Gujarat Earthquake Relief Mission
Fourth Report of WHO Activities following the Earthquake
(1 February - 31 July 2002)

WORLD HEALTH ORGANIZATION
Gandhinagar, Gujarat (India)
December 2002

Comments of Mr Ashok Bhatt, Hon'ble Minister for Health & Family Welfare, Government of Gujarat

Comments of Mr SK Nanda, Health Secretary, Government of Gujarat

Comments of Mr Amarjeet Singh, Commissioner of Health, Government of Gujarat

Background

From Disaster to Development - WHO's Role in the Gujarat Earthquake

Comments about WHO's contribution in relief and rehabilitation after the earthquake by Dr Tej Walia, Ag. WHO Representative to India

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Towards Sustainability - Expansion of Activities to other Districts

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Comments of Dr Bipin Verma, WHO Focal Point for EHA activities in India, who was spearheading the relief operations

Comments of Dr N Davadasan, National Professional Officer, Communicable Diseases, WHO/India [NPO(CDS)]

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Being a National UN Volunteer with WHO

Integrated Disease Surveillance (IDS) Implies

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Developing Operational Guidelines

Comments of the Regional Deputy Director, Gandhinagar

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4. Progress Report - Training Programmes for WATSAN

After many joint meetings with the Government of Gujarat and the European Commission, the Government of Gujarat and WHO signed the Letter of Agreement on 5 June 2002 for establishing Integrated Disease Surveillance in eight earthquake-affected districts of Gujarat. The Hon'ble Minister of Health and Family Welfare and the Health Commissioner of Gujarat hailed this occasion as a “historic moment” for Gujarat. Both the Government of Gujarat and WHO see it as a new beginning and hope for a long-term relationship. The Hon'ble Minister felt that WHO had an important role to play in helping the Government of Gujarat in reducing the morbidity and mortality rates and improving the lives of the people of Gujarat, especially the women and children.
Gujarat Earthquake Relief Mission

WHO Gujarat Team with Dr Tej Walia, Ag. WHO Representative to India, and Dr Bipin Verma, WHO EHA Focal Point, New Delhi

Report of WHO Activities, 1 February - 31 July 2002
Comments of Mr Ashok Bhatt, Hon’ble Minister for Health & Family Welfare, Government of Gujarat

An informal meeting with Hon’ble Mr Ashok Bhatt, Minister of Health & Family Welfare, Government of Gujarat, during his visit to the WHO Office, Gandhinagar

The World Health Organization has played a very crucial role in overall coordination of the medical relief and rehabilitation after the earthquake, which rocked Gujarat, and especially Kachchh, leaving misery and death behind. WHO assistance in disease and water quality surveillance has helped in the prevention of communicable disease outbreaks, avoiding further distress to the earthquake victims.

Even after the earthquake, we have found WHO always cooperative to give technical support for any health related matter. We feel strengthened by the presence of WHO in Gujarat and look forward to a long-term association.
Comments of Mr SK Nanda, Health Secretary, Government of Gujarat

The Government of Gujarat appreciates the support given by WHO in the aftermath of the earthquake. WHO worked very efficiently, giving weekly reports on the status of communicable diseases in Kachchh. The prevention of any epidemic outbreak after such a catastrophe has been one of the success stories of the health sector. We could have benefited more if WHO could have helped with the severely injured, so that the Government could have planned the rehabilitation of the disabled and injured with much more accuracy.

Comments of Mr Amarjeet Singh, Commissioner of Health, Government of Gujarat

Teams like the WHO team are required to handle the most important task of coordination after such a massive earthquake as the one which hit Gujarat. This task was carried out with great confidence and skill. It was also a great achievement that there was no major disease outbreak after the calamity.

One could unhesitatingly approach the WHO team for any technical guidance or help even after the emergency. This has been of great value to the Department of Health. We look forward to future support in establishing a sensitive disease surveillance system in Gujarat, which will indirectly strengthen the systems of reporting, and quality of services.
Background

Three reports have been issued describing the activities undertaken by WHO after the devastating earthquake hit the Kachchh district of Gujarat on 26 January 2001 affecting 37.8 million people covering the period 26 January 2001 - 31 January 2002. This is the fourth report in the series, for the period 1 February - 31 July 2002.

WHO has reached the conclusion stage of the Relief Mission in Gujarat. The report includes a section on reflections of the experiences of the Relief Mission after the earthquake, and some feedback and comments from agencies and individuals who worked closely with WHO for the Relief Mission.

From Disaster to Development - WHO's Role in the Gujarat Earthquake

As a part of its Emergency Humanitarian Action (EHA) programme, the WHO team responded to the calamity of January 2001. The objective of EHA is stated as:

“Through a concerted effort across WHO to increase the capacity and self-reliance of countries in the prevention of disasters, preparation for emergencies, mitigation of their health consequences and the creation of a synergy between emergency action and sustainable development”.

In keeping with this objective, WHO responded to the Gujarat earthquake which caused loss of life and property on a large scale. The death toll was estimated to be about 14,000 and the number of injured and treated were estimated to be around 166,834. There was large-scale destruction of the public services infrastructure such as water supply system, health facilities, schools, and colleges. The health facilities at the primary and tertiary levels were completely destroyed. WHO was one of the leading international organizations to respond to the earthquake. Since then, WHO has progressed to the stage of creating a synergy between emergency action and sustainable development. The path followed by WHO is briefly described below.
Comments about WHO’s contribution in relief and rehabilitation after the earthquake by Dr Tej Walia, Ag. WHO Representative to India

In the aftermath of the Gujarat earthquake in January 2001, the World Health Organization, in close association with the Government of Gujarat, undertook several health sector initiatives in the earthquake-affected areas for which a coordinated, adequate and timely health sector response could be mobilized by WHO. Thanks to the financial contributions received from the Director-General, WHO; Regional Director, WHO/SEARO; Office of Foreign Disaster Assistance (OFDA), USA, and the Department for International Development (DFID), UK, sustainable relief was provided to the affected population without loss of time. WHO's technical and financial support in the Kachchh district has been widely acclaimed by the Government of Gujarat. Based on successful inputs by WHO, the Government of Gujarat is keen to establish similar systems in other earthquake-affected as well as disaster-prone areas.

The request from the Government of Gujarat has demonstrated that an effective field disaster response could voluntarily generate demand for planned health sector emergency/disaster preparedness activities, which otherwise are forgotten, leading to ad hoc response during future emergencies/disasters. This experience is a typical example of converting emergency response to sustainable development.

Phases 1 and 2 - Relief and Rehabilitation in the Worst Earthquake-affected District

WHO set up a temporary base in Kachchh which was the worst-affected district of Gujarat. During Phase 1, i.e. relief operations, the role of WHO was to conduct a rapid assessment of the health needs of the populations in the affected areas, in cooperation with UNDAC, and provide trauma kits, emergency health kits and other essential
medical supplies. A detailed account of these activities is given in the progress report for the period 26 January - 30 April 2001.\(^1\)

### Highlights of Activities in Phases 1 and 2

#### Disease Surveillance

Supported the Government of Gujarat in establishing disease surveillance in the affected areas, including an early warning system and capacity for rapid response to epidemics:

- New formats for disease surveillance were developed and used.
- A weekly reporting system was established. Weekly reports of incidence of communicable diseases were published and circulated.
- The private sector participated actively.
- Training of medical officers on epidemiology, disease surveillance and management of diseases of public health importance was undertaken.

#### Water and Sanitation

Provided technical support for emergency repair of the water distribution system, water treatment and temporary distribution, sanitation and solid waste disposal, food safety, vector and zoonosis control:

- Established and enhanced coordination between the Health Department and the Water Board.
- Trained health staff on water quality monitoring and chlorination according to priorities in the risk areas.
- Strengthened surveillance of water quality (measuring residual chlorine) regularly and provided immediate feedback to the water supply departments and panchayat divisions for immediate response.
- Reviews at the district level by the Collector and the District Development Officers to ascertain timely actions.

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\(^1\)WHO Gujarat Relief Mission - First quarterly report of WHO activities following the earthquake, 26 January to 30 April 2001.
Teams from the existing WHO programmes, from the National Polio Surveillance Programme (NPSP) and the Revised National Tuberculosis Control Programme (RNTCP), were mobilized to undertake WHO activities. A team of experts from all over the world was called to assess the situation.

Consequently, three projects were conceptualized, namely, Disease Surveillance, Water and Sanitation (WATSAN) and Health Sector Coordination. All three projects were initiated in the emergency phase and were carried over to the rehabilitation phase. Three National Professional Officers (NPOs), seven National UN Volunteers (NUNVs) - five doctors and two sanitary engineers - and four support staff constituted the WHO team in Gujarat.

### Towards Sustainability - Expansion of Activities to other Districts

After the success of the efforts in Kachchh, as indicated by the fact that there was no disease outbreak in the aftermath of the earthquake, the Disease Surveillance and WATSAN activities were expanded to seven other earthquake-affected districts and three municipal corporations of Gujarat in the month of December 2001. The details are given later in the report.

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WHO’s presence in the State of Gujarat

At the request of the Government of Gujarat (GoG), the WHO field office established in Kachchh in the aftermath of the earthquake, was shifted to the State capital in Gandhinagar, for providing technical input in eight districts. The State Office was inaugurated on 15 December 2001. GoG has provided office space to WHO to begin sustainable interventions in the State.

The WHO Office started functioning in Gandhinagar under the guidance and technical support of WHO India Country Office. In addition to the integrated disease surveillance, many additional activities are being considered in close association with the concerned State authorities, such as guidelines for surveillance of noncommunicable diseases, NGO partnerships for pilot innovative projects, development of public health resource centre at the State Headquarters, a disaster epidemiology training course for the Government officials, and improvement of water and sanitation facilities in the health institutions.

Comments of Dr Bipin Verma, WHO Focal Point for EHA activities in India, who was spearheading the relief operations

Following the major earthquake in Gujarat on 26 January 2001, one of the challenges for the health sector was to meet the immediate public health needs of the affected population of about 4 million spread over five towns and almost 9,000 villages, of which 17,000 were killed and 1,450,000 seriously injured. Just three days after the event, WHO had field presence in the earthquake-affected area. I had the responsibility of accompanying the UNDAC team and subsequently leading the WHO team in the Kachchh district. On 9 February 2001, seventeen WHO professionals were assisting the local health authorities in the affected area consisting of four senior public health experts, five medical officers, a sanitary engineer, an information officer, and administrative and logistic staff. Rapid surveillance and response teams fanned out across the
affected area, working under WHO guidance. A WHO field sub-office was set up to coordinate work until communications were re-established. WHO provided assistance in terms of general and public health need assessment of earthquake damage, health sector coordination, timely distribution of emergency trauma kits and emergency health kits, funds and equipment for a new epidemiological cell under the district health authorities and daily reporting through the daily UN situation report. Provision of mobile and satellite phones and vehicles to the senior government health staff facilitated effective communication, monitoring and evaluation of the activities during emergency phase.

WHO-led coordination resulted in listing of damaged health facilities, preparation of action plan for restoration, re-establishment and rehabilitation of health services in affected areas with special attention to primary health care, containment of disease outbreaks and enhancement of capacity/capability of disease surveillance practices and coordinated water quality surveillance. WHO maintained a decentralized presence in Gujarat, assisting the State health authorities in coordinating action for rehabilitation and reconstruction throughout 2001.

The lessons learnt in Gujarat were the subject of the Workshop on Integrated Disease Surveillance held in Gandhinagar on 6 May 2002. Two important spin-offs of the lessons learnt exercise and of the continuing field work were enhanced collaboration between WHO and the Government of Gujarat leading to expansion of WHO technical input in eight additional districts, and the growth of awareness and interest in emergency preparedness on the side of the State health authorities.
The Government of India has made a policy shift from individual disease surveillance to integrated disease surveillance. This includes integration of the reporting systems for common epidemic-prone diseases, integration of the private sector with the public sector and also integration of urban surveillance with the rural surveillance mechanisms.

With WHO technical support in the aftermath of the Gujarat earthquake, the Government of Gujarat initiated Integrated Disease Surveillance (IDS) in the Kachchh District on a pilot basis. In fact, it has gone beyond disease surveillance and should actually be labelled as Integrated Public Health Surveillance since water quality surveillance is an integral part of the surveillance there. Operational for more than a year, the Government is keen to expand the Kachchh experience in eight districts.

In this direction, WHO and the Government of Gujarat organized a sensitization workshop on Integrated Disease Surveillance for the senior staff of eight districts. The commitment of the Gujarat Government was evident from the fact that the workshop was inaugurated by the Commissioner of Health himself. In spite of the ongoing civil strife, there was 100% attendance by the trainees. The sessions were well accepted and pertinent questions were asked to clarify the issues.

With this excellent support and the technical backing of the WHO team in Gujarat, I am sure that the IDS will soon be upscaled to cover the entire State.
Being a National UN Volunteer with WHO

The private clinic in which I was working was a reporting unit for the Disease Surveillance Programme of WHO after the earthquake. By sheer chance, I started visiting the same clinic as one of the Surveillance Officers of WHO to collect reports on diseases. It was a great opportunity to become a NUNV of the greatest public health organization.

WHO has a good work culture and provides excellent technical and administrative support to its workers. Here, I could get a panorama of experiences with all the levels of the health system from the grass-roots paramedical worker to the Health Minister and international experts on health. I could grow here as a professional and a humanbeing by serving the community.

I am ready to face the challenge of establishing a disease surveillance system in peace time in the other districts of Gujarat.

Dr Mukesh Prajapati

Integrated Disease Surveillance (IDS) implies:

- Integration of vertical health programmes with routine disease surveillance. Water quality surveillance with disease surveillance.
- Integration and coordination of resources and manpower of all vertical health programmes.
- Coordinated participation of NGOs, grants-in-aid and private sector health facilities in disease surveillance.
- Involvement of all health units of the district and private doctors in the surveillance system.
- Integration of water quality surveillance with disease surveillance, partnership with GWSSB, urban development and panchayat departments.
- Involvement of urban and rural health institutions of the health department, such as the municipal corporations and the district health machinery.
- Involvement of health and other departments.

The Disease Surveillance system is being strengthened in the eight districts, namely, Kachchh, Surendranagar, Mahesana, Patan, Jamnagar, Rajkot, Ahmedabad, and Banaskantha. The details of the population covered and the available government health infrastructure is given in Table 1 below. If there is hundred per cent reporting compliance, there will be 416 (PHCs, CHCs, General Hospitals) reporting units of the Government in these eight districts.

**Table 1: Details of Districts for IDS**

<table>
<thead>
<tr>
<th>Districts</th>
<th>Population</th>
<th>No. of Talukas</th>
<th>Existing Government health infrastructure</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>PHC</td>
</tr>
<tr>
<td>Kachchh</td>
<td>1,526,321</td>
<td>10</td>
<td>37</td>
</tr>
<tr>
<td>Surendranagar</td>
<td>1,515,147</td>
<td>10</td>
<td>28</td>
</tr>
<tr>
<td>Mahesana</td>
<td>1,837,696</td>
<td>8</td>
<td>48</td>
</tr>
<tr>
<td>Patan</td>
<td>1,181,941</td>
<td>8</td>
<td>27</td>
</tr>
<tr>
<td>Jamnagar</td>
<td>1,913,685</td>
<td>10</td>
<td>36</td>
</tr>
<tr>
<td>Rajkot</td>
<td>3,157,676</td>
<td>14</td>
<td>43</td>
</tr>
<tr>
<td>Ahmedabad</td>
<td>1,899,000</td>
<td>10</td>
<td>41</td>
</tr>
<tr>
<td>Banaskantha</td>
<td>2,502,843</td>
<td>13</td>
<td>61</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>15,534,309</strong></td>
<td><strong>83</strong></td>
<td><strong>321</strong></td>
</tr>
</tbody>
</table>
The main activities include timeliness and completeness in reporting, training of medical officers on various related subjects, establishment of task force, and assistance in outbreak investigation. An integrated system for surveillance of communicable diseases would be implemented in the coming months.

**Strategy for Expansion of Disease Surveillance Activities**

**(a) Objective of Expansion**

- To establish and strengthen the disease surveillance and water quality surveillance, and epidemic preparedness systems in the seven worst earthquake-affected and most needy districts and three corporation areas which are vulnerable to occurrence of outbreaks of epidemic potential in the Gujarat State.
- To facilitate the implementation of vertical national health programmes by available resources and manpower with active coordination and participation of NGOs and private sector to get early warning signals and prevent and control morbidity and mortality.

**(b) Strategy**

- Building integrated, coordinated, and positive partnerships with all stakeholders to improve and enhance coverage for data analysis and prediction.
- Providing technical inputs to the districts with assistance in building infrastructure such as strengthening the laboratories, communication, etc.
- Building the capacities of the medical and paramedical staff for sustainable programme implementation.
- Developing feasible reporting systems for data collection, compilation, analysis and action through core groups and task force.
Activities missed
Malaria should have been included in the disease surveillance programme. Another matter which was missed was follow-up of the paraplegic patients and psychosocial problems.

Future Scope of Activities
WHO can play an important role in surveillance of communicable and noncommunicable diseases, strengthening the immunization programme, introducing new vaccines such as MMR in the national immunization programme, and capacity building of the technical staff in the health department.

Comments of the Chief District Health Officer, Kachchh

Work done by WHO

Activities missed
Malaria should have been included in the disease surveillance programme. Another matter which was missed was follow-up of the paraplegic patients and psychosocial problems.

Future Scope of Activities
WHO can play an important role in surveillance of communicable and noncommunicable diseases, strengthening the immunization programme, introducing new vaccines such as MMR in the national immunization programme, and capacity building of the technical staff in the health department.

Comments of the Additional District Health Officer, Kachchh

We were very happy with the work done by WHO in the field of disease surveillance during the period immediately after the earthquake. It improved the motivation of the professionals in the health department. Unfortunately, it was scaled down and wound up too soon. It should have been institutionalized. After all, disease surveillance is not just for emergencies. It is a core function of public health.

What was missed?
Some important aspects which could have been included in WHO activities are surveillance and follow-up of malnutrition and rehabilitation of the trauma victims.
Activities Undertaken

Three surveillance officers (National UN Volunteer doctors) now share offices and other resources with NPSP (National Polio Surveillance Programme) officers in the field (Rajkot, Mahesana and Gandhinagar) to build on existing system and network of different surveillance activities. Currently, five NUNV doctors and two NUNV sanitary engineers (water and sanitation) work in the field for the integration of disease surveillance and coordinated water quality surveillance in eight needy districts of north-west Gujarat. Also, a very good understanding has been established amongst different WHO supported national programmes (NPSP, RNTCP) to share information and resources.

The major activities during the reporting period were:

Revising Reporting Formats

Formats for syndromic reporting and laboratory surveillance are being developed taking into account the prevalence of diseases of epidemic potential, with close interaction and sharing of expert opinion with senior officers of the Commissionerate of Health and the State Coordinator of Malaria, Gujarat State. These formats will help in studying the trends of morbidity and mortality as well as emergence and re-emergence of diseases of public health importance.

These formats were shared with the State and district health officials in a Workshop on Integrated Disease Surveillance (IDS) held in Gandhinagar on 6 May 2002 (brief report given on page 27) to get their comments and feedback. The participants gave valuable comments which have since been used to revise the formats. Overall, the participants found the formats easy to understand and appropriate.

Formats are developed for reporting units at district level and for both surveillance data from the PHC and the data of laboratory surveillance (Annexes 1 and 2).
**Developing Software for IDS**

User-friendly software has been developed for IDS with the help of the Remote Sensing and Communication Centre (RESECO). It is possible to use this software at the State and district levels for data analysis. This software will ensure quick data analysis and reports which can be used for rapid action. These reports can be shown on maps using the Geographical Information System (GIS). For the first time in Kachchh, disease surveillance data was shown on maps for easy readability. The software was demonstrated during the IDS Workshop held on 6 May 2002. The health officials welcomed the idea of using computers for data analysis but stressed the need for training in the use of computers. Sample windows of the software are given in Annex 3.

**Cases of Diarrhoea in Earthquake-affected districts of Gujarat**

This is an example of the use of GIS in the analysis and reporting of disease surveillance data. The map shows the incidence of diarrhoea in the eight project districts for the month of May 2002.

Source: Commissionerate of Health, GOG
Developing Operational Guidelines

A draft of detailed operational guidelines for implementing IDS has been developed. These guidelines touch upon technical details on disease surveillance, case definitions, formats and procedures, monitoring and outbreak investigation. Core activities for integrated surveillance and supportive function are described for developing the skill and knowledge of the professionals in the field. These activities are for epidemic preparedness such as vigilance and prediction, detection, confirmation of outbreaks and appropriate response.

The guidelines also suggest operational strategies and mechanisms for implementing IDS through task forces and core groups at the State and district levels, with clarity of roles of various Government and other bodies.

Once finalized, these guidelines will be used for training purposes and will be distributed as reference material to health officials while implementing IDS.

Comments of the Regional Deputy Director, Gandhinagar

WHO’s Work in Kachchh

All the activities of WHO in Kachchh were very well implemented. These were relevant and need-based.

What could have been done better?
Communication and reporting systems for disease surveillance should be well explained to working medical and paramedical staff.

What was missed?
WHO should actively intervene in primary health care, and help the Government in establishing an effective follow-up system for the disabled victims of the earthquake.
Future Scope of Activities

Train teams for disaster management, train the field teams in analysis of reports and data for planning.

Training Activities

In keeping with the needs of the programme, the important areas of training and the category of Government and other personnel to be trained, were decided in close consultation with the Government of Gujarat.

Table 2: Details of Training Programmes

<table>
<thead>
<tr>
<th>District</th>
<th>Dates</th>
<th>Topics</th>
<th>Participants</th>
<th>No.</th>
</tr>
</thead>
</table>
| Surendranagar| 22 March 2002  | • Epidemic preparedness  
• Outbreak investigation  
• Importance of water quality monitoring and surveillance  | CDHO, DIO, DTO, MO, District Supervisors                                    | 54  |
| Patan        | 26 March 2002  | • Epidemic preparedness  
• Outbreak investigation  
• Importance of water quality monitoring and surveillance  | CDHO, ADHO, DIO, DTO, EMO, MO, District Supervisors                          | 35  |
| Banaskantha  | 2 April 2002   | • Epidemic preparedness  
• Outbreak investigation  
• Importance of water quality monitoring and surveillance  | CDHO, ADHO, DIO, DTO, EMO, MO, District Supervisors                          | 80  |
| Mahesana     | 5 April 2002   | • Epidemic preparedness  
• Outbreak investigation  
• Importance of water quality monitoring and surveillance  | CDHO, ADHO, DIO, DTO, EMO, MO, District Supervisors                          | 75  |
| Jamnagar     | 9 April 2002   | • Epidemic preparedness  
• Outbreak investigation  
• Importance of water quality monitoring and surveillance  | CDHO, ADHO, DIO, DTO, MO, District Supervisors                              | 48  |
### Districts and Dates of Training

<table>
<thead>
<tr>
<th>District</th>
<th>Dates</th>
<th>Topics</th>
<th>Participants</th>
<th>No.</th>
</tr>
</thead>
</table>
| Rajkot     | 30 April 2002 | • Epidemic preparedness  
• Outbreak investigation  
• Importance of water quality monitoring and surveillance | CDHO, ADHO, DIO, DTO, MO, District Supervisors | 71  |
| Rajkot     | 28 May 2002  | **Laboratory surveillance**  
• Importance of laboratory surveillance  
• Collection, storage, transportation of laboratory samples | District Health Officials - MOs of CHC, PHC and Civil Hospitals, District Supervisors and selected Superintendents of CHCs | 62  |
| Jamnagar   | 30 May 2002  | **Laboratory surveillance**  
• Importance of laboratory surveillance  
• Collection, storage, transportation of laboratory samples | District Health Officials - MOs of CHC, PHC and Civil Hospitals, District Supervisors and selected Superintendents of CHCs, Laboratory Technicians | 75  |

Training programmes covering the following topics were conducted:
- Epidemic preparedness
- Outbreak investigation
- Importance of water quality surveillance
- Strengthening laboratory surveillance - collection, storage and transportation of laboratory samples

As seen in Table 2 above, some districts have not been covered because of the situation in Gujarat. These training programmes will be completed in due course. More than 20 training sessions were conducted on water and sanitation for a wide variety of participants such as medical officers, district health officials, members of panchayat, and school teachers. Details of the training programmes under WATSAN are given in Annex 4.
Building Linkages

The NUNVs of WHO play a vital role in building linkages with various service providers at the field level such as with medical colleges, the private sector, and Regional Deputy Director (RDD). A large chunk of their time is spent in liaison and coordination as described in the “A Month in the Life of a NUNV” below. Their main activities are to attend and conduct meetings and establish personal contacts with the various service providers, conduct training and provide technical advice, conduct field visits to prevent disease outbreaks, guide outbreak investigation, and document and report experiences.

A Month in the Life of a NUNV

Number of Meetings attended: 4

Meetings of:
- Private doctors
- Medical officers
- District officials for communicable diseases
- Regional meeting of the community health centres of three districts

Number of Training Sessions conducted: 2 in 5 batches

Topics covered:
- Outbreak investigation and epidemic preparedness for medical officers of two districts
- Refresher training on malaria and dengue fever for medical officers and paramedical staff of PHC

Disease Surveillance Activities with the District Health Professionals
- Epidemic preparedness - conducted visits to PHCs, CHCs and vulnerable villages for preventive measures for communicable diseases
- Visited places of large gatherings for preventive measures
- IEC activities
- Reported cases of diseases and took action - tuberculosis, malaria, dengue, polio, and typhoid

Other Activities
- Attended a workshop on Environmental Sanitation
- Submitted monthly report to the WHO Team Leader

The various health authorities have been contacted to form State and district level disease surveillance task forces. The role of the task force is data analysis and action. The response has been encouraging.

During the Workshop on Integrated Disease Surveillance held in Gandhinagar on 6 May 2002, the health professionals from each district discussed various aspects for the formulation of the task force. Most of the districts suggested the following members for the task force at the district level:

**Table 3: Members of the Task Force at the District and Block Level**

<table>
<thead>
<tr>
<th>District Level</th>
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<tbody>
<tr>
<td><strong>Chairman</strong></td>
<td>Chief District Health Officer</td>
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<tr>
<td></td>
<td>District Collector</td>
</tr>
<tr>
<td><strong>Vice-Chairman</strong></td>
<td>Chief District Medical Officer</td>
</tr>
<tr>
<td></td>
<td>District Development Officer</td>
</tr>
<tr>
<td><strong>Member Secretary</strong></td>
<td>Epidemic Medical Officer / District Malaria Officer</td>
</tr>
<tr>
<td></td>
<td>Chief District Health Officer</td>
</tr>
<tr>
<td><strong>Members</strong></td>
<td>Additional District Health Officer / District Immunization Officer</td>
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<tr>
<td></td>
<td>District Malaria Officer</td>
</tr>
</tbody>
</table>
A preliminary meeting to share the concept of district surveillance task force was held at Jamnagar. Representatives of different departments and disciplines who are going to play a major role in the task force attended the meeting. There were 30 participants in the meeting representing the following cadres:

- Collector in-charge of Jamnagar
- Regional Deputy Director of the Rajkot region
- District health officials such as CDHO, ADHO, DIO, DTO, CDMO
- Superintendents and Professors of medical colleges from the Departments of Paediatrics and Medicine
- Engineers from GWSSB and R&B department
- Press reporters from the media

<table>
<thead>
<tr>
<th>Represented Cadres</th>
</tr>
</thead>
<tbody>
<tr>
<td>District TB Officer</td>
</tr>
<tr>
<td>Chief District Medical Officer</td>
</tr>
<tr>
<td>Chairman, IMA</td>
</tr>
<tr>
<td>Head, GWSSSB</td>
</tr>
<tr>
<td>Head, Irrigation</td>
</tr>
<tr>
<td>Head, Forest</td>
</tr>
<tr>
<td>Representatives of NGOs</td>
</tr>
<tr>
<td>Representatives from the private sector</td>
</tr>
<tr>
<td>District Sanitary Inspector</td>
</tr>
<tr>
<td>Epidemic-cum-Sanitary Supervisor / Paramedical Assistant</td>
</tr>
<tr>
<td>Senior Medical Officers</td>
</tr>
<tr>
<td>Programme Officer</td>
</tr>
<tr>
<td>Medical Officer, PHC</td>
</tr>
<tr>
<td>Sector Supervisors</td>
</tr>
<tr>
<td>Block Extension Educators</td>
</tr>
<tr>
<td>Chief District Programme Officer</td>
</tr>
<tr>
<td>Mamlatdars (Sub-district Revenue Officers)</td>
</tr>
<tr>
<td>Taluka Development Officer</td>
</tr>
<tr>
<td>Taluka President</td>
</tr>
</tbody>
</table>
State Level Disease Surveillance Core Group

A core group under the chairmanship of Additional Director (Public Health) is established at the State level. All programme officers (of vertical programmes) are members of the core group. Monthly meetings have been held regularly since March 2002. The various agenda items discussed are:

- Reporting formats
- Reporting procedures
- Formulation of task force
- Involvement of private sector
- Linkages with water quality surveillance

WHO convenes and facilitates this meeting and also ensures follow-up on the various issues discussed.

Outbreak Investigations

A detailed report of the jaundice epidemic in Ahmedabad city is given as a Special Report 2. There was a small outbreak of typhoid in Mahesana district which was investigated and managed effectively by the district authorities and officials of WHO. A very brief case study of the outbreak is given below.

Case Study of Outbreak of Typhoid in Mahesana District

The Medical Officer in-charge of the PHC reported a sudden rise of fever cases from the Vadasan village of the Kukarwada Primary Health Centre. A team consisting of Chief District Health Officer, District Immunization Officer, Epidemic Medical Officer, District Malaria Officer, and WHO Surveillance Officer immediately visited the village.

Details of Cases

<table>
<thead>
<tr>
<th>Total: 9 cases</th>
<th>Male: 4</th>
<th>Female: 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>All the cases were below 30 years of age. Four cases were below 15 years of age. No child below 10 years was affected.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**Steps taken**

- The MO, PHC completed survey of the village.
- Nine serum samples were collected and sent to the District Laboratory for investigation. All the nine were Widal positive.
- Water sample was sent for bacteriological reporting to the Public Health Laboratory, Vadodara.
- 53 blood slides were taken for investigating the possibility of malaria. None were found positive.
- Water pipeline was checked for leakages. 11 leakages were detected. The Panchayat repaired these.
- Chlorine tablets (12 830) and ORS packets were distributed.
- IEC was taken up through written slogans, pamphlets and posters.

**Strengthening Laboratories for Disease Surveillance**

In view of supporting and building up the capacity of the State to tackle and manage communicable disease epidemics more effectively, WHO decided to strengthen the laboratory component of public health under its EHA programme. WHO had provided instruments to detect and diagnose common communicable diseases for establishing a temporary laboratory in Kachchh. WHO provided technical support, while the GoG was taking care of all other requirements to sustain the functioning of the PHL. This laboratory was under-utilized because of various reasons. The services of a consultant were sought to help in making the laboratory functional.
From the report submitted by the consultant and discussions with key Government officials at the district and the State levels, it was found that this laboratory would be difficult to sustain in Kachchh because of the non-availability of qualified human resources. Kachchh being a very large district in terms of area and owing to its remoteness, only the local people at Bhuj were the probable clients. It has been decided to shift the laboratory to the Rajkot Government Medical College so that more districts adjoining Rajkot can also take advantage. Some of the equipment would be given to the BJ Medical College, Ahmedabad, which is at present the focal institute to provide technical support to the State in the field of public health.
Sensitization Workshop on Integrated Disease Surveillance, Gandhinagar, 6 May 2002

Objectives

(1) To build teams at the district level and the municipal corporations for IDS;
(2) To look for possibilities for sharing resources/information amongst vertical programmes;
(3) To undertake area-specific brainstorming for the implementation strategies;
(4) To prepare a draft plan for actual and practical epidemic preparedness;
(5) To initiate thought processes for electronic data transmission and analysis at the State level, and
(6) To discuss constraints in implementing IDS and look for their solutions.

Attendance by Key Government Officials

The Commissioner of Health, Additional Directors of Family Welfare and Health participated in the workshop.

Participants

Seventy-one Government officials from eight districts of Gujarat and three municipal corporations attended the workshop.
Presentation of reporting formats of disease surveillance

Building linkages with disease surveillance and water quality
Resource Persons

- Dr N Devdasan, National Professional Officer (Communicable Diseases), [NPO (CDS)], Office of WHO Representative to India, New Delhi
- Dr Vasudev Raval, Head, Department of PSM, BJ Medical College, Ahmedabad
- Dr JC Gandhi, Technical Consultant (Malaria), Government of Gujarat
- Dr Nilesh Buddha and Dr Jagdish Barot from WHO Office, Gandhinagar

Sessions

- Introduction of Integrated Disease Surveillance
- Reporting formats and procedures
- Outbreak investigation
- Epidemic preparedness
- Brainstorming in groups for strategies for implementing IDS and constraints

Gist of the Group Work

The group was convinced that IDS was necessary. It found the reporting formats and the software for IDS appropriate, with some minor changes. The group also made broad strategies for implementing IDS in the areas. It decided on the members of the task force and the core group.
Follow-up

The report of the workshop and details of the group work have been shared with the State government officials. Each district and municipal corporation will develop specific plans for IDS with the help of the NUNV from WHO.

Table 3: Constraints Expressed by the Districts and Solutions Suggested

<table>
<thead>
<tr>
<th>Constraints</th>
<th>Solutions Suggested by the Group</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Manpower</strong></td>
<td>Link workers in each village who are paid honorarium.</td>
</tr>
<tr>
<td>• Vacancies of key personnel like Medical Officer, male and female health workers.</td>
<td>• Fill vacancies without further delay.</td>
</tr>
<tr>
<td>• Commitment and motivation of the staff at all levels.</td>
<td>• Ensure a PG seat for MOs after three years of service.</td>
</tr>
<tr>
<td>• Staff short of knowledge and skills.</td>
<td>• Good performance should be appreciated.</td>
</tr>
<tr>
<td>Constraints</td>
<td>Solutions Suggested by the Group</td>
</tr>
<tr>
<td>-------------</td>
<td>----------------------------------</td>
</tr>
</tbody>
</table>
| ● Frequent transfers are detrimental to the effective implementation of programmes.  
● Develop career paths in the field of PSM.  
● Raise the retirement age for MOs.  
● Hire staff on contract.  
● Improve feedback systems. | |
| Training | |
| ● Computers.  
● Disease surveillance.  
● Preparedness for prevention and control of epidemics and outbreak management and investigation.  
● PSM for new recruits at higher levels.  
● Continuing medical education. | |
| Logistics  
POL | ● Combining the POL amount of various programmes to give a consolidated Rs. 50-60 thousand every year.  
● No constraints for POL funds, provision should be according to area specific needs, made available as recommended by CDHO of the district.  
● Revising the rates. |
Strengthening laboratories.
Necessary equipments provided.
Chemical reagents and testing kits and media for culture should be furnished and replenished regularly.

Table 4: Constraints Expressed by the Municipal Corporations and Solutions Suggested

<table>
<thead>
<tr>
<th>Constraints</th>
<th>Solutions Suggested by the Group</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Infrastructure</strong></td>
<td>• Strengthening laboratories.</td>
</tr>
<tr>
<td></td>
<td>• Necessary equipments provided.</td>
</tr>
<tr>
<td></td>
<td>• Chemical reagents and testing kits and media for culture should be</td>
</tr>
<tr>
<td></td>
<td>furnished and replenished regularly.</td>
</tr>
</tbody>
</table>

Lack of Infrastructure
• Specifically for water and sanitation.
• No urban health infrastructure.
• Laboratories.

These issues could be taken up in the WHO's proposed IDS project.
• Priority should be given to replace old water supply structures.
• Urban infrastructure needs to be established.
• Need for basic amenities.

Resource Crunch
• Generate private sector funds.
• Pooling resources with other departments.
### Constraints

<table>
<thead>
<tr>
<th>Manpower</th>
<th>Solutions Suggested by the Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Vacancies.</td>
<td>• GoG officials trying their best - results are positive.</td>
</tr>
<tr>
<td>• Untrained Staff.</td>
<td>• Training.</td>
</tr>
<tr>
<td>• Private sector involvement is negligible.</td>
<td>• Enhanced and integrated disease surveillance project should be implemented where private sector involvement can be stressed.</td>
</tr>
</tbody>
</table>
In line with the emerging role of the WHO Office in Gujarat, three major proposals were developed and submitted to the Government of Gujarat to be funded by the European Commission (EC), and the Royal Netherlands Embassy. The major components of the three proposals are briefly described below.

**Strengthening Health Systems in Gujarat State following the Earthquake**

The proposal has been submitted to the Government of Gujarat to be funded by the European Commission.

Building on to the successful experience of disease surveillance in Kachchh, which was the worst affected district from the Gujarat earthquake, the Government of Gujarat is keen to broaden WHO technical input to other districts of the State. A detailed proposal for a period of 15 months has been submitted to the EC. There are four major components of the proposal as described below:

(a) **Establishment of an Integrated Disease Surveillance (IDS) System in the earthquake-affected districts of Gujarat:**

The main components under IDS will be:

- A multi-disease approach
- Integration with vertical programmes, coordination with water quality surveillance, and involvement of the private sector
- Strengthening laboratories
- Development of district and State disease surveillance task force - data collection for ACTION through intrasectoral coordination
- Field epidemiology, epidemic intelligence, and outbreak response
- Use of GIS for IDS in collaboration with the remote sensing agency of the State Government
• Training, capacity building of medical officers - follow WHO standards, case definitions and protocols

(b) **Linkages of Disease Surveillance with Water, Sanitation and Environmental Health**

The major activities under this component will be:

• Water quality surveillance and response
• Chlorination of water, water-borne and water-related diseases
• Health promotion, IEC
• Vulnerability and sustainability of water sector in Gujarat, operation and maintenance of water supply system, crisis management and disaster preparedness
• HRD, capacity building for WATSAN sector - training modules in local languages
• Institution building and networking
• Treatment of water and disposal of wastewater

(c) **Linkages of Integrated Disease Surveillance with Health Sector Disaster Preparedness and Response**

The activities will include:

• Activating and implementing Emergency Medical Relief (EMR) contingency plan for health sector crisis management at the State and district levels prepared by the Government of India
• Following rapid health assessment protocols for emergencies (WHO guidelines), and guidelines for assessing disaster preparedness in the health sector (PAHO/WHO guidelines in collaboration with the Gujarat State Disaster Management Association (GSDMA)
• Capacity building through training courses like HELP (Health Emergencies in Large Populations), and Supply Management (SUMA) for the senior district and State health managers
• Developing intrasectoral and intersectoral coordination committees
**Additional Activities (Technical Inputs and Monitoring) to be undertaken in the following areas:**

- Surveillance of noncommunicable disorders.
- NGO partnership for pilot projects like adolescent health education, blood disorders, early detection and prevention of disabilities, STDs/HIV counselling, and disaster preparedness at the community level.
- Providing public health library/publications/periodicals/journals - a resource centre.

**Providing Water and Sanitation facilities at Rural Health Centres in the Earthquake-affected areas of Gujarat** *(Proposal submitted to the Royal Netherlands Embassy)*

The project has two-fold activities: (i) to strengthen the infrastructure for water and sanitation in the Primary Health Centres (PHCs) in eight earthquake-affected districts of Gujarat, and (ii) to develop systems of monitoring water quality, and effective health promotion activities in the areas covered by the PHCs. The main activities of the project are planned as under:

- **Hardware support to PHCs where other agencies like Panchayats, the State Government, and UNICEF have not intervened to avoid duplication. This will include:**
  - To provide water facilities such as extension of water connection, water storage tank, hand pump/tap, and drawing platform.
  - To provide essential sanitation services such as latrine, bathroom, soak-pit, and wastewater channel.
  - To provide refuse collection bins and incinerators for biomedical/solid waste disposal.

- **Capacity building of the PHC staff for carrying out effective health promotion activities for behaviour change in their respective villages:**
  - To train rural health staff to understand the need for safe water quality and good sanitation and to be effective trainers and educators of the people using the health centres and also villagers under their jurisdiction.
  - To promote water quality and sanitation services and hygienic behaviour in the villages served by the rural health centres.
The project will also cooperate with and supplement the water quality monitoring and sanitation activities of other organizations in the earthquake-affected districts. A total of 200 PHCs in eight districts will be covered by the project.

**Course on Disaster Epidemiology in collaboration with CDC, Atlanta, USA** *(Proposal submitted to the European Commission)*

The Gujarat State is vulnerable to all kinds of natural and man-made disasters. As a step in the direction of upgrading the existing health delivery system for dealing with emergencies and disasters, a detailed proposal for developing a two-week training course on Disaster Epidemiology has been developed. The nodal agencies will be WHO (Gujarat Office, India Country Office, SEARO, PAHO, and HQ). The objective of the course is to have at least one trained official in each of the government health departments at the district, municipal corporation and the State levels in Gujarat.

Resource agencies for the course will be: CDC, National Centre for Environmental Health (NCEH), Atlanta, USA; Centre for Research on Epidemiology of Disasters (CRED), Belgium; Asian Disaster Preparedness Centre (ADPC), Bangkok; and International Committee of Red Cross (ICRC) & International Federation of Red Cross and Red Crescent Societies (IFRC), Geneva and Bangkok. Support will be taken from renowned local institutes such as Indian Institute of Management, Ahmedabad (IIMA); Gujarat State Disaster Management Authority, Gandhinagar (GSDMA), and others.

The course will cover important aspects related to health during any emergency. This would include:

- Effective first response and relief operations - care of the wounded, food and nutrition, and water and sanitation; communicable diseases - preventing disease outbreaks; reproductive and child health/IMCI; and mental health.
- Prosthesis and rehabilitation.
- Assessment for disaster preparedness - rapid assessment protocols.
- Health sector contingency plan for crisis management - coordination, SUMA.
- International humanitarian law, human rights.
Special Report 1

Role of WHO in Controlling the Jaundice Outbreak in Ahmedabad City, May 2002

In the second week of May 2002, it was observed that there was rise in the cases of jaundice in some parts of Ahmedabad City, as reported by the GoG. 764 cases had been reported till 31 May 2002. The outbreaks were focal and scattered over wards of east zone in the areas of Gomtipur, Saraspur, Rajpur, Naroda and the adjacent areas.

WHO was requested to participate and provide technical support in the control measures. The Hon'ble Health Minister took personal interest in designing an action plan for controlling the outbreak.

Trend analysis of cases of Hepatitis A
A three-year trend analysis clearly shows an outbreak in the year 2002 from the month of April.

**Control Measures taken**

- The AMC pressed 30 teams into service for a door-to-door survey of the affected areas. The teams were headed by one medical officer assisted by a male and a female paramedical staff each.
- A control room was established at ESIS Hospital at Hirpur, Ahmedabad, for coordination of outbreak investigations and control activities.
- Samples of drinking water were sent for testing from the source and from destination.
- The departments of water supply and wastewater disposal were activated to repair leakages in water lines and sewage lines.
- People were imparted health education for maintaining personal hygiene during the door-to-door survey.

### Source of Infection

As reported by the survey teams, the Medical Officers of the ESIS, and interviews with the patients, the source of infection seemed to be the tap water from the Ahmedabad Municipal Corporation.
- All cases of hepatitis occurred due to contamination of drinking water with sewage water at various places.
- The drainage pipes choked, leading to overflow and regurgitation of sewerage water and contamination of drinking water.

**Samples of Tap Water collected for testing showed:**
- +ve residual chlorine tests and presence of E-coli suggesting profuse contamination and/or water was not allowed to have a sufficient contact period for chlorine to disinfect it before it was used for drinking.
Recommendations

After attending the meetings and two visits to the control room, WHO gave standard recommendations for the control measures for hepatitis A. The teams were given details of case definitions based on which they could conduct the house to house survey. The Departments of Health and Safe Water Supply should permanently stay on the alert to avert occurrence of outbreaks of epidemic-prone diseases and move into quick action when emergencies occur.

1. **Coordination**
   - A permanent task force - high level coordination committee with various stakeholders as members, should be formed as an integral part of disaster management. The approach should be that for a transparent efficient system. Regular interdepartmental task force meetings should be held every fortnight to discuss the prevailing needs and evaluate how timely and effectively issues were addressed.

2. **Active Participation of Local Doctors and Social Workers**
   - A detailed directory of various agencies that can assist in disaster management should be prepared and made available to all concerned.
   - All these agencies should have coordination so that their participation at any given point of time and place is ensured.

- It was also found that chlorination is not carried out or chlorine demand is not met.
- There were complaints of choking of drainage pipes, stinking of water with sewage, turbidity of water one month prior to the occurrence of outbreaks from the areas and cases of hepatitis occurred after two months.
3. **Disaster Management Plan**
   - A Disaster Management Plan should be prepared immediately which should address all prevalent risk issues to be attended in each area.
   - If the plan is already prepared, it should be modified with current information.

4. **Training and Awareness**
   - Till the Institution on Disaster Mitigation comes up, appropriate regional centres should be identified to carry out this function.

5. **Strengthening of Disease Surveillance**
   - Disease surveillance data collection and reporting by various health facilities needs to be established regularly in view of endemicity of epidemic potential and prevailing environment which is conducive to transmission among overcrowded populations. Disease surveillance by trained workers has to be a regular activity of the health sector.
   - Regular intrasectoral and intersectoral reporting system should be established.
   - Better softwares and analytical methods and equipment must be made available for this crucial activity.
   - In post-disaster situations, the “risk model” should be used rather than the case-finding model.
   - In view of trends of the occurrence of diseases of epidemic potential, preparedness for prevention and control measures should be ascertained by the “High Level Coordination Committee”.
   - WHO assistance in the training and monitoring of disaster preparedness would help build up prevention and control measures.
   - Health sector should regularly conduct chlorination and pipeline surveillance and provide daily feedback to the water supply department to take immediate corrective measures.
6. **Solid and Liquid Waste Disposal**
   - The issues of sanitary waste disposal should be tackled even in normal times.
   - Desilting of choked drainage pipelines and repair of leakages should be attended by the concerned department.
   - The Department should also establish cell for “Pipeline Surveillance”.
   - The sewage and water supply department should ensure regular and effective disposal, and accord priority to risk areas.

7. **Safe Water Supply**
   - Taking into account the risk period, chlorinated water supply should be provided in the area of the walled city.
   - Water supply department should maintain strict vigilance and take all necessary measures.
   - A cell for “Pipeline and Chlorination Surveillance” should be established.
   - A plan for replacement of old rusted pipelines and joint system should be taken up in phases.
WHO’s Technical Input during Civil Strife in Gujarat

The WHO team visited some of the campsites in Ahmedabad at the request of the Government of Gujarat. These relief camps were set up for the riot victims of the city. WHO was asked to give technical guidance to the Government of Gujarat regarding issues of health and sanitation in the relief camps in the Ahmedabad city. The main concerns of the Government were to look after the health needs of the campsite population, by providing basic health services, adequate and safe water and sanitation facilities and to prevent communicable diseases amongst the sheltered people. There were around 52,000 people living in 30 camps in the city. WHO performed the following activities:

Situational Reports

As and when the Government of Gujarat requested, the WHO team comprising experts on disease surveillance and water and sanitation visited various camps to assess the health services, incidence and prevalence of disease, the status of drinking water and facilities of sanitation in the camps. The assessment included:

- Checking for cases for water-borne illnesses, vaccine preventable diseases, and vector-borne diseases.
- Checking stock of medicines.
- Checking for cases of noncommunicable diseases and other chronic illnesses.
- Checking for cases of injuries.
- Antenatal and postnatal care.
- Safe drinking water - measurement of residual chlorine.
- Sanitation facilities.

Recommendations from WHO were given to the Government of Gujarat with each situational report.
Technical Support

WHO also helped the Government of Gujarat to develop disease surveillance formats for the camps. The data from these formats were analyzed with the help of WHO to take appropriate action.

Training in Promotion of Health and Hygiene and Chlorination Guidelines

Volunteers and staff from 45 NGOs were given training on promoting habits of personal hygiene and general cleanliness in the campsites. The guidelines for chlorination and proper storage of water were also explained and discussed in detail.

Equipments

Chloroscopes were given to volunteers from NGOs and Government staff who were delivering services in the camps to regularly monitor the level of chlorination.
Other Special Activities

Government of Gujarat Recognition of WHO Technical Input

Like every year, the Government of Gujarat was very keen and enthusiastic in celebrating the World Health Day 2002 “Move for Health” with innovative concepts and programmes.

Statewide activities and programmes were carried out successfully in spite of the civil strife in the State.

WHO Office was also involved in providing technical assistance in documenting the events and generating sustainable awareness amongst the masses regarding importance of physical activities in the prevention of various lifestyle-related diseases.
Technical Inputs to Various Programmes

Mental health

The Indian Institute of Management conducted a Workshop on Mental Health where the World Health Report on Mental Health was discussed. WHO technical input was provided to develop a plan to introduce services for mental health as a part of the health programme of the Government of Gujarat. The Commissioner of Health and the Health Secretary were also present in the workshop. A community-based model for mental health was advocated.

State Planning Meeting for UNFPA-assisted Country Programme

A one-day workshop was conducted by UNFPA, Gandhinagar, for brainstorming on strategies to implement the next country programme in the under-developed selected districts of Gujarat. The thrust of the programme was Reproductive and Child Health (RCH). WHO was also invited to give technical inputs. Representatives of the UN agencies, the Government of Gujarat, other voluntary organizations and teaching institutions were invited to give suggestions for strategies for improving capacity building for RCH, decentralization, community participation, and gender.

Jeevan Raksha Yatra (Life Protection Programme)

This is an annual activity of the Government of Gujarat. A “procession” of health which is a mobile package of health education activities is taken from village to village to create awareness about various health issues. The activities include a mobile exhibition on health education messages depicted on charts and posters. Pamphlets and other reading material are distributed. The health workers and the block extension educator talk to the people about relevant health problems and basic medicines such as ORS packets, IFA tablets and paracetamol are distributed as per the need. The WHO professionals were invited by the Government of Gujarat to give technical inputs and participate in this week-long activity.
Indian Systems of Medicine

The Government of Gujarat is very keen to promote Indian Systems of Medicine. The Government has requested WHO for technical assistance in providing standard guidelines for promoting systems like ayurveda for selected chronic illnesses. Some Indian systems of medicine have proved effective for the management of some illnesses. A technical consortium has been established which is headed by the Health Secretary. The plan is to take benefit of the Jamnagar Ayurvedic University as an accreditation centre for validating and promoting treatment procedures. The Jamnagar Ayurvedic University is one of the very few institutions all over the world recognized by WHO for their quality.

Workshop on Master Disaster Management Plan for the Gujarat State

WHO was invited to a Workshop on “Master Disaster Management Plan” held in the month of January 2002 and hosted by the Gujarat State Disaster Management Authority (GSDMA) and the American Association of Physicians (AAP). The objective of the workshop was to brainstorm on a disaster management plan for the State of Gujarat covering all manmade and natural disasters. WHO gave technical inputs about the management of epidemics of controllable diseases, which is a frequent emergency. WHO continues to provide technical inputs for control and management of epidemics.

Medical Certification of Cause of Death and Registration of Births

The Government of Gujarat conducted a meeting on registration of births and deaths to which WHO was invited. The Government wanted to improve and strengthen the system of registration. WHO discussed how this could be facilitated using the Disease Surveillance system which WHO is planning to institutionalize in eight districts in Gujarat.

Inter-UN Agency Forum in Gujarat State

Various UN agencies have their offices at the State Headquarters (Gandhinagar) in Gujarat. These include UNICEF, UNFPA, UNDP, WFP and WHO. They have various
programmes as per their mandate. The inter-UN agency meeting and the forum has been established to share the experiences and learn from each other, to address issues concerned to the UN officials and many other matters.

**Epidemiological Study**

This post-earthquake community-based study was undertaken in one of the most affected zones of Ahmedabad City after 11 months of the earthquake. Besides assessing the disease prevalence in post-earthquake situation, the study also assessed the status of disaster preparedness of the health system and that of the community. The relation of morbidity in the context of other variables like housing conditions, type of houses, place of displacement after earthquake were also noted.

The data were collected by using three pre-tested standardized schedules, e.g. family schedule, individual schedule for illness, injury and disability. Health-related documents were perused. The records were examined for verification of the history of disease given by the subjects included in the study.

Systemic random sampling was selected for surveying the households in each portion of the ward so that a proper representation of the whole western zone of Ahmedabad City could be obtained. A total of nine wards of the Ahmedabad Municipal Corporation were taken as the study area.

Based on the observations of the study and reviewing the relevant literature, the following conclusions were arrived at :-

- This type of earthquake was never felt before. The people of Gujarat and Ahmedabad did not know that they were residing in an earthquake seismic zone V where earthquake can strike any time.
- 1 134 persons from nine wards of the Ahmedabad City were involved. Male population was 566 while female population was 568 which is more than the male population. 84 persons gave history of illness during first 30 days after the earthquake.
- 69 persons had chronic illness. They started their illness after earthquake and continue to suffer. Most of them were having psychological problems like anxiety, neurosis and depression. Some of them were taking regular treatment.

Total deaths recorded were 19. All deaths were recorded during entrapment. There were 52 persons who were trapped. All 19 deaths occurred among these persons. 33 persons were extricated alive.

46 persons were injured, 19 died and 27 survived. They were all given good quality of medical services and saved.

Seven permanently disabled persons were found but unfortunately without any vocational rehabilitation.

Regarding rescue of trapped persons, it has been included in the study because it has got great impact on short-term mortality. 52 persons were rescued by different agencies. Neighbours rescued 29 persons, fire brigade rescued 8 persons and other voluntary agencies rescued 15 persons. The findings are really very interesting that neighbours responded immediately and they rescued 16 persons of total 29 within half an hour, while the fire brigade could respond only after two hours and they extricated 8 people who all died.

The time of extrication in the context of the result of extrication was noted. It shows that as the time of extrication increases, the mortality increases.

The time of response in rescue work indicates that neighbours could respond early and managed to extricate 21 people in less than two hours.

Regarding the place of seeking medical care by ill or injured persons, which were 148 in number, 60 preferred Government hospitals while 88 preferred private hospitals. In the western zone of Ahmedabad, the Government has two large hospitals and they are well equipped, even though people have preferred private hospitals.
Regarding morbidity, some findings are of high importance in health. The female population is much more affected than male. Morbidity rate in female is 7.57% while in male it is 4.59%. Very high psychological morbidity is noticed, which is of serious concern.

Regarding rehabilitation, which was part of the questionnaire, it was not responded to by people. All people gave biased information.

Adequacy of medical services which was enquired in the questionnaire was also not well responded by the people.

**Recommendations of the Study**

Since earthquake cannot be forecasted and prevented, mitigation measures can be taken to reduce the mortality, morbidity and disability. Moreover, most of the casualties are not due to earthquake, but due to human error. Only buildings of poor quality construction are damaged due to earthquake and mortality and morbidity is seen in these buildings. So it is the buildings that kill persons and not the earthquake. Vulnerability analysis of all buildings should be done. Mitigation measures should be proposed by building design engineers.

There is no proper disease surveillance system which can give statistics on the burden of disease in the community. There should be a well-established disease surveillance system with due importance to the private sector.

Health infrastructure should be well trained to manage all types of disasters. There is acute need of training in this field, as Gujarat is a border and disaster-prone State.

Counselling sessions for persons who are psychologically ill should be arranged. People are still suffering from anxiety, which precipitates due to fear of the earthquake. Many people feel false earthquake tremors.
Training for community regarding rescue work is an important area which has come out of the study. People have done very good work of rescue without any instrument and skill. If training is provided, the community people can respond more quickly and save the lives of the people.

Rehabilitation services should be provided. There should be continuous surveillance for injured persons so that the disabilities and further complications due to injuries could be prevented.

Psychological morbidity is of serious concern and all psychiatric departments of medical institutions should be well-equipped and staffed to tackle this morbidity. Due to lack of counselling sessions, many psychologically ill persons have committed suicide. About 152 psychologically ill and disturbed persons have committed suicide due to mental depression.

**EHA Capacity Building in India through Regular Budget**

Following the Gujarat earthquake and the interstate meeting held in Ahmedabad in November 2001, it was recommended that there should be a State Contingency Action plan to deal with health consequences of emergencies. The Gujarat experience would be considered for developing health sector contingency plans and emergency preparedness activities in Sikkim, Mizoram and Orissa in addition to Gujarat. Activities such as establishing well-equipped control rooms and communication systems and training of staff will be taken up. WHO has given Rs. 50 lakhs to the Gujarat Government for these activities from the fund allocation of the biennium 2002-2003. Some funds could also be kept aside for emergency use during disasters for quick action, as a shortcut from bureaucratic procedures.

**Strengthening WHO Office Infrastructure**

Information Technology - free of cost lease line by the Government of Gujarat.
## Visitors to WHO Office, Gandhinagar

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Name</th>
<th>Designation</th>
<th>Purpose of Visit</th>
<th>Date of Visit</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>HE Mr Sundarsingh Bhandari</td>
<td>Governor of Gujarat</td>
<td>Inaugurate the WHO Gujarat Office</td>
<td>15 December 2001</td>
</tr>
<tr>
<td>2.</td>
<td>Dr Robert J Kim-Farley</td>
<td>WHO Representative to India</td>
<td>Attend inauguration ceremony of the WHO Gujarat Office</td>
<td>15 December 2001</td>
</tr>
<tr>
<td>3.</td>
<td>Mr Amarjeet Singh</td>
<td>Commissioner of Health &amp; Family Welfare, Government of Gujarat</td>
<td>Attend meeting regarding WHO’s technical guidance to maintain hygiene in camps during civil strife in Gujarat</td>
<td>8 March 2002</td>
</tr>
<tr>
<td>4.</td>
<td>Hon’ble Mr Ashok Bhatt</td>
<td>Minister of Health &amp; Family Welfare, Government of Gujarat</td>
<td>Attend follow-up meeting regarding WHO’s technical guidance to maintain hygiene in camps during civil strife in Gujarat</td>
<td>10 March 2002</td>
</tr>
<tr>
<td>5.</td>
<td>Dr Arvind Pullikal</td>
<td>Head, UNFPA, Gujarat</td>
<td>Attend meeting to share experiences</td>
<td>6 April 2002</td>
</tr>
<tr>
<td>6.</td>
<td>Dr Yogendra Mathur</td>
<td>Head, UNICEF, Gujarat</td>
<td>Informal visit and attend meeting to share experiences</td>
<td>10 April 2002</td>
</tr>
<tr>
<td>7.</td>
<td>Mr SK Nanda</td>
<td>Health Secretary, Government of Gujarat</td>
<td>Attend meeting to discuss the GoG plan for rehabilitation of the earthquake victims</td>
<td>16 April 2002</td>
</tr>
<tr>
<td>8.</td>
<td>Dr N Devadasan</td>
<td>National Professional Officer (Communicable Disease Surveillance), WHO/India, New Delhi</td>
<td>Resource person for the IDS Workshop, Gandhinagar, 6 May 2002</td>
<td>7 May 2002</td>
</tr>
<tr>
<td>9.</td>
<td>Mr JP Gupta</td>
<td>Head, UNDP, Gujarat</td>
<td>Informal meeting to share experiences</td>
<td>10 May 2002</td>
</tr>
<tr>
<td>10.</td>
<td>Dr Uma Vyas</td>
<td>State Representative, European Commission, Gujarat</td>
<td>Attend meeting for the project funding for integrated disease surveillance</td>
<td>12 May 2002</td>
</tr>
<tr>
<td>11.</td>
<td>Mr Bala S.</td>
<td>CEO, Torrent Pharmaceuticals</td>
<td>Explore possibility for joint projects</td>
<td>20 May 2002</td>
</tr>
<tr>
<td>12.</td>
<td>Dr Tej Walia</td>
<td>Ag. WHO Representative to India</td>
<td>Sign EC Letter of Agreement with the Government of Gujarat</td>
<td>5 June 2002</td>
</tr>
<tr>
<td>14.</td>
<td>Dr Anand Kaswekar</td>
<td>Additional Director (Health), Government of Gujarat</td>
<td>Attend meeting for developing formats for disease surveillance</td>
<td>10 July 2002</td>
</tr>
<tr>
<td>15.</td>
<td>Dr KN Patel</td>
<td>Additional Director (Family Welfare), Government of Gujarat</td>
<td>Attend meeting for developing formats for disease surveillance</td>
<td>10 July 2002</td>
</tr>
</tbody>
</table>
Achievements

WHO has been working in close association with the Government of Gujarat for nearly one and a half years since the earthquake which struck on 26 January 2001. When the WHO team under its EHA programme arrived in Gujarat, it had no intention of setting up office in Gujarat. Instead, the Government of Gujarat was keen to have the regular presence of WHO in the State. The Government offered office space to locate WHO presence in the State. Collaboration with the Government has been well documented and disseminated. However, some achievements which are qualitative and hence intangible are worth mentioning here.

- The top health professionals of the Government of Gujarat are increasingly seeking guidance from WHO on all technical matters related to health. The planned mandate of WHO in Gujarat is limited to disease surveillance, epidemic preparedness, water and sanitation and disaster mitigation. However, the Government of Gujarat consults WHO for matters such as:
  - Health sector reforms
  - School health programme
  - Immunization policy of the Government of Gujarat
  - Situational analysis during disasters like the Gujarat riots
  - Birth and death registration
  - Promotion of research
  - Promotion of Indian Systems of Medicine
  - WHO is seen as an agency promoting and encouraging innovation and seeking the growth of competent professionals.
When the Earthquake Relief Mission of WHO in Gujarat was coming to an end, it was felt appropriate to contribute the essence of the experiences of the health sector retrospectively, in the form of a critical document which would serve as a guideline for future preparedness specifically related to the health sector. This document would focus on an analysis of the “Health Response in its Totality”. It will contain information on what the various national, international agencies and the Government did in the field of health, will analyze this response, draw out lessons and make recommendations for future preparedness. Information for preparation of this document will be collected through:

- Key informant interviews of key Government officials, representatives of voluntary organizations and international agencies who played a major role in health-related relief and rehabilitation activities.
- Research through existing documents and reports.
- Field visits to the rehabilitation sites.

The key information interviews began in July 2002.
Since the extrabudgetary activities of WHO, i.e. the current earthquake relief mission in Gujarat, are coming to an end, WHO needs to find out funds to sustain activities in the State. On the request of the Government of Gujarat, two proposals: (i) Integrated Disease Surveillance Project and, (ii) Disaster Epidemiology Training Course, were worked out and submitted for European Commission (EC) funded Family Welfare programme in the State.

World Bank funded programme for integrated disease surveillance in five States is coming up with WHO technical assistance and monitoring. The same programme with EC support can also be taken up on pilot basis in Gujarat. EC and GoG are also willing to provide funds to WHO for conducting a training course (TOT) on disaster epidemiology for GoG health officials.

The Government of Gujarat has already requested the Government of India to consider the provision of regular budget for WHO's direct activities in Gujarat from WHO country budget, and to have cost-effective and sustainable WHO inputs for the health sector in Gujarat. Integration of various vertical national programmes on pilot basis in Gujarat can also be considered.
**Annex 1**

**Form L-1**

*Integrated Disease Surveillance (Govt. of Gujarat and WHO)*

Week No.: ______________

(Date: Sunday______________ to Saturday_______________)

**Weekly Reporting Form for Laboratory Surveillance**

*(Please fill-out this form on every Saturday to reach the Health Authorities on every Monday)*

Name of the reporting lab:__________________________________________________

Address:________________________________________________________________

Period included in this report: Sunday_______________ to Saturday _______________

<table>
<thead>
<tr>
<th>Disease</th>
<th>Positive</th>
<th>Total tests performed</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Malaria</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>(P. Falciparum)</em></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>(P. vivax)</em></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Enteric fever</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tuberculosis</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cholera</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diphtheria</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hepatitis A</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Others</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Meningococcal meningitis</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dengue fever</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Japanese encephalitis</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leptospirosis</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Whooping cough</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Others</td>
<td></td>
<td></td>
<td>1.</td>
</tr>
<tr>
<td><em>(Please specify)</em></td>
<td></td>
<td></td>
<td>2.</td>
</tr>
</tbody>
</table>

Signature of the authority:________________________ Telephone:_______________

Name and designation of the authority:_________________________________________

Diseases of public health importance like Cholera, Dengue fever, Diphtheria, Japanese encephalitis, Leptospirosis, Plague, Whooping cough, etc. must be reported to the district health authorities immediately.
Form S-1

Integrated Disease Surveillance (Govt. of Gujarat and WHO)

Week No.: ______________
(Date: Sunday______________ to Saturday_______________)

Weekly Reporting Form for all Reporting Units

(Please fill-out this form on every Saturday to reach the Health Authorities on every Monday)

Name & address of the Reporting Unit:_______________________________________

Estimated population catered by this Reporting Unit:____________________________

Name & designation of the person filling-out the report:_________________________

Signature of the authority:______________________ Telephone:__________________

Name and designation of the authority:_______________________________________

[Diseases/syndromes of public health importance like AFP, Cholera, Dengue fever, Diptheria, Japanese encephalitis, Leptospirosis, Plague, Whooping cough, etc. must be reported to the district health authorities immediately.]

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Suspected Diseases / Syndromes (New Cases)</th>
<th>Patients Treated</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>OPD</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&lt;5 &lt;5</td>
</tr>
<tr>
<td>1.</td>
<td>Diarrhoea</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Dysentry</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Cholera</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Acute viral hepatitis</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>AFP (below 15 years of age)</td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>Diptheria</td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>Whooping cough</td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>Neonatal tetanus</td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td>Measles</td>
<td></td>
</tr>
<tr>
<td>10.</td>
<td>Malaria</td>
<td></td>
</tr>
<tr>
<td>11.</td>
<td>Meningitis</td>
<td></td>
</tr>
<tr>
<td>12.</td>
<td>LRTI and pneumonia</td>
<td></td>
</tr>
<tr>
<td>13.</td>
<td>Fever (not included elsewhere)</td>
<td></td>
</tr>
<tr>
<td>14.</td>
<td>Sexually transmitted diseases</td>
<td></td>
</tr>
<tr>
<td>15.</td>
<td>Usual syndrome</td>
<td></td>
</tr>
</tbody>
</table>

Total of 1 to 15

Total new cases examined during the week (Communicable and Noncommunicable diseases)

Signature of the authority:______________________ Telephone:__________________

Name and designation of the authority:_______________________________________

Report of WHO Activities, 1 February - 31 July 2002
## Sample of a Screen of IDS Software

### Annex 3

#### Integrated Disease Surveillance

( Government of Gujarat and WHO )

#### Data Entry of Reporting Unit (Form L-1)

<table>
<thead>
<tr>
<th>Disease</th>
<th>Passive</th>
<th>Total Tests</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Malaria (P. falciparum)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Malaria (P. vivax)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tuberculosis</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Entero tox</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cholera</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diphtheria</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hepatitis A</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hepatitis E</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bacillus</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Meningococcal Meningitis</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dengue Fever</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Japanese Encephalitis</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leptospirosis</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Whooping Cough</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hepatitis Others</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Disease of public health importance like Cholera, Dengue Fever, Diphtheria, Japanese Encephalitis, Leptospirosis, Plague, Whooping Cough etc must be reported to the District Health Authorities immediately.
## Annex 4

### Training Programmes for WATSAN

<table>
<thead>
<tr>
<th>District</th>
<th>Date</th>
<th>Topics</th>
<th>Participants</th>
<th>No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sola, Ahmedabad</td>
<td>9-3-2002</td>
<td>- Health and sanitation promotion</td>
<td>MO &amp; PHC staff of the Directorate of Health (GoG)</td>
<td>163</td>
</tr>
<tr>
<td>Ahmedabad</td>
<td>13-3-2002</td>
<td>- Water quality monitoring and chlorination</td>
<td>Water works supervisors and laboratory staff of Ahmedabad Municipal Corporation</td>
<td>21</td>
</tr>
<tr>
<td>Sola, Ahmedabad</td>
<td>14-3-2002</td>
<td>- Health and sanitation promotion</td>
<td>MO &amp; PHC staff of the Directorate of Health (GoG)</td>
<td>156</td>
</tr>
<tr>
<td>St. Xavier's Social Service Society</td>
<td>18-3-2002</td>
<td>- Health promotion at relief camps</td>
<td>Volunteers from Federation of NGOs working for relief camps</td>
<td>45</td>
</tr>
<tr>
<td>Deesa, Banaskantha</td>
<td>20-3-2002</td>
<td>- Water quality monitoring and chlorination</td>
<td>Linemen/valve men/operators and supervisors from GWSSB</td>
<td>30</td>
</tr>
<tr>
<td>Patan</td>
<td>26-3-2002</td>
<td>- Water quality monitoring and chlorination</td>
<td>MO, PHCs of District Health Department</td>
<td>39</td>
</tr>
<tr>
<td>Palanpur, Banaskantha</td>
<td>2-4-2002</td>
<td>- Water quality health and chlorination</td>
<td>MO, PHCs of District Health Department</td>
<td>80</td>
</tr>
<tr>
<td>Mahesana</td>
<td>5-4-2002</td>
<td>- Water quality health and chlorination</td>
<td>MO, Chief Officers and health staff of the district from district health department and local body officers</td>
<td>40</td>
</tr>
<tr>
<td>Jamnagar</td>
<td>9-4-2002</td>
<td>- Water quality monitoring and chlorination</td>
<td>Medical and paramedical staff of talukas from District Health Department</td>
<td>50</td>
</tr>
<tr>
<td>Jamnagar</td>
<td>9-4-2002</td>
<td>- Water sanitation and health</td>
<td>Private practising doctors and teachers of medical college from IMA</td>
<td>40</td>
</tr>
<tr>
<td>District</td>
<td>Date</td>
<td>Topics</td>
<td>Participants</td>
<td>No.</td>
</tr>
<tr>
<td>------------------</td>
<td>------------</td>
<td>-----------------------------------------</td>
<td>------------------------------------------------------------------------------</td>
<td>-----</td>
</tr>
<tr>
<td>Radhanpur, Patan</td>
<td>17-4-2002</td>
<td>Water quality and chlorination</td>
<td>Medical and paramedical staff of talukas from District Health Department</td>
<td>80</td>
</tr>
<tr>
<td>Patan</td>
<td>18 &amp; 19-4-2002</td>
<td>Operation and maintenance of water supply</td>
<td>Operators and supervisors from GWSSB</td>
<td>42</td>
</tr>
<tr>
<td>Harij, Patan</td>
<td>19-4-2002</td>
<td>Water quality monitoring and chlorination</td>
<td>Medical and paramedical staff of talukas from District Health Department</td>
<td>82</td>
</tr>
<tr>
<td>Surendranagar</td>
<td>22 &amp; 23-4-2002</td>
<td>Operation and maintenance of water supply system</td>
<td>Operators and supervisors from GWSSB</td>
<td>47</td>
</tr>
<tr>
<td>Sidhpur, Patan</td>
<td>23-4-2002</td>
<td>Water quality monitoring and chlorination</td>
<td>Medical and paramedical staff of talukas from District Health Department</td>
<td>82</td>
</tr>
<tr>
<td>Patan</td>
<td>26-4-2002</td>
<td>Health and hygiene promotion</td>
<td>MOs, Patan district</td>
<td>28</td>
</tr>
<tr>
<td>Rajkot</td>
<td>30-4-2002</td>
<td>Water quality monitoring and chlorination</td>
<td>MOs, Rajkot district</td>
<td>85</td>
</tr>
<tr>
<td>Surendranagar</td>
<td>7-5-2002</td>
<td>Health and hygiene</td>
<td>MOs and medical staff from District Health Department</td>
<td>40</td>
</tr>
<tr>
<td>GJTI, Gandhinagar</td>
<td>13-5-2002</td>
<td>Water quality health and chlorination</td>
<td>New Chief Officers from Nagarpalikas</td>
<td>12</td>
</tr>
<tr>
<td>Bhuj, Kachchh</td>
<td>16-5-2002</td>
<td>Water quality surveillance</td>
<td>GWSSB Lab, staff and sanitary inspectors from GJTI</td>
<td>18</td>
</tr>
<tr>
<td>Modhera, Mahesana</td>
<td>16-5-2002</td>
<td>Water quality health and chlorination</td>
<td>Medical and paramedical staff from District Health Department</td>
<td>34</td>
</tr>
<tr>
<td>Kadi, Gandhinagar</td>
<td>17-5-2002</td>
<td>Water quality health and chlorination</td>
<td>Medical and paramedical staff from District Health Department</td>
<td>78</td>
</tr>
<tr>
<td>District</td>
<td>Date</td>
<td>Topics</td>
<td>Participants</td>
<td>No.</td>
</tr>
<tr>
<td>-----------------</td>
<td>------------</td>
<td>---------------------------------------------</td>
<td>-----------------------------------------------------------------------------</td>
<td>-----</td>
</tr>
<tr>
<td>Mahesana</td>
<td>18-5-2002</td>
<td>● Water quality health and chlorination</td>
<td>Medical and paramedical staff from District Health Department</td>
<td>104</td>
</tr>
<tr>
<td>Patan</td>
<td>18-5-2002</td>
<td>● Health awareness camps</td>
<td>Village heads, Panchayat members, teachers and others</td>
<td>38</td>
</tr>
<tr>
<td>Bechraji, Mahesana</td>
<td>19-5-2002</td>
<td>● Health awareness camps</td>
<td>Village heads, Panchayat members, teachers and others</td>
<td>63</td>
</tr>
<tr>
<td>Bechraji, Mahesana</td>
<td>22-5-2002</td>
<td>● Health awareness camps</td>
<td>Village heads from Taluka Panchayat</td>
<td>26</td>
</tr>
<tr>
<td>Ahmedabad</td>
<td>22-5-2002</td>
<td>● Health awareness camps</td>
<td>Village heads, Panchayat members, teachers and others</td>
<td>40</td>
</tr>
<tr>
<td>Unza, Mahesana</td>
<td>23-5-2002</td>
<td>● Water quality health and chlorination</td>
<td>Medical and paramedical staff from District Health Department</td>
<td>49</td>
</tr>
<tr>
<td>Amirgadh, Banaskantha</td>
<td>23-5-2002</td>
<td>● Health awareness camps</td>
<td>Village heads, Panchayat members of Amirgadh</td>
<td>30</td>
</tr>
<tr>
<td>Visnagar, Mahesana</td>
<td>24-5-2002</td>
<td>● Water quality health and chlorination</td>
<td>Medical and paramedical staff from District Health Department</td>
<td>84</td>
</tr>
<tr>
<td>Mandvi, Kachchh</td>
<td>29 &amp; 31-5-2002</td>
<td>● Water and health including pollution aspects</td>
<td>GWSSB lab. staff, sanitary inspectors from GJTI</td>
<td>21</td>
</tr>
<tr>
<td>Jamnagar</td>
<td>30-5-2002</td>
<td>● Health and hygiene</td>
<td>MOs and medical staff from District Health Department</td>
<td>46</td>
</tr>
</tbody>
</table>

| 1 793 |