

The Bhopal Gas Tragedy
1984 - ?

A REPORT FROM THE SAMBHAVNA TRUST, BHOPAL, INDIA

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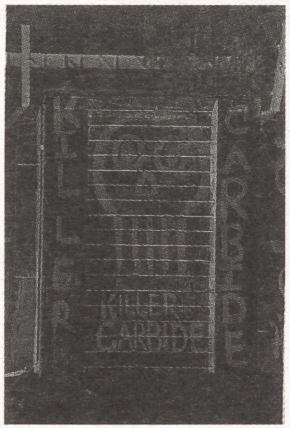
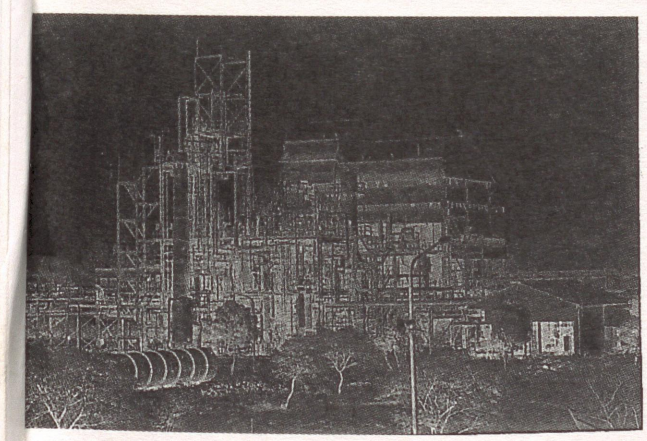
The Tragedy continues...





A Visit to Bhopal, India...

If you happen to pass by the derelict Union Carbide pesticide factory in Bhopal, nothing would strike you as out of the ordinary. It looks like any other abandoned factory. Rust has set in and creepers are growing over the machinery. The only sign of life is a bored watchman who isn't quite sure what exactly he is supposed to watch.

Apart from the angry graffiti scrawled on the walls, there is no visible link between this rotting structure and the worst industrial disaster in history. One that has taken the lives of over 16,000 children, women and men and maimed over 5,00,000 people. And the disaster is far from over.

ONE SUNDAY NIGHT IN THE CITY...

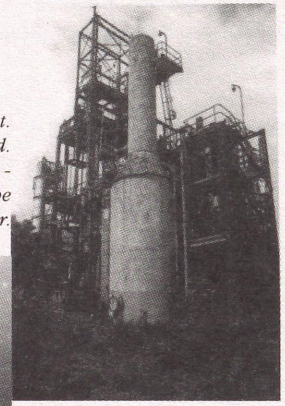
Late on Sunday evening, December 2, 1984 during routine maintenance operations in the Methyl Iso Cyanate (MIC) plant a large quantity of water entered one of the storage tanks containing 60 tonnes of MIC. This triggered off a runaway reaction resulting in a tremendous increase of temperature and pressure. Little before midnight, a deadly cocktail of MIC, Hydrogen Cyanide, Mono methyl amine and other chemicals was carried by a northerly wind to the neighbouring communities. Over the next couple of hours close to 40 tonnes of the chemicals spread over the city of about one million people covering an area of 40 square kilometres.

People woke up surrounded by a poison cloud so dense and searing that they could hardly see. With their eyes stinging and their throats burning, hundreds of thousands of people ran screaming for their lives. As they gasped for breath, the effects of the gas grew even more suffocating. The gases burned the tissues of their eyes and lungs and attacked their nervous system. People lost control of their bodies. Urine and faeces ran down their legs. Some began vomiting uncontrollably. Others were wracked with seizures and fell dead. The gases irritated peoples lungs into producing so much fluid that their lungs were filled with it, "drowning" them in their own body fluids.

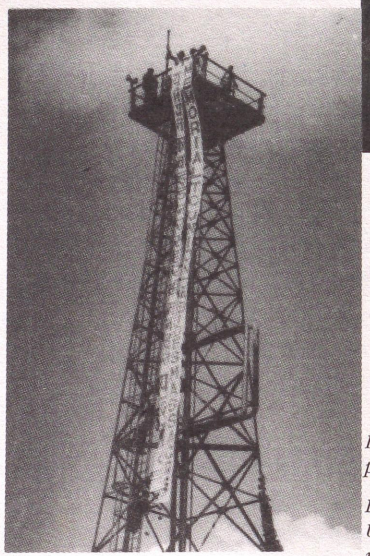
People had no way of knowing it but they would have been safer running against the wind towards the factory or by simply covering their faces with a wet cloth.



MIC Tank No. 610. Filled to 87% of its capacity with MIC gas. (Maximum permissible limit-50% of capacity. Also, recorded evidence of leaking valves.)



Vent Gas Scrubber, MIC plant. Dangerously under designed. Contained no caustic soda - neutralising agent for MIC - on the night of the disaster.



Flare Tower, MIC plant.

Badly designed. Under repair on the night of the disaster.

Nobody told them. The factory's emergency siren had been switched off. Not until the gas was upon them, filling their mouths and lungs, did people know of their danger. Union Carbide's plant manager was woken at 1.30 am as the gas was still pouring over the stricken neighbourhoods. The first official notification by the Union Carbide management was done at 3 am when they informed police officials that the leak had been plugged. In fact it had not been, there just wasn't any gas left in the tank. By 4.30 am the manager was in his office telling reporters that his safety measures were the best in the country. Another Carbide official was telling a newsman "Nothing has happened. Can't you see us alive?" Barely 100 yards away, dead bodies lay on the ground outside the factory gates.

A CITY OF DEATH....

It was a massacre. Dawn broke over streets littered with corpses. Though the official figure was 1,600, the exact death toll in the immediate aftermath is not known and possibly will never be. Many families living on the wayside without any address were wiped out. While it was still dark, hundreds of dead bodies were carried away in government vehicles and dumped in nearby forests and a river. In the days after the leak 6,000 shrouds were distributed by religious organizations and many were buried or cremated in the condition they were found. Union Carbide said that reports of its victims' deaths were greatly exaggerated. It said the leak had killed only 1408 people. The company complained that if only people had kept calm and not run away, they would probably have survived.

Doctors on duty in the Emergency ward at the Hamidia hospital were besieged by the thousands who came in choking and gasping for breath, had no knowledge of how to treat them. They called Union Carbide's medical officer who said that the gas MIC was like tear gas, an irritant but non-poisonous and the treatment was to wash with water. Not before long it was obvious that the medical officer had been lying. The hospital was filled with the dead and the dying. By mid morning the hospital mortuary was overflowing and soon the entire hospital compound was covered with dead bodies. Froth dry in their mouths and the horror of the poison cloud in their still eyes. By noon cremation grounds had rows of smouldering pyres and at the burial grounds old graves had to be dug up to accommodate fresh corpses.



A family awaiting medical attention outside Hamidia Hospital, Bhopal.

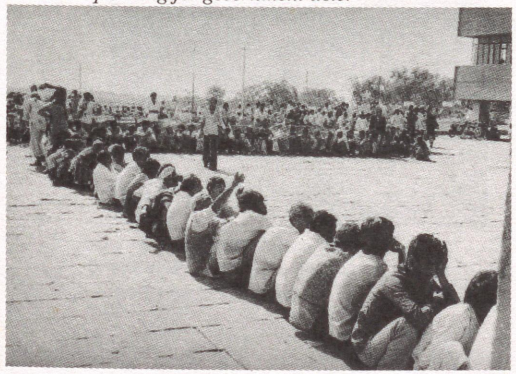
Many of the people who survived the terrible night died slow and painful deaths in the years following the disaster. In fact official figures show that more people have died in the subsequent years than in the immediate aftermath. To this day 10 to 15 people are dying every month from exposure related complications. The current death toll is well over 16,000 and counting.



An epidemic of gynaecological disorders has followed the disaster.



Children conceived by gas exposed women have physical and mental retardation.



Survivors queueing for government dole.

THE UNENDING AFTERMATH....

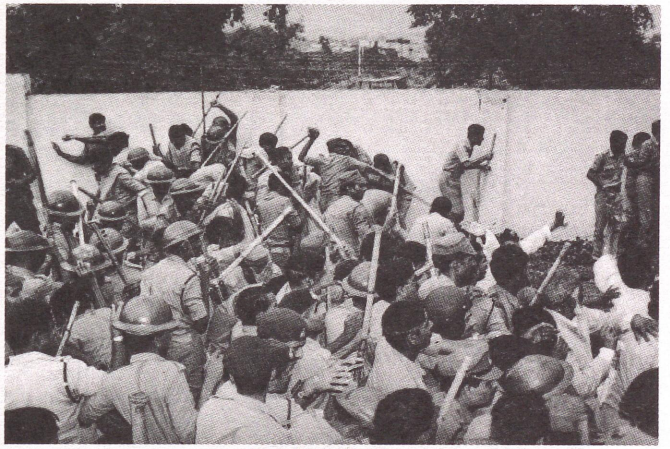
Medical research carried out by official agencies have established that the half a million people who were exposed to the toxic gases had poison circulating in their blood stream. The toxins caused damage to their eyes, lungs, kidneys, liver, intestines, muscles, brain and reproductive and immune systems. 40% of the women from the severely affected communities who were pregnant at the time of the disaster, aborted. Anxiety, depression, insomnia and irritability are common among the affected people. Chromosomal aberrations were detected in an unusually large number of survivors indicating the likelihood of congenital malformation in future generations of the survivors. Union Carbide continues to treat medical information on the leaked chemicals as a trade secret. Till today very little is known about how to treat chronic exposure induced diseases.

Like the Hibakushas of Hiroshima, people marked by Carbide's poisons have to suffer social ostracism. Young Bhopali women find it hard to get married and many women have been deserted by their husbands because of their inability to conceive. Impotence among men is a pain secretly carried and drowned in alcohol. Maleness is also seen to be lost in men who can no longer sustain their family.

With their bread winners unable to carry on with physically demanding jobs, families have been economically devastated. When a judge in the district court directed Union Carbide to pay Rs. 350 Crores (270 million US$) as interim relief, the company refused to comply. In the corporate logic a starving people were more amenable to a cheap settlement. The company succeeded in winning a settlement in 1989 with the Indian government that passed a law to become the sole representative of the victims. Over 95% of the people most of whom are likely to be sick all their lives have received Rs. 15,000 (500 US$) which is not even sufficient to pay for their medical bills for five years.

A LEGACY OF INDIFFERENCE....

The Indian government has shown much consistency in protecting the interests of the multinational. Taking action against the company, the government argues, will jeopardize the investment climate. Warren Anderson, the Chairman of the Corporation charged with homicide jumped bail and is yet to face the ongoing court

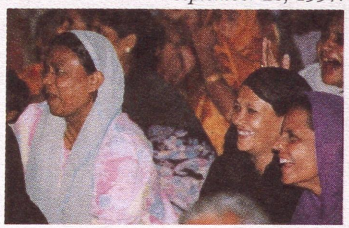


Police attack women survivors agitating against the settlement. March 1989.



Women of the Bhopal Gas Peedit Mahila Udyog Sangathan (Bhopal Gas-Affected Women's Organisation) marching in Bhopal. August 1992.

Participants at Sambhavna's Annual Day, September 20, 1997.



proceedings. Its more than six years since the Bhopal District Court issued an arrest warrant against him but the Indian government is yet to move on his extradition from the US. Charges against the rest of the officials have been diluted so that the disaster, legally speaking, has been made to look like an ordinary car accident.

The toxic legacy of Union Carbide continues to haunt the communities in the neighbourhood of the factory. Huge quantities of chemicals wantonly dumped in and around the factory have found their way into the ground water. The community handpumps bring forth water laced with poisons damaging to the liver, kidney and lungs. At least two of these chemicals are known carcinogens.

THE STRUGGLE TO SURVIVE....

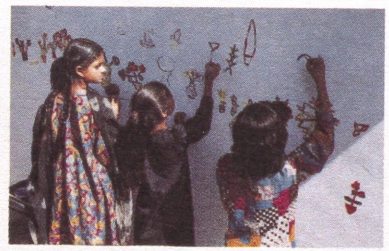
Faced with corporate machinations of liability evasion, a government that considers their lives expendable and a legal system that has persistently denied them justice, the survivors of Bhopal continue to carry on with the longest struggle ever. Most of these valiant victims are women. Many have cast off their veils, discarding the roles imposed by tradition. Hundreds gather every week in a public park, thousands rally on the streets and often take part in protest marches to New Delhi, the national capital, 750 kms away. On several occasions their demonstrations have been attacked by policemen leaving bleeding heads and fractured limbs behind. In defiance they chant, "We are the women of Bhopal, we are not flowers, we are flames."

KEEPING HOPE ALIVE....

The Sambhavna Trust is a voluntary initiative to help the victims in their struggle to survive. The clinic run by the Trust offers free medical care to the survivors. Many of whom have not had any respite in the last several years. While the treatment of exposure induced diseases remains to be known, herbal medicines and drug free therapies such as yoga and massage being offered at the clinic have had remarkable success. The clinic is funded by small contributions received from a large number of individuals across the world. ■







Children painting on the walls of the hall used for Yoga practice at the Sambhavna Clinic.

Name : _____

Address : _____

_____

I would like to volunteer my professional/non-professional/financial assistance by

_____

_____

Enclosed is a cheque/demand draft of

_____

(If overseas, please make the cheque/demand draft to
The Pesticides Trust/Bhopal Account, Eurolink Centre, 49 Effra Road, London SW2 1BZ UK
or Pesticide Action Network/Bhopal, 116, New Montgomery Street, Suite 810, San Francisco CA 94105, USA.
If in India, address it to the Sambhavna Trust.)

For more information write to Satinath Sarangi,
Sambhavna Trust, 44, Sant Kanwar Ram Nagar, Berasia Road, Bhopal or Call 0755-730914
email: sathyu99@hotmail.com

Prologue

*We present the **annual report** of the **Bhopal People's Health and Documentation Clinic, Sambhavna Clinic** for short, set up by the **Sambhavna Trust**.*

The word 'Sambhavna' in Hindi means possibility. Read as two words - 'Sama' and 'Bhavna', together it means similar feelings or compassion.

Both in terms of the number of months it covers and in its content, this report is different from the usual annual report.

It covers a period of 13 months from March 1, 1997 to March 31, 1998.

Those of you who read our first report will notice that this one is about twice the size. That's because we have a lot more to share.

In the chapters that follow, we talk about who we are, what is it that do we do, where we get our funds from and why do we do what we do. We talk about our small successes and our failures. About the support and encouragement we have received from individuals and organisation that have made our work possible.

We are painfully aware that our work at the clinic is far too insignificant to even begin to resolve the lingering medical issues of the disaster either in their magnitude or complexity. At the same time we believe every little bit helps.

Through this report we wish to share our observations and findings, our joys and despair, our limitations and our failures and our conviction and visions.

We look forward to your suggestions for improvement and your continued support.

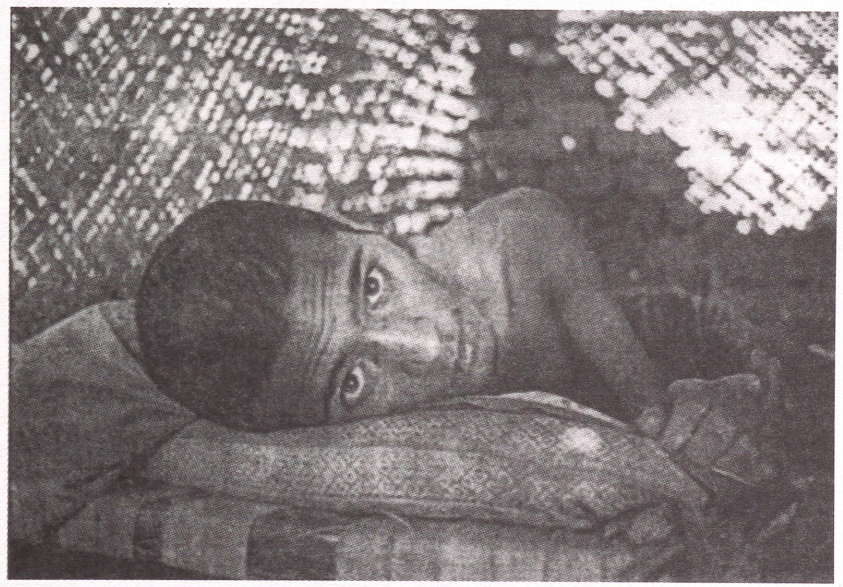
– The Sambhavna Team

In Bertholt Brecht's poem the sick man educates the doctor about the aetiology of the disease that the doctor is supposed to be curing. "The disease, dear doctor", he tells the professional, "is poverty".

The Union Carbide Gas Disease that continues to haunt the survivors of the disaster, is symbolic of a generic disease of the modern world. It is a disease that is rooted in the singleminded concern for the bottom line, that grows under governmental beneficence, and has a propensity to revictimize its victims.

This long background attempts to describe this disease as we know it in Bhopal. Yes it is more or less same everywhere else in the world. But there are few places where politics and the pursuit of profit so blatantly influence every medical aspect as they do in gas affected Bhopal.

THE UNION CARBIDE DISASTER IN BHOPAL



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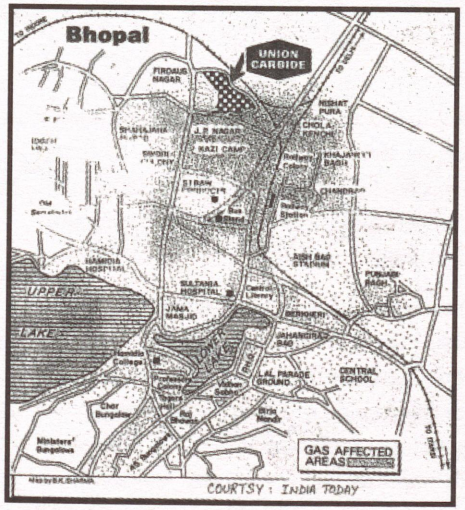
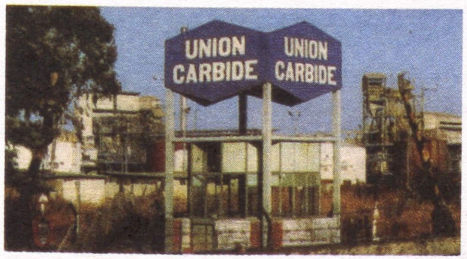
1. A Brief Summary

Bhopal City showing location of Union Carbide Factory and affected areas





Union Carbide Factory, Bhopal

On the midnight of 2nd - 3rd December 1984, the worst industrial disaster in history was caused by Union Carbide Corporation, USA in Bhopal, the capital of Madhya Pradesh, a city with about one million people.

Over 40 tonnes of Methyl Iso Cyanate and other lethal gases including hydrogen cyanide, leaked from Carbide's pesticide factory in the northern end of the city killing over 8,000 people in its immediate aftermath and causing multisystemic injuries to over 500,000 people.

The number of deaths has risen to over 16,000 in the subsequent years and there appears no end to the physical and mental suffering caused by the exposure to the poisonous gases.

Breathlessness, diminished vision , loss of appetite, pain, menstrual irregularities, recurrent fever, persistent cough, neurological disorders, fatigue, weakness, anxiety and depression are the most common symptoms. Research findings on chromosomal aberrations suggest that the future generations of the survivors will also carry ravages of the industrial toxins.

The factory in Bhopal, one of the 14 facilities operated by Union Carbide in India, was set up in 1969. The first batch of Methyl Iso Cyanate (MIC) was imported from the USA in 1973 and in 1979 a unit for the manufacture of MIC was set up by the company .

Though the design of the MIC unit was based on Union Carbide's Institute, West Virginia, plant, grossly lower standards were employed in the selection of construction materials, monitoring devices and safety systems.

The immediate causes of the disaster are related to the cost cutting drive initiated by Union Carbide Corporation from its headquarters in Danbury, Connecticut in 1980. The moves directed at enhancing profits included: reducing the number of personnel, use of low quality construction material, cutting down on vital safety measures and the adoption of hazardous operating procedures.

Workers had to pay the cost of these economy measures with their life, health and jobs. Between 1980 - 1984 the work crew of the MIC unit was halved from 12 to 6 workers and the maintenance crew from six to two workers. On December 26, 1981 a plant operator was killed by a phosgene gas leak. Another phosgene leak in January 1982 severely injured 28 workers and in October of the same year MIC escaped from a broken valve and four workers were exposed to the chemical.

Senior officials of the Corporation, privy to a "Business Confidential" safety audit in May 1982, were well aware of "a total of 61 hazards, 30 of them major and 11 in the dangerous Phosgene/Methyl Isocyanate units."

On the night of the disaster, water being used for washing the lines entered the tank containing MIC through leaking valves. The refrigeration unit which should have kept the MIC close to zero degrees centigrade had been shut off by the company officials to save on electricity bills.

Kamal Pareek (Safety Officer, Union Carbide India Limited): "That (the refrigeration unit - Ed) is the single most routine operating equipment available in Bhopal for keeping MIC at correct storage temperatures. If you take away that, what have you got if you have got some sort of an emergency?"

World in Action : "Why do you think that the refrigeration system was turned off ?"

Kamal Pareek : "It was a bid to save electricity or freon gas - who knows ?"

World in Action : "How much will it cost to run a day that sort of system ?"

Kamal Pareek : "I can make a guess : Rs. 500/to Rs. 700 ? a day."

From the transcript of "The Betrayal of Bhopal". A video documentary produced by World-In-Action programme, Granada Television, UK in June 1985. WIA confirmed from refrigeration companies that Mr. Pareek's guess about cost saving for the company was about right.

The entrance of water in the tank, full of MIC at ambient temperature, triggered off an exothermic run - away reaction and consequently the release of the lethal gas mixture. The safety systems, which in any case were not designed for such a run - away situation, were non-functioning. The scrubber designed to neutralise any escaping gas by spraying caustic soda was empty. And the flare tower meant to burn off any gases from the scrubber was under repair.

MEDICAL IMPACTS OF THE DISASTER :

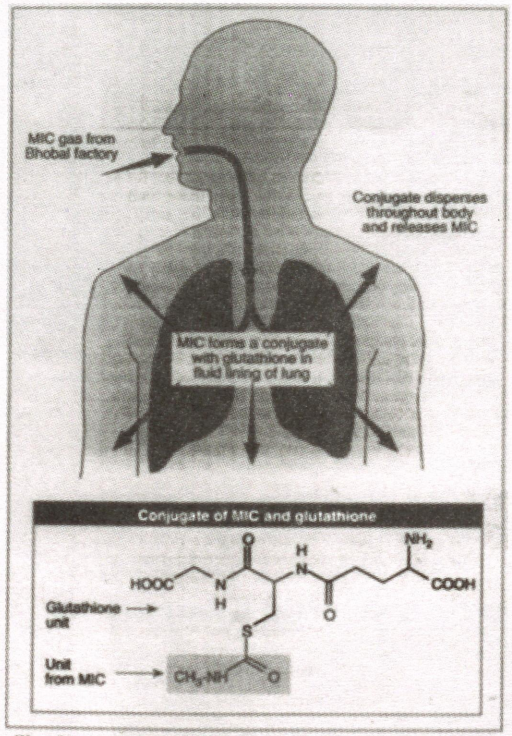
Most of the information on the medical consequences of the Union Carbide disaster in Bhopal has been generated by the Indian Council of Medical Research (ICMR), an agency of the Indian government that carried out 25 research studies from 1985 to 1994. Unfortunately several of the ICMR studies have been prematurely terminated and the remainder were ended in December 1994.

ICMR has established that the toxins from Carbide's factory have crossed into the blood stream of those exposed and have caused damage to the lungs, brain, kidneys, muscles as well as gastro- intestinal, reproductive, immunological and other systems.

Six monthly morbidity surveys by ICMR from 1987 to 1991, show that the number of people with exposure-related symptoms actually increased in that period. According to one study, there were three times more persons with respiratory symptoms in 1991 as compared to 1987. The damage to the respiratory system and particularly the lungs comprises the most obvious and significant part of the overall health damage.

Bronchial asthma, Chronic Obstructive Airways Disease, recurrent chest infections, and fibrosis of the lungs are the principal effects of exposure- induced lung injury. The prevalence of pulmonary tuberculosis among the exposed population has been found to be more than three times that of the national average.

Sketch of how MIC travelled through the lungs.



Glutathione may ferry MIC throughout the body, unloading its toxic cargo at distant organs

Damage caused to the eyes of the survivors has led to early-age cataracts found to be three times more prevalent among the exposed population compared to an unexposed population at the far end of the city. Pregnancy outcome studies on women who were pregnant at the time of the disaster have shown that the spontaneous abortion rate was almost three times that of the national average.

In the exposed population the stillbirth rate was three times, perinatal mortality was two times and neonatal mortality was one and a half times more than the comparative national figures. Study on growth and development of the children whose mothers were exposed to the toxic gases during pregnancy revealed that the majority of children had delayed gross motor and language sector development.

Studies have also presented evidence of chromosomal aberrations of gaps and breaks in the chromosomal material as well as increased sister-chromatid exchange indicating likelihood of congenital abnormalities among future generations of the exposed persons.

Toxic gas exposure was found by ICMR researchers to have had a detrimental effect on the immune system. Immunoglobulin levels were significantly raised , T-cells were reduced in number and there was a tendency towards the reversal of T4/T8 ratio indicative of immuno-suppression.

Various studies conducted by non-government organizations have pointed out that the medical consequences of the Union Carbide disaster have been under-assessed by the ICMR and certain exposure related injuries have been overlooked.

A pregnancy outcome survey was carried out by Medico Friend Circle in September '85 showed that the spontaneous abortion rate among gas exposed women was several times higher than that reported by ICMR. A survey of psychiatric morbidity carried out by a group of independent doctors from Bombay found that nearly 40% of those exposed suffered from post-traumatic stress disorder, a condition not studied by ICMR.

An epidemiological survey coupled with clinical investigation carried out by the International Medical Commission on Bhopal, composed of 14 medical specialists from 11 different countries, reported in January 1994 significant multi-organ symptoms persistent among the exposed population. Clinical examinations carried out by members of the Commission have shown significant lung impairment, marked reduction in control over limb movements and reduced memory function caused due to exposure. Their findings include evidence of a range of neurotoxic injuries in the exposed population that had not been studied by the ICMR.

In this fourteenth year of the disaster 10 - 15 persons are dying every month from exposure related diseases and their complications. However the official agency for recording disaster-related mortality was terminated in December 1992. Fourteen years after the disaster there are over 120,000 children, women and men who continue to suffer acutely from a host of exposure related illnesses and their complications.

With the premature termination of research and monitoring there is almost no current data on the prevalence of tuberculosis, cancers and infertility among the exposed population all of which are reported to

be on the rise by doctors involved with the treatment of the survivors.

ECONOMIC AND SOCIAL IMPACT :

There has hardly been any systematic effort to document the social and economic impacts of the disaster. Official information on orphaned children and families that lost their breadwinners in the immediate or long aftermath is scanty, if available at all. Over 70% of the exposed population has been in the unorganized sector, with people earning subsistence wages through day labour or petty trade. A large number of men and women who pushed hand carts, carried loads, dug soil, repaired cars and did other jobs can no longer pursue their trades after being exposed to Carbide's gases.

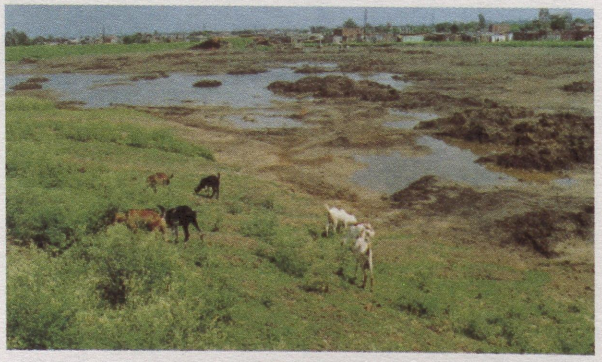
Gas exposed factory workers in textile and paper mills are more sensitive to occupational hazards and are absent from work due to illness as much as 15 days in a month. Given the complete inadequacy of official rehabilitation efforts the loss of regular income has driven tens of thousands of families to chronic starvation conditions. Loss of income also makes people borrow money from local money lenders who charge up to 200% interest so that chances of paying back are low and debts keep growing.

ENVIRONMENTAL PROBLEMS :

Fourteen years after the disaster, Union Carbide's toxic legacy continues to harm people in more ways than one. Communities in the vicinity of the Carbide factory continue to be exposed to toxic chemicals such as Dichlorobenzenes, Polynuclear Aromatic Hydrocarbons and Phthalates that are injurious to the lungs, liver and kidneys and can cause cancer. Water in over 200 wells around the Carbide factory have been declared unfit for human consumption by the municipal authorities.

This is a result of routine dumping of hazardous chemicals during the operation of the factory thus contaminating soil and ground water in and around the factory premises. Analysis carried out by the Citizens Environmental Laboratory (CEL), Boston in 1991 show presence of toxic chemicals in the community wells around the factory.

This report presented at the company's annual shareholders meeting drew the attention of the senior officials to the problem. The Corporation gave the job to Arthur D. Little Inc. who sponsored a collaborative investigation with an Indian government agency in 1994.



Solar evaporation ponds as they look now



Community tube well in Atal-Ayub Nagar. Sign putup by municipal authorities says 'water unfit for drinking.'

This study done without public knowledge recommends a fuller investigation for better assessment of the environmental contamination. The findings of this study confirm the worst apprehensions of activists and people in the community.

Meanwhile, in 1996 the company management dug up bottom soil from the 'Solar Evaporation Ponds' and buried the heavily contaminated sludge under three metres of farm soil in a bid to cover up evidence of environmental damage. Survivors' organizations have been calling for an official assessment of the damage wrought by Union Carbide so that the corporation could be asked to pay for the costs of environmental rehabilitation and supply of safe drinking water to the affected communities.

ECONOMIC, SOCIAL AND ENVIRONMENTAL REHABILITATION

The government programmes for economic rehabilitation have been badly designed and only a few have been implemented. While an estimated population of 50,000 is in need of alternate jobs currently less than 100 gas victims have found regular employment under the government's scheme. In 1987 a special industrial area for training and employment of over 10,000 survivors was inaugurated and 152 worksheds were constructed at a cost of Rs.8 crores.



Worksheds in the Special Industrial Area. 50 of these serve as barracks for the Rapid Action Force.

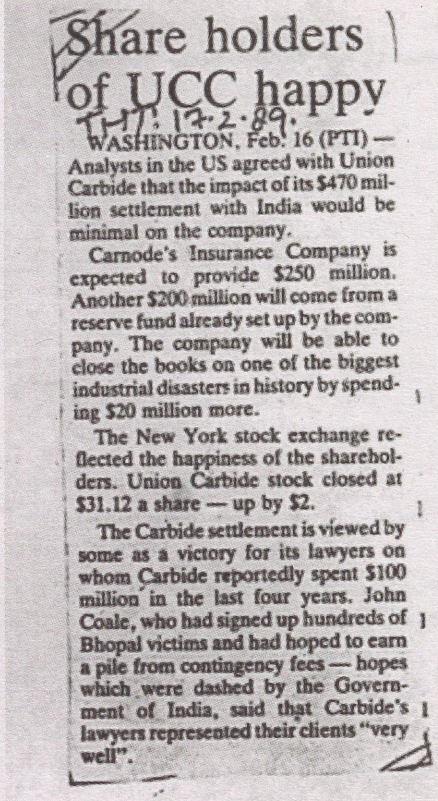
However, to date not a single survivor has found any employment. A programme offering women survivors tailoring jobs ran successfully from 1986 to 1992 employing 2300 women and made a yearly profit of Rs.1 crore. The rehabilitation centres where these jobs were offered were also places where women survivors could gather, share their concerns and organize themselves. However, this programme was terminated without any reason in July 1992.

Till date the government has no record of the social condition of the persons who have been widowed, orphaned, or have been permanently disabled as a result of the gas disaster. The state government has deemed its work of social rehabilitation to be over by constructing 2500 houses in a settlement called the 'Widows Colony' and a few schools.

There has been no official attention directed towards the urgent need of life long pension for widows, orphans, chronically ill and disabled survivors.



Garbage in the "Widows Colony.' In June '98, eight persons in this colony died due to faecal contamination of drinking water supply.



Share holders of UCC happy

HT; 17.2.89.

WASHINGTON, Feb. 16 (PTI) — Analysts in the US agreed with Union Carbide that the impact of its $470 million settlement with India would be minimal on the company.

Carnode's Insurance Company is expected to provide $250 million. Another $200 million will come from a reserve fund already set up by the company. The company will be able to close the books on one of the biggest industrial disasters in history by spending $20 million more.

The New York stock exchange reflected the happiness of the shareholders. Union Carbide stock closed at $31.12 a share — up by $2.

The Carbide settlement is viewed by some as a victory for its lawyers on whom Carbide reportedly spent $100 million in the last four years. John Coale, who had signed up hundreds of Bhopal victims and had hoped to earn a pile from contingency fees — hopes which were dashed by the Government of India, said that Carbide's lawyers represented their clients "very well".

News clip from The Hindustan Times, 17th February, 1989

The Supreme Court's final order with regard to provision of insurance coverage to about one lakh children likely to suffer delayed effects of the lethal gases is also being ignored by the Central government.

Despite the expenditure of over Rs. 70 crores in environmental rehabilitation basic necessities such as clean drinking water and sanitary facilities remain unavailable to the majority of the gas affected communities.

LEGAL ASPECTS :

Subsequent to the disaster the Indian government through the Bhopal Gas Leak Disaster (Processing of Claims) Act in March 1985 arrogated to itself, sole powers to represent the victims in the civil litigation against Union Carbide.

On behalf of the victims the Indian government filed a suit for compensation of more than 3 billion US $ in the Federal Court of the Southern District of New York. However, in May 1986 the case was sent to the Indian courts on grounds of forum non-convenience, under the condition that Union Carbide would submit to the jurisdiction of Indian Courts.

During the proceedings at the Bhopal District Court, Union Carbide was directed to pay an interim relief sum of Rs.350 crores so that the delay in the adjudication of the case does not adversely affect the claimants. However, Union Carbide refused to pay interim relief and its appeal against this decision reached the Supreme Court.

On Feb 14,1989 in a sudden departure from the matter of interim relief , the Supreme Court passed an order approving the settlement that had been reached between the government of India and Union Carbide without the knowledge of the claimants in Bhopal.

"Having given our careful consideration for these several days to the facts and circumstances of the case placed before us by the parties in these proceedings, including the pleadings of the parties, the mass of data placed before us, the material relating to the proceedings in the Courts in the United States of America, the offers and counter-offers made between parties at different stages during the various proceedings, as well as the complex issues of law and fact raised before us and the submissions made therein, and in particular the enormity of human suffering occasioned by the Bhopal Gas Disaster and the pressing urgency to provide immediate and substantial relief to the victims of the disaster, we are of opinion that the case is pre-eminently fit for an overall settlement between the parties covering all litigations, claims, rights and liabilities related to and arising out of the disaster and we hold it just, equitable and reasonable to pass the following order."

Opening paragraph of the settlement order of February 14, 1989..

According to the terms of the settlement, in exchange of payment of US $ 470 million the Corporation was to be absolved of all liabilities, criminal cases against the company and its officials were to be extinguished and the Indian government was to defend the Corporation in the event of future suits.

The settlement sum, nearly one-seventh of the damages initially claimed by the government, while being far below international standards is also lower than the standards set by the Indian Railways for railway accidents. There were widespread protests by the Bhopal victims against the betrayal by the government and many organizations and individuals including prominent members of the parliament supported the call to oppose the infamous settlement.

Several petitions seeking review of the order on settlement were filed and the Supreme Court announced its revised judgement on October 3,1991. This final judgement upheld the settlement amount paid by Carbide but directed the Indian government to make good any shortfall during the distribution of compensation. The criminal cases against the Corporation and its officials were reinstated in the final judgement. The Supreme Court also directed Union Carbide to finance a 500-bed hospital for the medical care of the victims.

COMPENSATION

The amount paid as compensation (Rs. 715 crores) has multiplied as a result of the increase in the value of the dollar and the accruing interest. Out of this amount, about Rs. 850 crores have been paid to nearly 3.2 lakh claimants and a balance of about Rs. 1100 crores remains to be disbursed.

The procedures for compensation disbursement have been tortuous and thoroughly unjust. More than 90% of the claimants have been paid a sum less than Rs. 25,000 as compensation for personal injuries out of which nearly Rs. 10,000 have been routinely deducted against interim monetary relief paid by the government from 1990. The remaining money does not half cover the medical expenses borne by the claimants in the last several years let alone provide for future expenses.

Out of the 15,168 death claims adjudicated 65% have been rejected or converted into personal injury cases. Judges at the claim courts are completely ignorant of the medical consequences of the toxic exposure and the administration of compensation is riddled with corruption so that the claimants' inability to pay bribes often results in the denial of compensation.

UNION CARBIDE'S MEDICAL RESPONSE TO THE DISASTER

The disaster presented an unprecedented situation for medical care and monitoring in its magnitude and complexity.

Neither the exposed people nor their doctors had any idea of the composition and toxicology of the gas mixture. Much of the treatment was symptomatic and the indiscriminate use of drugs compounded the injuries caused by the chemicals.

In the absence of a toxicological perspective, research and monitoring activities have failed to be comprehensive and lack direction. The situation, as we will see, has only marginally improved with the passage of more than fourteen years.

By all accounts, the December 1984 disaster has been followed by a medical disaster of unmatched



proportions. The following stories pieced together mainly from newspaper reports underline the moral, ethical and quite possibly legal transgressions of the principal author of this continuing medical disaster.

STAY QUIET AND DENY . . .

According to Union Carbide's own investigation report on the disaster, at 11.00 pm on the night of the disaster the field operator reported leakage of Methyl Iso cyanate (MIC) in the structure. Yet no information was given to the police officials, medical authorities or the civil administration about this incident. By 11.30 pm the leaking gases had spread all over the MIC process area and the poison clouds from the factory had reached the neighbourhood communities.

The first official knowledge about the disaster was recorded after 1 am when a town inspector on patrol sent a wireless message to the police control room. At 1.25 am when the Superintendent of Police Mr. Swaraj Puri reached the control room the gas clouds had reached there and the staff on duty were coughing violently. Puri put two of his men on the job of calling the Union Carbide factory to find out what had happened, which gas had leaked and what preventive or curative measures were to be taken.

Between 1.25 and 2.10 am he got through three times to the factory. Twice he was told "Everything is OK", once, "We don't know what has happened, Sir" before the phone was banged down at the other end. Meanwhile reports poured in of over 1,50,000 people having fled their homes in futile search for safety.

At 1.45 am the Additional District Magistrate of Bhopal got through to J Mukund, Carbide's Works Manager at home. His reply : "The gas leak just can't be from my plant. The plant is shut down . Our technology just can't go wrong, we just can't have such leaks."

The first official notification by the Union Carbide management was done at 3 am when they informed the police officials that the leak had been plugged.

If the Union Carbide authorities were so lax about mandatory notification to officials they were criminally negligent about warning neighbourhood communities and the rest of the city about the impending doom.

It was a worker of the factory, Mr. V N Singh who in desperation broke the alarm glass and started the factory siren at about 1 am. But this lasted for only a few minutes as the senior officials turned it off. It was not until 2 am, one hour later that the public siren was sounded once againl to alert the already terrified, injured and dying in the city. Incidentally, the public siren had been turned off for several months so as not to cause "undue panic" over "routine minor leaks" among the neighbourhood communities.

In the absence of any warning and information about the leaked gases the City and police officials failed to respond to the situation. And the children, women and men waking up from their sleep gasping for breath died like flies as they ran in the direction of the wind, because they did not know better.

There is little doubt that Union Carbide's deliberate silence and denial substantially contributed to the death

toll and the exposure levels of the affected population.

So why did they do it ? Judging by the official response of Union Carbide at the time of the disaster it appears that the official strategy was based on the thought that if they stayed quiet about the whole thing or stuck to plain denial, everything would turn out to be alright. People would die but maybe Union Carbide would not be blamed, is the hope the officials probably secretly nurtured.

It sounds horrid and bizarre to think that persons in the Union Carbide management, human beings like you and me, would rather let people die and suffer than wait and see if there was a way to escape liability. Yet this attitude of evasion of liability at immense human cost has been the overriding feature of the medical response of the Corporation in the last fourteen years.

IT IS LIKE TEAR GAS . . .

It was not just Carbide's medical officer who lied about the nature of chemicals that leaked from the factory. Senior officials of the company repeated the same lie over and over.

J Mukund, the Works Manager and the top man in the factory told a reporter "See in its effects, it is like tear gas, your eyes start watering. And you apply water, and you get relief."

Jackson B Browning, Director of Health, Safety and Environmental Affairs, Union Carbide Corporations a few days later referred to the poisonous chemicals that had, till that date, killed over 8000 people in Bhopal as "nothing more than a potent tear gas."

In 1986 US govt's National Institute of Environmental Health Sciences reported that exposure to Carbide's gases could lead to permanent lung injuries with high vulnerability to secondary infections.

Mr Browning said that these findings were similar to tests carried out by the company and these were reported to both US and Indian government. Quizzed by journalists he said he could not recall whether UCC had pointed out that high level exposure to MIC poses a risk of persistent lung damage.

DOCTORS WITH A MISSION . . .

Within the first week of the disaster several "medical experts" came on a visit to Bhopal sponsored by UCC.

While their stated purpose was to help people in distress, it did not take long before their real mission became clear.

In their meetings with senior doctors as well as in their interviews with the media these experts emphasized repeatedly that the leaked gases will not have any long term health effect on the exposed persons.

Dr. Hans Weil, Prof and Chairman of Pulmonary Medicine at the Tulane University Medical School, New Orleans after examining victims for over 3 days in Bhopal said "victims have an encouraging prognosis and most would recover fully."

Dr Weil has a long history of fudging medical data to minimize liabilities of Corporations and has been reprimanded in the past by court for his unethical conduct.

Dr. G Peter Halberg, Head of Clinical Ophthalmology, New York Medical College and another Carbide sponsored expert said to the press after his visit that there was not much likelihood of permanent eye damage as the acidity of MIC roughly matches that of the eye and this makes the damage self limiting.

His statement is without scientific basis and is in sharp contrast to research findings on permanent corneal opacities in over 90 % of the exposed persons.

It is not just foreign experts who put themselves in the service of Union Carbide.

Highly placed local doctors close to the company also joined Carbide's exercise in underplaying the damage caused by the disaster.

One of them, Dr M N Nagu, as Director of Health Services in the state government, played a key role in scuttling official plans for administration of sodium thiosulphate to exposed persons as a means for detoxification.

While the ICMR strongly recommended use of this drug on a large scale after its efficacy had been demonstrated through a double blind clinical trial, Union Carbide was quick to realize that the administration of this drug would establish that its toxins had indeed reached the blood stream and caused much more damage than the company would like people to believe.

Dr Nagu, whose brother held the company's lucrative security contract, went against official recommendations and demands of survivors organizations and deprived people from receiving this drug. The only other opponent of sodium thiosulphate administration was Dr N P Mishra then Head of the Department of Medicine at the local medical college who incidentally was the medical advisor to the company. Despite clear evidence to the contrary, Dr Mishra held on to the view that damage caused by Carbide's gases were only to the lung and eyes.

The company had bestowed gifts to Dr Mishra's ward at the Hamidia Hospital. Carbide's gifts to Hamidia Hospital included an artificial respirator plus two private wards which were lavishly furnished and equipped for the use of persons the company wanted to oblige.

Ironically, at the time of the disaster the chairman of the State Pollution Control Board was convalescing in one of them after a heart attack.

SQUEEZING HOSPITALS DRY . . .

In June 1985 Judge Keenan of the Federal Court in New York decided that UCC pay 5 million US dollars to American Red Cross Society (ARCS) to be transferred to the Indian Red Cross Society (IRCS) and used for medical care of the victims of Bhopal.

A plan was jointly finalized by the Red Cross Societies of the two countries and after the transfer of funds, the Indian Red Cross set up four community clinics with necessary staff and equipment in the gas affected area. In the drawing up of plans IRCS added an important caveat that it would not be obligated legally or otherwise for the purpose of working out set offs against compensation claims and made it clear that it would only accept the offer as a contribution.

However, four years later through legal initiatives

in India, Carbide asked Indian Red Cross to pay back US$5 million to its settlement fund. IRCS was forced to hand over all of its remaining funds and the hospitals were eventually closed down.

PAYING 4$ PER VICTIM . . .

Early in the course of adjucating the case for damages against Union Carbide, Judge M W Deo of the Bhopal District Court proposed to the corporation's counsel that it pay "reconciliatory substantial interim relief" that could be utilised for health care and generation of employment potential for gas victims.

Union Carbide, that had till then repeatedly proclaimed its eagerness to financially support medical care of the victims, offered 1.6 million US dollars as interim relief - less than four dollars per victim.

Survivors organizations promptly rejected the amount and instead offered to present an equivalent sum to any official of the corporation who volunteered to spend five minutes in a room full of methyl isocyanate.

THE FINAL TOUCH . . .

In October 1991, the Supreme Court of India in its final judgment on the case against Union Carbide revoked criminal immunity granted to the corporation and directed that it finance the construction of a 500-bed hospital for medical care of the survivors.

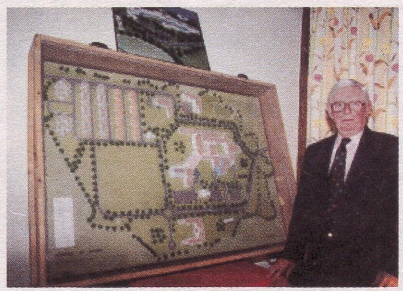
With the reinstatement of criminal charges of culpable homicide and other grievous offences against them, Union Carbide and its officials, including prime accused former Chairman Warren Anderson, responded in the manner most multinationals are known to do.

They repeatedly ignored summons of the Bhopal District Court and were declared to be absconding from criminal justice on February 1, 1992. The accused were warned by Judge Gulab Sharma that the multinational's property in India would be attached if they do not turn up in court and face trial.

In the face of Carbide's continued absence in court, on April 4, 1992, Judge Sharma of the Bhopal District Court directed the attachment of shares the multinational held in its Indian subsidiary.

Though not in the manner intended, the warning of the Bhopal District Court propelled Carbide to design a response that is legally untenable, morally reprehensible and yet not too bad as a public relations strategy.

Within three weeks of the warning, Union Carbide registered a "charitable trust" in London to provide medical relief in Bhopal with Sir Ian Percival as its sole trustee.



Sir Ian Percival with a model of the BHT Hospital, October '97

Sir Ian, a British conservative politician and former Solicitor General, had been working with the US-based Sidley & Austin, one of Carbide's law

firms, since 1984, the year of the disaster in Bhopal. Carbide put just one thousand pounds in to the Trust Fund and for the rest of the trust's assets, pledged its shares in the Indian subsidiary.

This scheme was foreseen and categorically forbidden by Judge Sharma of the Bhopal District Court who maintained in his order that the money to build the hospital for survivors in Bhopal must come from the Corporation's own coffers and that the shares remain attached till Carbide came to court.

In December 1993, Sir Ian pleaded before the Supreme Court of India and sought permission to sell the shares attached in the criminal case so that he could build the 500 - bed hospital that the Supreme Court had directed Carbide to build two years back.

Obviously Sir Ian was one of the architects of this diabolic legal strategy of using the order of the Supreme Court to defeat the criminal sanctions of the District Court. In January 1994 he argued before the Supreme Court that criminal charges against Carbide and its officials be dropped so that its shares would not be tainted by the criminal case and would fetch higher prices.

The Supreme Court was however not convinced that the greatest good of the survivors would be served by letting the persons and agencies responsible for the disaster go scot free.

Yet, possibly under the influence of Sir Ian's political weight, the Supreme Court chose to be unmindful of the fact that disattachment of its properties would only weaken the District Court's grip on the absconding criminals.

In February 1994, exactly five years after the Supreme Courts infamous decision on the settlement of the case, Sir Ian was granted permission to sell the attached shares so that the Bhopal Hospital Trust could build its hospital in Bhopal.

With the corporation's history of callous disregard for the medical situation in Bhopal there are good reasons to suspect that welfare of the survivors is not exactly a priority for its medical initiatives. The hospital in Bhopal is yet to be built but the company never tires of mentioning its "humane and decent" response to the disaster in its public relations campaign. Early this year Union Carbide has registered a web site called www.bhopal.com where the corporation denies its involvement with the disaster and mentions proudly of the hospital it is building.

Disattachment of its properties through the setting up of the BHT has only encouraged the corporation to continue to ignore summons to answer charges of causing the death of thousands of people in Bhopal and injuring hundreds of thousands.

On the other hand the sole trustee, Sir Ian, who died in early April this year, seems to have had an agenda of his own. Financial accounts of the trust submitted before the Supreme Court show that in the last three years Sir Ian had spent an astronomical sum of over Rs 10 Crores (US $ 2.5 million), from funds meant for medical care of survivors, paying himself fat fees, refurbishing his London office, and on travel and other office expenses.

In sworn affidavits before the Supreme Court, Indian government officials have complained that at least half of this money has been withdrawn by Sir Ian in an

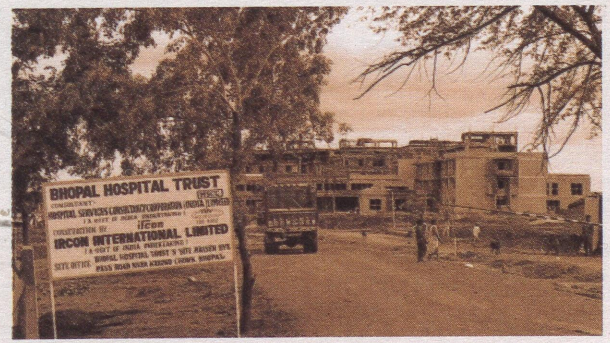
unauthorized manner.

The Bhopal Hospital Trust's plans of health care administration have been severely criticized by national and international professional groups including the International Medical Commission on Bhopal.

The Commission has expressed serious reservations regarding the relevance of the 30-bed cardio thoracic unit in the Trust's hospital. Professional organizations involved in the scientific aspects of the disaster apprehend that the 10 - bed research unit will be used to generate and suppress potentially sensitive information on long term health consequences.



Earlier the Delhi Science Forum has documented Carbide's involvement in chemical and biological warfare research prior to 1984 in its pesticide laboratory in Bhopal



Bhopal Hospital Trust's hospital under construction.

Survivors organizations in Bhopal who are bitterly critical about the Bhopal Hospital Trust and its role in furthering Carbide's public relation objectives have challenged its legal validity in the Supreme Court.

In their letters of protest sent to the BHT they point out that Bhopal already had far too many hospitals – possibly more hospital beds per thousand population than anywhere else in the world. And that in the absence of any information based treatment protocol being offered, the Trust's hospital will be just one more building, good to look at but ineffective in care.

They have charged that the sole purpose of Carbide's trust is to build a humane image for the corporation while helping it to abscond criminal justice on the massacre. As part of their ongoing struggle for justice in Bhopal, the survivors are calling for the setting up of a competent local body with survivors participation that would take control of the funds of Carbide's Trust and administer appropriate health care among the gas affected population.



On January 16 this year the construction site of the hospital being built by BHT was raided by Labour officials following complaints about employment of over a some as young as 9 years after hundred children in hazardous construction jobs.

Children found to be employed by BHT in construction work by labour officials, January '98.

On November 28, 1997 a 13 year old tribal boy was killed during work at the hospital construction site after a fall from an unprotected third floor stair. Subsequently the Deputy Labour Commissioner has found the Trust guilty of violating laws relating to employment of children and has initiated prosecution.

The BHT, following a strategy not unlike that of Union Carbide, continues to defy orders of the Deputy Labour Commissioner. Government officials responsible to ensure BHT's compliance with the law of the land look the other way.

GOVERNMENT'S REPONSE TO THE MEDICAL SITUATION IN THE AFTERMATH OF THE DISASTER

The continuing health problems of the gas affected persons is as much attributable to the apathy and neglect of the government as to their exposure to Carbide's toxic gases.

Official responsibility for medical care in Bhopal is shared between the central government which provides 75% of the finance and the state government that is supposed to implement health care programmes.

Since the disaster, close to Rs 150 crores have been spent from the public exchequer on the provision of medical care to the survivors. Yet there is very little to show for this expenditure. For one, no protocols for treatment of exposure induced illnesses have been developed and the medical treatment of chronic problems of the survivors remains essentially the same as it was on the morning of the disaster.

The Madhya Pradesh government's response in terms of medical care has primarily been to increase the number of hospitals and despite the obvious lacunae in this approach, the emphasis remains.

In addition to the already existing hospitals with a total of 275 beds, five additional hospitals with a total of 740 beds have been built. Little attention has been paid towards appropriate medical care in these hospitals.

In 1990 a study of 522 patients at two government hospitals meant for gas victims found that over 35% patients were prescribed irrational or unnecessary medicines as well as medicines known to be hazardous, having been banned in other countries.

A study undertaken by the International Medical Commission on Bhopal in 1994 confirmed that therapies prescribed for the ailing survivors are aimed at temporary symptomatic relief rather than the long term amelioration of chronic disease processes.

Official records show that in the last five years about 4000 persons have visited government hospitals everyday, yet there is no record of the treatment offered to these people and there is no information on the efficacy of treatment. The inadequacies of the government's health care system has led to a flourishing business for private medical practitioners.

In the severely affected areas nearly 70% of the private doctors are not even professionally qualified, yet they form the mainstay of medical care in Bhopal.

Almost half the equipment in the government hospitals and clinics are dysfunctional. Most are in

need of repair, accessories are missing in several and no one knows or cares about how to get them in working order.

The records relating to the stock position of medicines as on March 31, 1998, at the Jawaharlal Nehru Hospital, situated close to the most severely affected area, show that 40 % of the medicines required to be supplied to patients are out of stock and close to 30 % of the medicines are in quantities far below that required. Records of Khan Shakir Ali Khan hospital (dated April 6, 1998)situated in moderately affected area show that 60 % medicines are out of stock.

The Pulmonary Medicine Centre that was completed in 1994 and is meant to provide specialized medical care to persons suffering from respiratory disorders remains without provisions of permanant staff till today.

The 150-bed Indira Gandhi Hospital for women and children completed in 1994 is yet to be made functional.

The construction of the 540- bed Kamla Nehru Hospital began in 1987.It is yet to be completed, despite the expenditure of nearly three times the budgeted amount. The report of the Comptroller and Auditor General has pointed out gross irregularities in the financial administration of the hospital constructions and mentions misappropriation of huge sums of money. There are good reasons to suspect that the primary motive behind construction of hospitals is to fetch commissions for officials and not provision of medical care.

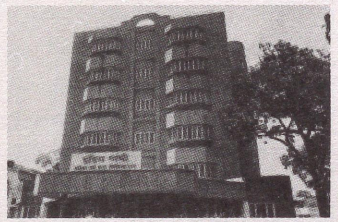
500-bed, Kamala Nehru Hospital under construction since 1987.



"For construction of Kamla Nehru Hospital, State Government accorded administrative approval for Rs. 498.75 lakhs in March 1987. . . . . revised administrative approval (Rs. 1100 lakhs) was accorded in September 1992 . . . . . Despite incurring expenditure of Rs. 829.19 lakhs upto March 1996 the work was incomplete. Besides cost of construction might go upto Rs. 1719.53 lakhs for which revised estimates were submitted. . . . .

Avoidable expenditure of Rs. 55.14 lakhs was incurred on construction of room for linear accelerator for the above hospital . . . . .Excess payment of Rs. 11.73 lakhs towards excess consumption of 108.592 tonnes of steel chips . . . was made due to incorrect computation of consumption of steel chips per unit volume of concrete.

Further the Superintendent Engineer had to incur an additional avoidable expenditure of Rs 12.19 lakhs due to sanction and purchase of steel chips at the rate of Rs. 10.80 per kgs against the prevailing rate of Rs 5.68 per kg at which M/S Bharat Heavy Electricals Limited (BHEL) were supplying steel chips. . . . . .Besides, there were also excess payment of Rs 9.26 lakhs due to incorrect determination of rates of steel chips.



150-bed, Indira Gandhi Hospital for women and children.Completed in 1994, yet to begin functioning.

. . . . Construction of 100 bedded ward in Indira Gandhi Hospital at an estimated cost of Rs. 239 lakhs was awarded to a contractor in April 1989 with stipulated period of construction of 24 months. The work was completed only in June 1994 at a cost of Rs 598.76

lakhs. There was an excess payment of Rs. 10.44 lakhs on construction of workers to contractors due to incorrect sanction of rates."

Extracts from the report of the Comptroller and Auditor General, Government of India, on expenditures made on construction of hospitals by the Department of Gas Relief, Government of Madhya Pradesh.

Survivors organizations have for long been demanding the setting up of a community based health infrastructure in which medical care and monitoring services are available to persons within the community itself and the hospitals function as referral centres. The IMCB too has proposed a four-tier health infrastructure with community health units as the base in place of the current hospital centred system.

Yet there has been hardly any government initiative in providing community based medical care to chronically ill survivors. In the recent Action Plan submitted by the state government for grant of funds by the centre, allocations for community health services is only 2 % of the total budget.

Provision of treatment through indigenous systems of medicine such as Ayurveda and Unani that have demonstrated their superior efficacy in the treatment of exposure related illnesses has also been neglected to only 0. 1% of the budget allocation.

In medical research and health surveillance work the performance of the government has been equally dismal. Medical research in the aftermath of the disaster has largely been conducted by the Indian Council of Medical Research (ICMR).

The ICMR set up the Bhopal Gas Disaster Research Centre (BGDRC) and initiated 24 research projects. Studies were initiated on respiratory, neurological, reproductive, ophthalmic, metabolic, forensic, genetic, psychiatric, orodental, and paediatric effects of the gas exposure. Of the 24 studies, seven were terminated by 1987, and another fifteen by 1992. The remaining two projects were terminated in December 1994. There was no review of data prior to termination of the studies to decide whether some of them needed to be continued or fresh studies were required to be commissioned.

The list of systems included in the ICMR studies is impressive, however, it is incomplete. Damages to many critical organ systems have not been investigated at all. Effects on the endocrine, musculoskeletal, cardiovascular, renal, gastrointestinal, gynaecological systems that are obvious in the symptomatic population have not been studied by ICMR. Several studies related to effect on fertility, immune deficiency and efficacy of pulmonary physiotherapy proposed at official meetings as early as 1988 were not taken up. Much needed studies related to therapeutic aspects were never carried out. Many of the studies conducted have been inadequate and in the absence of a toxicological perspective no linkages have been established among the different systemic injuries.

Critical studies, such as the effect on growth and development of children exposed in-utero, thyrotoxic injuries and others, have been prematurely terminated despite positive findings.

" . . . . Since the parameters (milestones and mental growth) studied so far in the affected group have shown a number of borderline cases ('questionables') it is

necessary to study the cohort till they attain puberty. .

Source : Minutes of meeting held at Gandhi Medical College, Bhopal

(Part of presentation by Principal Investigator, Dr N R Bhandari before the Project Advisory Committee on Studies on Children, ICMR underlining the need for continuation of his study on children exposed to Carbide's gases in their mother's womb. The study was terminated in April 1990 at least five years before any of the children attained puberty.)

At the time of ICMR's winding up its research activities in 1994 no attention was paid to 18 project proposals, including several that had been reviewed by the committee of experts, pending approval. Concern about poor quality of data generated through studies are recorded in the minutes of the advisory committee meetings.

Another concern that has been repeatedly expressed by members of the Review Committee as well as by the research personnel is the absence of an appropriate administrative set up. Research personnel were employed on a temporary basis and several projects suffered due to transfer of principal investigators employed by the state government.

In the absence of a system of data recording and exchange with even the government hospitals for gas victims, there was no possibility of linking data generated through research and that available with the hospitals.

The most worrisome aspect of ICMR's research in Bhopal has been the official ban on publication of its findings thus severely limiting the possibility of scrutiny of data and contributions from the national and international scientific community. Though the ban has been lifted, until today a scientific report on ICMR's research in Bhopal remains unavailable.

Survivors organization view the deliberate neglect of research issues by the government within the historical context of official pro-Carbide policy. Deliberate or not, such a situation is decidedly to the advantage of the Corporation .

Subsequent to the termination ICMR's involvement with the Bhopal disaster, the task of medical research and monitoring was entrusted to the Centre for Rehabilitation Studies (CRS) by the state government in March 1995.

A corpus fund of Rs 5 crores was made available by the Ministry of Chemicals and Fertilizers and a total of 50 individuals have been employed on a contract basis at this centre. In the last three years the only work that has been carried out at this centre is an epidemiological study on morbidity and mortality. The study is badly flawed and has been criticized by medical professionals earlier involved with ICMR research.

The centre has supposedly received approval, more than a year back, to commission four research projects on clinical profiling of respiratory disorders, long term ocular changes, genetic risk evaluation and on determination of immune status. However, none of these studies have actually begun.

The centre has not developed any research infrastructure and sophisticated laboratories and equipment left behind by ICMR lie unutilized. Since

its inception the CRS has had no system of monitoring and supervision of its research activities. Recently Dr M N Nagu, former director of health services in the state government known to be sympathetic to the interests of Union Carbide has been nominated as the research advisor for CRS.

UNRESOLVED MEDICAL ISSUES OF THE UNION CARBIDE DISASTER IN BHOPAL

1. Research and Monitoring

i. Absence of research on gynaecological, musculoskeletal, cardiovascular, renal, gastrointestinal and endocrinal system injuries attributable to exposure.

ii. Absence of administrative set up for carrying out long term, and possibly trans generational research activities in Bhopal.

iii. Absence of epidemiological and clinical research on continuing exposure related mortality and morbidity.

2. Information

i. Information on health impacts not available with government and private doctors involved with the medical care of the survivors.

ii. No official initiative towards disseminating information on health impacts and preventive and ameliorative measures to the survivors.

iii. Report on studies carried out by ICMR remains to be published four years after termination of research.

3. Health care

i. Absence of perspective and administrative set up to respond to the chronic nature of exposure related diseases.

ii. Absence of protocols for treatment of exposure induced illnesses.

iii. Absence of a system of recording health status and efficacy of medical interventions.

iv. Absence of a community based health care approach and overwhelming emphasis on hospital based treatment.

v. Negligence of indigenous systems of medicine.

vi. Unavailability of medicines and facilities for investigations at government hospitals and clinics.

vii. Indiscriminate use of steroids, antibiotics, psychotropic and symptomatic drugs.

viii. Absence of drug- free therapies, such as Yoga.

4. Health Education and Public Health improvement

i. Absence of official initiatives towards health education among survivors.

ii. No official initiatives towards provision of clean air, water and sanitation facilities to the survivors.

iii. No official action on toxic contamination of ground water and soil in the communities adjacent to the Union Carbide factory. ■

2. The Sambhavna Trust

It is indeed a gloomy background. A city distinguished by a modern industrial disease and death. A people surviving the most gruesome odds. A company carrying on with its business as usual and greatly improving its assets and image. A government that has decided that certain people are expendable. Non government agencies and the media deciding that Bhopal is no longer hot. It is indeed the deep end of a dark bog.

It is in such a context that the Sambhavna Trust came into existence. With a conviction of hope and possibility. Such an initiative should have begun years ago. It is a miniscule effort when compared to the yawning gap between what should be and what is. Yet we think what we are doing is making a difference.

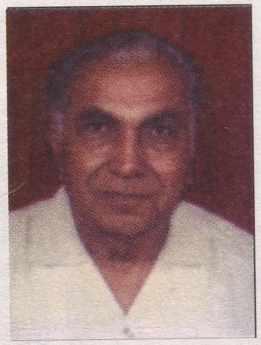
Sambhavna has as Trustees individuals who have been active on issues of health and health politics in Bhopal ever since the disaster. All are trained in science and a main concern of ours is the use and abuse of science and its methods in Bhopal. Through our work at Sambhavna, we express solidarity with the struggle of a victimized people to survive.

Our requirements are minimal. The endowment fund we need to raise to finance our activities for the next fifty years is less than what has been spent by the sole trustee of the Bhopal Hospital Trust on his own fees, office expenses and travel in one year. Also as you will see we are raising our funds from sources that are altogether different in nature. From individuals accross national boundaries with sama bhavna - similar



feelings.

The Sambhavna Trust was registered in June 1995 as a charitable trust with objectives of welfare of the survivors of the Bhopal gas disaster through medical care, research, health education and information dissemination. Other objectives include use of ayurveda, homeopathy,yoga and other alternative therapies, generation and publication of information on health consequences of Carbide gas exposure and supporting survivors initiatives for greater health awareness and for a healthy environment.



THE SIX TRUSTEES OF SAMBHAVNA

DR M P DWIVEDI,
Chairperson

Former Director of the Bhopal Gas Disaster Research Centre under the Indian Council of Medical Research from 1986 to 1992. His pioneering research on Lathyrism, a nervous disease especially among poor farm workers caused by organic toxins has brought him international recognition as an epidemiologist. He was a visiting Professor at the Albert Einstein Institute of Medicine, New York in 1984. Currently he is a consultant for the M. P. Bhoj Open University.

"I first heard about the disaster in the morning news of December 3, 1984 on All India Radio. I was at Sevagram, more than 400 kilometres away, where I was a Professor of Community Medicine at the Mahatma Gandhi Institute of Medical Sciences. My sons were in Bhopal and so were several friends and colleagues. I was extremely worried and eager to know what had happened. The newspaper that day gave very few details. I spoke to my sons on the phone and was relieved to know that they were safe. Meanwhile, there were people affected by the toxic gases who had fled the city and come to Sevagram for treatment. All of them had severe respiratory problems and there were many with neurological problems too. I was keen to do something to help the people in Bhopal.

In the first week of January '85, on my way back from Dhaka with my friend Dr Peter S Spencer, Director of Neuro sciences, Albert Einstein Institute of Medicine, New York I visited Bhopal and we met with the doctors involved in the management of patients at the Hamidia Hospital. We examined several patients and thanks to Professor Heeresh Chandra of the Department of Forensic Medicine were also able to see some of the autopsy material. The chemicals responsible for causing so many deaths had not been identified and there were different opinions among docotrs regarding the cause of death. Dr Spencer was of the opinion that there was evidence of Hydrogen Cyanide poisoning and the neurological system was one of the systems that had been injured.

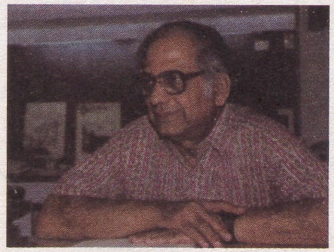
In December '85, I received a telegram from Dr V Ramalingaswami, Director General of the Indian Council of Medical Research (ICMR) asking me to join

the Bhopal Gas Disaster Research Centre (BGDRC) set up by the ICMR in Bhopal. 24 research projects were being carried out by the ICMR through this centre. During my five year tenure as Director, I did my best to improve the quality of the research studies. However, I failed to convince scientists involved in the studies on the medical impacts of the injuries caused to the neurological and gynaecological systems. My proposals for intervention programmes also failed to receive support.

In September '86 , I was at a public meeting with local physicians on research findings when two activists, who I later found were working with Sathyu, were arrested for recording the proceedings of the meeting. They were charged under the official secrets act. Obviously the authorities had over reacted and I was struck by the absurdity of keeping scientific information secret. However, there was little that could be done to change the official attitude.

In early '95, when Sathyu came to me with his plan of starting a clinic for treating survivors and carrying out research studies, I got very interested in the idea. I gladly accepted his offer to become a trustee and I was elected to be the Chairperson at the first meeting of the Board.

I am really happy that at Sambhavna we are paying attention to some of the important aspects of the problems that were not part of official concerns. It is good to see a culture of research being developed among the young staff members at the clinic. It is true that our resource constraints are severe but as we are demonstrating through our work - compassion and commitment are more significant than money. The culture of collective leadership being developed at the clinic will go a long way in making it a stable and dynamic organization."



DR P M BHARGAVA

Former and founder Director of the Hyderabad based Centre for Cellular and Molecular Biology a premier national research institution of international repute. His scientific contributions have brought him the highest civilian honour ,the Padma Bhusan, in 1986. He has travelled widely and has delivered lectures at scientific and educational institutions in several countries. Currently he is the Director of a research agency, Anveshna Consultancy Services, Hyderabad as well as a member of different national and international scientific bodies.

"The Bhopal gas tragedy affected some of us in a way that no event had after our non-violent battle for Independence was over. The issues that the tragedy raised were numerous and important. I wrote an article in the Economic and Political Weekly just after the tragedy in which I had attempted to raise some of these issues. The article, as I said in the footnote, was my own indictment for doing so little when so much needed to be done and could have been done. I was angry with myself. leave aside those within the country and outside who allowed the tragedy to occur and

then did nothing besides playing it down after it had occurred. The tragedy would have been prevented if only our society was a little more humanised and if the privileged were a little less selfish. The after - effects of the tragedy could have been vastly dampened if only the privileged in the country had a modicum of sensitivity to human grief .

When the occasion came for me, through the Sanbhavna Trust, to make a small contribution to alleviate the continuing suffering of the people affected by the tragedy, there was no way I could deny myself the opportunity. The logic of the privileged class argued against my getting involved with the Trust. The logic of humanism, which alone I believe can sustain the continuance of our species on this planet, argued in favour of my finding time for the Trust even at this stage of my life when ,traditionally, people shed and do not acquire new responsibilities.. Since then I have not regretted for a moment the decision that I took to associate with the Trust but I do wish I could find time to do more for Bhopal and Sambhavna."

MS CHANDANA CHAKRABARTI



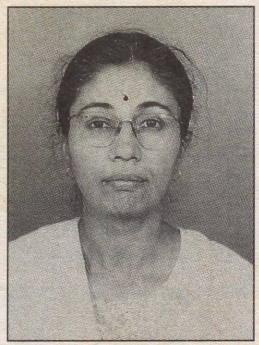
Former scientist at the Centre for Cellular and Molecular Biology, Hyderabad. She is a popular science writer and a media consultant. Currently she runs a communication research agency, Sukriti Consultancy in Hyderabad.

"I was a scientific worker in my early twenties at the famed Centre for Cellular and Molecular Biology (CCMB) in Hyderabad when the gas disaster occurred in Bhopal and stunned the civilised world. I too was stunned but had little experience how the real world worked. There was an intense desire to do something but no means and no ideas about what one could do and how, for that was not the culture in which I was brought up. (There is, in fact, a great deal more to argue against the so called middle class morality in the country - something that I learnt over the years.)

I shall not forget the day - a few days after the tragedy, when the then Director General of the Council for Scientific and Industrial Research (CSIR), Dr S Varadarajan, flew to Hyderabad in a state government plane to attend a meeting at the National Institute of Nutrition (NIN) in the morning. Dr Bhargava had just then received some important scientific information about methyl isocyanate through Dr Gopal Pande of the CCMB from the US. He called up Dr Varadarajan at NIN but learnt that he had left for the airport. I was then rushed to the airport and asked to do everything possible to see that this information was given to Dr Varadarajan who was then investigating the disaster as head of one of the most important scientific agencies in the country. When I arrived at the airport, Dr Varadarajan had already boarded the plane but it had not taken off. I managed to speak to the pilot from the control tower and convinced him about the importance of the information I was carrying for Dr Varadarajan. But Dr Varadarajan refused to take the message and asked it to be telexed to his office. I then realized how important ego can be to a person, even in the wake of a major disaster.

Circumstances have kept me close to the Bhopal tragedy over the years and whenever I have thought of it, there has been an overwhelming feeling of guilt and shame. Therefore, when Dr Bhargava and Sathyu asked me to help with the work of the Sambhavna Trust, I jumped at this offer.

For ordinary people like me, the problem often is to identify what one can do to alleviate (even in the smallest measure) the suffering of fellow human beings - some thing that would be within one's means and ability. The clear objectives of the Trust and the methods decided upon to achieve these objectives have given me the needed direction. For me there is only one regret; there is so much to do and we are able to do so little. I fear such problems will continue to arise and stay with us until a measure of social consciousness, awareness and responsibility comes to exist in all our people - until we as a nation become sensitive to the grief and tragedy of our fellow citizens. The attitude of the Government and the bureaucracy in respect of the Bhopal tragedy that I have witnessed (with a few exceptions) as a Trustee of Sambhavna is surely indicative of the long way we have yet to go in this regard."

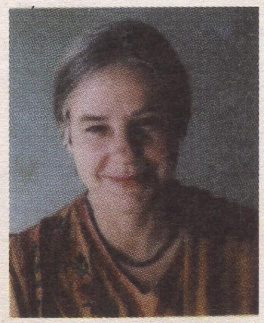


DR. PADMA PRAKASH

Activists/ journalist for over 25 years. Academic background in physics and in sociology. ph.d in sociology, on the development of medical research in india-a sociological analysis.Was involved with the first Bhopal health study conducted by the medico friend circle.Have been actively involved with issues concerning Bhopal for many years, as a health activists and as a journalist Currently working with the Economic and polical Weekly as senior assistant editor.Also help to bring out a quarterly health journal, the Radical Journal of Health brought out by the Socialist Health Review Trust.

DR MIRA SADGOPAL

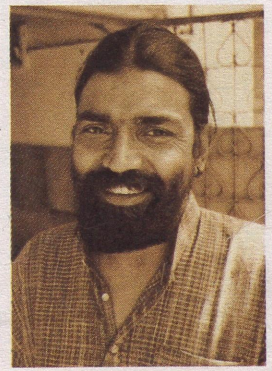
A physician and co-author of "An epidemic of gynaecological disorders in Bhopal." The first and one of the few studies carried out so far on the gynaecological consequences of the Union Carbide disaster. She has written "Hamari Sehat-Hamari Ladai" (Our health - Our struggle) a health awareness book for the survivors. She is involved in various projects, that involve women, traditional systems of healing, mental health, health education, writing and other creating. Fertility awareness education and alternative contraceptive technology are her



main professional interests.

"During several months of medical work with others in Bhopal in 1985, I realized not only the enormity of Union Carbide's assault on so many bodies and minds. But the difficult matter of organising, mediating and sustaining relief and advocacy efforts by diverse persons and organizations from the non - government and people's sectors.

To me it is somewhat ironic that the work Sambhavna began with was Verbal Autopsy. This work is obviously important since the State government stopped keeping record of exposure related deaths in 1992, but it does seem like a gloomy begining for an effort that is all about life and its possibilities. I agreed to join the Trust to promote possibilities in the present and the future - good relations within the health team and with the survivors communities, new outlooks on health and relevant health practices, collaboration between medical systems along with survivors exploring healthy sustainable ways of living, and more . . . . "



SATINATH SARANGI (SATHYU)

A metallurgical engineer by training who has no regrets about straying away from his profession. In his last fourteen years in Bhopal he has been part of the survivors agitations, medical care and research efforts, publication initiatives and solidarity campaigns on the disaster. He also writes fiction for children.

"As managing trustee of the Sambhavna Trust I am responsible for the day to day and long term running of the clinic. I came to Bhopal immediately after hearing the terrible news of the disaster on the radio and have stayed on. Since December '84, I have been involved with relief and campaign activities as well as research and publication efforts in support of the survivors' struggle for justice and dignity. It has never been easy being in this city of unending misery and frustration. In times of doubt, I have found inspiration from the every day life of the survivors and in their passionate search for possibilities in the midst of their deepest despair. In the long aftermath of the disaster I have shared their pain and sadness. I have tried to comfort them, often knowing that comfort is not possible, and held hands of friends dying painful deaths. I have also participated in their joy and abandon, in their songs, in their angry marches and their festive dances. Again and again I have been amazed at their powers to survive in the face of such apathy and injustice. I am happy that through my work at Sambhavna I am able to help them in their struggle for survival. And gain wisdom from them for my own.

I am happy that at Sambhavna we are exploring and finding possibilities in herbal medicines and drug free therapies. It is well known that in the prevalent economic system in the world, disasters are welcome as opportunities for growth through creation of additional market for commodities. Chemical disasters particularly are a windfall for pharmaceutical corporations. This is

so evident in Bhopal where if you ask any among the tens of thousands of survivors on constant medication about the quantity of medicines she has taken since '84, the answer would be more often in kilograms not numbers. As we have seen in our study of the drug market in the city, pharmaceutical corporations are benefitting the most from the continuing disaster. One of the top dozen multinationals that control the market is Rhone-Poulenc, the company that purchased Union Carbide's Agricultural products Division of which the Bhopal factory was a part. What is also clear in Bhopal is that most drugs people take offer only temporary and symptomatic relief, if at all. Very often chronically ill survivors have drug and doctor induced damages compounding the injuries caused by Carbide's gases. Also as the list of chemical induced diseases grows longer there are many for which modern medicine has virtually nothing to offer. Given such a situation in Bhopal and the origins and limitations of modern pharmaceuticals, I think our explorations in alternative medicine is relevant not only here but for all other situations in which people have been injured by routine or accidental exposure to chemicals.

Verbal Autopsy (VA) is another work that we think has as much significance elsewhere as it has in Bhopal. With the globalization of the toxic empire the possibility of one born poor, in the wrong country or with the wrong skin colour will be poisoned to death is growing exponentially today. Given such unprivileged birth it is also likely that such a person will die outside medical care and her death will go unrecorded, uncompensated and unlisted as murder with profit as motive. The encouraging results of our work in VA makes us hopeful that this scientific technique can be used by lay people in establishing corporate crime and pressing for remedial and deterrent measures.

I am happy that in Sambhavna we do this and other work in a participatory manner and with a sense of collective responsibility. I have always had a distaste for authority and am glad that I do not have to act like a "boss" in managing the work of the trust. Also I do not have to dress up for office. Most, if not all, decisions in running the clinic are taken by all those who work here, and most often after reaching a consensus. In our fund raising efforts too we strive to increase participation. We do not just ask people to write off cheques for "unfortunate victims" in Bhopal, our appeals for contributions are also aimed towards making people aware of the need for solidarity and compassion across national boundaries.

Living in the aftermath of the horrors of the worst industrial of the century, each day I am made aware how people are made expendable as corporations carry on with their business of business. In their insatiable desire for profits from poisons, toxic corporations today threaten the very existence of life on this planet. For creation to continue and its magic and miracle to be sustained, we need public awareness and resistance to the spread of the toxic empire, like we have never needed before. I am happy that through our work at Sambhavna we are making people aware of the need to oppose toxic corporations and in small ways demonstrating the possibility of successful opposition.

By all accounts, the poisoned night of December '84 is far from over in Bhopal. I am happy that along with the survivors, we at Sambhavna refuse to go silently in

to this night. We have lit a lamp and continue to curse the darkness."

Trustees of Sambhavna meet four times in a year for two busy days in Bhopal to decide on policy and practical matters as well as to meet with staff members. All decisions are by consensus. Except for the Managing trustee who is paid an honorarium of Rs 4000 /- a month, trsutees receive no monetary remuneration for their work towards the trust.

One of the unique features of Sambhavna is the manner in which we raise funds. Unlike most non-government organizations that run on government aid or funds from corporate charities or multinational funding agencies, we raise our funds mainly through individual contributions. Most of our fund has been collected through appeals for donations that we placed in several newspapers in UK and in USA.The appeal-ads created by Indra Sinha are radically different from the usual appeals that aim to generate pity and play upon guilt. In describing the deteriorating situation in Bhopal, we point fingers at those responsible and outline the possibilities in individual compassion in the face of corporate apathy and governmental neglect . Our ads are as much for raising awareness as they are for raising funds.

Well over six thousand school children, college lecturers, artists, housewives, workers and others have contributed sums in response to the ads. Pubs have sponsored cycle rides, pottery schools have organized sales,school children have organized charity events and university staff members have held meetings to decide on donating collections towards the building of Sambhavna. The ads have also received professional acclaim. In 1995 our ad was presented with two awards by the Newspaper Publishers Association of UK.

From the letters our contributors write to us, it is clear that those who support us, do so with a sense of involvement and in a spirit of solidarity . We tell the survivors receiving care at the clinic about the source of our funds and there are those who believe that the duwa (good wishes) of the individual donors make the dawa(medicines)at the clinic work better.We keep our donors informed about the clinic through a newsletter and invite them to visit us and possibly volunteer their services.

"Like most people we were shocked on hearing about the disastrous gas release in Bhopal, and were extremely angry with the company responsible. . . . . ,and with the indifference of todays governments people need to show their humanity and help each other, it is a reaching out between nations - a better way to peace and understanding between peoples."

Extract from a letter from Ms Vera and Mr Bill Haines, Leics, UK

"I received your information at exactly the same time as a letter informing me that I had obtained a new job. (I have been unemployed for several years so I regret it is some time since I have been able to send a donation.) I was so pleased to know that I could share this good fortune with you in the form of making a small covenant to contribute to your work."

Extract from a letter from Mr Frankie Hewett

"I was so pleased to see that the work you do combines traditional and allopathic methods of treatment and yoga therapy. I am a firm believer of combining methods of treatment and using diet to help heal conditions."

Extract from a letter from Ms Ruth Goundry, London

Thanks to the generosity of The Pesticides Trust, London we do not incur expenditures on administration of funds. All of Indra's ad designs and artworks were voluntary. We are now working on publishing appeal ads in Indian newspapers during the fourteenth anniversary of the disaster.

Recently, Tim Edwards and Ian Currie from Brighton, England have written to us about their plans to cycle to Bhopal on a sponsored ride to raise funds for the clinic. They start in September '98 and look forward to working at the clinic as volunteers when they reach here. They call their project, Lifecycle.

INTERNATIONAL ADVISORY GROUP

To provide a link between the international fund raising activities and the work of the clinic in Bhopal an International Advisory Group (IAG) has been formed at the request of the Sambhavna Trust. The members of the IAG who provide professional support to the work of the clinic in different ways are :

DR. RAJIV BHATIA is at the Division of Occupational and Environmental Medicine, University of California, San Francisco. He has been a member of the International Medical Commission on Bhopal and has carried out a study on the use of medicnes in the treatment of the survivors in Bhopal. Dr Bhatia has visited Bhopal twice and volunteers his professional support in training of staff and design of research studies at the clinic.

GARY COHEN is based in Boston, Massachussettes and is a writer and an activist on health impacts of industrial toxins. He is the coordinator of Health Care Without Harm (HCWH), a campaign to reform the environmental practices of the health care industry. He has for long been active in the international campaign for justice in Bhopal and in mobilizing resources for the Sambhavna clinic.

BARBARA DINHAM works at The Pesticides Trust a London based charity organization working on health and environmental problems of pesticides. A long term supporter of Bhopal victims, she has initiated the fourth International Tribunal on Industrial Hazards and Human Rights and through the Pesticides Trust processes and accounts for funds raised for the clinic.

INDRA SINHA is a friend of Bhopal based in East Sussex, UK. He has been adjudged one of the twenty best copywriters of the world and has authored several books. He has volunteered his writing skills to raise funds for the clinic and spread awareness on the continuing aftermath of the disaster.

DR GIANNI TOGNONI is an Epidemiologist at the Institute M. Negri, Milan, Italy, who initiated the Permanent Peoples Tribunal on Industrial Hazards and Human Rights and was a member of the International Medical Commision on Bhopal. He offers his professional advice on research being carried out at the clinic. ■

3. The Sambhavna Clinic

The Sambhavna Clinic doesn't look like a clinic and since we use plain water instead of biocidal synthetics for cleaning, it doesn't even smell like one. In many ways big and small we are different from other medical care facilities and proud of it. People receiving care are not called patients nor made to feel like one.

We must confess, when we started the clinic in September '96 we were not very sure about quite a few things. How will we be received by the community of survivors, how relevant would our work be, how successful will we be in our attempts to find appropriate herbal and yoga therapies, what, if any, support will we get from the local community of health professionals, these and many other, were the questions that remained half answered in the back of our minds.

Those were days of hope and apprehensions, the first few steps.

At the end of one and a half years we in the clinic and the trust are much more sure about ourselves. We have had very positive responses from the community of survivors and that of local medical professionals. Responses to alternate therapies have been more than encouraging and we are making more and more friends in and outside Bhopal. This journey has been far from easy but it has seldom been without excitement as journeys in unchartered territories are supposed to be.





The Bhopal Peoples Health and Documentation Clinic.



Ghrita Kumari or Gwarpatha (aloe plant) used for treatment of menstrual irregularities, excessive vaginal secretions & other gynaecological problems. Also for body aches/joint pains. Grown at the clinic alongwith 25 other plants so that people can see what their medicines are made from.

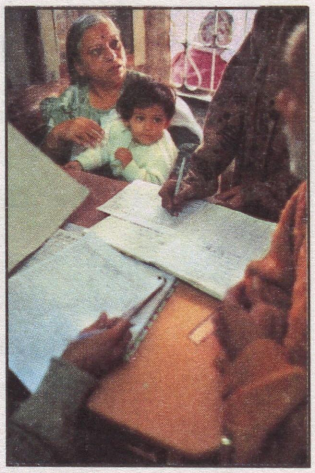
Sambhavna Clinic is located to the west of the now closed Union Carbide factory. We are not exactly happy having them as our neighbours but the location is also near to the communities most severely affected. It is still a longish walk for persons who come to receive care here and we are making efforts to move even closer to the community of survivors. Located in the northern end of the city, the clinic is spared some of the urban noise and grime. There is quite a bit of greenery in the area. A hundred years ago this spot used to be part of the orchards surrounding the playhouse of the former rulers of Bhopal, which lie in neglect and ruins today.

We have purchased a two storey building that houses the clinic and much voluntary labour has gone in to its renovation. It has a waiting room, a room for registration, three cubicles for doctors, an office, a room for dispensing medicines, a computer room, a pathology laboratory and a room for visitors on the ground floor. The first floor has a library and a room for ayurvedic massage. We have built a spacious lean - to on the terrace for yoga instructions. Walls of this 'yoga shed' are covered with flowers, birds, clouds and stars painted by children who visit the clinic.

Many potted flowering plants decorate the rooftop terrace. There is one mango tree and several pomegranate and guava trees on the premises. There are also some comfortable benches under these trees, so people seeking care can wait in the shade of the trees. A committee of three staff members takes care of maintenance of the building and all staff members are expected to keep their work places clean.

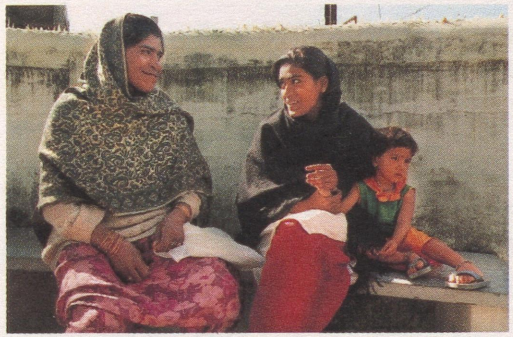
In contrast to many other public buildings including hospitals, our clinic has not one paan (betel leaf) stain anywhere. We take this as a sign of the community's appreciation of our services and their sense of the clinic existing for them.

The clinic remains open six days a week except on holidays. Every day, depending upon seasonal factors and weather conditions, 40 to 100 persons visit the clinic. Most of the persons are from the communities found to be most severely affected by the disaster. Most are chronically ill and have known little respite from their sickness in the last several years. Some wish they died on the night of the disaster. Almost all have a long history of inadequate and improper medical treatment at private clinics and government hospitals. Few have ever been even examined properly by a physician. A few times survivors have broken down in tears before our doctors saying that no doctor had ever held their pulse or listened to their chests all these years. Many of the medicines they have taken, almost without interruption, have either been useless or harmful. It is rare to find a person who has ever been told by any of the doctors she has visited about the nature of her illness.



Registration

Once in a while we have people come in with flowers and sweets to



Persons receiving care at the clinic.

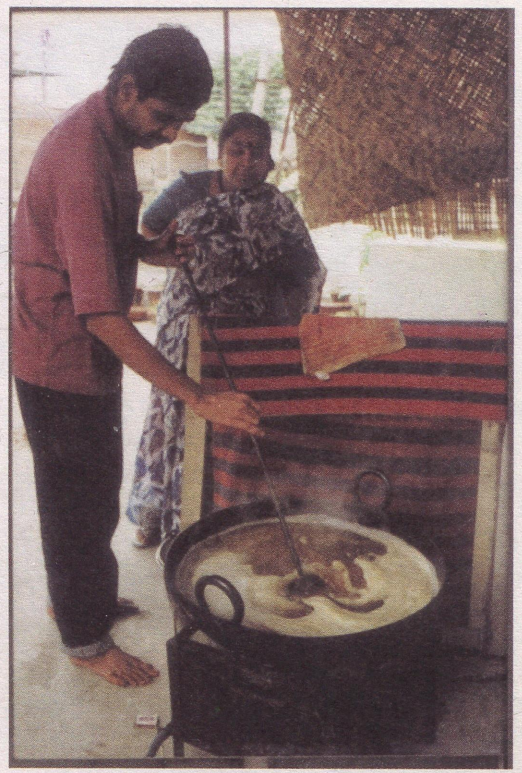
celebrate their improvement in health and share their joy of being able to breathe and move with long forgotten ease. The clinic serves as a meeting place for friends, relatives and neighbours moved away. A little girl run away from her allegedly violent mother comes to see her grandmother at the clinic. Friends recognize each other in embarrassing yoga positions. Neighbours share recipes that go with ayurvedic medicines. Conversations take place and they are not always about tired bodies and spirits.

The clinic begins at 8 in the morning in summer (April to July) and at 9 for the rest of the year. People are served on a first come first serve basis with exceptions made in emergencies. Great care is taken to ensure that only those persons who have actually been exposed to Carbide's gases are registered for care at the clinic. We have to do this so that the clinic can focus on the special problems of gas exposed persons. For this we need to go through documents that show that the person was indeed residing in the gas affected area in December '84. We do have persons coming to the clinic without the required papers. For such people we confirm through other members of their community that they were gas exposed.

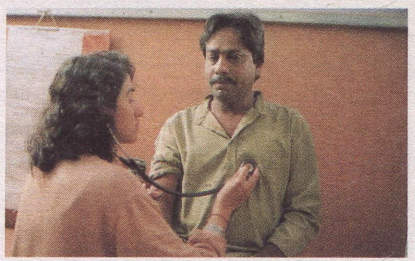
Madhu and Jeevan, who look after the work of registration, record relevant details about the person coming for care in a data sheet, assign an unique registration number, prepare a folder and fill out a health card that is given to the person with advise that she/he brings along the card at every visit to Sanbhavna. With this formal procedure over, facilities of the clinic are made available to the visitor and we as a team take responsibility for their care.

A person is free to choose the system of medicine through which he/she would like to be treated. Those preferring allopathy or angrezi dawai (literally English medicine) go to Dr. Rachna Pandey who is a post graduate in internal medicine with six years of research experience in pulmonary medicine with the ICMR. We purchase most of our allopathic medicines from LOCOST, Baroda - a non-profit organization dedicated to production of high quality medicines under generic names and at a low cost for charitable clinics. Dr P K Sarkar a renowned pharmacologist and founder of the Foundation for Health Action, Calcutta helps us in weeding out irrational drug formulations. We only buy drugs made by multinational corporations if they are not manufactured by Indian companies. Drugs are provided free of cost to persons receiving care. Often times Dr Rachna advises persons to go for yoga or take ayurvedic medicines for symptoms that are best treated by these systems.

Persons opting for ayurvedic medicine that people call jadi-booty or hakeemi dawai (herbal or traditional medicine) go to Dr Deshpande who has been practising ayurveda for 12 years after receiving his graduate degree in ayurvedic medicine. Dr Deshpande uses ayurvedic examination procedures but also takes help from laboratory investigations for diagnosis and treatment of illnesses. Persons who are likely to respond better to modern medicines are referred to Dr Rachna. Most ayurvedic medicines are herbal preparations. We avoid prescribing metallic preparations produced by ayurvedic companies that often are contaminated with heavy metals. Under guidance from Dr Deshpande, Biju prepares over 25 ayurvedic medicines with over 80 herbal ingredients gathered or purchased locally.



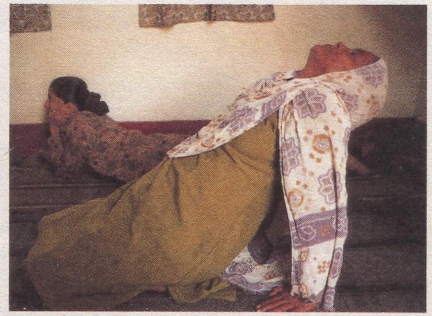
Biju preparing medicinal oil for massage therapy



Person being examined by allopathic doctor.

Thus we are able to get these medicines at less than half of the market price and with greater degree of purity. Biju and Alka both of whom are trained in ayurvedic massage techniques offer this treatment particularly to persons with joint pains and body aches.

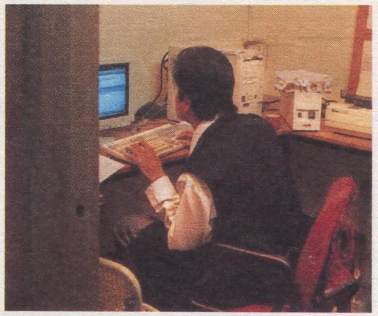
Basic laboratory facilities for examination of blood, urine, sputum and smears are available at the clinic. We are gradually expanding our facilities and in January this year facilities for biochemical investigations have been added. Amita, a postgraduate in biochemistry and qualified in medical laboratory technology, runs the laboratory in the morning hours. Reports of examinations are handed over to the person usually on the same day. Since January '98 Aziza has been trained in basic gynaecological examinations and in taking samples of cervical smear by Dr Jayshri Chander, a volunteer at the clinic from San Francisco.



Yoga at the clinic

Amita and Sushmita offer yoga instructions at the clinic for specific problems such as respiratory distress, insomnia, backache, joint pains, constipation, and anxiety attacks, all of which are common among persons coming for care at the clinic. Many of the survivors have been taking medicines regularly for these problems and despite adverse effects of long term drug usage are dependent on them. We find that yoga postures, breathing exercises and meditation offer sustained relief in these problems and those practising yoga are able to do without medicines. The results of our ongoing research on yoga in the treatment of exposure induced respiratory problems are indeed very encouraging.

Information on persons receiving care at the clinic is entered in to a computer on a daily basis by Pranay and Sushmita using Epi Info software. Periodic analysis helps us in monitoring the health condition of individuals and efficacy of care offered.



Computerisation of medical information at the clinic.

Community health workers from the clinic, Aziza, Diwakar and Ramesh visit neighbourhood communities every day providing the vital link between the community and the clinic. During their visits they collect information on status of health and health-care, identify those most in need of medical attention, follow up on persons in the community receiving care at the Sambhavna clinic and encourage participation of the community in improvement the health care situation. Identification of persons with pulmonary tuberculosis and ensuring their treatment is also part of the work of the commuity health workers. Setting up community based primary clinics with active local participation is one of the our main future projects.

The official body for registration of exposure related deaths in Bhopal was wound up in December 1992. Yet people continue to die from exposure related illnesses or their complications to this day. Most of these deaths occur at home and there is no way for the family to obtain a doctor's certificate about the cause of death. We have been using a scientific method called Verbal Autopsy for assessment of probable cause of death of persons in the affected communities.

We have completed one research study on the distribution of medicines in the gas affected area. The study shows that irrational formulations are the most sold drugs, that one out of every three prescriptions written by doctors are irrational and that multinational companies have the major share in the drug market in gas affected Bhopal.

A study on the effect of yoga therapy for exposure induced respiratory disorders is near completion. In this we record objective findings on the lung condition of persons with different degrees of breathlessness before and after yoga practice. We find marked and sustained relief in symptoms among persons following yoga instructions for 15 days to six months.

Ongoing studies at the clinic include clinical investigation of the problem of excessive vaginal secretions among gas affected women, comparative efficacy of ayurvedic formulations in treating respiratory problems and effect of Panchakarma therapy. A community based study on the physical growth and mental development of children exposed at infancy or in their mother's womb is being designed and expected to be carried out later this year.

The documentation unit at Sambhavna has an unique collection of medical, technical, economic, legal and other information related to the disaster. The collection is used by journalists and research scholars as well as staff members. Research findings and other information are shared with local doctors and simplified versions are made in Hindi for survivors.

In May '97 we organized a seminar on gynaecological and obstetric problems among the survivors. We invited local gynaecologists of both allopathic and ayurved systems of medicine who are involved in providing medical care to the gas affected people. Doctors from Sambhavna presented information from epidemiological, clinical and animal studies as well as their own observations. Other participants presented their findings on higher rates of spontaneous abortion among gas affected women and unusually high incidence of excessive vaginal secretions, menstrual irregularities and sterility . Possible ways of screening and treating exposure induced gynaecological problems were discussed at the seminar.



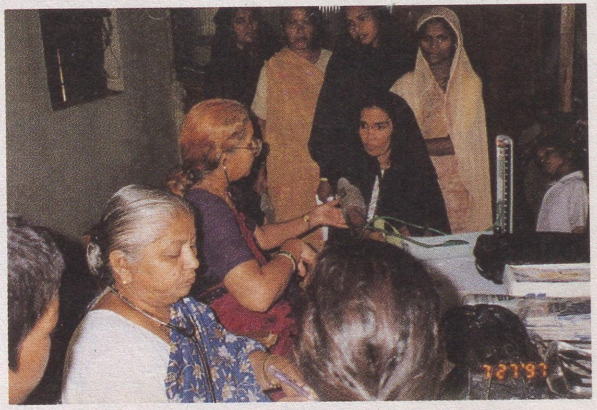
National seminar on Ayurvedic possibilities of care of survivors in Bhopal. September 1997.

In September '97 we organized a National seminar on possibilities in Ayurveda for the treatment of diseases caused by the Union Carbide disaster. More than a dozen ayurveda physicians and researchers from different parts of the country participated in the two

day seminar. Participants laid stress on development of ayurvedic symptomatology, investigation and diagnostic techniques for chemical induced diseases and presented findings on treatment of chronic occupational illnesses. Panchakarma treatment was suggested as one of the potentially effective ayurvedic procedures for providing sustained relief to gas affected persons in Bhopal.

A health camp was organized in July '97 at Jaiprakash Nagar, a severely affected community right in front of the Union Carbide factory. In this we set up a make shift clinic in the community itself. Local doctors including eye specialists and paediatricians volunteered their services and provided consultation and treatment to over 200 survivors at the camp.

Local gynaecologists volunteering at health camp at Jai Prakash Nagar.



An eight day camp was held in Arif Nagar a neighbourhood community, in November '97.Yoga instructions were given to women and men separately and objective measurements of lung conditions were made before and after a week of yoga practice. Yoga instructors from two local institutions offered their services at the camp.

On 21st September 1997 we had a public function for our Annual Day. It was held in Gandhi Bhavan and the hall was full of people who visit the clinic, our friends and supporters and some who came out of curiosity. Information on the activities, findings, funding, expenditures of the clinic over the last year were publicly shared through a poster exhibition outside the hall. We had Dr Manu Kulkarni, state representative of UNICEF, as the chief guest for the evening. He spoke on the need for health education and nutrition awareness particularly for children and women. Sathyu made a brief presentation on the lingering medical issues of the disaster and outlined the objectives of the trust. Dr U S Nigam, Professor of Ayurveda, talked about the principles of Ayurveda and their relevance in our daily lives. Dr M P Dwivedi spoke on unresolved issues of medical research on Bhopal. Dr Rachna presented an account of the activities of the clinic in the last year.

Thankfully it was not an evening full of speeches. Mohammad Idris, a young survivor, regaled the audience with his mimicry, bringing out the black humour in the corporate and government reponse to Bhopal. A music band played along as he sang songs of loss and hope. There were songs sung by the clinic staff too. Things got livelier as the evening progressed and people from the audience, old and young, came up on the stage to dance. Dr Deshpande compered the show and Amita thanked evrybody for their support to Sambhavna.

PRINCIPLES AND POLICIES :

We hold ourselves in solidarity with the survivors offering support in their efforts to survive the continuing disaster. Within the constraints of our resources, we pursue activities that we believe will improve the health of not only the survivors who accept our support but also to the larger community of survivors. We believe that the

economic, social and environmental rehabilitation of the survivors is as important as making health care available. We also believe that active participation of the individual and the community is a precondition for any change.

We believe that every individual working in the clinic has an equal right to decide on activities, programmes, responsibilities, expenditures and functioning of the clinic. Most decisions are by consensus among staff members at weekly meetings. On administrative matters such as hours of work, salaries, holidays, leaves and evaluation of performance the Trust has the last word.

To the best of our abilities we avoid use of environmentally destructive products, particularly plastics. We have stopped using disposable syringes and are searching for non-PVC gloves. We mostly use unbleached paper that are reused for packing medicines. We seggregate our waste at source and use safe methods for the disposal of PVC and biomedical waste. We are also working on a project to run the clinic on solar power.

OUR SUCCESSES AND FAILURES.

Through our work in the last one and a half year we have succeeded in :

1) Providing relief to a significant number of persons from chronic exposure related health problems many of whom have been ill ever since the disaster.

2) Designing a system of medical record keeping and health monitoring with special reference to gas affected persons with chronic illnesses. We will soon be presenting the design to the official health care administration as a workable idea implementation of which is long overdue.

3) Demonstrating the efficacy of ayurveda , yoga and massage therapy in the treatment of exposure related diseases.

4) Demonstrating the applicability of the technique of Verbal Autopsy in monitoring exposure related deaths.

5) Gaining support from affected communities as well as from the local medical community

6) Generating information on long term health effects of exposure to Carbide's gases.

7) Manufacturing part of the medicines used at the clinic.

9) Gathering funds and voluntary support locally, nationally and internationally.

Our limitations and failures have been the following :

1) The number of persons we have been able to offer care is at least twenty times less than the number of survivors in need of appropriate medical attention.

2) We have not been able to inspire patience and confidence in a significant number of persons who dropped out after one or two visits.

3) Substantial number of persons have not found relief despite treatment at our clinic and many report relapse of symptoms.

4) We have not been able to provide diagnostic facilities other than laboratory tests.

5) We have not been able to pay required attention to eye problems, neurological disorders and endocrine and immune system impairments due to lack of expertise in these areas.

6) We have not been able to set up a community health unit and much remains to be done in community health education.

7) We have not been able to popularize yoga in the communities.

8) With our present strength we will be able to record only a small number of exposure related deaths.

9) We still have a few glitches in our computerization of data. ■



4. Reports on work at Sambhavna

If you have stayed with us this far we would like to tell you more about our work and about ourselves. In the pages that follow, we, the members of the clinic staff, tell you who we are and what we are doing, in greater detail. Unless otherwise mentioned all the information in the following pages are from March 1, 1997 to March 31, 1998.

In addition to medical care through modern medicine, ayurveda, yoga and traditional massage we do health survey and education in the affected communities, monitor continuing exposure related deaths, carry out a few research studies, run a documentation unit, organize seminars and health camps and other activities.

There are fifteen of us working at the clinic. Our ages range from 19 to 65 (average 31 years). Six of us are women. Six of us have studied up to different grades in school, three are graduates and six have received post graduate degrees. We do our best to not let our differences of age, gender, education and salary grades come in the way of functioning as a collective. It is tiring but seldom unenjoyable to keep the various activities going.

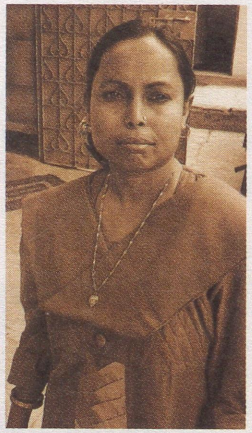




COMMUNITY HEALTH WORK

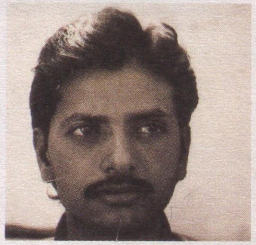
AZIZA SULTAN

"I have studied up to 2nd year of college and have taken training in yoga care. I am also getting trained in screening for gynaecological health problems. I work as a health worker in Sambhavna clinic. I am a gas affected person myself and I know and feel the continuing agony of gas affected people. As part of my job I go from house to house in the communities, making notes on people's health condition and meeting persons receiving care at our Clinic. Every day I see young people wasting away with chronic diseases, too many persons with tuberculosis, women with menstrual disorders and children whose growth is stunted. Most families we visit are too poor to afford the medicines they need."



DIWAKAR KUMAR SINHA

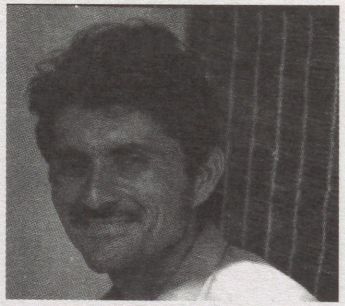
"I am doing an MA in sociology along with my work at Sambhavna as a Field Coordinator. I have also completed a diploma course in yoga. My work consists of health education in the communities, carrying out door to door health surveys, conducting verbal autopsy interviews and following up on persons who drop out in the middle of their treatment at the clinic. I am a survivor of the disaster myself and suffer from breathlessness due to injuries caused to my lungs.

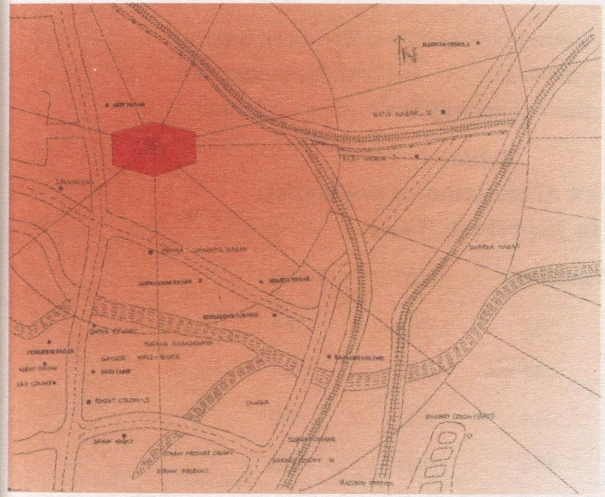


Before joining the clinic I used to work in the government's Department of Gas Relief. I could not continue with my work there as there was too much corruption at all levels and I left after a year. I enjoy working at Sambhavna and particularly like the way we treat everyone equally, irrespective of ones religious background and social class."

RAMESH MISHRA

"I have been in Bhopal since 1989. I am originally from Uttar Pradesh. At Sambhavna clinic I look after work related to bank, post office, telephone, and other government offices. I also join Diwakar and Aziza in the community surveys. In the course of the community visits I have seen that at least one member in each household is very ill. Private doctors give treatments that may provide immediate relief but quite possibly may cause long term damage. Tuberculosis is a big problem in the communities. I have been taking people to the District Tuberculosis Centre to ensure that they get treatment."





MAP SHOWING LOCATION OF BASTIS VISITED BY HEALTH WORKERS ON A REGULAR BASIS

Introduction

Community health work is by far the most important work that needs to be done in Bhopal. As it happens this is decidedly the most neglected aspect of official health care in Bhopal. Survivors organizations have been calling for a community based system of health care for a long time. Independent national and international bodies have presented workable plans for implementing a community based health care scheme. Yet government health care continues to be centred in large hospitals without any attention to the essential tasks of community based monitoring, follow up, health care and education.

OUR WORK AT SAMBHAVNA

Under the circumstances described above it is indeed not a privilege to be the only three, community health workers in all of gas affected Bhopal. Constrained as we are, we have limited our work to the communities in the neighbourhood of the clinic among people who have been most severely affected. The communities or basties in which we work are Jaiprakash Nagar, Shakti Nagar, Rishaldar Colony, Rajgarh Colony, Qazi Camp, Arif Nagar, Congress Nagar and Kainchi Chhola.

Among these we have collected detailed information through house to house interviews on two bastis that we present below.

INFORMATION ON TWO COMMUNITIES

1) JAIPRAKASH NAGAR

Location : It is the community most affected by the disaster and with the highest mortality rate. It is situated right opposite the Union Carbide factory, across the road. To its east is a cold storage, aloo (potato) factory in local parlance, and to its west is the electrical substation providing power to the Carbide factory. Its southern boundary is marked by a sewage nullah that was once a fresh water stream and a cremation ground in one corner.

History : The community came up in 1969 in abandoned farm land of black cotton soil that got the area its name Kali (black) Parade. The lands were used to grow fodder for the horses in the Sultania Infantry, the army of the rulers of Bhopal who joined the British in their war efforts. The first person to make a dwelling on this land was Balram Mukaddam who was a worker cum petty supervisor of a group of migrant workers from the western parts of the state. Balram was one among the hundreds employed by Union Carbide as contract workers during the erection of the factory and its walls. The community grew- about thirty other families of migrant workers, people from nomadic tribes, and gradually city dwellers forced to move to the periphery came to settle opposite the Carbide factory that they were told produced phasal ki dawai, medicine for crops.

In June 1975 the Prime Minister of the country declared a state of emergency. News of demolition of so called encroachments in different parts of the country reached the community . About 20 persons put their heads together on the problem and decided to name the basti Sanjay Nagar after the son of the PM

who was known to be leading the demolition squads. Curiously, it worked and the community survived the beautification pogrom. Their allegiance to the leaders son however was short lived and the name stuck for about twenty days. Soon after the Prime Minister was voted out of power the name of the community was changed to Jaiprakash Nagar after Jaiprakash Narain a Gandhian political reformer who had successfully led the popular movement against the dictatorship of the ruling dynasty. Emboldened by the power of the vote, a delegation from the community including its first resident Balram met with the Minister of Urban housing. Many more representations later they succeeded in getting piped water supply. In 1980 the newly elected Chief Minister of the state granted pattas to the residents of the community thus making it a legitimate settlement.

Jai Prakash Nagar



SOCIAL CONDITIONS

There are 463 households in this community with a total population of 2900. The age and sex distribution of the population in this community is shown in Table - 1.

Table - I
Age and Sex distribution of population in Jaiprakash Nagar

Age	Female	Male	Total
0 - 10	381	383	764
10 - 19	431	416	847
20 - 29	244	216	460
30 - 39	196	192	388
40 - 49	93	135	228
50 - 59	46	64	110
60 - 69	32	39	71
70 - 79	12	13	25
80 - 89	4	1	5
90 - 99	1	1	2

This pattern of distribution has arisen out of the death of a relatively larger number of older persons as a result of the gas disaster.

Hindus and Muslims are almost in equal numbers in this community. In 1992 when religious riots had engulfed the city the people in this community formed a defence committee with representatives from both hindus and muslims and protected themselves. The number of persons with formal education is very small in this community .

Economic Conditions : Most persons in this community earn their livelihood through hard labour in ill paid irregular jobs. A large fraction of the adult population (~ 60 %) is either too incapacitated to do any work or has not been able to find a job. The occupations and income distribution of the working population is shown in Table - 2.

Table -II.
Income and sex distribution of persons in different occupations

S. No	Occupations *	Income permonth in Rs.	Female	Male	Total
1	Daily wage labour, rolling bidis, making paper bags	< 1000	45	260	305
2	Sewing, selling vegetables, pushing hand carts, tea shop	1000 - 2000	14	81	95
3	Govt. job, electrical repair, painter, tailor, bangle seller	2000 - 3000	5	163	168
4	Truck driving, Mechanic, Railway employee	3000 - 4000	-	76	76
5	Building contractor	>4000	-	8	8

* - the occupations listed are indicative of the general nature of work in each income category, the list is not exhaustive.

A substantial portion of the family income (up to 30 %) is spent on medical care.

Condition of health and health care facilities : This community has been most severely affected by Carbide's gases and the health condition of people in this community is very poor. At least one person in every family is acutely ill and at least two persons are under constant medication. The main chronic health problems are - breathlessness, cough, chest pain, fatigue, body ache, abdominal pain, numbness and tingling in the limbs, hyper tension, anxiety attacks and mental illnesses. Unusually large number of women have menstrual irregularities and excessive vaginal secretions. Mothers complain of retarded physical and mental growth in children exposed at infancy or born after the disaster.

Most (77 %) of the persons taking medical treatment visit private clinics with very few (19 %) visiting government hospitals and clinics. Almost all the private doctors treating people in this community are without any formal medical training. These doctors use steroids, intravenous drips and antibiotic injections indiscriminately yet continue to enjoy the confidence of most of their patients.

Environmental Conditions : There is one public toilet in the community that charges money for people to use it. Defaecation in the open is common. Open drains are often clogged and garbage collection by municipal workers is infrequent. Water in the wells and hand pumps in this community have an offensive smell and has been found to contain several toxic chemicals that have come from the dumping sites within and outside the Carbide

factory. However, due to the paucity of municipal water supply people are forced to use this water despite complaints of skin rashes, abdominal pain and burning apparently related to its consumption.

2) SHAKTI NAGAR

Location : Shakti Nagar is a small community adjacent to the eastern wall of the Union Carbide factory. The railway line to Indore marks its northern boundary and the Chhola road is to its east. Rishaldar Colony lies to its south.

History : This community was settled more than 30 years back. It was fallow land with a stream passing through it used mostly by cattle belonging to local farmers. Mr Liyaquat Ali along with 15 others initially constructed mud huts that soon drew the attention of government officials. The huts were demolished by municipal officials as encroachments. However, Liyaquat who was a member of the communist party organized the evicted families and mobilized support from local leaders of his party and managed to rebuild the huts in the face of official opposition. Several rallies and demonstrations later, in June '84 people in this community were given pattas . Quite possibly the community got its name Shakti (meaning power) Nagar from this demonstration of the power of peoples defiance.

Social condition : There are 107 households in this community with a total population of 671. Age sex distribution of the population in this community is shown in Table - 3.

Table - III.
Age and Sex distribution of population in Shakti Nagar

Age	Female	Male	Total
0 - 10	81	78	159
10 - 19	94	86	180
20 - 29	59	55	114
30 - 39	43	52	95
40 - 49	28	33	61
50 - 59	11	20	31
60 - 69	10	17	27
70 - 79	2	2	4

Most people in this community are Hindus. The community has a fair number of persons with formal education.

Economic condition : There are more persons working as skilled workers and in better paid jobs compared to Jaiprakash Nagar. The number of women workers is very low compared to other communities. The fraction of adult unemployed is lower (40 %) in this community. The occupations and income distribution of the working population is shown in Table - 4.

Shakti Nagar



Table - IV
Income and sex distribution of persons in different occupations

Occupations *	Income permonth in Rs.	Female	Male	Total
1. Wage labour, domestic help, shop assistant	< 1000	15	52	67
2. Sewing, watch making	1000 - 2000	2	27	29
3. House painter, grocery store owner, auto driver repair, pushing hand carts, tea shop	2000 - 3000	-	28	28
4. Govt. job, plumber, photo studio, mason,	3000 - 4000	-	43	43
5. Building contractor, carpenter	>4000	-	4	4

* - the occupations listed are indicative of the general nature of work in each income category, the list is not exhaustive.

Condition of health and health care facilities : Being adjacent to the Carbide factory, this community has been quite severely affected by the disaster. The chronic health problems of the population are similar to those found in Jaiprakash Nagar. At least four times more people visit private clinics than government hospitals and clinics. Most visit the same unqualified doctors that treat people in Jaiprakash Nagar. However, those with higher income can afford to go to qualified private doctors thus receiving marginally better quality of health care.

Quite a few of the unqualified doctors have moved in to this neighbourhood after the disaster. If they have had any prior training at all, it has been from other unqualified doctors. One such doctor has 50 to 100 patients in his clinic everyday many of whom undergo treatment for months together. Medicines are given by the doctor himself and costs between 10 to 20 rupees per day. No prescriptions are ever given .

Environmental conditions : People in this community are exposed to toxic fumes from the burning of wastes within the Carbide factory premises that continues till today. Also it is close to the waste disposal area within the factory and water from the hand pumps is contaminated.

Identification, Treatment and Follow up of persons with Tuberculosis : Given the high prevalence of tuberculosis in the gas affected communities we consider action on this disease one of the most urgent public health intervention in Bhopal. At Sambhavna we are trying to identify the problems and possibilities in identification, diagnosis, counselling, treatment, follow

up and education. Our involvement is over a year old and it has been a frustrating, painful and a learning experience for us. On paper all persons with tuberculosis are supposed to receive free treatment under the National Tuberculosis Control Programme but in reality things do not work that way. Because of the high cost of anti tuberculosis medicines it is not possible for us to provide them at Sambhavna and we try our best that these medicines are made available to persons with tuberculosis from the government District Tuberculosis Centre or other centres.

In the course of our house to house survey in the communities, we keep an eye on persons who have been diagnosed with tuberculosis or those who have symptoms suggestive of pulmonary tuberculosis. People often seem ashamed about their disease and are hesitant to talk about their symptoms. Persons found to be with TB symptoms are encouraged, and in some cases persuaded, to visit Sambhavna clinic. Doctors at the clinic examine the person clinically and blood ESR and Sputum AFB tests (overnight sample) are carried out . A person diagnosed with tuberculosis is then referred to the District Tuberculosis Centre (DTC) with a letter describing clinical findings and investigation results so that required medicines are available free to the person.

At the DTC sputum and x-ray examinations are carried out and drugs are made available according to the standard protocol of the programme. However, this does not happen often and persons with tuberculosis are routinely denied free medicines. Many are found to have a long history of intermittent treatment for tuberculosis mainly because of lack of adequate supply of medicines.

MOHAMMED KHALEEL (32) (Arif Nagar)

"I have been taking treatment for tuberculosis since 1990. When I stopped getting medicines at the DTC, I went to private doctors. I was not able to purchase medicines regularly and pay the doctor's fees. Once I got admitted in the government TB Hospital but there was no improvement. In June 1997 members of Sambhavna advised me to visit the clinic and have myself examined. The doctor at the clinic sent me to the DTC with a letter describing my condition. I went to the DTC several times but was unable to get any medicines from there."

PARVEEN JAHAN (20) (Jaiprakash Nagar)

"I live right opposite the Union Carbide factory with my parents. I visited Sambhavna clinic in May '97. I had earlier taken treatment at the government Jawaharlal Nehru Hospital but had to discontinue because I could not get medicines regularly. For some



time I visited a private clinic but could not afford to bear the cost of medicines (~ Rs. 600/- a month). The doctor at Sambhavna said I had tuberculosis in my lung that had been inadequately treated and that I needed to take medicines regularly for at least six months. She gave me a letter that had the results of laboratory investigations and asked me to go to the DTC. At the DTC they examined my sputum again and I was given two drugs to be taken everyday. However, when I went to the DTC the next

month they gave me only one of the medicines and asked me to purchase the second one. My husband has left me with two children ever since I have had this disease and I am dependent on my parents. I can't afford to buy such expensive medicines."

At times persons denied medicines at the DTC apparently because tests are negative, are able to get medicines from other government centres.

RASHIDA BI (33), (Arif Nagar)



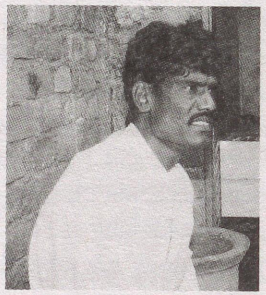
"I was examined by the doctor at the Sambhavna clinic and they tested my sputum. When I visited the DTC they said my sputum test was negative and I did not have TB. I went once again with Ramesh Bhai from Sambhavna on whose request the people at the DTC tested my sputum once again. But this too was negative they said. Then I went to the Jawaharlal Nehru Hospital where the doctor saw my medical record and I started getting medicines from there. Within 15 days my condition improved a lot and I hope I can get these medicines for as long as I need them."

Supply of anti-tubercular medicines at the JLN Hospital, however, is erratic and persons visiting this hospital seldom receive adequate treatment. But there are no places where a person with TB can be assured of treatment. The TB Hospital that has facilities for indoor care is possibly the worst place for a person with tuberculosis to be. Corruption is rampant in this institution and availability of medicines and facilities is linked to the persons ability to pay bribes or bakhshees.

JAHIDA BEE, (45) , (Teela Jamalpura)

"I have been badly exposed to Carbide's gases and have been very sick ever since. Three years after the disaster I was diagnosed with lung tuberculosis by a private doctor. I had to be admitted to a Nursing home for several days. Treatment was expensive and there was very little improvement in my condition so people in my family took me to the DTC. I took treatment for six months there. Some months I was given only one medicine and then I stopped getting medicines from there. I went back to the private doctor but had to discontinue again as money ran out. Then I visited the Sambhavna clinic in December '96. The doctor at the clinic examined me and I had my blood and sputum tested. I went back to the DTC with a letter from Sambhavna where I was told to go the TB Hospital. At the TB Hospital the doctor said I needed to be admitted for treatment but there were no empty beds. Then my son haggled about the bribe to be paid and after he paid 400 rupees, they discovered that a bed was indeed vacant in the hospital. But no body took care at the hospital. They would ask us to pay for the injections that I had to have every day. My condition deteriorated and I am back to taking treatment at a private clinic. But I know I can not continue to purchase medicines for long as I can not see my children starving on account of my treatment."

Follow up survey of persons referred to the DTC: In February 1998 we did a follow up survey to see the treatment (or its absence) that persons referred by Sambhavna were receiving from the DTC. We found that out of 32 such persons only six were able to receive free medicines from the DTC. Three persons had died because of lack of treatment . We could not locate five of the persons as they had moved away. 13 persons were denied medicines though they were found to have tuberculosis by doctors at the DTC. Five persons have been told that there tests were negative. Those denied free medicines have been without any treatment and most have given up hopes of recovering from their disease. Till March 1998 we have succeeded in getting free medicines from the DTC for four of the persons initially denied. This has been possible by the relentless efforts of Ramesh who dissuades people from giving up, accompanies them to the centre and then argues on their behalf with the doctors there.



AZEEZ KHAN (34), (Jaiprakash Nagar)

"I have been very sick ever since the disaster and was taking treatment from private doctors. Five years after the disaster my doctor told me that I have got lung tuberculosis. But the drugs for TB were expensive and I could not afford to buy them for more than six months. After some time I went to the TB hospital and was hospitalized for a month. I was then told to go home and get my medicines from the Jawahar Lal Nehru Hospital. I went to this hospital several times but could not get my medicines. Finally I went to Sambhavna clinic where the doctor gave me a letter to take to the District TB Centre. But I could not get medicines from the DTC. I showed them the letter from Sambhavna and all they said was there is no medicine in stock. Later Ramesh bhai came and visited me at my home to find out whether I was taking my medicines. He found me to be in a much worse state than when we first met. I told him there were no medicines to take. He came with me to the DTC and had bit of an argument with the staff there. They examined my sputum and it was positive. I was also given the required medicines. Today I feel much better, though I need to continue with the medicines for several months. I am hopeful that I will get rid of this disease."

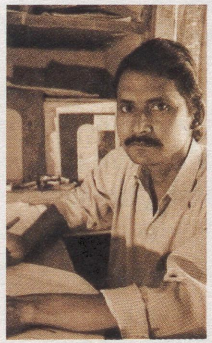
In the course of our work on tuberculosis we realize that we have neglected the very important work of community education on tuberculosis. It is important that people talk about TB without shame and are organized and empowered to make best use of the treatment facilities that exist for them albeit mostly on paper. This work has begun in March '98.

In addition to the work described above we follow up on persons who drop out of treatment from Sambhavna clinic and on persons who have been given yoga instructions. These have been described elsewhere in the report. We also organize weekly meetings in different bastis along with other staff members of Sambhavna. In these meetings people in the community have presented their suggestions, criticisms and questions with regard to the functioning of the clinic.

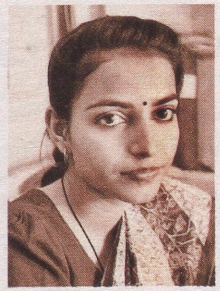
REGISTRATION & MEDICAL RECORD KEEPING

JEEVAN SHINDE:

"Before joining Sambhavna I used to come often to my son's school which is just opposite the clinic. I used to wonder what Sambhavna was. Once I met with Dr. Deshpande and he told me that this was a place for medical care of the gas affected. I was surprised to know this as I was a gas affected person myself and had not known about Sambhavna. I have gone through the pain of visiting government hospitals and have been witness to the misbehaviour of hospital staff. I have found Sambhavna to be a very different place where the staff are warm and friendly to the people.



It has been one year since I have been working here and I see that people who visit the clinic leave feeling a bit better by just having been here. Many of the people pray for the success of the clinic and the well being of those who work here. I would like to see Sambhavna grow. We are a small unit with limited resources trying to address a big problem. I assist Madhu in the work of registration. On the days that she is on leave I handle the job."



MADHULIKA DAS: "I have a bachelors degree in psychology and a masters degree in sociology I also have a second bachelors degree in library and information sciences and am currently doing a course in computer applications. I was initially appointed as a documentation assistant but later made the medical records keeper. My primary responsibility is registration and storage and retrieval of medical records.

When I first joined Sambhavna I thought my job was too easy with no challenge in it. Gradually I began to understand more about my work and responsibilities and became aware of the significance and complexities of my job. People coming to the clinic first come to us at the registration desk. Each day I meet different kinds of people. The manner in which people are greeted at registration has a definite impact on the success of the treatments offered at the clinic."

Introduction

A proper system for registration and maintenance of medical records is essential in the care of a population with chronic diseases. This is particularly important in Bhopal where so little is known about the chemicals and their medical consequences. Till today such a system has not been designed, let alone implemented, at the government hospitals and clinics. This is because the official administration of health care continues to be as it was on the morning of the disaster - geared towards an acute emergent situation and without any perspective for intervention in a chronic disease process.

As official records show, 4000 persons visit the government hospitals and clinics meant for gas victims every day. Every day at least four times this number of persons, from gas affected communities, visit private clinics in the city. Yet there is next to no medical information available on these persons. If you want to know about the addresses, exposure history, occupations, health complaints, investigation results, diagnoses offered, treatments taken, response to treatment and other such basic things about the population under official care you will draw a complete blank.

OUR WORK AT SAMBHAVNA :

At Sambhavna we have developed a system of registration and record keeping with the objectives of checking and recording of exposure history and monitoring health condition of individuals visiting the clinic. In their visits to the communities, health workers advise people to take along their documents related to gas exposure (1984 ration card, survey records, ICMR cards, medical prescriptions and other papers) when they visit Sambhavna to receive care. We go through these papers at the registration to make sure that the person being registered at the clinic is indeed one who has been exposed to Carbide's gases.

In addition to recording the name and address (both current and at the time of the disaster) of individuals visiting Sambhavna we record the person's nature of occupation (both current and at the time of the disaster), addictions, food habits and fuel used for cooking as these may have a bearing on her health status. Height and weight of the person is measured and recorded. Information about the persons medical treatment prior to visiting Sambhavna is also recorded. Assessment of the person's extent of disability through the Wonca Coop Rating Scale is made during registration. A health card is issued to each person and a folder with records of each visit of the individual is kept at the clinic.

Between March 1, '97 to March 31, '98 (317 work days) we have 2, 273 survivors of the Carbide disaster registered at our clinic with 15, 399 follow up visits. An average of 56 persons coming for care every day. With two doctors, two yoga teachers and two massage therapists in the medical care team in the clinic this is close to the maximum number we can offer our services to, in a day. The total number of persons registered at the clinic since September '96, when the clinic started, till March 31, '98 is 6,296 with 20, 880 follow up visits. [Please see Table - 1, on page57 for more information]

Most (88 %) of the persons registered between March '97 and March '98 visited the clinic for the first time after hearing about it from their family, neighbours or friends. 1036 persons (46 %) of the persons registered at the clinic are from communities lying within 1.5 kms. of the Union Carbide factory that are most severely affected. [Please see Table - 2, on page57 for more information]

INFORMATION ON 790 PERSONS REGISTERED AT THE CLINIC :

The following tables based on data on 790 ((505 female, 285 male) newly registered persons from October 1, 1997 to March 31, 1998, present a picture of the population visiting Sambhavna.

TABLE - I
DISTANCE OF RESIDENCE FROM THE UNION CARBIDE FACTORY AT THE TIME OF THE DISASTER AND CURRENT.

Distance in Kms.	Residents in 1984 (%)	Current residence* (%)
0.75	86 (10. 9 %)	200 (20. 2 %)
1.5	396 (50. 1 %)	323 (45. 6 %)
2.25	176 (22. 3 %)	105 (14. 8 %)
3	109 (13. 8 %)	72 (10. 2 %)
3.75	23 (2. 9 %)	9 (1.3 %)

* 5 persons from 0. 75 kms. , 44 from 1. 5 kms., 14 from 2.25 kms., 13 from 3 kms and 5 from 3.75 kms have moved away since 1984 to areas not covered by the grids drawn around the factory and their current residence is nor presented in the table.

61 % of these persons were resident of communities within 1.5 kms of the Carbide factory at the time of the disaster. In terms of current residence 66 % of the newly registered persons reside within 1.5 kms of the factory.

TABLE II
DIRECTIONWISE LOCATION OF COMMUNITIES OF PERSONS VISITING SAMBHAVNA

(with reference to the Union Carbide factory).

Direction	Residents in 1984 (%)	Current residence* (%)
South - East	247 (31. 3 %)	174 (24 . 5 %)
South - West	512 (64. 8 %)	377 (53 . 2 %)
North - West	1 (0. 1 %)	131 (18 . 5 %)
North - East	30 (3. 8 %)	27 (3 . 8 %)

* 33 persons from South - East, 43 persons from South - West and 23 persons from North - East direction have since 1984 moved to areas not covered by the grids drawn around the factory and their current residence is not presented in the table.

In terms of severity of exposure, empirical observations as well as research studies show that the communities to the south-east of the factory were most severely affected closely followed by those to the south and south - west. Communities in the north - west sector were most possibly unexposed to Carbide's gases. However, communities to the north- east were quite severely exposed. Researchers have found a positive relationship between distance from the factory and severity of exposure.

In the light of the above, it is interesting to see that the inter-migration of people exposed to the gas have been closer to the factory in a direction considered to be safe.

Occupations pursued by most of the persons visiting the clinic at the time of the gas disaster and currently are as shown below :

TABLE III
MAJOR OCCUPATIONS OF PERSONS VISITING SAMBHAVNA (1984 AND CURRENT)

S. No.	Occupations	Income per month	No of persons* ('84)	No of persons* ('97-'98)
1.	Housework	-	208 (26.4%)	274 (34.7%)
2.	Sewing	500 - 1000	30 (3.8%)	21 (2.7%)
3.	Shopkeeper	500 - 1500	33 (4.2%)	26 (3.3%)
4.	Wage labour	800 - 1200	40 (5.1%)	25 (3.2%)
5.	Private job	1000 - 1500	24 (3.0%)	28 (3.5%)
6.	Auto driver	1500 - 2500	7 (0.9%)	12 (1.5%)
7.	Truck/bus driver	3000 - 4000	14 (1.8%)	11 (1.4%)
8.	Government job	2000 - 3000	21 (2.7%)	10 (1.3%)
9.	Student	-	113 (14.3%)	117 (14.8%)
10.	Bidi rolling	800 - 1000	54 (6.9%)	22 (2.8%)
11.	Not old enough	-	94 (11.9%)	1 (0.1%)
12.	None	-	41 (5.2%)	151 (19.1%)
13	Retired	-	-	10 (1.3%)

* percentages are expressed in relation to the total sum of occupations of 790 persons.

The percentage of adult persons, in the population visiting the clinic, without any occupation is very high. Loss of occupation is a very significant effect of and cause for continuing ill health of this population.

76.5 % of these persons are Muslims, 22.7 % are Hindus and 0.9 % are Sikhs. Most (90 %) are non-vegetarians but its not every meal or every day. 21.4 % of the persons reported difficulty in walking, 25 % reported difficulty in performing household activites and 15 % reported difficulty in doing work because of their ill health. 234 persons were taking treatment just prior to visitng Sambhavna, majority (81.6 %) of them in government hospitals and clinics.

66 % of the persons had no addictions, 21 % are tobacco chewers and 10 % are smokers. In 20 % households firewood is used as fuel, in 35 % kerosene stoves are used and gas burners are in use in 33 %. Domestic smoke thus is a likely contributor to the respiratory distress of persons, and particularly so for housewives. 4.2 % of the persons registered have studied up to college, 15 % have passed school, 18 % have studied up to grade seven, 7 % are just literate and 29 % are not literate.

Monitoring of treatment efficacy : At every 6th visit of a person we interview her to find out whether she has found any relief with the treatment offered at the clinic and how much. Of course this is aside from the objective evaluation of the persons condition by the doctors but a persons own subjective assessment is as important. Persons report relief obtained, if any, as chawanni, atthanni or barah aana, fractions of a rupee in a currency no longer in use since the introduction

of the metric system some four decades back. These correspond to 25 %, 50 % and 75 % relief respectively.

Among the persons registered for allopathic care 38 % reported more than 25 % relief, 27 % reported 50 % relief and 12 % found 75 % or more relief from their many symptoms. 10 % of the respondents found no relief and 10 % reported relapse in symptoms.

In ayurvedic care 29 % persons reported more than 25 % relief, 31 % reported 50 % relief and 18 % found 75 % or more relief in their symptoms. 11 % reported no relief and 9 % said they had a relapse of symptoms. [Please see Table - 3, 4 & 5, on pages 109, 110, 111 for more information]

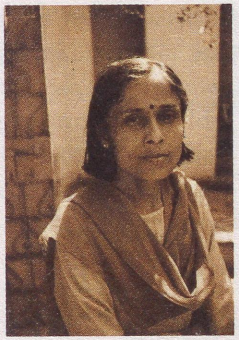
Survey of Persons who drop out : In February '98 we decided to investigate in to the reasons why people under our care drop out and do not make follow up visits. We found that 1091 persons from the severely affected communities have not come for regular treatment. With the participation of the community health workers we devised a questionnaire, field tested it and have launched a survey among 25 % (randomly selected) of the people dropping out.

We find that in Jaiprakash Nagar, of the 85 persons in the sample, 40 (47 %) discontinued treatment as they did not find any relief. However, 27 (68 %) of these 40 persons have made only two visits before dropping out and only nine have made up to six visits. It appears that people who have been sick for a long time and have been repeatedly frustrated in their efforts to get relief from different doctors, clinics and hospitals can no longer summon the required patience for treatment to take effect. This indeed is an issue of serious concern .

14 (17 %) respondents reported inability to find time from work as the reason for dropping out of treatment. These are persons who are forced by their economic situation to neglect, as long as they can, their health and just be fit enough to resume work [Please see Table - 6 , on page 112 for more information]. More worrisome is the fact that 41 (49 %) of the persons are not taking any treatment after dropping out of Sambhavna, 29 (35 %) are visiting private clinics and 13 (16 %) are receiving treatment at government hospitals and clinics.

ALLOPATHIC MEDICAL CARE

DR. RACHNA PANDEY: "I have done my post graduate residency in internal medicine at Gandhi Medical College, Bhopal. At the time of the disaster I was working as a resident medical officer in the internal medicine department. I have seen and treated the terrible effects of the gas disaster since the early morning hours of December 3, 1984, a few hours after the gas leak occurred. I have also worked with ICMR research projects concerning the respiratory effects of the exposure for six years. I have realized that the health problems of the survivors have become chronic and need re-evaluation for proper management."



Introduction

As mentioned elsewhere in this report, even today, vital issues of medical management of persons injured by the Union Carbide disaster remain to be adequately addressed, let alone resolved. The paucity of information on the toxicology of the leaked gases and the absence of standard treatment protocols has severely undermined appropriate health care. Without an official system of registration and monitoring, assessment of trearment efficacies have not been possible. There is much evidence pointing at indisciminate use of antibiotics, steroids and other potentially toxic drugs by doctors providing treatment to the survivors. Quite possibly, the iatrogenic injuries of modern medical care have compounded the injuries caused by Carbide's gases.

At Sambhavna, in providing medical care through modern medicine we do our best to follow the principle of 'First do no harm' by adhering to the principle of rational drug use. We believe that informed and judicious use of modern medicines can be of much help in the treatment of the survivors. We also believe that it is possible to combine treatment through modern medicine with traditional systems with established efficacy for enhancing quality of care.

My work at Sambhavna

From March 1, 1997 to March 31, 1998 I have offered care to 1098 survivors (793 females , 305 males) who have been registered during this period as well as previously registered persons who came on 5214 follow up visits. Most of the persons coming for care suffer from chronic problems. They get varying relief in their symptoms and frequent relapses mostly after physical exertion, exposure to the elements or stopping medicines.

Majority of the persons present a number of symptoms related to different systems of the body. Common symptom complexes observed at the clinic are different combinations of , breathlessness, joint

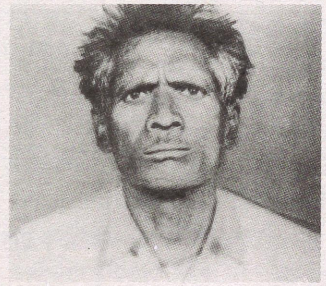
pains, retrosternal burning, tingling and numbness in the limbs, loss of appetite, anxiety attacks, giddiness, fatigue, bodyache and other problems.

Breathlessness is the most common symptom among persons coming for care They get breathless even on slight exertion and in many persons the condition is progressively deteriorating. Seasonal variation may or may not be present. Paroxymal Nocturnal Dyspnoea is not so common. Smoking, both active and passive, and exposure to fumes and smoke from cooking fuels cause marked aggravation in symptoms of breathlessness. Immediately after exposure, the toxic gases had caused generalized irritation of all mucous membranes including that of the lungs and airways. This caused intense breathlessness, cough and frothing from the mouth in the acute phase. Chronic lung disorders, a long term consequence, has been caused due to permanent injuries caused to the large and small airways diagnosed as chronic obstructive airway disease. At the clinic this condition is presented most by persons over age 40 years.

Breathlessness is often associated with cough with or without expectoration. During exacerbation of symptoms, bilateral crepitations and brhonchi are prominent and spirometry reveals obstructive pattern. Bronchiolitis obliterans ie. obstruction of the smallest size airways or bronchioles has also developed as a sequel to toxic gas exposure. These persons have complaints of breathlessness on exertion with clinically silent lungs without any localising signs. A small number of persons diagnosed with chronic obstructive airways disease at the clinic have been found to have developed the condition known as cor pulmonale ie. right sided heart failure secondary to pulmonary hypertension. It appears that a large number of persons are likely to develop such a condition as a long term sequel to gas exposure.

PYARELAL, (55), (Jaiprakash Nagar).

He came to Sambhavna in April 97 with complaint of breathlessness and swelling of feet. Pyarelal was a



carpenter but was unable carry on with his trade ever since the disaster. He smoked tobacco occassionally and had no other addictions. He had developed breathlessness since exposure to Carbide's gases that was progressively deteriorating and was found to be breathless even at rest. He had been receiving antibiotics, bronchodilators and steroids for the last 13 years with intermittent relapse and aggravation of symptoms. He also had developed paroxymal nocturnal dyspnoea for the last four years.

On examination he was found to have signs of right sided heart failure and mild systolic hypertension. Liver was just palpable and without tenderness. Bilateral basal crepitations were found in the lungs. There were no other positive finding. Blood and urine tests were normal. X-ray chest showed prominent hilar shadows. Echocardiography showed pulmonary hypertension with mild left ventricular hypertrophy. In view of the history of his symptoms and clinical profile he was

diagnosed with cor-pulmonale ie. right sided heart failure secondary to lung disease.

His treatment at the clinic comprised of bronchodilators, diuretics and tapered doses of steroid given intermittently. Pyarelal died in September 1997.

Toxic exposure has also caused hypersensitization of the immune system leading to reactive airways dysfunction syndrome (RADS). Persons with this condition present recurrent breathlessness like asthma along with cough and expectoration. Seasonal variation in symptoms is observed with aggravation during rain and winter. These persons get substantial relief with bronchodilators.

V K PATHAK,(42) , (Chhola Mandir)

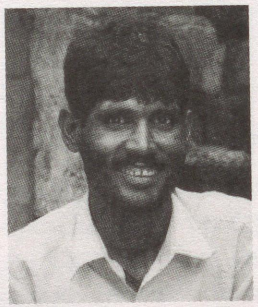
He came to Sambhavna in March '97 with complaints of breathlessness. He mentioned aggravation of symptoms with change of season and associated with cough and slight mucoid expectoration. On examination he was found to have bilateral rhonchi. His problem stays under control with regular use of salbutamol (oral or inhaled), etofylline and theophylline.



The treatment of persons with lung disorders prior to visiting Sambhavna appear to have been consisting of much indiscriminate use of antibiotics and steroids. Due to the use of steroids in large doses for several years, persons do not easily respond to other medicines and are prone to frequent respiratory and other infections due to steroid induced immune suppression. At Sambhavna we treat survivors with bronchodilators (both oral and inhaled) and steroids (where neccesary) in combination with ayurvedic medicines and or yoga. Attention is paid to problems such as hyperacidity, tremors and tachycardia arising out of bronchodilator use. There has been an encouraging response to treatment with bronchodilators simaltaneous with yogic breathing exercises.

MEHBOOB, (26), (Arif Nagar)

He developed bronchial asthma after exposure to Carbide's gases. Two years back he was diagnosed with pulmonary tuberculosis for which he took adequate treatment. He visited Sambhavna in January '98 with complaints of breathlessness. He was advised to take salbutamol inhalers and do regular pranayama exercises. Inspite of pulmonary damage caused by tuberculosis and recurrent bronchospasm, Mehboob is able to carry on with his work comfortably in a taxi service as he sticks to regular breathing exercises.



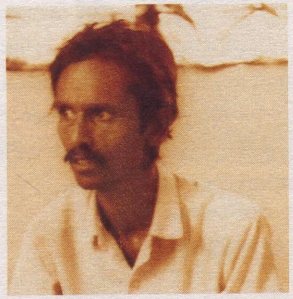
Combinations of allopathic and ayurvedic medication have also been successfully tried at the clinic.



RAMPYARI BAI, (47),(Jaiprakash Nagar)

She developed asthma like symptoms since gas exposure. She also presented complaints of joint pains. On examination her lungs presented signs of bilateral bronchospasm. She was found to be anaemic. She reported marginal relief in breathlessness with 10 days of treatment with oral bronchodilators. She was then put on combined therapy with ayurvedic medicines and haematinics which provided her with substantial relief.

The incidence of tuberculosis has risen in gas affected communities following the disaster. This could be ascribed to the damage caused to the immune system, both by the toxic gases and due to excessive use of steroids for various exposure related symptoms. According to a study conducted by the ICMR, the incidence of pulmonary tuberculosis in the gas affected population is three times more than the national average. In the period under consideration we have had 60 persons (32 female, 28 male) diagnosed with tuberculosis. Damage to the lungs caused by gas exposure has been compounded by tuberculosis and vice versa.



SAYEED, (35), (Housing Board Colony, Karond)

He visited Sambhavna in January '97 with complaints of breathlessness on exertion. He stated that his condition has been deteriorating. He was initially taking ayurvedic treatment but later advised to take allopathic treatment in combination. On exanination he presented signs of collapse of left lung. He had contracted lung tuberculosis a year back that was found to have been adequately treated. Quite possibly his pre existing lung disease has been aggravated by pulmonary tuberculosis. He has responded well to salbutamol, etofylline and theophylline and analgesics and ayurvedic medicines.

Persons diagnosed with tuberculosis are referred to the government's District Tuberculosis Centre (DTC) where they are supposed to receive free treatment under a national programme. Health workers of the clinic make follow up visits to such persons in the community and ensure that they receive anti-tubercular medicines from the DTC and take them regularly. Care is taken so that persons taking Rifampicin, for tuberculosis are not prescribed theophyllin for breathlessness lest their is aggravation caused by drug interaction.

The gastro-intestinal system has also been affected by the toxic gases. Irritation of the mucus membranes of the gastro-intestinal tract caused vomiting and loose motion in the affected people immediately after exposure. Today, more than 14 years after exposure a large number of gas victims are still suffering from complaints of retrosternal burning, constipation and abdominal distention. Analgesics, bronchodilators and steroids taken over the years have also contributed to retrosternal burning. Antacids and H2 receptor antagonists (Ranitidine) have been found to provide only marginal relief in these symptoms. Many persons have been taking antacids regularly ever since their

exposure without any benefit. Ayurvedic medicines along with dietary precautions have been found to be more useful in the treatment of such patients.

The effect of the toxic gases on the eyes have been very severe. In the acute phase, I have seen people in thousands with swollen eyes and having intense photophobia and lacrimation. Chlormycetin ointment and sulphacetamide eye drops have been liberally used without any benefit. Burning and watering of eyes are still very common symptoms. Corneal opacities, premature cataract and refractive errors in young gas victims are fairly common problems. At Sambhavna we have provided spectacles to persons with refractive errors who were unable to afford them.

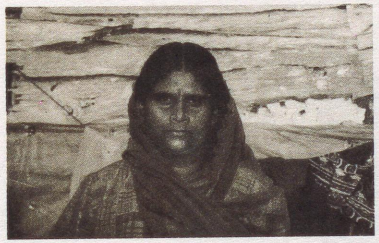
Musculoskeletal symptoms in the form of aches and pains in various parts of the body, myalgias and arthralgias are common among the persons coming for care at Sambhavna.Neurological symptoms such as tingling and numbness in the limbs with no localising neurological sign are also very common among the survivors. The use of analgesics, vitamins and low dose steroids in the teratment of these symptoms has not been effective. We have not been able to ascertain the cause behind these symptoms due to lack of facilities for neurological investigation . Quite possibly the toxic gases have caused disruption in the neuromuscular junction.

The endocrine system has also been disturbed by Carbide's toxic gases. Women who delivered in the aftermath of gas disaster had lactational failure. Menstrual abnormalities have also developed in a large number of women in the form of irregular cycles (shortened or prolonged) and scanty or excessive flow. I have seen twelve women who were exposed to the toxic gases in their twenties and stopped menstruating ever since. Quite possibly this secondary amennorrhoea is a result of endocrine disruption. We have not been able to look deeper in to this problem due to lack of investigation facilities. Thyroid dysfunction is also being seen in this population.

JYOTI, (15), (Chhola)

She came to Sambhavna with complaints of anxiety attacks, restlessness and weakness for the last four years. She had a small goitre, widening of palpebral fissure and fine tremors. Her thyroid function tests showed abnormally high values. She has been put on carbimazole an antithyroid drug and is showing relief in all of her symptoms.

Gynaecological problems are very common among gas affected women. Incidence of excessive vaginal secretions is very high though we need a case control study to compare it with an unexposed population. Since December '97 we have started testing Pap smears in women complaining of excessive vaginal secretions. An unusually large proportion of vaginal smears are inflamatory and there is likelihood of developement of malignancy in these cases. Cervical erosions are also seen in a large number of women. Some of these cases have responded well to combined (ayurvedic & allopathic) treatment.



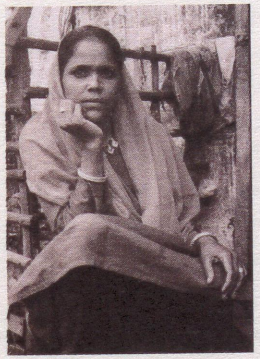
FEHMIDA, (45), (Arif Nagar)

She visited Sambhavna with complaints of excessive vaginal secretions ever since her exposure to Carbide's gases. She had a long history of taking various treatments but without sustained relief. Her cervical smear examination showed presence of inflamatory cells. She was given a course of ayurvedic medicines along with antibiotics (Doxycycline). She has been free from her problems for the last six months.

However, there are a number of instances in which women are getting only marginal relief with treatment and their problem is persistent in spite of allopathic and ayurvedic treatment.

SHAHEEN, (25), (New Arif Nagar)

Shaheen first came to Sambhavna with complaints of excessive vaginal secretions for the last 10 years. On clinical examination she was found to have cervical erosion. Her PAP's examination showed inflamatory smear. Inspite of combind allopathic (metronidazole, doxycycline)and ayurvedic treatment she has frequent relapse of her symptom.



Giddiness is a common symptom among persons reporting at the clinic. Persons report episodes of black out and 'spinning in the head', spinning sensation when getting up and loss of balance. In addition to possible neurotoxic injury anaemia, cervical spondylitis, acute labrythritis, hypertension, anxiety and depression are possible causes for such conditions. Loss of appetite is another symptom found to be prevalent among the survivors by ICMR epidemiologists. This too may be related to anaemia, anxiety, depression, chronic illnesses such as TB apart from endocrinal injury caused by Carbide's gases.

As with any major disaster, the disaster in Bhopal has been followed by mental problems in the community of survivors. Recurrent anxiety attacks, nightmares, insomnia, feeling of suffocation, breaking in to a sweat, palpitations and depression are commonly presented complaints at the clinic. Bereavement, loss of income due to death of the earning member in the family, inability to earn a livlihood, chronic illness of the person or other members of the family are some of the factors contributing to the mental illness of the survivors.

VIMLA, (45), (PGBT College Road)

She came to Sambhavna in May '97 with complaints of breatlessness, anxiety attacks and difficulty in sleeping. On examination she was found to be anemic. There were no other positive findings. She was found to have taken sedatives for a long time without any relief in her symptoms. She was given ayurvedic treatment with yogic relaxation techniques and a short course of



anxiolytics drugs and haemetinics. Her condition has improved a lot and she no longer requires sedatives.

Persons with mental illnesses are treated with tranquillizers and antidepressants as well as motivated to do yoga. Oftentimes, treatment through yoga alone is effective.

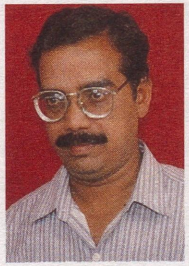
ANEESA BI, (45), (Housing Board Colony, Karond)

She came to Sambhavna with complaints of pain in the neck, anxiety attacks and difficulty in sleeping. She reported discomfort with allopathic drugs and was advised to do yoga exercises. With regular exercises she is able to sleep without being sedated.

Lack of facilities for investigation is a big handicap in my work at Sambhavna. Most people cannot afford the high costs of these investigations at private clinics and have to be referred to government hospitals for x-ray, ultrasonography, electro cardiography, electro encaphelography , thyroid function and other examinations. Very often these facilities are not available at the government hospitals and I have to rely solely on my clinical judgement.

AYURVEDIC MEDICAL CARE

DR. M.S. DESHPANDE:



"I received my degree in ayurveda from Ujjain, MP in 1982 and then did a one year training in yoga care at Lonavala, Maharashtra. Earlier this year I took training in panchakarma therapy.

Right after the disaster I had worked voluntarily at one of the government hospitals offering care to the affected people. I had seen the immediate problems of the affected people. Thereafter in my private clinic I have occasionally treated gas affected people as well as in yoga, ayurveda and nature cure camps in which I volunteered. Still I was not prepared for the severity and magnitude of the problems that are presented at the Sambhavna clinic.

After being appointed in Sambhavna as an auyurveda doctor I met with a few ayurveda physicians who were involved with the treatment of gas affected people. The information and knowledge available through them was not as helpful as I had hoped it would be. Then with the help of the trustees of Sambhavna and a few doctor friends, I have made progress in finding methods of diagnosis, treatment and documentation that are showing signs of success. The ayurvedic community is beginning to recognize the work being done here.

In addition to the medical aspects, I have learned a lot about the economic, social, political, and legal aspects of the gas tragedy. Sambhavna has achieved a lot in a very short time. This has been possible because of the teamwork here. It gives me satisfaction to use my knowledge and experience to alleviate the problems of the gas affected people. I feel it is imperative that ayurveda physicians find ways to treat toxin induced diseases. My work is to face this challenge with knowledge, creativity, devotion and enjoyment. I have received much support and encouragement from the staff and trustees in this endeavour."

Introduction

Ayurveda, as a system of medicine that is based on improving the body's ability to cure itself from diseases, has much potential in the treatment of diseases caused by industrial toxins. At Sambhavna we are exploring possibilities of treating people exposed to Union Carbide's poisons through ayurvedic medicines and procedures. It is our attempt to scientifically establish the efficacy of this system of medicine.

Every system of medicine has its limitations. It will be in the best interest of the patients if practitioners of different systems accept the limitations of their system and try to integrate different systems of medicine to provide healing.

In the last 14 years gas affected people have been seeking relief for their medical problems through modern medicines unsuccessfully. They have only got temporary symptomatic relief. At Sambhavna Trust, it is our aim to provide long

term sustained relief to people. It is with this objective that ayurvedic treatment is offered at the clinic since September 1996. We hope that through treatment of the underlying imbalances with herbal medicines and ayurvedic therapeutic procedures this will be possible. Between March 1, '97 and March 31, '98, 1508 persons (1047 women and 461 men) have registered themselves for ayurvedic treatment here. 6153 follow up visits were made by persons receiving care at the clinic during this period.

My work at Sambhavna:

People coming for care at the clinic can choose between ayurvedic and allopathic care. Those who chose ayurveda are examined through ashtavidha and dashavidha systems mentioned in the ayurveda texts. Where required, modern investigations, such as total blood leucocyte count and differential leucocyte counts, thyroid function tests, fasting blood sugar, haemoglobin, erythrocyte sedimentation rate are used. However diagnosis is reached through ayurvedic principles.

The presenting complaints, their duration, periodicity and course of the illness and treatments are recorded along with the findings with regards to the person's *prakriti, agni, pachan shakti, koshtha, bala, vyayam shakti, sattva, mala and jivha*. These are assessed through the interview and confirmed by *nadi parikshan* - pulse examination. *Sansthanik* or systemic examination is carried out to identify the *strotas* that has been affected. The imbalance in the *doshas, dushyas, and strotas* are deduced from these findings and appropriate treatment plans are made.

Treatment: In the treatment of the survivors herbal powders are mostly used. These and other medicines - *vati, rasaushadhi, kashaya* and other medicines used in the clinic are strictly according to Bhaishaj Ratnavali, Rasendra Sar Sangraha, Charaka Samhita, and other standard ayurveda texts. Herbal powders and medicated massage oils are made in the clinic. This ensures good quality medicines at half to one-third the market price. All treatments are free to the people. We have also started the cleansing procedures of *snehan* and *swedan* of Panchkarma therapy.

Observations with respect to Nidana : In the initial days at the clinic the diagnosis and treatment used to be based on symptoms as is the common practice among ayurveda physicians today. However, this does not provide any information on the balance of *doshas* and the relationship between *dosha, dushya, and strotas*. With time as we observed patterns of symptoms presented by gas affected people we began to see the relationship among symptoms involving different organs. It was evident that symptomatic diagnosis or treatment is not appropriate for the situation brought about by toxic gas exposure. Accordingly, we arrive at *Nidana* through *ashtavidha* and *dashavidha* examination.

Observations regarding symptoms : The persistence of symptoms in the exposed population is an important observation. .

Symptoms presented by persons coming for care at the clinic can be grouped as follows. Gas exposed persons commonly present at least one symptom from each group.:

1. Breathlessness, pain in the chest, dry or productive cough,
2. Malaise, excessive sweating, burning sensation in the body *(Daha)*, bodyache, headache, sensation of ants crawling on the body, dryness of mouth, excessive thirst,
3. Loss of appetite, constipation, burning sensation in abdomen and chest, distension of stomach after meals, bitter taste in the mouth. abdominal pain,
4. Back ache, joint pains, swelling in the joints, numbness, tension in the muscles, tingling
5. Giddiness, anxiety, irritability, insomnia, excessive sleep, fatigue, loss of capacity to work, black outs
6. Forgetfulness
7. Lachrymation, burning sensation in the eyes, diminished visual acuity,
8. Irregular menstrual cycles, excessive vaginal secretions.

THE COMMON SYMPTOM COMPLEXES PRESENTED BY SURVIVORS VISITING THE CLINIC ARE :

1. Breathlessness + cough + constipation + bodyache + loss of appetite
2. Backache + constipation + loss of appetite + joint pains
3. Giddiness + panic attacks + fever + burning sensation in the body + burning sensation in the abdomen + fatigue + loss of appetite
4. Loss of appetite + bitter taste in the mouth + persistent fever + body ache

The age and sex distribution of nidana findings with respect to *shwasa*, *kasa*, *pratishaya*, *agnimandya*, *vibandha*, *amlapitta*, *sandhivata*, *bhrama*, *ghabrahat*, *pradara* and *raktavikara* in the population visiting the clinic are given in Table 7 on pages _____. The data shows that :

1. 25.3 % of the persons coming for care were diagnosed with *shwasa*. It is a matter of great concern to find 21 % of persons in the age group 10 to 19 years with this diagnosis.
2. More men (23 %) were diagnosed with *kasa* than women (15.4 %)
3. *Pratishaya* was found most (13 %) among persons in the age group 10 to 19.
4. An unusually large proportion of the survivors visiting the clinic were diagnosed with *agnimandya* (31 %) and *vibandha* (34 %) which are related to the vitiation of *annavaha strotas*. *Agnimandya* is slightly more common in women (31.5 %) than men (29.5 %).
5. 16.2 % of persons in the age group 20 to 49 were diagnosed with *amlapitta*.
6. *Sandhivata* is much more seen in women (32 %) compared to men (13.8 %) in all age groups.

7. *Bhrama* and *ghabrahat* was found more in women (21.2 % and 20.1 % respectively) compared to men (9.3 % and 8.6 % respectively)

8. *Pradara* was most found in women in the age group 20 to 29 (20.2 %) and in 30 to 39 (18 %)

Malaise, loss of appetite, giddiness, panic attacks, back ache and joint pains are more common among females as compared to males and these symptoms are most presented by those of age between 25 and 40 years.

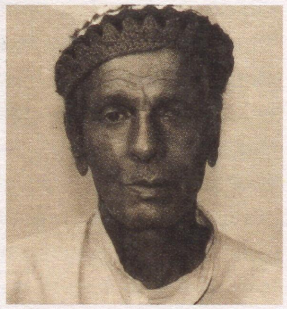
Spicy and oily food and particularly meat eating seem to aggravate symptoms of burning sensation in the body, malaise and loss of appetite.

Symptoms of fever, burning sensation in the body, body aches, headache which are related to imbalance of the *pitta* humour are seen to be aggravated in summer between April and June. Much relief in these symptoms has been reported with the use of *pitta shamak* medicines such as *chandanadi bati.*

Symptoms of breathlessness, cough and chest pain are found to be aggravated between July and November.

Burning in the abdomen, abdominal pain are found to be comparatively less severe between November and January and aggravated between July and October.

While most of the symptoms present in the immediate aftermath of the disaster continue to ail the victims, several symptoms have emerged in the subsequent years. Symptoms of fever, burning sensation in the body, loss of appetite, numbness and tingling in the limbs, backache, giddiness, panic attacks seem to have manifested 3 to 4 years after the disaster and are getting worse. For example, 38 year old Sajida Bano had experienced severe cough, burning sensation in the eyes and vomiting at the time of the disaster. She actually was not very ill until seven years ago when she started experiencing breathlessness, heavy sweating, dry mouth, excessive thirst, burning sensation in stomach, fatigue, headache, and a sensation of ants crawling over her body, vomiting, and an urge to be in a dark place. Another example is 50 year old Abdul Latif who has tremor, fatigue, giddiness, heavy sweating, a sensation of ants crawling on the body, loss of appetite, and an urge to be in a dark place for the last six years . In the immediate aftermath of the disaster his complaints were cough, burning sensation in the eyes, nausea and anxiety.



ABDUL LATIF (50), Arif Nagar

Observations regarding examination: *Nadi parikshan* shows many people to have aggravated pitta and vata and a decreased metabolic fire *(mandagni).* A large number of people have *krura koshtha, heena bala, avar sattwa, sama jivha* and *sama mala.* Systemic examination *(sansthanik pariksha)* shows *medo vridhi, shoth, raktalpta* and abdominal tenderness.

Observations regarding diagnosis: A preponderance of aggravated *pitta/vata* or *vata/pitta*

has been noted. The *rasa dhatu* is found to be vitiated in most cases. To some extent *rakta* and *shukra dhatus* and artav *upa-dhatu* are also found to be impaired. Among the *strotas* the following four namely *prana vaha, annavaha, pureeshvaha* and *rasavaha* are found to be vitiated among the gas affected people visiting the clinic. In addition to these *strotas* which have been most affected, *raktavaha strotas, shukrvaha strotas, artava vaha* and *manovaha strotas* have also been found to be impaired.

Observations regarding treatment: Since the *doshaj* basis of the symptoms presented is clear, treatment is most often *dosha pratyanik*, directed to correcting imbalances in *doshas*. Correction of the imbalance of the *doshas* takes care of the vitiation of the *dhatus* and *strotas*. The success of this treatment is more encouraging than treatments based on symptoms alone. For example, *Doshaj* based treatment is found to be very effective in cases of persistent fever, burning sensation in the body *(daha)*, bodyache, abdominal pain, loss of appetite, headache, joint pains, dizziness, anxiety, constipation and burning in the stomach. In certain cases, *vyadhi pratyanik*, treatment directed towards amelioration of specific diseases, is beneficial. For example, 35 year old Mumtaz with persistent upper respiratory infection and fever with eosinophilia, was relieved of all her symptoms and a return to normal of her eosinophil count within one month of *vyadhi pratyanik* treatment. For symptoms such as backache, breathlessness, vaginal discharge, cough, joint pain, both forms of treatment bring about relief.

Problems in ayurvedic treatment: One of the worrisome aspects of treatment is the relapse of symptoms. Patients report substantial relief in symptoms while they are taking the medicines, but the symptoms recur when the medicines are stopped. This is particularly seen in cases of breathlessness, cough, joint pain, dizziness, malaise, anxiety. However, the intensity of symptoms that return is much less than prior to treatment. Mohammed Mansoor, age 35, found 75% relief in symptoms caused by *aam dosh* and *amlapitta* with two months of treatment. On stopping the medicines his symptoms recurred but with only one-fourth the initial severity. Among the people who come for treatment regularly, 12 have come more than 50 times. They are on chronic medication.

In September 1997 a national seminar on ayurvedic possibilities for the treatment of Carbide Gas induced diseases was organized by us. The problem of relapsing symptoms was placed before the ayurveda specialists present. There was a consensus that *panchkarma* along with medication carries the potential for providing sustained relief. Following their suggestion I have taken training in *panchkarma* treatment. We have now begun to offer this at the clinic.

In cases of vitiligo and diabetes, ayurvedic treatments tried so far have not provided much relief. Most cardiovascular diseases are treated with modern medicine. However, if they have concurrent symptoms of constipation, loss of appetite that are being treated through ayurveda, care is taken to not give preparations containing salt.

GLOSSARY

agni - Metabolism

agnimandya - Lack of appetite due to lowered agni

amlapitta - Disease condition in which vitiated pitta humor becomes acidic due to spicy food.

annavaha - Channels and organs carrying food inside the body

artava - Ovum and menstrual blood

artava vaha strotas - channels carrying ovum and menstrual blood.

ashtavidha - Eight kinds of examination to know about the general condition of the diseased person and nature of the disease.

avar sattwa - Disturbed mental state

bala - Physical strength

bhrama - Giddiness

dashavidha - The ten examinations suggested by Charaka to ascertain a person's strength and stamina.

dhatu - One of the three principal elements of the body (other two being *dosha* and *mala*) that has to do with nutrition and nurturing of the body. There are seven *dhatus* in the body corresponding to blood, plasma, muscle, fat, bones etc.

dosha - Principal element in the body that is in three forms (humors) - *vata, pitta* and *kapha*. In a healthy body these humors are in equillibrium, in the diseased condition *doshas* vitiate the *dhatus*.

dosha pratyanik - Treatment procedure aimed at restoring equilibrium of *dosahas*.

dushya - *Dhatus* that are vitiated by the *doshas*

ghabrahat - Anxiety attacks.

heena bala - Lack of physical strength

jivha - Tongue

kasa - Cough

kashaya - Decoction produced from herbs.

koshtha - Bowel habits

krur koshtha - Constipated

mala - Waste in the process of digestion that include faeces, urine and sweat.

manovaha strotas - Channels and organs related to the mind.

medo vridhi - Excess fat in the body

nadi parikshan - One of the eight examinations in which the vitiation of humors are found out through examination of the pulse.

nidana - Determination of the disease process and the disease.

pachan shakti - Power to digest food

pitta - The humor mainly responsible for digestion

pitta shamak - That which brings down the effect of pitta imbalance

pradara - Disease with excessive vaginal secretion

prakriti - A characteristic of the individual

describing her physical and mental constitution.

prana vaha strotas - The channels and organs for carrying prana and related to the heart and lungs.

pratishaya - Fever and runny nose

pureeshvaha strotas - Channels carrying faecal matter out of the body including the large intestine.

rakta - Blood

raktalpta - Lack of blood

raktavaha strotas - Organ and channels for the circulation of blood including spleen, liver, arteries and veins.

raktavikara - Diseases caused due to vitiation of blood

rasa - Nutritive elements resulting from digestion of food

rasaushadhi - Combinations of herbs and minerals.

rasavaha strotas - The channels carrying rasa in the body.

sama jivha - Coated tongue indicating mucous in stool.

sama mala - Mucous in stool

sandhivata - Disease condition in which joints are painful due to vitiated vata humor.

sattva - Mental state

shoth - Swelling

shukra - Sperm and seminal fluid, one of the seven *dhatus*.

shukrvaha strotas - Channels carrying sperm and seminal fluid

shwasa - Disease characterized by difficulty in breathing

snehan - Oleation of the body with different oils and fats

strotas - Systems in the body that carry blood, nutrients, seminal fluid, ova, menstrual blood etc.

swedan - Causing the body to sweat through different techniques

upa- dhatu - These are *dhatus* whose only function is nurturing the body

vata - One of the three *doshas* responsible for movements within the body

vati - Tablet

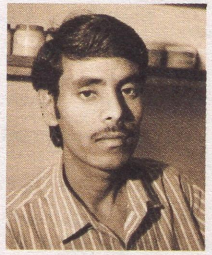
vibandha - Constipation

vyadhi pratyanik - Treatment with respect to particular disease condition.

vyayam shakti - Capacity to do physical work

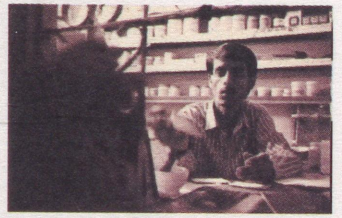
DISPENSATION OF MEDICINES

KAMAL YADAV: "I have studied until the tenth standard in school. I have had eight years of work experience prior to joining Sambhavna. I had spent five years working with an allopathic physician and three years working with Dr. Deshpande in his private clinic. I have also taken training in nature cure. I have been with Sambhavna since September 1996. My job is to dispense medicines that are prescribed by the doctors in the clinic. During the course of my work I have learned about medicines and their uses. It feels good that we give medicines to the people free of cost. Work at the clinic has allowed me to serve a poor and needy population. I enjoy the cooperative spirit among all those that work here."



My job as a medicine dispenser is to ensure that persons who have been advised to take medicines get the right medicines and understand how, when, how much and how long to take them. For medicines to work, one has to follow the prescribed regimen or else they may do more harm then good. I explain these things and also write down the instructions on the envelope in case people forget. I also write the name of the medicine in Hindi so that persons know the medicine they are taking. It is also my job to ensure that all allopathic and ayurvedic medicines are in stock so that people are not told to purchase them from the market as it happens so often in government hospitals.

At Sambhavna we take great care to ensure that drugs dispensed are rational that is they are mentioned in standard text books of medicine and pharmacology. We purchase most of our allopathic medicines from LOCOST which is a non-profit organization in Baroda that produces essential generic drugs at 200 - 4000 percent lower cost. Medicines that are not available from LOCOST are purchased locally. We avoid buying medicines produced by multinational companies and except for one, all the 75 medicines we stock at the clinic are manufactured by Indian companies.

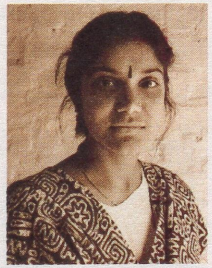


We try to avoid purchasing factory produced ayurvedic medicines which are often of low quality and not according to the texts. 22 herbal medicines are produced in the clinic itself with locally gathered or purchased ingredients. Rest of the medicines are purchased from small manufacturers that produce quality medicines at low profit. In all we stock 65 ayurvedic formulations.

With inspiration and help from Dr Jayshri Chander I am learning more about the different medicines we stock at the clinic. I try to share this knowledge and particularly on the adverse effects of long term medication with the persons visiting the clinic.

YOGA THERAPY

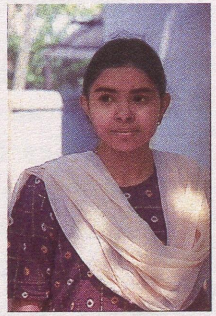
AMITA GUPTA: "I have a M.Sc. in biochemistry, a diploma in medical laboratory technology, and a diploma in yoga and nature cure. I was very happy to be selected here because Sambhavna clinic is the only place where yoga is used for treatment of chronic toxic exposure induced diseases. Initially, people would not come regularly for yoga therapy but gradually as word spread that people were getting relief through yoga, more and more people have shown interest. The use of yoga in ayurvedic treatment is well known. At Sambhavna yoga is also used in conjunction with modern medical treatment. The aim is to provide sustained relief.



I also look after the laboratory. I perform haemoglobin tests, urine analysis, ESR, sputum smears for AFB, complete blood counts, and other tests. We are hoping to expand our laboratory services gradually. I am also responsible for taking care of the plants and trees on the grounds of the clinic.

Equality and cooperation is what distinguishes Sambhavna from other places. I am very happy to work here as my education and skills are fully utilised in my work. I am always learning new techniques and gathering new knowledge."

SUSHMITA DURGVANSHI: "I have a bachelors degree in science and also have a diploma in yoga and nature cure. I am also doing post graduate studies in zoology. At the clinic I work as a yoga assistant.



When I joined the diploma course in yoga I had little knowledge that yoga can be of medical importance. After working in the clinic, I have come to realize that as a drug free therapy for exposure related diseases yoga can be very useful. Though there are other places in the city where yoga therapy is practised, the clinic is the only place where the special problems of gas affected persons are treated with yoga. Also in other places, medical records are not kept and there is no system of monitoring the benefits of treatments used. I have learned many aspects of the use of yoga for treatment in the community yoga camps held by Sambhavna and from the ongoing research here. I have also learned about yoga and its effects on the body from the literature available at the documentation centre here.

In addition to yoga, I also work on entering medical data into the computer. Through this, too, I learn a lot about the medical condition of the survivors. Every day I learn something new at the clinic. I am most impressed by the sense of equality among all those who work at Sambhavna. We share all the big and small tasks of running the clinic. This I like very much."

Introduction

As an alternative therapy to drug based treatments, Yoga is offered to survivors visiting Sambhavna. Survivors with chronic condition have been on regular medication over the last several years and have become dependent on medicines that often cause them harm. Combinations of specific yogic asanas (postures), shodhan kriya (cleansing actions), pranayama (breathing exercises) and dhyana (meditation) are known to provide sustained relief in many of the symptoms presented by the survivors such as : breathlessness, chronic cold, back ache, joint pains, constipation, anxiety and insomnia. Yoga has the potential of reducing the use of medicines for such conditions if not replace them completely. At Sambhavna we promote yoga as a drug free therapy for chronic physical and mental problems.

Our work at Sambhavna

Between March 1, 1997 and March 31, 1998, 136 survivors have been provided with medical care through yoga as per advise of doctors at Sambhavna. Repeated suggestions have been made to government officials in the last several years for providing facilities to learn yoga at the government hospitals and clinics. However, such suggestions have been overruled with the argument that yoga would be rejected as a 'Hindu imposition' by the Muslim survivors who constitute about half the affected population. The speciousness of this argument is evident from our records. 72 % of the persons under yoga care at Sambhavna are Muslims 53.6 % of whom are females. We at Sambhavna are aware of the spiritual potentials of yoga and believe that it is not bound by religion.

Persons have been referred to yoga care mainly for problems of breathlessness, joint pains, back ache, headache, anxiety, diabetes, hyper and hypo tension etc. Persons referred by doctors at the clinic are instructed in different yogic exercises specific to the symptoms presented for 8 to 15 days. For the initial two days persons are instructed in sukshma vyayam (exercise of all joints) of Pavanamuktasana series - I, so that they attain the required flexibility to practice the asanas advised to them.



Pranayama

As yoga instructors we carry out demonstrations of individual asanas and pranayama to persons under yoga care at the clinic. We teach simple breathing exercises to most persons to bring about breathing awareness. Instructions are given in pranayamas such as nadi shodhana, bhastrika, bhramari, chandra bhedi and surya bhedi. In shodhana kriyas we mostly teach kunjala and neti and advise persons to continue with them at home. Persons follow

instructions according to their specific problems and physical abilities. In addition to giving instructions and demonstrations at the clinic we also make occasional visits to the community to talk to people under yoga care and provide them fresh instructions if necessary.

Persons with breathlessness are advised to do shavasana, shashankasana, marjari asana, simhasana, ushtrasana, bhujangasana, dhanurasana, sarvangasana and matsyasana. Along with these asanas they are also given instructions in bhastrika and nadi shodhana pranayama and such shodhan kriya as kunjal or neti.



Jala neti

Persons with low back ache are instructed in shavasana, marjariasana, ushtrasana, bhujangasana, shalabhasana, suptavajrasana, makarasana, halasana as well as in nadi shodhana pranayama.

For problems related to the gastro-intestinal system, persons are advised to do exercises mentioned in pavanamuktasana series - II (vajrasana, marjari asana, paschimottasana, bhujangasana, naukasana, tadasana and katichakrasana) along with bhastrika pranayama and kunjala kriya.

For people with hyper tension, anxiety and insomnia instructions are given in shavasana, makarasana, baddha padmasana, trikonasana and shashankasana. Hypertensive persons are instructed in chandrabhedi pranayama and hypotensive persons in suryabhedi pranayama.

Persons with joint pains or pain in the limbs are offered instructions in shavasana and in pavanamuktasana series - I, sthulavyayama such as rekha gati and in nadi shodhana pranayama.

Ardhamatsyendrasana, paschimottasana, gomukhasana, pavanamuktasana series -II and kunjala kriya, bhrastika pranayama are effective in the treatment of diabetes.

Persons with spondylitis are instructed in suptabajrasana, bhujangaasana, ushtrasana, marjari asana and makarasana.

Information on persons under Yoga care and their symptoms is presented in Table 8 & 9 on pages 115, 116 & 117.

Evaluation of Yoga as therapy : Between Dec '97 to Jan '98 we carried out a survey to find out how many persons, who have received yoga instructions, are continuing with yoga practice at home and what has been the effect of yoga therapy on their health condition. We randomly selected 60 persons (20 % of the number of people who had been given yoga instructions till that time) and our community health workers interviewed these persons based on a field tested checklist questionnaire. The sample population was composed of 36 females and 24 males with a maximum of 17 persons in the age group 40 to 49 and a minimum of 5 in the age group 60 to 69. Analysis of the data generated, with the aid of Epi Info 6, produced the following conclusions (details in Tables 10 to 12 on page 118):

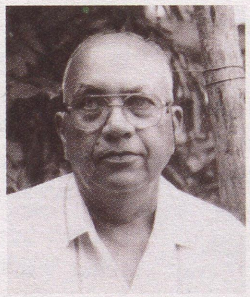
1) Women and persons in the age groups 11 to 20 and 41 to 50 form the largest sex and age groups under yoga care. The common problems for which doctors

have advised yoga are; breathlessness, low back ache, joint pains, anxiety and hypertension

2) Persons with breathlessness have found the most relief with yoga. Relief has also been reported by a large majority of the persons with symptoms of joint pains, body ache, low back ache, headache, loss of appetite and anxiety. Those who have reported sustained relief from any of their symptoms are not under any medication.

3) 15 persons among the 60 have reported complete relief in their symptoms of breathlessness, constipation, diabetes, hypertension, body ache, joint pains and insomnia.

One of the 15 persons is Mr Narendra Kumar Gupta



(62) from Green Park who visited the clinic in Sep '97 and was diagnosed with diabetes, hypertension and pain in the legs. He was first treated with ayurvedic massage and then advised yoga. In the beginning he had difficulty with the yoga postures in pavanamuktasana series I but he persevered and was very regular and punctual for his instructions. After 15 days of practice at the clinic he continues with his exercises and has been free from any symptoms since. His blood sugar and blood pressure readings are also within normal limits. He has not been taking any medicines since he started on yoga therapy. Inspired by his father Rajeev Gupta came for yoga therapy in Sep '97 for symptoms of breathlessness

4. Only 20 % of the people who have taken yoga instructions continue with regular (more than 20 days in a month) practice at home after their visit to Sambhavna. 25 % of the people do yoga for 10 to 20 days and 32 % for 5 to 10 days in a month and 23 % do not practice at home at all. Of those who continued with yoga practice at home 55 % did yogasana and pranayama and 20 % did just the yogasanas.

5. Lack of time was indicated to be the main reason for discontinuing yoga practice at home by 51 % of the respondents and one person (1.7 %) cited absence of any relief through yoga as the main reason for dropping out. 53 % of those who dropped out of yoga expressed an willingness to resume yoga practice.

YOGA CAMP

As an experiment in popularising yoga among the survivors we held an eight day long 'yoga camp' in Arif Nagar a neighbourhood community. Two local yoga institutes also participated in this effort and it was the first of its kind in a gas affected community. We focused on respiratory problems and recorded vital signs such as blood pressure, pulse rate, respiratory rate, as well as breath holding time and spirometry readings of persons in the community who wanted to join the camp. Though 24 male and 31 female survivors joined in, only 11 continued with regular practice at the camp. Every morning, hour long classes in yogasanas and pranayama were held separately for men and women. After 8 days of practice readings were again taken for individuals. Analysis of the data shows improved lung capacity among all the participants of the camp. Though the

duration of practice was small we found the difference in breath holding time and spirometry readings, prior to and after practice at the camp, to be statistically significant. Along with relief in respiratory symptoms, persons also reported relief in hypertension and anxiety. The results of this monitoring were conveyed at a public meeting held in the community at the end of the camp.

Both the follow up survey and the camp reconfirmed our belief in the potential benefits of yoga as a therapy for persons exposed to Carbide's gases. It also made us aware how difficult it is to popularise yoga among people who have had no previous exposure to yoga and given the exigencies of their lives are too hard pressed to find time and space for regular yoga practice. Women find it even more difficult to practice yoga at home due to pressures and restrictions of family. We are now discussing ways in which yoga practice can be moulded so that it is more accessible and convenient for survivors.

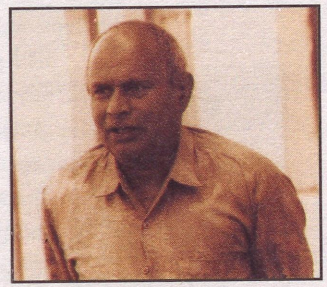
YOGA RESEARCH

We are carrying out a study titled - Effect of yoga therapy on chronic respiratory disorders caused by exposure to Carbide's gases, since Jan '97. In all 25 survivors (9 female and 16 male) have consented to be part of this ongoing study. Detailed medical history of these persons were taken prior to their inclusion in the study. None of the persons had any significant history of respiratory illness prior to the disaster.

Before starting on yoga instructions to the persons in the study the following parameters are measured for each individual :

1. Pulse rate before and after standard exercise (climbing up and down a flight of stairs), 2. Breathing rate before and after the standard exercise, 3. Peak flowmetry reading, 4. Spirometry reading

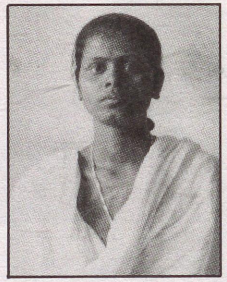
These measurements are repeated after 10 and 15 days of yoga practice at the clinic and after 1 month, 3 months and 6 months of practice at home. data on the effect of yoga therapy for six months is available for 17 persons. 3 persons have completed 3 months, 3 persons 1 month and 3 persons 15 days of yoga therapy.



LIYAQUAT ALI (53), Shahajahanabad. He had persistent problems of breathlessness, cough with sputum, burning sensation in the chest, pain in the ankles and hypertension. He was advised to take ayurvedic medicines and also take yoga treatment. He was instructed in pavanamuktasana series - I, shashankasana, makarasana, marjari asana, ushtrasana, simhasana, bhujangasana, shavasana, pranayama and kunjala without the use of salt. After 15 days of practice at the clinic he was advised to continue with practice at home. His peak flowmetry and spirometry readings after six months show marked improvement in the condition of his lungs. He is not taking any ayurvedic medicine for breathlessness.

He says "Before coming to the clinic I had taken treatment from different places but nowhere was I able to get more than temporary relief. I have found much relief from breathlessness and pain in the ankles through yoga. Kunjala has helped me a lot and I no longer have cough and I can now climb stairs without getting breathless. Earlier I could not do anything that was even slightly exerting and now I can walk more than one and a half kilometres without getting breathless. I tell every one I meet about the miracles of yoga."

SALEHA (18), Congress Nagar. She has had breathlessness since she was a child of five. She also had persistent headache that would not go with any medicines. She was instructed in shavasana, marjari asana, bhujangasana, makarasana, suptavajrasana, simhasana, ushtrasana and dhanurasana. She also learnt and practised nadi shodhana and bhastrika pranayama and jala neti. She has continued with yoga practice for three months at home.



"I suffered from breathlessness ever since the disaster. My parents took me to different government hospitals and private clinics but I could breath without difficulty only when I was taking medicines. Also I began to have this headache that wont go. My parents have had to spend a lot of money on my treatment. After learning yoga at Sambhavna I took along a copy of the yogasana chart to practice at home. After regular practice for a month I have found much relief and I do not need to take any medicines now. I am now giving yoga instructions to children in the school where I teach. Earlier I was not able to do any physical work, now I am learning to sew garments."

The interim observations of this ongoing study are much encouraging. It is found that yoga is providing sustained relief in breathlessness and improved lung capacity for persons with chronic respiratory disorders. Those who have continued with regular practice of yoga have shown steady improvement in their lung capacity. Even among those who have not done regular yoga practice respiratory parameters have remained steady at the improved value or improved even further.

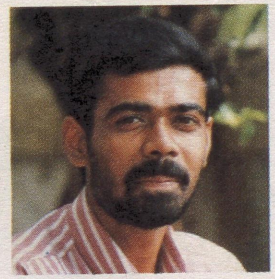
Plans for the future : We plan to hold yoga camps in different communities both to offer instructions and popularizing yoga as a therapy. In these camps we will request those in the community who have benefited from yoga practice to relate their experience and take part in the demonstrations. We also plan to train at least two persons in each community who can provide yoga instructions to others who can not come to the clinic for regular practice. We also plan to carry out an objective study in to the effects of yoga on persons with hyper tension.

MASSAGE THERAPY

ALKA BINGLE: "I joined the clinic in May 1997 as a part time massage therapist. Before joining the clinic I worked in a nature cure centre as a massage therapist for two years. At Sambhavna I offer ayurvedic massage to persons referred by doctors here. W e use medicinal oils that are prepared in the clinic itself. Persons are given massage for five to ten days for various aches. Backache, joint pains, and body aches are the most common problems that I treat. People are reporting 50 - 75% relief in their symptoms."



BIJU KUMAR: "I am from Kerala. I have been working at Sambhavna since April 1997. Before coming to Sambhavna, I used to work in a clinic in Kollam with Dr. Vijayan who is famous for his ayurvedic treatment of victims of low dose radiation exposure. In 1994, four gas affected persons from Bhopal came to our clinic in Kerala. I was involved with the care of these patients. These people were there for 45 days and reported marked relief after receiving panchakarma therapy. At Sambhavna I give ayurvedic massage to persons with backache, joint pains, pain in the limbs and body ache. I also prepare 22 herbal medicines including medicated massage oils every month at the clinic. Dr Deshpande supervises the work that I do. I will soon be working as an assistant in panchakarma therapy."



Introduction

Aches all over the body and pain in various joints are common problems among survivors of the Bhopal disaster. Most often people are given analgesics and anti-inflamatory drugs for these problems. But these offer only temporary relief for problems that are chronic in nature. Also these drugs are known to cause hyperacidity and potentially contribute to the injuries caused to the gastro intestinal system due to toxic exposure.

Our work at Sambhavna

At Sambhavna we offer ayurvedic massage to persons who have been suffering from these problems for the last several years so that they get prompt and sustained relief. The selection of persons likely to benefit from massage therapy is done by the doctors at the clinic.

According to ayurvedic principles, complaints of bodyache, backache, pain in the knees, ankles, wrists, elbows



and other joints and limbs are related to vitiation of Vata humour. The oil we use for massage is Vatari tailam that contains seven ingredients and is prepared in the clinic itself . Depending upon the severity of the problem we give massage to a person for 5 to 15 days for 30 to 45 minutes every day. The four types of strokes used in massaging are tapping, kneading, rubbing and squeezing. Persons with deep seated pain are treated by means of Kizhi, fermentation with hot oil and herbs. Steam fomentation is found to be particularly effective for persons with joint pains. Relief in symptom reported by the person is recorded at the end of the course of massage and they are advised to receive yoga instructions.

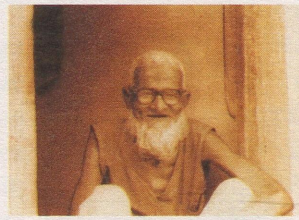
Between May 1, 1997, when massage therapy was started at the clinic, and March 31, 1998, 364 persons (286 female and 78 male) have been treated with massage therapy. The complaints presented by females and males in different age groups and relief reported are presented in Tables 13 & 14 on pages 119 & 120.

SHAMEEM BANO (36), Putlighar:

She had come to Sambhavna for allopathic treatment with complaints of severe pain in her shoulders, neck and chest. She followed Dr Rachna's advice and came for massage therapy. She felt much better with her neck within three days but very liitle relief anywhere else. She was then given Kizhi (hot oil fomentation) treatment for seven days. She reported 75 % relief from pains that had been troubling her for years.

RAYEES AHMAD (70), Chhola

He was advised massage therapy by Dr Deshpande. His body and particularly lower back ached so badly that he was unable to perform daily activities. After 15 days of massage he has been able to move freely including once on a bicycle. He has had little relief in his breathlessness though.



SHAMMO BEE (60), (Barkhedi)

She came for massage therapy while she was under ayurvedic treatment. She was suffering from low back ache and pain in the knees. She was treated with steam fomentation along with massage. After 15 days treatment she said most of her pains had gone.

BABULAL (55), Rishaldar Colony



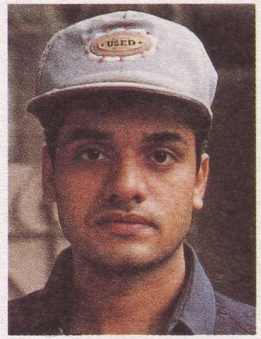
He was advised by Dr Rachna to take massage therapy for his back and knee problems. He reported much relief within 10 days of treatment with steam fomentation and massage.

The encouraging experience with massage therapy over the last several months affirms our conviction that traditional massage techniques can be

very effective in the treatment of exposure induced neuromuscular or musculoskeletal symptoms. It is a pity we have not been able to offer massage therapy to all persons visiting the clinic with these symptoms. It requires people to come everyday for 10 to 15 days for at least an hour and not many have that kind of time. Also we have a problem of space at the clinic and only one person can be given massage at a time.

VERBAL AUTOPSY

PRANAY SHARMA: "I have a diploma in civil engineering and computer applications. I have a bachelors degree in management. I got involved with the medical aspects of the gas disaster during the visit of the International Medical Commission on Bhopal in 1994. I was collecting data in the field surveys commissioned by them. I have been involved with Sambhavna since its planning stages. I have seen Sambhavna through the purchasing of the building, the renovation, the selection of staff and the evolution of the work here. I have developed technical and social skills here and have grown as a human being.



I am in charge of verbal autopsy and data processing work. The application of verbal autopsy for toxic disaster situations is pioneering work being done here. It is very painful both for us who conduct verbal autopsy interviews and for the relative of the deceased who has to recall and report details of the deceased persons suffering. Perhaps, conducting a regular autopsy is not as emotionally draining as VA.

I am happy that the work here happens in the spirit of cooperation. We are getting encouraging results in our work. We have a fresh perspective on the complex and unresolved issues of the disaster. I am hopeful that we can come up with new and innovative solutions. In the face of the uncooperative attitude of the government and Union Carbide's propaganda, we and the survivors are striving for justice to be served. I am glad to be a part of this struggle. I wish there was a local, national and international support network that would join us in this effort."

Introduction

Verbal Autopsy (VA) is an established scientific method that is in use in over 20 countries for the determination of the cause of death where no autopsies have been conducted. This method is particularly useful in situations where deaths occurring under medical care are low and death registrations are scarce or non-existent.

The technique of Verbal Autopsy : The VA technique is based on the assumption that most causes of death have distinct symptom complexes and that these can be recognized, remembered and reported by lay people. The technique has been primarily used for monitoring infant and maternal mortalities as well as deaths caused by respiratory infections, malaria, AIDS and other diseases. To the best of our knowledge Sambhavna is the only place where VA is being used for monitoring mortality in a toxic disaster situation.

Verbal Autopsy in Bhopal : Official records show that the number of persons who died in the years subsequent to the Union Carbide disaster far exceeds the casualty figures in the immediate aftermath. According to ICMR's decade long epidemiological study, the mortality rate in gas affected communities

was significantly higher compared to the control population as late as 1994.

Official monitoring of exposure related mortalities in Bhopal have been much inadequate and for reasons yet to be made known this exercise was prematurely terminated in December 1992. Because of the absence of an official system of registration and record keeping, gas affected people have few medical records and even these are mostly unavailable with them as they have had to be submitted to the claims courts for receiving compensation. Given such a situation VA is quite possibly the most appropriate method for monitoring deaths related to exposure to Union Carbide's gases in Bhopal.

Our work at Sambhavna

We started working on VA in October 1995 and spent several months in the field testing and finalizing the questionnaire. The questionnaire is designed to elicit details of the deceased person's exposure to the toxic gases, her health status prior to and after exposure and that of her medical treatment. Information is preferably collected from the person in the deceased's family who was mainly responsible for looking after the deceased. In our work we include deaths in gas affected communities that have occurred after 1992.

The filled questionnaire along with available medical records of the deceased are sent to an assessment panel of three physicians. Members of this panel independently write their opinion on the probable cause of death and whether it is attributable to the individual's exposure to Carbide's gases. The final opinion is then arrived at on the basis of the level of agreement among the three assessors in the panel. The final opinion is handed over to the family of the deceased who may use it for purposes of registration of claims and receiving compensation.

Between March 1, 1997 and March 31, 1998 we have recorded 170 deaths occurring after 1992 in the neighbourhood communities. Interviews have been completed in 69 cases and a final opinion on the probable cause of death has been made available to the family of the deceased in 52 cases.

RAISA BEE, Age at death - 16 years, Teela Jamalpura

She died at 6.45 in the morning of 31st October, 1996 in the TB Hospital. She was four years old when she was severely exposed to Carbide's toxic gases. In the interview her mother gave she recalled "That night my little daughter was vomiting all over the place and soiling her clothes over and over. She was coughing and gasping for breath and crying that her eyes were on fire.. She was very ill for over a week and we thought the worst was over. A few months later her problems worsened and she would get acutely breathless and bring out sputum when she coughed. She continued to have burning sensation in the eyes. She got weaker and weaker and was wheezing all the time. She lost her appetite for food and stayed



depressed all the time. Then we spotted streaks of blood in her sputum. We took her to different doctors and hospitals but her condition did not improve. She vomited a lot of blood before she died." The medical records available with her mother show that Raisa was admitted at the JLN Hospital on 7.8.'96 for 20 days with complaints of breathlessness, cough and anxiety attacks. Chest X-ray report dated 30.10.'96 from the TB Hospital mentions 'Bilateral infiltration with cavity formation left mid zone.'

All three doctors in the assessment panel have opined that Raisa's death is attributable to her exposure to Carbide's gases and the injuries caused to her respiratory and neuropsychiatric systems. In their opinions tuberculosis was a complication that arose out of the injury caused to her lungs.

No claim for compensation for Raisa's death has been registered till today.

We find that in 43 cases where experts have suggested a nexus between gas exposure and subsequent death, no claim for compensation has even been registered let alone paid. Only in one case out of 69 has an autopsy has been carried out. Details of the 52 cases in which final opinions have been obtained are given below.

The Support base

The work of VA at Sambhavna has been possible due to the voluntary contributions of a number of professionals. Dr Daniel Chandramohan Head of the VA group at the London School of Hygiene and Tropical Medicine, and advisor to the VA project at Sambhavna, is ever ready to help us tackle the many technical issues. In January '98, Dr Homi Mehta, Consultant, Apollo Hospital, Hyderabad has joined our efforts as an advisor. The doctors who are volunteering their services in the assessment panel are :

DR. R K BHARGAVA (MBBS, MD) **:** Consultant cardiologist and the physician to the Governor of the state. He is an Emeritus Professor of Medicine at the Mahatma Gandhi Medical College in Bhopal.

TABLE - 1

DETAILS OF VERBAL AUTOPSIES CARRIED OUT BETWEEN MARCH 1, 1997 AND MARCH 31, 1998

Deaths recorded	Interviews completed	Autopsy		Assessment completed			Cause of death related to the disaster			
		Done	Not done	Doc A	Doc B	Doc C	Most Probable	Probable	Possible	Unrelated
170	69	01	68	52	52	52	08 (15%)	20 (38%)	15 (24%)	09 (19%)

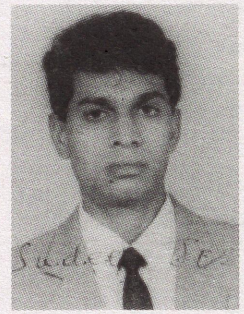
Dr. U N Das (MBBS, MD, FAMS) Chief, Division of Internal Medicine and Clinical Immunology, L V Prasad Eye Institute, Hyderabad. He was awarded the prestigious Shanti Swaroop Bhatnagar prize for his contribution to Medical Sciences in 1992.

Dr. Ajit Vigg (MBBS, DTCD, MRCP) Consultant physician and chest specialist at Apollo Hospital, Hyderabad. He is one of the members of the international panel for lung cancer in India

In January '98, Dr P N Rao, Head of the Department of Gastroenterology, MediCiti, Hyderabad offered his services to be in the assessment panel.

In January '98 we had a meeting of individuals who are associated with Sambhavna's VA project for a thorough review of the work done so far. We also prepared a plan of work for the next two years that includes establishment of the legal validity of this scientific method.

LIBRARY AND DOCUMENTATION



SUDEEP JOSHI: "I have a masters degree in management and had been developing a career in advertising for four years before joining Sambhavna. I work as a librarian at the documentation centre at the clinic. I find the work here has depth and requires multiple skills and carries varied responsibilities. I am enjoying contributing my bit for such a humanitarian cause."

Introduction

Much information on the December 1984 Union Carbide disaster and its aftermath is lost, unavailable or classified. Much remains to be generated. A large part of the information that is actually available remains within the circle of bureaucrats, scientists, medical researchers or academics. While official initiatives towards collection and distribution of information are absent, non-government attempts to document the disaster and its continuing aftermath are few and floundering.

My work at Sambhavna

At Sambhavna we are building a documentation unit as a repository and distributor of information related to the disaster. Our emphasis is on medical information but we pay attention to other aspects as well. The following is a description of information items available at this unit:

1. Reports, articles, letters to the editors from newspapers and magazines in Hindi and English from December 3, 1984 till date.
2. Published scientific and technical information on the leaked chemicals and their toxicology.
3. Yearly reports of ICMR's studies and occasional publications of non-government agencies on health status of survivors and their medical care.
4. Annual reports, financial statements, letters and press hand outs related to the disaster from Union Carbide Corporation.
5. Plans, budgets and reports on government programmes of relief and rehabiulitation.
6. Petitions, judgements and other legal documents related to the civil and criminal cases.
7. Pamphlets, posters and other literature produced by survivors organizations and their solidarity organizations.
8. Publications on toxic chemicals and their impact on health
9. Books on health effects of toxic exposure, rational use of medicines, yoga, tort law etc.

Sharing Information : In order to make information more accessible to users we have produced compilations of research publications on ocular and neurological consequences of exposure to Carbide's gases and more

such compilations on different systemic effects are in process. Research findings and other information including those available from the internet are translated to Hindi and shared with survivors and local doctors.

Right to Information ? On 12th December 1997, the Madhya Pradesh government announced that information from the Department of Gas Relief could be obtained, on payment of photocopying costs. On 23rd December we sent a letter to the Director, Department of Gas Relief requesting information under 14 specific heads on the leaked gases and government efforts in medical care, monitoring and research. On February 13, 1998 we received a copy of the report on research activities of the Centre for Rehabilitation studies from the Director. However, the quality of data in the report is unspeakably poor and this information is of little value. According to this report deaths due to heart problems are five times less, due to gastro intestinal problems are about half and maternal mortalities are less than half among the exposed population as compared to an unexposed population. This is in sharp contradiction of all earlier studies carried out by ICMR and other agencies. Some of the information contained in the report is so absurd that one suspects whether any data has been actually collected from the field. Till March 31, 1998 we had not received any response to the other 13 information queries.

Use of the Documentation Centre : The documentation unit has been used by journalists, research scholars, survivors and their organizations and by members of the clinic staff. We have had to suspend publication of our monthly newsletter, 'Sambhavna from Bhopal,' as we are not able to bring it out on a regular basis.

COMPUTERIZATION OF DATA

Our work at Sambhavna

We began computerizing data generated at the clinic from October 1997. The work required much preparation as there are no models we could follow and have had to evolve our own system that can accommodate information coming from different systems of medical care. We use a Pentium 486 with Epi Info version 6 software(word processing + data base + statistical programme) produced by Centers for Disease Control and Prevention, USA and the World Health Organization. We have designed formats for recording data at the registration desk and by those offering care. Separate formats are used for registration under different systems of care and for each follow up visit. The number of variables is very large (413) and they have been assigned numeric codes. The code sheets are updated periodically. Data is stored in disks as well as on hard copy. The analysis programme provides us with answers to the following questions at any point of time:

INDIVIDUAL PARTICULARS

1. How many persons (females & males in different age groups) have been registered at the clinic
2. How many persons have come on follow up visits?

3. How many persons have made more than n (n= 1,2,.....) visits ?
4. How many persons have been registered at the Clinic from different locations (distance and direction with respect to the Carbide factory) ?
5. How many persons from different locations have come on more than n visits ?
6. How have persons registered at the Clinic come (through health workers, after being told about the clinic by a friend. relative or neighbour, after reading about the clinc) ?
7. How many persons are smokers or tobacco chewers or both ?
8. What fuels for cooking (solid, liquid, gas) are used by persons registered at the Clinic ?
9. What religion (Muslim, Hindu, other) do persons registered belong to ?
10. How many persons are vegetarian and how many non-vegetarian ?
11. What are the nos. of persons in different occupational categories (Strenuous, Moderate, Light)?
12. What are the nos. of persons occupied in hazardous (dust/fibre, smoke/chemicals) and non-hazardous activities ?
13. What are the literacy/educational levels of persons registered at the Clinic ?

SYMPTOMS

14. How many persons have received care from different medical carer (individual doctors, Yoga, Panchkarma) singly or in different combinations (eg. Allopathy and Yoga) ?
15. How many persons are of different constitutions (according to Ayurved) ?
16. What are the nos. of persons presenting n (n = 0,1,2,3....) symptoms ?
17. What are the nos. of persons presenting specific symptoms either singly or in combination ?
18. What are the different combinations in which symptoms are presented and how many persons present these combinations ?
19. What are the symptoms presented by persons from different locations ?

FINDINGS AND DIAGNOSIS

20. What are the nos. of persons with different allopathic and ayurvedic findings ?
21. What are the nos. of persons who have been offered different diagnoses ?
22. What are the diagnoses of persons from different locations ?

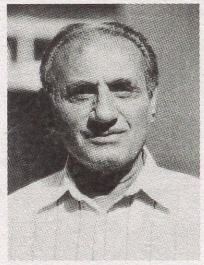
TREATMENT AND RELIEF

23. What are the nos. of persons given different allopathic treatments ?
24. What are the nos. of persons given different Ayurvedic treatments ?
25. What are the Allopathic and Ayurvedic treatments given for specific symptoms or combination of symptoms ?
26. What is the extent of relief reported by persons with different symptoms and symptom complexes ?
27. What is the no. of persons who have had relapse of symptoms ?
28. What is the number of persons who have suffered aggravation of symptoms as a result of treatment ?

Initially, we were rather skeptical about the advantage of using the computer for entry and analysis of data but we are now happy with the outcome of this effort. We are hopeful that the monitoring of health care at the clinic through periodic analysis of data will help us improve the quality of care offered at the clinic. A few glitches continue to be there and Drs Chandramohan and Rajiv Bhatia of the International Advisory Group are helping us iron them out.

STATEMENT OF ACCOUNTS

K.N. CHOWDHARY: "I am a retired officer of the Finance Department of the state government. At Sambhavna I am responsible for administration and management of the finances of the clinic. The clinic is no doubt doing a yeoman's service to the survivors of the gas tragedy. I think in order to continue its activities in the years to come, our immediate priority should be to build an endowment fund of about Rs. 20,000,000. This would ensure long term financial security. We have to evolve investment plans so that we can meet our regular expenditures and allow for expansion and diversification of our services. The total expenditure of the clinic during the current financial year(1997-1998) is Rs. 1,095,000 as against Rs. 1,069,000 in the previous financial year (1996-1997). We have kept our budget very tight and have not been able to purchase diagnostic equipments that we really need.



RECEIPT & PAYMENT ACCOUNT
FOR THE YEAR ENDED 31ST MARCH
Sambhavna Trust
44, Sant Kanwar Ram Nagar, Berasia Road, Bhopal
BHANDULA & JUBY CHARTERED ACCOUNTANTS
on the following page.

BHANDULA & JUBY CHARTERED ACCOUNTANTS

Sambhavna Trust 44, Sant Kanwar Ram Nagar, Berasia Road, Bhopal

RECEIPT & PAYMENT ACCOUNT FOR THE YEAR ENDED 31ST MARCH

1998 Receipts	**Amount (Rs)**
To Opening Balances - Cash	56, 814 . 00
- Punjab National Bank	11, 005 . 00
(S B A/c)	
- Investment in FDR	15, 00, 000 . 00
To Donation - Others	34, 482 . 50
To Miscellaneous Receipts	19, 696 . 00
To Interest Received	1, 04, 295 . 00
TOTAL (Rs)	**17, 26, 292 . 50**

Payments	**Amount (Rs)**
By Bank Charges	178 . 00
By Electrical & Civil Works	52, 802 . 00
By Equipments & Accessories	17, 705 . 00
By Furnitures, Fitting Furnishing	3, 527 . 00
By Local Travel	7, 266 . 00
By Medicines	1, 28, 270 . 00
By Meetings & Seminar	46, 827 . 00
By Petrol, Oil & Lubricants	2, 777 . 50
By Photocopy & Xerox	4,975.00
By Postage Charges	4,330.00
By Office Expenses	19,408.00
By Printing & Stationery	32, 300 . 00
By Salary & Remuneration	7, 29, 256 . 00
By Telephone charges	35, 145 . 00
By Travelling Expenses	11, 677 . 00
By Closing Balances - Cash	21, 348 . 00
- Punjab National Bank	8, 500 . 00
- Investment in FDR	6, 00, 000 . 00
TOTAL (Rs)	**17,26,292 . 50**

for Sambhavna Trust

(Managing Trustee)

Place : Bhopal Date : 16. 04 . 98

Examined & Found correct, the above Receipt & Payment Account in accordance with the Books of Accounts & Records produced before us. for Bhandula & Juby Chartered Accountants

(Juby Joseph) Partner

E - 3 / 56, Arera Colony, Bhopal - 462 016.
Phone : 567 546, 563 834

7, Zone - 1, M P Nagar, Bhopal - 462 011.
Phone : 763 625, 558 476

REPORT OF SURVEY for ASSESSMENT OF DRUG DISTRIBUTION in gas affected Bhopal

THE CONCERN

The December '84 Union Carbide disaster in Bhopal created a situation in which a large population has been on constant medication over a number of years. The paucity of information on the health impact of the leaked chemicals and the absence of appropriate treatment protocols has led doctors in Bhopal to indiscriminately prescribe drugs without any scientific basis. Quite possibly, the large scale use of drugs with significant potential toxicities has compounded exposure induced injuries.

The problem of irrational drugs : The prescription of irrational drugs and drug induced health damage is a world wide phenomena. The situation is particularly worrisome in our country where it has been estimated that nearly 80 % of around one hundred thousand pharmaceutical formulations available in the Indian market are unnecessary and in many cases harmful. Studies show that 86 % of cough syrups sold in the market are useless, 70 % antacid preparations should not be prescribed, 82 % of painkillers in the market can not be scientifically justified and 87 % of formulations for anaemia are irrational. However there is need for special emphasis on rational drug use in Bhopal given the long term and possibly life long medication to a large mass of people.

Irrational drug use in Bhopal : An audit of 522 prescriptions carried out to evaluate drug use at two government hospitals in 1990 shows that of the 220 medicines prescribed, 26.8 % are irrational and 13.2 % are those that are banned in several countries for their adverse effects. A drug utilization study conducted by members of the International Medical Commission on Bhopal in 1994 reports indiscriminate use of corticosteroids and antibiotics potentially compounding exposure related damages to the immune system.

Objectives of the study : In continuation of earlier studies we carried out a survey and a prescription audit in October -November 1996 to determine the extent of irrational drug use and treatment in the gas affected population. The survey was also meant to yield information on pharmaceutical companies that share the market in gas affected Bhopal.

Data collection : Data on 20 most sold drugs at particular shops and the most sold drugs for specific exposure related symptoms were collected from pharmacists at 50 chemist shops using a field tested questionnaire. The shops had been randomly selected from a total of 180 in the gas affected area. Data were also collected from prescriptions brought to 25 shops by 200 customers. The qualification of the prescriber, diagnosis, pregnancy status and symptoms of the patient were recorded.

Analysis of data : A prescription audit was carried

out according to guidelines on rational drug use. A total score of 10 was allotted for each prescription. Four marks were allotted for corroboration of treatment with diagnosis, three marks for completeness and one mark each for information on dose, frequency and duration of medication. Negative marks of one each was given on ; irrational / unscientific drugs or drug combinations, herbal and indigenous drugs prescribed by doctors of another system of medicine, prescription of more than four drugs without justification and prescribing unnecessary drugs like vitamins or tonics, when not needed. Prescriptions that scored less than 5 marks were marked irrational and those with 8 or more marks were marked rational.

Brand names occurring in the list of 20 most sold drugs offered by the interviewee pharmacists were listed according to their frequency of mention in the list. Manufacturers of the most sold drugs were categorised in to four groups - multinational corporations, joint venture companies, Indian private companies and Public Sector Undertakings and their market share was estimated by the sale of their brand names. Most sold drugs were also classified according to their pharmacological action and their rationality was assessed. Assessment of appropriateness of specific drugs that are most sold for specific exposure related symptoms was carried out separately.

RESULTS

It was found that only 16 % of the audited prescriptions scored 8 or more marks whereas 36 % scored less than 5 marks out of 10. 48 % prescriptions scored marks in between . 99 prescriptions were made by qualified doctors of modern medicine (MBBS -51, MD- 39, MS - 9) and 44 by registered medical practitioners (RMP), a qualification awarded by unrecognized agencies without formal training. 16 were prescribed by doctors qualified in other systems of medicine like Ayurveda and Unani and in 41 prescriptions the qualification of the prescriber was not mentioned.

There is no mention of symptoms for which the drugs were prescribed in 9 prescriptions including one written by an MD. Only in 36, diagnosis is mentioned on the prescription among which in 29 cases single diagnosis has been made. Not a single prescription mentioned the duration for which the drugs were to be taken. In 51 cases the dose of medicines to be taken each day is not mentioned. In the 200 prescriptions reviewed, a single drug was used in 51 cases, two drugs in 47 and three in 46, four drugs in 29 cases. Given that polypharmacy often results in increased adverse drug reactions it is a matter of concern that in 27 cases more than four drugs were prescribed.

34.34 % (one out of every three) prescription made by 99 doctors qualified in modern medicine and 22.73 % by 44 RMPs were irrational. Only 17.17 % of prescriptions made by qualified doctors and 15.91 % made by RMPs were rational. 41 prescriptions in which qualification of the doctor is not mentioned, scored an average of 4.05, and were irrational according to the guidelines mentioned here. It is found that 51 MBBS doctors scored a total of 264 (ave. 5.18), 39 MDs 174 (ave. 4.46), 9 doctors with MS degree scored 56 (ave.

6.22), making a total score of 494 (ave. 4.99) for all qualified doctors of modern medicine. 44 RMPs scored 245 (ave. 5.57).

The rationality scoring of prescribers with different professional qualifications is found to be as under :

TABLE - 1
SCORING OF PRESCRIBERS WITH DIFFERENT QUALIFICATIONS

Scoring	MBBS	MD	MS	RMP
Less than 5	13 (25.49 %)	19 (48.72 %)	2 (22.22 %)	10 (22.73 %)
5 - 7	30 (58.82 %)	14 (35.90 %)	4 (44.44 %)	27 (61.36 %)
8 or more	8 (15.69 %)	6 (15.38 %)	3 (33.33 %)	7 (15.91 %)

Curiously, in the sample studied, the prescriptions made by RMPs with no formal medical education are almost of the same quality as their qualified counterparts. Rationality scoring of prescribers of other systems of medicine is beyond the competence of the authors and has been avoided.

Among the most sold 391 drugs, 46 % were either irrational, useless, harmful / hazardous, banned/ bannable compositions or with no reference in standard textbooks of pharmacology or medicine (Table - 2). In terms of pharmacological action, anti infectives were found to be the most sold drugs in gas affected Bhopal.

TABLE - 2
CATEGORY AND MERIT WISE DISTRIBUTION OF MOST SOLD DRUGS

S. No.	Category	Number (%)	Merit	Number (%)
1.	Antiinfectives	79 (20.2 %)	Irrational	113 (28.9 %)
2.	Enzymes /tonics	59 (15.09 %)	Useless	24 (6.14 %)
3.	Cough syrup	50 (12.78 %)	Harmful/ Hazardous	5 (1.28 %)
4.	Unknown composition	34 (8.70 %)	Banned/ Bannable	4 (1.02 %)
5.	Ayurvedic	30 (7.67 %)	No reference in literature	34 (8.7 %)
6.	Analgesics	28 (7.16 %)	Ayurvedic	30 (7.67 %)
7.	Steroids	26 (6.65 %)		
8.	Anti-ulcer	22 (5.63 %)		
9.	Hypnotics/Sedatives	6 (1.53 %)		
10.	Anti-hypertensive	3 (0.76 %)		
11.	Others	54 (13.81 %)		

Analysis of the rationality of drugs for specific exposure related symptoms yields interesting information. Useless, hazardous and combinations of irrational drugs were mostly given for ill defined symptoms such as loss of appetite, weakness and loose motions. Appropriate drugs were more used for well defined symptoms or conditions (Table-3).

TABLE- 3

MERIT WISE DISTRIBUTION OF DRUGS FOR SPECIFIC SYMPTOMS

Symptoms	Appropriate drugs	Inappropriate drugs	Total
Vomiting	6	0	6
Ulcers	13	1	14
Breathlessness	7	2	9
Depression	15	3	18
Insomnia	7	1	8
Loss of appetite	0	20	20
Weakness	1	15	16
Loose motions	2	9	11
Constipation	3	7	10
Expectoration	7	15	22

It was found that 391 most sold drugs in gas affected Bhopal are manufactured by 163 companies and that despite their low numeric strength a major share of the drug market is held by multinational pharmaceutical corporations (Table-4).

TABLE - 4

MANUFACTURERS AND THEIR SHARE IN THE DRUG MARKET

Manufacturers	Number (%)	Frequency of inclusion of brand name in list of 20 most sold	Market share (%)
Multinational corporations	43 (26.38 %)	516	51.7 %
Indian private companies	114 (69.93 %)	473	47.39 %
Joint ventures	4 (2.45 %)	6	0.6 %
Public Sector Undertakings	2 (1.22 %)	3	0.3 %

On closer examination it is seen that the top dozen multinationals profit from a considerable share (37 %) of the market. Included among the top dozen is Rhone-Poulenc a French chemical / pharmaceutical multinational that bought over the Agricultural Products Division of Union Carbide of which the Bhopal factory was a part.

LIMITATIONS

One limitation of this study is its small sample size, particularly for prescription audit. Also given the differences of experience and knowledge among different pharmacists, the weight given to information on distribution and utilization of drugs furnished by them may not be fully justified.

CREDITS

Data for the study were collected by Pranay Sharma and Tarnjit Birdi, a volunteer at the clinic with help from Satinath Sarangi. Prof. P K Sarkar, Dr T K Bhattacharya , both from the School of Tropical Medicine, Calcutta and Dr Krisnangshu Ray of the Calcutta National Medical College carried out the analysis.

REPORT OF THE NATIONAL SEMINAR ON POSSIBILITIES IN AYURVEDA IN THE TREATMENT OF DISEASES caused by the Union Carbide diasater in Bhopal on September 20 - 21, 1997 at Gandhi Bhavan, Bhopal.

Concerns that motivated organizing the Seminar were described by Dr. Deshpande in the introductory address as following :

i. Unsatisfactory prognosis of persons affected by Carbide's gases under medical care based on modern medicine and limitations of modern therapeutic intervention in providing sustained relief from exposure induced symptoms.

ii. Findings of two drug utilization studies among the gas affected population in Bhopal that indicate high degree of unnecesary and hazardous medication and underscore the vulnerability of the population under modern medical care to iatrogenic diseases.

iii. Known limitations of modern medicine in treating several diseases caused by chemical exposure.

iv. Contribution of modern pharmaceutical production to industrial pollution.

Enthusiasm to explore possibilities in Ayurveda through the Seminar was based upon :

i. Encouraging prognosis of chronically ill survivors receiving Ayurvedic care at the Sambhavna Clinic.

ii. Detailed description of toxic induced diseases and their management practices found in Ayurveda texts.

iii. Availability and willingness of competent Ayurveda professionals in different parts of the country to contribute to the understanding of health impact of Carbide's gases and management of exposure related diseases.

iv. Lower possibilities of iatrogenic compounding of exposure induced injuries in Ayurvedic medication.

v. Superior efficacy of Ayurvedic therapy in the treatment of neuro- and immuno- toxic injuries.

EXPECTATIONS FROM THE SEMINAR WERE OUTLINED AS :

i. Brainstorming on an Ayurvedic perspective on pathogenesis of chronic diseases caused by Carbide's gases, their diagnosis and management.

ii. Gaining practical knowledge on Ayurvedic management of Carbide gas induced chronic diseases.

iii. Sharing of and receiving counsel on problems in diagnosis and management of exposure induced diseases among survivors visiting the Sambhavna Clinic.

iv. Providing inspiration and reason to Ayurvedic professionals to direct special efforts in to management of environmental diseases.

Dr V.N Pande, former Director of the Central Council for Research in Ayurveda and Siddha, in his keynote address laid emphasis on adopting an approach based in research in Ayurveda for treatment of exposure related injuries.

Former Professor of Medicine, Gandhi Medical College, Dr H.H Trivedi, involved in the treatment of gas victims ever since the disaster, underlined the need for research on ayurvedic management of chronic diseases caused by the disaster. Dr D.K Satpathy, Director, Medico Legal Institute, mentioned that toxins released from the Union Carbide factory were found during the autopsy of gas victims till 1986. He emphasised the need for dissemination of authentic information on the disaster. Chairperson of the Trust Dr M.P Dwivedi shared the main findings of ICMR research on health impact of the disaster with the assembled ayurveda physicians. Dr Rachna Pandey of the Sambhavna Clinic presented a summary of various research carried out in Bhopal.

Managing Trustee, Satinath Sarangi presented recent knowledge on the toxic effects of chemicals stating that till today only limited information is available on 6% of 50-100,000 chemicals in daily use. He described the reduction of sperm count and the damage to the immune system as a result of routine exposure to chemicals. Dr Rajish Kotecha of Chitrakoot outlined the possibilities of ayurvedic treatment of Silicosis, a chronic occupational disease. Dr Mahindra Vyas of Bombay described ayurvedic Rasayana Chikitsa for diseases caused by toxic exposure.

In the session on exposure induced disease process Dr M.S Deshpande of the clinic presented the difficulties encountered in the diagnosis of illnesses and sought advice from the participants of the seminar. Dr Lokenath Sharma of the National Institute of Ayurveda, Jaipur enumerated the diagnostic procedures followed in ayurveda. Dr Ajaykirti Jain of Ujjain advised the use of Mootra Pareeksha in the diagnosis of gas related ailments.

On the second day of the seminar there was extensive discussion on the treatment aspect of gas victims. Advisor to the seminar Dr U.S Nigam (Ujjain), emphasised on the importance of scientific treatment of gas victims according to ayurvedic texts.Dr D. Upadhyaya of Bombay spoke about the treatment of skin and eye diseases. Symptomatic treatment of gas victims according to Panchkarma method and ayurvedic treatment was explained by Dr B.D Nandurvarkar of Vadodra. Dr Pradeep Kolhe of Nagpur talked about the utility of 'basti' treatment of gas victims. Dr Dharmvir of New Delhi advised the adoption of Panchkarma Chikitsa at the Sambhavna Clinic to provide sustained relief.Dr B.S Rathore of Government Gas Relief Hospital presented ayurvedic ways of environment protection as described in ayurveda texts. Dr Rashmi Jha, Dr Mangala Rukmangat and Dr P.C Soni presented their experience in treating gas victims through ayurveda.

REPORT OF THE SEMINAR ON "GYNAECOLOGICAL AND OBSTETRIC PROBLEMS related to the Dec '84 Union Carbide disaster" held on May 6, 1997

A seminar on gynaecological and obstetric problems related to the December 1984 Union Carbide gas disaster was held at the Sambhavna Clinic on May 6, 1997. Speaking at the Seminar, Chairperson of the Sambhavna Trust Dr. M P Dwivedi emphasized the need for focused research on exposure related long term gynaecological consequences and expressed regret that due to certain pressures the Indian Council of Medical Research did not carry out studies on the gynaecological impact of exposure to Union Carbide's gases. Dr. Rachna Pandey, doctor working at the Sambhavna Clinic presented a review of epidemiological, clinical and animal studies related to the gynaecological and obstetric problems caused by the disaster. These studies have established significantly higher rates of spontaneous abortion and incidence of excessive vaginal seccretions, menstrual irregularities and sterility among gas affected women.

Eminent gynaecologist Dr. Smt. Surange who was involved in the treatment of gas affected women who came to Jabalpur in the immediate aftermath of the disaster stated that almost all the women who were pregnant at that time suffered from spontaneous abortion. Subsequently several gas affected women presented complaints of inability to conceive. Dr. Surange suggested holding camps in the affected area to provide medical care and health education on exposure related gynaecological problems. Dr. Sarla Jain, a private medical practitioner who was involved with medical care of gas affected persons since the morning of the disaster underlined the psychological trauma suffered by women along with problems such as menstrual irregularities, abortion and excessive vaginal discharges.

Dr. Shashi Shrivastava, a gynaecologist who runs a nursing home in the gas affected area presented the alarming fact that in the last few years there has been a 3-4 fold rise in male infertility among her gas affected patients. This is particularly seen among young males who had been exposed to the toxic gases in the post pubertal stage. She also pointed out that while there has been a decrease in the rate of abortion among gas affected women in the last few years there has been a concurrent rise of cases with decreased intra uterine growth rate.

Dr. M S Deshpande, Ayurved doctor at the Sambhavna Clinic presented the main features of medical care of exposure related gynaecological problems. It has been observed that there is a recurrence of these problems after temporary relief brought about by medication. Dr. Deshpande stressed upon the need for Panchakarma Chikitsa (Ayurvedic cleansing techniques) for effective treatment of such problems. Dr. Mangala Rukmangat, Ayurved Medical Officer at the government Unani Shafakhana presented important data related to the condition of young women who had been exposed to Carbide's gases in their pre-pubertal state. According to her only 50% of such women have normal menstrual cycles. Among the patients visiting her clinic 33% have complaints of delayed onset of menses, 21% have complaints of scanty menses and 3% of amenorrhoea. Dr. Rukmangat

presented information on the beneficial effects of herbal preparations in the treatment of gynaecological problems and made special mention of Ashok, Lodhra, Ashwagandha, Dashamul and Shatawari.

Ms. Nivritta Durgvanshi, Yoga instructor at the Sambhavna Clinic presented her observations on the treatment of gynaecological problems through the practice of Yoga. Dr. Kirti Dale, Assistant Surgeon at a government hospital meant for gas affected people emphasized the need for routine Pap's smear test for women suffering from excessive vaginal secretions so that cases of cervical cancer can be detected at a curable stage.

REPORT ON HEALTH CAMP ORGANIZED AT JAIPRAKASH NAGAR on July 27, 1997

Nearly one third of the gas affected persons from Jai Prakash Nagar reporting at the Health Camp organized by the Sambhavna Trust were found to be suffering from eye problems. Anaemia was also found to be quite common (18 %) among the people. One young boy was found to be suffering from Lymphoangioma and two young women were suspected to have cancer of the cervix. Breathlessness, hyperacidity, joint pain, panic attacks, recurrent fever and menstrual irregularities are some of the common symptoms presented by the persons visiting the camp.

212 persons from were examined and provided free medical care by ten doctors including medical specialists of the city. The doctors who provided their services voluntarily were Drs. J K Raizada, eminent eye specialist, M P Dwivedi, former Director of the Bhopal Gas Disaster Research Center, Smt. P B Surange and Smt K Lad, both gynaecologists, Rakesh Jain and G M Lal, eye specialists, Ashwini Syal, Paediatrician, Naloke Bannerji and Prashant Pathak, General Practitioner. Dr. Rachana Pandey and Dr. M S Deshpande from the Sambhavna Clinic also contributed their services.

The purpose of the Health Camp was to provide medical attention to those persons in the community who are unable to reach the hospitals and are too poor to afford treatment by private practitioners. The large number of persons who reported at the Camp indicate the continuing health problems of the gas affected people. The Sambhavna Clinic aims to hold such health camps on a regular basis so that people in other communities can also benefit from specialist medical attention free of cost.

The Health Camp organized by the Sambhavna Trust is a step towards promoting the voluntary spirit of the medical professionals of the City that was so remarkably evident in the immediate aftermath of the Union Carbide disaster. ■

5. Friends of Sambhavna

Much of the work we do at Sambhavna would not have been possible without the encouragement and support we have received from survivors, donors and individuals volunteering their time, talents and skills. Truly we need much more support locally and globally for our work to continue and grow. The disaster in Bhopal was followed by worldwide concern for the survivors but unfortunately it was not sustained. Today almost fourteen years after the disaster the situation in Bhopal is as desperate and as much in need of public concern as it was the morning of the disaster. We hope our work in the clinic and our initiatives in sharing information will contribute to a renewal of concern and hope.

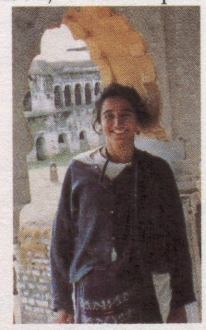
volunteer at Sambhavna. This must be the only clinic in the world that uses ayurveda, yoga, massage, and allopathy

VOLUNTEERS AT SAMBHAVNA CLINIC

We have had several volunteers who came and shared their ideas and worked at the clinic. Children who helped make medicine packets, people in the communities helping with survey and health education work and in the organization of health camps and others who came once in a while to do maintenance and repair work at the clinic. Two volunteers Dr Jayshree Chander, a doctor from San Francisco and Ms Tarnjit Birdi, a barrister from London trained in Shiatsu massage spent a couple of months working with the staff at the clinic.

DR. JAYSHREE CHANDER

"During my residency in family medicine at the University of Callifornia San Francisco, I developed interests in environmental and occupational health and in the traditions of ayurveda and yoga therapy. These seemed to be completely unrelated fields of medicine until I came to volunteer at Sambhavna. This must be the only clinic in the world that uses ayurveda, yoga, massage, and allopathy to treat problems caused by an environmental disaster. Given the successes



noted here with ayurveda and yoga, it now seems so obvious to try to use non-toxic therapies for toxin induced injuries.

In the four months I have been involved in helping with the work at this unique clinic, I have been impressed with the egalitarian way in which the clinic is run, the friendliness of the staff and their ability to learn new skills applicable to the functioning of the clinic. I have learned more than I could have imagined about the injustices the survivors of the Union Carbide Gas Disaster have endured.

One of the main things I did here was to initiate a gynecological screening program for the gas affected women visiting the clinic. Many women suffer from excessive vaginal discharge and menstrual irregularities. My intention was to investigate the nature and etiology of these problems as well as to screen for other unidentified problems such as cervical cancer, breast cancer, pelvic tumors and thyroid disorders. To this end I have taught Ms. Aziza Sultan, a healthworker here, to take a thorough menstrual and reproductive history and to perform thyroid, breast, and pelvic examiniations. She is becoming quite skilled at this. Pap smears are taken on every patient that presents for examination. The screening is just beginning to come into full swing and preliminary findings show a higher than expected rate of cervical erosions and chronic inflammation of the cervix.

The gas affected communities are afflicted by TB at 3-4 times the national rate. The care available at the government hospitals is inadequate. Although Sambhavna hopes to be able to provide treatment for TB in the near future, until then people still need to go to the government institutions. For people to seek care when appropriate and demand the care they deserve and avoid inappropriate care, they need to be well informed about their problem. To this end I worked with the health workers at the clinic to start a community health education program about TB with a vision of expanding it for other common health problems. Currently the community 'classes' are taking place sporadically. My hope is that this will regularize.

I am also designing a study to assess growth and mental retardation in the gas exposed children. Many parents complain their children aren't growing well. My own casual observations are that the children do appear much younger than their stated ages. My plan is to get financial support so I can return in January 1999 to conduct the study.

The work being done at Sambhavna has great potential to impact the lives of the survivors and as a model for caring for survivors of chemical disasters worldwide. I hope my talents and skills will help them to reach their potentials."

VISITORS AT THE CLINIC

In addition to survivors, local doctors, journalists, students, government officials and others from Bhopal we have had the following out -of- town visitors at our clinic, many of whom provided vital support :

Dr Amit Basu, Calcutta • Dr M R Vijayan, Trivandrum • Ms Rita Aggarwal, Nagpur • Ms Sujatha Gopal, Rewa • Dr A J Dixit, Dr J V Dixit and Dr S Ahankari, Nanded • Maharashtra, Mr C Krishnan, Mr Nityanand Jayaraman, Ms Priya Somaiya, Mr Raghu Rai, Mr Ravi Aggarwal, Ms Shobha Aggarwal, Ms T Padma, Mr R Ramachandran and Mr Vijay S T Shankerdass, New Delhi • S Sathyanarain, Thailand • Mr Yoichi Tani and friends, Japan • Dr Daniel Chandramohan, Mr Russel Miller, Ms Sapna Mallik, Mr Tahir Shah, UK • Mr Robin Schlaht and Ms Heather, Canada • Mr Anand Mehta, Mr Brian Mooney, Ms Monica Mehta, Ms Pam Montanaro, Mr Patrick D Sison, Dr Rajiv Bhatia, Mr Raj Sharma, Dr Ramesh Karra, Mr Suketu Mehta and Prof Ward Morehouse, USA ■

ACKNOWLEDGEMENTS

We thank

All survivors who have visited the clinic for their support and encouragement and shared our conviction in possibilities..

All our supporters in India, Australia, Japan, UK and USA who have contributed towards the fund for running the clinic.

Mr. Abdul Jabbar, Convenor, Bhopal Gas Peedit Mahila Udyog Sangathan *for his support to the clinic and help in the production of this report.*

Dr. Kamal Lad, Dr. Kirti Dale,Dr. Mangala Rukmangat, Dr. P B Surange , Dr. Sarla Jain, Dr. Shashi Shrivastava, Bhopal *for participating in the seminar on exposure related gynaecological problems.*

Dr Ashwini Syal, Dr G M Lal, Dr J K Raizada, Dr Naloke Bannerji, Dr Prashant Pathak, Dr Rakesh Jain, Bhopal *for volunteering their services for the health camp in Jaiprakash Nagar.*

Mr A K Trivedi , Mr Mahendra Gupta, Mr M K Ganguly, Mr Pradhyumna Gour, Ms R H Lata, Ms Sudha Tewary, Bhopal *for volunteering at the Yoga camp at Arif Nagar.*

Dr Ajit Wigg, Dr Daniel Chandramohan, Dr Homi Mehta, Dr P N Rao, Dr R K Bhargava, Dr U N Das *for voluntary involvement in work of Verbal Autopsy.*

The Bhopal Medical Appeal, Mr Gary Cohen, Mr Josh Mailman, Ms Pam Montanaro USA, Dr Satish Dhawan, Bangalore, and Mr Yoichi Tani, Japan *for help in fund raising.*

Prof. Jagdish Chander and Mr. Swadeep Nigam, USA *for material assistance to the medical care programme.*

Dr Jayshree Chander, USA for her voluntary work at the clinic for several months and most of all *for her emphasis and introduction of gynaecological health examination at the clinic.*

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6. Data Tables

In the thirteen tables in this chapter we present some of the data that has been generated through our efforts. As we have mentioned, the computerization of data was started in September- October '97 so we have had to combine this data with information recorded manually prior to this period. This has not been possible in the case of data collected in allopathic medical care. As you will notice, our information base is small and does not cover several important aspects. Inadequate as it is , we hope our initiatives in generation of information will contribute to the knowledge on health status, treatment efficacy and related matters that is close to being non-existent today.

TABLE - 1

Age-sex distribution of persons receiving care at Sambhavna Clinic (March 1, 1997 to March 31, 1998.)

Months	10-19 F	10-19 M	20-29 F	20-29 M	30-39 F	30-39 M	40-49 F	40-49 M	50-59 F	50-59 M	60-69 F	60-69 M
March 97	36	16	37	08	40	12	34	09	34	02	21	09
April 97	29	14	23	06	28	09	23	09	11	08	12	08
May 97	41	23	34	08	31	05	26	05	21	13	09	07
June 97	49	33	28	07	34	07	25	05	17	09	15	08
July 97	32	17	26	11	33	15	18	13	09	02	09	05
Aug 97	19	17	22	08	30	10	13	08	10	04	12	05
Sep 97	24	15	22	12	25	12	16	07	17	11	14	11
Oct 97	23	13	26	11	25	10	23	12	13	12	09	07
Nov 97	17	11	18	09	20	05	21	11	12	07	10	08
Dec 97	10	08	11	04	15	11	16	05	09	18	05	05
Jan 98	08	03	08	05	06	08	13	07	05	09	08	05
Feb 98	15	14	18	08	15	12	13	07	07	04	11	05
March 98	17	06-	17	05	13	02	16	04	05	00	08	06
Total	**320**	**190**	**290**	**102**	**315**	**118**	**257**	**102**	**170**	**89**	**143**	**89**

TABLE - 1 *(Contd.)*

Months	70-79	70-79	80-89	80-89	>90	>90	TOT	TOT	Total New Registered	Total follow up visits	Total New & follow up	No. of Working Days
	F	M	F	M	F	M	F	M				
March 97	9	2	1	1	0	0	212	59	271	1313	1584	24
April 97	2	1	0	0	0	0	128	55	183	1238	1421	24
May 97	1	1	1	0	1	1	165	63	228	0999	1227	25
June 97	5	3	0	0	0	0	173	72	245	1240	1485	25
July 97	2	4	1	1	0	0	130	68	198	1278	1476	26
Aug 97	1	1	1	0	0	0	107	53	160	1099	1259	24
Sep 97	5	3	3	0	0	0	126	71	197	1260	1457	24
Oct 97	0	3	2	0	0	0	121	68	189	1247	1436	24
Nov 97	4	2	2	2	0	0	104	55	159	1300	1459	24
Dec 97	1	3	1	1	0	1	068	46	114	1101	1215	25
Jan 98	2	2	1	0	0	0	051	39	090	0995	1085	25
Feb 98	2	2	1	1	0	0	082	53	135	1120	1255	23
March 98	3	2	0	0	0	0	079	25	104	1209	1313	24
Total	**37**	**29**	**13**	**6**	**1**	**2**	**1,546**	**727**	**2,273**	**15,339**	**17,672**	**317**

TABLE - 2

Persons coming from different distances to the clinic (March 1, 1997 to March 31, 1998)

Distance from Carbide	Number of persons (%)	Category according to ICMR	Number of persons (%)
0.75 Km	400 (17.6)	Severly affected	865 (38.05)
1.5 Km	1036 (45.57)	Moderately affected	714 (31.41)
2.25 Km	442 (19.44)	Mildly affected	695 (30.57)
3 Kms and more	398 (17.5)	**Total**	**2273**
Total	**2273**		

TABLE - 3

Subjective change in health condition in persons under allopathic care after 5th visit to the clinic (March 17, 1997 to March 31, 1998)

Allopath	10-19 F	10-19 M	20-29 F	20-29 M	30-39 F	30-39 M	40-49 F	40-49 M	50-59 F	50-59 M	60-69 F	60-69 M
5 to 20%	2	2	2	2	1	1	1	-	2	3	1	1
25 %	11	5	22	11	41	9	30	7	2	7	20	13
50 %	16	6	10	7	21	2	26	3	17	5	17	7
75 %	3	5	4	1	3	3	3	2	8	3	5	3
< 75 %	-	1	-	-	4	1	3	1	2	-	-	4
No Relief	5	4	6	1	9	3	12	1	4	-	4	5
Relapse	2	1	4	4	9	5	6	-	9	1	7	3
TOTAL	**39**	**24**	**48**	**26**	**88**	**24**	**81**	**14**	**62**	**19**	**54**	**36**

TABLE - 3 *(Contd.)*

Allopath	70-79 F	70-79 M	80-89 F	80-89 M	Total F	Total M	Total	%
5 to 20%	1	-	-	-	10	09	19	3.4
25 %	5	4	1	-	150	56	206	37.6
50 %	6	4	-	-	113	34	147	26.8
75 %	2	3	1	-	29	20	49	8.9
< 75 %	1	1	-	-	10	08	18	3.2
No Relief	-	-	-	-	40	14	54	3.2
Relapse	2	1	-	-	39	15	54	9.8
TOTAL	**17**	**13**	**2**	**-**	**391**	**156**	**547**	**9.8**

TABLE - 4

Subjective change in health condition in persons under ayurvedic care after 5th visit to the clinic (March 17, 1997 to March 31, 1998)

Ayurvedic	10-19 F	10-19 M	20-29 F	20-29 M	30-39 F	30-39 M	40-49 F	40-49 M	50-59 F	50-59 M	60-69 F	60-69 M
5 to 20%	-	1	1	-	1	1	1	-	1	-	1	2
25 %	8	4	11	-	43	5	19	4	22	3	9	6
50 %	16	9	18	1	27	6	22	4	12	7	16	6
75 %	6	3	5	-	13	1	10	1	10	2	9	3
< 75 %	4	1	2	-	1	-	-	1	4	2	1	1
No Relief	5	1	6	2	7	1	15	1	2	-	8	2
Relapse	5	-	3	-	6	1	9	6	2	6	5	1
TOTAL	**46**	**19**	**46**	**3**	**98**	**15**	**76**	**17**	**53**	**20**	**49**	**21**

TABLE - 4 *(Contd.)*

Ayurvedic	70-79 F	70-79 M	80-89 F	80-89 M	Total F	Total M	Total	%
5 to 20%	-	1	-	-	05	05	10	2
25 %	4	1	-	-	116	23	139	28.7
50 %	4	3	-	-	115	36	151	31.2
75 %	2	1	-	-	55	11	66	13.6
< 75 %	2	1	-	-	14	06	20	4.1
No Relief	3	-	-	-	46	07	53	10.9
Relapse	-	-	-	-	30	14	44	9.1
TOTAL	**15**	**7**	**-**	**-**	**381**	**102**	**483**	

TABLE - 5

Subjective change in health condition in persons under allopathic+ayurvedic care after 5th visit to the clinic (March 17, 1997 to March 31, 1998)

Allopath + Ayurvedic	10-19 F	10-19 M	20-29 F	20-29 M	30-39 F	30-39 M	40-49 F	40-49 M	50-59 F	50-59 M	60-69 F	60-69 M
5 to 20%	-	-	1	-	-	-	-	1	-	-	-	-
25 %	2	-	3	-	1	-	9	3	5	-	3	2
50 %	-	2	2	-	4	-	4	1	6	-	1	4
75 %	1	-	-	-	-	-	1	1	1	2	-	-
< 75 %	-	-	-	-	2	-	-	-	-	-	1	-
No Relief	-	1	-	-	5	-	3	-	2	1	-	2
Relapse	-	-	1	-	3	-	1	-	-	-	2	-
TOTAL	**3**	**3**	**7**	**-**	**13**	**-**	**18**	**06**	**14**	**3**	**7**	**8**

TABLE - 5 *(Contd.)*

Allopath + Ayurvedic	70-79 F	70-79 M	80-89 F	80-89 M	T otal F	T otal M	Total	%
5 to 20%	1	-	-	-	02	01	03	3.4
25 %	1	-	-	-	24	05	29	33.3
50 %	2	-	-	-	19	07	26	29.8
75 %	-	-	-	-	03	03	06	6.8
< 75 %	1	-	-	-	04	-	04	4.5
No Relief	-	-	-	-	10	04	14	16
Relapse	-	-	-	-	05	-	05	5.7
TOTAL	**5**	**-**	**-**	**-**	**67**	**20**	**87**	

TABLE - 6

Survey of persons from Jai Prakash Nagar who dropped out of treatment

		Treatment at the Clinic				No. of visits to the Clinic						
	Reasons for dropping out	**Allo-pathic**	**Ayur-vedic**	**Com-bined**	**Total**	**1-2**	**3-4**	**5-6**	**7-8**	**9-10**	**11-12**	**Total**
1	No. improvement	21	14	05	40	27	04	05	01	02	01	40
2	Can not find time	08	04	02	14	11	01	01	01	-	-	14
3	Medicine not available	05	-	-	05	05	-	-	-	-	-	05
4	Prescribed one medicine only	01		-	01	01	-	-	-	-	-	01
5	Did not get complete relief	01	01	-	02	01	-	01	-	-	-	02
6	Found complete relief	05	02	01	08	01	02	004	01	-	-	08
7	Symptoms	-	-	01	01	01	-	-	-	-	-	01
8	Clinic is too far from home	01	-	01	02	01	-	01	-	-	-	02
9	Symptoms relapsed	01	-	-	01	01	-	-	-	-	-	01
10	Had gone away	01	-	02	03	02	01	-	-	-	-	03
11	Not satisfied with investigation	01	-	-	-	01	-	01	-	-	-	01
12	Told to go for yoga	01	01	-	02	02	-	-	-	-	-	02
13	Treatment not available	04	01	-	05	05	-	-	-	-	-	05
	TOTAL	**47**	**26**	**12**	**85**	**58**	**09**	**12**	**3**	**2**	**1**	**85**

25% random sample taken from a total of 340 drop-outs from a population of 641 registered at the clinic from this community.

TABLE - 7

Diagnosis of 1508 persons registered for ayurvedic care (March 1, 1997 to March 31, 1998)

Diagnosis	10-19 F	10-19 M	20-29 F	20-29 M	30-39 F	30-39 M	40-49 F	40-49 M	50-59 F	50-59 M	60-69 F	60-69 M
Total persons	163	90	173	67	211	68	186	64	141	65	118	74
Swasa	36	17	43	16	44	13	53	19	35	19	41	21
(%)	22.6	18.8	24.8	23.8	20.8	19.1	28.4	29.6	24.8	29.5	34.7	28.3
Kaasa	26	21	33	17	37	12	25	15	17	15	16	19
(%)	15.9	23.3	19	25.3	17.5	17.6	13.4	23.4	12	23	13.5	25.6
Pratishaya	21	12	7	2	2	3	-	-	2	-	-	-
(%)	12.8	13.3	4	2.9	2.9	4.4			1.4			
Agnimandya	66	32	56	24	64	20	61	18	41	17	36	17
(%)	40.4	35.5	32.3	35.8	30.3	20	32.7	28	29.1	26	30.5	22.9
Vibandha	68	34	58	30	72	26	56	19	46	16	39	22
(%)	41.7	37.7	33.5	44.7	34	38.2	30	29.6	32.6	24	33	29
Amlapitta	5	1	30	11	36	11	30	7	16	5	10	1
(%)	3	1.1	17.3	16.4	17	16.1	16.1	10.9	11.3	7.6	8.4	1.3
Sandhivata	14	7	48	7	70	11	75	13	58	18	44	3
(%)	8.5	7.7	27.7	10.4	33.1	16.1	40.3	20.3	41.1	27.6	37.2	4
Bhrama	12	5	37	6	57	3	41	4	36	7	31	16
(%)	7.3	5.6	21.3	8.9	27	4.4	22	6.2	25.5	10.7	26.2	21.2
Ghabrahat	10	4	39	3	48	3	39	4	34	9	29	16
(%)	6.1	4.5	22.5	4.4	22.7	4.4	20.9	6.2	24.1	13.8	24.4	21.2
Pradara	6	-	35	-	38	-	16	-	3	-	1	-
(%)	3.6		20.2		18		8.6		2.1		.84	
Raktavikara	14	4	8	3	11	4	4	1	2	1	2	-
(%)	8.5	4.5	4.6	4.4	5.2	5.8	2.1	1.5	2.4	1.5	1.6	-

TABLE - 7 *(Contd.)*

Diagnosis	70-79 F	70-79 M	80-89 F	80-89 M	>90 F	>90 M	Total F	Total M	Total
Total persons	44	27	11	4	-	2	1047	461	1508
Swasa	11	8	3	2	-	1	266	116	382
(%)	25	29.6	27.2	50		50			
Kaasa	6	5	2	2	-	1	162	107	269
(%)	13.6	18.5	18.1	50		50			
Pratishaya	-	-	-	-	-	-	32	17	49
(%)									
Agnimandya	13	7	3	1	-	-	340	136	476
(%)	29.5	25	27.2	25					
Vibandha	15	6	4	2	-	-	358	155	513
(%)	34	22.2	36.3	50					
Amlapitta	-	1	-	-	-	-	127	37	164
(%)		3.7							
Sandhivata	19	4	6	-	-	-	334	64	398
(%)	25.6	14.8	54.5						
Bhrama	9	2	-	-	-	-	223	43	266
(%)	20.4	7.4							
Ghabrahat	11	1	1	-	-	-	211	40	251
(%)	25	3.7	9						
Pradara	-	-	-	-	-	-	99	-	99
(%)									
Raktavikara	-	-	-	-	-	-	41	13	54
(%)									

TABLE - 8

Age-sex distribution of persons who received care under Yoga (March 1, 1997 to March 31, 1998.)

Months	10-19 M	10-19 F	20-29 M	20-29 F	30-39 M	30-39 F	40-49 M	40-49 F	50-59 M	50-59 F	60-69 M	60-69 F
March 97	4	2	1		1	5		3	1	1	2	1
April 97	2	3		1	1	2		1	1	1		
May 97	1	3				4		5	2			2
June 97		3		3			1			1	1	
July 97	1	2	5	2		1	1	1				
Aug 97	1	1	1			1	1					
Sep 97	1	1		1	1	2		1	1	1	1	2
Oct 97	1	2		1	1	1		1		1		
Nov 97			2			2	1		1		1	
Dec 97	1		3	1	1	1	2				1	

TABLE - 8 *(Contd.)*

Months	70-79 M	70-79 F	80-89 M	80-89 F	>90 M	>90 F	Total M	Total F	Total
March 97							9	12	21
April 97							4	8	12
May 97							3	14	17
June 97							2	7	9
July 97							7	6	13
Aug 97							2	3	5
Sep 97							4	8	12
Oct 97							6	2	8
Nov 97							2	5	7
Dec 97							3	7	10

TABLE - 9

Symptoms Diagnosis of persons who received care through Yoga (March 1, 1997 to March 31, 1998.)

Complaints	10-19 M	10-19 F	20-29 M	20-29 F	30-39 M	30-39 F	40-49 M	40-49 F	50-59 M	50-59 F	60-69 M	60-69 F
Breathlessness	4	5	1	4	4	1	1	6	3	2	3	2
Joint Pain	2	1		2	1	6		4	3	4	3	3
Bodyache	2	5		4	1	3		4	1	2		1
Backache	1	1	1	4	3	5	1	7	1	2	2	1
GIT	1	1	3	1	3		1	3			1	
Insomnia				1				2		1		
Headache	1	2	2	2	1							
Cold/Cough	1	4	1	2	1							
Rhinitis				1								
Tingling/Numbness		1		1								
Uterine prolapse				3		2		1			1	
Ghabrahat		1		2			1	2		1		1
Chakkar					1							1
Diabetes						1				1		
Obesity		4	2	1	1	2		1				
Hypertension									1	2		1
Spondylitis					1	2	1	2		1	1	1

TABLE - 9 *(Contd.)*

Complaints	70-79 M	70-79 F	80-89 M	80-89 F	>90 M	>90 F	Total M	Total F	Toal
Breathlessness							16	20	36
Joint Pain							09	20	29
Bodyache							04	19	23
Backache							09	20	29
GIT							09	05	14
Insomnia							-	04	04
Headache							04	04	08
Cold/Cough							03	06	09
Rhinitis							-	01	01
Tingling/Numbness							-	02	02
Uterine prolapse							01	06	07
Ghabrahat							01	07	08
Chakkar							01	01	02
Diabetes							-	02	02
Obesity							03	08	11
Hypertension							01	03	04
Spondylitis							03	06	09

TABLE - 10

Percentage of complaints for which persons were advised Yoga therapy (Yoga follow up survey)

Complaints	No. of persons	Percentage
Breathlessness	27	35.0%
Backache	14	23.3%
Bodyache	14	23.3%
Joint Pain	08	13.3%
Cold	06	10.0%
Headache	06	10.0%
Ghabrahat	04	8.3%

TABLE - 11

Persons referred to Yoga from different systems

System of medical care	Percentage
Allopathy	55.0%
Ayurvedic	26.7%
Allopathic+ayurvedic	15.0%
Allopathic+ayurvedic+massage	3.3%

TABLE - 12

Percentage of persons who have done Yoga at home

Yoga at home	Percentage
5 to 10 days	31.7%
10 to 15 days	15.0%
15 to 20 days	10.0%
More than 20 days	20.0%
Not a single day	23.3%

TABLE - 13

Age sex distribution of persons with different symptoms treated by massage

Complaints	10 to 19 F	10 to 19 M	20 to 29 F	20 to 29 M	30 to 39 F	30 to 39 M	40 to 49 F	40 to 49 M	50 to 59 F	50 to 59 M	60 to 69 F	60 to 69 M
Pain in neck	-	-	01	-	04	-	03	-	02	-	01	-
Pain in shoulder	01	04	01	-	15	01	08	-	02	02	02	04
Backache	03	02	25	07	36	07	42	08	35	10	27	08
Knee Joint	03	01	07	01	23	05	18	03	25	05	21	02
Ankle	02	-	03	-	01	02	02	-	03	-	03	01
Pain in limbs	-	04	10	-	09	01	12	01	07	03	09	01
Pain in hands	01	-	01	-	04	-	45	-	04	01	09	01
Chest Pain	-	-	-	-	01	-	-	-	-	01	-	-
Pain in ribs	-	01	01	-	02	02	01	-	01	01	-	-
Bodyache	01	-	-	-	-	01	-	-	01	-	-	01

TABLE - 13 *(Contd.)*

Age sex distribution of persons with different symptoms treated by massage

Complaints	70 to 79 F	70 to 79 M	80 to 89 F	80 to 89 M	90 to > F	90 to > M	T O T F	T O T M	T O T
Pain in neck	-	-	01	-	-	-	12	-	12
Pain in shoulder	-	03	-	-	-	-	29	14	43
Backache	14	03	05	-	01	-	188	45	233
Knee Joint	05	01	03	-	01	-	106	18	124
Ankle	01	-	-	-	-	-	15	03	18
Pain in limbs	05	03	03		-	-	55	13	68
Pain in hands	-	-	01	-	-	-	65	02	67
Chest Pain	-	-	-	-	-	-	01	01	02
Pain in ribs	01	-	-	-	-	-	06	04	10
Bodyache	-	-	-	-	-	-	02	02	04

TABLE - 14

Relief reported by persons receiving massage therapy.

Complaints	25%	25%	50%	50%	75%	75%	100%	100%	Total Relief	No Relief	No Relief	Total No Relief
	F	M	F	M	F	M	F	M		F	M	
Pain in neck	04	-	04	01	01	01	-	-	11	01	-	01
Pain in shoulder	12	03	09	07	03	04	07	-	45	-	-	-
Backache	66	15	53	24	11	06	-	-	175	51	08	59
Joint Pain	29	07	31	07	07	06	-	-	87	29	03	32
Pain in limbs	22	01	13	12	01	03	-	-	52	21	01	22
Pain in hands	06	-	06	02	02	-	-	-	16	09	-	09
Chest Pain	-	01	-	-	-	-	-	-	01	01	-	01
Pain in ribs	-	01	04	03	01	-	-	-	09	01	-	01
Bodyache	-	-	2	-	-	02	-	01	05	-	-	-
Grand Total	139	28	122	56	26	22	07	01	401	113	12	125

TABLE - 15

Different laboratory investigations and their results (March 1, 1997 to March 31, 1998)

Name of Investigation	Abnormal Findings	Normal Findings
Haemoglobin	88	10
ESR	101	37
DLC	42	22
Blood Sugar	1	12
Sputum AFB	14	13
Urine Routine & Microscopy	72	10
Total	**318**	**104**











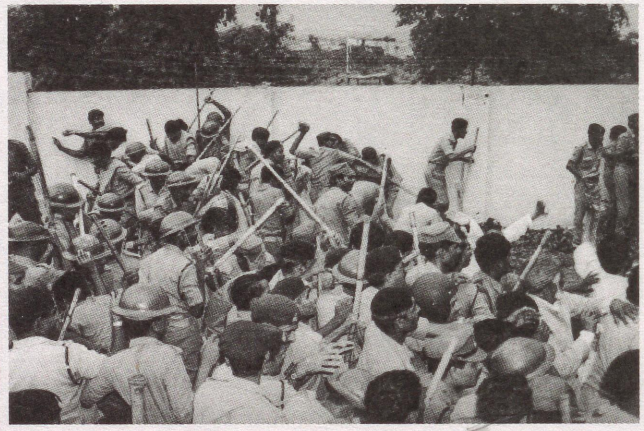



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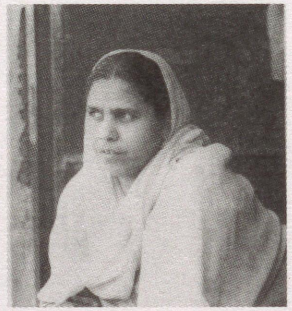

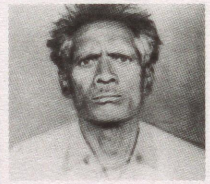

APPEAL

Thank you for reading these accounts of our work. Fourteen years after, global awareness of the disaster and its aftermath is still low, as ***Union Carbide continues its relentless efforts to bury historical memory.*** *But in Bhopal, the issue is very much alive; the deaths have not stopped for one single day, and the long-term effects of the gas are only now becoming apparent.* ***As important as the human toll in Bhopal is the significance that the tragedy has for the very future of technology on our planet. If we forget Bhopal, we are doomed to repeat it.*** *Every year sees more dangerous plants like the Carbide unit coming up in countries rich and poor around the world. The well-financed industrial lobbies that promote the death factories can be stopped in their tracks with two simple words : Remember Bhopal. If we keep Bhopal alive, we keep future generations of human beings alive.*

In this sense, Bhopal is everybody's business.

Unlike most nonprofit organisations, ***Sambhavna gets no corporate money, no large grants from foundations, no government assistance. It is built on the support of thousands of individuals like you.*** *This method of fund-raising can be tedious and occasionally frustrating, but in the long run, it ensures Sambhavana's total independence and integrity. We are not bound by any political agenda, and we have only one constituency.* ***We exist solely to serve the urgent needs of the survivors : for medical attention, for recognition and documentation of what they have suffered, and for ensuring that it never happens again.***

If you like to join the global Sambhavana family, here's what you can do. First, you can ***donate money,*** *to whatever extent you can afford. Second, you can* ***donate equipment.*** *The clinic is in urgent need of new or used medical equipment, to test and diagnose lung, neurological, opthalmic, and cardiac functions. Third, you can* ***donate your labor.*** *You can volunteer either by coming to Bhopal and working at the clinic, or you can raise awareness and funds in your own place, wherever you are.*

We can't do it without you.

- The Sambhavna Team

Yes

Yes,
I am a rabid optimist.
For me,
Every tree that continues to stand,
Every stream that continues to flow,
Every child that runs away from home,
Is an indication,
That the battle
is not only on,
It is being won.

Possibly you will tell me
about the nuclear arms race,
And all I can tell you
is that
An unknown child
held my hand
with love.

You will try to draw me
into the plateau of practical life
Tell me,
that not only God but all the religious
and irreligious leaders
are dead.
And all I can tell you
is that
Across the forest
lives a young man
who calls the earth
His mother

You will give me the
boring details of the rise of state power
after every revolution.
And all I can tell you
is that
in our tribe
we still share
our bread.

You will reason with me
And I will talk nonsense like this.
And because the difference between reason and poetry
Is the difference between breathing and living life,
I will read poems to you.

Poems full of optimism.
Poems full of dreams.
May be poems better than this.

- Sathyu

Sambhavna Trust, 44, Sant Kanwar Ram Nagar, Berasia Road, Bhopal

January 1999

Here is a copy of our recently published Annual Report. Fourteen years after the Union Carbide disaster many among the half a million people exposed to a deadly mixture of chemicals continue to suffer and die. The apathy of the Corporation and governmental neglect have contributed to the medical disaster that continues in Bhopal today. This report identifies some of the key factors responsible for the deteriorating situation with respect to medical care, research and health monitoring in Bhopal.

In the above context the report documents the work of the Sambhavna Clinic in providing free medical care to the survivors through modern medicine and ayurveda as well as drug free therapies such as yoga and massage. In the last two years we have been able to offer our services to more than seven thousand survivors with remarkable success among those who have not had any respite in the last several years. We also present accounts of our work in community health, health education, research and monitoring. Through our work we aim to present a workable model of appropriate medical response to the aftermath of the disaster in Bhopal.

As we mention in this report, all our funding and much of our activities are based on support by a large number of individuals. The production of this report has been possible through the generous support of a number of friends and the trust has not had to spend any of the monies meant for running the clinic. We would like this to happen next year too. So please send us a minimum contribution of Rs one hundred only towards the funds for producing next years report.

Most of all we request you to read it. It is quite a bit of reading, we agree, but we have had to include much information on the continuing aftermath because so little is commonly known. We will much appreciate your sending us suggestions for improving our work at the clinic as well as producing a better report next year. If you would like to help us through voluntary work either in Bhopal or elsewhere we would be more than happy to welcome you. Please visit http://www.bhopal.org for updates on the Bhopal disaster and the Sambhavna Clinic.

We look forward to hearing from you. Please do let us know if you would like us to send you more copies of this report. Good if you can send us addresses of individuals / organizations who may be interested to get a copy. Please help us in spreading the word on Bhopal.

We wish you a happy and meaningful new year.

The Sambhavna Team