ANNUAL REPORT

(2013 – 2014)

NATIONAL INSTITUTE FOR RESEARCH IN ENVIRONMENTAL HEALTH
(Indian Council of Medical Research)
Bhopal – 462 001 (M.P.)

National Institute for Research in Environmental Health
(Indian Council of Medical Research)
Department of Health Research
Ministry of Health & Family Welfare, Govt of India
Kamla Nehru Hospital Building
Gandhi Medical College Campus
Bhopal – 462 001 (M.P.), India
Phone: + 91 755 2533106, 2533976
Fax : + 91 755 2533976
e-mail: nirehbhopal@yahoo.in
web site : www/http/nireh.org

Goal

To understand the mechanisms of chemical–induced injury through basic, clinical, translational and community research and to develop diagnostic and therapeutic tools to chemical threat agents including toxic industrial and agricultural chemicals, toxins and other chemicals

Current Focus of Research

Bhopal Gas Disaster, Population Based Long Term Epidemiological Study, Genetics, Epigentics & Cytogenetics, Chronic Obstructive Pulmonary Disease, Chronic Kidney Disease

STAFF POSITION

Director (Additional charge)	:	Prof. Manoj Pandey (w.e.f. 30 August, 2013)	
Head of the Office	:	Dr. N. Banerjee, Scientist C	
Scientist F	:	Dr. Anil Prakash	(w.e.f 17 January, 2014)

Epidemiology Division

Scientist B	:	Dr.(Mrs.) R. Galgalekar	(w.e.f 4 September,2013)
Scientist B	:	Dr. K. K. Soni	-do-
Technical Assistant	:	Mr. A. M. Khan	-do-
Technical Assistant	:	Mrs. M. Chaturvedi	-do-
Technical Assistant	:	Mrs. A. N. Bhavsar	-do-
Technical Assistant	:	Mrs. H. Saxena	-do-
Technical Assistant	:	Mrs. S. Khare	-do-
Technical Assistant	:	Md. S. Khan	-do-
Technical Assistant	:	Dr. V. S. Rathore	-do-
Technical Assistant	:	Mr. U. S. Chauhan	-do-
Technical Assistant	:	Mrs. R. Sen	-do-
Technical Assistant	:	Dr. (Mrs.) A. Shukla	-do-
Technical Assistant	:	Mrs. R. Yadav	-do-
Technical Assistant	:	Mrs. S. Azhar	-do-
Technical Assistant	:	Mr. D. S. Shukla	-do-
Technical Assistant	:	Mr. R. K. Srivastava	-do-
Research Assistant	:	Mr. B.K. Dixit	-do-
MTS (Tech)	:	Ms. Ayesha Khan	-do-
MTS (Tech)	:	Mr. K. D. Sharma	-do-

Statistics Division

Technical Officer B	:	Mrs. M. Sharma	(w.e.f 4 September, 2013)
Statistical Assistant	:	Mr. S. Khare	-do-
MTS (Tech)	:	Mr. M. Ahmed	-do-
MTS (Tech)	:	Mrs. R. Lalwani	-do-

Computer Division

Scientist C	:	Dr. S. Singh	(w.e.f 4 September, 2013)
Technician C	:	Mr. R. Chandrasekhran Pillai	-do-
Technician C	:	Mr. S. Sharma	-do-
Technician C	:	Mr. A. K. Kori	-do-
MTS (Tech)	:	Mr. R. K. Pandey	-do-
MTS (Gen)	:	Mr. Srikant Mishra	-do-

Administration

Private Secretary	:	Mr. Krishnadas V.K.	(w.e.f 4 September, 2013)
Section Officer (Adm)	:	Mr. S. Srivastava	-do-
Section Officer (Acctts)	:	Mr. M. Waldhurkar	-do-
Technician B	:	Mr. R.K. Verma Thampuram	-do-
Technician A	:	Mrs. Anitha S. Pillai	-do-

Utilities

MTS (Gen)	:	Mr. D. Ugave	(w.e.f 4 September, 2013)
MTS (Gen)	:	Mr. P. Patva	-do-
MTS (Gen)	:	Mr. A. Husain	-do-
MTS (Gen)	:	Mrs. K. Bai	-do-

Attachment from BMHRC, Bhopal

Assistant Professor	:	Dr. R. M. Samarth	(w.e.f 24 October, 2013)
Asstt Administrative Officer	:	Mr. S. Subharwal	(W.e.f 10 September, 2013)

Advisors / Consultants

Advisor to DG	:	Dr. V. K. Vijayan
Consultant (Laboratory)	:	Dr. (Ms) Farida Khan
Consultant (Scientific)	:	Dr. B. Mishra (up to August, 2013)
Consultant (Scientific)	:	Dr. R. S. Murthy (up to August, 2013)
Consultant (Scientific)	:	Dr. A. Bhatnagar (up to August, 2013)
Consultant (Scientific)	:	Dr. R. K. Gupta (up to August, 2013)
Consultant (Administration)	:	Dr. R. C. Sharma

From the Director's desk

It gives me immense pleasure to present before you the activities and achievements of National Institute of Research on Environmental Health (NIREH) for the year 2013-2014. After the industrial disaster of 1984, a coordination unit was set up in 1985 that was later converted to Bhopal Gas disaster Research Unit in 1986. The Bhopal Gas Disaster Research Centre (BGDRC) of ICMR was handed over to Govt. of Madhya Pradesh in 1995, it continued to work as Centre of Rehabilitation Studies (CRS) till December 2010 and after establishment of NIREH, the CRS has been taken over by Indian council of Medical Research (ICMR). Established on 11th October, 2010 as the 31st permanent institute of Indian Council of Medical Research, the main focus of research in NIREH is on the Environmental health including that on population of Bhopal that had been exposed to toxic gas in the industrial accident of 1984.

The institution is still in its infancy, however, the scene is slowly changing and I hope that with the effective coordination and collaboration with the hospitals established for gas affected people, continued support of Government of Madhya Pradesh, various NGOs, national experts as well as international experts and different Department of Union Government we shall be able to fulfill our mandate soon. When I took over the office in September 2013, the first priority was to make the labs functioning and start the research. I am pleased that during the reporting year we were able to initiate four research projects on genetics and epigenetics, and biomarkers in COPD, long term genetic effects, and cytogenetic changes in the exposed and their progeny, besides the already ongoing long term epidemiological study. A number of projects are in various phases of development and very soon we will be seeing good academic and research contributions from NIREH.

Beside research, NIREH has been successful in preparing the manual for mental health care and COPD. NIREH has been successfully managing respiratory physiotherapy center and has been taking care of patients in the community and providing healthcare and referral to Bhopal Memorial Hospital and Research Centre (BMHRC) another institute under ICMR.

During the reporting year, 184 posts were sanctioned and the process of filling them was started. The architectural drawing for the centers' permanent building in Bhouri was prepared and approved, the SFC for the same was submitted. We hope that the construction of the institute building in Bhouri will start very soon.

I congratulate the scientists and the staff of NIREH for their hard work and I am confident that with further filling up of scientific posts NIREH's progress will be unparalleled and this will soon become the flagship institute of ICMR.

Prof. Manoj Pandey

Director (Additional Charge)

CONTENTS

NIREH…….THE JOURNEY BEGINS

After the gas accident at Bhopal in the night of 2/3 December 1984, the Indian Council of Medical Research (ICMR) initiated several research programmes. Initially in 1985 ICMR had set up a Coordinating Unit that was subsequently upgraded in August, 1986 to `Bhopal Gas Disaster Research Centre' to monitor the research programmes and also to undertake long term epidemiological study to record the morbidity and mortality of a cohort of gas exposed and control population. The clinical research studies were organized simultaneously on acute and sub-acute clinical phase viz. radiological aspects, mental health problems, respiratory afflictions including pulmonary function and arterial blood gases, pregnancy outcome, neurological diseases and immunological, mutagenic and geno toxic aspects to document the natural history of the morbidities caused, and to find rational methods of treatment. While most projects were undertaken by Gandhi Medical College, Bhopal, a few were carried out by scientists from Delhi, Lucknow, Bangalore, Bombay and ICMR Institutes.

In 1994, after review/recommendations of the projects by the Project Advisory Committee and Scientific Advisory Committee, it was observed that the projects have achieved the objectives and were completed except for the long term epidemiological study, which was subsequently handed over to the Madhya Pradesh Government, to continue under the `Centre for Rehabilitation Studies', M.P Gas Rehabilitation Department, Bhopal. Since the studies had achieved the original objectives, the ICMR handed over the Bhopal Gas Disaster Research Centre to MP Government for continuation of monitoring the possible health effects on long term basis with a corpus fund of Rs. 5 crore provided by the Ministry of Chemical and Petro Chemicals in 1994-95.

After the judgment of Sessions Court, Bhopal on 7th June 2010, Government of India, in the first half of June, 2010, set up a Group of Ministers (GoM) to examine all the issues related to Bhopal Gas Leak Disaster. The Union Cabinet passed a resolution on 24th June, 2010 directing, interalia, ICMR to establish a new permanent research centre at Bhopal. Thus, National Institute for Research in Environmental Health (NIREH), came in to existence on 11th October, 2010 as the 31st permanent institute of ICMR at Bhopal. Though the immediate focus of this Institute is to cater to the health research needs of the gas exposed population of Bhopal, the institute is mandated to focus on the entire issues of environmental health in long term.

To begin with NIREH started functioning from a couple of rooms allotted in the building of Kamla Nehru Hospital in the Gandhi Medical College Campus. Subsequently, two floors space was allotted to NIREH in the same building which was modified and refurbished to house various laboratories, clinics, library and administrative wing and currently NIREH is operating from there. In 2013, Govt of Madhya Pradesh allotted free of cost 8.0 hectares of land at Bhauri village, situated on Bhopal-Indore by pass road for constructing permanent residential and office campus of NIREH. The construction work of the NIREH permanent Campus will begin soon.

EXECUTIVE SUMMARY

- The long term population based epidemiological study on the health effects of the toxic gas continued and during the year 46th (Jan-June 2013) and 47th (July-Decemeber 2013) six monthly rounds of surveys were completed. The 46th round of survey covered a cohort of 16,815 gas exposed people from severely affected (5,052), moderately affected (6,574) and mildly affected (5,189) areas and 5,244 unexposed people from control area. Any morbidity recorded in severely exposed areas was 21.5%, in moderately exposed areas 17.2%, in mildly exposed areas 18.1% and in control areas 8.0%. In 47th round a cohort of 19,763 gas exposed people (severely affected 6,605, moderately affected 6,991, mildly affected 6,167) and 5,528 unexposed people from the control areas were followed up. The trend of various morbidities in 47th round, by and large, remained the same as that of 46th round with any morbidity ranging from 22.5 to 9.4%, respiratory morbidities from 11.3 to 1.9%, ophthalmic morbidities from 13.1 to 2.4% and gastrointestinal morbidities from 4.0 to 0.9% in the four areas.

- Four new Intramural projects were initiated during the last part of the year on long term genetic effects of toxic gas exposure; genetics and epigenetics of lung function among the victims of Bhopal gas disaster; cytogenetic analysis of MIC exposed population and their progenies; and evaluation of biochemical markers in clinically stable cases of COPD in gas affected population. Preliminary work in these projects were done including staff recruitment and procurement of supplies.

- For the benefit of gas exposed population a special respiratory clinic at the Institute continued to function along with running of a respiratory physiotherapy centre and community based health services in the affected areas.

- Govt of Madhya Pradesh allotted free of cost 8.0 hectares of land at Bhauri village, situated on Bhopal-Indore by pass road for constructing permanent residential and office campus of NIREH.

- A total of 184 scientific, technical and administrative posts were sanctioned by the Government of India for NIREH. Further, 39 staff members of erstwhile Centre for Rehabilitation Studies, Bhopal, Government of MP, who were taken on contractual basis by ICMR in NIREH after its establishment, were placed against the sanctioned permanent posts of NIREH w.e.f September, 4, 2013

RESEARCH WORK

Project -1 : Population Based Long Term Epidemiological Study

Investigators: (i) Team BGDRC (Jan 1985 – May 1994) - ICMR
Duration & (ii) Team CRS (Jan 1996 – Jan 2011) - Govt of M.P.
Funding (iii) Team NIREH (Feb 2011 onwards) - ICMR

Investigators from NIREH : Dr. N. Banerjee, Dr. S. Singh, Dr. R. Galgalekar, Dr. K. K. Soni, Mrs. M. Sharma

The population based long term epidemiological study on the health effects of the toxic gas exposure was carried out under Bhopal Gas Disaster Research Centre, ICMR (BGDRC) between 1985 and May 1994. The study, with the same protocol was reinitiated in January 1996 under Centre for Rehabilitation Studies (CRS), Govt of M.P. and was carried out till January 2011. Since the formation of NIREH in Oct 2010 the study is being continued under ICMR. This study has provided valuable information related to immediate and long term morbidity pattern in the gas affected population and changes in socio demographic profile over time. The morbidity and mortality data is being collected at six monthly intervals in the registered study cohort of gas exposed and unexposed (control) families using a structured health survey questionnaire by trained field workers.

1.1 Study cohort

Toxic gas leakage from Union Carbide India Limited factory in the intervening night of 2/3 December, 1984 exposed nearly 63% population (about 5.75 lakh individuals) of Bhopal living in 36 wards to varying degrees of adverse health effects and killed over 3,000 people. The gas exposed areas, on the basis of mortality rates between 3-6 December, 1984, were categorized in severely affected area (average death rate 22/1,000, range 20.2-23.8) covering a population of 32,476 (3.9% of Bhopal population), moderately affected area (average death rate 1.33/1,000, range 0.5-3.0) covering a population of 71,917 (8.6% of Bhopal population) and mildly affected area (average death rate 0.2/1,000, range 0.1-0.4) covering a population of 4,16,869 (50.1% of Bhopal population).

For the long term epidemiological study initially a cohort of 80,021 gas exposed individuals (26,382 persons from 2 severely affected wards, 34,964 persons from 5 moderately affected wards and 18,675 persons from 4 mildly affected wards) and 15,931 non-exposed individuals (from 3 unaffected wards) was planned to be assembled. However, when the actual study was launched in April 1986 only 62,706 exposed (19,260, 28,261 and 15,185 from the 3 category of affected areas respectively) and 13,526 non-exposed individuals from the control areas were available who were followed up to December 1994. The study under CRS (1996-2010) started following a part of the original cohort of 34,480 exposed (10,816 persons from severely affected areas, 14,137 persons from moderately affected areas and 9,527 persons from

mildly affected areas) individuals and 7,990 persons from unexposed control areas. However, due to variety of reasons such as shifting of population to different places, marriage related migration and deaths a substantial part of cohort was lost gradually and by the end of 2012 only 16,860 exposed individuals (5,658, 6,533 and 4,669 from severely, moderately and mildly affected localities) and 5,741 non-exposed from control areas were available for follow up. During 2013-2014 necessary steps were taken to trace the lost individuals of the cohort and about 3,500 individuals from 675 families could be traced and added to the existing cohort till 31st March, 2014.

1.2 Pattern of morbidities (1984 – 2012)

1.2.1 Any morbidity

Immediately after the disaster, the morbidities were very high to the extent of 98.9, 99.0 and 99.5% in severely, moderately and mildly affected area (Table-1). Morbidity in all areas came down during May-Nov 1988 survey and subsequently increased during Nov 1990- to May 1991 survey and declined again. Since 2006, any morbidities have been stabilized between 22.5 and 20.6 in severely exposed area; 16.0 to 17.4% in moderately affected area and 16.2 to 19.9% in mildly exposed area. Any morbidities in control area fluctuated between 7.7 to 11% since 1996 (Figure-1) .

Table – 1: Status of any morbidity in the study cohort (1984-2012)

Year	SEVERE			MODERATE			MILD			CONTROL		
	No. survey-ed	No. morbids	%	No. survey-ed	No. morbids	%	No. Survey-ed	No. morbids	%	No. survey ed	No. morbids	%
1984	24994	24743	98.9	33442	33127	99.0	18208	18126	99.5	15616	27	0.17
1991	8070	2820	34.9	13150	3404	25.8	6952	1931	27.7	7911	1758	22.2
1996	10816	3050	28.2	14137	3426	24.2	9527	2106	22.1	7990	884	11.1
2001	6895	1500	21.7	9792	1653	16.8	6176	982	15.9	5133	397	7.7
2006	4961	1120	22.5	5834	978	16.7	4814	781	16.2	5338	414	7.7
2010	5658	1229	21.7	6533	1093	16.7	4669	772	16.5	5741	480	8.3
2012	**6706**	**1344**	**20.0**	**7047**	**1335**	**18.9**	**5171**	**952**	**18.4**	**4984**	**489**	**9.8**

1.2.2 Respiratory morbidities

During acute stage overall 96.8% persons suffered with respiratory morbidities in the exposed areas. In the severely affected area, the morbidity specific to lung for males remained higher in all the follow-ups compared to other two exposed and control area. In 1996 respiratory

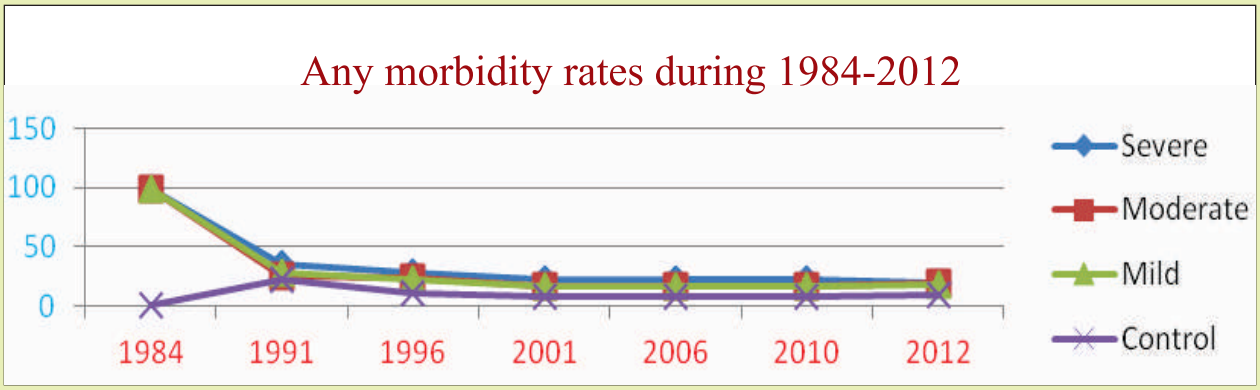


Figure-1: Trend of any morbidity in the study cohort (1984-2012)

morbidities came down from 1984 level of 96.8% to 20.1, 16.9, and 16.4 % in severely, moderately, mildly affected area in comparison to 4.3% in control area (Table-2). Since 1997, respiratory morbidity rates have

Table-2: Status of respiratory morbidities in the study cohort (1984-2012)

Year	SEVERE			MODERATE			MILD			CONTROL		
	No. surveyed	No. morbids	%	No. surveyed	No. morbids	%	No. surveyed	No. morbids	%	No. surveyed	No. morbids	%
1984	24994	24213	96.8	33442	32802	97.4	18208	17958	98.6	15616	10	0.06
1991	8070	1632	20.2	13150	2012	15.3	6952	1147	16.4	7911	288	3.6
1996	10816	2207	20.1	14137	2402	16.9	9527	1568	16.4	7990	349	4.3
2001	6895	1202	17.4	9792	1133	11.5	6176	856	13.8	5133	136	2.6
2006	4961	835	16.8	5834	630	10.8	4814	675	14.0	5338	160	3.0
2010	5658	978	17.2	6533	641	9.8	4669	608	13.0	5741	147	2.5
2012	6706	838	12.4	7047	729	10.2	5171	592	11.4	4984	113	2.2

been fluctuating between 12.4-20.1% in severely, 9.8-15.3% in moderately and 11.4-16.4%in mildly affected areas. These respiratory morbidity rates remained high in all affected areas in comparison to control area (0.06 - 4.3%) throughout 1984-2012 (Figure-2) showing no major change since 2001.

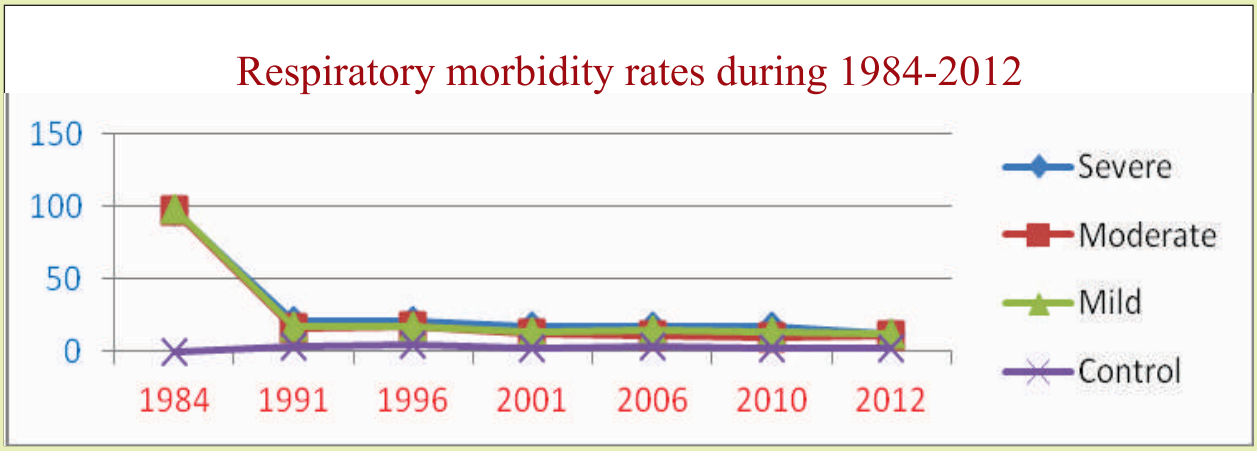


Figure-2: Trend of respiratory morbidities in the study cohort (1984-2012)

1.2.3 Ophthalmic morbidities

During acute phase in 1984, 98.5, 98.0 and 99.0% ophthalmic morbidities were recorded in severely, moderately and mildly affected area respectively in comparison to 0.07% in control population (Table-3). By 1996, ophthalmic morbidity rates came down to 16.6, 12.4 and 14.9%

Table-3: Status of ophthalmic morbidities in the study cohort (1984-2012)

Year	SEVERE			MODERATE			MILD			CONTROL		
	No. surveyed	No. morbids	%	No. surveyed	No. morbids	%	No. surveyed	No. morbids	%	No. surveyed	No. morbids	%
1984	24994	24621	98.5	33442	32802	98.0	18208	18027	99.0	15616	11	0.07
1991	8070	950	11.7	13150	1583	12.0	6952	1062	15.2	7911	533	6.7
1996	10816	1795	16.6	14137	1754	12.4	9527	1428	14.9	7990	330	4.1
2001	6895	1055	15.2	9792	831	8.4	6176	804	13.0	5133	153	2.9
2006	4961	656	13.2	5834	595	10.0	4814	708	14.7	5338	183	3.4
2010	5658	897	15.8	6533	614	9.3	4669	653	13.9	5741	193	3.3
2012	6706	712	10.6	7047	697	9.8	5171	612	11.8	4984	156	3.1

in the three exposed areas in comparison to 4.1% observed in the control area. These rates declined further and have been seen fluctuating between 10.6 - 15.8% in severely affected area, between 9.3 -11% in moderately affected area and 11.8 -17.8% in mildly affected area in comparison to 2.8 –3.1% in control area during 2005-2012 (Figure-3).

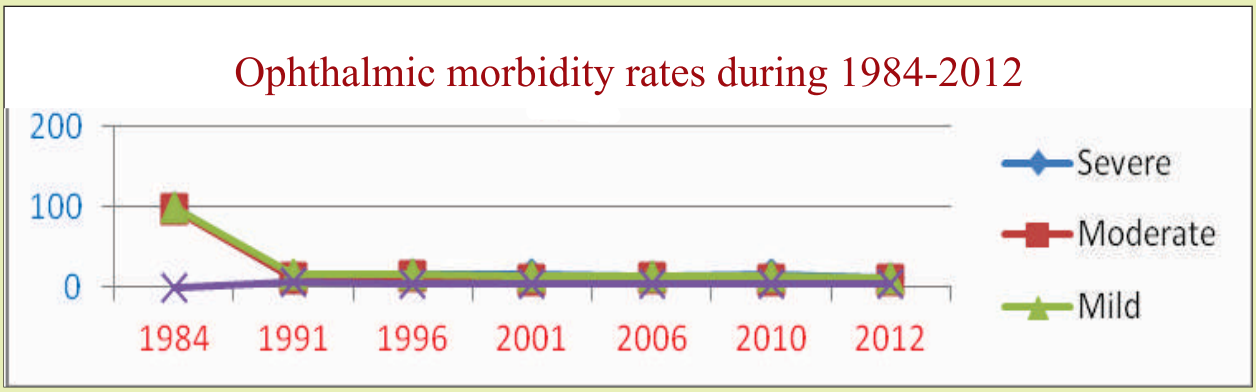


Figure-3: Trend of ophthalmologic morbidities in the study cohort (1984-2012)

1.2.4 Gastrointestinal morbidities

During the acute phase in 1984, 73.5, 26.3 and 15.0% of the surveyed people were found to be suffering from gastrointestinal morbidities in severely, moderately and mildly affected areas compared to 0.01% people in control areas. However, by 1991, GI morbidity rates fell down to 7.9, 6.5 and 5.8% in the three exposed areas while it increased to 5.8% in control areas (Table-4).

Table-4: Status of GIT morbidities in the study cohort (1984-2012)

Year	SEVERE			MODERATE			MILD			CONTROL		
	No. surveyed	No. morbids	%	No. surveyed	No. morbids	%	No. surveyed	No. morbids	%	No. surveyed	No. morbids	%
1984	24994	18379	73.5	33442	8817	26.3	18208	2733	15.0	15616	3	0.01
1991	8070	645	7.9	13150	857	6.5	6952	409	5.8	7911	459	5.8
1996	10816	649	6.0	14137	596	4.2	9527	743	7.8	7990	193	2.4
2001	6895	351	5.0	9792	345	3.5	6176	569	9.2	5133	81	1.5
2006	4961	256	5.1	5834	303	5.1	4814	508	10.5	5338	90	1.6
2010	5658	295	5.2	6533	265	4.0	4669	442	9.4	5741	119	2.0
2012	6706	210	3.1	7047	259	3.6	5171	269	5.2	4984	91	1.8

Since 1996, GI morbidity rates have been fluctuating between 3.1-6.0, 3.5-5.1 and 5.2-10.5 % in severely, moderately and mildly affected areas in comparison to 1.6-2.4% in control areas (Figure-4). The rise in morbidity rates in the mild area was further analyzed and an excessive reporting of symptom like abdominal pain and gastritis was identified.

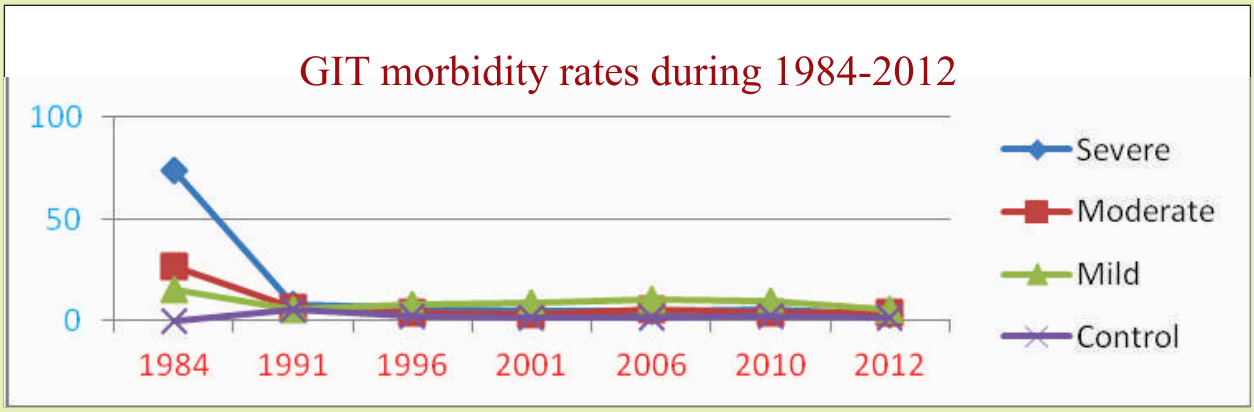


Figure-4: Trend of gastrointestinal morbidities in the study cohort (1984-2012)

1.2.5 Skin morbidities

Skin morbidities were observed in less than 1.8% people in all the exposed areas during the acute phase in 1984 while this was not reported from control area (Table-5). Morbidity rates rose

Table-5: Status of skin morbidities in the study cohort (1984 – 2010)

Year	SEVERE			MODERATE			MILD			CONTROL		
	No. surveyed	No. morbids	%	No. surveyed	No. morbids	%	No. surveyed	No. morbids	%	No. surveyed	No. morbids	%
1984	24994	321	1.2	33442	610	1.8	18208	163	0.89	15616	0	0.0
1991	8070	189	2.3	13150	260	1.9	6952	60	0.86	7911	109	1.3
1996	10816	146	1.3	14137	101	0.71	9527	49	0.51	7990	29	0.36
2001	6895	73	1.0	9792	42	0.43	6176	8	0.13	5133	16	0.31
2006	4961	58	1.1	5834	34	0.58	4814	4	0.08	5338	14	0.26
2010	5658	50	0.89	6533	26	0.39	4669	26	0.56	5741	17	0.29
2012	6706	40	0.59	7047	34	0.48	5171	21	0.40	4984	25	0.50

marginally in all areas including control in 1991. Except the peak recorded in 1991 in severe and moderate areas, skin morbidities remained less than 1% in all areas including control (Figure-5).

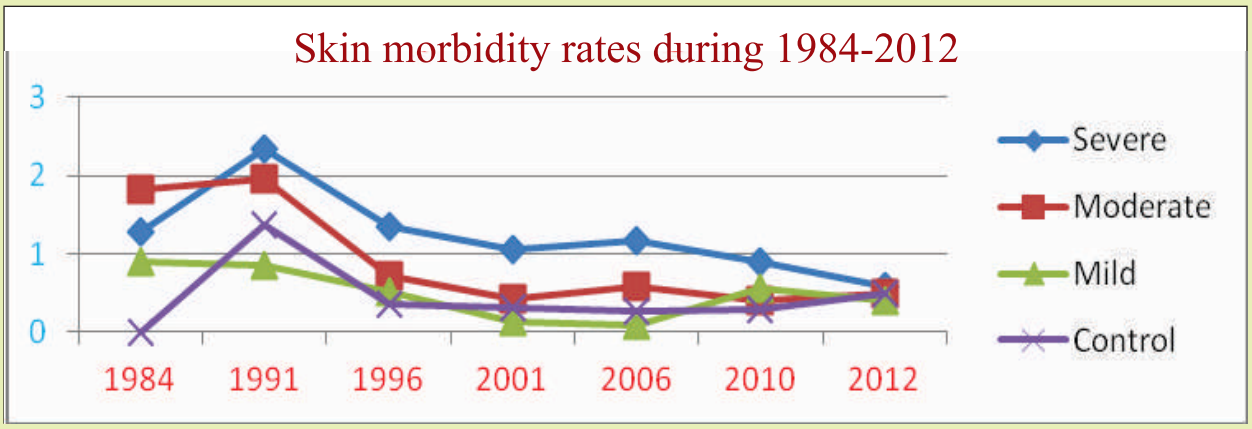


Figure-5: Trend of skin morbidities in the study cohort (1984-2012)

1.3 Pattern of morbidities (2013 – 2014)

During the reporting year two rounds of six monthly surveys were carried out- the 46th round (January-June 2013) and 47th round (July-December 2013).

46th round of survey: During the 46th round a cohort of 16,815 gas exposed people from severely affected (5,052), moderately affected (6,574) and mildly affected (5,189) areas and 5,244 unexposed people from control areas was followed up. Any morbidity recorded in severely exposed areas was 21.5%, in moderately exposed areas 17.2%, in mildly exposed areas 18.1% and in control areas 8.0% (Figure-6). The respiratory morbidity rates remained very high in the severely exposed areas (11.7%), moderately exposed areas (9.2%), and mildly exposed areas (11.1%) as compared to control areas (1.7%). The ophthalmic morbidities were also high *viz.* 12.9% in severely exposed areas, 8.7% in moderately exposed areas, 10.9% in mildly exposed areas in comparison to 2.0% in control areas. The gastrointestinal morbidities in severely exposed areas (3.6%), moderately exposed areas (3.1%), and mildly exposed area (4.7%) were higher than the control areas (0.7%). Total number of deaths recorded during the 46th round of survey was 117 (exposed areas 79, control 38). Death due to probable respiratory disorders was the highest in the exposed areas (35/79 i.e. 44.3%) compared to control areas (5/38 i.e. 13.2%). Cause of various deaths recorded are provided in Figures-7a and 7b.

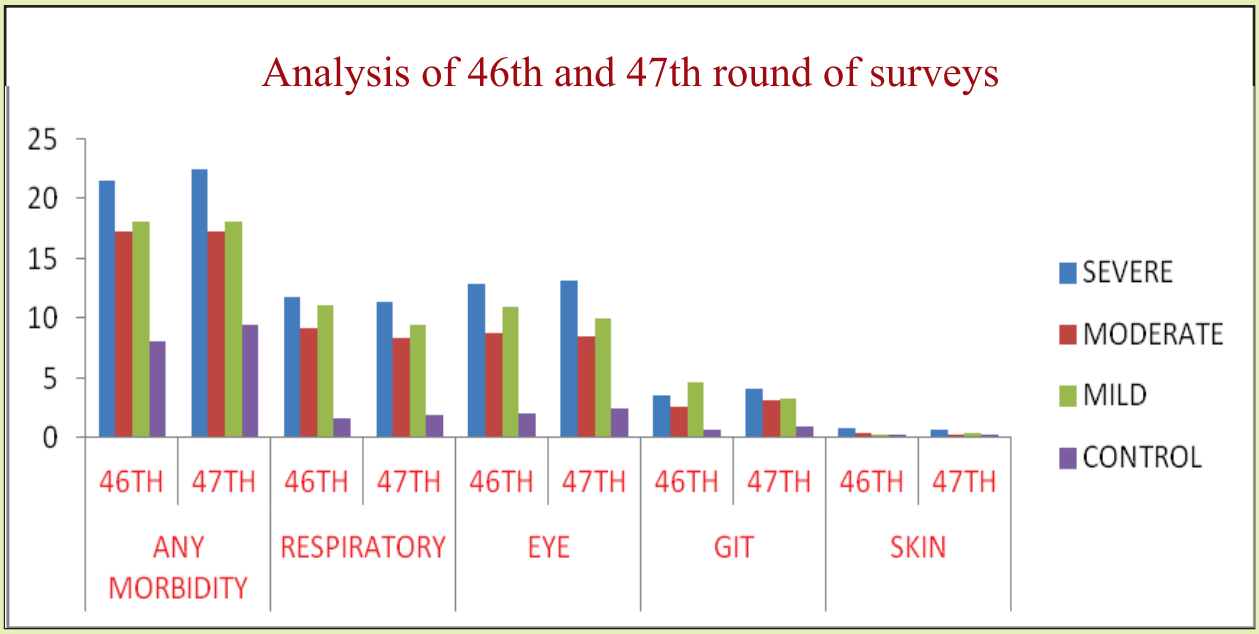


Figure-6: Trend of morbidities during 46th (Jan-Jun 2013)and 47th round of survey (July – Dec 2013)

47th round of survey: At the end of 47th round of survey a special drive was undertaken to trace out the migrated families of the original cohort resulting in reopening of 679 more families. Thus, in 47th round a cohort of 19,763 gas exposed people (severely affected 6,605, moderately affected 6,991, mildly affected 6,167) and 5,528 unexposed people from the control areas were followed up. The trend of various morbidities in 47th round, by and large, remained the same as that of 46th round with any morbidity ranging from 9.4 to 22.5%, respiratory morbidities from 1.9-11.3%, ophthalmic morbidities from 2.4 to 13.1% and gastrointestinal morbidities from 0.9-4.0% in the four areas (Figure-6). Pattern of deaths in 47th round remained similar to 46th round (Figures-8a & 8b) i.e. highest deaths in exposed areas were recorded due to respiratory disorders (40.1%) compared to only 4.2% in control areas.

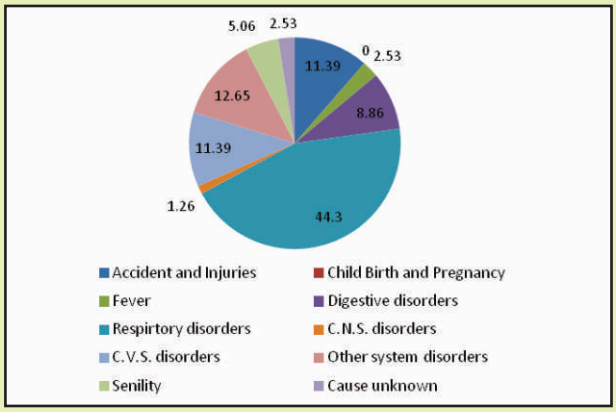


Figure-7a Pattern of mortalities in exposed areas during 46th round

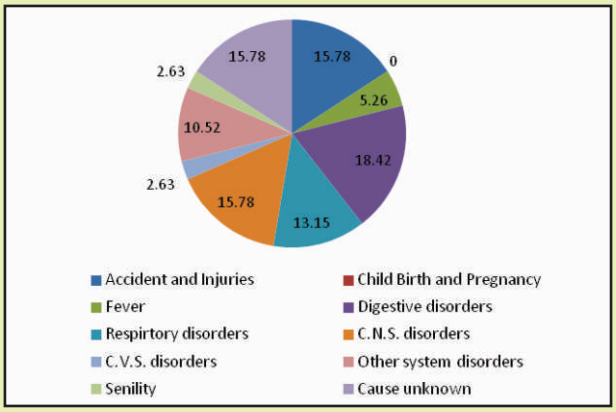


Figure-7b Pattern of mortalities in control areas during 46th round

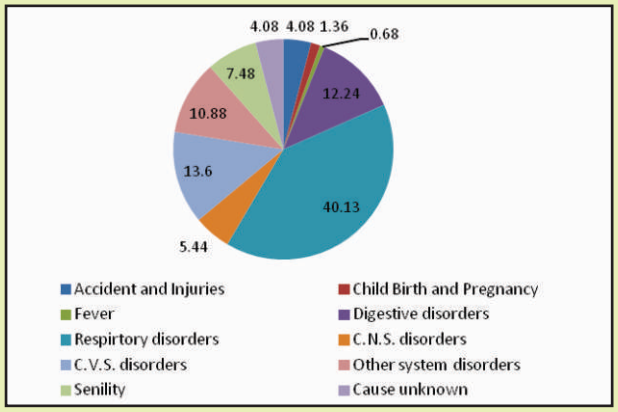


Figure-8a Pattern of mortalities in exposed areas during 47th round

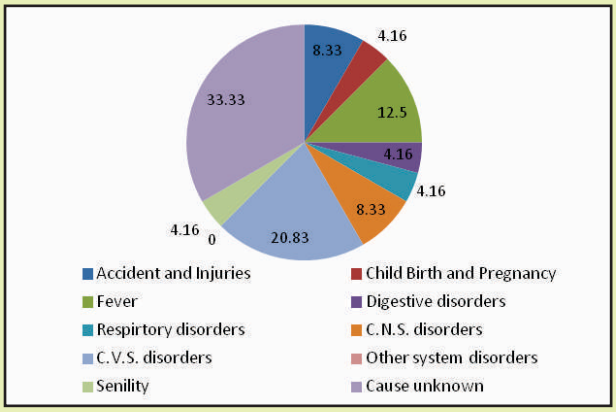


Figure-8b Pattern of mortalities in control areas during 47th round

Project-2: Genetics and Epigenetics of Lung Function among the Victims of Bhopal Gas Disaster

Investigators: Dr. Vipin Gupta, DU (PI), Dr. N. Banerjee, NIREH, Bhopal (Co PI), Dr. Raj Kumar, VP Chest Institute (Co PI), Dr. G. K. Walia, PHFI (CI), Dr. P. Dhillon, PFHI (CI)
Duration: 1 Year (Nov 2013-Oct 2014)
Funding: ICMR (IM)

With an aim to assess the effects of genetic and epigenetic variations on lung functions of the victims of Bhopal gas tragedy this study envisages to investigate the association of recently identified novel genome-wide association study genes related to lung function and COPD together with normal physiological range of lung function measures in 8,000 gas exposed subjects. It further envisages to study detailed gene-environment interaction in a sub set of 150 severely gas exposed subjects together with their unexposed healthy siblings by evaluating the effect of variation in DNA methylation of two genes through epigentic assays in relation to lung functions, based on the hypothesis that both genetic and epigenetic lesions may contribute to functional deterioration.

On the recommendations of the ICMR Expert Project Review Committee the target for the first year pilot study was set to study the genetic association among 1,500 gas exposed subjects (500 each from severely, moderately and mildly exposed areas) and 500 non-exposed subjects. Randomly selected, unrelated, toxic gas exposed subjects in 40-70 years age bracket are being recruited for the study. Recruitment of project staff and their training, procurement of necessary equipments and consumables, finalization of study instruments, bar codes has been completed. Pretesting of the questionnaire and field protocol was piloted. So far, 82 study

Spirometry in progress

Data collection through questionnaire

subjects from the severely exposed population, selected from the random list generated from the existing database of NIREH, have been recruited and their anthropometric (height, weight and circumference) and physiological measurements (blood pressure, PFT before and after bronchodilator) have been recorded. Information through structured questionnaire has been collected from the subjects on COPD risk factors (family history, tobacco smoking, chewing, indoor pollution) and other related aspects (socioeconomic status, diet, physical activity). The blood samples have been collected (for DNA extraction and genetic studies) and stored till further analysis.

Project-3 : Cytogenetic Analysis in Methyl Isocyanate (MIC) Exposed Population and Their Progeny

Investigators: Dr. N. Ganesh, JNCHRC, Bhopal (PI), Dr. N. Banerjee, NIREH, Bhopal (Co PI)
Duration: 2 Years (Nov 2013-Oct 2015)
Funding: ICMR (IM)

Aiming to explore the cytogenetic alteration in toxic gas exposed population of Bhopal and their progeny, this study is expected to unveil the present chromosomal status of toxic gas exposed survivors and the genetic effects on the progenies born to exposed individuals and to estimate the levels of risk of developing any genetic disorders. The study envisages to screen a total of 1,800 individuals of both sexes in age range of 29-59 years belonging to six categories *viz.* toxic gas exposed, unexposed, 1st and 2nd generation progeny born after exposure, those suffering from different ailments, and those with congenital malformation. The study will look at the chromosomal aberration assays, sister chromatid exchanges, confirmation of Trisomies on GTG banded slides through FISH along with pedigree analysis of gas exposed individuals. Study subjects are being selected from the registry of Jawahar Lal Nehru Cancer Hospital and Research Centre (JNCHRC) following defined inclusion and exclusion criteria. With the recruitment of the project staff the work on the project has been initiated and so far a total of 165 subjects (95 males, 70 females) belonging to various categories (Figure-9) have been enrolled.

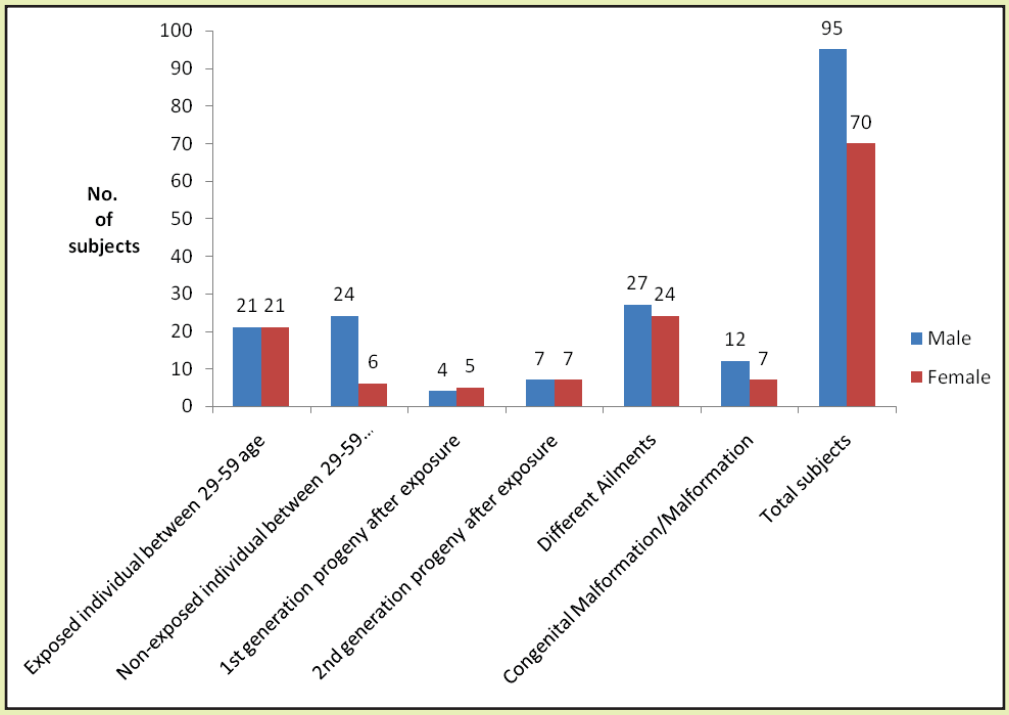


Figure-9: Subjects enrolled under various categories

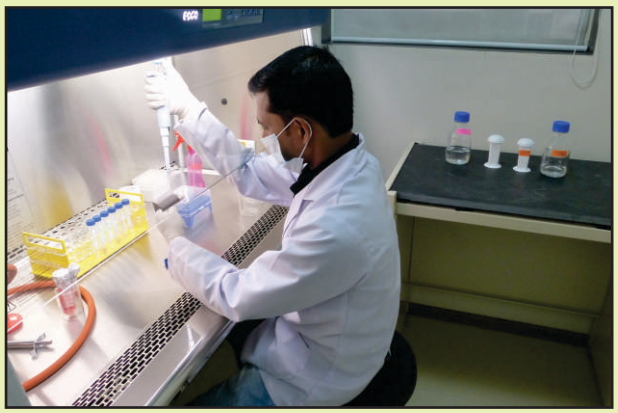
Project-4 : Long Term Genetic Effect(s) of MIC gas, if any, on the Bhopal Population Exposed in December, 1984

Investigators: Dr. B. B. Ganguly, MGMIHS, Mumbai (PI), Dr. N. Banerjee, NIREH, Bhopal (Co PI)

Duration: 1 Year (Nov 2013-Oct 2014)

Funding: ICMR (IM)

An earlier multi-centric study of ICMR (1986-1990), involving six centres *viz*. Kolkata, Bangalore, Delhi, Varanasi, Lucknow and Bhopal, had screened the genetic condition of exposed and unexposed population subsequent to the toxic gas leakage accident in Bhopal in December 1984. Present study envisages to evaluate current genetic condition of those pre-screened subjects and compare with the previous genetic data to identify long term effect of gas exposure, if any, after 30 years in the exposed population and their progenies and to correlate with their health status, especially with reference to reproductive outcome, birth defects and malignancies. The pilot study during its first year is concentrating on the cytogenetic studies on the pre-screened 159 families by the Kolkata centre and is targeting 100 subjects each of exposed and unexposed groups including their children amongst these during the I year. The study envisages preparation of 3-generation pedigree along with clinical examination and screening for current status of spontaneous chromosomal aberrations in first cycle mitotic cells (M1) of PHA-stimulated lymphocyte culture, constitutive aberrations by G-banding in second cycle mitotic cells (M2) and cryptic rearrangements by FISH technique. So far, 43 pre-screened families have been traced out and pedigree charts have been drawn from 27 of them. Information such as exposure history, family size, general health status etc. has been collected from the selected subjects. Further, Cell culture technique has been established in NIREH and is under validation. Blood samples have been collected from 17 subjects and their karyotyping completed.



Sample culturing in lab

Mitotic karyotyping reading

Project-5: To Evaluate Biochemical Markers in Cases of Clinically Stable Stages of Chronic Obstructive Pulmonary Disease (COPD) in MIC Affected Population

Investigators:	**Dr. Farida Khan, Consultant NIREH, Bhopal (PI), Dr. R. Galgalekar, NIREH, Bhopal (CI), Dr. K. K. Soni, NIREH, Bhopal (CI)**
Duration:	**1 Year (Nov 2013-Oct 2014)**
Funding:	**ICMR (IM)**

In view of the absence of reliable, robust and reproducible biomarkers for COPD this pilot study envisages to evaluate six biomarkers in serum and induced sputum of clinically stable cases of COPD in gas exposed population of Bhopal in a bid to find an ideal biomarker for potential prognostic use in COPD cases. It is proposed to carry out the study in 30 clinically stable mild, moderate and severe COPD cases (10 of each category) according to GOLD standard with no co-morbidities and 10 healthy subjects fulfilling the exclusion and inclusion criteria. It is further proposed to collect information from each subject on the level of gas exposure, smoking habits, medical history, routine lab investigations and preliminary assessment of lungs by X-ray and pulmonary function test. Laboratory investigations include ELISA, FACS and Western Blot on serum and induced sputum collected from the subjects to estimate SP-D, MMP-9, TGF β_1, CC-16, CCL 18 and MCP-1/CCL2 biomarkers for their expression and quantification. Subjects recruitment has been initiated and laboratory protocols are being standardized.

OTHER ACTIVITIES

Mental Health

After the establishment of NIREH, 600 gas exposed families were screened during 2011-2012 under the guidance of Dr. R.S. Murthy, Consultant (Psychiatry) using the WHO Self Reporting Questionnaire (SRQ) to estimate prevalence of psychiatric disorders in the community. The survey revealed that nearly 50% screened population expressed emotional distress of which 20% was attributable to diagnosable psychiatric disorder, while in remaining psychological distress was associated with chronic medical problem.

During the reporting period several patients were referred from gas exposed localities by the research staff of NIREH and trained doctors of different government hospitals for the assessment of mental health and clinical care by Dr. Murthy. This exercise revealed that (i) existing mental health services were not sufficient to manage the problem in the community (ii) there were multiple psychosocial issues like poverty, unemployment, domestic violence, alcoholism, old age related problem etc. prevalent in the gas affected community (iii) there was improvement in clinical condition with available treatment through different hospitals

During the reporting period the treatment manual for management of mental health problem was prepared and is being finalized.

Special Respiratory Clinic

A pulmonary clinic is being run at NIREH under the supervision and specialized services of Dr. V.K. Vijayan, Advisor to DG, ICMR. Severely ill cases having respiratory complaints, identified during the field surveys, are transported to NIREH where they are clinically examined and advised. Their blood investigation and X-ray are done at Kamla Nehru Hospital while ECG and PFT are carried out at NIREH. During the reporting year a total of 197 patients (males 87, females 110) were benefitted through the respiratory clinic.

A patient undergoing PFT at NIREH

A patient undergoing ECG at NIREH

Community based health services

Community based health services are being provided by NIREH to the gas exposed people in severely affected areas since June 2012. Under this programme needy morbid subjects in the severely affected areas, identified during the epidemiological surveys, are examined by a physician of NIREH at their door steps and, if needed, transported to BMHRC or referred to other government hospitals for investigations and treatment on every Wednesday and Friday. During the year 70 patients (males 34, females 36) availed the referral ambulance service of BMHRC.

Respiratory Physiotherapy Centre

Community based pulmonary rehabilitation activity was initiated at Kenchi Mini Unit of BMHRC by NIREH during April, 2013. At this mini unit a qualified part time Physiotherapist has been providing pulmonary physiotherapy services on regular basis. A total of 28 patients of COPD from severely affected areas have been benefited under this programme .

COPD patients undergoing tri flow lung volume exercise at respiratory physiotherapy centre

TRAININGS ORGANIZED/ IMPROTANT ENVENTS

Training of Medical Officers on Mental Health

Three training programmes (7-10 May, 2013; 10-13 June, 2013; 8-11 July, 2013) on mental health involving about 30 medical officers from BMHRC, Gas Relief Department, and Sambhavana Trust, Bhopal were organized during the year. Each interactive training programme was of 10 hours duration. Videos of patients with various types of emotional problems among the survivors of gas disaster and standard WHO videos on the specific syndromes were used during the training. Detailed discussions were held to bring out the applicability of the mental health care approaches to patients attending the clinics. Role plays involving the participants were carried out to increase the clinical skills of the participants. Feed back and intensive interaction with the participants brought out the following felt needs on psychiatric knowledge and skills (i) the diagnostic terms used are limited and non-specific (ii) limited diagnostic skills (iii) limited knowledge of psychiatric medicines (iv) near absence of psychological interventional skills (v) limited knowledge of course and outcome of mental disorders and emotional problems associated with physical condition.

Trainees from BMHRC

Trainees from Gas Relief Department

Trainees from Sambhavana Trust

Celebration of NIREH Foundation day

The fourth Foundation day of NIREH was celebrated on 11th October, 2013. Dr. V.M. Katoch, Secretary, DHR & DG, ICMR, the Chief Guest, started the function by lighting of the ceremonial lamp and invoking the goddess Saraswati. Dr. Manoj Pandey, Director I/C, NIREH, Dr. V. K. Vijyan, Advisor to DG, ICMR and Dr. D. K. Shukla, Head, Division of NCD, ICMR were the other dignitaries present on the occasion. The Second Technical Report on population based long term epidemiological studies was released by Dr. Katoch on this occasion.

Glimpses of NIREH Foundation Day celebrations

World Environment day

World Environment Day was celebrated on 5th June, 2013 in the institute which was attended by staff members of NIREH, Kamla Nehru Hospital and Gandhi Medical College. On this occasion a poster presentation was organized among the staff members

Vigilance Awareness week

Vigilance awareness week (29 October-3rd November, 2013) was observed in NIREH. During the week slogan writing, lecture session and poster presentation were organized by the Institute.

Library

Library of NIREH is gearing itself to support the academic activities and to meet the needs of the scientists and researchers. Library is having access to ProQuest Medline Library (PML) data base providing full text online access to 3,500 biomedical journals, and ICMR customized Journal Custom Content Consortia (JCCC-ICMR) covering 693 full text journals and 215 open access journals. Other available library resources include the online journals through Electronic Resources in Medicine (ERMED). In addition, library is also having access to 4 leading bio-medical journals *viz.* Lancet, Science, Nature and New England Journal of Medicine.

A view of the library

Presently NIREH library is maintaining a core collection of only about 100 books in areas like Bhopal Gas Disaster, Biomedical Science, Computer Science, and Bio-statistics. Library also has got a good collection of various documents, publications, reports of seminars and workshops etc. related to Bhopal Gas Disaster and related environmental health issues. The library is equipped with 2 computers with internet connectivity to help researchers in pursuit of their academic activities. The upgradation of library is in process.

Major Accomplishments

- Govt of Madhya Pradesh allotted free of cost 8.0 hectares of land at Bhauri village, situated on Bhopal-Indore by pass for constructing permanent residential and office campus of NIREH. The proposed land is located at a distance of about 7 km from Raja Bhoj Air port, Bhopal in the vicinity of Indian Institute of Science, Education and Research (IISER). Capital Project Administration has been identified as the construction agency. Lay out plan has been prepared.

ICMR Officials inspecting the land allotted for NIREH permanent campus at Bhauri village

- A total of 184 scientific, technical and administrative posts have been sanctioned by the Government of India for NIREH. Further, all 39 staff members of erstwhile Centre for Rehabilitation Studies, Bhopal, Government of MP, who were taken on contractual basis by ICMR in NIREH after its establishment on 11-10-2010, have been placed against the sanctioned permanent posts of NIREH w.e.f September, 4, 2013.

Meetings / Trainings / Seminars attended

Dr. Manoj Pandey, Director I/C

1. Meeting of the Epidemiology Expert Group on NIREH, Bhopal (22 January, 2014) at ICMR Hqts., New Delhi
2. 8th Advisory Committee Meeting on Gas Rahat constituted by Hon'ble Supreme Court (2 Feb, 2014) at BMHRC, Bhopal
3. Building Advisory Committee Meeting of NIREH (1 Mar, 2013) at BMHRC, Bhopal
4. Meeting to address issues raised by NGOs on a research proposal (11 Mar, 2014) at ICMR Hqts, New Delhi

Dr. Anil Prakash, Scientist F

1. Meeting of the Epidemiology Research Expert Group on NIREH, Bhopal (22 January, 2014) at ICMR Hqts., New Delhi
2. 8th Advisory Committee Meeting on Gas Rahat constituted by Hon'ble Supreme Court (2 Feb, 2014) at BMHRC, Bhopal
3. Expert Member in the Consultation Meeting on Vector Control in India for preparing background material for JMM (NVBDCP & WHO) (18 Feb, 2013) at VCRC, Pudduchery
4. Building Advisory Committee Meeting of NIREH (1 Mar, 2013) at BMHRC, Bhopal

Dr. N. Banerjee, Scientist C

1. Meeting of the Basic Research Expert Group on NIREH, Bhopal (9 April, 2013) at NIREH, Bhopal
2. Review meeting on planning and DPR of NIREH (2 May, 2013) at NIREH, Bhopal
3. Meeting of the Expert Group to review the approved research proposals (23-24 May, 2013) at NIREH, Bhopal
4. Advisory Committee Meeting of BMHRC (29-30 June, 2013) at BMHRC, Bhopal
5. Review meeting on planning and DPR of NIREH (21 May, 2013) at ICMR Hqts., New Delhi
6. Meeting of Institutional Ethics Committee of NIREH (23 August, 2013) at NIREH, Bhopal
7. Monitoring Committee Meeting on Gas Rahat constituted by Hon'ble Supreme Court of India (19 Nov, 2013) at Dte of Health Services, Bhopal

8. Meeting of the Epidemiology Expert Group on NIREH, Bhopal (22 January, 2014) at ICMR Hqts., New Delhi

9. 8th Advisory Committee Meeting on Gas Rahat constituted by Hon'ble Supreme Court of India (2 Feb, 2014) at BMHRC, Bhopal

10. Building Advisory Committee Meeting of NIREH (1 Mar, 2013) at BMHRC, Bhopal

11. Meeting to address issues raised by NGOs on a research proposal (11 Mar, 2014) at ICMR Hqts, New Delhi

Dr. Sushil Singh, Scientist C

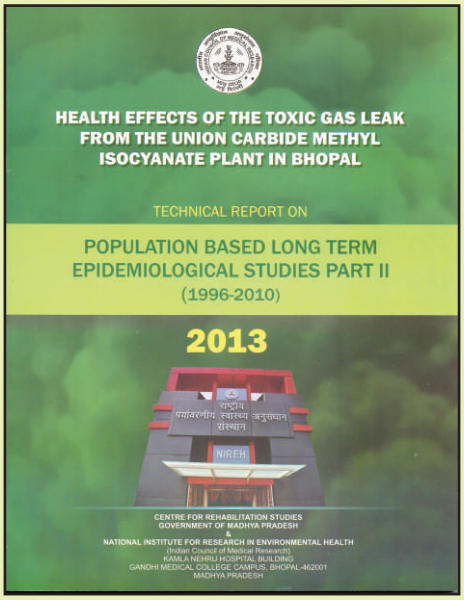
1. Workshop on Research Methods in Medical Sciences (4-7 April 2013) at AIIMS, Bhopal

2. Training-cum-User Awareness Programme on Biomedical and Health Information Resources (19 Feb, 2014) organized by National Informatics Centre, New Delhi

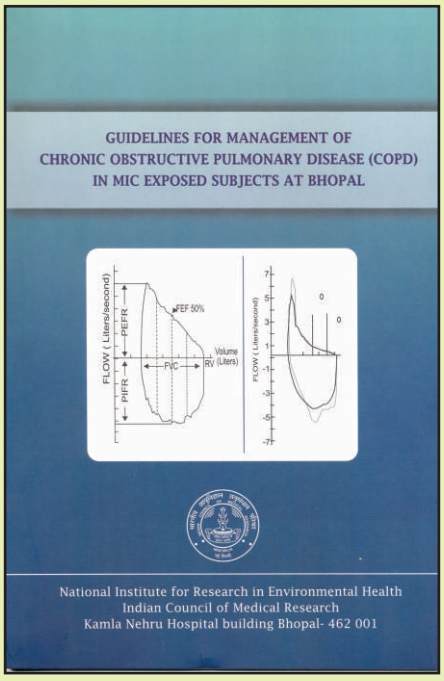
Publications

Institutional publications

1. ***Technical Report on Population Based Long Term Epidemiological Studies- Part II (1996-2010)***: Health Effects of the Toxic Gas Leak from the Union Carbide Methyl Isocyanate Plant in Bhopal,. 2013 : 1- 92



2. ***Guidelines for Management of Chronic Obstructive Pulmonary Disease (COPD) in MIC exposed subjects at Bhopal***, 2013 : 1- 42



Publications by Scientists

1. Dutta P, Khan SA, Topno R, Chowdhury P, Baishya M, Prakash A*, Bhattacharyya DR, Mahanta J. Genetic analyses of ribosomal loci of *Anopheles minimus* species from North east India. *Trop Biomed* 2013 ; 30 : 550-556

2. Sarma DK, Mohapatra PK, Bhattacharyya DR, Mahanta J, Prakash A*. Genotyping of chloroquine resistant *Plasmodium falciparum* in wild caught *Anopheles minimus* mosquitoes in a malaria endemic area of Assam, India. *Trop Biomed* 2014 ; 31 : 557-561

3. Sarma DK, Singh S, Bhattacharyya DR, Mohapatra PK, Sarma NP, Ahmed GU, Mahanta J, Prakash A*. Suitability of the boiling method of DNA extraction in mosquitoes for routine molecular analyses. *Intl J Mosq Res* 2014; 1 (3): 15-17

(* Based on work carried out by Dr. Anil Prakash, Scientist F at RMRC, Dibrugarh)

Institutional Committees

3rd Scientific Advisory Committee

1. Dr. V. M. Katoch, Director General, ICMR ……Chairperson
2. Prof. R. Azad, Dr. RP Centre for Opthalmic Sciences, AIIMS, N. Delhi ……Member
3. Dr. S. K. Jain, Vasundhara Enclave, New Delhi …..……Member
4. Prof. K. K. Talwar, President, NAMS, New Delhi ……..Member
5. Prof. L. K. Dhaliwal, PGIMER, Chandigarh ……..Member
6. Dr. S. Ramachandran, IGIB, Delhi ……..Member
7. Prof. V. K. Paul, AIIMS, New Delhi ……..Member
8. Prof. Rajesh Kumar, PGIMER, Chandigarh ……..Member
9. Lt. Gen. Dr. D. Raghunath, Jayanagar, Bangalore ……..Member
10. Dr. B. Kumar, PGIMER, Chandigarh ……..Member
11. Prof. V. N. Jha, Deptt of Nephrology, PGIMER, Chandigarh ……..Member
12. Maj Gen (Dr.) S. K. Bansal, NDMA, New Delhi ……..Member
13. Dr. Sunita Saxena, Director, NIOP, New Delhi ……..Member
14. Dr. P. S. S. Sunder Rao, Kothanour, Bangalore ……..Member
15. Dr. P. M. Bhargava, Habisguda, Hyderabad ……..Member
16. Dr. Sanjay Agarwal, Deptt of Nephrology, AIIMS, New Delhi ……..Member
17. Prof. R. S. Muthry, Association for Mentally Challenged, Bangalore ……..Member
18. Dr. Padam Singh, EPOS Health (India) Pvt. Ltd., Gurgaon ……..Member
19. Dr. R. Sarin, Director, ACTREC, Tata Memorial Centre, Mumbai ……..Member
20. Prof. D. K. Behera, Deptt of Pulmonary Medicine, PGIMER, Chandigarh…….Member
21. Dr. V.K. Vijyan, Karaparamba, Kozhikode ……..Member
22. Prof. Seneeta Mittal, Deptt of O & G, AIIMS, New Delhi ……..Member
23. Prof. N. K. Mehra, Deptt of Transplant Immunology, AIIMS, N. Delhi ……..Member
24. Prof. H. S. Chandra, Deptt of Microbiology & Cell Biology, IISc, Bangalore…..Member
25. Dr. D. C. S. Reddy, Radium Apartment, New Hyderabad ……..Member
26. Dr. N.G. Desai, Director, IHBAS, Delhi ……..Member
27. Prof. Y. K. Gupta, Head, Deptt of Pharmacology, AIIMS, N. Delhi ……..Member
28. Dr. P. Satishchandra, Director, NIMHANS, Bangalore ……..Member
29. Dr. K. Radhakrishnan, Director, SCTIMST, Thiruvanathapuram ……..Member
30. Prof. Savita Malhotra, PGIMER, Chandigarh ……..Member
31. Mr. Anirudha Mukherjee, Director, Deptt of Env & Forest, GOI, Delhi……...Member
32. Mr. Sanjay Bansal, Director, Min Chem & Petrochemicals, GOI, Delhi……...Member
33. Mr. R. S. Goswami, Chairman, CII, M.P., Bhopal ……..Member
34. Dr. Nirbhay Shrivastava, Dean, GMC, Bhopal ……..Member

35. Dr. K. K. Dubey, Director, KNH, Gas Rahat Department, Bhopal .....Member
36. Sh. S. K. Rao, Jt Sec, DHR, Min of H & FW, GOI, New Delhi .....Member
37. Dr. Arvind Pandey, Director, NIMS, New Delhi .....Member
38. Dr. Bela Shah, Head, Div of NCD, ICMR, New Delhi .....Member
39. Dr. D. K. Shukla, Scientist G, Div of NCD, ICMR, New Delhi .....Member
40. Dr. R. S. Sharma, Scientist F, Div of RCH, ICMR, New Delhi .....Member
41. Dr. R. C. Sharma, Consultant (Admn), ICMR on NIREH matters .....Member
42. Mr. Sanjiv Dutta, Advisor to DG, ICMR, New Delhi .....Member
43. Ms. D. Panda, Sr. FA, ICMR, New Delhi .....Member
44. Dr. R.S. Dhaliwal, Scientist F, Div of NCD, ICMR, New Delhi .....Member
45. Dr. M. Chaturvedi, Programme Officer for NIREH, ICMR, N. Delhi .....Member

Expert group on Epidemiologic Research

1. Dr. Padam Singh, EPOS Health (India) Pvt. Ltd., Gurgaon .....Chairperson
2. Dr. P. S. S. Sunder Rao, Kothanour, Bangalore .....Member
3. Dr. D. C. S. Reddy, Radium Apartment, New Hyderabad .....Member
4. Dr. J. S. Thakur, PGIMER, Chandigarh .....Member
5. Dr. Arvind Pandey, Director, NIMS, New Delhi .....Member
6. Dr. S. N. Dwivedi, AIIMS, New Delhi .....Member
7. Dr. V.K. Vijyan, Karaparamba, Kozhikode .....Member
8. Dr. B. Mishra, Consultant, NIREH .....Member
9. Dr. N. Banerjee, Scientist C, NIREH, Bhopal .....Member Secretary

Expert group on Clinical Research

1. Prof. D. K. Behera, PGIMER, Chandigarh .....Chairperson
2. Dr. S. K. Sharma, AIIMS, New Delhi .....Member
3. Dr. S. K. Jindal, PGIMER, Chandigarh .....Member
4. Dr. Kalpana Balakrishnan, Chennai .....Member
5. Prof. R. V. Azad, AIIMS, New Delhi .....Member
6. Prof. L. K. Dhaliwal, PGIMER, Chandigarh .....Member
7. Prof. Sanjay Agarwal, AIIMS, New Delhi .....Member
8. Prof. V. K. Paul, AIIMS, New Delhi .....Member
9. Dr. P. Kulhara, PGIMER, New Delhi .....Member
10. Dr. N. G. Desai, Director, IHBAS, Delhi .....Member
11. Dr. V. K. Vijyan, Karaparamba, Kozhikode .....Member
12. Dr. N. Banerjee, Scientist C, NIREH, Bhopal .....Member Secretary

Expert group on Basic Research

1. Prof. N. K. Mehra, AIIMS, New Delhi ……Chairperson
2. Dr. R. Sarin, Director, ACTREC, Mumbai ……..Member.
3. Dr. B. K. Thelma, Delhi University, New Delhi ……..Member
4. Dr. C. C. Kartha, Thiruanantpuram ……..Member
5. Dr. Rama Chaudhary, AIIMS, New Delhi ……..Member
6. Dr. Sunita Saxena, Director, NIOP, New Delhi ……..Member
7. Dr. Rameshwaran, ICGEB, New Delhi ……..Member
8. Dr. Rita Murelkar, ACTREC, Mumbai ……..Member
9. Dr. V. K. Vijyan, Karaparamba, Kozhikode ……..Member
10. Dr. N. Banerjee, Scientist C, NIREH, Bhopal ……..Member Secretary

Institutional Ethics Committee

1. Dr. P. S. Chauhan, Former District & Session Judge, Bhopal ……Chairperson
2. Dr. S. C. Dubey, Ex Jt.Director, HSADL, Bhopal (Basic Scientist)……Member
3. Prof. S. D. Seth, Consultant (CTRI), IRMS, N. Delhi (Basic Scientist)…….. …Member
4. Dr. N. P. Mishra, Former Dean, GMC, Bhopal (Clinician) ……Member
5. Prof. Reeni Malik, HOD, Pathology, GMC, Bhopal (Clinician) …… …Member
6. Prof. Ravi Kant, Deptt of Surgery, AIIMS, Bhopal (Clinician) ……Member
7. Dr. Raka Arya, Asstt. Prof. NLIU, Bhopal (Legal Expert) ……Member
8. Prof. Ranjana Srivastava, Govt. MLB College, Bhopal (Social Scientist)…….....Member
9. Dr. Nandini K. Kumar, Ex DDG (SG), ICMR, Chennai (Ethicist) …….....Member
10. Pandit A.K. Dwivedi, Mahakal, Shiv Mandir, Bhopal (Lay Person) …….....Member
11. Dr. N. Banerjee, Scientist C, NIREH, Bhopal ……Member Secretary

Building Advisory Committee

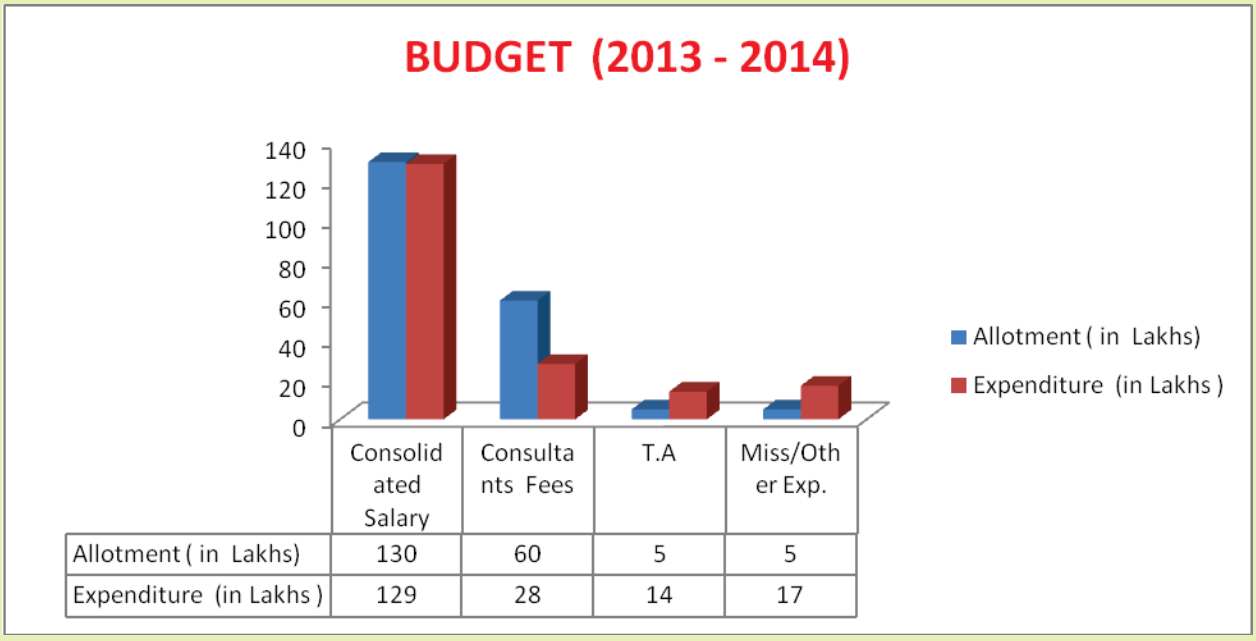
1. Prof. N. K. Mehra, AIIMS, New Delhi ……Chairperson
2. Dr. S. C. Dubey, Ex Jt. Director, HSADL, Bhopal ……..Member
3. Dr. B.B. Ganguly, MGM Medical College, Navi Mumbai ……..Member
4. Prof. Savita Raje, School of Planning & Architecture, Bhopal ……..Member
5. Representative of CPA (Mr. Neeraj Pandey, Ex Er.), Bhopal ……..Member
6. Prof. Manoj Pandey, Director I/C, NIREH, Bhopal ……..Member
7. Dr. R. C. Sharma, Consultant (Admn), NIREH, Bhopal ……..Member

Purchase Committee

1. Prof. Manoj Pandey, Director I/C, NIREH, Bhopal .....Chairperson
2. Prof. Sudhir Goel, Deptt of Biochemistry, AIIMS, Bhopal .....Member
3. Dr. A. K. Srivastava, Jt Director, Med Education, Govt of M.P., Bhopal .....Member
4. Prof. Reeni Malik, HOD, Pathology, GMC, Bhopal .....Member
5. Dr. Anil Prakash, Scientist F, NIREH, Bhopal .....Member
6. Dr. Farida Khan, Consultant (Lab), NIREH, Bhopal .....Member Secretary

Staff Grievance Committee

1. Dr. Sushil Singh, Scientist C, NIREH, Bhopal .....Chairperson
2. Mrs. Moina Sharma, TO (B), NIREH, Bhopal .....Member
3. Mr. Sudhir Srivatava, SO, NIREH, Bhopal .....Member
4. Dr. V. S. Rathore, Technical Assistant, NIREH, Bhopal .....Member
5. Mr. Anand Kori, Technician C, NIREH, Bhopal .....Member
6. Mr. Shrikant Mishra, MTS (Gen) NIREH, Bhopal .....Member
7. Mr. Dilip Kumar Ugwe, MTS (Gen), NIREH, Bhopal .....Member



	Consolidated Salary	Consultants Fees	T.A	Miss/Other Exp.
Allotment (in Lakhs)	130	60	5	5
Expenditure (in Lakhs)	129	28	14	17

Director I/C acknowledges the effort of Dr. Anil Prakash, Scientist F in bringing out this report