Family Welfare, Government of India. The composition of the Working Group is as follows:

1.	Director General of Health Services, Ministry of Health & Family Welfare, New Delhi	Chairman
2.	Secretary (Health), Government of Himachal Pradesh	Member
3.	Secretary (Health) Govt. of Andhra Pradesh	Member
4.	Representative of Andaman & Nicobar Islands Administration	Member
5.	Shri Rajeev Lochan, Director (Health), Planning Commission, New Delhi	Member
6.	Shri K.M. Gupta, Director, Ministry of Finance, New Delhi	Member
7.	Representative, Communication & Information Division, Planning Commission, New Delhi	Member
8.	Representative of Indian Council of Medical Research, New Delhi	Member
9.	Representative of Ministry of Information & Technology & Communication, New Delhi	Member
10.	Representative of Department of Space, New Delhi	Member
11.	Representative of Registrar General & Census Commissioner of India, New Delhi	Member
12.	Representative of Apollo Hospital, New Delhi (Telemedicine)	Member
13.	Chief Director (M&E), Ministry of Health & Family Welfare, New Delhi	Member
14.	Director, North Eastern Indira Gandhi Regional Institute of Medical Sciences, Shillong	Member

15	Dr. Arvind Pandey, Director, National Institute of Medical Statistics, ICMR, New Delhi	Member
16	Ms. Ganga Murthy, Economic Adviser, Ministry of Health & Family Welfare, New Delhi	Member
17	Dr. (Mrs.) M. Bhattacharya, Head of Department of Community Health Administration, National Institute of Health & Family Welfare, New Delhi	Member
18	Dr. Shashi Kant, Professor, Centre for Community Medicine, All-India Institute of Medical Sciences, New Delhi	Member
19	Dr. K.K. Aggarwal, Past President, Delhi Medical Association, New Delhi	Member
20	Dr. Y.P. Gupta, Health & IT Consultant, New Delhi	Member
21	Representative, EPOS Health Consultants, New Delhi	Member
22	Director, Central Bureau of Health Intelligence, Ministry of Health & Family Welfare, New Delhi	Member Secretary

2. The Terms of reference of the Working Group will be as under:

- (i) To assess the availability and quality of data, their accuracy and reliability and problems in making estimates. Methods for improvement in 11th Plan period.
- (ii) To review the present Health Management Information System(HMIS), its capability to provide up-to-date information for effective timely response to policy makers & implementing agencies so as to make HMIS an integral part of National Rural Health Mission.
- (iii) To suggest modification in policies, priorities and programmes during 11th Plan period , New initiatives and strategies such as tele-medicines etc., so to improve quality and coverage of services at affordable cost and also cope with existing, reemerging and new challenges in diseases, emerging problems of non-communicable diseases due to increasing longevity, life style changes and environmental degradation;
- (iv) To indicate Manpower requirement and financial outlays required for implementation of these programmes during the 11th Plan period.
- (v) To deliberate and give recommendations on any other matter relevant to the topic.

3. The Chairman may form sub-groups and co-opt official or non-official members as needed. The Steering Committee will submit its report by 31st August, 2006.

4. Shri Rajeev Lochan, Director (Health), Room No. 463, Planning Commission, Yojana Bhawan, New Delhi will be the Nodal Officer for all further communications.

5. The expenditure on TA/DA in connection with the meetings of the Steering Committee in respect of the official members will be borne by the parent Department

/Ministry to which the official belongs as per the rules of entitlement applicable to them. The non-official members of the Steering Committee will be entitled to TA/DA as permissible to Grade I officers of the Government of India under SR 190 (a) and this expenditure will be borne by the Planning Commission

R. Lochan
(Rajeev Lochan)
Director (Health)
Tel. No. 23096711
rlochan@nic.in

To: The Chairman and all Members of the Working Group.

Copy to:

1. PS to Deputy Chairman/MOS
(Planning)/Members(KP)/(AS)/(VLC)/(BLM)/(BNY)/(AH)/(SH)/Member-Secretary,
Planning Commission, Yojana Bhawan, New Delhi
2. All Pr. Advisers/Advisers/ HODs in Planning Commission
3. Prime Minister's Office, South Block, New Delhi
4. Cabinet Secretariat, Rashtrapati Bhawan, New Delhi
5. US(Admin.I) / Pay & Accounts Officer/ Accounts-I Section, Planning Commission
/ DDO, Planning Commission
6. Information Officer, Planning Commission

R. Lochan
(Rajeev Lochan)
Director (Health)

LIST OF MEMBERS of WG-HITm for XI Five Year Plan

Name And Address	Phone/e mail
1. Dr.R K Srivastava Chairman Director General of Health Services M/o Health & Family Welfare Nirman Bhawan, New Delhi-110011	(011) 23061438 dghs@nic.in
2. Dr. Arvind Pandey, Director National Institute of Medical Statistics ICMR, Ansari Nagar, New Delhi-110029	(011)-26588803 arvindpandey@vsnl.net
3. Sh. P. Chattopadhyay, Chief Director (M&E), MOHFW, Nirman Bhawan, New Delhi -110011	(011)-23062699 cdstat@nb.nic.in
4. Sh. B.S. Bedi, Scientist "G" HOD, Deptt. of Information & Technology M/o Communication & IT, New Delhi-110003.	24360582,9868243335 bedi@mit.gov.in
5. Ms. Ganga Murthy Economic Adviser, MOHFW Nirman Bhawan, New Delhi-110011	(011) 23062744 gangamurthy@gmail.com
6. Sh. L.S. Satyamurthy, Programme Director (Telemedicine) Deptt. of Space, Hqr. IRSO Antrix Bhavan, Bangalore-560094.	080-22172187, 3415459, 098451417905 lsaty@antrix.org
7. Prof. K. Ganpathy, Head Apollo Telemedicine Networking Foundation, Chennai-600006.	044-28295447 drkganapathy@gmail.com
8. Dr. (Prof) Sashi Kant, AIIMS, Ballavgarh, Faridabad, Haryana-121004.	0129-2211227 skant76@hotmail.com
9. Dr. R. K. Sharma, Director, NEIGRIMS, Shillong, Meghalaya-793012.	0364-2004681 neigri@sancharnet.in
10. Dr. M. Bhattacharya, HOD (CHA) Community Health Admn. NIHFW, New Delhi—110067	(011) 26165959 cha_nihfw@yahoo.co.in
11. Dr. D Bachani, Programme Officer IDSP NICD, 22, Sham Nath Marg, Delhi-110054	(011) 23932290 idsp-npo@nic.in
12. Dr. Sudhir Gupta, CMO, Dte.GHS Nirman Bhawan, New Delhi-110011	(011)-23061980 cmoncd@nic.in

13. Sh. Vidhya Prakash, Dy. RGI (SRS) O/o RGI, West Block I, Wing 1 R.K. Puram, Sector-1 New Delhi-110066	(011) 26104012 vp_58@yahoo.com
14. Ms. Rugimini Parraar, Director (PF-II) Deptt. of Expenditure M/o Finance, New Delhi-110001	(011) 23092761 rugmini.p@nic.in
15. Mr. Rajeev Sharma, Addl. Director, Director of Health Services, Swasthya Sadan Himachal Pradesh, Kasumpti, Shimla-171005	0177 – 2625060 raju1510@yahoo.co.in
16. Dr. Y. P. Gupta, Health & IT Consultant West Shalimar Bagh, New Delhi-110088	(011) 27485578 yg@ygconsultants.com
26. Dr. M.R. Surwade, Head (PH) EPOS, A-69, Ground floor, Hauz Khas, New Delhi-110016	(011) 26963946 drsurwade@epos.in
18. Dr. K. Satyanarayana Sr. DDG (P&I Division) ICMR, Ansari Nagar New Delhi-110011	(011) 26589258 kanikaram_s@yahoo.com
19. Mr. K.L. Gupta, Dy. Director (NRHM) Director of Health Services, Swasthya Sadan, Himachal Pradesh, Kasumpti, Shimla-171005	Ph: 0177-2623429, 09418060164
20. Representative of Secretary (Health) Andaman & Nicobar Island-744101	03192-234880 rajendra@and.nic.in
21. Mr. Rajeev Lochan Director (Health) Planning Commission, New Delhi-110001	(011) 23096711 rlochan@nic.in
22. Dr. (Mrs.) Jagdish Kaur, Chief Medial Officer (JK), 352, Nirman Bhawan, Directorate General of Health Services, Nirman Bhawan, New Delhi-110011	(011)23063120 jagk2001@rediffmail.com
23. Sh. M.M. Chanda, Joint Adviser (C&I), Planning Commission, New Delhi-110001	(011) 23096759 mmchanda@nic.in mmchanda@yahoo.com
24. Principal Secretary (Health) Department of Health, Medical & F. W. Govt. of Andhra Pradesh, A.P. Secretariat, Hyderabad – 500 022	040-23455824 prisecy_hmfw@ap.gov.in

25. Dr. K. K. Agarwal, Ex-President Delhi Medical Association S-344, GK-I, New Delhi-110048	(011) 41620701, 41620702 drkk@ijcp.com
26. Dr Ashok Kumar Dy. DG & Director Member Secretary Central Bureau Of Health Intelligence, Dte. General Of Health Services, MOHFW Nirman Bhawan, New Delhi-110011.	(011)-23063175 dircbhi@nb.nic.in

Officers of CBHI Co-opted to Support

27. Shri P K Mukhopadhyay Joint Director Central Bureau Of Health Intelligence, Dte. General Of Health Services, MOHFW Nirman Bhawan, New Delhi-110011.	(011)-23062695 dircbhi@nb.nic.in
28. Shri Anirudh kr Singh Assistant Director Central Bureau Of Health Intelligence, Dte. General Of Health Services, MOHFW Nirman Bhawan, New Delhi-110011.	(011)-23062695 dircbhi@nb.nic.in

Proceedings of the
Meetings of
WG-HITm held on
5th July
and
1st August 2006

The First Meeting of Working Group on Health Informatics including Tele-Medicine (WG-HITm) for the Eleventh Five Year Plan (2007-12), under the chairmanship of Dr. R.K. Srivastava, DGHS was held on 5.7.2006 at 1030 hrs at Resource Centre (Room No. 445 A), Nirman Bhawan, New Delhi .

In his opening remarks, Dr. R.K. Srivastava, DGHS welcomed all and briefly emphasized importance of Health Informatics including telemedicine sector. India being a very vast country, different geographical condition exist still there are lot more common things than the differences. He requested that endeavour of this committee should be to bring the diverse expertise to our advantage and work for providing health care service in the country. Chairman further emphasized the need for preparing vision document for 2020, while looking at the Resource (including manpower) available on hand. The task will be to reach each and everyone with a right use of existing technology and for that purpose we have to convert available technology into user friendly and doable. He also requested this group to prepare a one-page vision note, which should be in simple and understandable language without using much of the Technical Jargons. He stressed the need of proper level of participation and desired that the appointed WG members should attend all the meetings to maintain continuity and help in decision making process.

Dr. Ashok Kumar, Member Secretary and Director CBHI made a presentation on TORs of WG-HITm, Information on TORs, and time schedule for functioning of working group upto the submission of final report to Planning Commission. After that the members were invited for open discussions. Following were the main points that came up during the course of this discussion:

1. As there is already a national task force working on the telemedicine, therefore, there is no need to look into the matters separately as it may lead to duplicacy and inconsistency. It may contradict the report of national task force. Rather there should be proper coordination between the working group on HITm and the national task force on telemedicine so that its reports and recommendations may be included in the report of the working group of HITm. Further, members from the national task force on telemedicine informed that the draft report of the task force on telemedicine would be submitted by the end of July 2006. One of the member suggested that we should get all the reports of task force and the sub group may look into the report and after studying it the WG on HITm may further emphasizes on.

2. Ms. Ganga Murthy, Economic Advisor informed that 15 working groups and 5 steering committees have been formed in the health sector, by the Planning Commission for XI FYP. This particular working group on HITm should concentrate on Health Management Information System including the manpower as well as financial requirement. She also informed that another task force of the Planning Commission is working on planning for human resources in the health sector.
3. Initially it was decided to form three sub groups viz. (i) Sub Group 1 on Health Informatics, (ii) Sub Group 2 on Telemedicine and (iii) the third sub group will be looking after the manpower and financial aspect separately. During the discussion consensus emerged that instead of three sub groups there should be only two Subgroups. The two subgroups should look into manpower and financial requirements simultaneously alongwith their respective TORs. Based on the discussions two sub groups were formed thereafter on (i) Health Informatics and (ii) Telemedicine. These two sub groups will work independently and simultaneously and finalise their report as per the target of 19 July 2006.

The Convener of the two sub groups held separate meetings.

In the meeting of the Sub Group – I, convened by Dr. Arvind Pandey, Director NIMS, ICMR the members were provide with (i) the report of the Committee for Comprehensive Assessment of Health Management Information System (HMIS) under the chairmanship of DGHS n the year 2004 and (ii) a brief note on Integrated Diseases Surveillance Project (IDSP). During the discussions the following points emerged out:

1. A Task Force on Health Information System has been formed under the chairmanship of DGHS in March 2006. This task force is to submit its report by 31st August 2006. This subgroup should work in coordination with this task force. Accordingly, the minutes of the two meetings of this subgroup held on 17.4.2006 and 18.5.2006 were forwarded to all the members of this subgroup on 6th July 2006.
2. The latest development and the future plan in IDSP were explained by Dr. D. Bachhani, NPO, IDSP

2. The subgroup should emphasize how it can be an integral part of the National Rural Health Mission (NRHM) launched by MOHFW in April 2005.
3. The set of formats for collecting information should be simplified.
4. A World Bank supported study on IT Infrastructure on Health is presently being conducted by EPOS – a brief about this study will be presented by Dr. Surwarde in the next meeting.

The next meeting of Sub Group I has been fixed on 17th July 2006, 1100 hrs in the office of its convener.

In the meeting of Sub Group II, convened by Mrs. Gangamurthy, Economic Adviser, Ministry of Health & FW, following major points emerged:

1. Medical Council of India should make it mandatory to include at least 20 hrs syllabous in application of IT in health care delivery system. It should be for all the Doctors, and All the medical workers involved in health care delivery.
2. There should be training and teaching for the general physicians in IT Application in Health sector.
3. Training and Capacity building in private and Public Sector in Health care and IT delivery.
4. There should be at least one National Training institute and 4-5 Regional Training institutes. The students from IITs should also be trained in the application of IT in Health Sector.
5. National Institute of Health Information should be set up.
6. Trauma is one of the major emerging public health problems.
7. There should be integration of all the existing information on health related field. The website of the MOHFW should be the repository of the health information. The information should come from all the sources to the Central repository.
8. There should be identification of all the Shortcomings.
9. There should be standard protocol available for the general public.

The next meeting of Sub Group II to be held on 12th & 24th July 2006 in the office of the convener.

The meeting ended with vote of thanks.

Second Meeting of Working Group on Health Informatics including Tele-Medicine (WG-HITm) for the Eleventh Five Year Plan (2007-12), under the chairmanship of Dr. R.K. Srivastava, DGHS was held on 1.8.2006 (1100-1330 hrs) at Committee Room (No. 249 A), Nirman Bhawan, New Delhi.

While welcoming all the participants, **the chairman** requested the Member Secretary to summarise the activities & progress of working group, so far. **Dr. Ashok Kumar, Member Secretary** briefed about the summary of first meeting already communicated to all members and formation & TORs of two sub groups on 5.7.2006 itself viz. Sub group I (**Convener Dr. Arvind Pandey, Director NIMS, ICMR**) and Sub Group II (**Convener Ms. Gangamurthy, Economic Adviser, MOHFW/GOI**) and the meetings of these two sub groups and he then requested **Ms. Gangamurthy, Convener Sub Group-II** to present the report of her group.

While presenting & sharing the report of Sub Group-II, Ms. Gangamurthy explained about the developments that has already taken place in the field of telemedicine during Xth Five Year Plan, existing gaps, and the recommendations of this group for the eleventh five year plan. She also briefed about the setting of National Task Force on Tele-Medicine in MOHFW/GOI. She however, informed that this sub group has not yet finalized about the manpower and financial requirement that can be incorporated after the report of the National Task Force on Telemedicine under the chairmanship of Union Secretary (HFW/GOI), which is likely to be finalized by 14.8.2006. While clarifying the query of the chairman **Sh. L.S. Satyamurthy**, the expert from ISRO shared the experiences in tele-consultation system that has been implemented on the pilot basis in different states like Karnataka, Tamil Nadu, Kerala, Rajasthan, Chhattisgarh etc. He explained the need of the project to be operationalised now along with capacity building for this purpose that can be taken up in the next five year plan. **Prof. K. Ganapathy** from Apollo Telemedicine Networking Foundation informed about the development in technologies which can be useful not only for tele-consultation but also for tele-treatment with proper training to the service providers. Chairman desired that capacity building exercise should be taken to properly utilize the existing telemedicine facilities. **Dr K K Aggrawal**, former DMA President, stressed the need to of e-prescription as it is already in practice in USA. **Mr. M M Chanda**, Director (I&T) from planning Commission was of the view that students from all the engineering and polytechnic colleges should be trained in application of IT in health sectors.

The **chairman** also shared his experience in telemedicine while he was working with SGPGIS wherein the objective was the text and graphic transfer which ended up as text transfer only. He also stressed the **need** of further discussions in this issue with Dr. B.S. Bedi, Deptt. of IT; representative from C-DAC, Govt. of Himachal Pradesh and West Bengal on the initiative taken in telemedicine and this meeting can be organized in his office immediately. The chairman further expressed the need of preparing a **doable model**, keeping in mind the financial and the physical capacity of the country. He requested the experts of this Working Group to further debate on this issue and come up with a suggestive planned document. He informed that the National Task Force will definitely cover all these aspects but this group should identify those **gaps** on telemedicines including tele-consultation and tele-treatment with suggested solutions which might have already been taken by some individuals efforts. The technological and the legal issues must be kept in mind while developing the model. The model should setup the goals which may include the plan for successive five year plans also and move in this direction in a phased manner. He observed that at this stage, during Eleventh Five Year Plan, it may be difficult to go below district level. He requested to come up with the planned **document** involving the financial outlay which is feasible and can be afforded by the Planning Commission. Further he stressed on the need for holistic treatment including Standard treatment protocol, health education, related regulatory Authority, working through the system having dedicated Satellite involving all the stakeholders. He talked about ideal situation wherein there should be a dedicated satellite but we have to see our resources. The chairman desired that we can have different goals like for 10 yrs, 15 yrs, 20 yrs goals. He further stressed that our targets should be fixed keeping in mind what is the scope of improvement in TI sectors as well. What are the likely advances which is likely to take place. Dr. Ganapathy also informed that while developing the financial outlay, the contribution from private sectors may also be incorporated and he hoped that around 20% of this outlay could be contributed by the private hospitals.

Dr. Arvind Pandey, the convener of SubGroup-I presented & shared the reports and recommendations of Sub Group-I. This sub group met twice, on 5.7.2006 and again on 17.7.2006 to finalise the report. He briefly presented about the historical background of HMIS which was introduced during the Eighth Five Year Plan by CBHI. However, this could not take off due to some major problems like (i) maintenance of registers and formats (ii) inadequate facilities of NIC (iii) Non availability of any legal provision for collection of data from Non Govt. sector etc. He then described about the developments taken during the Xth Five year plan period (2002-07). The National Statistical Commission recommended a comprehensive Assessment of the Health Management Information

System (HMIS) by a small committee. Accordingly MOHFW constituted a **committee** under the chairmanship of DGHS with 13 members from MOHFW/GOI, Planning Commission and NIC with Director CBHI as the Member Secretary. This committee after due deliberations **recommended** that Integrated Disease Surveillance Project (IDSP) launched by MOHFW should be further strengthened and efficient health information system from periphery with computer/server facilities at each district and State/UT and with due flexibility to State/UT to incorporate local information in the system. There is a **need** to integrate HIMS and IDSP with an appropriately designed information format and indicators at various levels of health care delivery for an appropriately timely corrective measures. He also briefed about the **development** of IDSP since November 2004, the disease covered under it and its satellite communication system viz. **EDUSAT** with 800 Satellite Interactive Terminals. He also emphasized about the report of National Commission on Macroeconomics and Health on "Building a Health System for Improving Health Information System – The Way Forward". This report recommended **establishment of a National Institute of Health Information & Disease Surveillance** comprising of economics, public health specialists, epidemiologists, doctors etc. This institute should have additional fund for research and capacity building to develop a skilled health work force for policies in an objective manner. He also briefed about the **National Rural Health Mission** and their goals. He then briefed about the recommendations of this sub group on:

- Reduction of the loan of MPW (female) at the sub center level in filling up registers etc.
- Creation of more CHCs in the country.
- Unified formats under NRHM for monitoring of information and evaluation system.
- Strengthening of HIS with its proper linkage with IDSP.
- Creation of National Institute of Health Information System and capacity building of health manpower.

The **chairman** observed that this group should very clearly analyse the failure of HMIS and the basic reasons may be the obsession of the management in collecting information which are irrelevant and redundant. At the sub center level, the grass root level worker were loaded with large volume of registers and formats which ultimately was the reason for not taking up the work load and there was very little support from NIC regarding electronic data transmission system.

He explained that for all planning purposes, fixing of targets for our work plan, the Health Information System is extremely important. At present, neither IDSP nor CBHI is able to do justice to HIS. He insisted that we must learn from our earlier failures and design the plan for Health Information System in Eleventh Plan in a more realistic manner. He felt the need of support from Donor Agencies like World Bank, WHO, UNICEF, UN Agencies etc. in developing a successful model for HIS. He also gave a practical demonstration with the Form No. 6 related to Family Welfare programme and described about various indicators that are redundant and should be deleted while collecting information at the grass root level. He said that at every level like district, state and at national level, the health indicators must be determined and accordingly the data should be collected while keeping in mind removing all redundant components in the data reporting system. **Ms. Gangamurthy** emphasized the need of HIS for critical planning. She explained about the change of concept from the outlay budget to the outcome budget and thus there is a definite need of validated information at every level. She felt the need of locating State Institutes which can take up the responsibility of data validation. **Mr. P. Chattopadhyay, Chief Director, MOHFW** also requested for creation of manpower who will be responsible for providing validated data from grass root level to the national level. **Dr. Ashok Kumar, Director CBHI** emphasized that at every level starting from district the state machineries need to be mobilized in Health Information System. He felt that the major issue is the managerial problem in getting and transmitting this data from periphery upward.

The chairman in his concluding remark expressed his satisfaction about the progress of WG-HITm & work done so far. However, he also requested both the sub groups to design their plan in a justified manner and to link with the outcome of the plan. He requested both the sub groups to concretize and finalise their plan that should also include the manpower and financial requirement for the Eleventh Plan and finalise the **positively submit their respective sub groups reports to Member Secretary by 11.8.2006**. He also emphasized the need of preparing a well documented doable plan for the Eleventh Five Year Plan.

The meeting ended with the thanks to the chair.

Formation of Subgroups & Their TORs

Subgroup-I
On Health informatics

Subgroup-II
On Telemedicine

Formation of two Sub Groups

Sub Group – I

(TOR 1) To assess the availability and quality of data, their accuracy and reliability and problems in making estimates. Methods for improvement in XIth FYP.

(TOR 2) To review the present Health Management Information System (HMIS), its capability to provide up-to-date information for effective timely response to policy makers & implementing agencies so as to make HMIS an integral part of National Rural Health Mission.

(TOR 4) - To indicate Manpower requirement and financial outlays required for implementation of these programmes during the 11th Plan period.

1. Dr. Arvind Pandey, Director NIMS – Convener, ICMR, Ansari Nagar, New Delhi-110029 Ph: (011)26588803, (Fax) 26589556 E: mail: arvindpandey@vsnl.net	2. Sh. P. Chattopadhyay, CD (M&E), MOHFW, Nirman Bhawan, New Delhi -110011 Ph : (011) 23062699 E-mail: cdstat@nb.nic.in
3. Sh. B.S. Bedi, Scientist "G" HOD, Deptt. of Information & Technology M/o Communication & IT New Delhi-110003. Ph : (011) 24360582, 9868243335 E-mail : bedi@mit.gov.in	4. Dr. R. K. Sharma, Director, NEIGRIMS, Shillong, Meghalaya-793012 Ph : 0364-2004681 E-mail: neigri@sancharnet.in
5. Dr. M. Bhattacharya, HOD (CHA) Community Health Admn. NIHFW, New Delhi--110067 Ph : (011) 26165959 E-mail : cha_nihfw@yahoo.co.in	6. Dr. (Prof) Sashi Kant, AIIMS, Ballavgarh, Faridabad, Haryana-121004 Ph : 0129-2211227 E-mail: skant76@hotmail.com
7 Dr. D. Bachani, Programme Officer IDSP NICD, 22, Sham Nath Marg, Delhi-110054 Ph : (011) 23932290, E-mail: idsp-npo@nic.in	8. Ms. Rugimini Parmar, Director (PF – II), Deptt. of Expenditure M/o Finance, New Delhi-110001 Ph : (011) 23092761 E-mail : rugmini.p@nic.in
9. Sh. Vidhya Prakash, Dy. RGI (SRS) O/o RGI, West Block I, Wing 1 R.K. Puram, Sector-1 New Delhi-110066 Ph : (011) 26104012 E-mail: vp_58@yahoo.com	10. Mr. Rajeev Sharma, Addl. Director, Director of Health Services, Swasthya Sadan Himachal Pradesh, Kasumpti, Shimla-171005. Ph: 0177 – 2625060 E-Mail: rajul510@yahoo.co.in
11. Dr. Y. P. Gupta, Health & IT Consultant West Shalimar Bagh, New Delhi-110088 Ph : (011) 27485578 E-mail: yg@ygconsultants.com	12. Dr. M.R. Surwade, Head (PH) EPOS, A-69, Ground floor, Hauz Khas, New Delhi-110016 Ph : (011) 26963946 E-mail: drsurwade@epos.in

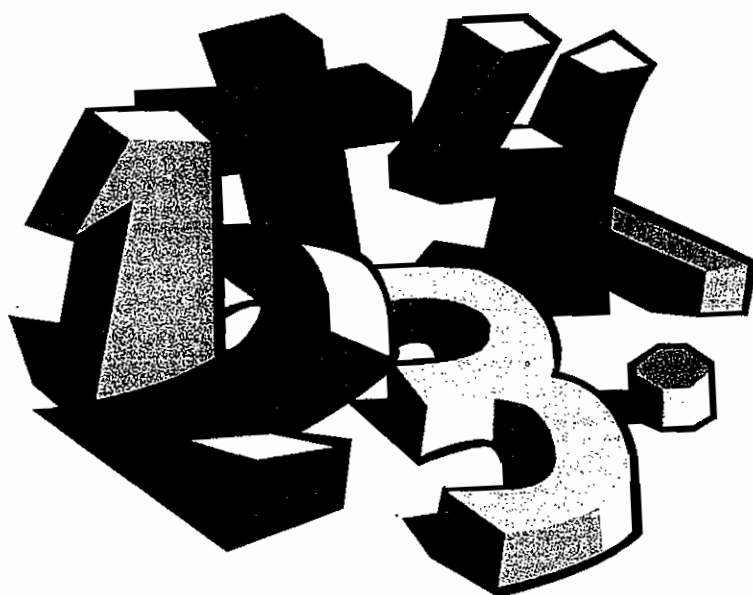
Sub-Group --II

(TOR 3) To suggest modification in policies, priorities and programmes during 11th Plan period, New initiatives and strategies such as tele-medicines etc., so to improve quality and coverage of services at affordable cost and also cope with existing, re-emerging and new challenges in diseases, emerging problems of non-communicable diseases due to increasing longevity, life style changes and environmental degradation.

(TOR 4) To indicate Manpower requirement and financial outlays required for implementation of these programmes during the 11th Plan period.

1. Ms. Ganga Murthy – Convener , Economic Adviser, 244(B) A Wing, MOHFW, New Delhi-110011 Ph : (011) 23062744 E-mail : gangamurthy@gmail.com	2. Sh. B.S. Bedi, Scientist "G" HOD, Deptt. of Information & Technology New Delhi-110003 Ph : (011) 24360582, 9368243335 E-mail: bedi@mit.gov.in
3. Prof. K. Ganpathy, Head Apollo Telemedicine Networking Foundation, Chennai-600006 Ph : 044-28295447 E-mail: drkganapathy@gmail.com	4. Sh. L.S. Satyamurthy, Programme Director (Telemedicine) Deptt. of Space, Hqr. IRSO Antrix Bhavan, Bangalore-560094 Ph: 080-22172187, 23415459, 098451417905 E-mail: lsaty@antrix.org
5. Dr. K. Satyanarayana Sr. DDG (P&I Division) ICMR, Ansari Nagar New Delhi-110011 Ph : (011) 26589258 E-mail : kanikaram_s@yahoo.com	6. Dr. D. Bachani, Programme Officer IDSP NICD, 22, Sham Nath Marg, Delhi-110054 Ph : (011) 23932290, E-mail: idsp-npo@nic.in
7. Dr. Sudhir Gupta, CMO, Dte.GHS Nirman Bhawan, New Delhi-110011 Ph : (011) 23061980 E-mail: cmoncd@nic.in drsudhirgupta@gmail.com	8. Dr. (Mrs.) Jagdish Kaur, Chief Medical Officer (JK), 352, Nirman Bhawan, Dte GHS, Nirman Bhawan, New Delhi-110011 Ph: (011) 23063120 E-mail: jagk2001@rediffmail.com
9. Sh. M.M. Chanda, Joint Adviser (C&I) Planning Commission, New Delhi-110001 Ph : (011) 23096759 E-mail: mmchanda@nic.in	10. Mr. Rajeev Lochan Director (Health) Planning Commission, New Delhi-110001 Ph : (011) 23096711 E-mail: rlochan@nic.in
11. Principal Secretary (Health) Department of Health, Medical & F. W. Govt. of Andhra Pradesh, A.P. Secretariat Hyderabad – 500 022 Ph : 040-23455824 E-mail: prisecy_hmfw@ap.gov.in	12. Representative of Secretary (Health) Andaman & Nicobar Is.-744101 Ph: 03192-234880 E-mail: rajendra@and.nic.in
13. Dr. K. K. Agarwal, Ex-President Delhi Medical Association S-344, GK-I, New Delhi-110048 Ph: (011) 41620701, 41620702 E-mail: drkk@ijcp.com	14. Mr. K.L. Gupta, Dy. Director (NRHM) Director of Health Services, Swasthya Sadan Himachal Pradesh, Kasumpti, Shimla-171005 Ph: 0177-2623429, 09418060164

Report and Recommendations of SubGroup-I on Health Informatics for the XI Five Year Plan



**10TH FIVE YEAR PLAN (FYP) – FOCUS
INITIATIVES TAKEN DURING 10TH FYP
MAJOR THRUST AREAS DURING XI FYP
MANPOWER & FINANCIAL REQUIREMENT**

Report & Recommendation of Sub Group – I for XI Five Year Plan

In its first meeting of the Working Group on Health Informatics held on 5.7.2006 under the Chairmanship of DGHS, the sub-group I was constituted with Dr. Arvind Pandey, Director, National Institute of Medical Statistics (NIMS), as the Convener and other members. This sub-group focused on three terms of references (TORs) of the Working Group viz. (i) **to assess the availability and quality of data, their accuracy and reliability and problems in making estimates. Methods for improvement in XI FYP** (ii) **to review the present Health Management Information System (HMIS), its capability to provide up-to-date information for effective timely response to policy makers & implementing agencies so as to make HMIS an integral part of National Rural Health Mission** and (iii) **to indicate Manpower requirement and financial outlays required for implementation of these programmes during the XI Plan period.**

The sub-group I in its meeting held on 17.7.2006 discussed at length the present scenario of the health information, its limitations and inadequacies. It was noted by the sub-group that accurate, relevant and up-to-date information is essential to health service managers if they are to recognize the weaknesses in health service provision and take actions that will improve service delivery. Accordingly, the development of effective information systems is a necessary precursor to managerial improvement. It was observed that a health management information system is a process whereby health data (input) are recorded, stored, retrieved and processed for decision-making (output). Decision making broadly includes managerial aspects such as the planning, organizing and control of health care facilities at the national, state and sub-state levels and clinical aspects which can be subdivided into (i) providing optimal patient care (ii) training of medical personnel to generate appropriate human resources, and (iii) facilitate research and development activities in various fields of medicine.

Subsequently after the **second meeting** of the working group held on 1st August 2006 the chairman expressed his satisfaction about the progress made so far. However, he also suggested both the sub-groups to design their plan in a more focused manner linking with the outcome of the plan. He suggested concretizing and finalising their plan with due inclusion of the manpower and financial requirement for the Eleventh Plan and submit report by 11 August 2006. Accordingly, a meeting of this subgroup was organized on 8.8.06 to review the recommendations and to finalise the report of subgroup – I.

HMIS is an essential management tool for effective functioning of the health system. During the Eighth Plan the Central Bureau of Health Intelligence and the state Bureaus of Health Intelligence developed a HMIS system for sending district level information on morbidity reported by the government primary health care institutions through National Informatics district computer network. Though some states responded initially the system was never fully operationalised in any state. The HMIS system did not take root due to the several inherent deficiencies. The **major problems** faced in the implementation of HMIS were:

- a) HMIS proforma requires continuous maintenance of detailed Subcentre Registers, numbering 13, along with the Reporting formats. This involves substantial recurring expenditure for printing of forms and registers. The States/UTs expressed inability to meet the recurring expenditure for printing of forms and registers.
- b) Lack of hardware, software and trained personnel at the district and lower levels and the NIC facilities were inadequate to meet computing requirements of HMIS
- c) Separate programme wise Information System - required by some users
- d) No legal provisions for collecting data from non-government sector.
- e) No compulsion at State / UT level to implement the system.

As a result there is no system through which **reliable data** on morbidity in different districts/states could be collected and analyzed and used for decentralized district based planning. So far there has not been any effort to use the currently available IT tools to build up a comprehensive HMIS and use it to improve efficiency and functional status of the health system.

2. 10TH FIVE-YEAR PLAN (2002-07) – FOCUS

During the Tenth Plan the focus was to **ensure** that effective two way management information system is built up throughout the country; all data pertaining to health and family welfare programmes to be collected, collated and reported from all districts and utilized to improve functional status and efficiency of the health system. **Efforts** would also be made to build up a fully functional, accurate HMIS utilizing currently available IT tools; this real time communication link requires to send data on births, deaths, diseases, drugs, diagnostics and equipment and status of ongoing programmes through service channels within existing infrastructure and manpower and funding. It also facilitates **decentralized** district based planning, implementation and monitoring.

The Tenth Plan envisaged a **comprehensive review** of (a) disease surveillance programmes which was being implemented in different states under different disease control programmes and under the project on disease surveillance. Private sector provides over 75% of curative care. However, data from private health providers is not yet included in any disease surveillance system, (b) laboratory facilities available for investigation of epidemic prone diseases and (c) also the reporting systems currently in use. However, health and family welfare issues continued to follow two different pathways which were far from the concept of integration necessary for a unified health information system. Efforts also need to be made to integrate the ongoing programmes for disease surveillance and develop a comprehensive disease surveillance programme at the district level.

Thus tenth five year plan (2002-07) focused on:

- **Building up** a fully functional, accurate Health Management Information System (HMIS) utilizing communication link will send data on births, deaths, diseases, request for drugs, diagnostics and equipment and status of ongoing programmes through service channels within existing infrastructure and manpower and funding; it will also facilitate decentralized district based planning, implementation and monitoring.
- **Building up** an effective system of disease surveillance and response at the district, state and national level as a part of existing health services.

3. INITIATIVES UNDERTAKEN DURING X FIVE YEAR PLAN

3.1 Constitution of National Statistical Commission

The Union Ministry of Statistics & Programme Implementation (MOSPI) during the year 2001 constituted the National Statistical Commission (NSC) under the Chairmanship of Dr. C. Rangarajan which had articulated the deficiencies observed in the health and family welfare statistics. It had **observed** * that as extensive data are being collected by various agencies and compiled, there exist various problems, deficiencies and gaps. The system was not successful on account of non-reporting, under-reporting, variable coverage, delays in receipt of reports, data not being gender-specific and age specific, data not catering to the needs of the general public, etc.

The **major problems** faced in the implementation of HMIS in the past were lack of hardware, software and trained personnel at the district and lower levels. The National Informatics Centre (NIC) facilities were inadequate to meet the computing requirements

* – Report on National Statistical Commission published by M/o SPI 2001

of HMIS. Further, while the information for various programmes is collected separately by the peripheral worker and sent upwards from sub-centre, primary health centre and community health centre to the district and

State levels, there is no coordination between the various health programmes implemented by the several Departments of Ministry of H&FW. Maintenance of patient care records is also very poor in most of the Government hospitals. The information from the private sector is not properly collected and included in the data generated by the official sources. Most of the States have not paid attention to implement the programme due to various reasons including lack of funds and trained manpower resources. As a result the HMIS has failed to achieve the objectives for which it was set up and has not functioned satisfactorily.

Due to **poor implementation** of HMIS by the States, the earlier system of collection of information by various programme authorities has continued to be in existence along with HMIS, which has created an undue burden on the peripheral workers as they have to fill up a number of proforma and maintain a number of records related to various programmes namely, malaria eradication, goitre, immunisation, MCH, family planning, blindness control, tuberculosis, AIDS and leprosy.

The Commission observed that a computerised health information system at all treatment facilities is an essential prerequisite for establishing an effective Health Management Information System. The HMIS has a good potential to provide a comprehensive database on working of health programmes at the decentralised level up to the district. The HMIS if properly implemented would reduce delays in the information flow, provide qualitative information in a standardised form, avoid duplication and facilitate quick retrieval of information by all agencies concerned. Some of the key recommendations of the Commission are:

- (a) A comprehensive **assessment** of the Health Management Information System (HMIS) should be made by a small Committee quickly and HMIS be reintroduced in the country in a phased manner with necessary modifications. The combined HMIS format should be separated into programme-wise modules. While revising the programme modules, care should be taken to meet the data requirements of both the Central and State Governments. Flexibility should be given to the States and UTs to include additional items to meet their State specific data requirements.

- (b) Steps should be taken to **rationalise and minimise** the number of records and registers maintained by the peripheral health workers such as ANMs and public health inspectors to **reduce their burden** and to improve the quality of data. The minimum data set on which data from the grass root levels should be regularly collected along with their periodicity should be clearly identified.
- (c) A suitable **mechanism** to collect the data at the grass roots level and its upward transmission to the district, State and the National level should be evolved and for that methods of data collection, transmission, and processing must be modernised. As NIC facilities are inadequate to meet the requirements of HMIS, adequate funds need to be provided for necessary hardware, software and connectivity and training of personnel.
- (d) The Central Bureau of Health Intelligence (**CBHI**), which is at present a part of Directorate General of Health Services (DGHS) should be separated and **upgraded** to a full-fledged Directorate of Health Statistics (DHS) directly under the Department of Health. An officer from the Indian Statistical Service at the Additional Secretary level should head this Directorate and act as the Statistical Adviser to the Ministry. Also required posts of supporting officers should be created. The DHS should be the nodal agency in matters of health statistics and should advise the Department in all matters related to the collection of Health Statistics; coordinate with the National Statistical Office the Central and State Governments as well as international agencies in matters related to health statistics.
- (e) The CBHI upgraded as DHS should be strengthened with adequate **Electronic Data Processing (EDP)** personnel and existing personnel should be **trained** in EDP operations, to enable the processing, tabulation and presentation of the large volume of data on health. Adequate funds out of the national health programmes should be earmarked for development and maintenance of information system as well as for verification of field level performance data through independent agencies.
- (f) In order to facilitate effective implementation of the HMIS in the States and UTs, the State Department of Health and Family Welfare in every State **should have a Statistical Division** headed by a senior level statistical officer. In the districts, a health statistics cell should be set up in the Office of Chief Medical Officer (CMO) to implement HMIS and to take care of all health and family welfare statistical activities of the district.

3.2 Constitution of a committee by MOHFW/GOI to review HMIS & its recommendation

Accordingly, Union M/o Health & Family Welfare constituted a Committee* under the chairmanship of DGHS with 13 members from MOHFW/GOI, CSO, Planning Commission and NIC and Director CBHI as the Member Secretary, with the following terms of references:

- I. Comprehensive Assessment of HMIS for re-introduction with modifications and schedule of re-introduction in phased manner.
- II. Separation of combined format into programme-wise modules.
- III. Flexibility of States/UTs to include additional items to meet States specific data requirements.
- IV. Setting up of detailed action plan with definite milestones and target dates for implementation of recommendations of National Statistical Commission, keeping in view result of HMIS assessment.

The committee met twice, on 5.10.2004 and 2.12.2004 and reviewed the HMIS and its functioning in the country.

Keeping in view of National Health Policy (1983) and to achieve the goal of Health for All by 2000 AD through Primary Health Care Approach there was a strong need for efficient Management Information & Evaluation System in health sector. As a combined effort of Dte.GHS/MOHFW, State Health Departments, NIC, Planning Commission and WHO (1986-88), the need based HMIS was developed and field-tested in 1989 in one District each of Gujarat, Haryana, Maharashtra and Rajasthan. It was only meant to cover rural health services. In a review meeting during 1989 HMIS found to be satisfactory and merited implementation throughout the country in phased manner. Also it was decided that the system should be given a computer compatible format and to operate the same through NICNET in due course. Accordingly the system was made computer compatible by NIC/ CBHI and PHC/District Hospital/Private Hospital Formats were developed (HMIS version 2.0) in 1990. During 1992, under HMIS Ver. 2.0, NIC/CBHI developed thirteen Sub-Centre Registers, three Model Reporting Formats and Control Charts for PHC & District levels. In all 13 States were included for HMIS Ver. 2.0 implementation and the States were requested to examine the model formats and adapt accordingly to specific needs with minimal set of essential information.

In a review meeting held in March 1996 it was observed that only two States (Haryana & Sikkim) had implemented HMIS 2.0. This review recommended that (i) a task force with adequate and appropriate representation from various programme and states be constituted which should inter-alia look into desirability of devising a unified programme by consulting the existing machinery at sub-centres, PHC, District, State and Central level programme officers to

(*) - Vide Order No. Z – 18021 / 5/2002 – PH(CBHI) dated 31.12.2003

come up with suitable recommendations for changes in the existing formats, **(ii)** since the district NIC facilities are inadequate to meet the computing requirements of HMIS, this set up needs to be suitably strengthened in terms of manpower, equipment and infrastructure, for meeting the HIS requirements, **(iii)** also to make the HMIS more comprehensive and effective, the urban health care system should also be studied, **(iv)** the training programmes required more funding and manpower to make the implementation rapid and effective, and **(v)** the respective State Governments may consider bringing an Act with a view to formulate guidelines making it obligatory on the part of private sector, Local Self Govt. Departments (LSGD) to provide information related to various health services being rendered by them.

In a subsequent workshop held in **December 1997** on HMIS reviewed the extent of computerization of distt. Chief Medical & Health Officer & their connectivity to NIC-NET. Following important **recommendations** emerged:

- i) Computers at NIC district centre are hardly available for entry of HMIS and other health data. It is, therefore, necessary that the requisite hardware with accessories and the latest operating softwares are provided to the District Chief Medical Officer and Directorate of Health Services at State/UT HQrs. with common software.
- ii) The trained personnel may be available at district and state level for operation and maintenance of computer hardware and softwares. Each programme should have a component of training in "General awareness to computer, data entry, programming etc." at district and state level. The requisite fund may be kept at the disposal of District Chief Medical Officer and Directorate of Health Services/State Bureau of Health Intelligence at State/UT HQrs. Distt. Programme Manager to ensure data entry in Distt. CMHO office computer.
- iii) It was strongly felt that 15% of the total cost of hardware may be earmarked for annual maintenance and a fixed amount in every district may be provided towards purchase of computer consumables and other stationery items. There should be a nodal agency at the national level and also at the state level for all the programmes responsible for drawing funds from different programmes and make available the registers and formats.
- iv) HMIS format to be revised to independent programme wise modular formats keeping in view that the modular formats may be uniform over States/UTs and contain gender information and also information by specific age groups wherever applicable.
- v) NIC to Centrally Develop Data entry software with flexibility for add on information.

This Committee under the chairmanship of DGHS/GOI after due deliberations observed that over last two decades an appreciable advancements have taken place in the development of health information systems in India, especially National Health Programmes like RNTCP, NVBDCP, NBCP, NLEP, etc. have utilized the modern information technology/software for their information system. The Union Ministry of Health & Family Welfare after due planning has **launched** (November 2004) the World Bank supported Integrated Disease Surveillance Project (**IDSP**) with cost of more than Rs.400 Crores and this projects envisages the further strengthened and efficient health information system from periphery with computer/server facilities at each district and State / UT and with due flexibility to State / UT to incorporate information in the system.

Under this project, **care has been taken** to link all the program specific computers in each district with IDSP server so as to make integration of all health information. With this advancement and commitment by the MOHFW / GOI, there is a **need to integrate** HMIS with IDSP with an appropriately designed information format and indicators at various levels of health care delivery for an appropriate timely corrective measures.

The **final recommendation** of this committee was communicated to M/o Statistics & PI * clearly indicating that "it will be desirable to strengthen this IDSP as a national health information system with appropriate computer connectivity rather than pursuing the HMIS which was conceived about two decades back and could not succeed for various reasons. In the present context, this Union M/o Health & FW is committed to ensure the efficient implementation of IDSP which is one of the major projects undertaken with World Bank loan. This Ministry is also tracking the **information** on financial, logistics, manpower and implementation aspects for ensuring timely corrective appropriate measures I hope this will suffice fulfilling the need of aforesaid recommendation of NSC on the subject matter. Your further suggestion will be appreciated".

3.3 Launch of Integrated Disease Surveillance Project (IDSP)

Integrated Disease Surveillance Project (**IDSP**) is a decentralized, State based Surveillance Program in the country. It is intended to detect early warning signals of impending outbreaks and help initiate an effective response in a timely manner. It is also expected to provide essential data to monitor progress of on-going disease control programme and help allocate health resources more efficiently.

The **IDSP was launched** by Hon'ble Union Minister of H&FW in November 2004 with following **objectives** to:

- i) Establish a decentralized district based system of surveillance for communicable and non-communicable diseases so that timely and effective public health actions can be initiated in response to health challenges in the urban and rural areas while establishing Public private Partnership.
- ii) Integrate the existing surveillance activities (to the extent possible without having a negative impact on their activities) so as to avoid duplication and facilitate sharing of information across all disease control programmes and other stake holders, so that valid data are available for decision making at district, state and national levels.

A **brief** on IDSP indicating (a) diseases covered in Regular Surveillance, Sentinel Surveillance, regular Periodic Surveys, State Specific Diseases, (b) Organization Structure, (c) Training of District Surveillance Teams, (d) Procurement of Goods (e) Development of software for diseases surveillance (f) Baseline study on Public Health Laboratories (g) External Quality Assurance System (h) Participation of Private Sector & Medical colleges (i) NCD Risk Factor Surveillance (j) budget allocated and utilized, are enclosed at **Annexure – I**.

3.3.2 IDSP Satellite Communication System

IDSP launched Satellite Linkage on 29th March 2006 with Central studio at National Institute of Communicable Diseases with a sub-hub in Nirman Bhawan and 800 Satellite Interactive Terminals (SITs) located throughout the country would be set up connecting all the State and Districts Units, Medical Colleges and premier state and national public health institutions. For a fully functional network, it is also being considered of intervention of network under National Rural Health Missions and various National Health Programmes. **EDUSAT**, a dedicated educational satellite launched by ISRO is being utilized to set up communication and information network throughout the country. Proposal has been submitted to the World Bank for clearance. This network will be utilized for distance training programmes, teleconferencing and data transmission. Funds have been sanctioned from IDSP Budget for 2005-06 to ISRO to cover 400 SITs by June 06. Remaining 400 SITs would be covered during 2006-07 and covered by December 2006.

3.4 Constitution of National Commission on Macroeconomics and Health (NCMH) by Govt. of India

The NCMH in its **Report*** titled “Building a Health System for Improving Health in India – The Way Forward” **recommended:**

- A National **Institute** of Health Information & Disease Surveillance **needs to be established** as an autonomous body consisting of Board members from other ministries, statisticians, researchers and State-level policy makers. The Institute must also have a multidisciplinary composition comprising economists, public health specialists, epidemiologists, and doctors. Disease burden estimations, National Health Accounts, cost-effectiveness studies of interventions, efficacy of vertically driven interventions including ICDS in countering the problem of malnutrition in the country, independent evaluations of programme implementation are examples of the kind of work that needs to be undertaken.
- There is a **need of reviewing** National health information system at various levels – Central, State, district and block - by various agencies - different ministries and departments in the government – method of data flow, gaps in data, utilization of the data, organizational set up, accessibility of information to various persons at various levels are aspects to be examined.
- Alongwith domestic resources, external aid, WHO assistance etc. be fruitfully utilized for processresearch capacity by earmarking fellowships every year to institutes of excellence abroad and within India. Of the total 25% must be at the doctoral level and the rest at the Master’s level. It should be our target to have a pool of atleast 500 persons with a combination of such critical skills by the end of 2012. Such fellowships should be open for competition and not be confined to central government employees of the Ministry of Health. This will help develop capacity and expertise outside government and be available for policy advise in an objective manner.

3.5 Launch of National Rural Health Mission (NRHM) by Govt. of India

Recognizing the importance of Health in the process of economic and social development and improving the quality of life of our citizens, the Government of India has **launched the NRHM in April 2005** to carry out necessary architectural correction in the basic healthcare delivery system. The Mission adopts a synergistic approach by relating Health to determinants of good health viz. of nutrition, sanitation, hygiene and safe drinking water.

* – Report of National Commission on Macroeconomics and Health – 2005

It also aims at mainstreaming the Indian systems of medicine to facilitate health care. The Plan of Action includes increasing public expenditure on health, reducing regional imbalance in health infrastructure, pooling resources, integration of organizational structures, optimization of health manpower, decentralization and district management of health programmes, community participation and ownership of assets, induction of management and financial personnel into district health system, and operationalising Community Health Centres into functional hospitals meeting India Public Health Standards in each Block of the Country.

The **goal** of the Mission is to **improve** the availability of and access to quality health care by people, especially for those residing in rural areas with specific **objectives**:

- Reduction in Infant Mortality Rate (IMR) and Maternal Mortality Ratio (MMR)
- Universal access to public health services such as Women's health, child health, water, sanitation & hygiene, immunization, and Nutrition.
- Prevention and control of communicable and non-communicable diseases, including locally endemic diseases
- Access to integrated comprehensive primary healthcare
- Population stabilization, gender and demographic balance.
- Revitalize local health traditions and mainstream AYUSH
- Promotion of healthy life styles

The NRHM seeks to **provide** effective healthcare to rural population throughout the country with special focus on 18 states, which have weak public health indicators and/or weak infrastructure. These 18 States are Arunachal Pradesh, Assam, Bihar, Chhattisgarh, Himachal Pradesh, Jharkhand, Jammu & Kashmir, Manipur, Mizoram, Meghalaya, Madhya Pradesh, Nagaland, Orissa, Rajasthan, Sikkim, Tripura, Uttaranchal and Uttar Pradesh.

3.6 Constitution of Task Force on HMIS by Union Ministry of Health & FW

A Task Force on HMIS was constituted by the Ministry of Health & Family Welfare during March, 2006 * under the chairmanship of DGHS with the **TOR's** to:

- (a) Suggest a format of reporting from Districts and States that could capture health information required for purposes of planning, monitoring and review.
- (b) Suggest the manpower structure at District, State and national levels for a commonly agreed system of data collection, data entry and data analysis.

- (c) Agree on the formats of data collection at various levels and its analysis.
- (d) Reconfigure the system of statistics and data gathering at the national level to provide for a more effective and efficient internal organization that meets the requirements of States.
- (e) Develop illustrative structures of coordination among various health data interventions including IDSP at district and State levels.
- (f) Weed out unwanted data collection systems and replace them with a consolidated and comprehensive data system; which can thus satisfied the need.

This task force in its two meetings held till date, viewed the HMIS of different states like Tamil Nadu, Rajasthan, Gujarat and Chattisgarh through their detailed presentations as well as through video conferencing. This task force is in the process of deliberation and is expected to come out with its recommendations on the above TORs by end of August 2006.

3.7 In depth Review with all the States/UTs for Improving & Strengthening Health Information System & use of ICD 10 and National Recommendations

In order to ensure electronic data flow and further improve the efficient Health Information System (HIS), CBHI had held (a) training workshop of States/UTs for sensitizing them on electronic data transmission, October 2003, and (b) followed by four regional workshops with the State/UTs for improving and strengthening the Health Information System during 2002-2004. The **Combined Report & Recommendation** (Annexure-II)** of the above said workshops were communicated to all State/UT health authorities for necessary action. This was **pursued by CBHI officers who visited 18 states/UTs** upto peripheral level to make an “on the spot” situation analysis & supportive supervision for efficient HIS. **During 2005**, two national workshops were organized to review the action plan of all the States/UTs to implement the above said national recommendations.

During 2006-07, CBHI has planned with selected states to concretize their District specific action plan to improve & strengthen HIS upto peripheral level, while involving Private Public Partnership and also study for electronic flow of health information from peripheral to district/state/national level.

CBHI undertook a case study of 20 hospitals belonging to Central Govt, State Govt, Local Bodies, Private Sector in cities of Delhi and Rohtak, during years 2004 & 2005 with the objective to identify the status of implementation of ICD 10, the major constraints and their feasible solutions to improve and strengthen the use of ICD 10 as well as medical record department in the country. The important recommendations of the case study are (i) Capacity Building and Trained Manpower development for using ICD 10, (ii) ensuring administrative actions to ensure and improved use of ICD 10 in all medical & health institutions in the country and

(*) Vide order no. N-23011/13/2006-Policy dated 23.3.2006

(**) Combined Reports & Recommendation published by CBHI in August 2004

(iii) establishment of World Health Organisation Collaborating Centre for Family of International Classifications on Diseases & other Health Related Aspects for South East Asia Region in India, in CBHI.

The Executive summary & major recommendations (**Annexure-III**) * of this case study have been communicated to all States/UTs health authorities & others concerned for prompt implementation.

3.8 Health Sector Policy Reform Options Database (HS-PROD) with website address www.prod-india.com

HS-PROD is a Health Sector Reforms Database. On request of the Donor Coordination Division, MOHFW, GOI; CBHI after getting due approval from Director General of Health Services has allotted a Project of high national importance on "Health Sector Policy Reform Option Database (PROD) of India" which is being supported by European Commission through its Sector Investment Plan (SIP) with an estimated budget provision of Rs.84 lakhs (approx.). Already 152 entries have been uploaded in the website prod.india.com and this site is being brought to MOHFW/GOI through NIC. The brochure detailing on HS-PROD is placed as **Annexure IV**.

4. MAJOR THRUST AREAS SUGGESTED/RECOMMENDED DURING XI FYP

1. While prioritizing Efficient Health Information System (HIS), to begin the States/UTs should strengthen the existing **State/UT health statistics unit** in their respective health & FW directorates with identified nodal officers, trained personnel and computer so as to effectively coordinate for validated health data base & capacity building in State/UT & closely link with CBHI. Subsequently States/UTs to make efforts for establishing a dedicated State/UT Health Statistics Division, equipped with adequate infrastructure. This Division be responsible for efficient HIS, validated health database of the State/UT, monitoring & evaluation as well as capacity building, while keeping close linkages with CBHI and various reporting unit within the State/UT.
2. At district level, Chief Medical & Health Officer is responsible for all health statistical activities under whom the existing **Distt. Health Statistics cell** be strengthened by the States/UTs and efforts be initiated to equip this cell with a dedicated trained officer as its incharge and a Group C staff oriented in computer operation and atleast one computer with accessories. This Distt. Health Information Unit can then coordinate for efficient health information system in the district, including on the spot supervision and related capacity building of PHCs & other Health units in the district.

* - Report & Recommendations Published by CBHI, 2006..

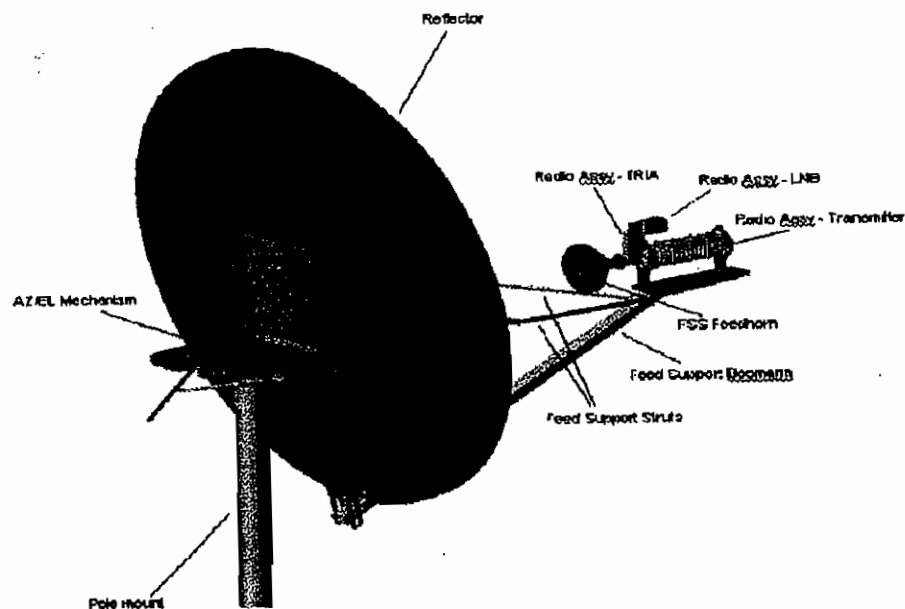
3. At **PHC/CHC/Dispensary** level, the States/UTs should make efforts to orient & reorient the medical officers and health supervisors towards health data management through continued supportive supervision and wherever necessary through in service training program organized by State/UT, CBHI and other Institutions. A close coordination with all the existing govt./non govt. health institutions in respective jurisdiction will ensure maximum coverage of health & medical data with requisite quality & timeliness.
4. Since ANMs at grass root levels are **heavily loaded** due to their multitasking operations it is necessary to reduce their workload by providing two MPW(F) in each sub-centre as per IPHS requirements. They should be given the responsibility of maintaining registers for all health and family welfare related database. The acute shortfall of MPWs* (64211 out of sanctioned strength of 81561) has been a cause of concern not only to provide basic health services but also to document the quantifiable services as a pivot for health management information system. Similarly there is an **urgent need** on part of all the States/UTs to fill in all the post of MPW (male) at both, Sub-Centre and PHC levels, that will be responsible for collection of health related information.
5. There is a **acute shortage** of CHCs too. To maintain the norm of having one CHC per 1,00,000 population, the present requirement is at least 7415 CHCs, against only 3043 CHCs. Moreover, in the 3,043 CHCs that we *do* have, only 440 have a pediatrician, only 704 have a physician, only 780 have a gynecologist and 781 a surgeon. So not only is the infrastructure inadequate, we don't even have the staff to use the existing infrastructure. Such a large shortfall in medical and paramedical personnel has got an important bearing on the low priority of the documentation of the information, which should on priority basis be attended by all concerned state/UT and central level health authorities.
6. Central & State/UT Governments may bring an **act for compulsory registration** of all private / non govt. medical institutions and practitioners with the State/UT Government and mandatory for them to furnish medical/health reports to appropriate Govt. Health Facility in their vicinity.
7. For Monitoring of Information & Evaluation System (MIES) an **integrated format** on different health indicators is being developed under RCH/NRHM with an aim to ensure uniformity in the health information collection system. It is expected that this format will rationalize the information system avoiding the multiplicity of formats, weeding out redundant information and thus leading to qualitative dissemination with varying periodicity

* Rural Health Bulletin, 2006, MOHFW/GOI

8. In order to maintain **data quality** which is required to be used as inputs for any decision making, the exercise of validation at different levels hardly needs any emphasis. Since NRHM had already initiated the concept of establishing Programme Management Units at state and sub-state levels, their involvement in the validation process should be ensured. In addition, possibilities may also be explored to associate and identify a nodal officer in the district health offices so as to assume the ownership of data being transmitted from the district to the state.
9. What is most important is to remove any underlying apathy to collect the health information and document them with greater speed and accuracy. This can be achieved by putting the right people at the right place having a data sense and data use. The States have got a greater visible role to play to ensure this important aspect of HMIS. To improve the **quality of data**, the grassroots level functionaries need to understand the importance and use of data generated at their level so that the recording and reporting of data by them could be improved. Also, the monitoring system at all levels need to be strengthened and emphasis should be on monitoring of all programmes/components, strengthening feedback mechanism and utilization of data at all levels for monitoring and planning purposes. States/UTs may ensue all measures to **fully utilize the in-service training programs of CBHI** on Health Statistics and Medical Coding (ICD-10) as well as Medical Record Management, being organized for various categories of medical/non-medical staff involved in handling medical/health data, for which purpose CBHI communicates its annual training calendar well in advance to all States/UTs. For this purpose, every State/UT should prepare district wise inventory of such training needs, people trained and remaining to be trained and utilize this inventory for promptly recommending the names of untrained personnel to various CBHI in-service training courses. The **GIS mapping** is an essential tool now-a-days. NIC has already developed GIS maps up to the village level. The facility should be availed by all the State/UT authorities for GIS mapping on various health indicators.
10. The Birth and Death Registration System in the country is still way behind and there is an **urgent need** to improve the system. The Civil Registration System must be improved and strengthened. For this purpose the ASHA, recruited under NRHM can also be utilized for recording & reporting the birth and death cases to the appropriate authority with a suitable honorarium.
11. The **capacity building** of the Health manpower starting from grass root level is extremely essential and allocation of funds for providing the training must be earmarked in this plan period. The training on the electronic data management system should also be provided in association with D/o IT and NIC.

12. **ICD-10 coding system** be implemented throughout the country for comparison at both, national and international levels and the use of ICD-10 be concurrently monitored by hospital administration for timely corrective measures at various levels, including meeting the ICD-10 trained manpower needs.
13. As already decided by the MOHFW/GOI, it will be desirable to strengthen IDSP as a national health information system with appropriate computer connectivity rather than pursuing the HMIS which was conceived about two decades back and could not succeed for various reasons. In the present context, this Union M/o Health & FW is committed to ensure the efficient implementation of IDSP which is one of the major projects undertaken with World Bank loan. Apart from the work on surveillance, also attempt to collect information on financial, logistics, manpower and implementation aspects in the health sector.
14. Like CBHI has developed a central website for health information, the States/UTs may also initiate efforts to develop similar websites along with district specific health information, while utilizing the available expertise of state & districts NIC units.
15. States/UTs may initiate steps towards **computerizing the Hospital Information System** in a phased manner to begin with state/regional level hospitals. This will facilitate efficient hospital database on morbidity & mortality based on ICD-10, essential for District/State/National Statistics on morbidity & mortality. Likewise at the grass root level, on a **pilot basis** the use of Hand Held Electronic Device can be explored in association with the Ministry of Information Technology.
16. A National Institute of Health Information System, as already recommended by NCMH may be considered, for which purpose, CBHI be properly upgraded with necessary supports from public health, statistics and national health programmes to play the role effectively. This institute will also be responsible for Human Resource Development and research studies. NIMS, ICMR may be involved in taking up evolution studies and operation research periodically. The recommendation of National Statistical Commission to upgrade the CBHI as a full fledged Directorate of Health Statistics as a nodal agency to provide sufficient inputs on health statistics should be seriously pursued. The M & E division of the Department of Family Welfare which is responsible for collecting and collating all Family Welfare information including RCH should be merged in the proposed National Institute of Health Information System. Keeping in view the recommendations of NRHM, the synergy between the Health and Family Welfare Information System need to be made and this Institute should be responsible for Monitoring and Evaluation of all health related programme including RCH.

Report and Recommendations of SubGroup-II on Telemedicine for the XI Five Year Plan



10TH FIVE YEAR PLAN (FYP) – FOCUS

INITIATIVES TAKEN DURING 10TH FYP

MAJOR THRUST AREAS DURING XI FYP

MANPOWER & FINANCIAL REQUIREMENT

REPORT OF SUB-GROUP II

The Working Group on Health Informatics including Telemedicine in its first meeting on 5.7.2006 discussed the terms of reference and time schedule for its functioning. It was decided in this meeting that the terms of reference would be gone into in-depth by two sub-groups separately constituted for the purpose. Sub-group-II was constituted with Mrs Ganga Murthy, Economic Advisor/ MOHFW as Convenor to look into the following TORs: **(i) To suggest modification in policies, priorities and programmes during 11th Plan period, New initiatives and strategies such as tele-medicines etc., so to improve quality and coverage of services at affordable cost and also cope with existing, reemerging and new challenges in diseases, emerging problems of non-communicable diseases due to increasing longevity, life style changes and environmental degradation.(ii) To indicate Manpower requirement and financial outlays required for implementation of these programmes during the 11th Plan period.**

With the area of 32,87,268 Sq km, Population of 1.1 billion, urban-rural divide, inaccessible hilly regions, islands and many tribal areas, India is an ideal setting for telemedicine assisted health care delivery. Growing number of medical, paramedical colleges and schools with lack of adequate infrastructure, learning materials and teachers needs is a matter of grave concern. E health technology has the potential to create a national level GRID which can form the backbone to be shared by healthcare providers, trainers and beneficiaries. A strong fiber backbone and indigenous satellite communication technology in place with large mass of human potential trained in IT and local presence of telepathy industry, e health application and implementation should not be a problem technically. Further a number of pilot projects over last five years with successful outcome stand to its testimony. A ground work on telemedicine in the country has already been laid with the efforts of ISRO and Information Technology department partnering with many State Government and specialty Institutes/hospitals. Policy standardization and infrastructural issues have already been researched. Professional societies on telemedicine/e health have been active. Print and electronic media are participating in awareness campaign. However, a country level plan is long due to steer the Telepathy ship by the Captain (M/o Health & Family Welfare/GOI) with its crew (technology and healthcare providers/educators) and passengers (citizen) in right direction (policy, implementation, application, security, social and legal issues) to reach at the destination (Quality healthcare & wellness).

1. Focus & initiatives on telemedicine During 10th Five Year Plan period

The 10th Plan inter-alia had focused on building up a fully functional accurate health management system, utilizing available IT tools, so as to enable the real time communication link to send data on births, deaths, diseases, requests for drugs, diagnostics and equipment, facilitate decentralized district planning, implementation and monitoring.

A strong formulation for telemedicine in the country has been laid by ISRO and the Department of Information & Technology partnering with many State governments, hospitals and speciality hospitals. Issues of policy, standardization and infrastructure have been delved into by them. Professional societies on telemedicine/ e-health are actively engaged in its development.

Information Technology is now one of the major components of the technological infrastructure for health management. All sub-sectors dealing with the generation, transmission and utilization of demographic and epidemiological data such as bio-informatics, bio-statistics, HMIS and the decision support systems (DSS) are finding increasing use in health planning and management. The nationwide network of NICNET provides rapid reporting mechanism for health information; MEDLARS Biomedical Informatics Programmes provides ready access to medical databases to post graduates and research workers as well as practicing physicians. Planning Commission has provided additional central assistance to the UHSs in Karnataka, Andhra Pradesh, Tamil Nadu, Punjab and Maharashtra for strengthening of libraries and networking them through IT. This effort has to be augmented and all medical colleges need to be brought into the network.

1.1 Indian Space Research Organisation (ISRO)

ISRO has been actively engaged in applying space technology for healthcare and education through specific initiatives which include inter-alia:

- (a) Providing telemedicine technology and connectivity between remote/rural hospitals and super-speciality hospital for tele-consultation, treatment and training of doctors and para-medics.

- (b) Providing technology and connectivity for continuing medical education between medical colleges and post-medical institutions/hospitals.
- (c) Providing technology and connectivity for mobile tele-medicine units for rural health camps in the areas of ophthalmology and community health.

ISRO's experience goes back to more than 2 decades of SatCom Application Programmes namely "Training and Developmental Communication Channel" (TDCC) and "Jhabua Developmental Communication Project" (JDCP) for application of SatCom for rural development. The Telemedicine initiative developed in selected parts of the country during the past 4 years has been one such effort to reach the Speciality Health care to the rural and remote district / trust hospitals. The technology involved the ICT based system consisting of customized medical software integrated with computer hardware along with the medical diagnostic instruments and connected through the telecom medium like ISDN or VSATs at each location. The initial pilot efforts had adopted point-to-point telemedicine system wherein at a given time one rural end could have tele-consultation with one specialist end. The telemedicine software consisted essentially of store and forward modules for tele-radiology, tele-cardiology and tele-pathology purposes alongwith video-conferencing facility.

With the growing demands of telemedicine facility by various States; "point-to-multipoint" connectivity through Local Area Network (LAN) and finally "multi point" to "multi point" connectivity with Wide Area Network (WAN) with integration of the facility for Continuing Medical Education requirement have been evolved and established. ISRO has constantly been upgrading the technology with a view of bringing down the cost both for the ICT hardware and software. Over more than 1,00,000 patients have been treated in the ISRO network including the Army network, Mobile Tele-Ophthalmology for rural eye camps, telemedicine services for special situations catering to the large pilgrim population etc. The aspects of development of business model and also the involvement of medical insurance scheme is getting evolved gradually.

1.2 Department of IT, Ministry of Information and Technology

As with ISRO, the DIT has also started tele-medicine projects in different parts of the country. DIT by acting as facilitator has taken initiatives for development of technology, launching of pilot schemes and standardization of tele-medicine in the country. Some of the achievements of DIT in this regard include:

- (a) Development of tele-medicine software systems. Under the ongoing C-DAC project, technology developed has been used for connecting 3 premier institutions namely SGPGI, Lucknow, AIIMS, New Delhi and PGIMER, Chandigarh using ISDM connectivity.
- (b) Tele-medicine for diagnosis and monitoring of tropical diseases has been implemented in West Bengal.
- (c) An oncology network for providing tele-medicine services in cancer detection, treatment, pain relief, patient follow-up and continuity of care in peripheral hospitals of RCCs has been established.
- (d) Development of State-wise telemedicine network based on terrestrial communication in the State of Himachal Pradesh.

1.3 Private Sector

A number of initiatives in tele-medicine have been made in the private sector, SGPIMS, Apollo Hospitals, Asia Heart Foundation, Escorts and others are presently engaged in extending consultations through tele-medicine and are conducting regular tele-education, tele-consultation and tele follow-up sessions with patients.

1.4 Initiatives by State Governments

State-wise location & progress of telemedicine projects is at **Annexure-III**. Several States have also come up with their own initiatives with the usage of information technology. A drug inventory monitoring and control system has been evolved in Haryana. The med-centre of Haryana is an integrated software project to capture utilization of medicine inventory data and analysis consumption pattern of various medicines location-wise to monitor disease occurrence pattern, pilferages and any other deviation in the functioning of the health institutions. The initiative of personal digital assistant provided to auxiliary mid-wife in Nalgonda district of Andhra Pradesh is another illustration in point. Through this device, ANMs could record patient information directly on the PBAs which enable them to follow up cases, whether of pregnant women for ante-natal care or of children for immunization. In electronic format, this data can be also transmitted to higher administrative levels. (Advantages of better targeting the beneficiaries for ante-natal care and immunization and identification of high risk population in terms of illness). The tele-doc initiative of the JIVA Institute provides for field health representatives in villages transmitting health information on mobile phones to doctors who then diagnose and prescribe treatments according to which medicines are supplied.

2. Need for strengthening telemedicine / e-health initiatives in India

Despite the massive public health infrastructure, **healthcare in rural areas remains a critical challenge**. The magnitude of healthcare services required in the context of the existing shortage of medical officers and trained para-medics clearly demonstrate the need for strengthening tele-medicine and other e-health initiatives over the next Plan. The National Rural Health Mission provides an opportunity for taking tele-medicine to the healthcare facilities at the primary, secondary and tertiary levels of care. Computerization of health related data would be an essential first step.

With the establishment of about **300 Telemedicine** nodes by Govt. / Private / Trust agencies of which 175 nodes by ISRO all over the country and the experiences gained by each of the implementation agencies have brought to bear some of the important issues that needs to be addressed for future implementation strategies for the development of telemedicine and e-health for augmenting the present healthcare delivery system in the country.

Internet and mobile communication can enormously enhance connectivity between grass-root health worker and medical specialists as well as translation and storage of data from the field through the Centralized units.

Telemedicine aims at equal access to medical expertise irrespective of the geographical location of the person in need. Recent developments in Information and Communication Technologies (ICT) have enabled the transmission of medical images in sufficiently high quality that allows for a reliable diagnosis to be determined by the expert at the receiving site.

Access to many different sources of medical data, usually geographically distributed, and the availability of computer based tools that can extract the knowledge from that data are key requirements for providing a standard healthcare provision of high quality.

Developments in the integration of bio-medical knowledge, advances in imaging, new computational tools and the use of these technologies in diagnosis and treatment suggest that Grid-based systems can make a significant contribution to this goal. In addition to enhancement of improved access by integration of information, the benefits are raised to a new level, over a Grid because of multi dimensional access to the information.

Medical informatics is often called healthcare informatics or biomedical informatics, and forms part of the wider domain of e-Health. Medical informatics optimises the computer analysis, storage, retrieval and transfer of patient and other health care data.

3. Lessons Learnt during X Five year Plan:

- Lack of IT infrastructure in the state governments health administration and the district/taluk hospital.
- Non- acceptability of telemedicine/e governance by doctors, patients and the associated staff due to certain “fear of the unknown” and “fear of loss of opportunity” which has retarded the speed with which the facility could be established.
- The administrative and financial constraints by the State Health Administration for supporting the implementation of telemedicine at the District Hospitals.
- Lack of requisite infrastructure and financial support for establishment of the facility.
- The cost of the equipments though progressively brought down considerably, is still expensive for most of the hospitals and the Government establishments.
- The communication bandwidth cost, presently provided by ISRO’s satellites free of charge whereas others like BSNL and Private Agencies are charged which is expensive for most of the Hospitals, Health Centre and even Super Specialty Hospitals.
- Need for enhanced public awareness of the advantages of Telemedicine / Tele-health for medical consultations, treatment and postoperative follow-up.
- The present Healthcare delivery system in each state has detailed procedures established long time ago in terms of Medical Administration and practice covering diagnosis, treatment, drug prescription and distribution, surgery and follow-up, Continuing Medical Education and Training of Doctors and Paramedics etc., and they have certain policy and operational guidelines. This requires to be extended or additionally enunciated for appropriate implementing the technology based healthcare delivery system of telemedicine / tele-health.
- The policy aspects related to availability and utilization of information which constitute medical Information and Communication Technologies (ICT) which constitute the connectivity need to be integrated with the healthcare delivery system effectively.

4. MOHFW/GOI has constituted task force vide order no. T 2105/1/2004-NCD in September 2005 on Tele-Medicine in India for formulation of strategies regarding its

applications in Health Sector under the chairmanship of Secretary, Health & Family Welfare with the following **TORs**:

1. To work on inter-operability – Standards for data transmission; software, hardware, training etc.
2. To define a National telemedicine Grid and consider its standards and operational aspects. (The task force needs to consider connectivities to be provided in the next two-three years, as currently there is certain ad-hocism in this process. Available bandwidth etc. has to be most efficiently used for obtaining priority connectivities).
3. To identify all players and projects currently involved in telemedicine in India and evaluate their performance, capacity and replicability.
4. To prepare pilot projects for connection of super speciality hospitals/ medical colleges with district hospitals and /or CHCs / PHCs specially keeping in the mind to provide access to remote areas. (The focus would be North-East, J&K, three new States, other tribal areas and Lakshdeep).
5. To prepare National Cancer Telemedicine Network.
6. To examine possibility of utilization of stand alone centers of the deptt. Of communication in rural areas.
7. To define standards and structures of electronic medical records and patient data base which could be accessed on a National telemedicine Grid. For this purpose, the national task force may constitute sub committees for developing electronic medical records in various fields.
8. To enable the telemedicine centers in teaching institutions to impart training to all govt. medical/Dental/Nursing Colleges in 3 years time (as there is a huge shortage of teaching faculty).
9. To prepare curriculum and projects for CMEs through telemedicine.
10. To draft a National Policy on 'Telemedicine and Telemedical Education and to prepare a central scheme for the 11th plan.

Five subgroups have been formed to look into different matters:

Subgroup I: On Telemedicine Standards.

Subgroup II: For formation of National Telemedicine Grid.

Subgroup III-A: To identify players and framing evaluation framework for projects involved in Telemedicine in India, prepare pilot projects (pending proposals, mobile services, national medical Colleges network etc.) (TOR 3&4).

Subgroup III-B: For ONCONET INDIA (TOR 5).

Subgroup IV: For utilization of existing tele linkage facility in rural areas by Department of Communication, Standardisation of e-records, training and CMEs in telemedicine, human resources- medical informatics.

Subgroup V: For preparation of National Policy on Telemedicine and to prepare central scheme for 11th FYP.

5. Initiatives Needed on telemedicine During XI Five Year Plan:

All these aspects will need to be carefully addressed in the XI Plan. The action plan would need to take into account the following:

- A massive **awareness** programme to the public, doctors and the hospitals staff – about the benefits of telemedicine & e-health and its efficacy.
- A proper **inter-departmental** coordination and cooperation to ensure adequate support to the doctors and hospitals for commissioning, operation and maintenance of the facility.
- A **cost effective** business model by which the system can be made self sustainable over a period of time.
- Effort by the concerned Industries to ensure availability of the equipments and facilities at reasonable and affordable costs.
- Aspects of drugs distribution at the remote hospitals when provided with teleconsultation/treatment by speciality hospitals.
- **Social aspects** of telemedicine covering the licensing aspects of medical practitioners / agencies including the legal aspects.
- Aspects of **private, public partnership** for delivery of health care to the rural and semi-urban population.
- An appropriate policy by Government of India to provide bandwidth at affordable cost.
- Aspects of **Continuing Medical Education & Training** for Doctors, Paramedics and Health care workers in the form of separate network.

- **Referral hierarchy** for medical treatment, disease prevention and health promotion aspects.
- Introduction of **academic courses** on all aspects of Telemedicine / Medical information in various Engineering and Medical Institutions.

5.1 The National Task Force is recommending a national telemedicine grid which will contain the following major functions / constituents. The Task Force is already looking into the connectivity, hardware, software requirements for projection under the 11th Five Year Plan which could be incorporated in the Report of the Health Informatics Working Group. Essentially the following is already under consideration of the Task Force:

- a. A health portal at the M/o H&FW providing all information related to health informatics, telemedicine, disease surveillance data, medical care details and other educational material or information related to specific Indian healthcare system not available in the internet or hyper link to the internet data repository. This portal will be a constituent of the national grid for repository of information and guidance.
- b. An All India Medical Institution network connecting the various recognised medical institution, national institutes like PGIMER, AIIMS, JIPMER, SGPGI etc., and major super speciality hospitals (Govt. & Private) in the country for medical education, exchange of knowledge, CME etc.
- c. An All India Network connecting the various selected district hospitals in the country to be connected to major super speciality hospitals (Govt. /Trust/ Private) for specialist referrals for consultation and treatment and also medical informatics, disease information and health promotion aspects from different states of the country. (super speciality hospital network).
- d. A national network for medical training connecting various agencies in the country and also establish/integrate similar networks at state levels. (National Medical Training Network).

5.2 State Telemedicine/e-Health Grids (STG)

As a part of e-health program and digitalisation of health records some of the states have been operating Telemedicine Networks initiated by ISRO and other agencies like Department of Information Technology (DIT) under Closed Usage Group (CUG) concept e.g. Chhattisgarh, Karnataka, and Kerala. Many more states are planning to implement such state level networks. There is a need to formalise the state Telemedicine networks into standard State Grids for specific purposes of application and usage like; providing State Health Information, Monitoring and Surveillance of Disease/Epidemic outbreak, identification and mapping susceptible areas and population etc., as mandated by MoH&FW for health governance.

5.3 National Medical Education Institutions Network (NMEIN)

A National Medical Education Institutions Network if created would act as a useful resource base for knowledge sharing for Medical Education, Research and training including CME. The teaching and practical sessions can be configured in live or recorded video, audio and information data broadcast, accessed on the grid, for an effective learning experience.

5.4 Association / Society / Health portals Network (ASHPN)

Several associations/agencies are hosting and maintaining diverse health portals like DOCTORYANYWHERE.COM in health care services.

It is necessary to pool the resources available with the various autonomous/government/trust medical associations like Indian Medical Association (IMA), Cardiology Society of India (CSI), Neurological Society of India (NSI), Federation of Gynaecological and Obstetrics Society of India (FoGSI) etc and form an Association/society /health portals Network.

5.5 Digital Library & Medical Informatics Network (DLMIN)

It is required to establish a Digital Library & Medical Informatics Network, that will be a network of pooled information in the form of digital library of data bases and Medical/Health Information that can be accessed through Internet / Intranet and used for administrative/research and / or clinical purposes.

Some of databases of immediate value would include, but not limited to:

1. Manuals of illness, diseases, symptoms, and diagnostic tools.
2. National registry of speciality hospitals and specialists: names, contact information.
3. Health education programs and curricular materials.
4. Medicines: description, side effects, location, costs.
5. Online journals, abstracts, preprints.
6. Environmental profiles by state/region
 - (a) Locations of safe water supplies.
 - (b) Location of polluted sources (symptoms and treatment).
 - (c) Location of emergency food supplies.
 - (d) Location and description of health services.
 - (e) Location of disease outbreaks.
 - (f) Changing environments.

5.6 Disaster Management Support Network (DMSN)

It is required that the health care services in times of disaster can be effectively provided through establishment of Disaster Management Support (DMS) Network. This network is required to integrate identified disaster Monitoring Stations (current and proposed) across the country and provide periodic and timely information both statistical and remedial to the central station for necessary advice/action through the power of medical informatics and digital connectivity.

Capacity building: Thrust of health informatics education should be use of health information standards, storage of health information in electronic health records and research and extra collation of health information for better healthcare. Clinicians, healthcare managers, technologists, researchers would all need to specialize in various aspects of healthcare technologies. The course for skill development to include, certificate course in computer application, education framework for general, para-medical and nursing staff. These course would need to be certified by Medical Council of India.

6. Major thrust areas for 11th Five Year Plan

Focus in the XI Plan should be on:

- Establishment of e-Health department in M/o H&FW in states D/o H&FW with support of state IT Department.
- Computerisation of health care delivery system and health records at state, institutions, district and taluk / block level for the flow of information over the network.
- Computerisation of three tier healthcare system: CHC/PHC & SC.
- To acquire and implement IT equipments like servers and client systems, multicast video conferencing facilities, data storage and archival facilities in all the speciality hospitals, medical institutions and other centres of excellence who will be providing teaching and training facility.
- To identify agencies within the medical institutions / speciality hospitals / research institutions to develop content for medical education / CME / training modules.
- To acquire and implement terrestrial / wireless / satcom technologies required for various connectivities from taluk / block to district to the state capital.

- To plan for one dedicated medium weight class Communication satellite (HEALTHSAT) for satcom based connectivity which will have the capability to meet the broadband connectivity requirements for various applications of the National Grid.
- The cost of HEALTHSAT with launch, operations and maintenance of the satellite is around Rs.400 crores. Apart from this, the various connectivity charges by other technologies have to be incorporated. The present cost of a standard telemedicine node including computer hardware/software and video conferencing system is around Rs.4.0 lakhs at the district hospital level. Whereas at the CHC / PHC level the cost will be around Rs.1 to 1.5 lakhs. Hence number of nodes which will come up during the 11th Five Year Plan upto the block level may have to be worked out.
- All tele-medicine network should evolve around a National tele-medicine grid. Ultimately, every individual would need to have a unique ID.
- Formal specific training programmes in tele-health for all levels (grass-root to policy makers depending on requirements) and facilitate a support system to provide current information to doctors in the management of patients through new data bases, software packages etc.
- Medical Council of India to include Information Technology in healthcare in the curriculum of all medical and para-medical degree courses. Information Technology to be also included in all IT and MBA courses.
- Introduce at least one mobile van in each district.
- Trauma care, ambulance on National Highways to be provided with technology for transmitting audio-video images using EDGE, GPRS, MMS etc. Pilot studies using tele-medicine and ambulances would be required.
- Setting up of a Tele-health Corporation of India. Given the highly specialized and technical nature of tele-medicine, a Tele-medicine Board of India needs to be established under the aegis of the Ministry, which will include a set of technical experts with representatives from major healthcare organizations and NGOs working for tele-medicine. The basic objective of this Board would be to oversee the growth of tele-medicine, develop R&D tools, provide software, manage the National tele-medicine grid and interact with international organizations.
- E prescriptions at all levels by the end of XII Plan but to cover atleast PHCs and above during the XI Plan. This will necessitate availability of computers and net facility at all healthcare facility.

- Minimum standards of treatment to be documented and made available on the Ministry of Health website. Details should be available regarding new drugs, banned drugs, new indications, list of essential drugs, adverse effects, standard treatment protocol, drugs of choice etc. Skill, knowledge and care should be the corner stone of what we strive for.
- Magnitude of care may vary at different levels but the standard of care to remain the same. This will be possible once the standard treatment protocols are available and will help in identifying the kind and nature of drugs to be placed at each level and the financial requirements for making available these drugs at different health facilities.
- **Synergy amongst all existing initiatives and programmes between different Departments/Ministries in the area of health:**
 - TCI network being created under Department of IT.
 - North-Eastern Council initiatives with support from ISRO.
 - E-governance initiatives like common service centres under Department of IT.
 - Integration of existing infrastructure like CBHI, IDSP, NICD etc. in the Ministry of Health & F.W. to have proper synergy between them and avoid duplicacy in data collection, compilation and transmission.
 - Proposed Tele-medicine project by Delhi Government.
 - Any other State initiative/Central project which will cater to health needs and requirements.

Tele-medicine would require minimum bandwidth connectivity which facilitates video-conferencing, image, x-ray, medical transcription etc.

7. Financial and Manpower requirements

Tele-medicine/Health Information Unit upto the District level

The objectives of this would be to facilitate proper data collection, compilation, storage and facilitate analysis and flow of information. The end objective would be to create the basic foundation structure and build in future the Tele-medicine grid and take on e-governance activities.

7.1 Total number of units to be covered under telemedicine programme

Sl. No.	ITEMS	Total
1	District Hospitals	604 (As per NIC website)
2	Government Medical Colleges	115 (Only Govt. Medical College excluding Trusts, Societies, Pvt.)
3	State Headquarters	36 (Jammu & Kashmir has two separate Division).
4	Total	755

7.2. Manpower required and financial Implication

Sl. No.	Items	Expenditure	Total cost in a year
1	1 Supervisor	Rs.10, 000 per month	9.06 Crore
2	1 Data Entry Operator	Rs.6500 per month	5.90 Crore
3	Total for the annual Plan	Rs.16, 500 per month	15 Crores
4.	Provision for XIth five year plan:		80 Crore

(a) Equipments

Sl. No.	ITEMS	Total Cost
1	Financial assistance for equipments @ Rs.10 lakh each unit for 755 units	Rs. 75.5 Crs.
2	Maintenance @Rs. 2 lakh per annum/unit X 5 years for 755 units	Rs.75.5 Crs.
	Total	Rs. 151 Crs.

This can be provided in a phased manner (in three years) with a provision of Rs. 50 Crores in annual plan 2007-08, 2008-09 and Rs. 51 Crore in 2009-10

(b) Cost of Computerization at PHC level:

Sl. No.	ITEMS	Total Cost
1.	Computer with 5 years on-site maintenance with spares & training @ Rs.35, 000 per PHC per annum X 23109 (PHC).	Rs. 80.90 crores

This also can be provided in a phased manner (in two years) with a provision of Rs. 40 Crores in annual plan 2007-08 and Rs. 41 Crore in 2008-09.

(c) Health Channel

There should be one dedicated Health Channel from Doordarshan. It should cover the areas like Education to UG, PG and Post PG Courses; Education to medical practitioners; Consultations; News at certain intervals; National programmes, disease forecast, helpline one hour a day, live OPD etc. It should be made mandatory to all cable operators to beam this channel.

- 30 minutes programme
- 12 hours per day
- 30 days every month
- $30 \times 24 = 720$ programmes per month
- Total cost per month = 720×2 lakhs = Rs. 14.40 crores
- Total cost per year = Rs. 14.40 X 12 = Rs. 172 crores
- Software development of programme can be for **Rs. 100 crores** instead of Rs. 172 cores
- Also equipments = **25 Crores**
- Total cost in the entire plan period = 125 Crores (Entire expenditure to be taken during the first year of the Plan period)

7.3 Other Expenditure

7.3.1 Digital ECG Machine at District hospitals Rs. 20,000 X 604 Hospitals = 1.2 Crore

7.3.2 Web-site and Content Development = Rs. 5 crores

There should be a national health website covering various aspects like Standard Treatment Protocols, links to various health related website etc.

7.4 GRAND TOTAL: Rs. 443.2 Crores – for the entire Five Year Plan

Year wise Annual Plan requirement

Year	2007-08	2008-09	2009-10	2010-11	2011-12	Total
Amount Rs.in Crores	236.2	108.0	67.0	16.0	16.0	443.2

Financial Requirement

**Proposed Outlay for the XI Five Year Plan
Period (2007-012)**

In Respect of :

- 1. Scheme : Strengthen of Health Information and Monitoring Systems**
- 2. Telemedicine (Scheme yet to be proposed by Union MOHFW/GOI)**

1. Scheme "Strengthening of Health Information and Monitoring System"

Central Bureau of Health Intelligence a national nodal institution for Health Intelligence, with the broad objectives to (i) Maintain and disseminate the data on Health Profile of India, (ii) Facilitate capacity building, human resource development and need based operational research for efficient Health Information System (HIS) and ICD 10 use. CBHI in the Ministry of Health & FW is responsible for this ongoing scheme on "Strengthening of Health Information and Monitoring System" through its Field Survey Units and training centers. The six FSUs of CBHI are located in different Regional Offices of Health and Family Welfare (ROHFW) of GOI at Bangalore, Bhopal, Bhubaneswar, Jaipur, Lucknow & Patna; each headed by a Dy. Director with Technical & Support staff, who function under the supervision of Regional Director (HFW/GOI). Regional Health Statistics Training Centre (RHSTC) of CBHI at Mohali, Punjab and other Training Centres namely (i) Medical Record Department & Training Centre at Safdarjung Hospital, New Delhi and (ii) JIPMER Pondicherry are responsible for capacity building and trained manpower development.

In order to achieve the objective^{of} this scheme as well as efficient functioning of CBHI, while also keeping in view the thrust required to improve & strengthen the health information system during XI five year plan, the following outlay for the XI five year plan period (2007-012) has been worked out ;

OUTLAY FOR THE XI FIVE YEAR PLAN (2007-12)

(Rs. In lakhs)

YEAR	2007-08	2008-09	2009-10	2010-11	2011-12	Total
PLAN	212.00	207.00	227.00	247.00	272.00	1165.00
NON- PLAN	98.00	93.00	98.00	108.00	118.00	515.00
TOTAL	310.00	300.00	325.00	355.00	390.00	1680.00

Note: This outlay does not include the requirement on "National Health Accounts", which is a separate scheme.

2. "Telemedicine"

Under this new initiative, it has been proposed to introduce this facility of telemedicine in district hospitals, Govt. Medical Colleges and the State Health Directorate. A total number of units to be covered under telemedicine programme is as follows:

S. No.	Type of the facilities	Total
1	District Hospitals	604 (As per NIC website)
2	Government Medical Colleges	115 (Only Govt. Medical College excluding Trusts, Societies, Pvt.)
3	State Headquarters	36 (Jammu & Kashmir has two separate Division).
4	Total	755

In this scheme, it is proposed to provide one supervisory official and one Data Entry Operator alongwith equipments for this purpose in the above mentioned 755 units. The manpower requirement and financial implication for this purpose is as follows :

Sl. No.	Items	Expenditure	Total cost in a year
1	1 Supervisor	Rs.10, 000 per month	9.06 Crore
2	1 Data Entry Operator	Rs.6500 per month	5.90 Crore
3	Total for the annual Plan	Rs.16, 500 per month	15 Crores
4.	Provision for XIth five year plan:		80 Crores

The total budget requirement under equipment is as follows :

Sl. No.	ITEMS	Total Cost
1	Financial assistance for equipments @ Rs.10 lakh each unit for 755 units	Rs. 75.5 Crs.
2	Maintenance @Rs. 2 lakh per annum/unit X 5 years	Rs.75.5 Crs.
	Total	Rs. 151 Crs.

This can be provided in a phased manner (in three years) with a provision of Rs. 50 crores in annual plan 2007-08, 2008-09 and Rs. 51 Crore in 2009-10

This scheme also proposes to provide computers at every PHC

(a) Cost of Computerization at PHC level:

Sl. No.	ITEMS	Total Cost
1.	Computer with 5 years on-site maintenance with spares & training @ Rs.35, 000 per PHC per annum X 23109 (PHC).	Rs. 80.90 crores

This also can be provided in a phased manner (in two years) with a provision of Rs. 40 Crores in annual plan 2007-08 and Rs. 41 Crore in 2008-09.

Taking all the above aspects the year wise Annual Plan requirement for the XI Five Year Plan will be as follows:

Rs.in Crores

Year	2007-08	2008-09	2009-10	2010-11	2011-12	Total
Amount	236.2	108.0	67.0	16.0	16.0	443.2

NOTE : This outlay is an indicative and the Task Force on Telemedicine in India as constituted by MOHFW/GOI vide order no. T 2105/1/2004-NCD, September 2005, under the chairmanship of Union Secretary (Health & Family Welfare) is already in process of working out & recommending with regard to the central scheme on Telemedicine for the XI Five Year Plan. This task force in its report will present the final outlay for this scheme.

Integrated Disease Surveillance Project INDIA

Progress Report- March 2006

1. INTRODUCTION

Integrated Disease Surveillance Project (IDSP) is a decentralized, State based Surveillance Program in the country. It is intended to detect early warning signals of impending outbreaks and help initiate an effective response in a timely manner. It is also expected to provide essential data to monitor progress of on-going disease control programme and help allocate health resources more efficiently.

The IDSP proposes a comprehensive strategy for improving disease surveillance and response through an integrated approach with rational use of resources for disease control and prevention. Data collected under IDSP would also provide a rational basis for decision-making and implementing public health interventions. Specific objectives of the IDSP are :

- To establish a decentralized district-based system of surveillance for communicable and non-communicable diseases so that timely and effective public health actions can be initiated in response to health challenges in the urban and rural areas
- To integrate existing surveillance activities (to the extent possible without having a negative impact on their activities) so as to avoid duplication and facilitate sharing of information across all disease control programmes and other stake holders, so that valid data for available for decision making at district, state and national levels.

Regular Surveillance

Vector Borne Disease:

Water Borne Disease

Respiratory Diseases

Vaccine Preventable Diseases

Diseases under eradication

Other conditions

Other International commitments

Unusual clinical syndromes

(Causing death/hospitalization)

1. Malaria

2. Acute Diarrhoeal Disease (Cholera)

3. Typhoid

4. Tuberculosis

5. Measles

6. Polio

7. Road Traffic Accidents

8. Plague, Yellow fever

9. Meningoencephalitis/ Respiratory Distress

Hemorrhagic fevers, other undiagnosed conditions

Sentinel Surveillance

Sexually transmitted

diseases/Blood borne diseases

Other Conditions

10. HIV/HBV, HCV

11. Water Quality

12. Outdoor Air Quality (Large Urban centers)

Regular Periodic Surveys

NCD Risk Factors

13. Anthropometry, Physical Activity, Blood Pressure, Tobacco, etc.

State Specific Diseases

Each State can include upto 5 diseases prevalent in the State.

2.3 Training of District Surveillance Teams (Rapid Response Teams)

Nine training institutes were identified to conduct training of the District Surveillance Teams. A training module has been developed for use during the training programme. States were allotted to the training institutions and time frame for various batches is fixed mutually by the training institutions and the State Surveillance Units. Training of State/District Surveillance Teams has been completed for 9 States covered under Phase-I of the Project as indicated below :

Training Institution	States Allotted	No. Trained
NIHFW, New Delhi	Himachal Pradesh, Uttarakhand	95
NICD, Delhi	Madhya Pradesh	113
NIE, Chennai	Tamil Nadu	99
CMC, Vellore	Kerala, Karnataka	118
JIPMER, Pondicherry	Andhra Pradesh	67
BJ Medical College, Pune	Maharashtra	59
GMC, Nagpur	Maharashtra (Vidharbha)	58
AIHH&PH Kolkata	Mizoram	41
	Total	650

Training of Phase-II states has begun. Funds for training of District Surveillance Teams are released directly to the training institutions based on estimated cost governed by financial norms prescribed for the Project.

Training Institution	States Allotted	No. of Trainees
NIHFW, New Delhi	Haryana, Rajasthan	108
NICD, Delhi	Gujarat, Delhi	106
NIE, Chennai	Orissa, Pondicherry	146
BJ Medical College, Pune	Goa, Gujarat	53
GMC, Nagpur	Chhattisgarh	69
AIHH&PH, Kolkata	West Bengal, Manipur, Meghalaya, Tripura	167
PGI, Chandigarh	Haryana, Rajasthan, Chandigarh	115
	Total	764

Quality control of training is an essential component of training strategy. In view of this it would be necessary to conduct an evaluation as proposed in the PIP. This will be compared with similar surveys during mid-term and end-line evaluation of the training activities. Faculty from Teacher training centers (BHU, Varanasi; PGI, Chandigarh; AIIMS, Delhi and St. Johns Medical College, Bangalore) and IndiaClen have been identified to conduct this evaluation as per plan given below:

Organization	States/UTs covered		
	Phase-I	Phase-II	Phase-III
Teacher Training Centre, BHU, Varanasi	Mizoram	NE Region	Uttar Pradesh
Teacher Training Centre, PGI Chandigarh	Uttarakhand Himachal Pradesh	Haryana & Chandigarh	J&K
Teacher Training Centre, AIIMS	Maharashtra Madhya Pradesh	Gujarat Rajasthan & Delhi	Punjab
Teacher Training Centre, St. Johns, Bangalore	Karnataka Andhra Pradesh	Goa Chhattisgarh Pondicherry	UTs
India Clen Group	Kerala & Tamil Nadu	West Bengal & Orissa	Bihar Jharkhand

First meeting of the Working group on evaluation of training was held on 12.12.05 at NICD. It was attended by faculty from BHU, Varanasi, AIIMS & Indiaclen. It was decided that the survey instrument will be prepared by IndiaClen & pre-tested by them after approval. This has been sent & comments from other members are awaited. Pilot testing of the instrument will be completed by May 06 & final report is expected by July 06.

States are organizing other training programmes for medical Officers, Lab technicians and Health Workers. Training of Accountants in Financial Management and Training of Data Entry Operators in Application Software is also organized at the State level.

2.4 Procurement of Goods

M/s. Hospital Services Consultancy Corporation (HSCC) was appointed as Procurement Consultant. During the year 2005-06, centralized procurement of major laboratory equipment, computers and accessories and other office equipment was initiated. Current status is as follows :

- Letter of Award issued for Binocular Microscopes. Supply under process.
- Evaluation of bids for other Lab. Equipment has been completed. Approval of Integrated Purchase Committee (IPC) being sought.
- Invitation for Bids for Diagnostic Kits being initiated
- Evaluation of bids for Office equipment has been completed. Approval of IPC being sought.
- Computer Hardware :
 - a) To ensure that data collected in prescribed formats are compiled and analyzed at the District level, 215 PCs with accessories were procured through National Shopping procedures (DGS&D Rate Contract)
 - b) Centralized procurement of Computers and System Software for Phase I and II. Bids were opened on 16.2.2006. Evaluation of bids has been completed. Approval of IPC being sought.
 - c) Servers would be procured after selection of software development agency.

2.5 Development of Software for Disease Surveillance

- Preliminary software has been developed in-house for data entry and basic analysis.
- In response to an advertisement published in leading national newspapers and UNDB journal for selection of agency for software development and related services, 22 vendors submitted Expression of Interest.
- A committee was constituted by the Ministry of Health & FW to shortlist 6 most qualified bidders who were issued 'Request for Proposals'
- Detailed proposals have been received from following 4 short-listed bidders : IBM, Tata Consultancy Services, Wipro and ECIL

Technical evaluation for the proposals has been completed and report submitted to the World Bank for clearance.

2.6 Baseline Study on Public Health Laboratories

"Expression of Interest" was sought for conducting Baseline Study on Public Health Laboratories and conducting Baseline External Quality Assurance System. 24 organizations had expressed interest. Six agencies were shortlisted. After seeking clearance of the World Bank, RFP was issued to the six agencies. Proposals have been received on 21st March 2006 and evaluation of the proposals has been initiated. Report would be submitted by April 2006.

2.7 External Quality Assurance System :

There is limited availability of institutions who have capacity and/or experience of conducting EQAS of laboratory services. It was decided to engage NICD, Delhi, NIV, Pune, NICE, Kolkata and CMC, Vellore to share the responsibility. CMC Vellore was given the responsibility to work out detailed proposal. This has been submitted and being examined.

2.8 Monitoring of the Project through Regional Coordinators

“Expression of Interest” was sought for Monitoring of Project through six Regional Coordinators to be posted at Chandigarh, Bhopal, Bangalore, Gandhinagar, Kolkata and Guwahati. 22 organisations had expressed interest. Six agencies were short-listed. After seeking clearance of the World Bank, RFP was issued to the six agencies. Proposals have been received on 21st March 2006 and evaluation of the proposals has been initiated. Report would be submitted by April 2006.

2.9 Participation of Private Sector and Medical Colleges in IDSP

A Workshop was organized in April 2005 in Bangalore to discuss strategies for involvement of private sector. A task force was constituted to develop scheme for involvement of private sector in disease surveillance. A scheme including MOU was prepared and forwarded to Indian Medical Association and Indian Academy of Pediatrics, who have agreed to facilitate participation in IDSP. Four Orientation Workshops of key members of these associations were planned of which two have been organized in Delhi and at Thiruvananthapuram. Third workshop is being organized in Mumbai on 16th April 2006. Scheme for participation of medical colleges has been prepared and forwarded to the States and other stakeholders.

2.10 NCD Risk Factor Surveillance

The Working Group was constituted for development of protocol for NCD Risk factor Surveillance. After several meetings, Study design and Sampling has been worked out. Questionnaire to be used during the surveys has been finalized and being pre-tested. Terms of reference for National Nodal Agency, Regional and State level Institutions have been forwarded to the World Bank for clearance. Surveys would be undertaken after awarding the contract.

2.11 Satellite Communication :

EDUSAT, a dedicated educational satellite launched by ISRO is being utilized to set up communication and information network throughout the country. Central studio at National Institute of Communicable Diseases with a sub-hub in Nirman Bhawan and 800 Satellite Interactive Terminals (SITs) located throughout the country would be set up connecting all the State and Districts Units, Medical Colleges and premier state and national public health institutions. Proposal has been submitted to the World Bank for clearance. This network will be utilized for distance training programmes, teleconferencing and data transmission. Funds have been sanctioned from IDSP Budget for 2005-06 to ISRO to cover 400 SITs by June 06. Remaining 400 SITs would be covered during 2006-07 and covered by December 2006. Satellite Linkage would be formally launched on 29th March 2006.

2.12 Information, Education & Communication

2.12.1 Guidelines, Operations Manuals and Reporting Formats

For an effective surveillance system, case definitions, operational procedures, reporting formats etc. have been standardized by publishing and disseminating following formats :

- Operations Manual for District Surveillance Units
- Operations Manual for Medical Officers and Private Practitioners
- Operations Manual for Health Workers
- Laboratory Manual on Disease Surveillance
- Training Manual for District Surveillance Teams (Rapid Response Teams)
- Manual on Financial Management
- Standard Reporting Formats and Guidelines for their use
- Guidelines on Utilization of grant-in-aid
- Brochure/Executive Summary on Integrated Diseases Surveillance Project
- National Project Implementation Plan

A manual on Laboratory Techniques has also been developed by National Institute of Communicable Diseases and would be used in the Project. Separate Manuals for Lab Technicians posted at PHCs/CHCs and Manual on Bio-safety have been drafted and would be published and disseminated.

2.12.2. Medical Agency

“Expression of Interest” was sought for selecting Media Agency at the central level. 18 organizations had expressed interest. EOI are being assessed and short-listing would be completed by 15th April 2006.

2.12.3. Alternate approaches of communication

A proposal to capture information through alternate means of communication has been prepared to capture information regarding focal out-breaks in the country through scanning of newspapers and tele-news and by supporting Toll Free telephone services. Details are given at **Annexure 4**.

2.13 PIP from Phase-II States

State PIPs have been received from all Phase-II States/UTs (Haryana, Goa, Gujarat, Chhattisgarh, Rajasthan, Nagaland, West Bengal, Manipur, Orissa, Tripura, Pondicherry, Meghalaya, Chandigarh and Delhi). MOU is awaited from Meghalaya. First instalment of GIA has been released to the states, who have submitted MOUs. Orientation workshops have been organized by Gujarat, Haryana, Chhattisgarh.

A Workshop was organized in October 2005 to orient Phase-III states about preparation of State PIP. It is expected to get PIPs from remaining states early during the year 2006-07.

2.14 Prevention & Control of Avian Influenza

Following the outbreak of Avian Influenza in chickens in Maharashtra and Gujarat, two meetings were held with the officials from the World Bank. A draft Project Implementation Plan on Surveillance Prevention and Control of Avian Influenza in India.

3. BUDGET ALLOCATED & UTILIZED

Since inception of the Project, Rs.810 million has been allocated for IDSP and additional Rs.1020 million is available during 2006-07 as indicated below:

(Rs. in million)

Year	BE	RE	Utilization
2004-05	300.00	260.00	250.10
2005-06	880.00	550.00	487.30
2006-07	1020.00		

3.1 Component wise utilization :

Funds allocated for the project are utilized under three main Heads

- Central level activities** : these include Training of Trainers, Surveys and Studies, Monitoring & Review, Consultancy services and Operational expenses by CSU.
- Grant-in-aid to States** : Funds are released to State Surveillance Units through identified societies for utilization at the State level and distribution to District Surveillance Units. These funds are utilized on renovation & furnishing, procurement of minor equipment and consumables, training of personnel, IEC activities, personnel cost and operational expenses. A separate Head is meant for NE States of the country.
- Commodity Assistance** : Major laboratory, office and IT equipment and some consumables are procured centrally through ICB/NCB and supplied to consignees identified by the States.

Funds utilized for the above three components during last two years are summarized below :

(Rs. in million)

Year	Component	Expenditure	Percent
2004-05	Central level activities	11.1	4.4
	Grant-in-aid to States	227.9	91.2
	Grant-in-aid to NE States	11.1	4.4
	Commodity Assistance	0.00	0
	Total 2004-05	250.1	
2005-06	Central level activities	39.8	8.2
	Grant-in-aid to States	299.7	61.2
	Grant-in-aid to NE States	41.5	8.5
	Commodity Assistance	106.3	21.8
	Total 2005-06	487.3 *	

* Expenditure incurred/committed upto 20th March 2006

3.2 Budget Allocation for 2006-07

Allocation for 2006-07 has been substantially raised to expedite implementation of the project. Provisional break-up of budget is given below :

Component	Amount (Rs. in million)
Central level Activities	
Salaries of Incremental Staff	3.500
Domestic Travel Expenses	2.000
Training at Central Level	2.500

Central Level IEC	5.000
Consultancy : Procurement, Software Development and Baseline Surveys	130.000
Operational Cost	7.000
Sub-total (Central Activities)	150.000
Assistance to States	
GIA to State Societies for various State/District Level activities	400.000
GIA to Societies for North-Eastern States for various activities	90.000
Commodity Assistance Lab/Office equipment, Computer hardware/software	380.000
Sub-total Assistance to States	870.000
Total Budget for 2005-06	1020.000

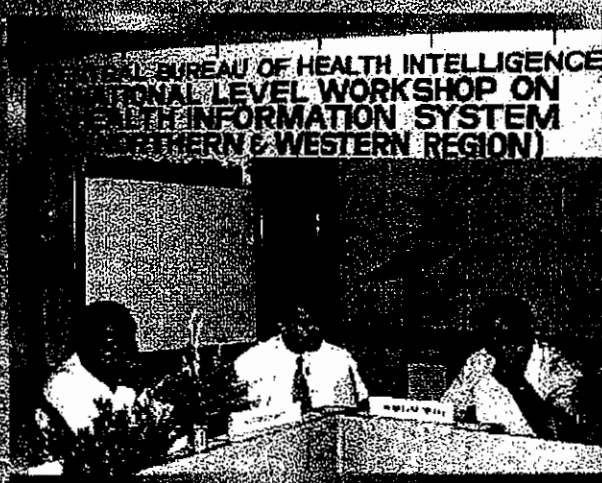
3.3. Disbursement Status:

Claims for reimbursement of expenses have been submitted to CAAA to the extent of Rs.13 million covering the period upto September 2005. Application for further claim of approximately Rs.11 million is under preparation and will be submitted to CAAA shortly.

x



Regional Workshops for Improving and Strengthening Health Information System



Combined Report and Recommendations

August 2004



Government of India
Central Bureau of Health Intelligence (CBHI)
Directorate General of Health Services
Ministry of Health & Family Welfare,
Nirman Bhawan, New Delhi - 110 011

CBHI Website : www.cbhidghs.nic.in

CBHI email : dircbhi@nb.nic.in



Regional Workshops for Improving and Strengthening Health Information System

Northern and Western Regions
New Delhi : 28-29 August, 2002

Southern and Central Regions
Bhopal : 8-9 May, 2003

Eastern and North Eastern Regions
Bhubaneswar : 22-23 January, 2004

Follow up Workshop
New Delhi : 7 April, 2004

COMBINED REPORT & RECOMMENDATIONS

Compiled and Edited by

*Dr. Ashok Kumar, M.D., Director
Smt. S Jeyalakshmi, Joint Director (NFSG)
Sh. P K Mukhopadhyay, Joint Director*



Central Bureau of Health Intelligence (CBHI)
Directorate General of Health Services
Ministry of Health & Family Welfare
Nirman Bhawan, New Delhi - 110 011

In collaboration with
World Health Organisation

CBHI Website : www.cbhidghs.nic.in
CBHI email : dircbhi@nb.nic.in

HIS strengthening



Dr. S. P. AGARWAL
M.S. (Surg.) M.Ch. (Neuro)
DIRECTOR GENERAL

भारत सरकार
स्वास्थ्य सेवा महानिदेशालय
निर्माण भवन, नई दिल्ली - 110 011
GOVERNMENT OF INDIA
DIRECTORATE GENERAL OF HEALTH SERVICES
NIRMAN BHAWAN, NEW DELHI-110 011
TEL. NO. 23018438, 23019063
FAX NO. 91-11-3017924

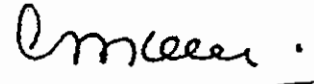
Dated 30th August, 2004

FOREWORD

The health data originate from the periphery levels and flow upward to District, State and Central levels. The Central Bureau of Health Intelligence (CBHI) is the national nodal institution for health statistics in the country. Similar nodal division is essential to be established by each State/UT in their respective Health & Family Welfare Directorates.

In order to facilitate national updated health database, CBHI regularly collects health information from the Directorate of Health & Family Welfare Services of States/UTs and other source agencies. For improving and strengthening health data collection from the States/UTs and electronic health data transmission through e-mail (dircbhi nb, nic, in), CBHI through four regional workshops had closely interacted with all States/UTs.

These workshops deliberated in detail on the issues and constraints influencing the health information system and through this report have come out with important recommendations towards its efficient functioning at all the levels of health care delivery. The sincere efforts on parts of all the States/UTs and various concerned organizations in prompt implementation of these recommendations will go a long way for achieving our National Health Goals.


(S.P. AGARWAL)

HIS strengthening

EXECUTIVE SUMMARY

Central Bureau of Health Intelligence (CBHI) is the national nodal Institution for Health Statistics in the country. The Directorates of Health Services of States/UTs are the primary source agencies for health data and responsible for its transmission to central level. In order to improve and strengthen health data collection & flow from States/UTs to CBHI, a series of regional workshops were conducted with the **objectives to suggest** :

- (1) to improve & strengthen the timely flow of validated requisite health information from States/UTs to CBHI as well as to enhance the linkages.
- (2) to improve & strengthen the infrastructure, both, physical and functional for efficient Health Information System from periphery through State/UT.
- (3) for computerized Health Information System by the States/UTs and timely health data dispatch to CBHI through electronics means.
- (4) for improving the annual CBHI publication "Health Information of India "in terms of need for including new data series, modifying present data series and presentation as well as requirement for new publication(s) on relevant health related aspects.
- (5) for strengthening the use of ICD-10 for morbidity & mortality coding by all medical/health care facilities in the States /UTs, and
- (6) enhanced efforts of States /UTs towards optimal utilization of CBHI's in-service training programs for better human resource development and capacity building for efficient health information system.

Four workshops were organized in order to cover all States/UTs viz (i) Northern & Western Region, 28-29 August 2002 at YMCA New Delhi, (ii) Central and Southern Region, 8-9 May 2003 at Academy of Administration, Bhopal, (iii) Eastern and North Eastern Region, 22-23 January 2004 at Bhubaneswar and (iv) Follow up workshop for all those states/UTs which could not attend earlier workshops, 7th April 2004 at Dte GHS, Nirman Bhawan, New Delhi.

Each Workshop programme included Registration and Inaugural Session, Plenary Technical Sessions wherein the problems in data receipt from States/UTs faced by CBHI, introduction to website of CBHI and presentations by States/UTs about their health information system & its functioning etc. were made and deliberated. Subsequently the groups discussions were held towards the workshop objectives and their reports were thoroughly discussed during the plenary session leading to finalisation of the recommendations.

Besides the representatives from the States/UTs, these workshops were attended by senior officers & experts from Dte GHS, Department of Family Welfare, the Registrar General of India, WHO, National Informatic Centre (Central & State), Central Statistical Organisation (CSO), Planning Commission, National Health Programmes, Institute for Research in Medical Statistics (ICMR), Medical Record Officers of state Hospitals and officers of CBHI.

Twenty one major recommendations as emerged on the six broad objectives of workshop are summarized in the next chapter. It could be seen that most of these recommendations are feasible to be implemented immediately while a few like establishment of an equipped State /UT & Distt. Health Statistic cells and computerization of Medical/Health Information system need to be initiated now so that they can be possibly implemented in due course with appropriate planning and resource mobilization.

Major Recommendations

I. To improve & strengthen the timely flow of validated requisite health Information from States/UTs to CBHI as well as to enhance the linkages

1. While prioritizing Efficient Health Information System (HIS), to begin with the existing State/UT health statistics unit in health directorate be strengthened with an identified nodal officers, trained personnel and computer so as to effectively coordinate for validated health data base & capacity building in State/UT & closely link with CBHI. Subsequently make efforts for establishing a dedicated State/UT Health Statistics Division, equipped with adequate infrastructure This Division be responsible for efficient HIS, validated health database of the State/UT, monitoring & evaluation as well as capacity building, while keeping close linkages with CBHI and various reporting unit within the State/UT.
(Action : States/UTs)
2. States/UTs to punctually and regularly send the consolidated and validated weekly, monthly, annual reports to CBHI on the prescribed formats. Even 'Nil' report is required timely.
(Action : States/UTs)
3. All the Regional Offices for Health & Family Welfare of GOI also need to further strengthen their supportive and coordinating roles with the State/UT Health Directorates for facilitating timely submission of validated data by States/UTs to CBHI as well as their capacity building for efficient health information system.
(Action : ROHFW/GOI and CBHI/DteGHS)
4. Central & State/UT Governments may bring an act for compulsory registration of all private / non govt. medical institutions and practitioners with the State/UT Government and mandatory for them to furnish medical/health reports to appropriate Govt. Health Facility in their vicinity. (Action: Centre and States/UTs)
5. For better linkages, communication & capacity building, CBHI may hold review-meetings and workshops with States/UTs at appropriate intervals. (Action : CBHI)
6. The existing CBHI formats for sending health information by States/UTs should be reviewed for their further simplification while avoiding duplication and redesign them as per present need, with definition of the key terminologies used. (Action : CBHI)

II. To improve & strengthen the infrastructure, both physical and functional, for efficient Health Information System from periphery through State/UT

7. At district level, Chief Medical & Health Officer is responsible for all health statistical activities under whom the existing Distt. Health Statistics cell be strengthened on priority basis and efforts be initiated to equip this cell with a dedicated trained officer as its incharge and a Group C staff oriented in computer operation and atleast one computer with accessories. This Distt. Health Information Unit can then coordinate for efficient health information system in the district, including on the spot supervision and related capacity building of PHCs & other Medical/Health units in the district.

(Action: States/UTs)

8. An expert group to review and suggest an appropriate Health Information System (HIS) from subcentre to district to state level with reference to the contents of records/registers, data recording, their validation, appropriate reporting and analysis for timely corrective measures at various levels. A manual to this effect needs to be prepared and shared for better understanding and uniformity of HIS at all levels and by all concerned authorities/ agencies.

(Action: CBHI and States/UTs)

9. At PHC/CHC/Dispensary level, the medical officers and health supervisors should be oriented to health data management through continued supportive supervision and wherever necessary through in service training program organized by State(s)/UT, CBHI and other Institutions. A close coordination with all the existing govt./non govt. health institutions in respective jurisdiction will ensure maximum coverage of health & medical data with requisite quality & timeliness.

(Action: States/UTs)

10. To strengthen Health Information System at Sub-centre/PHC/CHC Level, the State/UT may ensure the full compliment of Multipurpose H.W. (Male & Female), Health Supervisor, Doctors and other supportive staff as per GOI norms with their specified responsibilities and continued supportive supervision

(Action: States/UTs)

11. At the Sub centre level the non-availability of formats/registers needs be taken seriously and the State/UT may ensure their adequate supply & timely replenishment.

(Action: States/UTs)

III. For Computerized Health Information System by the States/UTs and timely health data dispatch to CBHI through electronics means.

12. Validated and authenticated health data should be transmitted by States/UTs to CBHI through electronic media (e-mail: dircbhi@nb.nic.in) with immediate effect as all the States/UTs have been sensitized to this effect by CBHI during 2003-04 and computerised data entry formats of CBHI are already available in CBHI website (cbhidghs.nic.in) for this purpose.

(Action: States/UTs)

13. The data collection for CBHI may be done through computerized formats to be made available on the Internet. Necessary on-line and off-line systems may be designed in order to automate this process and NIC's expertise may be used for designing appropriate systems including databases. NIC's connectivity in districts and states can enable on-line updation as well as transmission of data electronically.

(Action: CBHI & NIC)

14. Like CBHI has developed a central website for health information, the States/UTs may also initiate efforts to develop similar websites along with district specific health information, while utilizing the available expertise of state & districts NIC units.

(Action: States/UTs and State/Distt. NIC)

15. States/UTs may initiate steps towards computerizing the Hospital Information System in a phased manner to begin with state/regional level hospitals. This will facilitate efficient hospital database on morbidity & mortality based on ICD-10, essential for District/State/National Statistics on morbidity & mortality.

(Action: States/UTs)

IV. For improving the annual CBHI publication "Health Information of India" in context of need for including new data series, modifying present data series and Presentation as well as requirement for new publication(s) on relevant health related aspects.

(Action: CBHI)

16. The Annual Publication "Health Information of India (HII)" with latest/updated information be brought out within six months of the following calendar year and for this purpose all the States/UTs and other reporting units should furnish requisite updated information to CBHI positively within three months following the calendar year. The presentation of HII may be improved in context of well-designed cover/back pages, quality of inner pages, their printing and contents with relevant analysis wherever necessary.

17. Following new health data series are suggested to be included in CBHI publication "HII":

- (i) Morbidity and Mortality due to trauma/road traffic accidents, disaster/natural calamities.
- (ii) Incidence/prevalence as well as estimation of important non-communicable diseases such as diabetes and hypertension, based on sample survey through NSSO &/or other such agencies.
- (iii) Data on age, sex & disease specific mortality rates.
- (iv) State/UT specific innovative schemes for the welfare of people like in Madhya Pradesh "Rogy Kalyan Samiti, Jan Swasthya Rakshak Samiti and State Illness Fund".

18. CBHI may bring out publication on; (i) Information on hospitals for specialised treatment including facilities available, cost thereon etc., and (ii) Directory of Health Research Organisations, including National Surveys in health and related subjects, along with brief on their contributions.

V. For strengthening the use of ICD-10 for morbidity & mortality coding by all medical/health care facilities in the States /UTs.

19. ICD-10 coding system be implemented throughout the country for comparison at both, national and international levels and the use of ICD-10 be concurrently monitored by hospital administration for timely corrective measures at various levels, including meeting the ICD-10 trained manpower needs

(Action: States/UTs)

20. Both, CBHI and States/UTs should design and initiate appropriate training course on ICD-10 for human resource development/capacity building at all levels, instead of presently run long (5 weeks) course on Medical Coding. WHO may support CBHI for training of master trainees on ICD-10 from all States/UTs. Only trained personnel should be kept for efficiently handling the medical & health records.

(Action: CBHI, States/UTs and WHO)

VI. Enhanced efforts of States /UTs towards optional utilization of CBHI 'In-Service Training programs for better human resource development and capacity building for efficient Health Information System.

21. States/UTs may ensue all measures to fully utilize the in-service training programs of CBHI on Health Statistics and Medical Coding (ICD-10) as well as Medical Record Management, being organized for various categories of medical/non-medical staff involved in handling medical/health data, for which purpose CBHI communicates its annual training calendar well in advance to all States/UTs. For this purpose, every State/UT should prepare district wise inventory of such training needs, people trained and remaining to be trained and utilize this inventory for promptly recommending the names of untrained personnel to various CBHI in-service training courses.

(Action: States/UTs and other agencies requiring training of their staff)



Government of India

Improving and Strengthening the use of ICD 10 and Medical Record System in India

A Case Study (2004 & 2005)

Report and Recommendations



Central Bureau of Health Intelligence (CBHI)
Directorate General of Health Services
Ministry of Health & Family Welfare,
Nirman Bhavan, New Delhi - 110011

CBHI website : www.cbhidghs.nic.in

CBHI email : dircbhi@nb.nic.in



Dr. R.K. SRIVASTAVA
M.S. (Ortho) D.N.B. (PMR)
DIRECTOR GENERAL

भारत सरकार
स्वास्थ्य सेवा महानिदेशालय
निर्माण भवन, नई दिल्ली-110 011
GOVERNMENT OF INDIA
DIRECTORATE GENERAL OF HEALTH SERVICES
NIRMAN BHAVAN, NEW DELHI-110 011
TEL. NO. : 91-11-23061438, 23061063
FAX NO. : 91-11-23061924
E-mail: dghs@nic.in
rakeshshrivastava789@hotmail.com

FOREWORD

The International Statistical Classification of Diseases and Related Health Problems 10th version (ICD 10) is the international standard prescribed by World Health Organisation. Countries need to adopt and implement this classification so that the morbidity & mortality databases are comparable within the various region/states of the country and between countries of region/world. Such reliable information are essential for meaningful conclusion on the health status of the population and for planning the development of facilities for medical and health care and their efficient functioning. ICD 10 coding was introduced by WHO in the year 1993 and India adopted the same in the year 2000. India is to move alongwith the other countries of world. CBHI's continuing efforts to promote use of ICD 10 will yield results only if all the medical & health authorities decide to implement ICD 10 and work towards it.

A case study on ICD 10 involving 20 Delhi & Rohtak hospitals belonging to various management categories, as undertaken by Central Bureau of Health Intelligence (CBHI) with the WHO Biennium 2004-2005 support is an appropriate effort in this direction. This case study involved the Medical Record Officers, heads of Medical Record Departments, Medical Superintendents of the hospitals and other administrative authorities. These officials and authorities who were oriented on the importance of implementing ICD 10, committed to provide the requisite support and logistics to the Medical Record Departments for efficient use of ICD 10 coding system. Through workshops, review meetings and visits to the medical establishments during this case study; the issues and constraints influencing the use of ICD 10 were identified and deliberated in detail on their feasible solutions. This study has come out with valuable recommendations for improved use of ICD 10 as well as strengthening the Medical Record Departments in the country.

Implementation of ICD 10 system necessitates continued sincere efforts in the form of orientation training programmes and computerized Medical Record System Departments in all medical & health institution. From 2005 onwards, CBHI has taken the important initiatives of conducting short term national level Orientation Training Courses on ICD 10. CBHI has also developed a Module and Workbook for Orientation Training on ICD 10 which serves as a handy self learning material for all concerned medical, nursing & paramedical personnels.

I hope that all the concerned medical & health authorities of various states/UTs as well as medical/health institutions will make every effort to efficiently implement the recommendations of this case study.

(Dr. R.K.Srivastava)

EXECUTIVE SUMMARY

Hospital records coded uniformly using ICD 10 form a vast data base and conclusions drawn on the processed data are extremely important for understanding the public health situation of the country. World Health Organisation (WHO) brought out the 10th version of International Statistical Classification of Diseases and Related Health Problems (ICD 10) in 1993 for systematic coding of morbidity and mortality causes in the medical records of medical/health institutions. India adopted this classification in the year 2000. Five years have gone by since the adoption of ICD 10 in India and evaluation of the implementation and use of ICD 10 by the Medical and Health Institutions needed to be done, in order to examine the extent of use of ICD 10, various problems, constraints and bottlenecks experienced and to come out with a model for improving and strengthening the use of ICD 10 and Medical Record System in the country and to assess the practical training needs and identify the processes which need to be initiated / speeded up to gear up the proper use of ICD 10. For this purpose, CBHI undertook a case study of 20 hospitals in Delhi and Rohtak under the aegis of WHO/GOI Biennium 2004 and 2005.

This case study of 20 hospitals in cities of Delhi and Rohtak spanning over the various management categories such as Central Government, State Government, Local Bodies and Private Sector consisted of the following well thought of initiatives :

1. Workshop of key trainers on ICD 10 from cities of Delhi and Rohtak (New Delhi : 21-23 July 2004)
2. First Review Meeting of key trainers on the action plan and efforts made to improve and strengthen the use of ICD 10 and identification of the major constraints and technologic requirements (New Delhi : 03 September 2004)
3. Visit of experts to the study hospitals for on the spot assessment on the status as well as techno-operational and administrative constraints in the use of ICD 10 (11-14 October 2004)
4. Second Review meeting of Key Trainers on ICD 10 and the Incharges of Medical Record Department to review the implementation of the action plan for improving the use of ICD 10 and strengthening the medical record system (New Delhi : 17 November 2004)
5. Review Workshop of key trainers on the major actions undertaken in order to improve the regular use of ICD 10 as well as to strengthen the MRD in the hospital (New Delhi : 25 January 2005)

The workshop of key trainers on ICD 10 was conducted during 21-23 July 2004 at conference room of YMCA New Delhi. In this workshop, **Medical Record Officers/Officials of 20 study hospitals from Delhi and Rohtak (Post Graduate Institute)** participated. These hospitals belong to various management categories such as Centre, State, Local Bodies and Private Institutions. During this workshop, the participants were introduced to - ICD 10 rules for morbidity and mortality coding and experiences of ICD 10 use in South East Asia Region. Through group work and self work sessions, the measures for improving and strengthening the use of ICD 10 in each hospital were discussed and the participants drafted the hospital specific action plan, logistics and support requirements for efficient use of ICD 10. Resource persons were

drawn from World Health Organisation Country Office, South East Asian Regional Office of World Health Organisation (SEARO), Ministry of Statistics and Programme Implementation, All India Institute of Medical Sciences, Office of Registrar General of India (RGI), Maulana Azad Medical College (MAMC) and State Bureau of Health Intelligence (SBHI), New Delhi.

The follow up first review meeting of all those representatives from 20 study hospitals who participated in the July 2004 workshop, was held on 3rd Sept. 2004 at Resource Centre, Dte.GHS/GOI, Nirman Bhawan, New Delhi wherein the participants made presentations on the efforts made towards the use of ICD 10 and/or its further improvement in the Hospitals, major problems and constraints experienced (with feasible solutions) to operationalise and/or improving use of ICD 10 and further support and logistics required from Hospital Administration and CBHI for ensuring better use of ICD 10 in the hospitals. During the afternoon session, the participants were taken to Indraprastha Apollo Hospital, New Delhi for demonstration of computerized system of coding and maintaining medical records. The ICD 10 (3 volumes) were provided to all those hospitals which did not have the same in their Medical Record Departments (MRD). Also, a self work in three groups on "Action plan, logistics and support requirements for efficient use of ICD 10 in their hospital and suggestion in workbook on ICD 10 training were done. Experts and resource persons were from MAMC and office of RGI.

Subsequently the **6 hospitals of the case study** where no coding system of Medical Records was being used were visited by CBHI officers during 11-14 October 2004 for on the spot assessment and discussions with hospital authorities and MRD officials. The very purpose of this visit was to recognise the constraints and problems which were preventing the Medical Record Department of the hospitals from effectively using ICD 10 coding in the Medical Records/System. Also, the current status on the use of ICD 10 and their further plans on its implementation were discussed. Suggestions were given by visiting CBHI officer to the Medical Record Department officials for effective use of ICD 10 in the hospital.

The **2nd review meeting on implementation of ICD 10** of these 20 hospitals was held on 17th November 2004 (1000-1800 hrs) in Conference Room of NIHF, New Delhi. During this 2nd review meeting, **the medical officer/authority incharge of Medical Record Deptt. from 20 study hospitals** were also invited alongwith the Medical Record Officials who participated in the earlier workshop and review meeting. The efforts made by the hospital authorities for implementing ICD 10 and action taken to handle major problems and constraints and further support and logistics required from hospital authorities and CBHI for ensuring continued use of ICD 10 were discussed, which was followed by self work session in which each hospital identified specific issues requiring further attention for coding the morbidity and mortality records according to ICD 10 and prepared hospital specific action plan to address these issues. The "ICD 10 (3 volumes)" on CD-ROM were provided to all the Govt. hospitals for facilitating the use of ICD 10.

As already planned, in the final stage of this case study on ICD 10, review and concretization of the actions undertaken by the hospitals was done in order to come out with a model to improve and strengthen the use of ICD 10 in the country. The review

workshop was organized on 25th January 2005 (0930-1730 hrs) at India Habitat Centre, New Delhi, wherein the (i) **hospital authorities viz. Medical Superintendents and Medical Officer Incharges of Medical Record Departments of the 20 study hospitals from Delhi and Rohtak**, (ii) **administrative authorities of Govt. under which these hospitals function viz. DHS of NCT of Delhi, Medical Officer of Health from MCD and NDMC**, (iii) **Director Medical and Health Services of Railways and ESI**, (iv) **Director CGHS/Dte.GHS**, as well as (v) **experts from WHO and various partners i.e. RGI, Ministry of Statistics and Programme Implementation, Medical College(s), concerned authorities for MOHFW and Dte.GHS/GOI**, deliberated and made far reaching recommendations for improved use of ICD 10 in future.

The Proceedings of the individual workshops and review meetings are attached as Annexure I, II, III, IV and V respectively. The copies of Technical Presentations are also annexed. Major recommendations as emerged during the deliberations of the different activities of the case study are summarized in the next few pages. The implementation of these recommendations will definitely result in improved use of ICD 10 in the medical/health institutions across the country.

MAJOR RECOMMENDATIONS

A. Essential use of ICD 10

1. All Government and Private health and medical institutions in the country should essentially use ICD 10 in their records and reports and the same should be ensured by all concerned authorities through well designed guidelines, directives and continued monitoring.

[Action : Centre and States/UTs]

2. All medical and health institutions, including hospitals of any size, in the country should equip themselves with WHO publication on ICD 10 (3 volumes) as a reference and ICD 10 codes relevant to each medical specialty be prominently made available in concerned wards in the hospitals. No medical record should remain without ICD 10 code for the diagnosed disease.

[Action : Centre, States/UTs and Respective Medical and Health Authorities]

3. CBHI should be appropriately further strengthened and equipped to efficiently function as National Nodal Institute on ICD 10 with the objective of further strengthening use of ICD 10, its continuous monitoring, evaluation and capacity building including creation of Master Trainers.

[Action : CBHI]

4. WHO may consider setting up of WHO Collaborating Centre on Family of International Classification of Diseases and Related Health Problems for SE Asia Region, on priority basis, at CBHI, Dte. General of Health Services, Govt. of India, New Delhi

[Action : WHO and CBHI]

B. Manpower Capacity Building for ICD 10 Use

5. All State/UT authorities should formulate a plan for regular orientation training on the use of ICD 10 and every medical and health institution should make efforts to keep their medical/nursing/paramedical staff duly oriented on ICD 10 through well drawn and regularly conducted Orientation Programs in their institutions.

[Action : States/UTs and Respective Medical & Health Authorities]

6. The syllabi and curricula of undergraduate and postgraduate medical as well as paramedical courses in India should appropriately cover the teaching on ICD 10 and its appropriate use.

[Action : All concerned Councils]

C. Operational Plan for implementation of ICD 10, its Monitoring and Evaluation

7. States/UTs should set up a task force for time-bound implementation and monitoring of ICD 10 use. They should maintain a database of various medical and health institutions using/not using ICD 10 and ensure that all these institutions use ICD 10.

[Action : States/UTs]

8. WHO may develop offline software package for ICD 10 coding of disease nomenclatures and provide it for its use in various medical/health institutions in India. Computerised user manual/self learning module for ICD 10 may be prepared and circulated through website of CBHI. Further, online help and a newsletter on ICD 10 aspects may be established through CBHI website. CBHI should make an inventory of all such vendors which are involved in designing the health information system using ICD 10 and share the list with States/UTs for getting the institution specific hospital information system designed through a suitable agency.

[Action : CBHI and WHO]

9. Directives need to be issued from heads of the medical/health institutions to all concerned Medical/Nursing/Paramedical personnel of all departments in the medical/health institutions for ensuring completion of medical records of both outpatient and inpatient departments, and for clearly writing diagnosis using standard medical terminology, while avoiding the abbreviations.

[Action : States/UTs and Respective Medical and Health Authorities]

10. Data on morbidity/mortality based on Medical Records should be regularly compiled, analysed and should form the part of various documents/reports of the medical/health institutions including their annual report.

[Action : States/UTs & Respective Medical and Health Authorities]

11. There should be regular visits / interaction by CBHI to facilitate the speedy implementation of ICD 10 in the States/UTs.

[Action : CBHI & States/UTs]

D. Strengthening Medical Record Unit/Department and Computerised Medical Record System

12. The medical record system in each medical/health institution should be computerized with appropriately designed software for both outpatient and inpatient records, while using meticulously designed formats, local area network as well as internet facility in all the departments/wards of the medical/health institution.

[Action : States/UTs and Respective Medical and Health Authorities]

13. The medical record department in each medical/health institution should be given highest priority and be headed by a senior level expert/officer of the same rank as in other existing technical departments in the same institution. The medical record department should be equipped with requisite number of trained personnel of different categories like medical record officer, Dy. Medical Record Officer, Assistant Medical Record Officer, Sr. Medical Record Technician, Medical Record Technician and other support staff in order to efficiently handle and manage the medical record system of the institution. The standardized staffing pattern of medical record department, keeping in view the bed strength in an institution be worked out by the concerned State/UT authorities and medical record departments in various medical and health institutions be equipped accordingly.

[Action : States/UTs and Respective Medical and Health Authorities]

14. All the technical functionaries in the medical record department be trained through the prescribed training programmes and such training personnel should not be diverted to other departments. The contribution of medical record department functionaries in any of the research papers be duly acknowledged.

[Action : States/UTs and Respective Medical and Health Authorities]

15. There should be clear guidelines for period of retention of medical records for both outpatient and inpatient departments and after the said period, they must be destroyed. This will provide adequate space for the records.

[Action : States/UTs and Respective Medical & Health Authorities]

Health Sector Policy Reform Options Database (HS-PROD)

"Sharing innovative solutions to common health management problems"

Central Bureau
of Health
Intelligence
(CBHI)

What is HS-PROD?

HS-PROD is a user friendly, state-of-the-art website which shares information about Indian good practice and innovations in health services management. An instantly accessible library of reform materials, it provides a summary of each option/scheme and links to more details source documents. The aim is to share reform know how to tackle common management problems in the health sector. HS-PROD currently contains carefully researched entries, in respect of 16 major Health Sector Areas as given below and the database is expanding rapidly:

- | | |
|--|--------------------------------------|
| (1) Infrastructure and equipment | (10) Access to service and coverage |
| (2) Logistics | (11) Health Financing |
| (3) Financial management systems | (12) Human Resources |
| (4) Monitoring, evaluation and quality control | (13) Community Participation |
| (5) Public/private partnership | (14) Urban Health |
| (6) Management structures and systems | (15) Behavioral Change Communication |
| (7) Social marketing and franchising | (16) First Referral Units |
| (8) Health information systems | (17) Others |
| (9) Intersectoral links | |

Who owns HS-PROD?

Developed as a collaborative initiative between the Government of India (GOI) and the European Union, HS-PROD now resides with the Central Bureau of Health Intelligence (CBHI), Directorate General of Health Services in the Union Ministry of Health & Family Welfare and is being further developed with technical support from the National Institute of Medical Statistics, Indian Council for Medical Research, New Delhi.

Who manages HS-PROD?

HS-PROD is managed by the CBHI through a broad-based management group with representatives from Government, development partners, NGO/Private Sector and experts from the fields of Public Health, Economics, Bio Statistics, IT etc. The group meets every quarter but approves each new entry added to the database concurrently.

Why was HS-PROD developed?

Many States face similar problems in the health sector but have no way of sharing their experiences or ideas with each other. They may have heard of successful schemes in other parts of the country but do not know how to get more detailed information about them.

The internet is an excellent way of promoting Indian reforms, and especially partnerships with the private sector and NGOs, both within India and worldwide.

It is an efficient and low cost means of sustaining and replicating reforms instigated by GOI, development partners and other organizations.

It has valuable potential as a learning resource for health sector reform training events and courses (HS-PROD already forms part of the professional development course in Public Health, Management and Health Sector Reform)

It fits well with the revised role of the Ministry of Health & Family Welfare in a more decentralized context. It encourages and supports convergence between sectors.

It represents an ideal tool for communicating good practices under the National Rural Health Mission (NRHM) and Reproductive and Child Health (RCH2) Programme.

It meets a need for information that is continually expressed. Feedback at State level has been extremely positive. During field visits, the HS-PROD team has been repeatedly told that this is a tool that people want and need

What information does HS-PROD contain?

Each HS-PROD entry is described in terms of concise summary, location, duration, advantages, challenges, prerequisites for implementation elsewhere (such as consultation); implementer etc. The aim is to provide up-to-date and accurate information about options or interventions, using a standard format and to organize such options systematically.

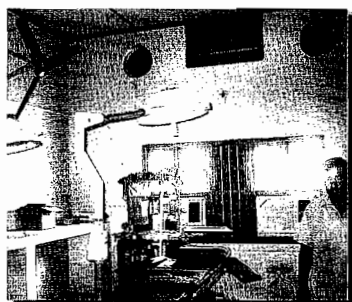
Few examples of HS-PROD entries:

Sahiya movement (community health workers), Jharkhand : more than 1000 sahiyas providing quality health care services to the needy in marginalized sections of the community, particularly women and children in remote, unreachable areas.

Corporate policy on HIV/AIDS, Larsen & Turbo, Powai, Maharashtra: orientation on HIV/AIDS awareness to over 10,000 employees, 4500 family members and 1600 local children.

Primary health care and RCH services in urban slums, Uttar Pradesh : A public-private partnership





providing primary health care and reproductive and child health services in eight identified slums of Varanasi City.

Providing round-the-clock comprehensive emergency obstetric and new born care centers, Tamil Nadu leading to a drop in maternal mortality rate by 36 percent between 2001 and 2005.

Provision of essential maternal and child health services in Tribal Areas, Rajasthan in each village a tribal woman working as a health volunteers or Swasthya Sakhis who carry out community based education & distribution and accompany women & children to health centers.

What kind of source documents can I access through HS-PROD ?

Each entry provides a basic summary of 'good practice' or innovation plus the ability to access a range of source material for those interested in more detail. The material includes Government Order, powerpoint presentations, evaluation reports, photographs, video clips, newspaper articles and links to relevant websites. Where the source item is too big for immediate access through a hyperlink, a request can be e-mailed directly to the HS-PROD team at CBHI. The HS-PROD reference library is already a valuable and extensive resource freely available to all users.

HS-PROD Users & Beneficiaries

HS-PROD users include Central/State/UT/ District health and other related authorities including NRHM (Central /State), Governmental/Non governmental organisations in health and related fields, including Research, Education & Training, Regional offices of MOHFW & CBHI, ICMR Institutes, CBHI Field Survey Units to undertake visits for collecting on the spot information on HS-PROD, ECTA state facilitators, Developmental partners (WHO, EC, UNICEF, WB, USAID, etc.), Media, internet and Individuals

How do I access HS-PROD ?

At www.prod-india.com or you can request the CD from CBHI. **This website is being shortly moved to www.hsprodindia.nic.in.**

How do I find what I am looking for in HS-PROD ?

HS-PROD entries are listed by the subject areas (16) as explained above. There is also a search facility which allows you to search by keywords or by HS-PROD reference number. Facility for searching entries by States has also been incorporated.

Can I add an entry to HS-PROD ?

Yes. You can enter your information online through the website (help screens are available) or by sending a Word document by email to dircbhi@nb.nic.in. The HS-PROD team will then contact you to verify the entry.

Is HS-PROD limited to Indian best practices and innovations ?

The database itself focuses exclusively on the huge number of excellent initiatives in India but details of related international experience are also included.

Does HS-PROD provide links to related websites ?

Yes. HS-PROD has a module devoted to links with other national and international websites. The team seeks to maximize such connections while maintaining the focus on India in the database to avoid duplication of content.

Does HS-PROD include clinical good practices ?

No, the emphasis is rather on management and organizational matters in health.

Where does the information come from ?

The HS-PROD team carries out regular field visits to States/UTs to meet various health authorities, national health programme manager and learn about initiatives at first hand. In addition, they hear about reforms through the media, the Internet and the regional offices of the CBHI, NIMS and EU. They then contact those involved in the project for more information. However the HS-PROD team does not carry out an independent evaluation of each reform. It demands proof of results (such as evaluation reports) but it is up to the HS-PROD user to make their own judgment as to whether the reform is useful or not.

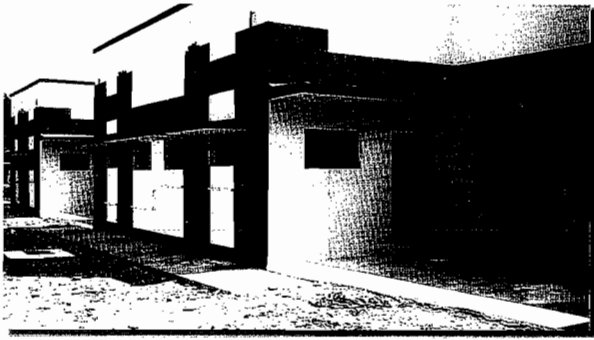
How often are the entries updated ?

The HS-PROD team aims to update each entry as and when required. However each option is dated so that user can see when the information was last revised.

What are the plans for HS-PROD in the future ?

While HS-PROD has been developed as an operational information tool, it also has great potential as a learning resource for training events and courses in health sector reform and capacity development. This learning aspect of HS-PROD will form a major part of the on-going development programmes under the National Rural Health Mission (NRHM). In addition, a discussion group facility is being developed so that users can discuss projects online. The number of entries increases every month and regional workshops have been organized in order to sensitize & encourage the use of the website and to generate new entries.

A Few Examples of HS-PROD entries



Devolution of financial and administrative powers to districts, Haryana (35)

Haryana State Government has sought to improve the efficiency of management at various levels of the health service through greater decentralisation, in keeping with national policy. State Government Orders were issued to devolve powers according to rank. Medical Superintendents, for example, are now able to buy drugs and equipments upto the value of INR 50,000 per purchase, while Senior Medical Officers can spend INR 10,000 and Medical Officers INR 5,000.

Mitanin programme, Chattisgarh (49)

A "Mitanin" is a Community Health Volunteer (CHV) trained and deployed under a State-wide programme in Chattisgarh, where levels of disease are high and use of health services low. The mitanin is a married local women whose main role is to organize and empower women, provide health education, facilitate access to health care and provide referral advice. A State Health Resource Centre, set up under a Memorandum of Understanding between the State Government and Action Aid India, was formed to guide the programme which effectively extends outreach of all existing projects.



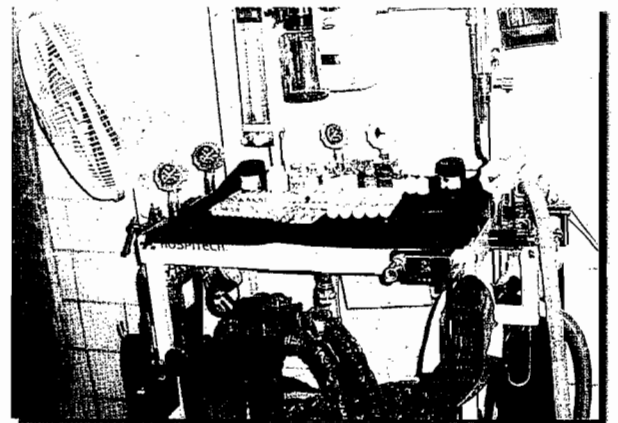
Public Private Partnership for delivering of reproductive and child health services to the slum population of Guwahati city, Assam (51)

Urban health services in Guwahati have improved since the State Government contracted a trust hospital (Marwari Maternity Hospital) to provide services in eight low-income wards of the city. In addition to State funds, vaccines and contraceptives are provided free of charge to the hospital which now covers 17 outreach sites in slum areas providing Reproductive and Child Health services. Sterilisation, spacing and termination services are free to patients; deliveries, operations and diagnostic tests are charged at concessionary rates.

Operationalisation of First Referral Units, Maharashtra (103)

In 2002 Washi rural hospital was upgraded to First Referral Unit and provided with a dedicated EMOC team consisting of three specialists; a gynaecologist, an anaesthetist and a paediatrician besides other staff.

Facilities at FRU Washi, include an operating theatre, blood transfusions, laboratory services, x-ray facilities, ambulance services and medico-legal works including post-mortems. As a result between 2000-2005 obstetric admissions have risen from 562 in 2000 to 971 in 2004; deliveries have more than doubled from 328 to 700; live births have risen from 325 to 685; obstetric complications treated have gone from nil to 164 and there have been no maternal deaths at the hospital since July 2002.

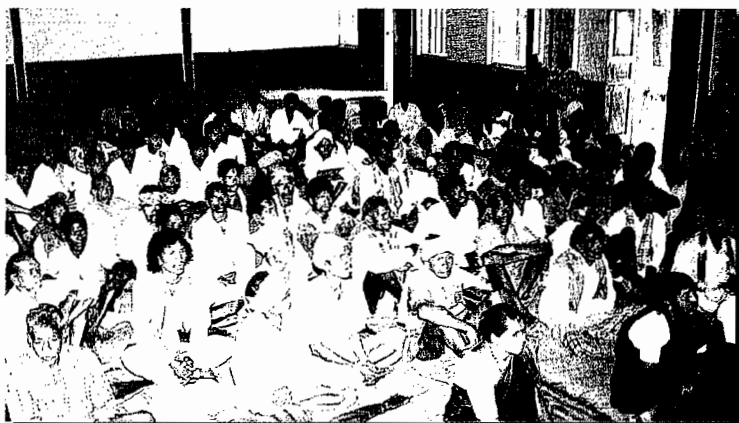


Aapni-Yojana-Safe drinking water in the villages of Rajasthan (124)

Availability of safe drinking water is a pre-requisite for good health. To tackle the water shortage in the districts of Churu, Hanumangarh and Jhunjhunu of Rajasthan, the Aapni Yojana scheme was designed to supply drinking water from Indira Gandhi Canal to 1000 villages and 11 towns at an affordable price. Funding for the project was provided by the Government of India (GOI) and the German government, through its development bank, Kreditanstalt fuer Wiederaufbau (KfW). By March 2006, the project had expanded to 370 villages and two towns, covering 20,000 square kilometers and 900,000 people. It is benefiting mainly those engaged in agriculture and animal rearing. The overall objective was to improve the health status of the population.

Change in reproductive behaviour of adolescents and youth in Bihar is being promoted by PRACHAR Project of Pathfinder International through the support of 30 Non Governmental Organisations. The program is widely accepted in the 552 villages where it was implemented. The project has reached more than 90,000 adolescents and young adults with information on key issues in Reproductive Health and Family Planning. More than 100,000 parents and other community adults received similar messages aimed at building wide social acceptance for the ideas of delaying and spacing children.

The Hamara Project is a replicable programme model for HIV prevention and care for migrant men and their sexual partners from two states-Rajasthan and Karnataka. India Canada Collaborative HIV/AIDS Project (ICHAP) with collaboration from Rajasthan State Aids Control Society is running the programme and Canadian International Development Agency (CIDA) is providing assistance to the program. The project has covered 30,000 Migrants, 24,000 migrants' wives and 6,000 "potential" migrants.



A suitable strategy was evolved by the district Collector and Chief Medical Health Officer (CMHO), Bastar whereby traditional healers known as Sirha-Gunia-Baigas were made partners in promotion of modern health care services among the tribal population. Currently, Bastar district has 1500 Sirha-Gunias-Baigas as depot holders. This initiative has helped service providers in their work. According to the CMHO of Dantewada, the initiative has led to fewer casualties and deaths in the district.



Medicine bag provided to Mitanins

Dy. Director General & Director
Central Bureau of Health Intelligence
Directorate General of Health Services,
Nirman Bhawan, New Delhi-110011
Tel./Fax : 91-11-23063175 and 23062695
E-mail : dircbhi@nb.nic.in
CBHI Website : www.cbhidghs.nic.in
HS PROD Website : www.hsprodindia.nic.in (www.prod-india.com)

- Of a general nature only and is not intended to address the specific circumstances of any particular individual or entity;
- Not necessarily comprehensive, complete, accurate or up to date;
- Sometimes linked to external sites over which the CBHI has no control and for which it assumes no responsibility;
- Not a legal advice and if you need specific advice, you should always consult suitably qualified Professionals.

Concept Paper
On
Telemedicine in India

Submitted to
First Meeting of
National Task Force on Telemedicine

on

20th October, 2005

Ministry of Health, Govt. of India, New Delhi

Background Paper in Telemedicine in India

1. Introduction:

With its huge area of 32,87,268 Sq km, population of 1.4 billion, urban-rural divide, inaccessible hilly regions, islands and many tribal areas, India is an ideal setting for telemedicine assisted health care delivery. Growing number of medical, paramedical colleges and schools with lack of adequate infrastructure, learning materials and teachers needs is a matter of grave concern. E health technology has the potential to create a national level GRID which can form the backbone to be shared by healthcare providers, trainers and beneficiaries. A strong fiber backbone and indigenous satellite communication technology in place with large mass of human potential trained in IT and local presence of telepathy industry, e health application and implementation should not be a problem technically. Further a number of pilot projects over last five years with successful outcome stand to its testimony. Groundwork on telemedicine in the country has already been laid with the efforts of ISRO and Information Technology department partnering with many State Government and specialty Institutes/hospitals. Policy standardization and infrastructural issues have already been researched. Professional societies on telemedicine/e health have been active. Print and electronic media are participating in awareness campaign.

However, a country level plan is long due to steer the Telepathy ship by the Captain (M/o Health & Family Welfare/GOI) with its crew (technology and healthcare providers/educators) and passengers (citizen) in right direction (policy, implementation, application, security, social and legal issues) to reach at the destination (Quality healthcare & wellness).

As has been happening globally, the technical agencies like ITU, NASA have taken a lead in the technical issues and the health agencies like WHO had been watching these technical developments closely over the years and now has taken over the mandate under its own arena as "strategy 2004-2007 e-health for Health-care Delivery" (www.who.int/eh/ehealthHCD/), the Ministry of Health, Govt. of India has been watching the development in the country and is now following the same strategy as a member state of WHO.

We have collated data on telemedicine/ e health obtained from different sources and tried to summaries in the following presentation.

2. Telemedicine in India- Current Scenario

2.1.1 Initiatives taken by different Govt./Public sector & Private Agencies

Different government/public sector/ and private agencies are venturing into Tele-healthcare by providing hardware and software solution for tele-health care. Efforts are directed towards setting up 'standards' and IT enabled healthcare infrastructure in the country. Some of those activities are summarized below:

Indian Space research Organization (ISRO) Initiatives

ISRO telemedicine pilot project was started in the year 2001 as a part of proof-of-concept demonstration programme. Telemedicine system consists of customized medical software integrated with computer hardware along with medical diagnostic instruments connected to the commercial VSAT at each location. The medical record/history of the patient is sent to specialist doctors, who study and provide diagnosis and treatment during videoconference with patient's end.

During the year, telemedicine network has been further expanded and it now covers 100 hospitals- 78 remote/rural/district hospitals/ health centre connected to 22 super specialty hospitals located in the major cities as follows:

- Nine hospitals in Jammu and Kashmir, six district hospitals including Leh and Kargil and three medical college hospitals connected to All Indian Institute of Medical Sciences, Delhi, Apollo Hospitals, Delhi and Amrita Institute of Medical Sciences, Kochi.
- Five islands of Lakshadweep (Kavaratti, Amini, Agatti, Andrott and Minicoy) connected to Amrita Institute of Medical Sciences, Kochi.
- Five remote /field/base hospital of Indian Army connected to research and referral (R&R) Hospital at New Delhi. INHS, Dharwantri under the naval Command at Port Blair, Andmans connected to R&R Hospital, New Delhi.
- Eleven hospitals of North Eastern States (STNM Hospital Gangtok, Sikkim regional Institute of Medical Sciences, Imphal, Manipur Medical College Hospital, Guwahati and District Hospital at Udaipur, Tripura) connected to Asia Heart Foundation, Kolkata.
- Tata Memorial Cancer Centre, Mumbai connected to B B Barua Cancer Centre, Guwahati and Wal Waker Rural Cancer Centre at Chiplun, Maharashtra.
- Three Medical College Hospital of Orissa connected To SGPGI, Lucknow.
- Operational telemedicine network in Karnataka –11 district / taluk hospitals connected to five super specialty hospitals in Bangalore and Mysore.

Besides the above, a temporary telemedicine facility was set up for two months at Pamba at the foothills of Sabrimala shrine for the benefits of visiting pilgrims. A mobile teleophthalmology facility has been provided to Shankara Netrayalaya, Chennai and Arvinda Eye Hospitals, Madurai to extend services to rural population of Tamilnadu.

Operational telemedicine network is being established at Chhatisgarh connecting 14 district hospitals/health centers to Raipur Medical College Hospitals.

More than 25000 patients have so far been provided with teleconsultation and treatment. An impact study conducted on thousand patients has revealed that there is a significant cost saving in the system since the patients has revealed that there is a significant cost at the hospitals in the cities. The Andman Telemedicine Network consisting of telemedicine Centres at G B Pant Hospital, Port Blair, Bishop Richardson Hospital, Car Nicobar and INHS, Dhanvanthri Naval Hospital at Port Blair alongwith the Andmans Gramsat Network was extensively used for tele-consultation and treatment in the aftermath of the tsunami that hit the island.

Source: <http://www.isro.org/rep2005/SpaceApplications.htm> accessed on 23rd Sept 2005.

2.1.2 Department of Information Technology (DIT), Initiatives

M/o Information and Communication & Technology, Government of India:

Department of Information Technology (DIT), as a facilitator, has taken initiatives for development of technology, initiation of pilot schemes and standardization of Telemedicine in country. The pilot schemes take into account the diverse issues related to currently available telecommunication infrastructure, specialist availability, geographical considerations, etc. Some of these initiatives are:

DEVELOPMENT OF TELEMEDICINE

As a part of promotion of Telemedicine in India, Department of Information Technology has supported development of technology at different premier institutions in India. The major consideration to develop a Telemedicine platform included its cost effectiveness and conformity to standards so that interoperability between different systems could be a possibility. Efforts have been made to ensure that these systems are compatible with most of the available communication infrastructure in India like PSTN, ISDN, Leased lines and V-SAT. During the development, clinical specialist from major institution like SGPGIMS, Lucknow, PGIMER Chandigarh, AIIMS, New Delhi were also associated to benchmark the technology for its user friendliness and acceptance. A number of Telemedicine software systems including Mercury & Sanjivani by CDAC and Telemedik by IIT Kharagpur have been developed and are in use.

TELEMEDICINE PILOT SCHEMES

Some of the pilot projects initiated by Department of Information Technology are presented below:

- Tele-medicine for diagnosis & Monitoring of tropical diseases in West Bengal using low speed WAN, developed by Webel (Kolkata), IIT, Kharagpur has been installed in School of Tropical Medicine Kolkata and two district hospitals. More than a thousand consultations have already taken place over this network. Another two projects on setting up of telemedicine facilities at five referral hospitals and nine district hospitals using the above technology are also under implementation. Part of this network is already under effective utilization. The system uses the high speed leased lines and West Bengal State Wide Area Network (WBSWAN) as the communication backbone.

- The above technology is also being employed to set up a telemedicine network in the state of Tripura where two referral hospitals in the capital Agartala are being connected with four sub-divisional hospitals. Govinda Ballav Panth Hospital at Agartala has already been connected with the 4 Nodal hospitals and more than 175 consultations have taken place since the inauguration of the network in June 2005.
- An Oncology Network for providing Telemedicine services in cancer detection, treatment, pain relief, patient follow-up and continuity of care in peripheral hospitals (nodal centers) of Regional Cancer Centre (RCC) has been established. The project is implemented by C-DAC, Trivandrum and RCC. More than 4000 patient consultations have been done till date using the network. A cost benefit analysis has shown major economic benefits to the patients. The project is now being upgraded to include high bandwidth VSAT connectivity and other advanced features in Tele-consultation.

In another project Telemedicine & Telehealth Education facilities are being set up of in Kerala using the Technology developed by CDAC Pune in which three speciality medical hospitals are being linked up with 4 District/Rural Hospitals. Continuing Medical Education (CME) will also be part of this project.

- Another pilot scheme of setting up telemedicine centers has been undertaken connecting Apollo Hospital, Delhi with district hospitals in the states of Mizoram and Sikkim with technology developed by CDAC. District hospital at Namchi in south Sikkim and Civil Hospital, Aizwal, in Mizoram have been connected with Apollo Hospital and regular consultations have started.
- Department of IT earlier facilitated setting up Telemedicine system at Naga Hospital, Kohima that is connected with Indraprastha Apollo Hospital, New Delhi. The project was commissioned in partnership with M/s. Marubeni India Private Limited with financial assistance from Govt. of Japan. The network is effectively used for continuing medical education of the doctors and paramedical staff of Naga Hospital.
- A Telemedicine network connecting 14 remote hospitals with Indira Gandhi Medical College Shimla is being set in Himachal Pradesh to provide quality healthcare consultations to population in those areas. Fibre Optic communication backbone of the state is being utilized in this project. CDAC is providing the technology and implementing the project.

STANDARDIZATION ACTIVITY IN TELEMEDICINE

To streamline establishment of telemedicine centers and standardize services available from different Telemedicine centers need to define a set of standards and guidelines for practice of telemedicine is felt. The document, "Recommended Guidelines & Standards for Practice of Telemedicine in India", has been prepared by Department of IT through deliberations of Technical Working Group and is aimed at enhancing interoperability among the various Telemedicine systems being set up in the country. In addition to suggesting standards for various equipment needed for setting up Telemedicine centers, it also provides guidelines for conducting Telemedicine interactions.

BUILDING FRAMEWORK FOR IT INFRASTRUCTURE FOR HEALTH (ITIHI)

An exercise has been carried out to suggest a framework for ITIH to efficiently address all information needs of different stakeholders (government, hospitals, insurance companies, patients, vendors and others) in the healthcare industry. The framework addresses to the key elements of Standards, Legal framework and Medical Informatics Education. ITIH framework prescribes appropriate standards for each stakeholder across diverse healthcare settings towards build an Integrated Healthcare Information Infrastructure for India. A document titled "The Framework for Information Technology Infrastructure for Health in India" has been prepared and is being widely disseminated through DIT website for feedback and comments from the different stakeholders and public infrastructure for Health in India.

2.1.3. State Govt. initiatives in partnership

Jammu & Kashmir

The Telemedicine Pilot Project in Jammu & Kashmir, undertaken by ISRO is extended to cover district hospitals of Kargil, Kupwara, Poonch, and Doda. These hospitals will soon have telemedicine connectivity with the Shere-Kashmir Institute of Medical Sciences, Srinagar, the Government Medical College, Srinagar and the Government Medical college, Jammu. Further, they will also have connectivity with super speciality hospitals in Delhi and Kochi.

Source : http://jammukashmir.nic.in/gov/SNL_aprilmay.pdf

Himachal Pradesh (Under Implementation)

To provide specialized medical care and treatment to the patients in the remote and inaccessible areas from the speciality hospital, the community and primary health centers of Himachal Pradesh will be connected to General Hospitals and IGMSC Shimla which in turn will be connected to PGIMER, Chandigarh, a super speciality hospital, by CDAC under DIT, Govt. of India. Twenty four locations have been identified for the deployment of the project – 14 centres are to be taken in the Phase I and rest of the centers would be connected in the Phase II.

Uttaranchal Telemedicine Project

In April 2004, Uttaranchal Government started this project with the support of Online Telemedicine Research Institute, Ahmedabad to provide speciality consultation and distance learning to the doctors of the district hospitals of Uttaranchal region. In the first phase two district hospitals of Srinagar and Almore got connected to SGPGIMS, Lucknow, a tertiary level referral hospital

Punjab Telemedicine Project

Aimed to provide modern health facilities at affordable prices in remote areas, Punjab Government in April 2005 launched a Telemedicine project linking PGIMER, Chandigarh with three hospitals i.e Mata Kaushalya Hospital at Patiala, the sub-divisional government hospitals at Dasuya and Ajnala in Hoshiarpur and Amritsar districts respectively.

Source : <http://www.hindu.com/2005/04/14/stories/2005041405310500.htm>

West Bengal Telemedicine Projects

A "Non Profitable" project sponsored by Rabindranath Tagore International Institute of Cardiac Sciences (RTICS), Kolkata, Narayana Hrudayalaya (NH) Bangalore, Hewlett Packard, Indian Space Research Organisation (ISRO) and state Governments of the seven North Eastern states of India. The Rabindranath Institute at Kolkata and Narayana Hrudayalaya at Bangalore will be the main hub for Telemedicine linking the seven states.

Orissa Telemedicine Project

This project is sponsored by Indian Space Research Organisation and Govt. of Orissa, in 2003, to support the distant medical education programme. Three Medical colleges of Orissa i.e. SCB Medical College, Cuttack, MKCG Medical College, Behrampur and VSS Medical College, Burla are connected to SGPGIMS via VSAT at 384 kbps bandwidth.

Maharashtra Telemedicine Project

The Pune district administration in partnership with global health portal and Tata Council for Community Initiatives has launched a telemedicine service to connect all the primary health centers in the district for speciality consultation. In the first phase, three PHCs in Wagholi, Chakan & Paud regions would be linked with the district administration and specialist.

Source : http://www.itforchange.net/resources/20_initiatives.html

Karnataka telemedicine Network Project

In the first phase of Karnataka telemedicine project Narayana Hrudayalaya at Bangalore linked to Distrit Hospital, Chamarajanagar in Mysore district and Vivekananda Memorial Hospital, Saragur and in the second phase of this project smaller hospitals in all the 25 districts in North Kanara and the Western Ghats, including NGO and trust hospitals will link with the super speciality hospital Narayana Hrudayalaya and Rabindranath Tagore International Institute of Cardiac Sciences, Kolkata.

Source : <http://www.expresshealthcaremgmt.com/20030228/tech2.shtml>

Kerala Telemedicine Project

In August 2004 with collaboration of ISRO and C-DAC, Kerala Government launched a telemedicine project to provide Telemedicine facilities in five medical colleges, 14 district hospitals and two taluk hospitals in Kerala. These hospitals would be in turn linked with AIIMS, New Delhi, AIMS, Kochi, and Sri Chithira Tirunal Institute of Medical Science and Technology, Thiruvananthapuram. Currently the project is getting expanded and getting integrated with Kerala Onconet (Cancer Network) with the support of ISRO and Department of IT, GOI.

Source : <http://www.cdacindia.com/html/press/3q04/spot434.asp>

In August 2004 with collaboration of ISRO and C-DAC, Kerala Government launched a telemedicine project to provide Telemedicine facilities in five medical colleges, 14 district hospitals and two taluk hospitals in Kerala. These hospitals would be in turn linked with AIIMS, New Delhi, AIMS, Kochi, and Sri Chithira Tirunal Institute of Medical Science and Technology, Thiruvananthapuram.

Source : <http://www.cdacindia.com/html/press/3q04/spot434.asp>

Regional Cancer Centre, Thiruvananthapuram with the support of department of information technology had launched telemedicine project called ONCONET to broadbase diagnostic evaluation and consultation services for cancer patients with telemedicine nodes in six points in the state.

Andaman & Nicobar Telemedicine Project

This project links the G.B. Pant Hospital in Port Blair with the Sri Ramachandra Medical College and Research Institute in Chennai.

In ISRO Telemedicine Network, GB Pant Hospital and INS Dhanvantari Hospital two Hospitals at Port Blair and Indira Gandhi Hospital at Car Nicobar enable the local Doctors to communicate with speciality hospitals like Apollo Hospital at Chennai and Amrita Institute of Medical Sciences at Kochi.

Source : <http://www.and.nic.in/telemedicine.htm>

Lakshadweep

Indira Gandhi Hospital, Kavaratti linked with AIMS, Kochi with the support of ISRO.

Source : <http://www.and.nic.in/telemedicine.htm>

2.1.4. Super speciality hospital Telemedicine Network (Public & Corporate Sector)

Apollo Telemedicine Network Foundation (ATNF)

Apollo has set up over 45 Telemedicine Centres across different locations in the country and abroad.

Source : <http://www.whoindia.org/EIP/GATS/13-Annex2.pdf>

Apollo hospital groups project at Aragonda, serves 24 villages covering 48000 people in the vicinity and provides access to super-specialists at the Apollo hospitals in Chennai and Hyderabad. The project will soon extend across five states, covering 10 districts and 20 village groups in each state. In the next phase of the project 125 primary, Maharashtra, Gujarat, Madhya Pradesh, Tamil Nadu and Andhra Pradesh will be covered. Phase three will connect 500 primary, 500 secondary and 100 tertiary centers all over the country.

Source : <http://medind.nic.in/maa/t05/i1/maat05i1p51.pdf>

The Indian Army has tied up with ATNF for setting up of Telemedicine centers to connect its smaller hospitals in the periphery to its main Command hospitals. Command Hospital (CH, CC), Lucknow is now the hub center and linked to the military hospitals at Jabalpur, Allahabad, Namkum, Meerut, Dehradun and Bareilly. Apollo Hospitals Group free Telemedicine consultation at Naga Hospital, Kohima, Guwahati and Tinsukhia in the North East region.

Source : <http://www.telemedicineindia.com/news.html> accessed on 23rd Sept. 2005

Telemedicine Initiatives at Sanjay Gandhi Postgraduate Institute of Medical Sciences (SGPGIMS), Lucknow, Uttar Pradesh

SGPGIMS is linked with three medical colleges of Orissa i.e. Cuttack, Berhampur and Burla under ISRO/DIT funding and with district hospitals of Almora and Srinagar in Uttaranchal region under Govt. of Uttaranchal support to provide tele-education, tele-consultation and tele-followup services. Through National Informatics Centre (NIC) project, CME sessions are conducted monthly towards professional carrier development of doctors with 8 district hospitals and 450 Community Information Centres of North East States. SGPGIMS is connected via satellite and ISDN to similar facilities with other tertiary level hospitals like AIIMS, New Delhi, PGI, Chandigarh, AIMS, Kochi, SRMC, Chennai. Under a project of Ministry of Information Technology, the Mercury

and Sanjeevani software for telemedicine was developed by SGPGIMS, AIIMS and PGIMER in collaboration with Centre for Development of Advanced Computing (C-DAC) as part of Research and Development. SGPGIMS is now setting up a School of Telemedicine & e Health in its campus with the objective of meeting the demand of highly skilled health technologist in this emerging area. The department of radiotherapy of SGPGIMS with support of Department of Science and Technology is planning to link the radiotherapy department of medical colleges of Uttar Pradesh.

Source : www.sgpgitelemedicine.in

The Amrita Institute of Medical Sciences (AIMS) Telemedicine facility

AIMS is presently connected to the following Telemedicine centers in India: SRMC, Chennai; Sankara Netralaya, Chennai; Indira Gandhi District Hospital, Kavaratti, Lakshadweep Islands; GB Pant Hospital, Port Blair, Andaman & Nicobar Islands; Sanjay Gandhi Post Graduate Institute of Medical Sciences, Lucknow; SNM hospital, Leh-Ladakh; Katuah district Hospital, J&K; Govt. District hospital, J&K; Swami Vivekananda memorial Hospital, Sargur, Karnataka; District Hospital, Carnicobar, Andaman & Nicobar Islands; AIIMS, New Delhi; Trivandrum Medical College; Pattanamthitta District Hospital, Kerala; Narayana Hrudayalaya, Bangalore; Ravindranath, Kolkata; Ramchandra Bhanja, Cuttack.

The Indian Space Research Organisation (ISRO) has drawn up ambitious plans to extend AIMS Telemedicine facility to connect 80 more district hospitals to speciality hospitals in the north eastern states of India.

Source : <http://www.chennaionline.com/health/homearticles/2003/AIMS.asp> accessed on 23rd Sept. 2005.

Asia Heart Foundation (AHF)

AHF is an organization working towards establishing cardiac network in and around the country with establishment in Bangladesh and The Republic of Yemen. Installed in 2002 by Narayana Hrudayalaya, Bangalore, Karnataka it has now achieved a figure of more than 2000 tele-cardiology consultation through an enterprise based network. Creating a Hub and Spoke Network between the Tertiary Care Centres in the Cities and the peripheral Coronary Care units in the remote areas.

Source : <http://www.expresshealthcaremgmt.com/20011231/bangalore2.shtml>

Escort Heart Institute & Research Centre Project :

Installed in 2002 by Escort Heart Institute & Research Centre, it has been involved in telecardiology service.

Mobile Tele-Ophthalmology service :

With the support of ISRO, Shankar Nethralaya at Chennai, Meenakshi Eye mission at Madurai & Arvinda Eyecare Centre has Centres at Madurai, Theni, Tirunelveli & Coimbatore districts of South India have launched Mobile Tele-ophthalmology to give tertiary care service on wheels.

Telepathology India

Telepathology India is a free consultancy service and distance learning by the use of the internet in the field of diagnostic pathology. Telepathology is basically "Second Opinion" on gross and microscopic images which have been amply proved in the world literature to be useful for those pathologists staying in remote areas.

Source : <http://www.telepathology.org.in/about.html>

3. The Telemedicine/ e Health Grid

The Primary Health Care Centre (PHC) is the first echelon in the health care delivery system in India, which cater to a group of villages and are posted with General Duty Medical Officers. There are sub centers under the PHCs, which cater to the remote villages. Community Health Centers (CHC) are located at the block levels.

The PHCs and CHCs can be connected to the respective District/General Hospitals, where basic speciality care is available. This is as per the existing patient referral chain. The doctors from the PHCs will be able to take expert opinion from the specialists without sending the patient. Even if the patient requires specialized treatment at the CHCs/District hospitals, a prior appointment can be taken, saving the patient a repeat trip due to non availability of a specialist/malfunctioning equipments.

The District Hospitals can be connected to the regional Super Speciality Hospitals/teaching hospitals as per the chain of patient referral. The district hospitals can also be connected amongst themselves, which will help to obtain a second opinion or getting expert comment from concerned specialists in case of non-availability.

Ultimately a patient can be referred to the national facility centers/premier institutes if so desired. Due to the vast geographical area of our country and huge numbers of health care centres, it may not be feasible to keep the whole network under one platform. There can be independent state level TM networks connected with the countrywide network.

In addition to the above, other governmental/semi-governmental organizations like the railways, defence services, oil and steel PSUs have their own large medical setups. Some of these organizations have started developing their own TM networks. It may be planned from the very outset to integrate these smaller networks to the national TM setup.

The issues to be considered for the National Telemedicine/Health Grid (Configuration, management, layering etc.), will include issues on Telecommunication for e-Health (defining optimum cost-effective bandwidth application wise, mix and match connectivity solution etc.), unlicensed spectrum under USO, Co-ordination with DOT/TRAI/ERNET/Public-Private broadband connectivity providers (BSNL, MTNL, GAILTel, PowerTel, RailTel, TataIndicom, Reliance etc.), Wireless LAN option with WiMax technology, Broadband Internet based telemedicine applications.

4. Implementation issues in Telemedicine

With the rapid growth of telecommunication technologies and the availability of adequate bandwidth at reasonable cost, telemedicine is bound to spread all over the country and reach the far-flung areas.

A need has therefore arisen to put in place a regulated network with proper referral mechanism for teleconsultations from the periphery to the super-speciality hospitals. A basic model for setting up a Telemedicine network with a large teaching hospital at the apex is proposed in the following paragraphs.

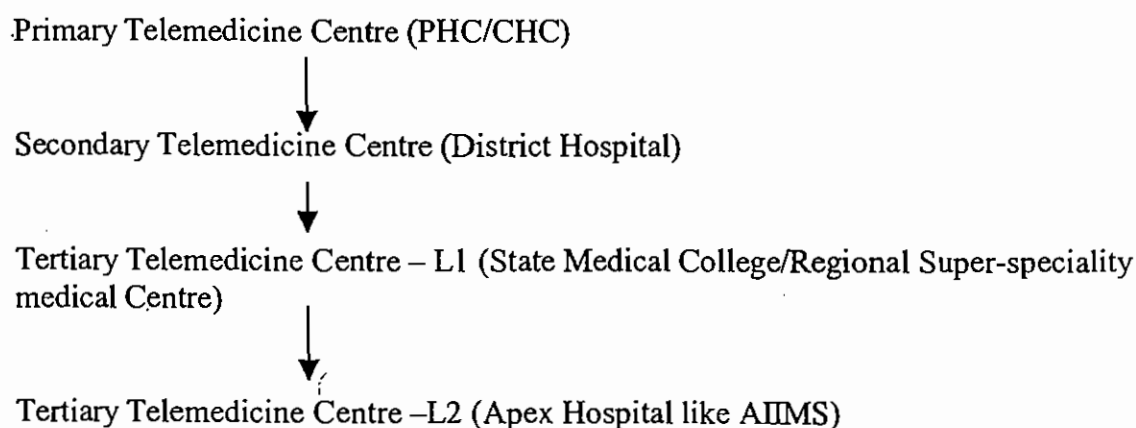
There are certain points which need to be kept in mind before setting up a network for Telemedicine.

- (a) Interoperability : The Telemedicine networks must be able to interface together and create an open environment which permits the sharing of various applications on different participating systems in real-time or seamless interface between several applications.
- (b) Scalability : It must be possible for the systems inducted to be augmented with additional features and functions as modular add-on options.
- (c) Portability : It must be possible to port data generated on one system to another platform with minimum effort
- (d) Reliability : Telemedicine systems must ensure availability of service with minimum system downtime.

4.1. Implementation Strategies

In a large country like India having vast area with different environmental and health care issues, it is important to carry pilot projects for testing and framing/planning of any project at a large scale and extend it country wide. The benefit of the telemedicine must first be extended at the rural level in plains and difficult terrain and inaccessible areas in the mountains like Leh and Zaskar. Careful strategy and planning would ensure that the bottlenecks that may come in the way of implementation of Telemedicine project are recognized and removed before it is implemented at national level.

A schematic diagram of a possible referral model is given below which ensures the availability of the telemedicine facility to be available at the Primary Health Centre :-



It is therefore necessary to prepare such pilot projects in different parts of the country to work simultaneously, results of which may help establish the national grid in a successful manner.

Annexure

Table-1 State wise location of telemedicine platforms

Sl. No.	State	District hospital, CHC & PHC	Types of Communication	Funding and Implementing Agencies
1	Jammu & Kashmir	Kargil, Kupwara, Poonch, Doda, Leh	VSAT	ISRO
2	Himachal Pradesh (Implementation)	Chamba, Tissa, Hamirpur, Dharamshala, Recong-Peco, Kullu, Sangla, Mandi, Shimla, Rampur, Khaneri, Rohru, Pooh, Nichar, Bharmaur, Bilaspur, Keylong, Nahan, Solan, Una, Killar, Shalai, Kwar, Udaipur, Kaza	Leased line, VSAT & ISDN	DIT, CDAC
3	Punjab	Mata Kaushalya Hospital, Patiala, Govt Hospital, Hoshiarpur & Amritsar	VSAT	ISRO
4	Uttaranchal	Almora & Srinagar Base Hospitals	ISDN	Govt of Uttaranchal
5	West Bengal	Coochbehar, Habra, Midnapore, Behrampur, Suri, Purulia	ISDN & VSAT	IIT Kharagpur, Webel ECS Ltd.
6	Orissa	Medical Colleges at Cuttack, Burla, and Berhampur	VSAT	ISRO, DIT
7	Maharashtra	Primary Healthcare Centres Wagholi, Chakan & Paud villages of Pune		Pune District Adm, Global Health portal & Tata Council for Community Initiatives
8	Karnataka	Mandya, Maddur, Tumkur, Shimoga, Chitradurga, Bagalkot, Yaddgir, Gadag, Kavar(operational), Bidar, Gulbarga, Bijapur, Raichur, Belgaum, Dharwad, Coppala, Haveri, Bellary, Davangere, Udipi, Chikmangalur, mangalore, Hassan, Madikeri, Mysore, Kolar, Sirsi(to be linked).	VSAT, ISDN	ISRO
9	Kerala	14 district hospital and 2 taluk hospital, Kollam, Kozhencherry, Kochi, Palakkad and Kannur	VSAT, ISDN	ISRO, DIT, CDAC, Trivandurm, Malabar Cancer Society
10	Andman & Nicobar	G B Pant Hospital and INS Dhanvantri Hospital in Port Blair, Indira Gandhi Hospital at Car Nicobar are linked with Sri Ramachandra Medical College and Apollo Hospital, Chennai.	VSAT	ISRO
11	Lakshdweep	Indira Gandhi Hospital, Kavaratti linked with AIMS, Kochi.	VSAT	ISRO

Table II. Super Speciality Hospital Telemedicine Network (Public & Corporate Sector)

Sl. No	Super Speciality Hospital	Telemedicine nodes linked with	Type of communication	Funding & Implementing Agencies
1.	SGPGIMS Lucknow	Orissa, Uttaranchal State network	VSAT, ISDN	ISRO, DIT, Govt. of Oriss. Uttaranchal
		AIIMS, New Delhi PGIMER Chandigarh	ISDN	DIT, CDAC Mohali
		AIMS, Kochi, SRMC, Chennai	VSAT&ISDN	
		Eight states of North East	VSAT	NIC
2.	All India Institute of Medical Sciences, New Delhi	J&K network, Haryana (Rohtak Medical College, Ballabgarh Community Centre), Cuttack, Guwahati, Chennai, Kochi	ISDN, VSAT	DIT, ISRO, CDAC, Mohali
3.	PGIMER Chandigarh	Punjab and Himachal network, SGPGIMS Lucknow, AIIMS, New Delhi	VSAT, ISDN	ISRO, DIT and Govt. of Punjab and Himachal
4.	Amrita Institute Medical Sciences (AIMS), Kochi	SRMC, Chennai; Sankara Netralaya, Chennai; Indira Gandhi District Hospital, Kavaratti, Lakshadweep Islands; Andaman & Nicobar Network; Sanjay Gandhi Post Graduate Institute of Medical Sciences, Lucknow; J&K Network; Swami Vivekananda memorial Hospital, Sargur, Karnataka; AIIMS, New Delhi; Trivandrum Medical College; Pattanamthitta District Hospital, Kerala; Narayana Hrudayalaya, Bangalore; Ravindranath, Kolkata; Ramchandra Bhanja, Cuttack, AIMS Emergency Medical Centre, Pampa	VSAT	ISRO
5.	Tata Memorial Hospital, Mumbai	Cancer Hospital at Barshi, Dr. B. Barooah Cancer Institute at Guwahati, Dr. Walawalkar Hospital at Dervan, Chiplun, Six Hospitals in the North east and Regional Cancer Centres		
6.	Asia Heart Foundation, Bangalore	Rabindranath Tagore International Institute of Cardiac Sciences (RTIICS) Calcutta, Narayana Hrudayalaya (NH), Bangalore	VSAT	ISRO
7.	Shankar Nethralaya, Chennai, Meenakshi Eye Mission & Arvinda Eyecare Centre, Madurai (Mobile Teleophthalmology)	Mobile tele-ophthalmology	VSAT	ISRO
8.	Apollo Hospital Group	Apollo Hospitals, Hyderabad, Aragonda village in Andhra Pradesh	33 nodes in India 24 villages	ISRO, Apollo Telemedicine Network Foundation (ATNF)
