FIELD PROJECT REPORTS

By

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(MAE- FETP Scholar 2002-2003)

Submitted in partial fulfillment of the requirements for the degree of

Master of Applied Epidemiology (M.A.E) of

Sree Chitra Tirunal Institute for Medical Sciences and Technology,
Thiruvananthapuram Kerala-695 011.

This work has been done as part of the two year Field Epidemiology Training Programme (FETP) conducted at

National Institute of Epidemiology,
(Indian Council of Medical Research),
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JANUARY 2004

CERTIFICATION

This is to certify that all the field projects submitted in this Bound Volume are original work carried out by Dr. Vinod Kumar Mehta during the two field postings of six months each under the guidance of faculty of National Institute of Epidemiology (ICMR), Chennai and the local supervisor specially nominated for this purpose. This is in partial fulfillment of the requirements for the degree of Master of Applied Epidemiology and has not been submitted earlier by him in part or whole for any other (Publication or degree) purpose.

Date: 29.1.04

DIRECTOR

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ACKNOWLEDGEMENT

Several dignitaries and institutions have extended their valuable time, advice and assistance to me during preparation of this thesis. I extend with gratitude my sincere thanks to:

Prof. M.D. Gupte, Director National Institute of Epidemiology (NIE), Chennai for his valuable guidance amidst his very tight schedule.

Prof. K. Ramachandran, Formerly Professor and Head of the Department of Biostatistics, All India Institute of Medical Sciences, New Delhi and presently Adviser to DG ICMR for Field Epidemiology Training Programme at NIE, Chennai for his valuable comments suggestions and advice.

Dr. Vidhya Ramachandran Assistant Director,NIE and MAE-FETP Course coordinator, for her close guidance and encouragement.

Dr. Rajesh Kumar Head of the Department Community Medicine PGIMER Chandigarh, Late Dr. Vijay Sood, Former Chief Medical Officer Shimla District, Dr.Rajender Mehta District Tuberculosis Officer Shimla, Dr RN Mahanta Deputy Director H&F.W.D Himachal Pradesh and other officials from State of Himachal Pradesh, for their constant advice as and when necessary at the field work

I will really do injustice if I do not mention several scientists and staff of NIE like Dr. R. Ramakrishnan, Assistant Director, Dr. T. Venkatarao Assistant Director, Dr P. Manickam Research officer, Dr. Suajata Chandersekran, WHO Consultant MAE –FETP at Chennai and Mr. S. Satish librarian and Uma Manoharan Secretary to the FETP for their constant support and guidance.

My family for bearing with me in this endeavor of hard work with patience.

Last but not the least all the respondents who very graciously spared me their valuable time and information in addition to extending their cooperation and generous hospitality, which rendered the entire research, endeavor a very memorable, pleasant and profitable experience.

Date **Vinod Kumar Mehta**

SECTION.1

FIRST

FIELD POSTING

1.1 HEALTH SITUATION ANALYSIS

HIMACHAL PRADESH

I. INTRODUCTION:

I had been working as Block Medical Officer in Block Nankhari District Shimla Himachal Pradesh prior to joining MAE course at NIE Chennai.I was an administrative officer for the health institutions falling under this Block and responsible for implementation of all the National programmes & providing health facilities at times of emergencies. Although I was looking after public health affairs of the Block I was not holding any public health degree so when I was given this opportunity I accepted it in order to increase my skills and efficiency.

After completing three months contact session at NIE Chennai I reported back for my duty at District hospital Shimla for my field assignments. Here I was attached with the District TB unit for further activities. Most of the time I am engaged in my field assignments and occasionally when requested I help in carrying out some of their activities.

II. OBJECTIVE:

1. To know the state as a whole & district Shimla in particular.
2. To know the health facilities available within the state & district so that in cases of epidemics no time is wasted in searching for the facilities available.
3. To understand the socio-cultural & disease profile of people of Himachal Pradesh.

III. METHODOLOGY:

III.1 Background information:

Himachal Pradesh is a land of scenic beauty with wide variation in altitudes, ranging from low hills to high mountains, a land studded with lakes, draped with flowing rivers, and where flora and fauna flourish in its forest. It is a land of fairs, festivals and folklores. The hilly state of Himachal Pradesh came into being as Union Territory on 15th April 1948 with integration of 30 princely states. In 1954 another princely state Bilaspur was merged with it. On 1st November 1966 after reorganization of Punjab, district Kangra, Shimla, Kullu, Lahaul & Spiti, & Nalagarh tehsil of Ambala, Una of Hoshiarpur and Dalhousie of Gurdaspur district were merged with it .It was granted full statehood on 25th January1971.The state is divided in to three Zones, 12District, 51 Sub Division, 75 Blocks, 3037Gram Panchayats having 16997 Villages.

III.A.I Geographic Profile

The state is located on the north-west of the country at latitude of 30°22'40" N to 33° 12'40"N and longitude of 75° 45'55" E to 79° 04'22"E. The altitude of state ranges from350 meters to 6975meters above mean sea level. The state has an area of 55,673Sq.Kms. It constitutes 1.69% of India's area and 10.54% of the Himalayan Land mass. This land locked state is bordered by Jammu & Kashmir in the North, Punjab & Haryana in the South West and Northern part of Uttaranchal in the South East. In the North-East the state forms the international boundary with the Tibetan part of China.Shimla, which once was the summer capital of India, now serves the state capital The state can be divided into four agro-climatic zones viz.: -

1. Sub-mountain low hills and valleys (sub-tropical)
2. Sub-humid mid hills and valleys (sub-humid)
3. High hills and interior valleys (wet temperate)
4. High hills (temperate dry zones)

The average rainfall varies between 500 mm in Lahaul & Spiti to more than 3400 mm in Dharamsala.

Out of 16997 villages in the state only 7867 are directly linked with the all weather roads. Total motor able road in the state is 20,270Kms out of which 7394Kms is mattled. Rail communication is restricted to only two narrow gauge lines connecting Shimla with Kalka (96Km) & Jogindernagar with Pathankot (113Kms) & one 16Kms broad gauge railway line from Nangal dam to Una.At present there are only three Airports namely Jubbar Hatti (Shimla) Bhuntar (Kullu) and Gaggal (Kangra) and about 54 operational helipads in the state.

Figure: 1 District map of Himachal Pradesh (HP)

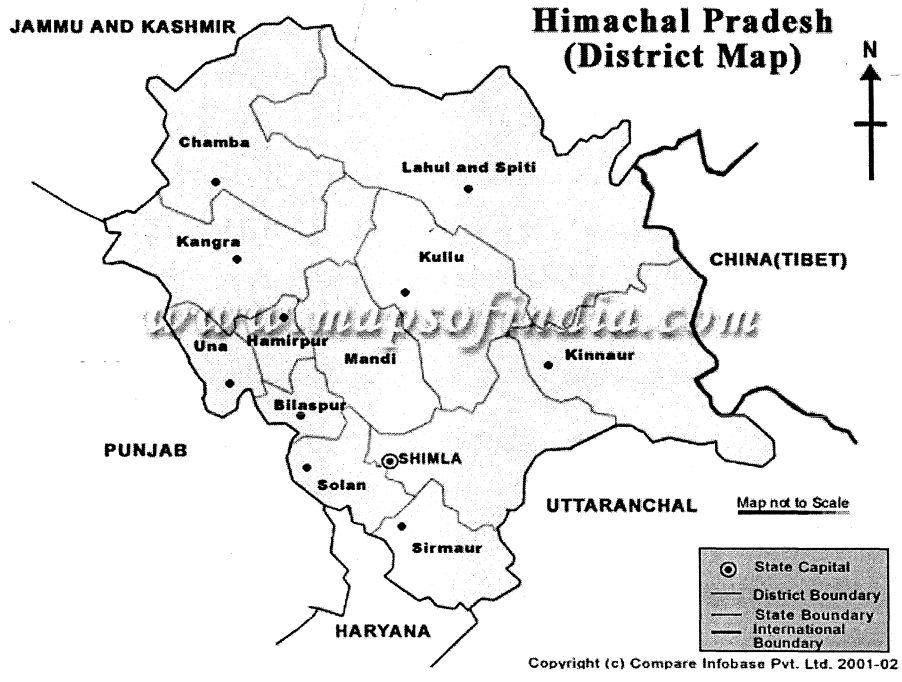
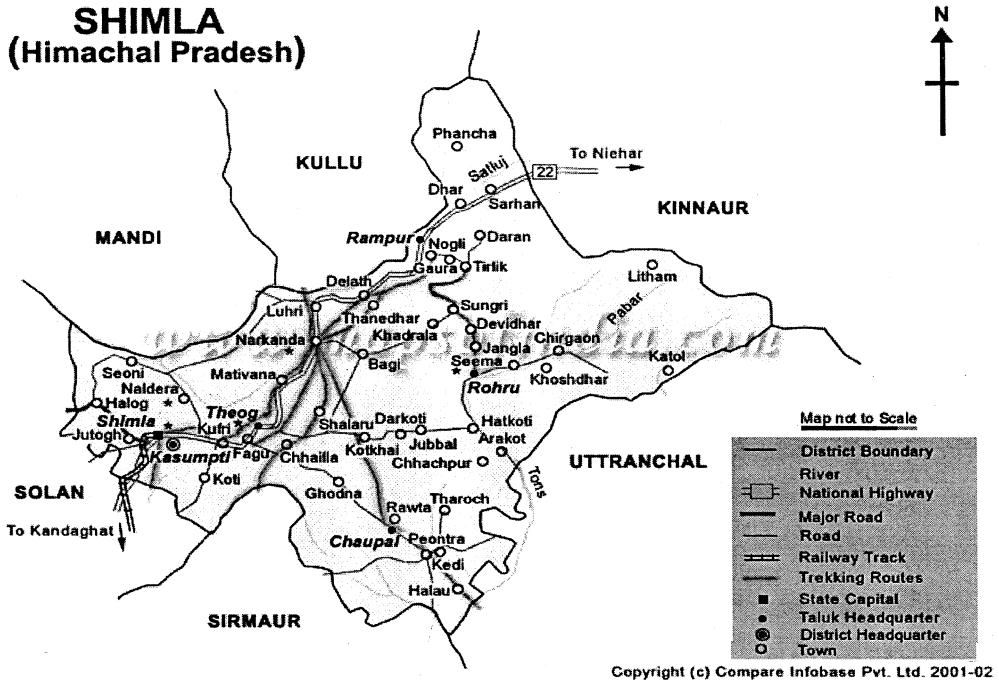


Figure: 2 District map of Shimla district HP



III.A.2. Demographic characteristics of Himachal Pradesh State & Shimla District: -

The demographic characteristics of Himachal Pradesh State & Shimla District are given in (Table 1). Almost 90% of the state resides in the rural area. Sex ratio is of particular concern in the Shimla district.

Table-1 Demographic characteristics of Himachal Pradesh State & Shimla District:

Characteristics	State (Himachal Pradesh)	District (Shimla)
Population:		
Urban	5,94,963	1,47,453
Rural	54,82,285	5,74,292
Total	60,77,248	7,21,745
Sex ratio per thousand males	970	898
Life expectancy at birth	63	N/A
Official spoken language	Hindi	Hindi
Birth rate	22.6	N/A
Death rate	7.7	N/A
Literacy rate:		
Males	86.02%	N/A
Females	68.08%	N/A
Aggregate	77.13%	79.68%

Source: Directorate of Health Services HP

Himachal Pradesh has a large area under tribal belt, which covers two districts of Lahaul & Spiti and Kinnaur & Bharmaur & Pangi Development Blocks of Chamba District. Geographically about half of the area of the state is covered under Tribal belt whereas the population here is just 2.2 lakhs i.e.4.2% of the total population of the state

III.B.3. Social Cultural Factors

The state has three well-defined eco-cultural zones, which are: -

1. The Tribal belt dominated by Buddhism and Tibeto-Burmese language of the Himalayan group.
2. The middle belt adjoining the Tribal areas, inhabited by communities following terraced cultivation, horticulture and some elements of pastrolism.
3. The lower areas are inhabited by communities practicing settled cultivation and animal husbandry.

The inhabitants of the latter two belts are mainly Pahari speakers, whereas in the first belt, only the Gaddis, Pangwalas, Gujjars, Sipis and some minor communities-including Swangala are Pahari language speakers. The rest speak a language akin to the Himalayan group of Tibeto-Burmese. Although the population is predominately Hindu, there is a sprinkling of Christians, Muslims, Sikhs, and Buddhists.

The institution of the village Gods is a remarkable one. There are between six thousand to ten thousand temples in the state. The Deities are personified and their images are taken out in wooden palanquins (Rath). The medium replies to the queries of the followers. Deities are made to dance in palanquins held by the bearers. Their impression and practice in middle and higher belts of the state are typical and impressive but in Shivalik region, there is no arrangement for this system and deities stay inside their shrines. Godlings dominate the social scenario in the villages and are believed to be the owner of sacred groves, forests and the village land. This institution of village Gods in Shimla, and elsewhere, in Himachal Pradesh has contributed to maintain the age-old traditions in a village society. The beliefs, myths, folklore, sacred goroves, system and feeling of social security are the manifestation s of

divine wish among the settlers in the region. This institution has contributed to the conservation of local cultural values.

On the basis of four indicators listed below Himachal Pradesh is one of the three leading, states in India

1. Life Expectancy: Kerala, Punjab, Himachal Pradesh
2. Literacy rate: Kerala, Maharashtra, Himachal Pradesh
3. Sex ratio: Kerala, Himachal Pradesh, Tamilnadu
4. Lower BPL %age: Punjab, Haryana, Himachal Pradesh

III.A.4. Economic & Occupation

As per 1991Census, 34.41% of the total population of the Pradesh is classified as mainworker's, 8.42%marginal workers and the rest of 57.17% as non-workers. Of the main workers, 63.25% are cultivators and 3.30%agricultural labourers, 1.43%are engaged in household industries and 32.02%in other activities.

Total Employment of Himachal Pradesh up till 1st January 1998

1. Regular: 123626
2. Work Charged: 21039
3. Daily paid: 54983
4. Contingency paid: 7242

Agriculture is the main occupation of the people, contributing 35.87% towards the state gross domestic product. Apple cultivation is of special significance for the economic emancipation of the people living in the higher hills of the state. With stone and citrus fruits growing sub-tropical and sub-humid areas, the state is known as Fruit Bowl of India. Crops like wheat maize &pulses are grown here. Agriculture production is 16,lac tons per year and horticultural production is 4.36lac tons.

The total employment in the state as on 31-12-2000 was 3.03lakhs both, in the public & private sectors. The number of unemployed persons (live register of all the employment exchanges) is at 9.11lakh (November 2001).

Due to large rural population and hostile geographic and weather conditions, the state is still economically backward. On the basis of a survey for poverty (1998-99) 27.59% of the total households are below the poverty line. According to quick estimates based on 1993-94 series, the per capita income at current prices of Himachal Pradesh in 2000-01 is at Rs. 18920.

IV. METHODOLOGY:

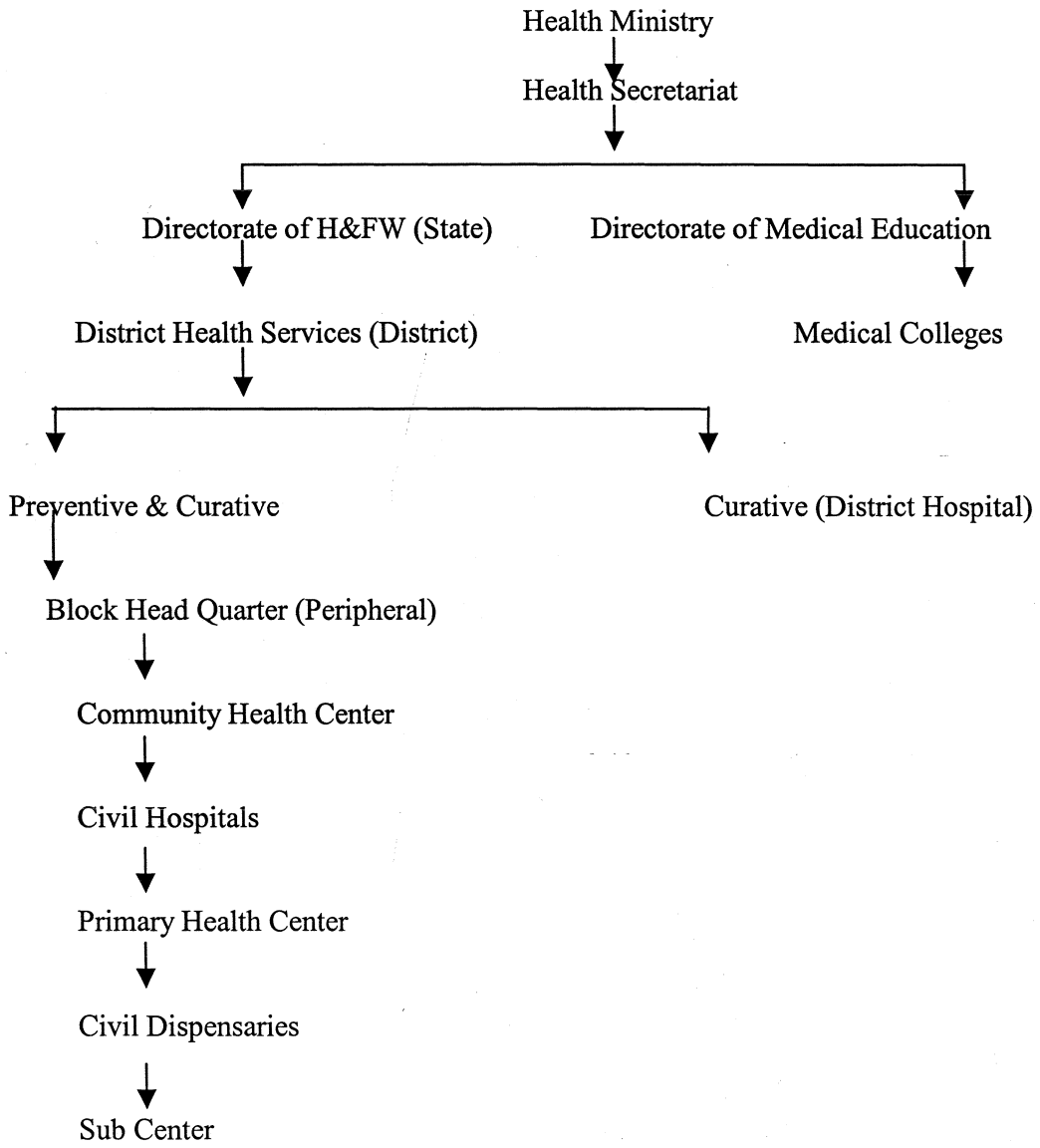
To obtain the information on existing health facility in district Shimla, I visited the various level of institution to obtain the available secondary data and held informal discussions with the officials. Sources of data were:

1. Annual Report on the working of the registration of births and deaths act, 1969 for the year 2000
2. Himachal Health Vision 2020
3. Economic Survey 2002 Himachal Pradesh.
4. Family Welfare Programme Year Book 1999-2000
5. State of the Environment Report Himachal Pradesh March 2000.

V. STATE OF HEALTH SERVICS IN HIMACHAL PRADESH:

V.A1. Organizational structure of the health system in Himachal Pradesh:

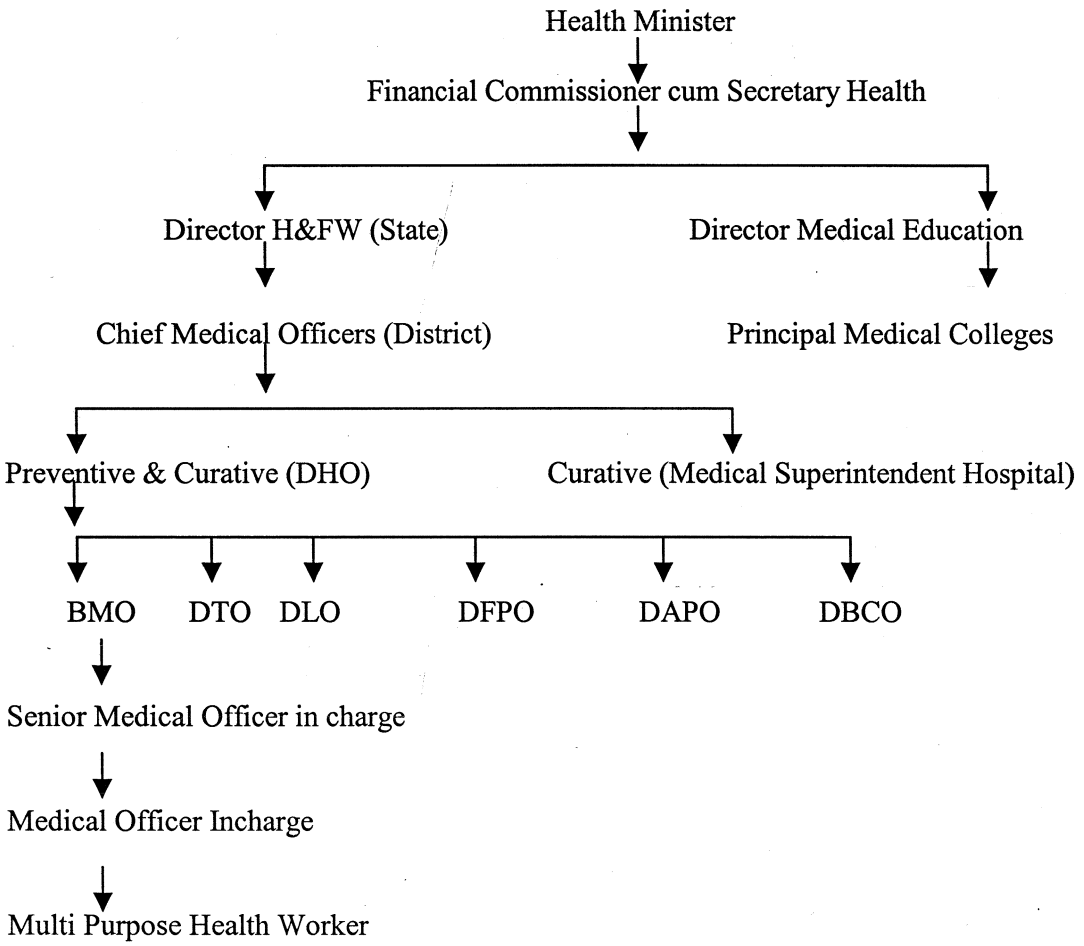
Structure of Health Services in Himachal Pradesh



V.A2.Health Manpower Profile:

Health manpower profile of Shimla district as per the available sanctioned report and as per posts filled reflects gross manpower shortage especially in nursing, pharmacist, laboratory technicians, and multi purpose health workers categories (Table 2)

Organogram of Health Services in Himachal Pradesh



BMO (Block medical officer) DHO (District health officer) DTO (District tuberculosis officer) DLO (District leprosy officer) DFPO (District family planning officer) DAPO (District AIDS programme officer) DBCO (District blindness control officer)

Table: 2 Staff position in Health & Family Welfare Department: on 31-3 2001

Category	State			Shimla District		
	Sanctioned	In Position	Vacant	Sanctioned	In position	Vacant
Medical Officers	1498	1369	129	222	175	47
Staff Nurse	1433	1107	326	179	97	82
Female Health Worker	2210	1974	236	318	268	50
Male Health Worker	2005	1437	568	264	205	59
Sr.Lab.Technicians	634	471	163	95	46	49
Lab. Assistants	169	115	54	12	-	12
Pharmacists	934	750	184	156	81	75
Radiographers	189	142	47	26	19	7
Ophthalmic Assistant	145	95	50	18	11	7
OT Assistant	97	76	21	9	6	3
Male Health Supervisor	413	384	29	19	13	6
Female Health Supervisor	350	347	3	29	24	5

Source: Directorate of Health services HP.

V.A3. Health Manpower Population Distribution: The distribution of health manpower in district Shimla on the population basis is given (Table)

Table: 3 Health Manpower –Population Distribution Profile

Indicator	State	District Shimla
Number of Doctors per persons	4439	4124
Number of Staff Nurses per persons	5490	7440
Number of Pharmacist per persons	8103	8910
Number of Health Worker per persons	1782	1526
Number of Laboratory technician	12903	15690

Source: Directorate of health services HP.

From the above table it is clear that there are still many vacancies with regard to categories like Medical Officer, Staff Nurses, Health Workers, Pharmacists, and Laboratory Technician at the state as well as district Shimla level.

These officers at different levels are responsible for a variety of jobs. The Ministry is responsible for framing & developing the various health programmes in the state. Secratory health is responsible for implementing the Ministry decisions as well as appointing authority for Doctors. Directorate health services is concerned with getting decisions implemented by the Districts and reporting the activities above and downwards. Chief Medical Officer heads the district & is responsible for implementing various programmes in his district. In the process he is helped by the various programme officers and Block Medical Officer is responsible for the Blocks. These programme officer are responsible for implementing their respective programmes in the District and maintaing their records. They are responsible for transmitting the data both ways that is to the State HQ and to the peripheral Blocks thus developing a networking between the State HQ and the peripheral units for reporting and other activities. At the Tehsil level & the sub-tehsil level are the Block HQ which is headed by the BMO under whom are the civil hospitals, community health centers, PHC, Civil Dispensary & sub-centers. The most peripheral worker is the MPW i.e. multipurpose health worker who is the peripheral unit of health manpower responsible for actual implementation of all the National Programmes.

V.A4. Health Infrastructure:

The difficult hilly terrain and limited resources has not deterred the state in attempting to solve the problem of accessibility by establishing and locating health institutions as close to the people as possible. The position as on 31st March 2001 is as under.

Table: 4 State of health institutions in HP state and Shimla district (2002)

Place	Hospitals	CHC	PHC	CD	ISM Inst.	Sub-centers	No. Of Beds
Shimla	11	6	55	31	149	259	2097
State	50	65	304	155	1153	2068	8797

Source: Directorate of health services HP.

In addition to above there are two Leprosy Hospitals, two Tuberculosis Hospitals, two Medical Colleges and three Dental Colleges, besides there are civil Dispensaries which are run by different departments

From the above table we can say that distribution of institutions per persons at the State & District level is as following:

Table: 5 Distribution of health institutions according to population in HP state and Shimla district (2002)

Name of Institution & Indicator	State	Shimla
	Persons per Institution	Persons per Institution
Hospitals	1,21,545	65,613
Community health centers	93,496	1,20,291
Primary health centers	19,991	13,123
Civil Dispensary	39,208	23,282
Sub –Centers	2939	2787
Indian System Of Medicine Institutions	5270	4844
Persons per Bed	691	344
Total Persons per Treating Institution excluding Sub-centers	3519	2864
Total Persons per Treating Institution including Sub-centers	1601	1412

Source-Directorate of health services HP.

Buildings:

The status of health institutions regarding their location in Government and Private or other premises on 31st March 2000 is shown in table (6):

Table: 6 Locations of Health Institutions

Health Institution	Total	In Government buildings	Other Premises
CHC	65	54	11
PHC	304	165	139
CD	155	80	75
Sub-Centers	2068	1167	907

Source: Directorate of heath services HP.

V.A5. Indian System of Medicine:

The state has shown keen interest in promoting Indian System of medicine, especially Ayurveda that is widely popular, acceptable and affordable system for the people of the state. There is a separate department for ISM&H in the state .The ISM institutions as on 1-1-2000 were:

1.	Ayurveda College	1
2.	Ayurvedic Hospital	22
3.	Ayurvedic Dispensaries	1112
4.	Unani Dispensaries	3
5.	Homeopathic Dispensaries	14
6.	Panchkarama Unit	2
7.	Amchi Clinic	4
	Total	1156

The total Bed capacity in the department of Ayurveda is 410.

V.A6. Private Sector:

This is a fast developing sector in the state now. A large number of private clinics, nursing homes have sprung up mainly at Shimla and other District towns. A few private hospitals have been set up at sub- division level. Total Bed capacity of private sector in the State is about 500.

V.A7. NGO & Voluntary Sector:

NGO and Voluntary sector is not providing curative services in the state so far. However one free hospital is being set up in District Hamirpur by a charitable organization.

V.A8. Health Services Utilization:

Distance from nearest Health Facility:

According to NFHS-1 (1992), median distance of a sub-center and PHC is 3.5& 6.9 Kms. respectively. Percent distribution of villages according to distance from the nearest health facility in Himachal Pradesh is shown in the following table:

Table: 7 Distance from the nearest health facility.

Distance	Sub-Center	PHC	PHC or Sub-Center	Hospital	Dispensary/Clinic	Any health Facility
With in village	14.9	3.3	17.8	-	14.5	28.8
Less than 5Kms.	44.5	23.4	51.6	-	51.1	55.7
5-9 Kms.	17.6	35.5	22	18.8	21.7	14.2
10Kms.	13.5	38.6	8.4	63.3	10.6	1.3
Median Distance (Kms.)	3.5	6.9	2.9	15.9	3.5	2.2

Source: Directorate of health services HP.

According to figures available on 30 June 2000 maximum radial distance covered by a sub-center, PHC, and CHC are 2.93, 7.66 and 16.51Kms. respectively.

VB. HEALTH VITAL STATISTIC:

V.B1. Child Care:

Childcare is best measured by two indicators i.e. infant mortality rate and child mortality rate. Given below is the account of various child indicators as estimated by NFHS-1 and 2:

Table: 8 Vital rates for children

Indicator	NFHS-1 (1992-93)	NFHS-2 (1998-99)
Infant Mortality rate/1000	56*	34**
Neo-natal Mortality rate/1000	34.2	22.1
Peri-natal Mortality rate/1000	21.7	12.3
Child Mortality rate/1000	14.1	8
Under Five Mortality rate/1000	69.1	42

Source: NFHS-I&II *SRS estimate (63) ** SRS estimate (64)

Going by the SRS estimates, the state IMR is less than that of the country (72). It was 63 in 1992 and than showed an upward trend to 64(1998 SRS) and has remained their for last five years.

V.B2. Morbidity profile of ten major diseases in Himachal Pradesh for the year 1998

Currently the population of Himachal Pradesh suffers from the following communicable & non-communicable diseases:

1. Respiratory problems like bronchitis, TB, and acute respiratory infection in children's.
2. Water and food borne diseases like diarrhea, dysentery, Amoebiasis, worm infestation, hepatitis, and enteric fever.

3. Contact diseases such as reproductive tract infections, sexually transmitted diseases including HIV/AIDS and skin diseases.
4. Among the non-communicable diseases of cardio-vascular system, dental problems, cancers, diabetes mellitus, nutritional disorders visual impairment caused by cataract form the disease burden at present.
5. The state is prone to road accidents due to its terrain and poor road conditions. Every year a large number of persons get killed and disabled due to accidents. Facilities for trauma care is limited to district /zonal hospitals only since diagnostic and management facilities exist only at these levels, resulting in delayed treatment of injured.

Table: 9 Morbidity profile of top ten major diseases in Himachal Pradesh for the year 1998

Disease	Number of Cases	Prevalence per thousand
Acute Bronchitis	3,37,915	56.54/1000
Anemia	3,12,070	52.21/1000
Chronic Bronchitis	2,30,620	38.58/1000
Dental Diseases	2,23,139	37.33/1000
Gastroenteritis	1,83,301	30.67/1000
Skin Diseases	1,88,610	31.56/1000
Tonsil, Adenoids	1,29,536	21.67/1000
Wound, Injuries	1,30,153	21.78/1000
Ill defined Intestinal Infection	1,02,504	17.15/1000
Amoebiasis	1,02,785	17.20/1000
Total	19,45,633	325.53/1000

Estimated Mid year population of HP year 1988: 5976788

Source: MIS H&FWD H.P.

V.B3. National Health/Disease Control Programmes In Shimla District

State is providing promotive, preventive, curative and rehabilitative health services to people. Specific public health problems are being managed through implementations of national health programmes, which are as follows:

1. Reproductive and child health programme.
2. National Aids control programme.
3. National Tuberculosis programme.
4. National Leprosy control programme.
5. National programme for prevention of Blindness.
6. National anti-Malaria programme.
7. National Iodine deficiency disorders programme.
8. School health services programme.

VI. OTHER SECTORS LINKED WITH HEALTH:

VI.A.1 ICDS:

The state is covered under ICDS scheme and all the 72 Blocks are providing the defined package of services to children and pregnant women through7123 Anganwadis.In Simla district number of anganwadis are837, which comes to 862 persons being served by each anganwadi on an average. The projects have contributed immensely in improving the health of the beneficiaries i.e. women and childrens. These anganwadis are helping in:

- To weigh each child every month, record the weight in graphs on the growth cards, use referral card for referring cases of mother /children to the sub-center/PHC etc, and maintain child cards for children below six years.
- Top carry out quick samples census of all the families especially mothers and children's in those families in their respective area of work.
- To organize non-formal activities in an anganwadi for about 40 children in the age group 3-6 years of age and helping designing and making of toys and play equipment of rural character and origin for use in anganwadi
- To organize supplementary nutrition feeding for childerns0-6 years and expectant and nursing mothers.
- To provide health and nutrition education to mothers
- To assist the PHC staff in the implementation of health component of the programme viz. immunization, healths check –up etc.

VI.A2 Irrigation & Public Health:

Out of the total 45,367 habitations, 58.91% habitations are fully covered and 30.96% habitations are partly covered with piped drinking water supply. About 10% habitations are yet to be covered. The position of rural water supply has further improved with the installation of hand-pumps, but only in villages situated on the road heads. In rural areas of Himachal Pradesh 80% drinking water is provided through "gravity water supply scheme" which is frequently contaminated due to pollution in the catchment areas. There is no regular system of chlorination of water sources. A good indication of this problem could be the frequent occurrence of gastroenteritis in Himachal Pradesh which is a still a major public health problem.

Natural water bodies like rivers, khads, nallahs, lakes etc. are vital sources of drinking water supply and they are frequently exposed to contamination through pollutants on account of increasing urbanization, industrialization and tourist activities in the state. Presently the method adopted for water purification is building storage tanks where chlorination is done and sedimentation is allowed and then sent by pipes for domestic consumption.

VI.A3. Education department:

According to 2001 census Himachal Pradesh has a literacy rate of 77.13%. Male /Female differentials in literacy are wide in the state .As against 86.02% literacy rate for males; it is 68.08% for females. Detail of educational institutions in the state are as following up to December 2001:

Table: 10 Number of School in H.P. State and District Shimla

Name of Institution	State	District Simla
Primary School	10633	225
Middle School	3188	156
High/ Senior Secondary School	1514	65
Colleges	37	8

Source: Education directorate HP

VI.A4. Social Welfare & Welfare of Backward classes:

The Welfare department of the state is engaged in socio-economic and education uplift of scheduled caste, scheduled tribes, other backward classes, infirm, handicapped, orphans, children, widows, destitutes, poor children and women etc. The following schemes are being implemented under social welfare programme.

1. Social Welfare: Under this scheme pension is provided to those person who are 60 years old and above @ 150Rs.per month & has none to support them & their annual income does not exceed Rs.6, 000.
2. Women Welfare: Major schemes are as under
    a) Construction of state homes for destitute women's and wayward girls/women.
    b) Construction of working women hostels.
    c) Marriage grants to destitute girls.
    d) Women Development Corporation with a view to provide financial assistance to women for various trade purposes.
3. Welfare of handicapped:

    a) Artificial limb to handicapped with full assistance to those whose income is less then1200 Rs. & half assistance whose monthly income is between Rs.1201 to Rs2500.
    b) Handicapped scholarship to encourage handicapped children for education.
    c) Marriage grant for handicapped.
    d) Self-employment scheme for handicapped.
4. Welfare of Scheduled Caste/Scheduled Tribes and other Backward Classes:
    a) Award for intercast-marriage @25000/- per couple is given as incentive money.
    b) Housing Subsidy up to Rs.10, 000 per family in snowbound areas and up to 8000 per family in other areas for house construction purposes.
    c) Compensation to victims of atrocities on Scheduled Castes families.

VII. DISCUSSION –COMMENTS –RECOMMENDATIONS:

VII.A. Discussion:

Morbidity profile of top ten major diseases of the state for the year 2001 identifies four major groups of diseases. They are:

1. Respiratory diseases
2. Water and food born diseases
3. Dental diseases.
4. Injuries and wounds.

VII.A1. Respiratory diseases:

Respiratory disease, which includes tonsils & adenoids, acute and chronic bronchitis form the major causes of morbidity. Shimla being a hilly terrain with an altitude ranging from 300 meters to 3000 meters experiences extreme climatic conditions. Warm weather in a year is for 2-3 months only. People usually stay indoor and cook and eat in a small room with little ventilation. This clustering of people in small room that is kept warm, favors the transmission of respiratory diseases infection that usually spreads in the form of aerosols. Moreover people in the villages still depend upon fuel wood for cooking as well as warming the rooms.

As 90% of the population resides in the rural areas, smoke produced by these may be another risk factor for prevalence of respiratory diseases in highest numbers. Inadequate treatment for acute conditions and chronic exposure to the risk factors leads to the prevalence of chronic diseases in such large numbers.

VII.A2. Water and food born diseases:

This is second largest cause of morbidity in the state. Natural water bodies like rivers, khads, nullahs, lakes and springs etc. are vital sources of drinking water supply. They are frequently exposed to contamination through pollutants during rainy seasons and winter as the tanks made for storage of water at the source are washed by the rains or disrupted because of the landslides or the pipes are frozen and broken at various places leading to contamination of

the drinking water and possible explaining the prevalence of diseases caused by water in such high numbers. Practiceing unhygienic sanitary habits like outdoor defecation in the cultivable lands, washing hand with mud after defecation and the most important is the ignorance about the mode of spread of these diseases are all possible risk factors.

VII.A3. Dental Diseases:

Poor oral hygiene is the possible explanation for high prevalence of such diseases. The prevalence for the year 1998 was 37.33/1000.

VII.A4. Wound & Injuries:

Hilly terrain forces people to climb up and down for their livelihood. This exposes them to occupational injuries. Possible causes are slippery and narrow tracks, land slides, distant places of work, and poor means of communications.

VII.A5.Skin diseases:

The climatic conditions are extreme with severe winter for five months and rainy season for four months forcing people to stay indoors clustered in a small room, which favors spread of skin diseases. As proper personal hygiene is not practiced may be because of extreme cold and lack of awareness the skin diseases have a high prevalence (1998 31.56/1000). Adhoc treatment in the form of self-medication and traditional beliefs and taboos also favors the spread of these diseases. Lack of specialized care at the block and sub-divisional level also contribute to the prevalence of skin diseases in such large number.

VII.B. Comments and Recommendations:

There are many factors that influence the quality of health services, morbidity and mortality of people residing in the state of Himachal Pradesh. Some of them can be identified as following:

1. Distribution of the primary health care facilities is uneven. Of the 2922 Gram Panchayats, 400 are with out primary health care facilities.

2. There is no urban primary health care setup in the state resulting in over-crowding in zonal, district and sub-district hospitals.

3. Uneven distribution of health manpower's: PHC & CHC remain without prescribed number of medical officers and supporting staff. Institutions located in comfortable areas are better staffed than those in rural and remote areas. This results in undue referrals and delayed treatments.
4. Human Resource development: There is a need of continuous medical education (CME) and in service training of existing health manpower at different levels of the system.

5. The existing primary health care facilities are under utilized because of ill-defined referral system. The secondary and the tertiary care centers, as a result are overcrowded. Herby diluting their effectiveness as they have to perform the dual role of primary & secondary or tertiary health care level.

6. Health Management and Information System: It has yet to be fully developed and established in the State. Efforts in this direction are being mobilized by the state at different levels particularly in context to the communicable diseases surveillance activities.

7. Private Sector: There is a need to establish a mechanism to ensure non- government health institutions deliver quality care of desired level. There is a need for a dialogue between the private and public health sectors to avoid / reduce duplication of efforts and wastage of resources.

8. NGO and voluntary sectors are still in infancy in the state.

9. The state Government has provided drinking water supply to approximately 90% villages and all urban areas. The quality of water however needs to be kept under surveillance at pre-ensured acceptable standards to prevent water born diseases, as they are the second largest cause of morbidity in the state.

10. Sanitary facilities: They are meager in the state at present. This area needs urgent strengthening if disease burden due to Helminthes and intestinal protozoa is to be reduced.

11. Issues related to epidemiological- demographic transitions requiring urgent attention:
    a. Increase in age and prevalence of chronic diseases in the form of non-communicable diseases: Increase in the population of elderly people have resulted in increase in prevalence of Geriatric ailments including isolation and neglect of old.
    b. Reproductive health of population: Gender issues affecting women resulting sexual exploitation, rape, domestic violence, unwed mothers, harassment of women at working places, and off course widow related continuing problem.
    c. Life style related problem:
        - Risky Behaviors: Teenage problems like premarital sex and its consequences e.g. teenage pregnancy, and increasing incidence of Reproductive Tract Infections /Sexually Transmitted Diseases/, and HIV AIDS.

- Drugs addiction: Increase in smoking, drug addiction, and alcoholism, which is unfortunately, on the increase, both between adolescent and adults in all parts of the state.
- Misuse of technology: X-rated Internet surfing and long hour telephoning etc.

VIII. CONCLUSION:

The major strategies for improving health of people, which can be adopted, are

1. Educating the communities for adopting responsible health care practices,
2. Seeking prompt medical attention when needed.
3. Provision of graded referral system by the State that is with in the reach of communities through primary, secondary, and tertiary institutions.
4. Developing partnership with non-government organization and private-practioners,
5. Functional integration of Indian system of medicine with health services.
6. Inter-sectoral co-ordination for health with other departments.
7. Greater utilization of information technology.

Although efforts to improve health of the people of the state are in progress a lot still remains to be done if the present morbidity and mortality are to be reduced.

1.2 LABORATORY FACILITIES, SHIMLA DISTRICT, HIMACHAL PRADESH
-A Critical Assessment

I. INTRODUCTION:

High quality laboratory services are essential in our health care system both for providing the basis for clinical decisions and monitoring the etiological agents. Timely and accurate laboratory report is essential for disease surveillance and control programme. It forms a backbone for these two components. Before an outbreak laboratory supported surveillance, allows early detection of cases. It is crucial for identifying and limiting public health diseases spread and ultimately there by reducing the rates of preventable morbidity and mortality. It has become the basis on which the current disease treatment, prevention, and control programmes are based upon.

II. OBJECTIVE:

The aim of carrying out this study is: "existing laboratory facility in district Shimla"

1. To assess the existing laboratory infrastructure in the district and their capacity for laboratory diagnosis of diseases of Epidemic potential.
2. To establish net working linkage & partnership for effective outbreak management.

III. METHODOLOGY:

To obtain the information on existing laboratory facilities in district Shimla I visited the various levels of institutions to obtain available secondary data there. Secondary data were obtained from Primary health centers, Community health centers, Civil hospital, District hospital and Medical College situated in the district.

IV. DETAIL OF LABORATORY SUPPORT IN THE DISTRICT

There are all together 46 sanctioned laboratories in the district of which only 24 are functional. Details are as follows:

Table: 1 Distribution of Laboratory institutions in District Shimla Himachal Pradesh by Health Institution Care Facilities.

Institutions	Sanctioned	Functional
Primary Health Center	32	11
Community Health Center	05	04
Civil Hospital	07	07
Referral Hospital	01	01
District Hospital	01	01
Total	**46**	**24**

Source: Directorate of health Services HP

The Laboratory facilities available with in District Shimla from sub-center to District level are covering15690 peoples per Laboratory. At District there is a Medical College to further strengthen the health facility. But at present only 24 laboratories out of 46 laboratories are functional that is only 52% are rendering services to the people. 46-laboratory technician out of the sanctioned 95 are in position making 48% manpower available to do the work, thus hampering almost 50% employment.

The staff pattern in these laboratories is as below:

1. Primary Health Center – One Laboratory Technician.
2. Community Health Center - Two Laboratory Technician
3. Civil Hospital - Two Laboratory Technician
4. District Hospital - One Microbiologist
   - Twelve Laboratory Technicians

IV.A1. Facility at Primary Health Center.

Now if we look at the type of test done we see that at the peripheral health system that is the primary health center it is doing only routine hematological test &staining for acid fast bacilli of tuberculosis & malarial parasite. The figures taken from this institution for one month is as below i.e. 1st August to 31stAugust: (Annexure-1)

1. Total number of patients examined in the laboratory = 96
2. Hematology plus Biochemistry = 9
3. Sputum for Acid Fast Bacilli = 10
4. Malarial Slides = 77

IV.A2. Facility at Community Health Center level:

At the community health center level apart from the routine hematological some biochemistry is also done. The figures for one community health center for the type of test done there monthly is as below i.e. 1st August to 31stAugust:

1 Total number of patients examined in the laboratory = 639
2 Hematology plus Biochemistry = 419
3 Sexual Transmitted Disease Test = 85
4 Sputum for Acid Fast Bacilli = 40
5. Malarial Slides = 95

On average 25 tests are being done daily on working days. Universal precautions are being followed in the form of using gloves, aprons, mask, bleaching powder, goggles etc. Supplies are annually & sometime even on demand. The district authorities do repair of the equipment. Except for the national programmes no reporting is done. No orientation training is given in general but National programme specific trainings are held.

IVA.3 Facility at Civil Hospital level:

At the Civil Hospital level figures for one month are as below i.e. 1st August to 31stAugust:

1	Total number of patients examined in the laboratory	= 817
2	Hematology plus Biochemistry	= 440
3	Sexual Transmitted Disease Test	= 136
4	Sputum for Acid Fast Bacilli	= 226
5	Malarial Slides	= 15

On an average 31 test are being done here daily on working days. Universal precaution and other activity are same as at the community health center level. Here Rogi Kalyan Samiti's have been formulated where nominal charges have been fixed for the various tests undertaken in the hospital. This money is being used for repair of equipment & procurement of the reagents as and when required. They are also having the annual supplies as the community health centers.

IV.A4. Facility at District Hospital level:

At the District level figures for one month are as below i.e. 1st August to 31stAugust:

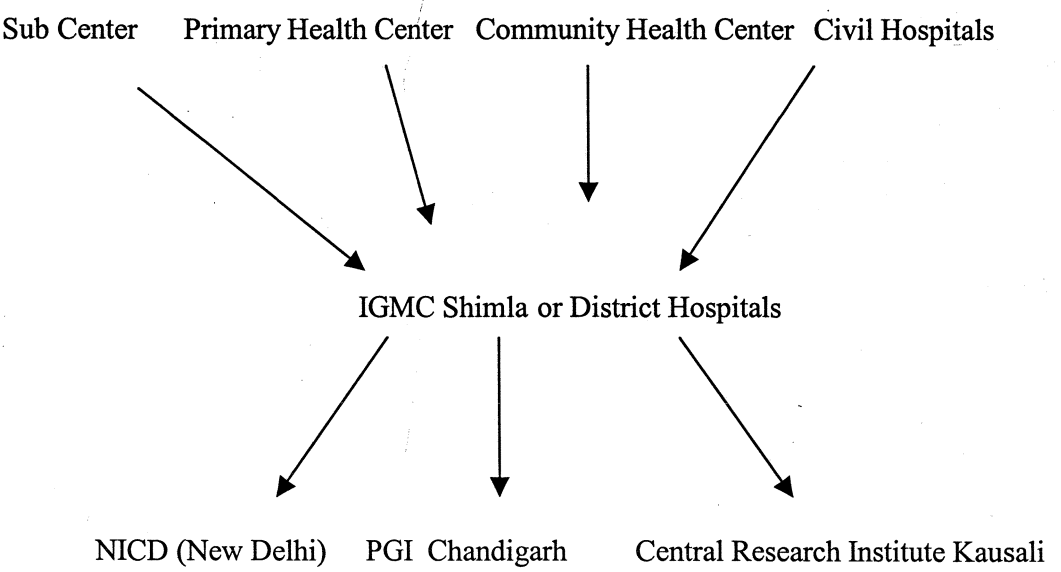
1	Total number of patients examined in the laboratory	= 7175
2	Hematology	= 2761
3	Biochemistry	= 1075
4	Microbiology	= 1983
5	Body Fluids	= 30
6	Sexual Transmitted Disease Test	= 453
7	Sputum for Acid Fast Bacilli	= 687
8	Malarial Slides	= 186

On an average 276 test are being done here daily on working days. Other activities are same as the Civil Hospital.

At the Medical College level except for the Virus culture and isolation as well as the Fungus all other test are being carried out. The highly specialized tests like PCR technique and DNA finger Printing are not available with in the District or State. No quality checks procedure are being followed at any level. At the Medical College level they do have the internal quality check to some extent by means of supervision by the qualified Microbiologist, Bio-chemistrian & the Pathologists on regular intervals.

Details of type of tests performed at various levels are as given as annexure - 1.

Flow Diagram Of Samples and test Results in the District



IGMC- Indra Gandhi Medical College Shimla
PGI –Post Graduate Institute Chandigarh

V. DISCUSSION-COMMENTS & SUGGESTIONS:

A clinical laboratory plays an important public health role especially during epidemics outbreaks. A laboratory is the one that can quickly provide the information needed to develop appropriate treatment policy for the said outbreak. In Himachal Pradesh in particular Shimla district we had an outbreak of Plague in February 2002.Which was effectively controlled but it gave us a caution to improve our laboratory facility. To start with we have to:

1 Identify the diseases of epidemic potential in the state:
The Diseases of epidemic potential in the state as well as in the District are given in the following table:

Table: 2 Diseases of Epidemic Potential in the District with availability of confirmatory test

Diseases	Confirmatory Test	Test available
Plague	Demonstration of plague bacilli	Yes
Hepatitis	Serology for Hepatitis A, B, C, D, & E.	Yes
Cholera	Stool culture & cholera toxin test	Yes
Gastroenteritis & Water quality	Chlorination test & colony count & rapid test for fecal contamination	Yes
Enteric fever	Rapid diagnostic test & blood culture	Yes
Malaria	Thick & thin slide	Yes
Tuberculosis	Demonstration of AF Bacilli &culture	Yes
Measles	Kit for Measles IgM antibody	
Dengue	IgM test for Dengue	**No**

Source: Directorate of Health Services HP

Now if we look at the diseases in the table except for malaria and tuberculosis all other diseases test are not available in the periphery that is at the primary health center

and at the community health center. The facility for diagnosing diseases like Plague, Cholera, Gastroenteritis & water quality exist only at the Medical College only. At present in the state we do not have facility for culturing and isolating viral diseases. Hence steps should be taken to improve in the lab testing capabilities of the peripheral laboratories by providing rapid diagnostic kits

2 Ensure the diagnostic kits availability for these diseases in our laboratories.
At present our laboratories are equipped with only performing routine test. They have to be upgraded for performing test for epidemic potential diseases both in skill and from equipments point of view. Also an action plan for mobilization of resources from district laboratory to peripheral laboratory should be kept ready which can be used at times of emergency. For diseases like Measles and Dengue for which no diagnostic kits are available in the state at present efforts may be made to procure rapid diagnostic kits and made available at the district headquarters as we know as these diseases are of high outbreak potential

3 Train laboratory technician for effectively identifying these pathogens.
   a. Provide laboratory modules for easy access in performing these test
   b. Provide orientation training at regular basis.

4 Ensure the quality control procedures & programmes in our laboratories.

5 Provide building facility and ensure utility services by the community.

6 Ensure safety measures in the laboratories and post exposure prophylaxis's to the people working in our laboratories. Ensure Segregation of hazardous laboratory waste and its proper disposal to prevent environmental pollution and spread of infection.

7 Develop rapid & effective communication & dissemination of the laboratory information generated to the concerned by use of the modern electronic media at all levels.

8 As the state do not have any facility for identification of virus an understanding with National Institute Of Virology may be undertaken and help the early detection of viral diseases to prevent its morbidity and mortality.

To strengthen the existing laboratory facility in the state of Himachal Pradesh, National Surveillance programme for communicable disease have been started in three districts. They are, District Hamirpur, Solan & Shimla. The objective of the programme is to:

1 Capacity building at district, regional and state level for disease surveillance and implementation of the programme through existing health infrastructure.
2 Training of Medical and Para-Medical personnel.
3 Up-gradation of Laboratory services for confirmation of diagnosis.
4 Communication and data processing system for rapid transmission of information.
5 Strengthening basic entomological services.

Establishment of suitable Laboratory support will achieve:

a) Early detection of cases.
b) Reduction in morbidity.
c) Reduction in mortality.
d) Reduction in associated economic loss.
e) Effective control.

One Regional Laboratory at Indira Gandhi Medical College Shimla has been established to provide referral support for the laboratories. For the test not available in the state networking is being done with following institutions:

1 Central Research Institute Kassuli located in Himachal Pradesh.
2 Post Graduate Institute Chandigarh.
3 National Institute of Communicable Disease New Delhi

The laboratory back up of District Shimla HP have the infrastructure available to investigate an Epidemic from the epidemiological view but at present there is a shortage of trained manpower and equipments. These laboratories are having adequate, conveniently located space so the quality of work, quality control procedures, safety of its personals and patient care services are not compromised. All laboratories personals reasonably expected to have direct contact with body fluids have received education on, precautionary measures to be taken, mode of transmission and prevention of Human Immuno Deficiency Virus and Hepatitis B Virus and application of universal precautions to their work practices. Universal precautions are being strictly implemented in view of hazardous work being done there. The National Institute of Epidemiology & ICMR group of institutions can help in providing training to the state health personnel's in developing the skills of the health professionals and they're by strengthening the existing infrastructure.

Conclusion:

Plans are underway for strengthening the laboratory back up of district Shimla under NSPCD and it is expected to full-fill the existing gaps in s the laboratory back up off district Shimla

Annexure –1 Various type of laboratory test available in the district institutions

S.No.	Type of Test	PHC	CHC	Civil hospital	District hospital	Medical college
1	**Hematology:**					
	Hb, TLC, DLC, ESR.	Yes	Yes	Yes	Yes	Yes
	Platelets Count	-	-	-	-	Yes
	Bleeding Time	-	Yes	Yes	Yes	Yes
	Blood Grouping	Yes	Yes	Yes	Yes	Yes
	Clotting Time	-	Yes	Yes	Yes	Yes
	Prothrombin Time	-	-	-	-	Yes
2	**Biochemistry:**					
	Blood Sugar	Yes	Yes	Yes	Yes	Yes
	Total Protein	-	-	-	-	Yes
	Albumin/Globulin	-	-	-	-	Yes
	Total Billurubin Conjugated / Non-Conjugated	-	Yes	Yes	Yes	Yes
	SGOT	-	-	Yes	Yes	Yes
	SGPT	-	-	Yes	Yes	Yes
	Creatanine	-	Yes	Yes	Yes	Yes
	Urea	-	Yes	Yes	Yes	Yes
	Electrolytes	-	-	-	-	Yes
	Uric Acid	-	Yes	Yes	Yes	Yes
	Lipid Profile	-	-	-	-	Yes
	Thyroid Function Test	-	-	-	-	Yes
3	**Body Fluids:**					
	Biochemistry	-	-	-	-	Yes
	Cytology	-	-	-	-	Yes
	Culture	-	-	-	-	Yes
4	**Microbiology:**					
	Urine: Routine & Microscopic Examination	Yes	Yes	Yes	Yes	Yes
	Stool: Routine &Microscopic Examination	Yes	Yes	Yes	Yes	Yes
	Pregnancy Test	Yes	Yes	Yes	Yes	Yes
	Widal Test	-	Yes	Yes	Yes	Yes
	VDRL Test	-	Yes	Yes	Yes	Yes
	Gonnococus/Trichomonosis	-	Yes	Yes	Yes	Yes
	Semen Analysis	-	Yes	Yes	Yes	Yes
	Hepatitis Marker	-	-	-	-	Yes
	ASO Titer	-	-	-	-	Yes
	RH Factor	-	-	-	-	Yes
	C Reactive Protein	-	-	-	-	Yes
	Elisa	-	-	-	-	Yes
	HIV (screening test for aids)	-	-	-	-	Yes
5	**Staining:**					
	AFB ZN Staining	Yes	Yes	Yes	Yes	Yes
	Malarial Parasite	Yes	Yes	Yes	Yes	Yes

	Albert's stain for Diphtheria	-	-	-	-	Yes
	Grams Stain	-	-	-	Yes	Yes
6	**Pathology:**					
	Histopathology	-	-	-	-	Yes
	Cytology	-	-	-	Yes	Yes
	FNAC	-	-	-	-	Yes
	Pap Smear	-	-	-	-	Yes
	Bone Marrow	-	-	-	-	Yes
7	**Cultures:**					
	Bacteria: Aerobic& Anaerobic	-	-	-	-	Yes
	Viruses RNA & DNA	-	-	-	-	-
	Fungs	-	-	-	-	-

1.3 DESCRIPTION OF EXISTING DISEASE SURVEILLANCE SYSTEM HIMACHAL PRADESH.

I. INTRODUCTION

Disease Surveillance has assumed a greater importance in the last two decades because of emerging (HIV/AIDS Lassa Fever) and reemerging infections (Plague, Cholera, Dengue, Hepatitis, C, E,) and also because of non-communicable diseases (Cancer, Trauma, etc.). Various pathogens responsible for causing diseases like Tuberculosis, Malaria, Cholera, Pneumonia have developed resistance to antibiotics thus adding to the existing burden. In Himachal Pradesh burden of infectious diseases continues to be high. Although in the last five decades the State has come a long way in providing health services to its people, much still remains to be done. To achieve this proper planning and coordinated implementation, of programmes is necessary. This in turn requires an effective database. The available data is inadequate and incomplete

A sensitive Surveillance system help in bridging this gap. An efficient surveillance system forms the backbone for effective control of communicable diseases. A disease surveillance system is also essential for priority setting, resource mobilization and allocation, prediction and early detection of epidemics, monitoring and evaluation of disease prevention and control programmes. The distribution and spread of disease can be documented from surveillance data. Surveillance information provides a direction to health officials as to where the problems lie, whom they affect, where resources could be directed and preventive actions taken.

Disease surveillance system is thus a critical component of health system, providing essential information for optimal health care delivery and effective health strategies. In the absence of surveillance, diseases may spread un-recognized by health functionaries.

In the state of Himachal Pradesh three type of surveillance system exists.

1. A surveillance system for all vertical disease control programme.
2. Sentinel surveillance exists for HIV-AIDS control programme
3. National Surveillance Programme for Communicable Disease (NSPCD) has been established in two district of Himachal Pradesh since 1999.The NSPCD has just been initiated in district Shimla since 2002 as a aftermath of the Plague outbreak of February 2002.

It is there fore proposed to describe each of the above three diseases surveillance system operating in Himachal Pradesh in brief. With respect to the vertical surveillance control programme surveillance activities for one disease i.e. Tuberculosis will be described in detail.

II. OBJECTIVE:

The objective of this project is to:

(1) Describe critically the, three different Disease Surveillance System existing in the state.

(2) Identify the strengths and existing gaps in each system.

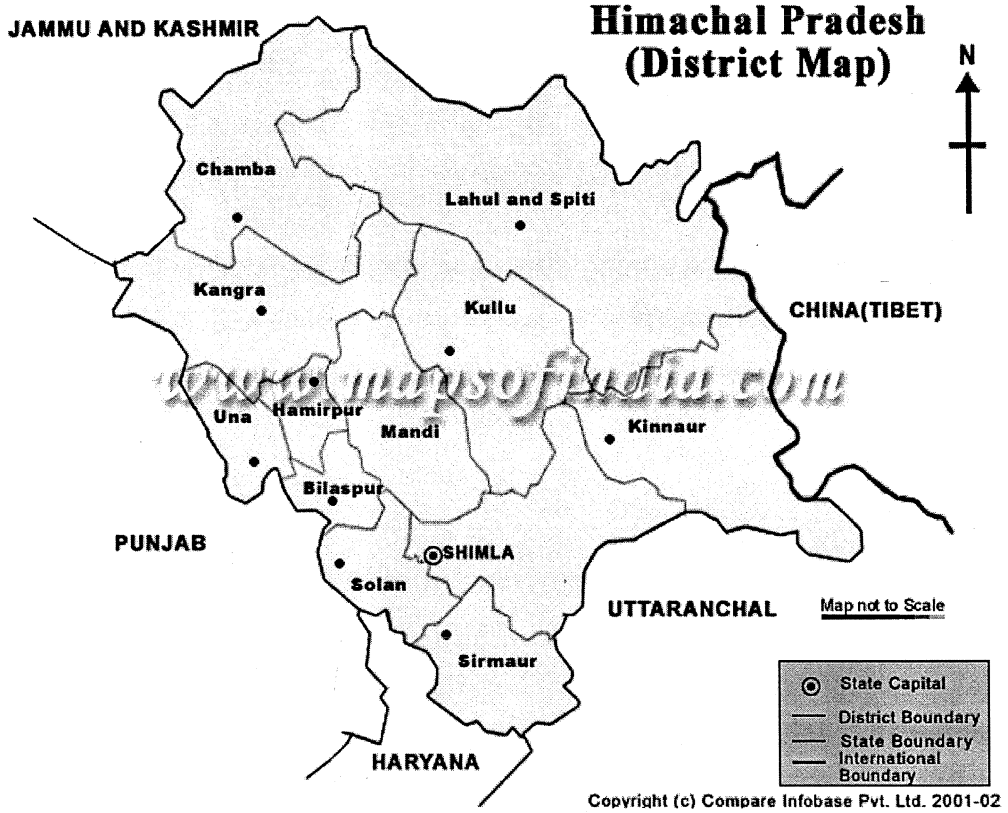
(3) Suggest appropriate remedial measures to bridge gaps identified and sustain positive attributes.

III. METHODOLOGY:

Description of existing surveillance system was done by:

1. Visiting various levels of health institutions and gathering the required information by going through their reports and records.
2. Informal Discussion with the health personal at the Directorate level, District level, Block level, Community Health Center level, Primary Health Center level and at the Sub-Center level.

III. AI. Background information of Himachal Pradesh:



The H.P. is located on the north-west of the country with altitude ranging from350 meters to 6975meters above mean sea level. The state has an area of 55,673Sq.Kms. It constitutes 1.69% of India's area. This land locked state is bordered by Jammu & Kashmir in the North, Punjab & Haryana in the South West and Northern part of Uttaranchal in the South East. In the North-East the state forms the international boundary with the Tibetan part of China.

The H.P. has a population of 60,77,248 (2001 Census) density of population is 109 persons per sq km. It ranges from 2 in district L&S to 369 in Hamirpur district. Majority of population is rural i.e. 91.3%. Most of the villages have population less than 500.

Himachal Pradesh has a large area under tribal belt, which covers two district of Lahaul & Spiti and Kinnaur and two parts of Chamba Districts namely Pangi and Bharmaur development block. Geographically half of the area is covered under tribal belt whereas the population is just 2.2 lakhs i.e. 4.2% of the total population. The sex ratio is 970 females per 1000 males (2001 census). Literacy rate of the state is 77.13%(M=86.02%F= 68.08% which is higher than National average of 65.38%.State has been divided into 12 Districts, 51 Sub-Divisions, 75 Development Blocks, 3037 Gram Panchayats and 21118 villages.

III.A2. Health Infrastructure:

The state has a developed fairly extensive network of health institutions. In addition to Allopathic institutions, health care is provided by large number of ISM institutions. The position of allopathic and ISM institutions, as on 30.6.2002 is below: -

Hospitals	CHC	PHC	CD	ISM Inst.	Sub-centers	No. Of Beds
50	66	303	156	1156	2068	8797

III.A3. Private Sector:

Private health institutions (18) are also coming up in the state now. There are good number of Private Hospitals, Nursing homes, and private clinics with indoor facilities, mainly in Shimla and other district towns. Few private hospitals have been set-up in semi urban areas. Services provided by private institutions are of questionable quality. Total Bed capacity of private sector in the State is about 500.

III.A4. Population Covered by Health Institution: -

On an average on sub-centre covers the population of 2698 (GOI Norm=3000), Primary Health Centre, 18412 (GOI norm being 20,000) CHC is serving more than one lack population. Majority of the Community Health Centers /Block level Primary Health Centers are linked with telephone.

III.A5. Manpower

Staff position in Health & Family Welfare Department: on 31-3 2001

S.No.	Category	State		
		Sanctioned	**In Position**	**Vacant**
1	Medical Officers	1498	1369	129
3	Female Health Worker	2210	1974	236
4	Male Health Worker	2005	1437	568
5	Sr.Lab.Technicians	634	471	163
6	Lab. Assistants	169	115	54
7	Pharmacists	934	750	184
11	Male Health Supervisor	413	384	29
12	Female Health Supervisor	350	347	3

IV.A. SURVEILLANCE SYSTEM FOR VERTICAL/ NATIONAL DISEASE CONTROL PROGRAMME:

IV.A1. Since Independence several measures have been taken by the government of India to improve the health status of its people. Among these measures the National health programmes are the prominent and they have been launched for the control / eradication of communicable diseases. A brief account, of these programmes which are currently, in operation in the state of Himachal Pradesh is as following.

1. Reproductive and Child health Programme having following components.
    a. Family Welfare.
    b. Maternal Health.
    c. Child Health.
    d. Adolescent Health.
    e. Reproductive Tract Infection's.
2. Revised National Tuberculosis control Programme
3. National Leprosy Eradication Programme.
4. National Programme for Control of Blindness.
5. National Anti-Malaria Control Programme.
6. National Iodine Deficiency Disorders Control Programme.
7. National Aids Control Programme.

Data is collected for the above-mentioned programme passively in the form of monthly/Quarterly reports. These reports start from sub center level where a multi purpose health worker does the job. The Multipurpose Health Worker who is in charge of the most peripheral health Unit Sub-Center is generating the data in a form of monthly report. A sub-center is catering to the population of 5000-3000 and at difficult terrains it is even catering to the needs of 500-300 populations. In a Sub-center one male and one female health worker is posted. They are responsible for the health of the population, which is under their sub-center. They do the touring of their area provide the basic treatment for minor ailments & immunization against the vaccine preventable diseases. They maintain the household &family register by doing the survey of their sub-center area & take part in all the national programmes &activities.

IV.A2. SOURCE OF DATA:

Sources are the weekly, monthly, quarterly and annual repots that are being submitted to the state headquarter.

- **WEEKLY REPORTS:**
    1. Weekly report of cases and deaths due to Cholera and Plague.

2. Weekly report of cases and deaths due to Meningococcal and Meningitis.
3. Weekly report of AFP Surveillance cases.

- **MONTHLY REPORTS:**

1. Monthly report under Twenty Point Programme.
2. Monthly report under CNAA in Form No.9.
3. Monthly report on cases and deaths due to communicable diseases*
4. .Monthly Patients treated report
5. Monthly report of cases and deaths due to Gastroenteritis.*
6. Monthly Snake-Bite report
7. Monthly Dog-Bite report
8. Monthly Poliomyelitis report*
9. Monthly report of x-ray's and screenings done in the Institutions.
10. Monthly report under National Programme for Control of Blindness
11. Monthly Surveillance report under Anti Malaria Programme*
12. Monthly progress report under I.D.D. Control Programme
13. Monthly report under TB Control Programme*
14. Monthly report under School Health Programme
15. Monthly Progress report of STD (Etiological based)*
16. Monthly Progress report of STD (Syndrome based)*
17. Monthly Progress report under Leprosy Control Programme*
18. Monthly report of Births and Deaths under Civil Registration Systems
19. Monthly report under PFA Act.
20. Monthly MTP Report.

(* Reports concerning disease surveillance)

- **QUARTERLY REPORTS:**

1. Quarterly report of Tubectomy Operations Performance
2. Quarterly report of Conception after sterilization operations.
3. Quarterly report under TB Control Programme*

4. Quarterly training report National AIDS Control Programme *
5. Quarterly IEC report

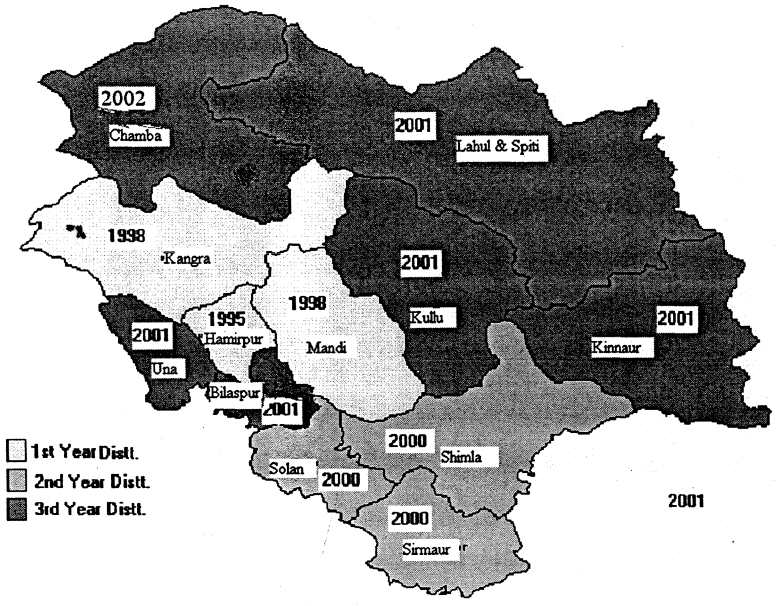
- **ANNUAL REPORTS:**
  1. World Health Organization report based on I.C.D X^{th} Revision
  2. Annual General Administration Report.
  3. Annual report Twenty Point Programme
  4. Annual report on updating of Eligible Couples.
  5. Annual report on Demographic Characteristics of Family Planning Acceptors.
  6. Other Annual reports as required under various National Health Programme

Now I will take up Revised National Tuberculosis control Programme for tuberculosis and explain it in detail:

IV.A3. Revised National Tuberculosis control Programme:

RNTCP was implemented in Himachal Pradesh in phased manner. Of the twelve districts Hamirpur was the first District to take up the activity in 1995, followed by Kangra and Mandi in 1998. These three districts are collectively called as 1^{st} year district. Shimla, Solan and Sirmaur have started service delivery from 1^{st} July 2000. These three districts are collectively called as 2^{nd} year districts. Out of remaining six (collectively called as 3^{rd} year districts) districts Lahul and Spiti, Una and Kullu have started service delivery from first quarter of 2001and Bilaspur in the 2nd quarter of 2001.Kinnaur and Chamba has also started service delivery in December 2001 and January 2002 respectively.

Status of RNTCP implementing District in HP



IV.A3.1. Objective of the RNTCP programme:

1. Achieve > 85% cure rate in all new smear positive pulmonary patients. For this no active survey is recommended. Strategy is to examine all symptomatic presented to health system for routine checkup and it is recommended that district should be able to achieve minimum 85% cure rate in total diagnosed new sputum positive patients.
2. Detect 70% of cases once the >85% cure rate is achieved. This is the second objective and recommended to achieve; once the district is sure about the quality of service to the people after achieving 85% cure rate.

To achieve the above said objective the strategy identified under the RNTCP programme is:

1. Political and administrative commitment to ensure funds, staffing, procurement and contracting as necessary.
2. Diagnosis primarily by Microscopy among patients attending all health facilities.

3. Uninterrupted supply of good quality drug for short course chemotherapy.
4. Direct observation of treatment at a time and place convenient to patients by a trained observer who is accountable to the health system
5. Accountability: an intensive system of monitoring and supervision that tracks the diagnosis, progress and outcome of each and every patient treated.

IV.A3.2. Case Definition:

- **Pulmonary tuberculosis, Smear-positive**

Tuberculosis in a patient with at least 2 initial sputum smear examinations (direct smear microscopy) positive for AFB,

Or: Tuberculosis in a patient with one sputum examination positive for AFB and radiographic abnormalities consistent with active pulmonary Tuberculosis as determined by the treating Medical Officer,

Or: Tuberculosis in a patient with one sputum specimen positive for AFB and culture positive for Mycobacterium tuberculae.

- **Pulmonary tuberculosis, Smear-negative**

Tuberculosis in a patient with symptoms suggestive of Tuberculosis with at least 3 sputum examinations negative for AFB, and radiographic abnormalities consistent with ctive pulmonary Tuberculosis as determined by an Medical Officer, followed by a decision to treat the patient with a full course of anti-tuberculosis therapy,

Or: Diagnosis based on positive culture but negative AFB sputum examinations.

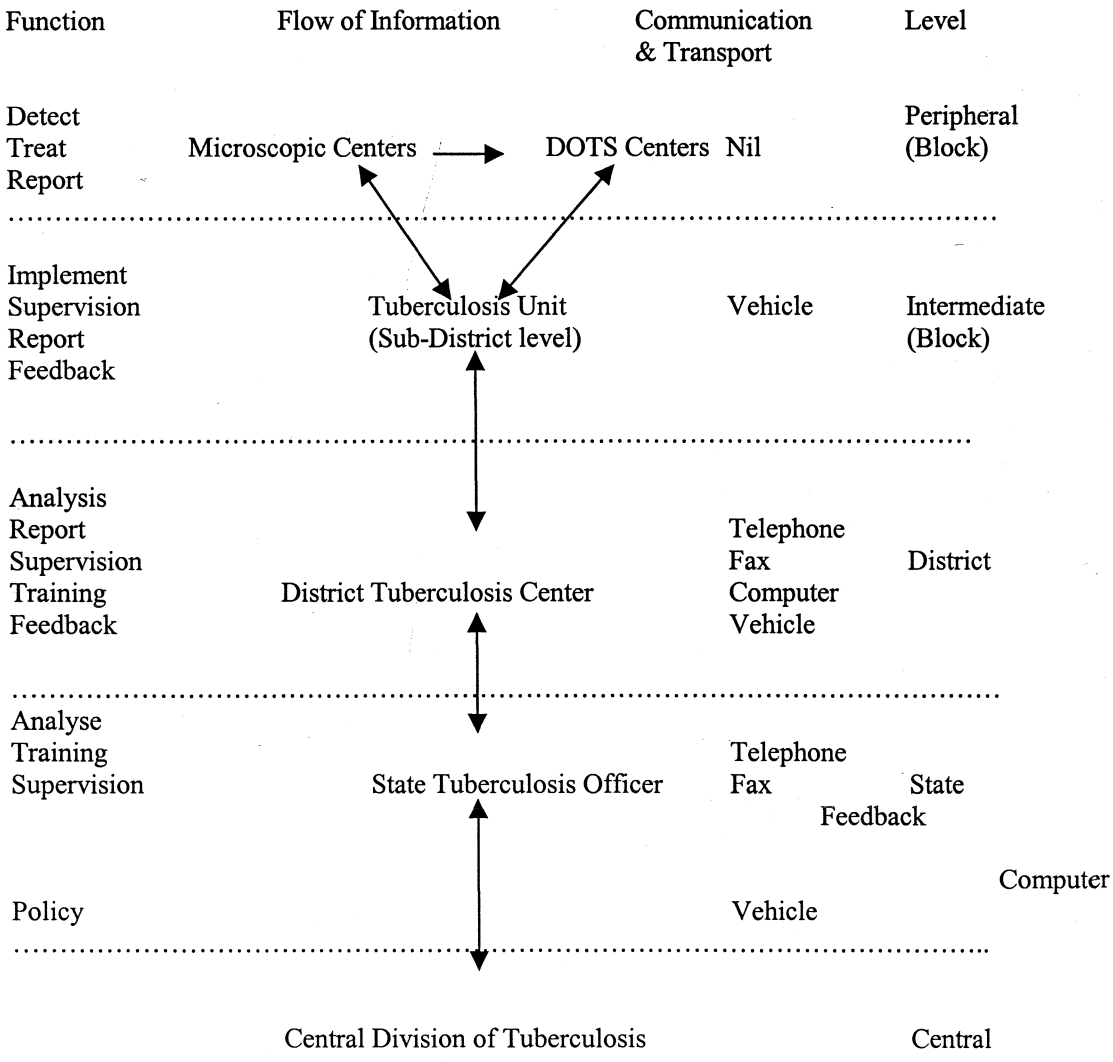
- **Extra-pulmonary tuberculosis**

Tuberculosis of organs other than the lungs, such as the pleura (TB pleurisy), lymph nodes, abdomen, genitourinary tract, skin, joints and bones, tubercular meningitis, tuberculoma of the brain, etc are classified as extra pulmonary tuberculosis.

Diagnostic criteria:

Diagnosis should be based on one culture-positive specimen from the extra-pulmonary site, or histological evidence, or strong clinical evidence consistent with active extra-pulmonary Tuberculosis followed by a Medical Officers decision to treat with a full course of anti-Tuberculosis therapy. Pleurisy is classified as extra-pulmonary Tuberculosis. A patient diagnosed with both pulmonary and extra pulmonary Tuberculosis should be classified as pulmonary Tuberculosis.

IV.A3.3 Flow of Information, Task Orientation & communication



Peripheral Level:

DOTS (Directly Observed Treatment Short Course chemotherapy) is the key word of RNTCP to ensure cure, in which a trained peripheral Health Worker watches as patient swallows all the medicines in his/her presence. Under RNTCP, patients diagnosed in health-care facilities with cough lasting ≥3 weeks; undergo three sputum smear examinations over a 2-day period at the Microscopic Center. If all three smears are negative for acid-fast bacilli (AFB), 1-2 weeks of broad-spectrum antibiotics are prescribed. If two but not all of the specimens are positive, or if a patient with negative smears continued to have symptoms after 1--2 weeks of broad-spectrum antibiotics, a chest radiograph is taken, and if indicative of disease, the patient is treated for Tuberculosis. All TB treatment is given three times weekly on alternate days; During the first 2 months of treatment (intensive phase), patients are treated with isoniazid, rifampicin, pyrazinamide, and ethambutol (streptomycin is added for re-treatment patients, and ethambutol is omitted for smear-negative, non-seriously ill patients); every dose is observed directly by either a health-care provider or a non-family community member or a volunteer. For the remaining 4--6 months of treatment (continuation phase), isoniazid and rifampicin or isonizaid, rifampicin, and ethambutol are prepared into weekly packs, and at least the first dose of each week is observed directly. To prevent drug shortages during TB therapy, medications for both phases of treatment are maintained in individualized patient boxes containing the entire course of treatment for a given patient at the health facility or residence of the community volunteer providing DOTS. Case finding is Passive detection by means of a patient-friendly and clinically efficient service based primarily on smear microscopy.

Intermediate level

A team comprising a specifically designated MO-TC, STLS and STS is based at a sub-divisional level. The team constitutes the Tuberculosis Unit, and the STS and STLS are under the administrative supervision of the DTO. The sub-district covers a population of approximately1.5 Lakh. The sub-district is responsible for accurate maintenance of the

Tuberculosis Register and timely submission of quarterly reports along with monitoring and supervision at the TU level.

District level

The district is the key level for the management of primary health care. The Chief Medical Officer is the principal health functionary in the district and is responsible for all medical and public health activities including control of TB. The District Tuberculosis Centre (DTC) is the nodal point for TB control activities in the district and also functions as a specialized referral Centre. The **District Tuberculosis Officer** at the DTC has the overall responsibility of the Programme at the district level and is assisted by an MO, Statistical Assistant and other paramedical staff.

State level

At this level, a **State Tuberculosis Officer** (STO) is responsible for planning, training, supervising and monitoring the programme in the state. He is responsible administratively to the State Director of Health Services and technically follows instructions of the Central TB Division.

Central level

At the Central level policy decision are made and routine feed back are given. The state reports are analyzed and trainings are organized.

IV.A3.4. Strength of the system:

1. Infrastructure
    a. Availability of adequate manpower trained under RNTCP. As RNTCP programme was implemented in phased manner n the State so were the

trainings organized in the state for the health personals. At present in the state out of 1369 medical officers 75% of them are trained and of the 344 laboratory technicians 85% are trained under RNTCP.

b. Up gradation of microscopic center laboratory facilities. Laboratories, which were designated as microscopic centers, were upgraded by adopting minor civil works so as to create more space and cleanliness. The laboratories were equipped with Functional binocular microscopes and other reagents required for sputum microscopy. They were provided with adequate stationeries and reporting materials.

2. Prompt action for case holding through active tracing of defaulters.

   Under the programme the DOTS provider has been made responsible to trace the patient who is defaulting and bring back to treatment. In the process STS and the medical officer in charge of that area help him. In this manner the likelihood of loosing patients have been reduced.

3. Involvement of Panchayati Raj bodies to enhance community awareness involvement and participation:

   Tuberculosis is considered as a social stigma. To remove this stigma and to create awareness among the community through the Panchayati Raj Institutions inter personal camps have been organized for the members of the Panchayati Raj bodies. Efforts have been to made to make them aware of the tuberculosis and its control strategies so that they spread the message across the community.

4. Establishment of district societies facilitates:
   a. Access to funds for procurements of consumables under the programme.
   b. Early actions.

IV.A3.5. Constraints of the system

1. Improve Access: Topography of the state being hilly and lack of transport facilities makes access to health facilities e.g. Microscopic Center difficult. Median distance to any health facility in the state is 2.2 K.m. For a patient of tuberculosis whose respiratory system has already been compromised it becomes extremely difficult to walk across this distance as the distance in one-way have to be climbed against the slope.

2. The distribution of the health facilities is also uneven.
   Of the 2922 Gram Panchyats in the state 14% are still with out any medical facility. The people living in these panchyats have to cover lot of distance on foot to reach the health institution and most of these panchyats are located in difficult area of the State.

3. Monitoring and supervisory gaps are seen at all levels. Most of the health institutions are located off the road in the state. It becomes difficult for supervisors to visit their area as one TU caters to the need of 1.5-lac population. Public transport facility is also timely and meager. Moreover the population in the hills is scattered and dense populated area are scanty. The weather is also hostile giving only four clear months in a year.

IV.A3.5. Suggestions/ Recommendations

1. Improve access: Increase number of Tuberculosis Units and microscopy centers. By increasing the number of Tuberculosis Units and microscopy centers the accessibility factor can be taken care off. People will have to walk less to access the health facility. At present one TU have been provided for a population of 1.5 lac. It may be reduced to 50,000 per population to improve accessibility for the people. More ever at present every laboratory is not functioning as an microscopic center efforts be made to convert every laboratory in to microscopic

center and its an cost effective and nothing will have to be spent on logistics as they are available in the laboratories and it is only the training of the technician under the programme which have cost factor attached to it.

2. Strengthening of monitoring and supervisory activities at all levels. This creation of TU for a population of 50,000 will also strengthen supervision and monitoring by Medical officer tuberculosis unit, senior treatment supervisor and senior treatment laboratory supervisor. More ever a method should be evolved so that there is a cross check on the supervisory visit of the junior supervisors by the senior supervisors. A system of written feed back mechanism should be initiated to the staff at peripheral so that they are also made aware of the facts happening at the district and state level.

3. IEC:
   a. Continuing IEC for DOTS providers in the form of reorientation trainings may be started so as to update his knowledge.

   b. IEC for community so that full cooperation is taken from them for achieving the objectives of the programme. IPC should be conducted involving yuvak mandals, mahilla mandals and efforts to create awareness about tuberculosis so as social stigma attached wit the disease is removed. Efforts may be made to facilitate these programmes by patients who have been cured for tuberculosis by taking DOTS.

V. SENTINEL SURVEILLANCE SYSTEM

Sentinel surveillance is for Aids control programme under NACO. In Himachal Pradesh the first HIV positive case was detected in 1992, followed by occurrence of many cases in most of the district. It started in the state of Himachal Pradesh in1994. First survey was done under this programme was from 24th May 1994 onward. Initially the activity was carried out twice a year .Now this activity is done once year. The activity starts from 1st August to 31st October.

V.A1. Objective of Sentinel surveillance for HIV –AIDS:

The objective of this surveillance is to do annual cross-sectional survey by unlinked anonymous serological testing procedures of the high-risk group and the low risk group that is at the STD Clinics and the Ante-Natal Clinics and to estimate the burden of disease in the high risk and the low risk population.

V.A2. Case definition:

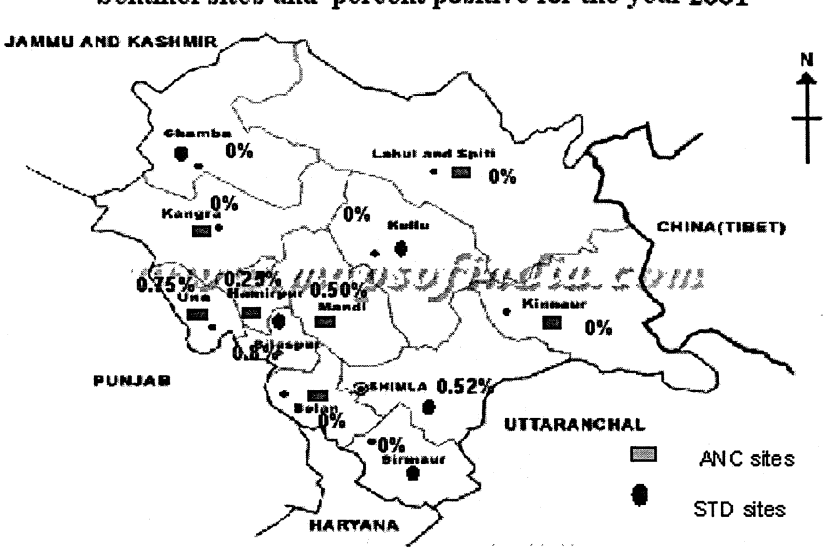
Case definition used at the STD clinic is as those who are coming with complaint of any one of the following four syndromes:

1. Genital Ulcer male or female.
2. Cervical discharge or Cervicitis.
3. Urethral discharge.
4. Genital Wart.

Sample size taken for sexually transmitted diseases is 250 and for antenatal cases it is 400.The collected samples are sent once in fortnight to the referral laboratory, which is Indira Gandhi Medical College Shimla.

As on 30th June2002 out of 31223 persons screened at the only one blood-testing center in Indira Gandhi Medical College, 396 were found as HIV positive which includes 112 AIDS cases. Sero-positivity rate is 12.7 /1000 persons screened.The prevalence of aids cases is 3.5/1000 persons screened. The only one blood-testing center is also a voluntary HIV testing center. The test done there are the Elisha and the Western Blot test. In the state there are altogether 12 sentinel sites. These are seven Ante-Natal sites and five STD clinics sites. They are given in the table below

V.A3. Sentinel sites and percent positive for the year 2001



V.A4. Trends of HIV infection among ANC in Himachal Pradesh

S.No	District	Feb- Mar-98	Aug-Oct 98	Aug-Oct 99	Aug-Oct 2000	Aug-Oct 2001
1	Dharamasala (Kangra)	0.25%	0.5%	0%	0.24%	0%
2	Hamirpur	0%	0.25%	0.5%	0.73%	0.25%
3	Solan	-			1.23%	0%
4	Kinnaur (Reong –Peo)	-			1.05%	0%
5	Mandi	-				0.5%
6	Una	-				0.75%
7	Keylong (L&S)	-				0%

V.A5. Trends of HIV infection among STD clinics in Himachal Pradesh

S.No	District	Feb- Mar-98	Aug-Oct 98	Aug-Oct 99	Aug-Oct 2000	Aug-Oct 2001
1	Shimla	0%	0.4%	0.4%	0%	0.52%
2	Nahan	0%	0.4%	0.8%	0.79%	0%
3	Bilaspur	0%	0%	0%	0%	0.8%
4	Kulu				0%	0%
5	Chamba				1.18%	0%

The trends at the ANC is on the decrease but at Hamirpur it is increasing. At the STD clinic sites the trend is increasing for district Shimla but not so for other sites.

Strengths:

It gives a trend among the high-risk group i.e. at the STD sites and ANC sites that is the low risk group.

Constraints:

As people with sexually transmitted disease tend to visit private sector more than the government sector it does not estimate the burden of the disease. More ever the HIV –AIDS presenting with other diseases is not taken care of.

Suggestion:

As is known know that HIV –AIDS patient is more prone to get infected by tuberculosis bacterium microscopic centers for tuberculosis may also be included under the sentinel surveillance system for HIV-AIDS.

VI. NATIONAL SURVEILLANCE PROGRAMME FOR THE COMMUNICABLE DISEASE (NSPCD):

In Himachal Pradesh after the outbreak of Plague like illness in 1983 a plague Surveillance unit was set up. Active and passive surveillance activity had been going on the state under the various vertical National programmes. In the recent past, AFP surveillance mechanism has

made judicious use of both these systems of surveillance to generate dependable, accurate data on the situation. The outbreak of Plague at Surat in1994, Cholera at Delhi in 1995 and dengue hemorrhagic fever in 1996 have high lightened the urgency for disease surveillance system so that early warning signals are recognized and appropriate control measures are initiated in a timely manner. Hence National Surveillance Programme for Communicable Diseases (NSPCD) was launched as a pilot project in five districts in 1997-98.

In Himachal Pradesh, the programme was launched in the following year 1998-99, when two districts Solan and Hamirpur were taken up. It has been started in Shimla district in the year 2002 after the Plague epidemic in February 2002.

VI.A1. Objective of the programme is:

- Capacity building at state and district level for developing effective surveillance system for early detection and appropriate response to early warning signals of outbreaks of communicable diseases.
- Strengthening of laboratories.
- Installing network of electronic communication.
- Strengthening of basic entomological services.
- Improving epidemiological analysis of data.

It was impossible to include all infectious diseases in the surveillance system at the outset and prioritization was done. The conditions were:

- Those diseases that are targeted for eradication, elimination and control using specific intervention strategies that are already being applied on a high priority.
- Those diseases that can be controlled locally especially in outbreak situation and against which effective interventions are available.
- Diseases for which epidemiological information is needed, to design control strategies.

VI.A2. The programme identifies following diseases of epidemic potential; they are:
1) Cholera /Acute Diarrhea / Dysentery 2) Viral Hepatitis 3) Typhoid Fever 4) Measles 5) Chicken Pox 6) Diphtheria 7) Dengue /DHF 8)Japanese Encephalitis 9) Meningitis 10) Others

Example: Cholera /Acute Diarrhea / Dysentery:

- **Cholera** is an epidemic and endemic disease. The epidemics of Cholera are abrupt and often create a public health problem with a high potential to spread fast and cause deaths. If left untreated case fatality rate is very high. Hence the need for surveillance.

  Case definition: In an area where Cholera is not endemic: -Severe dehydration or death from acute watery diarrhoea in a patient aged five years or more. **or**
  In an area where Cholera is endemic: -Acute watery diarrhoea, with or without vomiting in a patient aged five years or more.

  Case classification:
  Suspected: A case that meets the clinical case description
  Probable: Not applicable
  Confirmed: A suspected case that is laboratory confirmed
  Laboratory criteria for diagnosis: Isolation of Vibrio cholerae 01 or 0139 from the stool samples of any patients with diarrhoea.

- **Acute Diarrhoeal diseases**: It is one of the major causes of morbidity and mortality in young children's especially under five years.
  Case definition: Three or more loose or watery stools with or without vomiting, with or without dehydration in the past 24 hours.
  Case classification: - As per the clinical description.

Laboratory criteria for diagnosis: -Laboratory culture of stools may be used to confirm the possible outbreaks of specific agents, but is not necessary for case definition or case management.

- **Dysentery:** Bloody diarrhoea is a sign of invasive enteric infection that carries a substantial risk of morbidity and death especially in children's. Shigella is most frequently isolated from the stool of affected children's. The high case fatality and epidemic potential make surveillance to detect and control outbreak.

  Case definition: -Acute diarrhoea with visible blood in stools with or without fever or pain abdomen.
  Case classification: - As per the clinical description.

  Laboratory criteria for diagnosis: -Laboratory culture of stools may be used to confirm the possible outbreaks of specific diarrhoea, such as Shigella, salmonella etc.

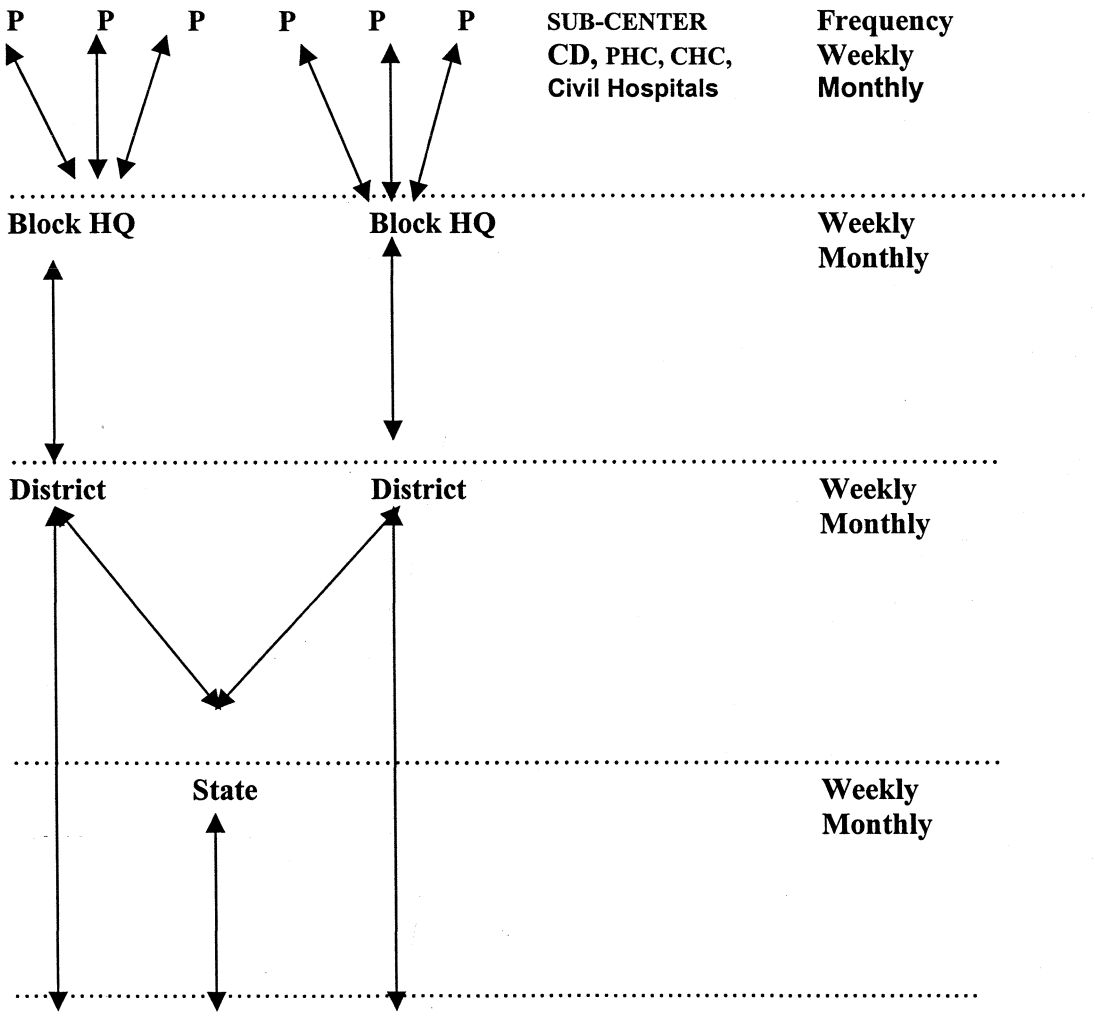
The reporting formats used by the programme are attached as annexure. They are the same right from peripheral to central level. The reporting is weekly and monthly. Zero reporting is also mandatory. Under the NSPCD, the data originates from the lower most level of the system that is the sub-center level; the Multi Purpose Worker (Health Worker, Male and Female) collects the data and reports to the concerned PHC medical officer or directly to the block medical officer. The PHC medical officer then reports to the Block Level. These reports are compiled at Block level by the Block Medical Officer and forwarded to the Chief Medical Officer of the District on weekly and monthly basis. The week starts from Sunday to Saturday. Monday is the reporting day. Reports are sent on telephonic messages and later written reports are also sent. At the state level, the district reports are consolidated on weekly and monthly basis and sent to the National Institute of Communicable Diseases New Delhi. In emergency scenarios like Outbreaks or Epidemics, daily or even hourly reports are being sent to the district and state HQ from the periphery.

VI.A.3. Organizational structure of the NSPCD is as following:

Structural organization of NSPCD under the State

Level of Health Structure	Man Power	Communication Provided under NSPCD	Activities
HSC	Multipurpose Health Workers (Male and Female)	Nil	Detect Treat Report
PHC, CHC, Civil Hospitals	Medical Officers Paramedic	Nil	Detect Treat Report Response
Block Head Quarter	Block Medical Officer Rapid Response Team	Telephone	Analyse Investigate Report Respond Feedback
District Head Quarter	District Nodal Officer Rapid Response Team	Telephone Fax Computer E-Mail	Analyse Investigate Report Confirm Respond Feedback
State Head Quarter	State Nodal Officer Rapid Response Team	Telephone Fax Computer E-mail	Analyse Investigate Confirm Respond Feedback Plan &Fund

Flow of Information & Task Oriented



National Institute of Communicable Diseases
(New Delhi)

VIA.4. Strengths of the Programme

1. Man power development: The training of state and district Rapid Response Teams, Medical Officers, Multi purpose Health Workers and laboratory technicians has been done in the districts implementing the programme.

2. Improved laboratory facilities: The laboratories have been strengthened at State and district levels, by supplying equipments and reagents. Rapid diagnostic kits have been made available in these laboratories to investigate the diseases of epidemic potential like cholera and typhoid.
3. Outbreaks are being reported and investigated. During the year 2002 six outbreaks were reported. They were the Plague outbreak in Shimla District 2002, Gastroenteritis Hamirpur ,Hepatitis E Mandi, Fever cases Una, Hepatitis Bilaspur, Measles Chamba.
4. Communication equipments upgraded with the provision of telephone and fax machine at state and district, telephone at the block level.
5. For data management computers with printers and Email facilities have been installed at state and district level and electronic processing of data is possible for rapid transfer of data and information.

VI.A5. Constraints of the Programme:

1. Only three distracts are involved under the programme presently.
2. Private sector is not addressed under the NSPCD programme
3. Non-communicable diseases are not addressed which are emerging as big challenge.

VI.A6. Suggestions:

1. There is a need to extend NSPCD programme to all Districts of Himachal Pradesh so that a database can be built upon for taking appropriate action.
2. Need to involve NGO's private practitioners & private hospitals. The NGO, private practitioners, and private hospital are fast coming up in the state. There is an need to address theses sectors so that effective strategies to tackle disease burden are made and implemented..
3. Non-communicable diseases need to be addressed. Non-communicable diseases in the form of cancer, hypertension, diabetes etc are fast coming up in the state. At present because of paucity of data there prevalence can not be estimated but report from regional institute of cancer Shimla shows that prevalence of genitourinary

cancer to be the most commonest forms of cancer followed by cervical cancer and cancer of respiratory system.

4. As the terrain is hilly and rough the need to address injuries is urgently required. At present they constitute about 21.78/1000 and are among the top ten diseases of the state.

VII. CONCLUSION:

Disease surveillance system is evolving in Himachal Pradesh. Efforts to improve surveillance system are making progress.

ANNEXURE

N.S.P.C.D. HIMACHAL PRADESH

FORMAT FOR OUTBREAK INVESTIGATION REPORT
(MEDICAL OFFICERS)

1. **General Information**
   State:
   District:
   Town/PHC/CHC:
   Ward/Village:
   Population:

2. **Background Information**
   Person reporting the outbreak:
   Date of report:
   Date investigations started:
   Person(s) investigation the outbreak:

   - **Details of investigation:**

   Describe how the cases were found (may include: **(a)** house-to-house searches in the affected area; **(b)** visiting blocks adjacent to the affected households; **(c)** conducting record reviews at local hospitals; **(d)** requesting health workers to report similar cases in their areas, etc.):

3. **Descriptive Epidemiology**
   1. Cases by time, place and person (attach summary tables and relevant graphs and maps).
   2. Age-specific attack rates and mortality rates:
   3. High-risk age groups and geographical areas:

4. **Description of Control Measures taken:**

5. **Description of Measures for follow-up visits:**

6. **Brief Description of Problem encountered:**

7. **Factors which, in your opinion, contributed to the outbreak:**

8. **Conclusion and Recommendations:**

Date: **(Name and Designation)**

Copy to: The Chief Medical Officer, Hamirpur for information and n /a please.

Date: **(Name and Designation)**

Weekly Reports of NSPCD

1. Week reporting: ..... to.....
2. Outbreaks
   - Number.....
   - Nature.....
     (Number of cases, Number of deaths)
3. News paper cutting
4. Investigation report carried out (Yes, No)

National Surveillance Programme for Communicable Diseases

Epidemic Prone Diseases

Name of District	Approximate Population			Week ending / Month		
Diseases	Cases			Deaths		
	IPD	OPD	Total	IPD	OPD	Total
Cholera /Acute Diarrhoea/Gastroenteritis						
Viral Hepatitis						
Typhoid						
Measles						
Chicken Pox						
Diphtheria						
Dengue/DHF						
Meningitis						
Japanese Encephalitis						
Others						

REVISED NATIONAL TUBERCULOSIS CONTROL PROGRAMME
Quarterly Report on New and Retreatment Cases of Tuberculosis

Patient registered during ---------- quarter*of----------	Name of area District ---------- No.#
Name of Reporter:	

Signature:_____
Date of completion of this form

Block 1: All patients registered in the quarter

Pulmonary tuberculosis							Extra-Pulmomory Tuberculosis (4)		Total(5)		
Smear –Positive					Smear-negative (3)						
New Cases (1)			Relapses (2)								
M	F	Total	M	F	M	F	M	F	M	F	TOTAL

Block 2: Smear-positive New cases only: form Column (1) above

Age Group(Years)														TOTAL		
0-14		15-24		25-34		35-44		45-54		55-64		65above				
M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	TOTAL

Block 3: All patients started on treatment

Type of patient	Category I		Category II		Category III		Total
	Smear Positive.	Smear neg. Extra pulm.	Smear Positive.	Smear Neg.	Smear Neg.	Extra pulmonary	
New							
Relapses							
Failures							
Treatment After Default							
Other							
Total							

MEDICAL OFFICER INCHARGE
TUBERCULOSIS UNIT
REVISED NATIONAL TUBERCULOSIS CONTROL PROGRAMME

Quarterly Report of Sputum Conversion of New Cases, Relapses and Failures

Patient registered during --------- quarter*of ----------

Name of area ----------District No.#

Name of Reporter: ----------

Signature:_____

Date of completion of this form

D D M M

Complete this Performa for sputum smear –positive .The total number should be the same as in the Quarterly Report on New and Retreatment Cases of Tuberculosis of the previous quarter.

Total number of new Sputum-positive patients	**Sputum at 2 months**			**Sputum at 3 months**		
	Negative	Positive	N.A.	Negative	Positive	N.A.

Total number of smear-positive relapse patients	**Sputum at 3 months**			
	Negative	Positive	N.A.	Total

Total number of smear-positive failure patients	**Sputum at 3 months**			
	Negative	Positive	N.A.	

REVISED NATIONAL TUBERCULOSIS CONTROL PROGRAMME

Quarterly Report on Programme Management and Logistics

District Level

Name of District: Shimla Quarter ---------- Year ----------

Number of Tuberculosis Units planned in the District: ----------
Number of Tuberculosis Units operational in the District: ----------
Total population of the District: ----------
Population of the District covered by the RNTCP: ----------

The following reports are enclosed (Tick [ ] to indicate that report is enclosed)

- ☐ Quarterly Report on case finding.
- ☐ Quarterly Report on Sputum Conversion.
- ☐ Quartely Report on Treatment Outcome.

If any report is not enclosed, give reason:

_____

Supervisory Activities

Type of Unit	Number in the District	Number participating in the RNTCP	Number of these Visited during quarter
TB Unit			
Government Hospital			
Sanatorium/TB Hospital			
PHC			
CHC			
BPHC			
Microscopy Center			
Treatment Center			
Patient's Home			
Other:			

Microscopy Activities (all Tuberculosis units including the DTC)

(a) Number of new adult outpatient visits in health facilities	
(b) Out of (a), number of chest symptomatic patients whose sputum was examined for diagnosis	
(c) Out of (b), number of smear- positive patients diagnosed	

Treatment Initiation (All Tuberculosis units including the DTC)

(d) Of the smear –positive patients diagnosed (c),the number who reside within the district	
(e) Of the smear –positive patients diagnosed who reside with in the district (d) number put on DOTS	
(f) Of the smear –positive patients diagnosed who reside within the district (d),number put on treatment other then DOTS	
(g) Of these patients (f), number who were new smear - positive	

(h) Number of smear negative patients residing with in the district put on treatment other then DOTS	
(i) Number of extra-pulmonary patients residing with in the district put on treatment other then DOTS	

Laboratory Quality Control Network (all Tuberculosis units including DTC)

Initial reading	Number of slides checked	Supervisor reading		Percentage of Discordance
		Number of Positive	Number of Negative	
Positive slides				(b/[a+b]) [false positive]
Negative slides				(c/[c+d]) [false negative]

Staff Position and Training

(Tick [ ] if in place or not during quarter)

District Tuberculosis Officer ☐ Yes ☐ No Trained in RNTCP ☐ Yes ☐ No

Statistical Assistant ☐ Yes ☐ No Trained in RNTCP ☐ Yes ☐ No

Treatment Organizer Yes ☐ No ☐ Trained in RNTCP ☐ Yes No ☐

Laboratory Technician Yes ☐ No ☐ Trained in RNTCP ☐ Yes ☐ No

Category of staff	Sanctioned	In Place	Trained in RNTCP in past quarter	Total trained in RNTCP
Medical Officer of the DTC				
Designated Medical Officer of the TB unit				

of the TB unit				
Senor Treatment Supervisor				
Senior Tuberculosis Laboratory Supervisor (STLS)				
Laboratory Technician/Microscopist				
Treatment Organizer				
Medical Officer(at BPHC/CHC/PHC/others)				
Pharmacist				
Lady Health Visitor				
Staff Nurse				
Health Assistant				
Multipurpose Supervisor				
Multipurpose Health Worker				
TB Health Visitor				
Anganwadi Worker				
Trained Dai				
Community Volunteer				
Ayurvedic Medical Officer				

Medications

Item	Stock on first day of quarter	Stock received During quarter	Patients started on treatment during quarter	Stock on last day of quarter	Quantity requested
Category I patient-wise box					
Category II patient wise box					
Category III patient wise box					

Item	Stock on first day of month	Stock received during month	Consumption During month	Stock on last day of month	Quantity requested
Pouches for prolongation of the intensive phase					
INH 300 mg tablets					

INH 100mg tablets					
Streptomycin 0.75 gm vials					
Rifampicin 150mg capsules					
Pyrazinamide 500gm tablets					
Ethambutol 800mg tablets					

Consumables

Item	Stock on first day of quarter	Stock received during quarter	Consumption During quarter	Stock on last day of quarter	Quantity requested
Sputum containers (Numbers)					
Slides (numbers)					
Carbol fuchsin (liters)					
Methylene blue (liters)					
Sulphuric acid (liters)					
Phenol (grams)					
Xylene(liters)					
Immersion oil (liters)					
Methylated spirit (liters) if supplied					
X-Ray (Rolls)					

Equipment

Item	Number	In working condition	Not in working condition
Monocular microscopes			
Binocular microscopes			
X-Ray Machine			
Photocopier			
Computer			
Air –conditioner for drug storage area			
Over Head Projector			
Jeep	**1**	**1**	
Two /Three Wheeler			

Name of the Officer reporting (in capital letters----------
Signature: ----------
Date: ----------

REVISED NATIONAL TUBERCULOSIS CONTROL PROGRAMME

Quarterly Report on the Results of Treatment of Tuberculosis

Patients Registered 12-15 Months Earlier

Name of area: Distt. Shimla No:_____ Date of completion ------ ----------	Patients registered during ---------- Quarter of ---------- ---	Name of Reporter---------- ------ Signature:_____

Patients reported during quarter**	Type of patient	Cured (1)	Treatment completed (2)	Died (3)	Failure (4)	Defaulted (5)	Transferred to another district (6)	Total number evaluated (sum of columns 1 to 6)
	NEW CASES Smear Positive							
	Smear Negative							
	Extra Pulmonary							
	Total							
	RETREATMENT CASES Smear positive relapses							
	Smear positive failures							
	Smear positive Treatment after default							
	Others treated with Category II							
	Total Category II							

*The Reporter is the Medical Officer responsible, not the person completing this form. This form includes patients on Category I, CategoryII, CategoryIII , treatment, both smear positive and smear negative. These totals should match those of the Quarterly Report on New and Retreatment cases for the quarter

** Of these,_____(number) were excluded from evaluation of chemotherapy for the following reasons

REVISED NATIONAL TUBERCULOSIS CONTROL PROGRAMME

Quarterly Report on the Results of Treatment of Tuberculosis Patients Registered 12-15 Months Earlier

Name of area Shimla No:_____ Date of completion	Patients registered during ---------- Quarter	Name of Reporter* Dr Rajnish Signature:_____

Patientsreported during quarter**		Type of patient	Cured (1)		Treatment completed (2)		Died (3)		Failure (4)		Defaulted (5)		Transferred to another district (6)		Total number evaluated (sum of columns 1 to 6)	
M	F		M	F	M	F	M	F	M	F	M	F	M		M	F
		NEW CASES Smear Positive														
		Smear Negative														
		Extra Pulmonary														
		Total														
		RETREATMENT CASES Smear positive relapses														
		Smear positive failures														
		Smear positive Treatment after default														
		Others treated with Category II														
		Total Category II														

*The Reporter is the Medical Officer responsible, not the person completing this form. This form includes patients on Category I, CategoryII, CategoryIII , treatment, both smear positive and smear negative. These totals should match those of the Quarterly Report on New and Retreatment cases for the quarter

** Of these,_____(number) were excluded from evaluation of chemotherapy for the following reasons

REVISED NATIONAL TUBERCULOSIS CONTROL PROGRAMME

Quarterly Report on Programme Management and Logistics

Tuberculosis Unit (Sub district) Level (including Tuberculosis Unit at DTC)

Name of TB Unit: ---------- Quarter ------ Year -------

The following reports are enclosed (Tick [ ] to indicate that report is enclosed)

☐ Quarterly Report on case finding.

☐ Quarterly Report on Sputum Conversion.

☐ Quarterly Report on Treatment Outcome.

If any report is enclosed, give reason:

Supervisory Activities

Type of Facility	Number in TU	Number of these visited atleast once
BPHC		
CHC		
PHC		
Government Hospital		
TB Hospital/ Sanatorium		
Microscopy Center		
Treatment Center		
Patient's Home		
Other :		

Microscopy Activities

(a) Number of new adult outpatient visits in health facilities	
(b) Out of (a), number of chest symptomatic patients whose sputum was examined for diagnosis	
(c) Out of (b), number of smear- positive patients diagnosed	

(d) Of the smear –positive patients diagnosed (c),the number who reside within the district	
(e) Of the smear –positive patients diagnosed who reside with in the district (d) number put on DOTS	
(f) Of the smear –positive patients diagnosed who reside within the district (d),number put on treatment other then DOTS (g) Of these patients (f), number who were new smear - positive	

Treatment Initiation

(h) Number of smear negative patients residing with in the district put on treatment other then DOTS	
(i) Number of extra-pulmonary patients residing with in the district put on treatment other then DOTS	

Laboratory Quality Control Network

Initial reading	Number of slides checked	Supervisor reading		Percentage of Discordance
		Number of Positive	Number of Negative	
Positive slides				(b/[a+b]) [false positive]
Negative slides				(c/[c+d]) [false negative]

Staff Position and Training
(Tick [ ] if in place or not during quarter)

Designated Medical Officer-TB ☐ Yes ☐ No Trained in RNTCP ☐ Yes ☐ No

Senior Treatment Supervisor (STS) ☐Yes ☐No Trained in RNTCP ☐ Yes ☐No

Senior Tuberculosis Laboratory Supervisor (STLS) ☐ Yes ☐ No Trained in RNTCP ☐ Yes ☐ No

Category of staff	Sanctioned	In Place	Trained in RNTCP in past quarter	Total trained in RNTCP
Medical Officer				
Microscopist				
Lady Health Visitor/Staff Nurse/ Health Assistant / Multi Purpose Health Supervisor				
Multi purpose Health Worker/ TB Health visitor				
Anganwadi Worker				
Trained Dai				
Community Volunteer				

Medications

Item	Stock on first day of quarter	Stock received During quarter	Patients started on treatment during quarter	Stock on last day of quarter	Quantity requested
Category I					

patient-wise box					
Category II patient wise box					
Category III patient wise box					

Item	Stock on first day of month	Stock received during month	Consumption During month	Stock on last day of month	Quantity requested
Pouches for prolongation of the intensive phase					
INH 300 mg tablets					
INH 100mg tablets					
Streptomycin 0.75 gm vials					
Rifampicin 150mg capsules					
Pyrazinamide 500gm tablets					
Ethambutol 800mg tablets					

Consumables

Item	Stock on first day of quarter	Stock received during quarter	Consumption During quarter	Stock on last day of quarter	Quantity requested
Sputum containers (Numbers)					
Slides (numbers)					
Carbol fuchsin (liters)					
Methylene blue (liters)					
Sulphuric acid (liters)					
Phenol (grams)					
Xylene(liters)					
Immersion oil (liters)					
Methylated spirit (liters) if supplied					

Equipment

Item	**Number**	**In working condition**	**Not in working condition**
Monocular microscopes			
Binocular microscopes			

Name of the Officer reporting (in capital letters: ----------
Signature: ----------
Date: ----------

1.4'SECONDARY DATA ANALYSIS 0F DISEASES

DISTRICT SHIMLA - HP

I. NTRODUCTION:

Disease means illness and Profile means brief bio-graphy meaning a portrait of illnesses present in that locality or the given geographic area. Its knowledge and understanding is an essential pre-requisite to asses and address public health needs. Its proper knowledge enables efficient health programme planning and management.

In the last three decades the population of Himachal Pradesh has grown from 3.2 million to 6.1 million. That is the population have doubled in a span of thirty years but the area of the state remains the same so does the resources. This demographic shift has resulted in overcrowding in cities and in rural areas. Communication systems have improved so have the economics status of the people. These developments have given way to:

1. Changed life styles and habits of people leading to emergence of non-communicable diseases.
2. Faster transportation and means of communication leading to population migration and easy spread of infection.
3. Poor water supply, sanitation and personal hygiene and developments of slum areas resulting in congestion and easy spread of communicable diseases.
4. More occupational hazards that were not there thirty years back & increased in road traffic accidents.

These above mentioned factors have contributed to the existing disease profile or the disease burden on the State. Keeping these factors in the background it becomes important to study the available secondary data of the district in order to look at the disease profile of the district and take effective steps to reduce the mortality and morbidity in the community and to promote better health. More ever public health activities have to be primarily directed against preventive strategies for the various prevailing diseases. Secondary data analysis

gives us the available best information and insight on magnitude of health problem and in a way comprehensive assessment of the health challenges in front of the state. It helps in proper distribution of our resources. It helps the policy and decision makers to focus on the priorities and inequalities in the existing system of practices. It helps in the long term planning and has the preparedness for the same.

II. OBJECTIVE:

A. To describe and to study disease trends over a period of time.

B. Identifying disease of epidemic potential.

C. Identifying diseases that need to be included in the surveillance system.

D. To develop action plan for strengthening existing health infrastructure and to reduce diseases burden

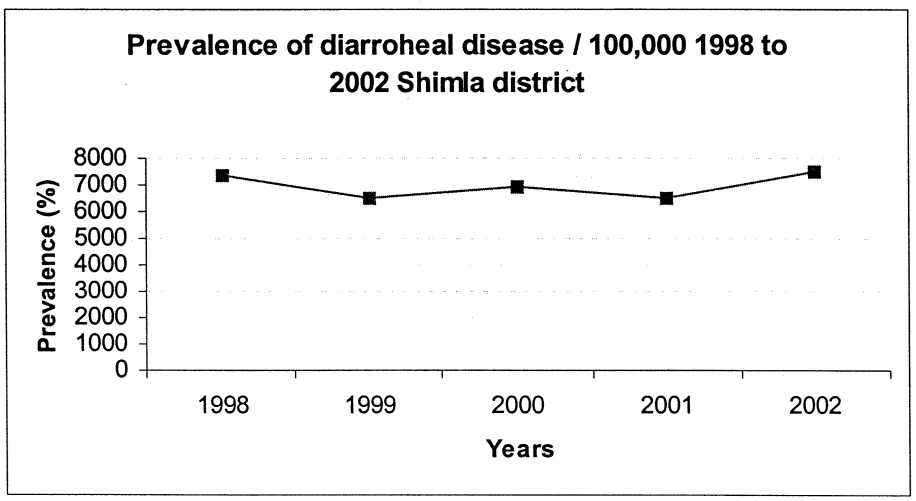
III. METHODOLOGY:

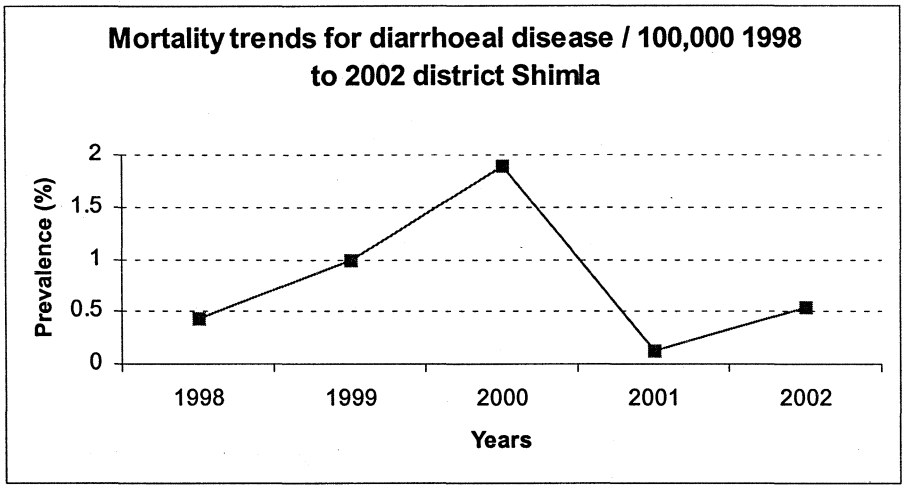
Using secondary data available on different diseases prevalent in Shimla district

IV. SOURCES OF DATA:

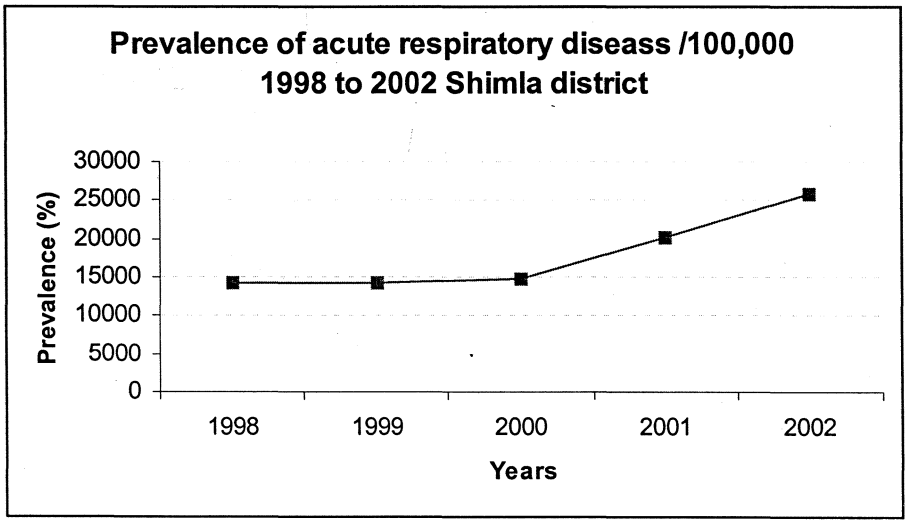
Statistical Cell of Chief Medical Officer office of Shimla district.

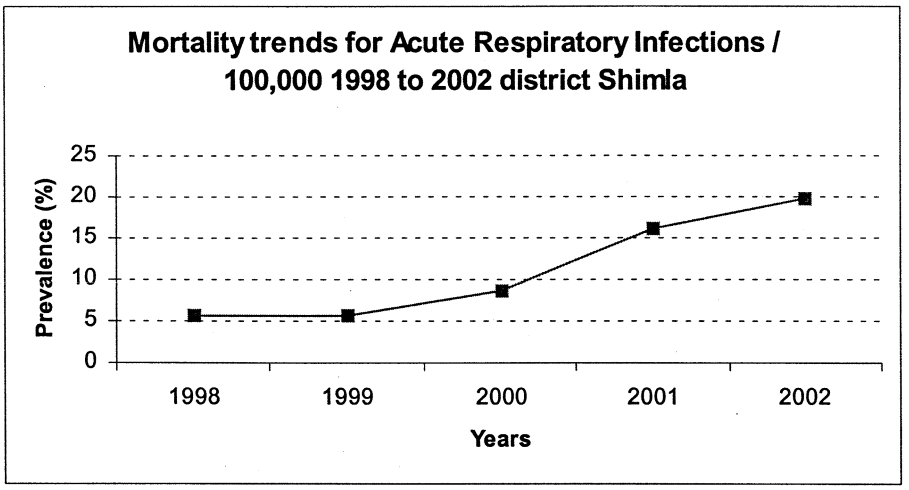
V. RESULTS:



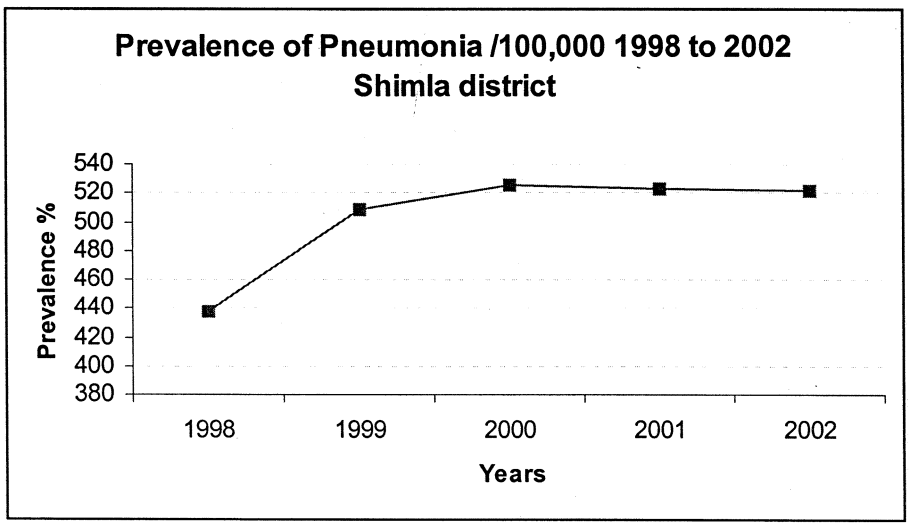


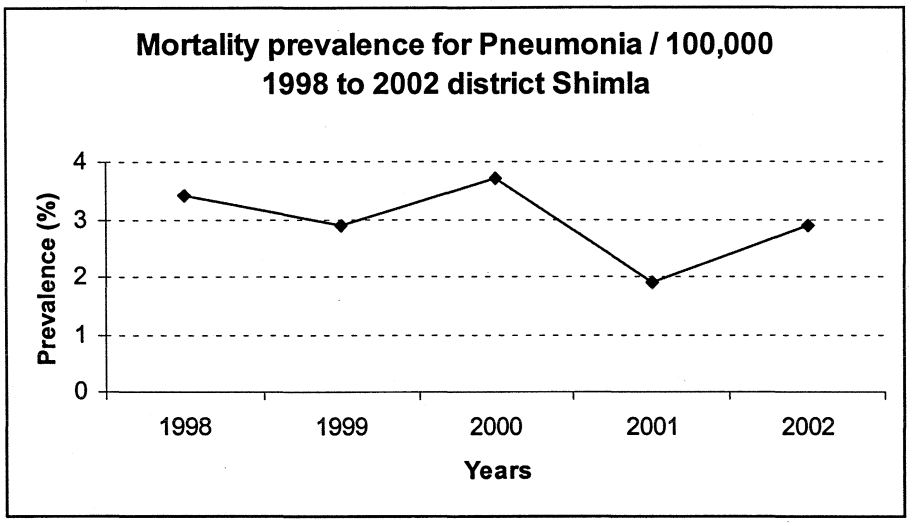
Prevalence of diarrhoeal diseases is very high in the district although the morbidity associated with it is low. Prevalence shows alternate year rise in prevalence, this may be because of intense measures taken the year the prevalence is high but not sustained in the following year.



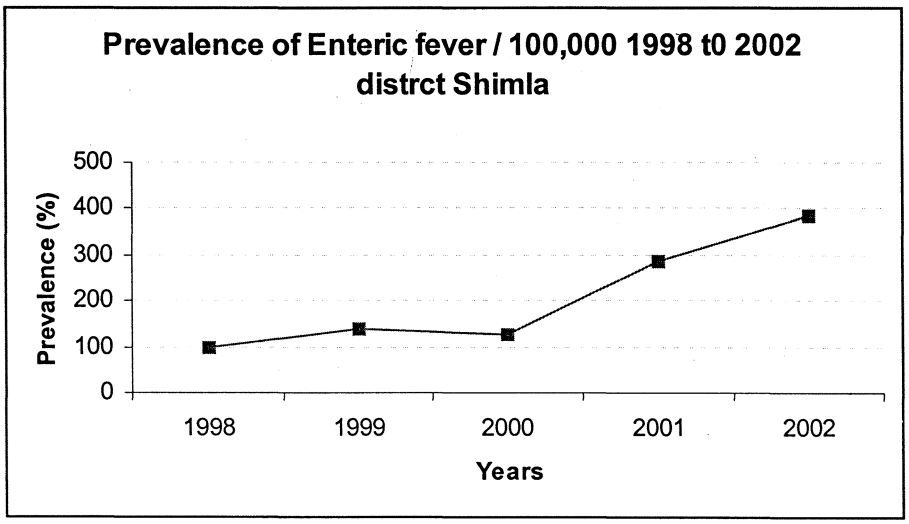


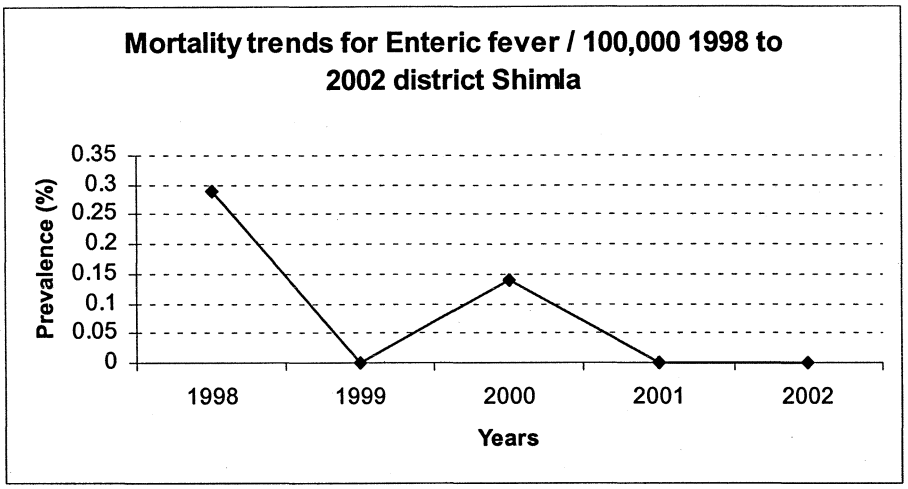
The prevalence of acute respiratory infection shows an increasing trend over the last five year, which is also associated with increase in mortality as well. The mortality associated with it have almost doubled in 2002 as compared to 1998.



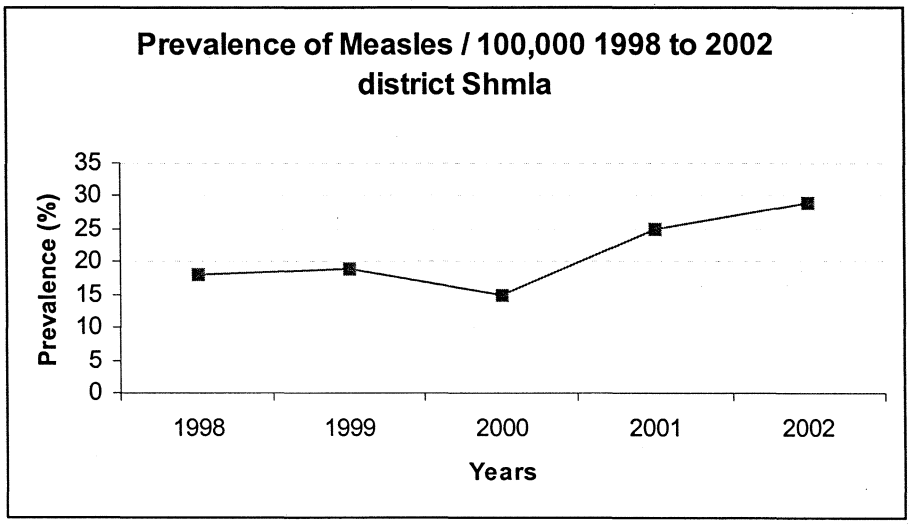


The mortality due to pneumonia have come down as compared to 1998 in 2002 but the prevalence of pneumonia have increased from 1998 to a maximum in year 2000 there after it is similar.

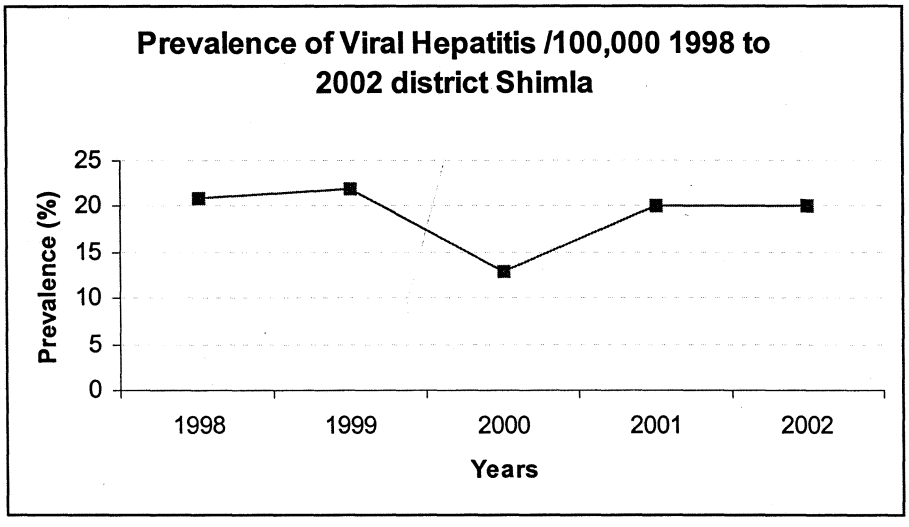


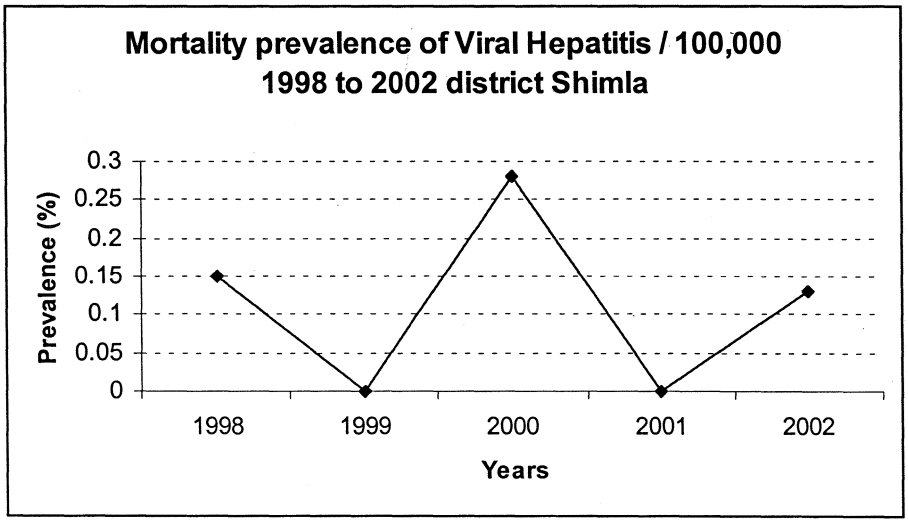


The prevalence of enteric fever has risen to three folds in 2002 as compared to 1998 but the mortality associated with it have come down, this may be due to better facility of diagnosis as well as better treatment.

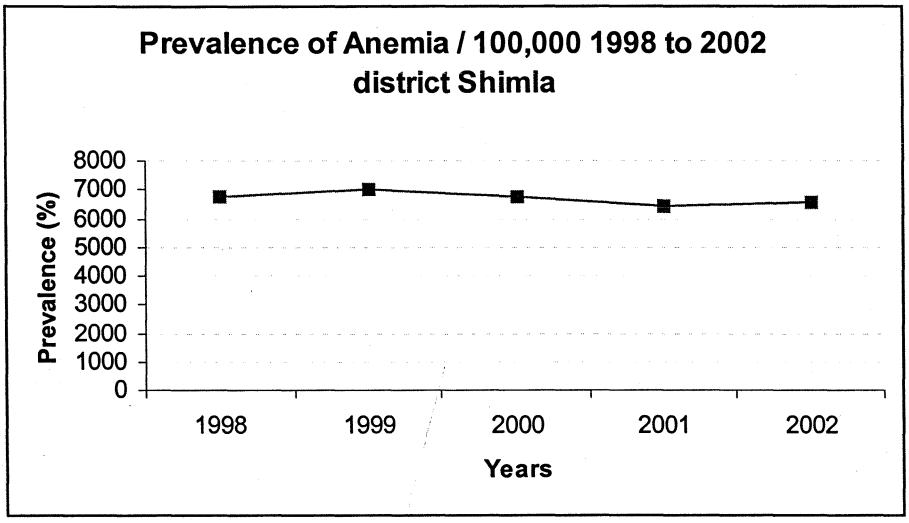


The prevalence of measles has increased from 1998 to 2002 with no associated mortality. This slow rise in measles forecasts an epidemic may be in coming in the year 2004, as it is known that epidemics of measles occur after a silent period of four to five years.

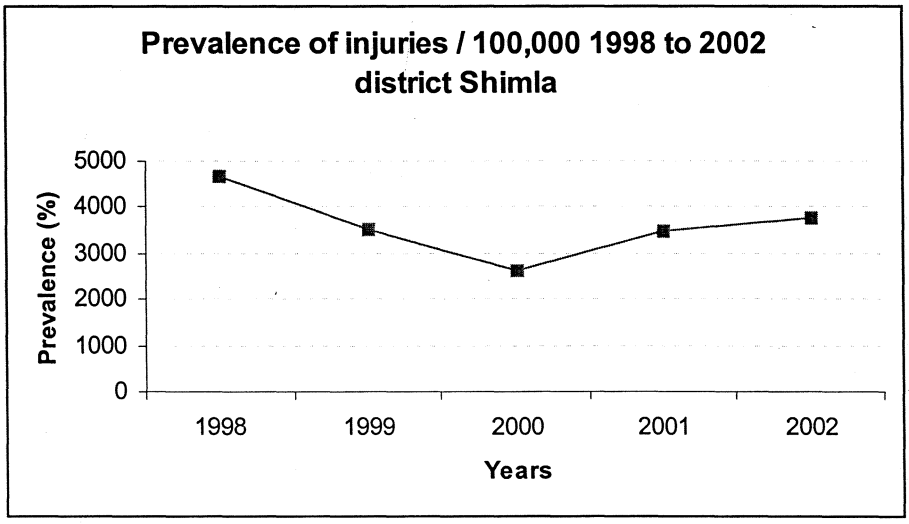


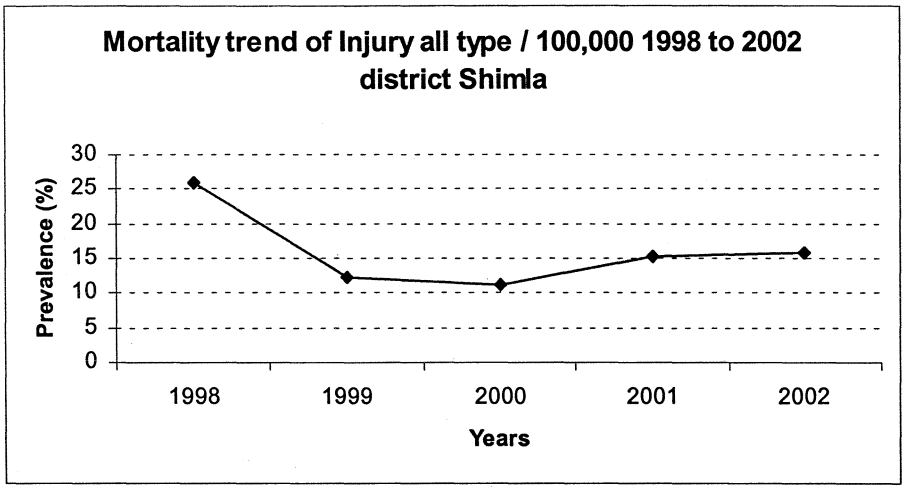


The prevalence of viral hepatitis is similar in last five years except for the year 2000 when it was at its minimum. The mortality associated with it also show fluctuating trends

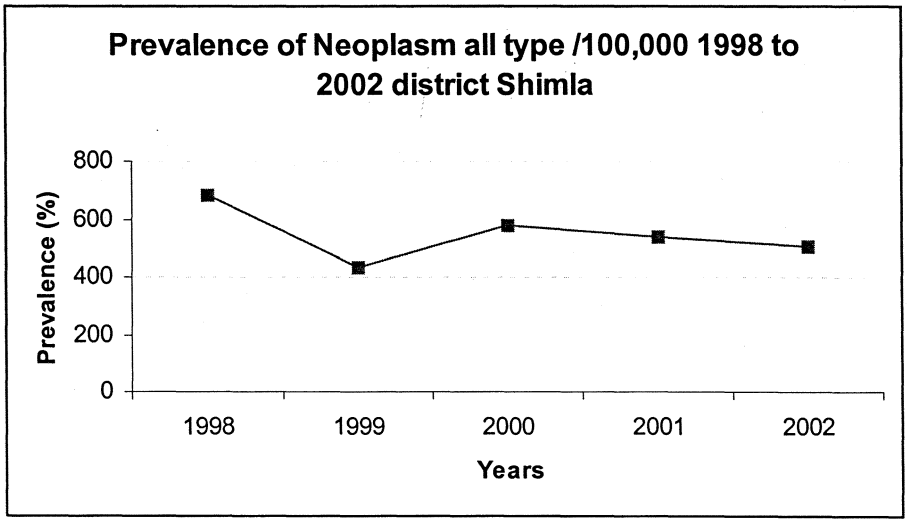


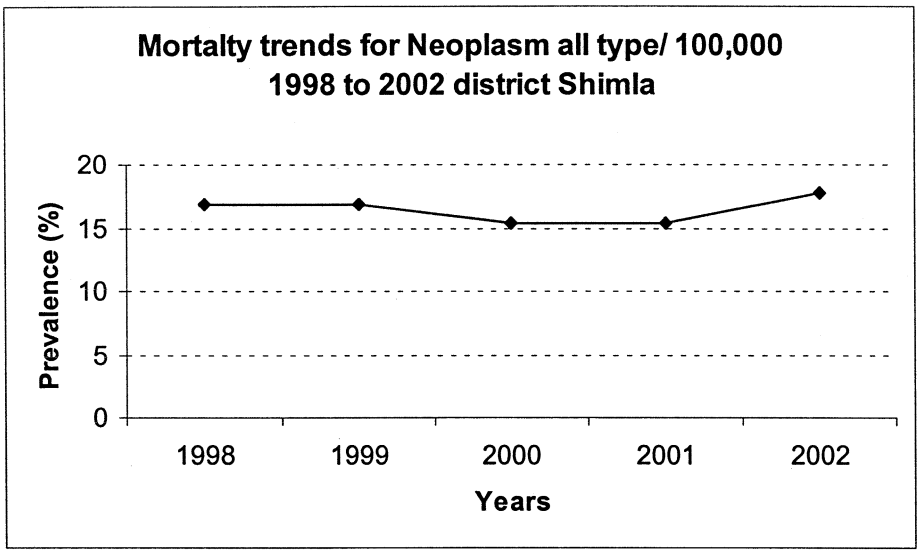
The prevalence of anemia in the district over the last five years is similar except for the year 1999 when it has infect risen.



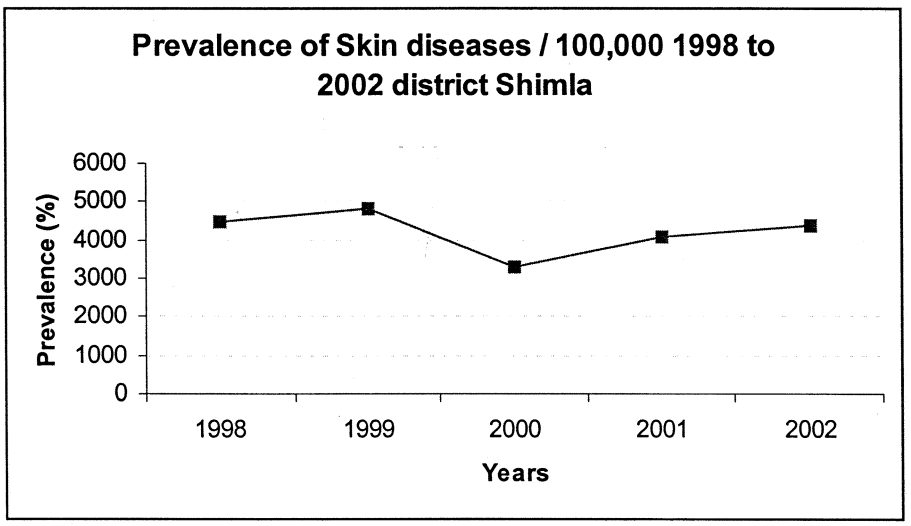


Prevalence of all kind of injuries has come down from 1998 to 2000 but have than started rising up. The mortality associated with it also shows the same trend but have come down as compared to 1998 in 2002





The annualized case detection of neoplasm has come down in 2002 as compared to 1998 in district Shimla district but the prevalence is high with mortality ranging from 15.3 in 2001 to 17.8 in 2002.



The prevalence of skin diseases has come down in 2002 as compared to 1998 but it does not show any trend except that prevalence is very high.

VI. COMMENTS AND DISCUSSION:

I. Disease trend in terms of morbidity, mortality, prevalence and total number

The available secondary data of communicable disease for district Shimla Himachal Pradesh for the last five-year shows those among the communicable diseases the respiratory diseases are responsible for majority of morbidity and mortality in the district.

A. Respiratory problems like acute respiratory infection, Tuberculosis, and Pneumonia:

Respiratory infection contributes to maximum morbidity in the district. This is because of the topography of the district and prevailing extreme weather. 91% of the district population is rural. People usually live in clusters and indoors. This facilitates spread of droplet respiratory infections. Along the years morbidity has grown although mortality has decreased.

B. Water and food-borne diseases like diarrhoea, dysentery, hepatitis, and enteric fever:

In Himachal Pradesh, various water sources of drinking water include rivers, streams, springs, tube wells, percolation wells, and hand pumps. These sources makes Himachal Pradesh vulnerable to epidemics of water borne diseases because of unsafe drinking water supply due to open air defecation, poor hygienic condition, lack of health education, social customs, superstitious ideas, illiteracy, poverty and influx of tourist into the state.

In District Shimla water borne diseases are on the rise but mortality have decreased It shows better health care or better health seeking behavior of the people. Diarrhoea is responsible for large number of infant deaths. National Family Health Survey-2 has estimated the prevalence of diarrhoea for the state to be 31% amongst children under three years of age.

C. Contact disease such as skin diseases, reproductive tract infection, and sexually transmitted diseases:

The data for these diseases is under reported as the clients usually visit private practionner for seeking treatment. The problem is quite high in the state. As for HIV /AIDS status in Himachal Pradesh on 30th June 2002 out of 31083screened at the only one blood testing center in State that is Indira Gandhi Medical College Shimla, 371were found as HIV positive which includes 96 AIDS cases.

D. Vaccine preventable diseases like measles, diphtheria, tetanus & neo-natal tetanus, whooping cough:

Among the vaccine preventable diseases Measles is on the rise. All other vaccine preventable diseases have not been reported in the last five year in the district. The traditional beliefs of tribal population, poor nutritional status of children and peculiar topography are some of the contributing factors for theses vaccine preventable diseases incidences and prevalence's.

E. Non- communicable diseases like anemia, injuries and cancer.

Non-communicable diseases data was available for anemia, injuries all type, skin diseases and neoplasm all type only at the district level hence the trends for these diseases were looked for. Despite the fact national Anemia Prophylaxis Control Programme had been there for the last three decades the prevalence of anemia is still very high. This is reflected in the last five-year data, as the prevalence had remained almost similar. Important is that its only the reported cases from hospitals not the community survey where the prevalence would be much higher. High prevalence of skin diseases reflects not adopting hygienic practices which may be due to ignorance among the community. For diseases like cancer the risk factors need to be identified so that appropriate measures can be adopted.

OUTBREAKS IN THE DISTRICT SHIMLA AND STATE OF HIMACHAL PRADESH:

The state of Himachal Pradesh has witnessed an epidemic of following communicable diseases in the last decade. The available data regarding outbreaks shows the following picture:

Table Detail of Outbreaks in Himachal Pradesh 1999 to 2002.

Diseases	Area affected	Date of outbreak	Number of cases	Number Of deaths
Dengue	-----	1999	7	2
Cholera	-----	1999	16	1
Plague	Jubbal	4-2- 2002	16	4
Gastroenteritis	Gardi (Barsar)	20-2-2002	61	----
Fever cases	Arloo (Bangana)	21-2-2002	17	----
Hepatitis (E)	Mandi town	4-3-2002	612	----
Hepatitis	Bilaspur town	8-5-2002	34	----

Epidemics are a public health emergency that disrupts routine health services and are a major drain on resources. While not all outbreaks can be predicted or prevented, epidemic preparedness and precautionary measures can reduce the risk of outbreaks, minimize their scale and lessen their impact on human suffering.

These outbreaks which occurred in the state of Himachal Pradesh were successfully controlled and managed but there epidemic potential to occur again and again still exits. I will take up in brief the outbreak of Plague in Shimla district of Himachal Pradesh.

PLAGUE OUTBREAK:

Notification about the outbreak:

On 11th of February 2002 in the afternoon Senior Medical Officer Incharge Rohru informed the Chief Medical Officer of District Shimla over telephone and later followed by fax. The message reported unusual clustering of cases of severe Pneumonia like illness at Hatkoti village. The fax message was discussed at the Chief Medical Officer office and a team comprising of district health officer, clinician, laboratory technician and other paramedical staff was sent to Rohru. A day after a team comprising of members of medical college was also sent to investigate the outbreak. At that time of year there was a heavy snowfall in the area.

The then Health Secretary to the government of Himachal Pradesh, on 13/02/2002 after admission of few cases presenting with fever and haemoptysis (severe Pneumonia like illness) in the two hospital of Shimla district that is Civil hospital Rohru and Indira Gandhi Medical College Shimla and Post Graduate Institute of Medical education and Research Chandigarh requested National Institute of Communicable Diseases New Delhi to depute team for investigation of the outbreak.

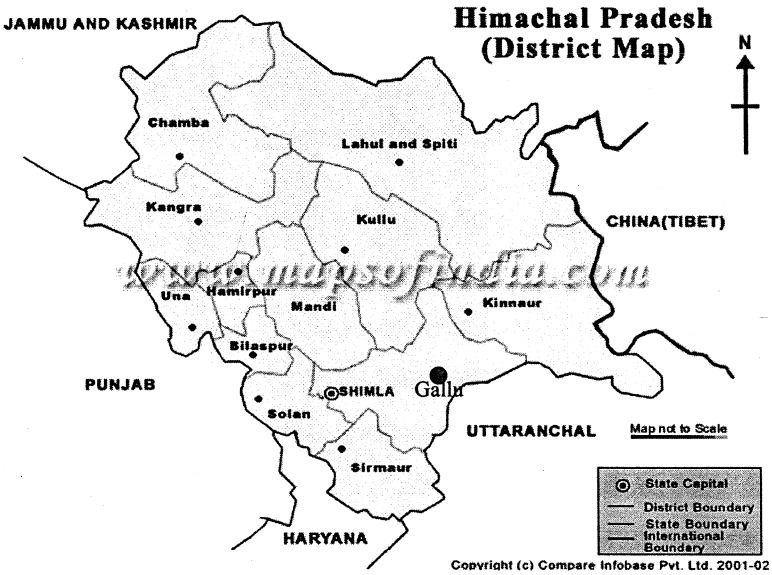
Background:

Himachal Pradesh is one of the northern State of India situated at the foothills of western Himalayas, some of its peaks reaches as high as 5000 meters and contains traces of snow throughout the year. The district of Shimla is bounded by Mandi and Kullu district in North, Kinnaur district in East and Solan district of Himachal Pradesh in West. Dehradun district of Uttaranchal forms its Southern boundary. (Fig-1) .The villages in this district are scattered on the mountains slopes and valleys with small clusters of houses and sparsely populated. The terrain is rugged and mountainous with very poor communication facilities.

The affected hamlet Gallu is situated in Hatkoti village of the Jubbal-Kothkhai Block of District Shimla Himachal Pradesh. Hatkoti village is having a population of 94 and 28 houses. Houses are scattered over a large area on the hillock. The nearest health facility that

is a Primary Health Center at Sarswati Nagar which is about 15 Km. from the affected village. A sub-divisional hospital is also located at a distance of 25 Km. from the affected village. This hamlet is at least 500 meters away from the next near inhabitation.

Fig-1



Investigations conducted by investigating agencies:

Investigation agencies involved in the outbreak were:

- Directorate of Health Services, Government of Himachal Pradesh.
- Indira Gandhi Medical College Shimla
- Post Graduate Institute of Medical education and Research Chandigarh
- National Institute of Communicable Diseases New Delhi

National Institute of Communicable Diseases New Delhi investigated the outbreak w.e.f. 14th to 17th February 2002. The investigating team reached Post Graduate Institute of

Medical education and Research Chandigarh on 14th of February and examined the patients there, took samples, reviewed records of the deceased and held discussion with the heath officials involved in managing Plague cases. Then on 15th of February they reached Shimla and examined the patients, took samples, reviewed the record of patient and held discussions with different officials of Indira Gandhi Medical College and reviewed the facilities present in the laboratory of Indira Gandhi Medical College. On the evening of 15th February they reached Rohru. The investigating team after reaching Rohru discussed the situation with senior Medical Officer Rohru and other health official at Civil hospital Rohru, District health team at Hatkoti, Medical College team at Hatkoti and other local government officials. They examined the patients admitted in the hospital and took samples. They reviewed the medical records of the deceased and the patients admitted in the hospital. They collected epidemiological data and histories from family members of the deceased. They laid traps at Hatkoti village and collected rats. They could not go to Kalvi forest because of the heavy snowfall. The officials of the Health Department actively participated with the investigating teams and supported them in terms of logistic and manpower.

Findings of the investigating Teams:

The investigating team concluded that the illness was due to infection of ***Yersinia Pestis*** **(*Y.pestis*),** and it was pneumonic Plague. They hypothesized that Randhir Singh who has gone for hunting to Kalvi forest might have contacted the infection there from the infected animal while handling it.

Clinical materials collected from the cases were initially processed in the laboratories of hospital where the cases were admitted. Further laboratory investigations including confirmatory tests were carried out in the laboratories of National Institute of Communicable Diseases (NICD) New Delhi. Results are shown in (table 1).

Table-1

Results of laboratory investigations for diagnosis of Plague in Hatkoti village

Name	Age/ Sex	Bacteriological	Molecular	Serological	Case classification as per WHO definition
Randhir	35M	-	-	-	Suspected
Sulochana	29F	No organism grown	Confirmed	Single sample positive	Probable
Naveen	26M	Y.pestis confirmed	Confirmed	Negative	Confirmed
Anu	31F	Y.pestis confirmed	Confirmed		Confirmed
Jyoti	27F	-	--	Negative	Probable
Rakesh	35M	-	-	Negative	Probable
Pradeep	35M	-	-	Negative	Probable
Stya Devi	38F	-	-	>4-fold rise	Confirmed
Purshottam	36M	-	-	Same titer in paired sera	Probable
Krishna	37F	-	-	>4-fold rise	Confirmed
Pushpa	40F	Y.pestis confirmed	Confirmed	Negative	Confirmed
Asha Devi	57F	Y.pestis confirmed	Negative	>4-fold rise	Confirmed
Damayanti	46F	-	-	>4-fold rise	Confirmed
Hapinder	22M	-	-	>4-fold rise	Confirmed
Bankru	60M	-	-	>4-fold rise	Confirmed
Kesarmani	47F	-	-	Negative	Probable

Source Directorate of health services Himachal Pradesh

Preventive and Control measures:

Once the disease was suspected to be plague by the local Health Officials, the state health authorities were informed about the outbreak, and the government came into action to control the outbreak. Surveillance reporting units were established in 84 health institutions of the area. A senior medical officer of the district was made responsible to report the cases and to carry out control measures. Following steps were taken

Immediate:

1. All cases were admitted to designated hospitals (isolated) and treated with antibiotics and supportive therapy.
2. Use of protective gear advised to all relatives, health professionals, attending the cases in the form of facemask, gloves, head caps and gown.
3. Quarantine of affected villages to prevent migration and there by prevent spread of the disease.
4. Epidemiological investigations were initiated and NICD teams were supported after their arrival in the affected area.

During:

1. Chemoprophylaxis was provided to all the possible contacts of cases in the family, neighborhoods and other people in the affected area in the form of Ciprofloxacine tablets, Doxycycline capsules, Septaran Tablets and Septran syrups. A total of 24215 were given prophylaxis's from 12-2-2002 to 26-2-2002
2. Workers went door to door to find out new cases, educate the community and to provide chemoprophylaxis.
3. Fumigation of residence of index case and the vehicles used to transport the cases was undertaken

4. A massive IEC camp was started in the district to make the people aware of the symptoms of plague and seek treatment, and to ensure community participation by means of mass-media dissemination of correct information
5. Guidelines for safe disposal of dead bodies were framed and advised to be followed..

Long Term:

1. District Shimla was included under the National Surveillance Programme for Communicable Diseases from 2002-2003
2. The state Government proposed to establish a plague surveillance unit in district Shimla under the guidance and training of NICD.

DISEASES OF EPIDEMIC POTENTIAL:

After looking at the secondary data available for the last five years for the district and the recent outbreaks we can identify diseases of epidemic potential. Their list can be as follows: **Plague, Hepatitis, Cholera, Gastroenteritis, Enteric fever, Measles, Dengue, and Tuberculosis.** The prevailing socio-economic and cultural beliefs also help in spread of these diseases

In Himachal Pradesh after the outbreak of Plague like illness in 1983 a plague Surveillance unit was set up. But with the passage of time this surveillance unit had become non-functional. In the year 2002 in the month of February an outbreak of Plague took place in Shimla District and the district was brought under the NSPCD programme along with other two districts Hamirpur and Solan where the programme was implemented in the year 1998-1999.

The basic **objective** of the programme is:

- Capacity building at state and district level for developing effective surveillance system for early detection and appropriate response to early warning signals of outbreaks of communicable diseases.
- Strengthening of laboratories.

- Installing network of electronic communication.
- Strengthening of basic entomological services.
- Improving epidemiological analysis of data.

It was impossible to include all infectious diseases in the surveillance system at the outset and prioritization was done. The conditions were:

- Those diseases that are targeted for eradication, elimination and control using specific intervention strategies that are already being applied on a high priority.
- Those diseases that can be controlled locally especially in outbreak situation and against which effective interventions are available.
- Diseases for which epidemiological information is needed, to design control strategies.

The programme identifies following diseases of epidemic potential; they are:

1) Cholera /Acute Diarrhea / Dysentery **2)** Viral Hepatitis **3)** Typhoid Fever **4)** Measles **5)** Chicken Pox **6)** Diphtheria **7)** Dengue /DHF **8)**Japanese Encephalitis **9)** Meningitis **10)** Others

Although the NSPCD looks at the communicable diseases but it does not address the non communicable diseases like Trauma / Motor Vehicle Accidents, Cancer, Ischaemic heart diseases, and Dental problems which constitute a major burden of diseases after the communicable diseases. So there is a need for inclusion of theses non communicable diseases also under the programme.

6. Under the NSPCD Rapid Response Teams have been constituted at the state and District level having the following members.
    a. Nodal Officer
    b. Epidemiologist/ Public health specialist
    c. Microbiologist
    d. Entomologist
    e. Clinician
    f. Statistician

7. Man power development has taken place in the form of training of state and district Rapid Response Teams, Medical Officers, Multi purpose Health Workers and laboratory technicians has been done in the districts implementing the programme.
8. Up gradation of Laboratories: The laboratories have been strengthened at different levels, by supplying equipments and reagents. Suggested microbiological test at district laboratories are:

Procedure /Specimen	Diseases /Organism
Microscopy for stained smears	Diphtheria
(Gram, Albert, Ziehl Neelsen)	Plague
Nasopharynx and throat.	Vincent angina
Sputum	Tuberculosis, Pneumonia
CSF	Meningitis(Pyogenic &tuberculosis)
Stool	Cholera / Dysentery
Culture	
Serological tests	Cholera
Dipstick and	Enteric Fever(Widal)
particle agglutination test	RPR /VDRL
Bacteriological analysis	HBsAg, HIV
	Water

Communication equipments upgraded with the provision of telephone and fax machine at state, district and block level.

9. For data management computers have been installed at state and district level and electronic processing of data is possible

Nodal Officer at the district level is the key person for the success of the programme .HIS Role is to

a. Collection and compilation of data of district
b. Analysis of data
c. Action on data
d. Communication of data to higher level

e. Coordination between peripheral healthy institutions, block level ,district level and the state level
f. To arrange training of all categories of staff.
g. Review of programme.
h. Feedback

SECONDARY DATA ANALYSIS OF TUBERCULOSIS DISEASE FOR THE YEAR 2001 IN SHIMLA DISTRICT.

Tuberculosis is a major public health problem worldwide and about one third of the world population is infected by Mycobacterium Tuberculosis the causative agent. Of all avoidable deaths tuberculosis constitute 25% of the deaths. Tuberculosis remains the leading cause of death due to infection in India. In India it is estimated that more than 40% of the adults are infected with TB bacilli and every year two million people develop tuberculosis and nearly 500,000 die from it. WHO estimates of 2000 indicates that unless urgent action is taken, more than 4 million people in India will die of Tuberculosis in the next decade. Further studies have shown that tuberculosis is a major barrier to economic development, costing approximately 13000 crores in a year. Tuberculosis patients spend more than 645 crores on private tuberculosis care in India. Tuberculosis has a devastating social costs as more than 300,000 children are forced to leave school as their parents have tuberculosis and more than 100,000 women are rejected by their families. This continued burden of tuberculosis is tragic despite the fact tuberculosis is 100% curable

Most of the people affected by tuberculosis are in the age group of 15-45, which is the economically active age group. They are the bread earners for their families and the productive people for the nation as well as their families. Hence tuberculosis imposes considerable economic/ financial/ social loss to the families affected.

Tuberculosis remains a public heath problem for the district of Shimla Himachal Pradesh also. The prevalence of tuberculosis has not changed in the last three decades, despite having had a tuberculosis control programme in the district. With the rise in HIV- associated

tuberculosis and the emergence of multi-drug resistant tuberculosis the magnitude and severity of tuberculosis epidemic will increase further. For the control of tuberculosis RNTCP was implemented in Himachal Pradesh in phased manner. Hamirpur was the first district to implement the programme in 1995 and in district Shimla the programme was implemented in the year 2000.

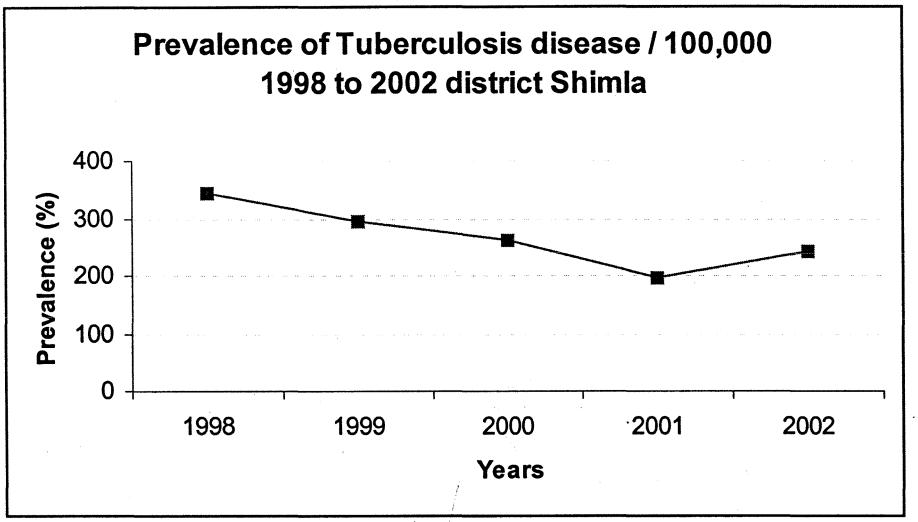
RNTCP, Shimla District.

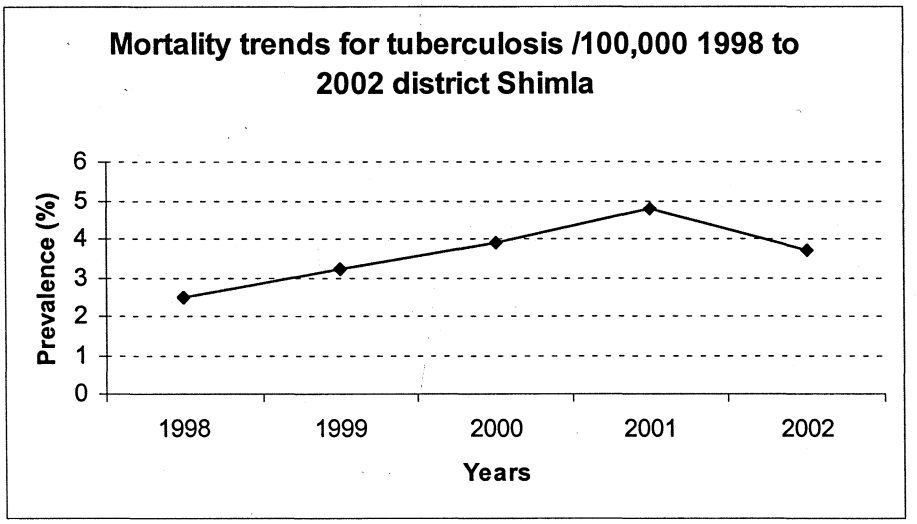
The total population covered under RNTCP in the year 2001 was 721,745 that was the entire population of district Shimla. The population has been dived in four Tuberculosis Units (TU) and 19 microscopic centers (Table).

Table Distribution of Tuberculosis Units (TU) in Shimla district 2001

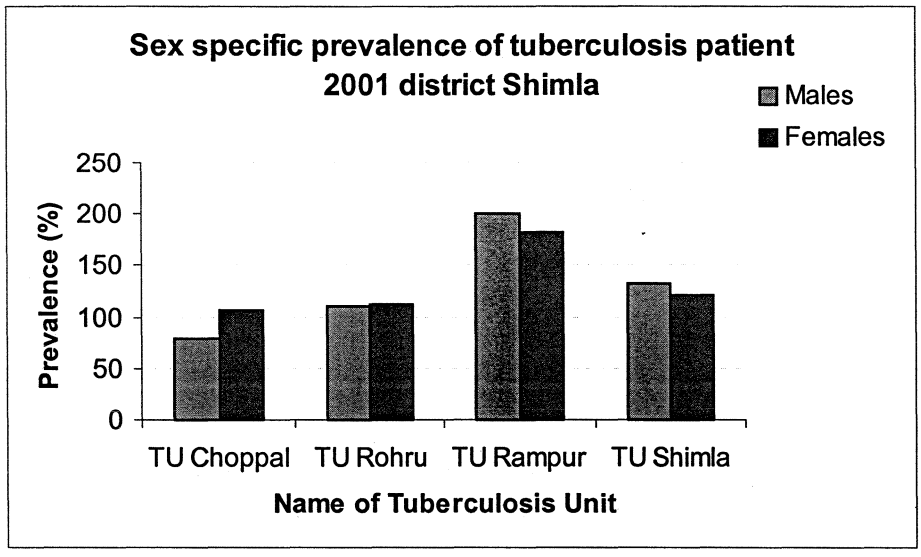
Name of TU	Microscopy Centre	Population	Functional	Area under TU
Shimla	1. DTC Shimla	211408	Yes	Mashobra &
	2.CH Theog		Yes	Matiana
	3. PHC Chailla		yes	Blocks
	4. PHC Sunni		Yes	
	5. CH Junga		Yes	
Rampur	1.MGMSC Rampur	160335	Yes	Kumarsain &
	2.CHC Kumarsain		Yes	Nankhari
	3.CH Sarahan		Yes	Blocks
	4.PHC Nankhari		Yes	
	5.PHC Kholighat		Yes	
Rohru	1. CH Rohru	184353	Yes	Chirgaon &
	2. PHC Tikker		Yes	Tikker blocks
	3. PHC Chirgaon		Yes	
	4. PHC D. Kwar		No	
Chopal	1. CH Chopal	165649	Yes	Nerwa
	2. PHC Nerwa		Yes	(Chopal) &
	3. CHC Kotkhai		Yes	Jubbal Block
	4. CH Jubbal		Yes	

OBSERVATIONS:





The annualized case detection of tuberculosis patients per lakh population has come down as compared to 1998. This may be because of launching of Revised National Tuberculosis Programme (RNTCP) under which emphasis is laid down to diagnose sputum positive cases by microscopy and there by avoiding over diagnosis which was happening earlier by means of radio diagnosis. The mortality has increased from 2.5 in 1998 to 3.7 in the year 2002.



Of the four tuberculosis units in Shimla district Rampur was having the highest prevalence of tuberculosis both in males as well as females and TU Choppal the minimum.

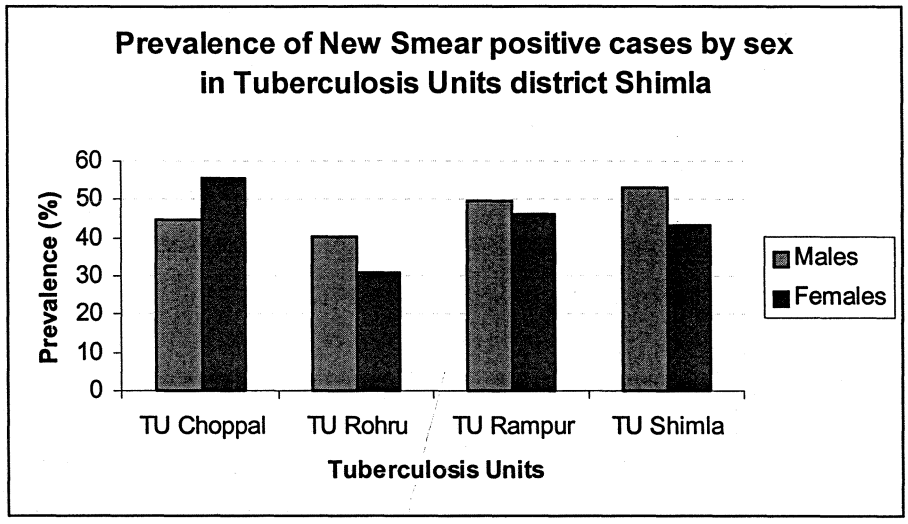
Total Tuberculosis patient's registered TU wise by type of diagnosis under RNTCP for District Shimla 2001

Tuberculosis Unit	New smear positive patients		Relapse patients		New smear negative patients		New extra – Pulmonary patients	
	M	F	M	F	M	F	M	F
TU Choppal	38	45	5	7	24	26	7	8
TU Rohru	38	28	19	14	29	31	19	27
TU Rampur	41	36	32	20	74	50	18	36
TU Shimla	57	45	22	10	50	44	14	27
Total	174	154	78	51	177	151	58	98

The diagnosis of non-smear positive patients was highest for tuberculosis unit Rampur as compared to other tuberculosis units. It may be because of over diagnosis on other

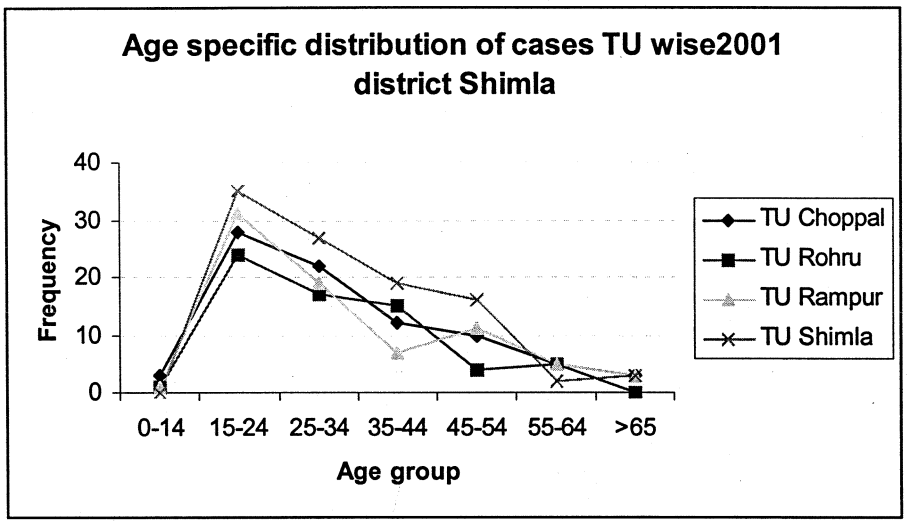
parameters and not strictly adhering to sputum microscopy, which has to be verified with tuberculosis unit Rampur Table .

Fig Prevalence of new smear positive cases of Tuberculosis for District Shimla 2001



Overall prevalence of new smear positive cases is high among males as compared to females. Among males it is highest at Tuberculosis Shimla this may be because being a tertiary care hospital people tend to come to the hospital for diagnosis and treatment more as compared to other institutions. Among females it was highest in TU Choppal, which is one of the toughest block of district Shimla in respect to terrain.

Fig Age specific distribution of new smear positive cases of Tuberculosis for District Shimla 2001



The overall prevalence of tuberculosis is highest in the age group 15-54 which is the most productive age group in all the tuberculosis units of district Shimla.

Table Distribution of patients as per Microscopic activities

Tuberculosis Unit	Number of new adult out patients	Number of chest symptomatic	Number of smear positive diagnosed	Number of smear positive put on DOTS
TU Choppal	60625	1288(2.1%)	125 (9.7%)	83(66.4%)
TU Rohru	74463	2266(3.0%)	148(6.5%)	66(44.6%)
TU Rampur	79986	2125(2.6%)	171(8.0%)	77(45.0%)
TU Shimla	90903	2752(3.0%)	231(8.4%)	102 (44.1%)
Total	305977	8431(2.8%)	627(7.4%)	328(52.3%)

The overall patients put on DOTS was 52.3%, which is only 47.3% of the total sputum positive patients diagnosed in the district. The placements of patients on DOTS were lowest at TU Shimla with only 44.1% being put on DOTS. This may be due to selection bias of patients to complete treatment on the behalf of health providers in order to get the desired cure rate of 80% and sputum conversion rate of 85%, which is recommended under the programme. But this selection of patients is not decreasing the burden of tuberculosis as 50% of them are put on non-DOTS treatment under the National Tuberculosis Programme where our experiences shows that the completion as well as defaulters rates are very high due to poor logistic supplies and supervision.

Discussion and Conclusion:

Tuberculosis is among the leading infectious disease burdens of the district affecting both the sexes in all age group in particular (15-54). Annual risk of infection for Tuberculosis for the state of Himachal Pradesh is 2.3 where as it is 1.4 for the rest of the country. The high number of TB cases may be attributed to the extreme climatic conditions prevailing in the state which forces people to stay indoors and crowded in place of heating arrangements. Being a hilly terrain the accessibility to health institutions may also be a constraint in seeking early treatments and diagnosis thereby spreading the infection. The social stigma associated with tuberculosis is also a major constraint for seeking treatment especially among the female patients.

The number of patients put on DOTS averages to 52.3% for the district, which means that 48% patients are placed on non-DOTS strategy. Thereby favouring emergence of multi – drug resistant cases and defaulters as it has been shown that cure rate under the national tuberculosis programme has been 30-40%. Strategies have to be adopted so that maximum numbers of sputum positive case are put on DOTS and the burden of tuberculosis decreased.

Emphasis has to be laid on IEC activities so that people are motivated and avail the treatment facility under RNTCP for effective management of tuberculosis disease. It has to be targeted for social behavioral change rather than informing the community. The

responsibility has to be shared both by health providers and community empowered by the political commitment at all levels to control the spread of disease.

COMMENTS:

Burden of communicable diseases as well as the non-communicable diseases is increasing day by day. Knowing the magnitude of problem it is essential that appropriate public health strategies are adopted for timely control and prevention so that both mortality as well as morbidity is brought down.

Most of the population, of the district Shimla and even the State live in the rural area. The state Government has provided drinking water supply to approximately 90% villages and all urban areas, yet the quality of water is not up to the desired standards. The secondary data analysis for the last five years shows the majority of communicable diseases are water borne and Respiratory diseases. Steps have to be taken up for improving the waste management in the rural and urban areas and provision of safe drinking water to the people. Mass health education programmes has to be launched and implemented to create awareness among community about the prevention of these diseases.

The possible reason s identified for the spread of waterborne disease and respiratory infections could be:

1. There is no proper system of waste disposal in rural and even urban areas.
2. The practice of indiscriminate disposal of waste in town.
3. Open-air defecation is common practice seen in villages.
4. Hospital waste is generally dumped in the open, leading to grave environmental degradation, particularly air, soil and water pollution.
5. Overcrowding and lack of ventilation in dwelling rooms.
6. Ignorance about the disease itself.
7. Lack of access to health care because of distance or non-availability of the heath care provider.
8. Social stigma attached to diseases like tuberculosis, leprosy etc.

PREVENTIVE STRATEGIES:

1. Promotion of intersectoral coordination with departments like Education, Irrigation and Public Health and ICDS.
2. Education department can send health education messages through the students and create awareness among the community by way of giving health talks in assembly, organizing debates on issues of local heath concern and making students participate in the heath programmes by taking out rallies.
3. School health programmes can screen the children's and ensure their proper treatments and follow up for dental diseases, anemia, worm infestations skin diseases etc.
4. ICDS department can help in Universal Immunization Programme and prevention of anemia in children as well as women by distributing iron tablets. These institutions can be converted in to condoms depot for distribution of condoms for prevention of unwanted pregnancy as well as prevention of sexually transmitted disease.
5. Irrigation and Public Health department should carefully monitor water quality with health department and ensure its proper Chlorination and storage, thus preventing the preventable water borne diseases. Yearly action plans should be prepared for keeping the quality of water to a satisfactory level in-coordination with the health department.

6. Involvement of NGO for bringing people forward for seeking of treatment for diseases like Tuberculosis and spreading the message of health education in the community.

7. Establishment of Trauma Care Centers at Sub-Divisional level for management of Trauma and accident cases and thus preventing mortality which caused by delay in treatment because of referral to higher institutions.

8. Documentation of Action Plans of Epidemic Potential diseases should be done at the block level so that early response can be initiated at the peripheral level there by decreasing the morbidity and mortality caused by Epidemic prone diseases.

9. Sub divisional co-ordination should be formed under the chair of sub-divisional magistrate. The members in the committee should include heads of all the department

mentioned above and also include the elected public representatives like Pradhan, Bock Chairman, Zila Parishad member etc. They should hold periodical meetings and address the local health needs of the community and ensure the remedial measures are followed.

To conclude we can say that secondary analysis of Data does give a picture of disease burden in the district and gives leads and suggestions for improvement. It helps in prioritizing the resources allocation in the health sector and draws attention towards the limitation of the available data.

Secondary Data for communicable Diseases from 1998 To 2002 For Shimla District Himachal Pradesh

Diseases	1998 Population (679352)				1999 Population (693483)				2000 Population (707614)				2001 Population (721745)				2002 Population (735876)			
	No of cases	No of Deaths	Prevalence /100000	Mortality / 100000	No of cases	No of Deaths	Prevalence /100000	Mortality/ 100000	No of cases	No of Deaths	Prevalence /100000	Mortality / 100000	No of cases	No of Deaths	Prevalence /100000	Mortality/ 100000	No of cases	No of Deaths	Prevalence /100000	Mortality / 100000
Acute diarrhoeal diseases (Gastroenteritis &Cholera)	49889	3	6919	0.41	45238	7	6153	1	48853	14	6520	2	47095	1	6169	0.13	55393	4	7256	0.51
Diphtheria	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Acute Poliomyelitis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tetanus other then neo-natal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Neo-natal tetanus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Whooping cough	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Measles	128	0	18	0	134	0	18	0	106	0	14	0	180	0	24	0	212	0	27	0
Acute respiratory infection	97561	39	13531	5.4	98674	39	13422	5.3	104711	61	13975	8.14	145378	117	19043	15.32	189830	79	24414	10.2
Pneumonia	2977	23	413	3.18	3531	20	480	2.72	3716	26	496	3.46	3775	14	494	1.83	3037	22	391	2.82
Enteric fever	656	2	91	.27	981	0	133	0	890	1	119	.13	2069	0	271	0	2841	0	365	0
Viral hepatitis	26	0	4	0	45	0	6	0	44	0	6	0	52	0	7	0	107	1	14	.12

se alitis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
goco itis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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	792023	1006	109804	140	711517	882	96783	120	760069	893	101438	119	901736	833	118117	109	920545	874	118389	112

SECTION.2

SECOND FIELD POSTING

2.1 EVALUATION REPORT, NATIONAL SURVEILLANCE PROGRAMME FOR COMMUNICABLE DISEASES, DHARAMPUR BLOCK, SOLAN DISTRICT, HIMACHAL PRADESH

1. INTRODUCTION:

Disease surveillance is the backbone of any public health system. It is defined as the ongoing systematic collection, collation, analysis and interpretation of data, and the dissemination of information to those who need to know in order that action may be taken. Surveillance system generates data for public health action. .

Disease surveillance system in Himachal Pradesh:

In Himachal Pradesh after the outbreak of Plague like illness in 1983 a plague Surveillance unit was set up. Active and passive surveillance activity had been going in the state under the various vertical National programmes. In the recent past, acute flaccid paralysis (AFP) surveillance has made judicious use of both these systems of surveillance to generate dependable, accurate data on the situation. The outbreak of Plague at Surat in1994, Cholera at Delhi in 1995 and dengue hemorrhagic fever in 1996 have highlighted the urgency for disease surveillance system so that public health events are detected early and appropriate control measures are initiated in a timely manner.

In1997-98 National Surveillance Programme for Communicable Diseases (NSPCD) was launched as a pilot project in five districts in the country. In Himachal Pradesh, the programme was launched in two districts i.e Solan and Hamirpur in 1998-99.

NSPCD includes communicable diseases with integrated laboratory support. Already two years have been passed since the implementation of NSPCD in the state but no assessment has yet been done. As evaluation helps in planning for the best use of limited resources and strengthening the system the present study was conducted with following objectives.

2. OBJECTIVES OF EVALUATION:

- To assess the achievement of the objectives of the NSPCD in Solan district
- Identify gaps and underlying factors contributing to the gaps.

- Suggest appropriate measures to narrow down / close existing gaps

3. METHODOLOGY:

A cross sectional study was conducted for the evaluation of NSPCD in one block area of Solan district.

The study dealt with the following issues.

1. Public health priority of the diseases included.
2. Objectives of the system.
3. Assess the system with respect to structure, process and outcome variables

Selection of the study area:

There are five blocks in Solan district out of which Dharampur block was selected for the study. The Block was selected purposively keeping in view the feasibility with respect to time and logistic constraints. The accessibility in Dharampur Block is easier than other blocks as here the difficult terrain areas are less.

In Dharampur block, the community health centre (CHC) is situated at the block Head quarter. Along with the CHC two Primary health centres (PHCs) i.e. PHC Deothi and PHC Sabathu were selected for the study. Under each PHC two sub-centers were selected by lot method. Thus total four sub-centers were selected: sub-center Ghatti, sub-center Shilli, Sub-center Kakarhatti and Sub-center Shadiyana.

The evaluation was conducted in the month of August and September 2002.

The evaluation team was constituted of MAE-FETP scholar as the principal investigator, one local volunteer and one health worker.

Collection of data:

Both primary and secondary data were collected using data collection tools.

Data collection formats were designed with technical guidance of NIE staff, which were field-tested. These formats were used for primary data collection by survey. A checklist was developed for keeping tack of the evaluation activities.

Both quantitative and qualitative methods were adopted for the evaluation.

For quantitative data collection, registers and records were reviewed. A proportion of secondary data containing reporting and diagnosis from the selected health institutions were reviewed and checked for consistency at different level. Field survey data were compiled.

Following qualitative methods were adopted.

In-depth interviews:

Separate questioners were developed for different health officials like State Nodal Officer (SNO), District Nodal Officer (DNO). Block Medical Officer (BMO), Medical Officers and Multi purpose Health Workers (Annexure 5,6,7,8).

Observation: Different level of health institutions like, State Surveillance cell, District Surveillance cell, District Laboratory, Block headquarter Dharampur, Community health center Dharampur, Primary Health Center Deothi, Primary health center Sabathu, S/C Kakar Hatti ,S/C Shadiyana, S/C Ghatti and S/C Shilli were visited during the study to understand the structure of NSPCD, its functioning at different levels by using checklist (Annexure 1,2,3) and semi-structured questionnaire.

Data analysis:

Data generated were analyses by using computer- Excel package.

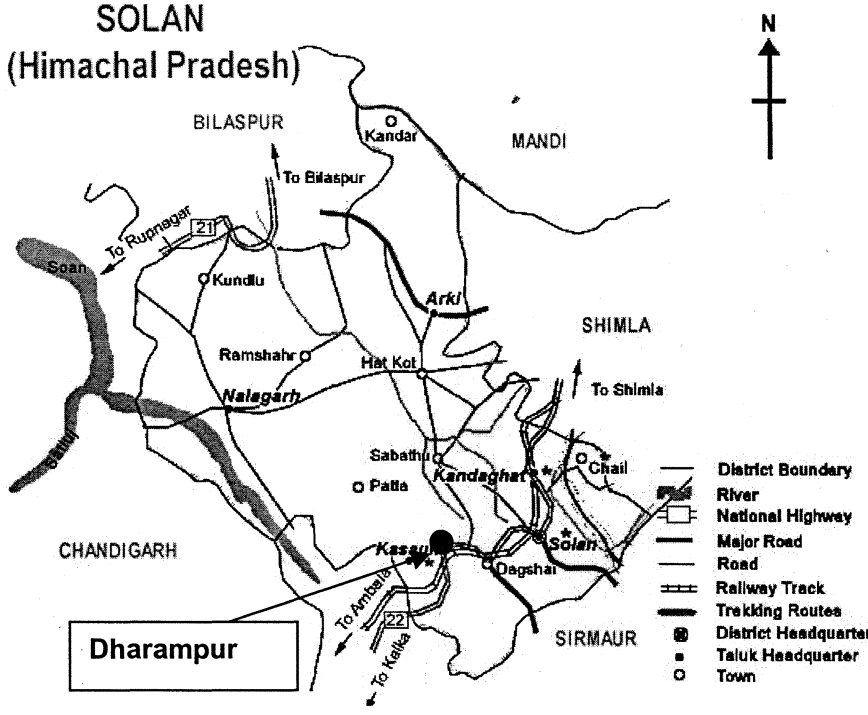
4. Findings:

Introduction to NSPCD in Solan district:

Solan district - an overview:

The Solan district of Himachal Pradesh is bounded by Sirmaur, Shimla & Bilaspur District of Himachal Pradesh on one side and State of Punjab and Haryana on the other side. Solan district is known as the gateway of Himachal Pradesh. The total geographical area of the district is 1936sqkm and the population is 499380 as per 2001 censuses. The topography of the districts is mountainous and terrain at the altitude ranging from 300 meters to 3000 meters above mean sea level.

Figure 1. Map of Solan District showing the study area.



2. Health Infrastructure:

As on 31-3-2001 the health infrastructure of the Solan district is as follows (table-1). (Other Detailed information of Solan district is given as annexure: 1)

Table1: Health institutions in Solan and Himachal Pradesh

Place	Hospitals	CHC	PHC	CD	ISM Inst.	Sub-centers	No. Of Beds
Solan	5	3	20	17	77	179	921
State	50	65	304	155	1153	2068	8872

Source: Directorate of health services Himachal Pradesh

Dharampur Block:The Dharampur block is situated at the southern part of Solan district having a population of 149380.The health infrastructure in the block is as follows:There are two hospitals 1.Zonal Hospital Solan and 2.ESI Hospital Parwanoo .The PHCs under the Dharampur CHC are 4 in number: Sultanpur, Pratha, Sabathu and Deothi. Number of Civil

dispensaries are 3 (Jangeshu ,Kasauli and Chambaghat-ESI).Total number of Sub-centres are 39 (source CMO office Solan)

NSPCD was implemented in Solan district in 1999 with following objectives:

- Capacity building at state and district level for developing effective surveillance system for early detection and appropriate response to early warning signals of outbreaks of communicable diseases.
- Strengthening of laboratories.
- Installing network of electronic communication.
- Strengthening of basic entomological services.
- Improving epidemiological analysis of data.

It was impossible to include all infectious diseases in the surveillance system at the outset. Hence prioritization was done with following criteria.

- Those diseases that are targeted for eradication, elimination and control, using specific intervention strategies that are already being applied on a high priority.
- Those diseases that can be controlled locally especially in outbreak situation and against which effective interventions are available.
- Diseases for which epidemiological information is needed, to design control strategies.

Diseases identified as of epidemic potential were as follows.:

1) Cholera /Acute Diarrhea / Dysentery **2)** Viral Hepatitis **3)** Typhoid Fever **4)** Measles **5)** Chicken Pox **6)** Diphtheria **7)** Dengue /DHF **8)**Japanese Encephalitis **9)** Meningitis **10)** Others. Case definitions, case classification and laboratory criteria is enclosed (annexure 9).

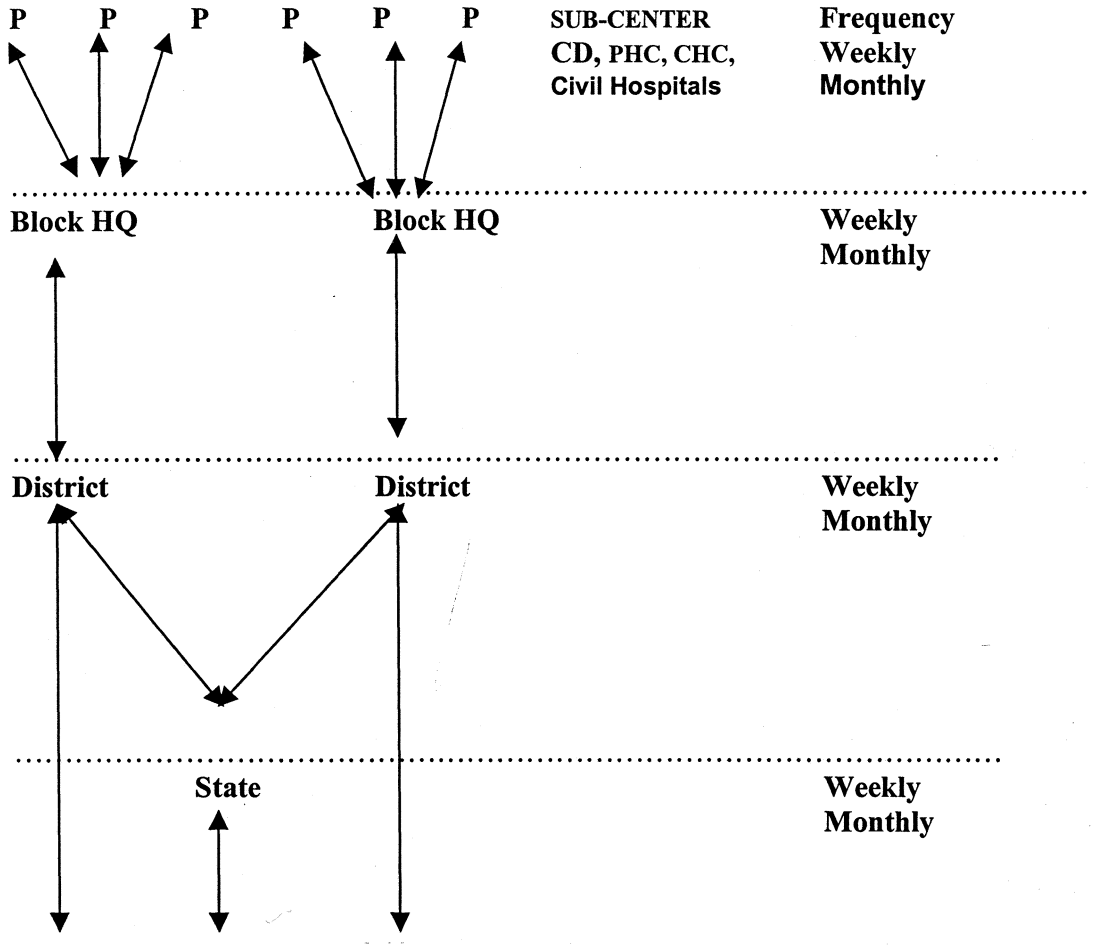
NSPCD Reporting system: Under the NSPCD programme the reporting is both weekly and monthly. Zero reporting is mandatory. The data originates from the lower most level of the system that is the sub-center. The Multi Purpose Health Workers (Male and Female) collect the data and report to the concerned PHC medical officer or directly to the block medical officer. PHC medical officer then sends the reports to the Block CHC. These reports are compiled at Block CHC by the Block Medical Officer and forwarded to the Chief Medical Officer of the District on weekly and monthly basis. The week starts from Sunday to Saturday. Monday is the reporting day. Reports are sent by telephonic messages, which is followed by written reports. At the state level, the district reports are consolidated on weekly

and monthly basis and sent to the National Institute of Communicable Diseases New Delhi. In emergency situations outbreaks or epidemics, daily or even hourly reports are being sent to the district and state head quarter from the peripheral health institution.

NSPCD Organisation structure

Level of Health Structure	Man Power	Communication Provided under NSPCD	Activities
HSC	Multipurpose Health Workers (Male and Female)	Nil	Detect Treat Report
PHC, CHC, Civil Hospitals	Medical Officers Paramedic	Nil	Detect Treat Report Response
Block Head Quarter	Block Medical Officer Rapid Response Team	Telephone	Analyse Investigate Report Respond Feedback
District Head Quarter	District Nodal Officer Rapid Response Team	Telephone Fax Computer E-Mail	Analyse Investigate Report Confirm Respond Feedback
State Head Quarter	State Nodal Officer Rapid Response Team	Telephone Fax Computer E-mail	Analyse Investigate Confirm Respond Feedback Plan &Fund

Flow of Information



Diseases under NSPCD in Solan district:

Though NSPCD was officially launched in the district in the year 1988-199, it became operational only in the year 2000.The three years NSPCD enlisted disease profile prior to 2000 is mentioned below (Table 2).

Case definitions for the diseases were used as per the NICD guidelines.

Table 2. Diseases under NSPCD, Solan District (1997 to 1999)

Months	1997 Population 446148			1998 Population 456234			1999 Population 466321		
	Cases	Deaths	Incidence rate /10000	Cases	Deaths	Incidence rate /10000	Cases	Deaths	Incidence rate /10000
Cholera /Acute Diarrhea / Dysentery	59619		1336	52842		1158	54812		1175
Viral Hepatitis	42	0	1	92	0	2	47	0	1
Typhoid Fever	818	0	18.33	728	0	16	307	0	6.6
Measles	20	0	0.45	8	0	0.2	0	0	0
Chicken Pox	0	0		0	0		0	0	
Diphtheria	0	0		0	0		0	0	
Dengue /DHF	0	0		0	0		0	0	
Japanese Encephalitis	0	0		0	0		0	0	
Meningitis	0	0		0	0		0	0	
Others	0	0		0	0		0	0	

Among the diseases identified under NSPCD incidence was high for water borne diseases and more so for diarrheal diseases. Cholera /Acute Diarrhea / Dysentery etc were having highest incidences .The table shows declining trend for Cholera /Acute Diarrhea / Dysentery, Typhoid fever and measles. But incidences of viral hepatitis remain at same level. Considering the morbidity and mortality and its public health importance we selected diarrhea diseases (Cholera /Acute Diarrhea / Dysentery) for further evaluation.

On the other hand it was observed from the available secondary data (1997-1999) that Acute Respiratory infections were also having high morbidity. Incidences were high 30158, 34910 and 38631 per 100,000 in 1997,1998, 1999 respectively but this has not been included in the NSPCD.

Structure indicators:

Physical infrastructure: The buildings at CHC, PHC and sub centers level were well developed and adequate assets are available. The CHC vehicle is on the road.

Communication system: The communication system at district and block levels has been strengthened. Telephone and FAX are available at state and district level. At block level phone is available but no FAX.

Computers with Internet facilities are available at district and state level.

Laboratory: laboratory is one of the important components of NSPCD. The district level laboratory is well equipped with building and laboratory equipments and other investigation facilities.

The laboratory at the district level has been strengthened under the programme. Both equipments and reagents have been provided from NSPD. Minor civil works have been done to improve the available working space.

At the block level laboratory facility is very poor and practically nil at PHCs and below. There are no emergency arrangements for biological sample collection and transportation to referral laboratories especially during the outbreaks. Referral laboratories are not clearly defined for the Block. No laboratory protocol is available at PHC and CHC level.

Biochemical analysis of water is done at CTL, Kandaghat which is located in the district as there is no facility available at the district laboratory.

Diagnostic facilities available at different levels are mentioned below.

Laboratory facilities at different lvels:

- Community Health Center (Dharampur Block): Malaria, Tuberculosis, Routine Hematology.
- District (Solan): Hematology, Bio-chemistry, Malaria, Tuberculosis, and Syphilis.
- Regional Laboratory (Indira Gandhi Medical College Shimla): Malaria, Tuberculosis, Cholera, Viral Hepatitis, Culture and sensitivity for common bacteria, Syphilis, Gonorrhea, and HIV- AIDS

Manpower: Staff position is adequate at all levels, which is as follows (Table3).

Table 3: Institution wise staff position in Dharampur Block 2003

Institution	Category	Sanctioned*	In position**	Vacant
CHC Dharampur	Block Medical Officer	1	1	-
	Medical Officer	2	2	-
	Dental Surgeon	1	1	-
	Senior Assistant	1	1	-
	Computer	1	1	-
	Pharmacist	2	2	-
	Radiographer	1	1	-
	Ophthalmic Assistant	1	1	-
	Laboratory Technician	1	1	-
	Driver	1	1	-
	Male Health Supervisor	3	2	1
	Female Health Supervisor	4	3	1
	Staff Nurse	1	1	-
	Dai	2	1	1
	Class IV	2	2	-
	Sweeper	2	2	-
PHC Subathu	Medical Officer	2	2	-
	Pharmacist	2	2	-
	Staff Nurse	1	1	-
	Laboratory Technician	1	-	1
	Clerk	1	1	-
	Female Health Supervisor	1	1	-
	Dai	2	1	1
	Class IV	2	2	-
	Class IV(Daily Wager)	1	1	-
	Sweeper	1	1	-
PHC Deothi	Medical Officer	1	1	-
	Pharmacist	1	1	-
	Staff Nurse	1	1	-
	Laboratory Technician	1	-	1
	Clerk	1	1	-
	Class IV	1	1	-
	Sweeper	1	1	-

*Source CMO office Solan

** As observed by investigator.

Both Male and female health workers were in position in the sub-centers that were assessed. Though the Laboratory is crucial in NSPCD the laboratory technician posts were lying vacant at the PHC since last two years and had rendered the laboratory non functional.

Constraints: It was observed that there were frequent transfers of key persons in the system, which bears adverse effect on surveillance activities. As for example within 2 years two State nodal officers were transferred from sate surveillance cell and similar was the situation at the district level.

Entomological teams are very important to keep track of vector dynamics and vector control measures. But no steps have been taken for strengthening entomological services at the state and district level till now.

Process Indicators:

The total population of district Solan is covered under the NSPCD programme. Distribution of population sex wise for the institutions visited is shown in 5 7. Except sub-centre Kakarhati male population is more than the female population in the block.

Table 4 .Sex wise population distribution

Institution	Population	Males	Females
District	499380	269451	229929
Block Dharampur	149380	76183	73197
CHC Dharampur	48063	25473	22590
PHC Deothi	10575	5393	5182
PHC Sabathu	5780	3006	2774
Subcentres			
Kakarhati,	1332	639	693
Sharyana,	1823	928	895
Ghatti,	3850	2002	1848
Shilly	1416	713	703

Data Collection, Transmission and Feedback:

Sub Center Level:

Both male and female multi purpose health worker collect data by active and passive method. Active collection is only done for malaria. Female health worker is responsible for maintaining the record of the sub center. Treatment for minor ailments is being given at the sub center level. The outpatient attendance is very low (2-4 patients /day). All 8 health workers interviewed stated that there is inadequate supply of medicine which is the main

factor for the low attendance of patients. The reporting formats as advocated under the NSPCD programme were not available in all the four sub centers visited. Case definitions provided under the programme were also not available in any of these sub center visited.

Diarrhea and acute respiratory infection were the most common complaints diagnosed in the OPD register in all the sub- centers. Although diarrhoeal disease was stated to be most common ailment but no water sampling test had been done for any of the four-sub center areas in the last one-year. The health workers had no knowledge about the reference laboratory. All the four sub centers were recording the data by age and sex in the OPD register but were being reported as number and sex only.

Population data were collected in all the four sub centers on yearly basis by survey. Registers were available in all the four sub centers for storage of population data. Only diarrhoeal diseases were reported weekly and all other reports were submitted monthly in the monthly meeting, which is held on 20th of every month. The reports are being submitted to Block medical officer through the PHC medical officers. As Fax and other electronic transmission mechanisms, are not available the reports are submitted manually (by staff). Previous year collected data are not utilized by block / PHC medical officers for predicting potential threats of outbreaks Data analysis is not being done at this level. Except for one sub center the supervisors have regularly visited all the three sub centers during last six months. Feedback was given verbal only. No out break was reported in these four-sub center areas in the last one year.

Primary Health Center Level:

At the PHC level data is being collected passively in an out door register, which is maintained by a pharmacist. The pharmacist is responsible for reporting and compiling data at this level. Weekly reports of acute diarrhoeal diseases are being sent by both the PHCs to the district level through the Block medical officer. In each PHC there were two medical officers in position. Water borne diseases and acute respiratory diseases and injuries constituted the main bulk of the morbidity found in the OPD registers. The average OPD attendance in one PHC was 30-40 patients /day and in the other PHC was 70-80/day. None of the two PHCs had the case definitions for the diseases under NSPCD. Blood film for malarial parasite was collected

in both the institutions actively. Data was being collected and stored in the OPD registers by name, age, sex and address, but reporting was only by number and sex. No sample of water were collected in the two PHC areas for biochemical analysis during last one year although waterborne disease were reported as major health problem in the area by all the four medical officers. The medical officers were not sure about the referral laboratory as two of the four medical officers said CHC Dharampur as referral lab and other two-mentioned district hospital as the referral lab.

Denominators for the population were available. Acute diarrhoeal diseases report was being sent weekly and all other reports were sent monthly by both the PHCs. Reporting was done through the block medical officer. Previous year available data was not used in any of the two PHC's. All the four medical officers were not aware of the all the diseases that are under NSPCD. The block medical officer has supervised the PHCs twice during last six months but there was no supervision by the district officials. Verbal feedback is given in the monthly meetings.

District Level:

Data is being collected passively at district and stored in registers by statistician although computers have been provided at this level these are not utilized optimally for this. Data is being reported by number and sex. No mention of age is made. Reporting formats are available as advocated under the programme. Data analysis is done in tabular forms. Reports are disseminated by post; fax. Internet facility, though available is not being used.

Acute diarrhoeal disease reports are received weekly and all other reports are received monthly. Reports are sent to directorate of health services and National Institute of Communicable Diseases New Delhi. In Solan district written action plan was available for epidemic preparedness against the diarrhoeal diseases. Previous year data were being used to identify the potential area of outbreak. Appropriate map has been prepared to define the high-risk area for the outbreaks of diarrhoeal diseases. State health directorate officials have supervised the District NSPCD twice during last six months. Written feed back is being received from the higher officials at State and NICD level. No out breaks were reported in the district in last one year.

Trainings:

Training under NSPCD was provided to the state and district Rapid Response Teams, Medical Officers, Health Supervisors (Male and Female), and Multi Purpose Heath Workers (Male and Female), Laboratory Technicians in the year 2000-2001 for the Solan district. It was only one time training. Training modules were given during the training to the participants. The training module for health worker was in Hindi.

Out of the four medical officer and eight-multi purpose health workers interviewed three medical officers and all health workers had undergone the NSPCD training (Table).

Table Status of Training among the Health staff interviewed.

Health Personnel	Training Status
District Health Officer	Not trained but have the orientations by attending meetings at NICD and state health and family welfare training center Shimla
Block Medical Officer CHC Dharampur,	Not trained but have the orientation by attending monthly meetings at district head quarter
PHC Medical officers	Three were trained and one was not trained
Health workers	Out of the 8 health workers 6 were trained in NSPCD. There was lack of clarity on case definition of cholera and acute diarrhoeal diseases:

Information education and communication:

Promoting community participation through IEC activities is one of the important component of NSPCD. It was found that no separate health talks have been organized for activities under NSPCD but it was informed that the events under surveillance were discussed in particularly water borne diseases during health talks being organized under IPC camps for HIV-AIDS and during the immunization sessions held monthly. Posters have been printed under the programme and made available at the peripheral level. They were placed on the walls of all the institutions visited in their OPD rooms and also space provided for patient waiting. No other activities has been to promote IEC under the programme.

Systems attributes:

1.Simplicity:

We found that the health personnel at block, PHC and S/C levels are accepting NSPCD, due to its simple methodology. All health workers interviewed (total 8) and all the medical officers interviewed (4) said that the system is simple.

Following observations were made on the simplicity aspect of NSPCD

Structure and operation	NSPCD uses the existing infrastructure of the health system, but it does not create any confusion. Health staff of the block feels that it becomes easy to carry out the programme along with other activities.
Reporting sources	Presently the reporting sources are the sub centres, OPDs of PHC & CHC and record keeping is routine activity of all these heath facilities.
Data collection procedure	Cases are detected and recorded on a register manually giving importance to name/ address, age and sex.
Case definitions	Case definitions are as per the NSPCD guidelines, which are available in English and Hindi and easily comprehensible.
Communication	Communication system for data transmission and feedback are very simple. From sub centre to Block head quarter the communication is manual and from there onward telephone is used. Any telephonic message transmission is followed by the written document.
Institutions involved	At present only the Government Health Institutions are involved, though there is plan to involve the private sector.
Staff training	One round of training have been imparted since the NSPCD got operational in the District. Training manual is available in Hindi and English.
Type of users	The health staff who are in public health activities (i.e. Multi Purpose Health workers, Health Supervisors, Medical Officers of

	PHC, CHC, Block Medical Officer, District Health officer and Chief Medical Officer at the district level are the main users of the NSPCD.
Feed back	Staffs at sub center level get feed back from their respective supervisors in monthly PHC review meetings. Feed back from District level to Block level is given in monthly district review meetings and through phone during emergencies.

3) Acceptability of the system:

Acceptability reflects the willingness of persons and organisations to participate in the surveillance system

We approached 8 health workers, 4 PHC medical officers, the block medical officer and district health officer responsible for NSPCD and all responded to our interview without any reluctance.

3.Timeliness and Completeness of reporting: These reflect the acceptability of the system by the stakeholders:

Timeliness of Reporting: NSPCD disease data on acute diarrhoeal diseases are collected on a weekly basis. We assessed the completeness and timeliness of reporting in two PHC and four sub centers for one-year period (January 2002 to December 2002). We found that the timeliness of reporting is 100 % in both the PHC but at the sub centre level there were missing reports in between for one sub centre. The reason stated was proceeding of female health worker on maternity leave and male health worker had also taken leave. There was no substitute arrangement for this and hence the missing reports.

Completeness of Reporting:

The weekly report on acute diarrhoeal diseases were found to be complete as even nil reporting has also been submitted from the PHC level but of the four sub center one sub center was not submitting the nil reports.

Block Head Quarter level: The Timeliness of acute diarrhoeal disease report transmission to District was 90 % and completeness of reporting was 92% during the above mentioned one-year reference period.

(c) Use of data: We found that all the staffs that are involved in collection and compilation of data are very much interested to utilise the data but they lack the skill.

As no outbreak was reported in the district for the last one year, the prevention and control aspects of preparedness and rapid response could not be evaluated.

Outcome Indicators:

Although the majority of the health personals were trained under the programme, they lacked clarity about its objectives especially in relation to data analysis. Data analysis is being done in a crude manner, that too at district level only in the form of tabulation where numbers and sex are used. None of the health workers or the medical officers and even Block medical officer interviewed were doing any analysis. Previous year data is not at all looked upon at the peripheral level. There is no proper understanding regarding utilization of collected data for prediction and detection of outbreaks at Block level although at district level this is not so. The status of training of the rapid response team at the district level presents grim picture. Off the six identified members only one was trained under NSPCD (Clinician). The rest all are not trained including the Nodal officer. Epidemiologist and Microbiologist are not in strength of the district manpower. Thus, district headquarter does not full fill the guidelines of NSPCD in regard to required manpower for rapid response team and its training status.

In Solan district of Himachal Pradesh the trend of diseases included in the surveillance system is as follows:

Except for Cholera /Acute Diarrhea / Dysentery, Viral Hepatitis, Typhoid Fever, and Measles no other disease has been reported.

The prevalence of these diseases in Solan district over time that is over past 3 years after the introduction of NSPCD in Solan district is shown in fig2, and 3. There has been no indoor death because of these diseases thus bringing the indoor mortality attributable to these diseases to zero.

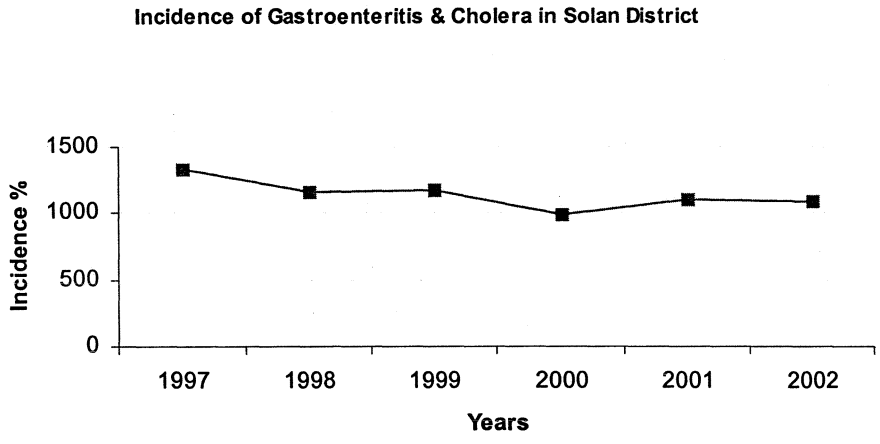
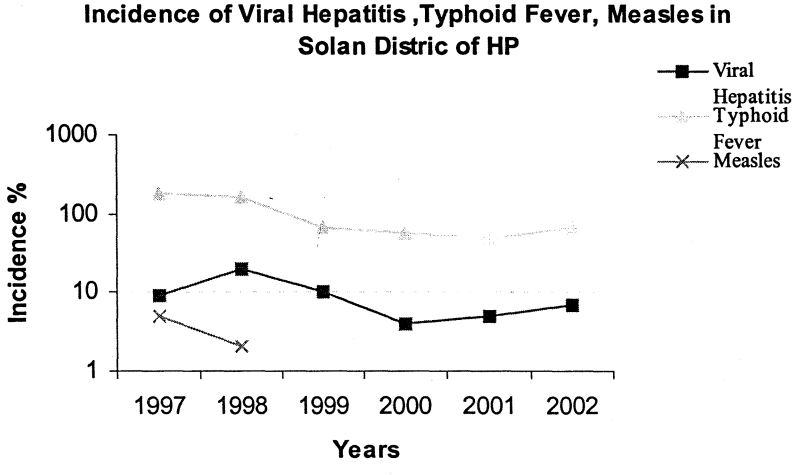


Figure one shows that the incidence of Acute diarrhoeal diseases/Gastroenteritis/ Cholera have reduced as compared to 1997 in 2002. We find that for the year 2000 it is at its lowest level it may be because the programme was made functional that year but after that it have again started rising.

Fig 3



Incidence of enteric fever is more than the viral hepatitis and the measles (Fig2). The incidence for all the three diseases have come down in 2002 as compared to 1997 but it was at its lowest in the year 2000 again depicting that the implementation of NSPCD had some role in bringing down the morbidity as the programme was made functional in the year 2000 in the district.

Epidemic Preparedness and response:

Epidemic management committees have been formulated at district and block level and there are mechanisms of intersectoral co-ordinations in the eventuality of an outbreak but they do not meet at regular interval and regular interaction is not there. Action plans for waterborne outbreaks have been prepared at the district level. Rapid Response Teams have been constituted especially to tackle the Diarrhoeal Outbreaks, which are the major cause of concern for the district authorities. Review of the outbreak in last one year revealed that there was no outbreak in the district during last one year. Sufficient anti diarrhoeal drugs are available to meet the demand if the need arises and the mechanism to procure essential drug in emergency are in place to meet the required demand.

Knowledge and perception of the health officials regarding NSPCD:

All the health staff interviewed starting from PHC to district level said that health institutions have been benefited by the implementation of NSPCD. Staff at the peripheral level particularly the medical officers and the multi purpose health workers admitted that they have been sensitized about the epidemic prone diseases which have been kept under surveillance and in particular the outbreaks. However as it was only a one-time training it was observed that knowledge about various aspects NSPCD was not adequate.

Table 5 Knowledge and perception of the health officials regarding NSPCD

Indicators	**Medical Officer**	**Health Workers (Male and Female)**
Objectives of NSPCD	Partly aware	Not aware at all
Knowledge on the components of NSPCD 1.Data Collection 2.Data compilation 3.Data transmission 4.Data analysis 5.Feed back 6.Action Taken	Medical officers are aware of components but not fully conversant on data analysis & Outbreak investigation	All the eight health workers said data collection and transmission. None added compilation, analysis, action taken & feedback
Reporting time interval	Every body knew	Every body knew

(weekly) Monday to Saturday		
Case definition (Acute diarrhoeal diseases/Gastroenteritis/ Cholera)	Knew but not according to NSPCD document	Not conversant with definition
Job responsibility	100 % aware	100 % aware

Strengths:

1. NSPCD programme is in operation at the district and block level for the last three years
2. Government Primary Health Care infrastructure is available with adequate manpower at all levels.
3. NSPCD utilizes the Existing Health system by providing necessary additional inputs.
4. Reporting for acute diarrhoeal disease is on weekly basis without interruption.
5. Reporting routes have been specified and are being implemented at all level
6. Case definitions of the diseases under NSPCD are clearly defined and available in the local language for grass root workers to follow.
7. Submissions of the reports are satisfactory with respect to time and completeness.
8. Health officials placed at different level are motivated and had interest about the programme.
9. As the reports are to be submitted weekly health officials at all level are kept informed and alert

Weaknesses:

1. There are duplications in reporting due to existence of other vertical surveillance system and monthly reporting systems.
2. The surveillance system includes only the communicable diseases and non-communicable diseases are not addressed.
3. Data received is only from Government health institutions and private sectors have not been included.
4. Data Transmission is done manually from sub centre to block headquarter. From Block level it is mostly done over phone followed by a hard copy. It causes delay in reporting .
5. NSPCD designed formats under the programme are not available below district level. This was found to be due to inadequate contingency funds under the programme.
6. Analysis and Interpretation: Data analysis is poor at all level. No data analysis is done at sub centre level and block level. At district level analysis is done in a crude manner. Knowledge and skills for data analysis are lacking even at the district level.
7. Computers are not utilized, for data analysis and storing as there is no trained person.
8. Epidemic response mechanism: There is no formal Block level response team, as it is defined at State and District level.
9. Data collection: Mostly data is collected passively except malaria slides.
10. Supply of formats and registers: There is inadequate supply of reporting formats. The health workers used to buy registers for own money, as there is no contingency fund.
11. Laboratory Facility: There is lack of laboratory facility at block level for epidemic prone diseases. There is no arrangement for biological sample collection and transportation to referral laboratory. Training on laboratory aspect is very poor even for the medical officers.

Discussion and Recommendations

The NSPCD is operational in Dharampur Block of Solan district needs inputs on various aspects to fulfill the objectives that are set for it. Himachal Pradesh has already been identified for implementing Integrated Disease Surveillance Programme (IDSP). The lessons learnt from NSPCD may be applied to IDSP so that IDSP inputs can be optimally utilised. Based upon the findings of this small study we suggest the following few things for the improvement of NSPCD in Dharampur Block of Solan district.

Trainings: Health officials at all level require second round of training with respect to case definition, diagnosis, data analysis and its interpretation for predicting disease trend, disease outbreak/epidemic preparedness and response.

Logistic and supply: Regular and adequate logistic supply like data collection formats, patient registers, surveillance manual, mobility support and contingency fund is essential from district level to the peripheral health institutions.

Communication: Communication facility like telephone may be provided at the PHC and FAX at CHC level.

Data management: Trained data entry operators should be appointed at the district level data analysis, interpretation and storing by computer.

Reporting Units: Other government health institutions like Ayurveda should be involved for case detection and reporting in NSPCD.

Laboratory facility: Laboratory support is essential in investigation of communicable diseases. At least there should be facility for sample collection in proper media and transportation of the same to the designated referral laboratory. Rapid diagnostic kits should be available at block level for some of the epidemic prone diseases like measles, enteric fever, and viral hepatitis etc. Laboratory manuals should be made available at the health institutions where medical officers and lab technicians are in position. The non-functional laboratories should be made functional by appropriate placement of trained personal.

Laboratory Training should be imparted to all laboratory technicians and medical officers. Laboratory networking should be strengthened. Contingency plans should be available at the block level in the eventuality of an outbreak.

Identifying community volunteers and upgrading their skill for NSPCD activities.

Involving elected representatives (Panchayati Raj Bodies) in NSPCD with proper orientation.

Strengthening Information Education and Communication (IEC) activities by holding interpersonal communication sessions and giving radio talks.

Inter sectoral Coordination: For an effective surveillance system intersectoral coordination is an important aspect. There should be close coordination with Ayurveda health system, ICDS, Panchayati Raj, Education, veterinary, Irrigation department and NGO's. Role of each sector should be defined identified. Administrative and technical bodies should be formed for coordination purpose. Review meetings should be held at regular intervals and minutes of meeting circulated to all for information and action.

Conclusion

NSPCD in Dharampur Block of Solan district is a reflection of the NSPCD programme being implemented in state of Himachal Pradesh. The system is simple but requires inputs for capacity building contingency funds for logistics and regular monitoring for effective use by the health system. With more technical and laboratory inputs the system can be the real forerunner for the public health activities in the State. IDSP when will be implemented in Himachal Pradesh should consider the strength and weaknesses of NSPCD.

Annexure -1

Check list for Structural Indicators

Manpower

Rapid Response Team (State Level)

- State Level Officer designated as State Nodal Officer
- Epidemiologist
- Microbiologist
- Entomologist
- Clinician
- Statistician

Rapid Response Team (District Level)

- District Nodal Officer
- Epidemiologist
- Microbiologist
- Entomologist
- Clinician
- Statistician

Laboratory

- Staff
- Space
- Registers
- Forms
- Supply of regular water
- Supply of source of energy
- Waste disposal
- Guidelines for specimen transportation

- Equipment and supply
  - Microscope
  - Centrifuge
  - Sterilization facilities- Autoclave
  - Transport Media
  - Kits for rapid diagnostic test
  - Glass ware
  - Sterilized syringes and Needles
  - Micropipettes
  - Sterile collection bottles for blood /serum and water analysis
  - Sterile swabs

- Reagents for staining
    - Grams stain
    - Albert stain
    - Ziehl Neelsen stain
    - Romanowsky stain
    - Reagents for rapid diagnostic test

Transport

- Vehicle
- Driver
- Petrol

Communication

- Telephone
- Fax
- Computer

Annexure -2

Check list Process Indicators.

- Case Definitions

- Recording of Cases

- Laboratory Confirmation

- Reporting frequency

- Analysis Levels

- Action Initiated

- Supervision

- Feedback
- Detection of Early warning Signals for outbreaks
- Date of initiation of Response
- Date of Containment
- Details of Control and Preventive measures

Annexure 3

Check list Outcome Indicators:

Training

- Rapid response teams at state level
- Rapid response team at District level
- PHC Medical Officer
- Health Workers (Male and Female)
- Laboratory Personnel
- Others

- Preparedness to meet the disease outbreak situations
  - Existence of rapid response teams
  - Status of training
  - Availability of case definitions
  - Availability of written action plans for epidemic preparedness and response for diseases under surveillance
  - Ability to respond
- Ability to provide early warning signals or early detection of cases
  - Number of out breaks detected in last one year
  - Number of true outbreaks
  - Number of false alarms
- Early institution of containment measures
  - How early were the control measures initiated? – Reduction in attack rate and case fatality rates
- Improvement in measurable term of laboratory diagnostic facilities at district level
  - Number of specimens received
  - Number of tests available
  - Number of test done
  - Number of specimen referred
- Communication with state and centre
  - Telephone
  - Fax
  - Computers
  - E-Mails

- Reduced mortality (Case Fatality Rate)

- Reduced morbidity (Attack Rate or Incidence Rate)

Annexure -4

QUESTIONNAIRE FOR STATE NODAL OFFICER

Name ..... Designation.....

Name of the State.....

Total no. of service years.....

No. of service years in this position.....Date of Visit.....

GENERAL

Q. When was the NSPCD started in State of Himachal Pradesh?

Q. What is the population under surveillance?

Q. What were the reasons for Developing NSPCD?

Q. What are the Objectives of NSPCD?

STRUCTURE INDICATORS

Manpower

Q. Does Rapid Response Team exits at the state level.

Yes ☐ No ☐

Q. How many meetings in a year do you hold with the members of rapid response team?

☐

Q. How many meetings in a year do you hold with district nodal to discuss administrative and technical matters pertaining to NSPCD implementation?

☐

Q. Do you have a state manual for disease surveillance under NSPCD?

Yes ☐ No ☐

(If yes kindly attach a coy of state manual)

Laboratory-Supply -Communication

Q. How many laboratories been identified and upgraded at State level under NSPCD?

☐

Q. Has any steps been taken for strengthening of entomological services at state level?

Yes ☐ No ☐

Q. What communication facilities have been provided by NSPCD at this level?
Telephone Fax Computer E-Mail

Q. What Transport facilities have been provided by NSPCD at this level?
Vehicle Driver Petrol

Q. What are the IEC materials available at State level under NSPCD?

Banners	Yes ☐	No ☐
Posters	Yes ☐	No ☐
Flip Charts	Yes ☐	No ☐
Video Films	Yes ☐	No ☐
Others		

PROCESS INDICATORS

Q. Do you have standard case definitions for the diseases under surveillance?
Yes ☐ No ☐
(If yes kindly attach a coy of case definitions)

Q. Are there written action plans for epidemic preparedness and response for diseases under surveillance?
Yes ☐ No ☐
(If yes kindly attach a coy of action plans)

Q. Is there a written case management protocol for diseases under surveillance?
Yes ☐ No ☐
(If yes kindly attach a coy of it)

Q. Have, action thresholds, for diseases under surveillance been defined?
Yes ☐ No ☐

(If yes kindly give detail of the diseases and the rational on which the thresholds were developed)

Q. What is the frequency of data flow at different level?

Frequency	State	District	Block	PHC	Sub-Center
Weekly	☐	☐	☐	☐	☐
Monthly	☐	☐	☐	☐	☐
Quarterly	☐	☐	☐	☐	☐

Q. How do you receive reports?

Telephone	Fax	E-Mails	By Post
☐	☐	☐	☐

Q. What are the levels of analysis?

State ☐ District ☐ Block ☐ PHC ☐

Q. How often is the analysis being done?

Frequency	State	District	Block	PHC
Weekly	☐	☐	☐	☐
Monthly	☐	☐	☐	☐
Quarterly	☐	☐	☐	☐

Q How often do you review quarterly reports and send feedback ☐

Q. At what level action is initiated?

State ☐ District ☐ Block ☐ PHC ☐ Sub-Center ☐

Q. Do you provide any feedback, if yes:
To whom

In what form Written Telephonic Fax Computer / E-mail

At what interval Weekly Monthly Quarterly

Q. Do you receive any feedback? If yes?

From whom

In what form Written Telephonic Fax Computer / E-mail

At what interval Weekly Monthly Quarterly

Q. How often do you visit each implementing District? ☐

Q. How many outbreaks were detected in last one year?

Q. What was the date of identification of suspicion of the outbreak?

Q. What was the date of initiation of response?

Q. What was the date of containment of outbreak?

Q. What were the control and preventive measures taken?

OUTCOME INDICATORS

Manpower

Q. What are the numbers of personnel's trained in NSPCD?

Medical Personals
Para-Medical Personals
Laboratory Technicians
Others

Q. Are the members of RRT trained under NSPCD?

Nodal Officer	Yes	☐	No	☐
Epidemiologist	Yes	☐	No	☐
Microbiologist	Yes	☐	No	☐
Clinician	Yes	☐	No	☐
Entomologist	Yes	☐	No	☐
Statistician	Yes	☐	No	☐

Outbreak Preparedness

Q. Do you have the case definition available for the diseases under surveillance?

Yes ☐ No ☐

Q. In an outbreak situation how early are you able to respond?

With in 6 hours
With in 12hours
With in 18 hours
With in 24hours
More than 24 Hours

Q. How many outbreaks were suspected in last one year?

Q. What were the numbers of true outbreaks?

Q. What was the number of false alarms?

Q. How early were the control measures initiated?

With in 12 hours
With in 24hours
With in 48 hours
With in 72hours
More than 72 Hours

Communication

Q. What is the means of communication at this level?

Telephone Fax Computer E-Mails

Q. Have any programmes been organized for enlisting community support for surveillance strengthening and epidemic preparedness?

Yes / No. If yes:
Who were the audience?

What is the frequency?

Organized at what level

Q. What are the sectors other than health linked with NSPCD?

Q. Are there any administrative and technical obstacles for implementation of NSPCD in the State?

Q. What are your recommendations for improving implementation of NSPCD in the State?

Recommendations for Center:

Recommendations for State:

Recommendations for Districts:

Annexure -5

QUESTIONNAIRE FOR DISTRICT NODAL OFFICER

Name ..... Designation.....

Name of the State..... Name of the District.....

Total no. of service years.....

No. of service years in this District.....Date of Visit.....

GENERAL

Q. When was the NSPCD started in District Solan of Himachal Pradesh?

Q. What is the population under surveillance?

Q. What is the number of health institutions under this district?

Government	CHC	PHC	C.D	S.C	CIVIL HOSPITAL
Private	Dispensaries	Nursing Homes	Indian system of Medicine		

Q. What constitutes major public health burden diseases in your district?

Q. What were the reasons for Developing NSPCD in Solan District?

Q. Do you see the diseases included under NSPCD as public health priority diseases in Solan district of H.P? If yes what is the criteria, if no then why?

STRUCTURE INDICATORS

Manpower

Q. Have you formed a Rapid Response Team exits at the district level.

Yes ☐ No ☐

Q. How many meetings in a year do you hold with the members of rapid response team?

☐

Q. Do you have manual for diseases under surveillance under NSPCD?

Yes ☐ No ☐

Laboratory

Q. What is the laboratory staff in the District laboratory?

Staff Number sanctioned Number in position

Q. What is the space available in the District Laboratory?

Q. What are the registers available in district laboratory?

Q. What are the forms available in the district laboratory?

Q. Is there a supply of regular water to the laboratory?

Yes ☐ No ☐

Q. What is the source of supply of energy?

Q. How is the waste disposal done in the laboratory?

Q. Do the district have guidelines for specimen transportation to the next higher level.

Yes ☐ No ☐

Q. Have any steps been taken for strengthening of laboratory services at District level?

Yes ☐ No ☐

Q. Have any steps been taken for strengthening of entomological services at District level?

☐ ☐

Yes No

Q. What communication facilities have been provided by NSPCD at this level?

Telephone Fax Computer E-Mail

Q. What are the IEC materials available at District level under NSPCD?

Banners	Yes ☐	No ☐
Posters	Yes ☐	No ☐
Flip Charts	Yes ☐	No ☐
Video Films	Yes ☐	No ☐

PROCESS INDICATORS

Q. Do you have standard case definitions for the diseases under surveillance?

Yes ☐ No ☐

Q. Who collects the data?

Q. What data is collected?

Q. How is the data collected?

Q. Are there recommended reporting Performa's, if yes:

Who are responsible for providing these Performa's?

Availability of these Performa's Regular ☐ Irregular ☐

If irregular than why

Q. What are the sources of data?

Government Hospitals ☐
Private Hospitals
Others ☐

Q. How is the data stored?

Registers	Yes ☐	No ☐
Computer	Yes ☐	No ☐

Q. What specimens you are able to collect at this level

Sputum ☐
Stool ☐
Blood
CSF ☐

Q. Are water samples collected for sampling?

Yes ☐ No ☐

Q. Where are these water samples sent for testing and what are the numbers of collected water samples in last one year?

Q. What diagnostic tests are available at this level?

Q. Which is your referring laboratory?

Q. Do the district have guidelines for specimen transportation to the next higher level. If yes; were any specimens transported in last one year?

Yes ☐ No ☐

Q. What is the frequency of data flow at different level?

Frequency	State	District	Block	PHC	Sub-Center
Weekly					
Monthly					
Quarterly					

Q. What are the numbers of reporting units?

Q. What are the numbers of institutions involved in receiving the reports?

Q. How do you receive reports?

Telephone Fax E-Mails By Post Special Messenger

Q. To whom are reports disseminated?

Q. How are reports disseminated?

Telephone Fax E-Mails By Post

Q. Who analyze the collected data?

Q. What are the levels of analysis?

State	District	Block	PHC	Sub-Center
☐	☐	☐	☐	☐

Q. How often is the analysis being done?

Frequency	State	District	Block	PHC	Sub-Center
Weekly					
Monthly					
Quarterly					

Q. Do you have written action plans for epidemic preparedness and response for diseases under surveillance?

Yes ☐ No ☐

Q. Do you have written case management protocol for diseases under surveillance?

Yes ☐ No ☐

Q. Do you have, action thresholds, for diseases under surveillance?

Yes ☐ No. ☐

Q. At what level action is initiated?

State	District	Block	PHC	Sub-Center
☐	☐	☐	☐	☐

Q. What is the response mechanism for action at the district level?

Q. Are feasible interventions available for each of these diseases in the district?

Yes ☐ No ☐

Q. How many times in a year do you conduct technical and administrative review of NSPCD with block medical officers?

☐

Q. How many times do you visit each block of your district in a year?

☐

Q. Can you please show me your trip report, diary etc.

Yes ☐ No ☐

Q. How many times have you been supervised in last six months?

Q. Do you provide any feedback, if yes:
To whom

In what form Written Telephonic Fax Computer / E-mail

At what interval Weekly Monthly Quarterly

How many feedbacks were given in last six months?

Q. Do you receive any feedback? If yes?
From whom

In what form Written Telephonic Fax Computer / E-mail

At what interval Weekly Monthly Quarterly

Q. How many feedbacks were received in last six months?

Q. How many outbreaks were detected in last one year?

Q. What was the date of identification of the outbreak?

Q. What was the date of initiation of response?

Q. What was the date of containment of outbreak?

Q. What were the control and preventive measures taken?

OUTCOME INDICATORS

Manpower

Q. What are the numbers of personnel's trained in NSPCD?

Medical Personals
Para-Medical Personals
Laboratory Technicians
Others

Q. Have you been trained in disease surveillance and epidemic management? If yes, Specify

When
Where
How long
By whom

Q. What is the status of training of members of rapid response team?

Nodal Officer	Yes ☐	No ☐
Epidemiologist	Yes ☐	No ☐
Microbiologist	Yes ☐	No ☐
Clinician	Yes ☐	No ☐
Entomologist	Yes ☐	No ☐
Statistician	Yes ☐	No ☐

Outbreak Preparedness

Q. Do you have the case definition available for the diseases under surveillance?

Yes ☐ No ☐

Q. Do you have written action plans for epidemic preparedness and response for diseases under surveillance?

Yes ☐ No ☐

Q. In an outbreak situation how early are you able to respond?

With in 6 hours
With in 12hours
With in 18 hours
With in 24hours
More than 24 Hours

Q. How many outbreaks were suspected in last one year?

Q. What were the numbers of true outbreaks?

Q. What was the number of false alarms?

Q. How early were the control measures initiated?

With in 12 hours
With in 24hours
With in 48 hours
With in 72hours
More than 72 Hours

Laboratory

Q. How many laboratories have been up graded?

Previous status Present status

Q. What are the numbers of specimen received in last one year?

Q. What are the numbers of test doe in last one year?

Q. What are the numbers of specimen referred to referral laboratory in last one year?

Communication

Q. What is the means of communication at this level?

Telephone Fax Computer E-Mails Special Messenger

Q. Have any programmes been organized for enlisting community support for surveillance strengthening and epidemic preparedness?

Yes / No. If yes:

Who were the audience?

What is the frequency?

Organized at what level

Q. What are the sectors other than health linked with NSPCD at this level?

Q. Are there any administrative and technical obstacles for implementation of NSPCD in the District?

Q. What are your recommendations for improving implementation of NSPCD at the district, state and center level?

Annexure -6

QUESTIONNAIRE FOR BLOCK MEDICAL OFFICER

Name ..... Designation.....

Name of the District..... Name of the Block.....

Total no. of service years.....

No. of service years in this Block.....Date of visit.....

GENERAL

Q. What is the population under surveillance?

Q. What is the number of health institutions under this Block?

Government CHC PHC C.D S.C CIVIL HOSPITAL

Private Dispensaries Nursing Homes Indian system of Medicine

Q. What constitutes major public health burden diseases in your Block?

Q. Do you see the diseases included under NSPCD as public health priority diseases in your Block? If yes what is the criteria, if no then why?

STRUCTURE INDICATORS

Manpower

Q. Have Rapid Response Team been formed at the Block level.

Yes ☐ No ☐

Q. How many meetings in a year do you hold with the members of rapid response team?

☐

Q. Do you have manual for diseases under surveillance under NSPCD?

Yes ☐ No ☐

Laboratory -Communication

Q. Have any steps been taken for strengthening of laboratory services at this level?

Yes ☐ No ☐

Q. Does the block have guidelines for specimen transportation to the next higher level.

Yes ☐ No ☐

Q. What communication facilities have been provided by NSPCD at this level?

Telephone ☐ Fax ☐ Computer ☐ E-Mail ☐

Q. Do you have any Transport facilities at this level?

Yes ☐ No ☐

Q. What are the IEC materials available at this level under NSPCD?

Banners	Yes ☐	No ☐
Posters	Yes ☐	No ☐
Flip Charts	Yes ☐	No ☐
Video Films	Yes ☐	No ☐
Others		

PROCESS INDICATORS

Q. What is the standard case definitions used for e.g. Cholera /Acute diarrohoeal disease under surveillance?

Q. Who collects the data?

Q. What data is collected?

Q. How is the data collected?

Q. Are there recommended reporting Performa's, if yes:

Who are responsible for providing these Performa's?

Availability of these Performa's Regular Irregular

If irregular than why

Q. What are the sources of data?

Government Hospitals
Private Hospitals
Others

Q. What specimens you are able to collect at this level

Sputum Stool Blood CSF

Q. Are water samples collected for Lab - testing?

Yes ☐ No ☐

Q. Where are these water samples sent for testing and what are the numbers of collected water samples in last one year?

Q. What diagnostic tests are available at this level?

Q. Do the block have guidelines for specimen transportation to the next higher level.

Yes ☐ No ☐

(If yes; were any specimens transported in last one year)

Q. Which is your referring laboratory?

Q. How is the data stored?

Registers	Yes	☐	No	☐
Computer	Yes	☐	No	☐

Q. What is the frequency of data flow at different level?

Frequency	State	District	Block	PHC	Sub-Center
Weekly	☐	☐	☐	☐	☐
Monthly	☐	☐	☐	☐	☐
Quarterly	☐	☐	☐	☐	☐

Q. What are the numbers of reporting units?

Q. What are the numbers of institutions involved in receiving the reports?

Q. How do you receive reports?

Telephone Fax E-Mails By Post By special messenger

Q. To whom are reports disseminated?

Q. How are reports disseminated?

Telephone Fax E-Mails By Post

Q. Are any analysis being done at this level?

Yes ☐ No ☐

Q. Who analyze the collected data?

Q. How often is the analysis being done?

Frequency	State	District	Block	PHC
Weekly	☐	☐	☐	☐
Monthly				
Quarterly	☐	☐	☐	☐

Q. In what form analysis is being done?

Graphs Histograms Maps Tabulations Other

Q. At what level action is initiated?

State District Block PHC Sub-Center

Q. What is the response mechanism for action at the Block level?

Q. Are feasible interventions available for each of these diseases under NSPCD at this level?

Yes ☐ No ☐

Q. How many times do you visit health institutions of your block in a year?

Yes ☐ No ☐

Q. Is there documentary evidence of above (e.g. trip report, diary)

Yes ☐ No ☐

Q. How many times have you been supervised in last six months?

Q. Do you provide any feedback, if yes:
To whom

In what form Written Telephonic Fax Computer / E-mail

At what interval Weekly Monthly Quarterly

How many feedbacks were given in last six months?

Q. Do you receive any feedback? If yes:
From whom

In what form Written Telephonic Fax Computer / E-mail

At what interval Weekly Monthly Quarterly

How many feedbacks were received in last six months?

Q. What do you take as early warning signals for outbreak detection for e.g. Acute Diarrhoeal Diseases?

Q. How many outbreaks were detected in last one year?

Q. What was the date of identification of the outbreak?

Q. What was the date of initiation of response?

Q. What was the date of containment of outbreak?

Q. What were the control and preventive measures taken?

OUTCOME INDICATORS

Manpower

Q. What are the numbers of personnel's trained in NSPCD?

Medical Personals
Para-Medical Personals
Laboratory Technicians
Others

Q. Have you been trained in disease surveillance and epidemic management? If yes, Specify

When
Where
How long
By whom

Outbreak Preparedness

Q. Do you have the case definition available for the diseases under surveillance?

Yes ☐ No ☐

Q. Do you have written action plans for epidemic preparedness and response for diseases under surveillance?

Yes ☐ No ☐

Q. Do you have written case management protocol for diseases under surveillance?

Yes ☐ No ☐

Q. Have, action thresholds, for diseases under surveillance been defined?

Yes ☐ No. ☐

Q. In an outbreak situation how early are you able to respond?

With in 6 hours
With in 12hours
With in 18 hours
With in 24hours
More than 24 Hours

Q. How many outbreaks were suspected in last one year?

Q. What were the numbers of true outbreaks?

Q. What was the number of false alarms?

Q. How early were the control measures initiated?

With in 12 hours with in 24hours with in 48 hours
With in 72hours More than 72 Hours

Laboratory

Q. How many laboratories have been up graded at this level?

Previous status Present status

Q. What are the numbers of specimen received in last one year?

Q. What are the numbers of test done in last one year?

Q. What are the numbers of specimen referred to referral laboratory in last one year?

Communication

Q. What is the means of communication available at this level?

Telephone Fax Computer E-Mails Special Messenger

Q. Have any programmes been organized for enlisting community support for surveillance strengthening and epidemic preparedness?

Yes / No. If yes:

Who were the audience?

What is the frequency?

Organized at what level

Q. What are the sectors other than health linked with NSPCD at this level?

Q. Are there any administrative and technical obstacles for implementation of NSPCD at the block level?

Q. What are your recommendations for improving implementation of NSPCD at this level?

Annexure -7

QUESTIONNAIRE FOR MEDICAL OFFICER

Name ..... Designation.....

Name of the District..... Name of the Block.....

Name of the PHC/CHC/CH.....

Total no. of service years.....

No. of service years in this Institution.....Date of Visit.....

GENERAL

Q. What is the population of the area served by the institution?

Q. What other public health services are available in the area?

Q. What are the private health services available in the area?

Q. What are the numbers of beds in the institution?

Sanctioned In Position

Q. What are the numbers of outpatients for last one year?

Q. What are the numbers of admissions for last one year?

Q. What are the major public health problems in the area served by the institution?

Q. What are the services available in the institution?

Q. What is the staff available in the institution?

STRUCTURE INDICATORS

Manpower

Q. Have you formed a Rapid Response Team at this level?

Yes ☐ No ☐

Q. How many meetings in a year do you hold with members of rapid response team?

☐

Q. Do you have manual for diseases under surveillance under NSPCD?
Yes ☐ No ☐

Laboratory-Supply –Communication

Q. Have any steps been taken for strengthening of laboratory services at this level?
Yes ☐ No ☐
Q. Does the block have guidelines for specimen transportation to the next higher level.
Yes ☐ No ☐
Q. What communication facilities have been provided by NSPCD at this level?
Telephone ☐ Fax ☐ Computer ☐ E-Mail ☐
Q. Do you have Transport facilities?
Yes ☐ No ☐
Q. What are the IEC materials available at this level under NSPCD?
Banners Yes ☐ No ☐
Posters Yes ☐ No ☐
Flip Charts Yes ☐ No ☐
Video Films Yes ☐ No ☐
Others

PROCESS INDICATORS

Q. What definition do you use for Cholera /Acute diarrohoeal suspect?

Q. Who collects the data?

Q. What data is collected?

Q. How is the data collected?

Q. Are there recommended reporting Performa's, if yes:

Who are responsible for providing these Performa's?

Availability of these Performa's Regular Irregular

If irregular than why
Q. What are the sources of data?
Government Hospitals
Private Hospitals
Others
Q. What specimens you are able to collect at this level
Sputum Stool Blood CSF
Q. Are water samples collected for Lab - testing?

Yes ☐ No ☐

Q. Where are these water samples sent for testing and what are the numbers of collected water samples in last one year?

Q. What diagnostic tests are available at this level?

Q. Do you have guidelines for specimen transportation to the next higher level.

Yes ☐ No ☐

(If yes; were any specimens transported in last one year)

Q. Which is your referring laboratory?

Q. Do you describe the data by?

- Age
- Sex
- Person
- Place

Q. Are denominators for data being collected? If yes what are the sources and do you have denominators like:

- Population under five years
- Population by villages
- Total Population

Q. How is the data stored?

Registers	Yes ☐	No ☐		
Computer	Yes ☐	No ☐		

Q. What is the frequency of data flow at different level?

Frequency	State	District	Block	PHC	Sub-Center
Weekly	☐	☐	☐	☐	☐
Monthly	☐	☐	☐	☐	☐
Quarterly	☐	☐	☐	☐	☐

Q. What are the numbers of reporting units?

Q. What are the numbers of institutions involved in receiving the reports?

Q. How do you receive reports?

Telephone Fax E-Mails By Post By special messenger

Q. To whom are reports disseminated?

Q. How are reports disseminated?

Telephone Fax E-Mails By Post

Q. Are any analysis being done at this level?

Yes ☐ No ☐

Q. Who analyze the collected data?

Q. How often is the analysis being done?

Frequency	PHC
Weekly	☐
Monthly	☐
Quarterly	☐

Q. In what form analysis is being done?

Graphs Histograms Maps Tabulations Other

Q. At what level action is initiated?

State District Block PHC Sub-Center

Q. What is the response mechanism for action at this level?

Q. Are feasible interventions available for each of these diseases under NSPCD at this level?

Yes ☐ No ☐

Q. How many visits do you make in a year to the sub-centers under your primary health center?

☐

Q. Is there documentary evidence of above (e.g. trip report, diary)

Yes ☐ No ☐

Q. How many times have you been supervised in last six months?

Q. Do you provide any feedback, if yes:

To whom

In what form Written Telephonic Fax Computer / E-mail

At what interval Weekly Monthly Quarterly

How many feedbacks were given in last six months?

Q. Do you receive any feedback? If yes then:

From Whom

In what form Written Telephonic Fax Computer / E-mail

At what interval Weekly Monthly Quarterly

How many feedbacks were received in last six months?

Q. What are the early warning signals for outbreak detection for e.g. Acute Diarrhoeal Diseases?

Q. How many outbreaks were detected in last one year?

Q. What was the date of identification of the outbreak?

Q. What was the date of initiation of response?

Q. What was the date of containment of outbreak?

Q. What were the control and preventive measures taken?

OUTCOME INDICATORS

Manpower

Q. What are the numbers of personnel's trained in NSPCD?

Medical Personals
Para-Medical Personals
Laboratory Technicians
Others

Q. Have you been trained in disease surveillance and epidemic management? If yes, Specify

When
Where
How long
By whom

Outbreak Preparedness

Q. Do you have the case definition available for the diseases under surveillance?

Yes ☐ No ☐

Q. Do you have written action plans for epidemic preparedness and response for diseases under surveillance?

Yes ☐ No ☐

Q. Do you have written case management protocol for diseases under surveillance?

Yes ☐ No ☐

Q. Have, action thresholds, for diseases under surveillance been defined?

Yes ☐ No. ☐

Q. In an outbreak situation how early are you able to respond?

With in 6 hours With in 12hours With in 18 hours
With in 24hours More than 24 Hours

Q. How many outbreaks were suspected in last one year?

Q. What were the numbers of true outbreaks?

Q. What was the number of false alarms?

Q. How early were the control measures initiated?

With in 12 hours With in 24hours With in 48 hours
With in 72hours More than 72 Hours

Laboratory

Q. Have any laboratories up graded at this level?
Previous status Present status

Q. What are the numbers and types of specimen referred to referral laboratory in last one year?

Communication

Q. What is the means of communication at this level?

Telephone Fax Computer E-Mails Special Messenger

Q. Have any programmes been organized for enlisting community support for surveillance strengthening and epidemic preparedness?

Yes / No. If yes:

Who were the audience?

What is the frequency?

Organized at what level

Q. What are the sectors other than health linked with NSPCD at this level?

Q. Are there any administrative and technical obstacles for implementation of NSPCD at the primary health center level?

Q. What are your recommendations for improving implementation of NSPCD at this level?

Annexure -8

QUESTIONNAIRE FOR HEALTH WORKERS

Name ..... Designation.....

Name of the District..... Name of the Block.....

Name of the PHC/CHC..... Name of the HSC.....

No. of service years in this area.....Date of Visit.....

GENERAL

Q. What is the population of the area served by the institution?

Q. What other public health services are available in the area?

Q. What are the private health services available in the area?

Q. What are the numbers of outpatients in last one year?

Q. What are the major public health problems in the area served by the institution?

Q. What are the services available in the institution?

Q. What is the staff available in the institution?

STRUCTURE INDICATORS

IEC

Q. What are the IEC materials available at this level under NSPCD?

Banners	Yes ☐	No ☐
Posters	Yes ☐	No ☐
Flip Charts	Yes ☐	No ☐
Video Films	Yes ☐	No ☐
Others		

PROCESS INDICATORS

Q. What definition do you use for Cholera /Acute diarrohoeal suspect?

Q. Who collects the data?

Q. What data is collected?
Q. How is the data collected?

Q. Are there recommended reporting Performa's, if yes:
Who are responsible for providing these Performa's?

Availability of these Performa's Regular Irregular

If irregular than why

Q. What are the sources of data?
Government Hospitals
Private Hospitals
Others
Q. What specimens you are able to collect at this level
Sputum,
Stool
Blood
CSF
Q. Are water samples collected for Lab - testing?
Yes ☐ No ☐
Q. Where are these water samples sent for testing and what are the numbers of collected water samples in last one year?

Q. Which is your referring laboratory?

Q. Do you describe the data by?
Age
Sex
Person
Place
Q. Are denominators for data being collected? If yes what are the sources and do you have denominators like:
Population under five years

Population by villages

Total Population
Q. How is the data stored?
Registers Yes ☐ No ☐
Computer Yes ☐ No ☐

Q. What is the frequency of data flow at different level?

Frequency	Block	PHC	Sub-Center
Weekly	☐	☐	☐
Monthly	☐	☐	☐
Quarterly	☐	☐	☐

Q. To whom are reports disseminated?

Q. How are reports disseminated?

Telephone
Fax
E-Mails
By Post
Other

Q. Are any analysis being done at this level?

Yes ☐ No ☐

Q. At what level action is initiated?

State District Block PHC Sub-Center

Q. What is the response mechanism for action at the Sub-Center level?

Q. What action on the collected data is being taken?

Q. Do you have a diary to maintain details of your daily field activities?

Yes ☐ No ☐

Q. How many times have you been supervised in last six months?

Q. Do you receive any feedback? If yes then:

From whom

In what form Written Telephonic Fax Computer / E-mail

At what interval Weekly Monthly Quarterly

How many feedbacks were received in last six months?

Q. What will you use as early warning signals for outbreak detection (e.g. Acute Diarrhoeal Diseases)?

Q. How many outbreaks were detected in last one year?

Q. What was the date of identification of the outbreak?

Q. What was the date of initiation of response?

Q. What was the date of containment of outbreak?

Q. What were the control and preventive measures taken?

OUTCOME INDICATORS

Manpower

Q. Have you been trained in disease surveillance and epidemic management? If yes,

Specify

When

Where

How long

By whom

Outbreak Preparedness

Q. Do you have the case definition available for the diseases under surveillance?

Yes ☐ No ☐

Q. Do you have written action plans for epidemic preparedness and response for diseases under surveillance?

Yes ☐ No ☐

Q. Do you have written case management protocol for diseases under surveillance?

Yes ☐ No ☐

Q. In an outbreak situation how early are you able to respond?

With in 6 hours

With in 12hours

With in 18 hours

With in 24hours

More than 24 Hours

Q. How many outbreaks were suspected in last one year?

Q. What were the numbers of true outbreaks?

Q. What was the number of false alarms?

Q. How early were the control measures initiated?

With in 12 hours With in 24hours With in 48 hours

With in 72hours More than 72 Hours

Laboratory

Q. Which is your referral laboratory?

Q. Have you referred any specimen to referral laboratory in last one year?

Communication

Q. What is the means of communication at sub-center level?

Telephone Fax Computer E-Mails Personal Visits

Q. Have any programmes been organized for enlisting community support for surveillance strengthening and epidemic preparedness at this level?

Yes ☐ No ☐

If Yes: When was it organized and what is the frequency?

Q. What is your opinion about the overall function of the NSPCD with respect to surveillance and outbreak preparedness?

Q. How do you think the NSPCD can be improved at this level?

Annexure –9 (Case definitions, case classification and laboratory criteria as per NSPCD)

Cholera /Acute Diarrhea / Dysentery:

- **Cholera** is an epidemic and endemic disease. The epidemics of Cholera are abrupt and often create a public health problem with a high potential to spread fast and cause deaths. If left untreated case fatality rate is very high. Hence the need for surveillance.
- **Case definition:** In an area where Cholera is not endemic: -Severe dehydration or death from acute watery diarrhoea in a patient aged five years or more. **or**
  In an area where Cholera is endemic: -Acute watery diarrhoea, with or without vomiting in a patient aged five years or more.
  Case classification:
  Suspected: A case that meets the clinical case description
  Probable: Not applicable
  Confirmed: A suspected case that is laboratory confirmed
  Laboratory criteria for diagnosis: Isolation of Vibrio cholerae 01 or 0139 from the stool samples of any patients with diarrhoea.

- **Acute Diarrhoeal diseases**: It is one of the major causes of morbidity and mortality in young children's especially under five years.
  Case definition: Three or more loose or watery stools with or without vomiting, with or without dehydration in the past 24 hours.
  Case classification: - As per the clinical description.
  Laboratory criteria for diagnosis: -Laboratory culture of stools may be used to confirm the possible outbreaks of specific agents, but is not necessary for case definition or case management.
- **Dysentery:** Bloody diarrhoea is a sign of invasive enteric infection that carries a substantial risk of morbidity and death especially in children's. Shigella is most frequently isolated from the stool of affected children's. The high case fatality and epidemic potential make surveillance to detect and control outbreak.
  Case definition: -Acute diarrhoea with visible blood in stools with or without fever or pain abdomen.
  Case classification: - As per the clinical description.
  Laboratory criteria for diagnosis: -Laboratory culture of stools may be used to confirm the possible outbreaks of specific diarrhoea, such as Shigella, salmonella etc.

2) **Acute Viral Hepatitis:**
   It is widely prevalent in India. Based on clinical diagnosis around 100,000 cases of viral hepatitis are reported annually. It is important that the disease is kept under surveillance so that early identification of outbreaks, or potential high-risk areas or groups is done. Hepatitis A&E are endemic. Transmission is mainly faeco-oral for

hepatitis A&E; percutaneous for B, C & D and sexual for hepatitis B. The course of the disease may be fulminating (eg hepatitis E in pregnancy); chronic infections and severe sequel occur for hepatitis B, C & D. Control measures include transfusion safety, safe and appropriate use of injection and immunization for Hepatitis A & B. Hepatitis B is targeted by WHO (9GPW6.3) for reduced incidence/prevalence. Health education and public awareness are important to prevent and control Hepatitis. Hence the need for surveillance.

Case definition: Acute illness compatible with following clinical description: jaundice, dark urine, anorexia, malaise, extreme fatigue and upper right abdominal quadrant pain. Increase in Alanine Aminotransferease (ALT)>8 times previously known as SGPT and serum bilirubin >2mg% in clinically compatible illness.

Case classification:

Suspected: A case that is compatible with the clinical description.

Probable: Not applicable

Confirmed: A suspected case that is laboratory confirmed.

Laboratory criteria for diagnosis:

Hepatitis A: IgM anti-HAV +ve
Hepatitis B: IgM anti HBC with or without HbsAg +ve
Hepatitis C: anti-HCV +ve
Hepatitis D: HbsAg and anti HDV +ve
Hepatitis E: IgM anti-HEV +ve

3) Typhoid fever:

Typhoid fever continues to be a significant problem in India. The disease is caused by Salmonella typhi. They occur where sanitation is poor and drinking water is insufficiently safe. Even with the modern treatment morbidity is considerably high and an increasing tendency to antibiotic resistance means that some cases are difficult to treat. Hence the need for surveillance

Case definition: Insidious onset of continued fever, headache, rose spot on the trunk, malaise and loss of appetite usually with gastrointestinal symptoms of more than one week duration having any two or more than two of the following signs:

- Toxic look
- Coated tongue
- Relative bradycardia
- Spleenic enlargement
- Non-productive cough

Case classification:

Suspected: A case that meets the clinical case description.

Probable: A case compatible with the clinical description having any one of the following:

- Widal test positive (Titer 1:80) and / or
- Exposure to confirmed case / carrier during last 3 weeks and / or
- Clinical presentation with complication eg. Perforation etc.

Confirmed: A suspected case that is laboratory confirmed.

Laboratory criteria for diagnosis:

- Isolation of Salmonella typhi / paratyphi from blood, stool or other clinical specimens
- Fourfold rise in agglutination titre in paired sera taken 10 days apart.

4) Measles:

It is an acute respiratory disease that presents with fever and rash mainly affecting children's .The disease is highly infectious with an secondary attack rate in a susceptible population is usually 95% or greater. Transmission is mainly by droplet. Measles is targeted for reduction by 90% for incidence and by 95% for mortality (9GPW6.2). Surveillance here must be used to predict potential outbreaks and identify high-risk areas and population. Effective preventive measure is immunization in the form of live attenuated vaccine. Hence the need for surveillance.

Case definition: Any person with:
Fever and maculopapular (i.e. non-vesicular) rash and cough, coryza (i.e. running nose) or conjunctivitis (i.e. red eyes **or**
Any person in whom a clinician suspects measles infection.)

Case classification:

Suspected: A case that meets the clinical case description.

Probable: Not applicable

Confirmed: A suspected case that is laboratory confirmed.

Laboratory criteria for diagnosis:

- At least fourfold increase in antibody titre
- Isolation of Measles Virus
- Presence of Measles specific IgM antibodies

5) Chicken Pox:

It is an acute and highly infectious disease. It occurs in epidemic. The most important source of infection is a case of chicken pox. Chicken pox occurs predominantly in young children's. Hence the need for surveillance.

Case definition:

Suspected case: Acute onset of fever and generalized vesicopustular eruptions on trunk and face but less on limbs.

Presumptive: Fever, body ache, rash on 3^{rd} –4^{th} day on trunk and face less on limbs. Lesions have irregular oval shape, are not homogenous and are generally unilocular, but never indented. Crops of spots appear so that lesions are at different stages. A clinically compatible case epidemiologically linked to another probable case confirms the diagnosis.

Laboratory criteria for diagnosis: No laboratory tests are required.

6) Diphtheria:

It is an acute infectious disease caused by corynebacterium Diphtheriae. It primarily involves non-immunized children's under 15 years of age.

Case definition: An illness of the upper respiratory tract characterized by laryngitis or pharyngitis or tonsillitis, and adherent membranes of tonsillitis, pharynx and / or nose.

Case classification:

Suspect: A case that meets the clinical description.
Probable: Not applicable.
Confirmed: A case compatible with clinical description and is laboratory confirmed or linked epidemiologically to a laboratory confirmed case.
Laboratory criteria for diagnosis: Isolation of Corynebacterium diphtheria from membrane/ lesion of a suspected case.

7) Dengue:

Dengue Fever: It is a viral infection, which have the potential for rapid spread leading to acute public health problem. It spreads by bite of infected mosquitoes principally Aedes. aegypti, which bites in daytime.
Case definition: An acute febrile illness of 2-7 days duration with 2 or more of the following: Headache, retro-orbital pain myalgia, arthralgia, rash, haemorrhagic manifestations, and leucopoenia.
Case classification:
Suspect: A case compatible with the clinical description.
Probable: A case compatible with the clinical description with one or more of the following:

- Supportive serology.
- Occurrence at same location and time as other confirmed cases of Dengue fever.

Confirmed: A suspected case that is laboratory confirmed.
Laboratory criteria for diagnosis: One or more of the following:

- Isolation of Dengue virus from serum, plasma leukocytes or autopsy samples
- Demonstration of a fourfold or greater change in reciprocal IgM or IgG antibody titers to one or more Dengue virus antigen in paired samples
- Demonstration of Dengue virus antigen in autopsy tissue by immuno-histo-chemistry or immunofluorescence or in serum sample by EIA.
- Detection of viral genomic sequences in autopsy tissue, serum or CSF sample by Polymerize Chain Reaction. (PCR)

Dengue Haemorrhagic fever:

Case Definition: probable or confirmed case of Dengue fever and haemorrhagic tendencies evidenced by one or more of the following:

- Positive tourniquet test
- Petechiae, ecchymoses or purpura
- Bleeding: mucosa, gastrointestinal tract, injection sites or other
- Haematemesis or melaena
- Signs of plasma leakage (pleural effusion, ascities, hypoproteinaemia)

Case classification: As per the clinical description
Laboratory criteria for diagnosis:

- Thrombocytopenia (100000 cells or less per mm^3)
- 20% rise in average haematocrit for age and sex.

- 20% drop in haematocrit following volume replacement treatment as compared to base line.

8) Meningococcal Meningitis:

It is a bacteraemic disease with a rapid and acute onset. It is always a medical emergency because of high mortality of untreated or late treated cases. The importance of meningitis is preventable morbidity, which can be reduced to 4-8% in children's and 8-25% in adults. N meningitides is the commonest cause of bacterial meningitis.

Clinical case description: An illness with sudden onset of fever (>38^0-38.5^0 C) and one or more of the following:

- Neck stiffness
- Altered consciousness
- Other meningeal sign (Kerning and Brudzinski sign positive)
- Petechial or purpural rash

Case classification:

Suspect: A case that meets the clinical case description.

Probable: A suspect case as defined above and

- Turbid CSF
- On going epidemic and epidemiological link to confirmed case of meningitis.

Confirmed: A suspect or probable case with laboratory confirmation

Laboratory criteria for diagnosis:

- Positive CSF antigen detection or
- Positive culture (Gram negative diplococci)

9) Japanese Encephalitis:

It is a zoonotic disease whose man is an incidental dead end host. The disease is transmitted to man by the bite of infected Culicine mosquitoes. This mosquito born encephalitis has an potential for outbreak and can be associated with high case fatality rate.

Case definition: Japanese encephalitis virus infection may result in a febrile illness of variable severity associated with neurological symptoms ranging from headache to meningitis or encephalitis. Symptoms can include: Headache, fever, meningeal sign, stupor, disorientation, coma, tremors, paresis (generalized), hypertonia, and loss of coordination. The encephalitis cannot be distinguished clinically from other central nervous infections.

Case classification:

Suspect: A case that is compatible with the clinical description.

Probable: A suspected case with presumptive laboratory results.

Confirmed: A suspected case that is laboratory confirmed.

Laboratory criteria for diagnosis:

Presumptive: Detection of an acute phase antiviral antibody response through one of the following:

- Elevated and stable serum antibody titer to JE virus through ELISA, haemagglutination- inhibition or virus neutralization assays or
- IgM antibody to the virus in serum

Confirmed:

- Detection of the JE virus, antigen or genome in tissue, blood or other body fluid by immuno-chemistry or immunofluorescence or PCR, or
- JE virus specific IgM in the CSF, or
- Four fold or greater rise in JE virus specific antibody in paired sera (acute and convalescent phases) through IgM /IgG, ELISA, haemagglutination inhibition test or virus neutralization test.

2.2 EVALUATION OF REVISED NATIONAL TUBERCULOSIS CONTROL PROGRAMME, DISTRICT, SHIMLA HIMACHAL PRADESH

1. Introduction

Tuberculosis is an ancient disease in India and is mentioned in Vedas and Ayuvedic Samhitas. Every year, approximately 2 million people in India develop tuberculosis, accounting for one fourth of the world's new tuberculosis cases. Organized TB control activities have existed in India for last 40 years; however, the quality of diagnosis and treatment of TB in the public and private sectors has been variable, and TB incidence and prevalence trends have not changed substantially over this time. Despite the availability of highly effective and inexpensive drugs, in each year TB causes more deaths (421,000) in India than malaria, hepatitis, meningitis, nutritional deficiencies, sexually transmitted diseases, leprosy, and tropical diseases (e.g., dengue fever, trypanosomiasis, schistosomiasis, leishmaniasis, lymphatic Filariasis, and onchocerciasis) combined (258,000). Tuberculosis in India continues to take a toll of 1,000 per day and i.e. one every minute. It is estimated that there are 14 million TB cases in India out of which 3.5 million are sputum positive. About 1 million sputum cases are added every year.

In Himachal Pradesh the first non-missionary sanatorium was built at Dharampur near Shimla in 1909. As in the country the National Tuberculosis Programme (NTP) was also started in the state of Himachal Pradesh in the year 1962.The objectives of the Programme were to reduce:

1. The morbidity and mortality and disease transmission
2. To diagnose as many cases of tuberculosis as possible and to provide free treatment.

However, it could not make much of an impact on this dreaded disease. Despite the continuous input under NTP, it was observed that TB is still the leading cause of death among adults. Detailed review of NTP in 1992 at the country level had revealed some important facts regarding NTP. These were: Managerial weaknesses, inadequate funding, non-standard treatment regimens, low rate of treatment completion (30-40%), over-reliance on X-ray and

lack of systematic data recording and reporting. As a result Revised National TB Control Programme was designed to overcome all these hurdles (RNTCP) in the year1992.

Under NTP an extensive infrastructure at district level was created as District TB Center (DTC). RNTCP strengthens the existing DTC by creating a Sub District level supervisory team known as Tuberculosis Unit (TU). Under each TU, 5-6 specified centers (to perform direct sputum smear microscopy for AFB) are also identified and recognized. These centers are known as Microscopic Centers (MC).

DOTS (Directly Observed Treatment Short Course chemotherapy) is the key word of RNTCP to ensure cure, in which a trained peripheral Health Worker watches as patient swallows all the medicines in his/her presence. Under RNTCP, patients diagnosed in health-care facilities with cough lasting $\geq$3 weeks; undergo three sputum smear examinations over a 2-day period. If all three smears are negative for acid-fast bacilli (AFB), 1-2 weeks of broad-spectrum antibiotics are prescribed. If two but not all of the specimens are positive, or if a patient with negative smears continued to have symptoms after 1--2 weeks of broad-spectrum antibiotics, a chest radiograph is taken, and if indicative of disease, the patient is treated for Tuberculosis. All TB treatment is given three times weekly on alternate days; During the first 2 months of treatment (intensive phase), patients are treated with isoniazid, rifampicin, pyrazinamide, and ethambutol (streptomycin is added for re-treatment patients, and ethambutol is omitted for smear-negative, non-seriously ill patients); every dose is observed directly by either a health-care provider or a non-family community member or a volunteer. For the remaining 4--6 months of treatment (continuation phase), isoniazid and rifampicin or isonizaid, rifampicin, and ethambutol are prepared into weekly packs, and at least the first dose of each week is observed directly. To prevent drug shortages during TB therapy, medications for both phases of treatment are maintained in individualized patient boxes containing the entire course of treatment for a given patient at the health facility or residence of the community volunteer providing DOTS. Case finding is Passive detection by means of a patient-friendly and clinically efficient service based primarily on smear microscopy.

Already two years have been passed since the of implementation RNTCP in Shimla. The programme has not been evaluated so far. The present evaluation study has been conducted with the following objectives.

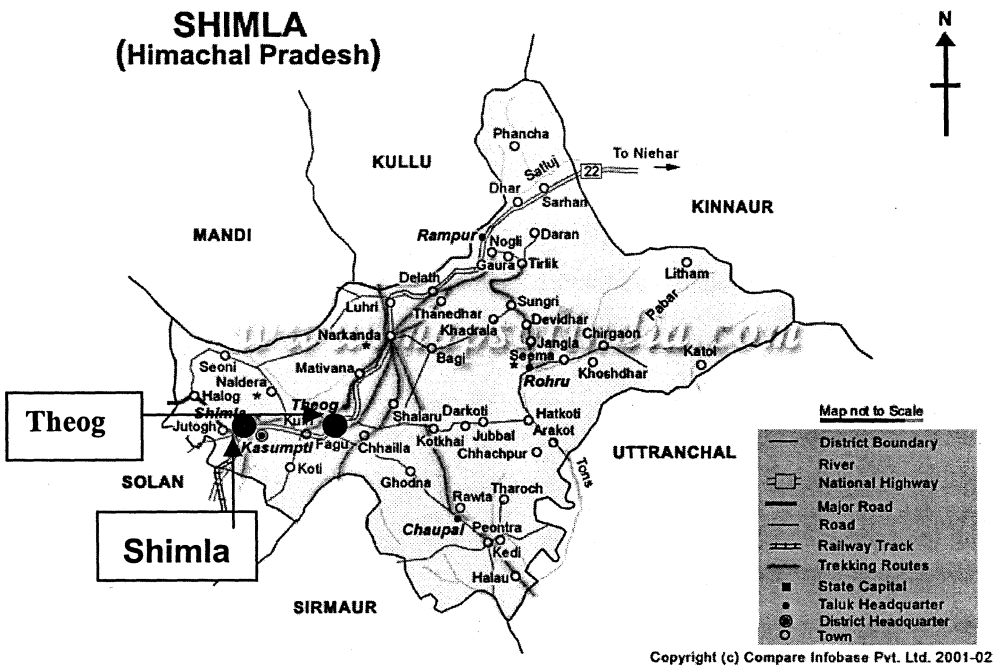
2. Objective:

1. To assess the achievement of objectives of RNTCP in two Microscopic Centers of Shimla District under one Tuberculosis Unit.
2. To identify gaps and underlying contributing factors.
3. To suggest appropriate measure to narrow down the existing gaps

3. Methodology:

Study Area: The topography of the district Shimla is mountainous with altitude ranging from 300 meters to 5000 meters above mean sea level (Figure 2). The total geographical area of the district is 5131 km^2 and the population is 7,21,745 as per census 2001. Means of communication is by roads or foot owing to topography. Extreme winters are experienced especially from November to March. Two Microscopic centers were selected for evaluation of the DOTS programme Microscopic Center Shimla and Microscopic Center Theog under the Tuberculosis Unit Shimla.

Figure 1. Map of Shimla District showing the study area.



Study design:

Study design was cross-sectional.

Sampling frame:

Sampling frame was the Shimla district of Himachal Pradesh

Sample size:

One tuberculosis unit (Shimla TU) of Shimla District Himachal Pradesh was selected for the study. Under this TU two Microscopic Centers (MC) were selected. The two MC were the MC Shimla and Microscopic center Theog.

Microscopic center Shimla: Under MC Shimla five patients were selected from fourth quarter 2001 and five were selected from fourth quarter 2002 randomly by lot method.

Microscopic center Theog: Under MC Theog five patients were selected from fourth quarter 2001 and five were selected from fourth quarter 2002 randomly by lot method.

In all 20 patients were selected. These patients were of 4th quarter 2001 and 2002 and were new sputum positive patients who had undergone tuberculosis treatment under the DOTS programme.

Data sources:

Data sources were primary data collected and the secondary data available from the records.

Data collection techniques and tools:

Quantitative methods: Review of registers and records (Tuberculosis register, laboratory register, treatment cards)

Qualitative method: In depth interview using semi-structured questionaires.

Both quantitative and qualitative methods have been adopted for the evaluation of RNTCP. A proportion of secondary data containing registration, diagnosis, treatment and outcome reports from the selected health institutions were reviewed and checked for consistency between them.

Following qualitative methods were adopted for the study.

1. In-depth interviews:

Separate questioners were developed for different health officials like State Tuberculosis Officer (STO), District Tuberculosis Officer (DTO). Medical Officer Tuberculosis Center (MOTC), Senior Treatment Supervisor (STS), Senior Treatment Laboratory Supervisor (STLS), Laboratory technician at the MC, and DOTS provider at the DOT center. They were interviewed during the study (Annexure 3).

Apart from the health officials, 20 patients who had completed treatment were selected from 4^{th} quarter 2001 and 2002 to check the consistency of the reports and actual outcome.

2. Observation:

Different level of health institutions likes, District TB center, Microscopic center, DOTS Center and Tuberculosis patient's house have been visited during the study to understand the structure of RNTCP, its functioning at different levels and ultimately the outcome i.e. the

cure rate, sputum conversion rate and annualised case detection rate with the use of checklist(Annexure 1,2) and semi-structured questioner.

Selection of health institutions:

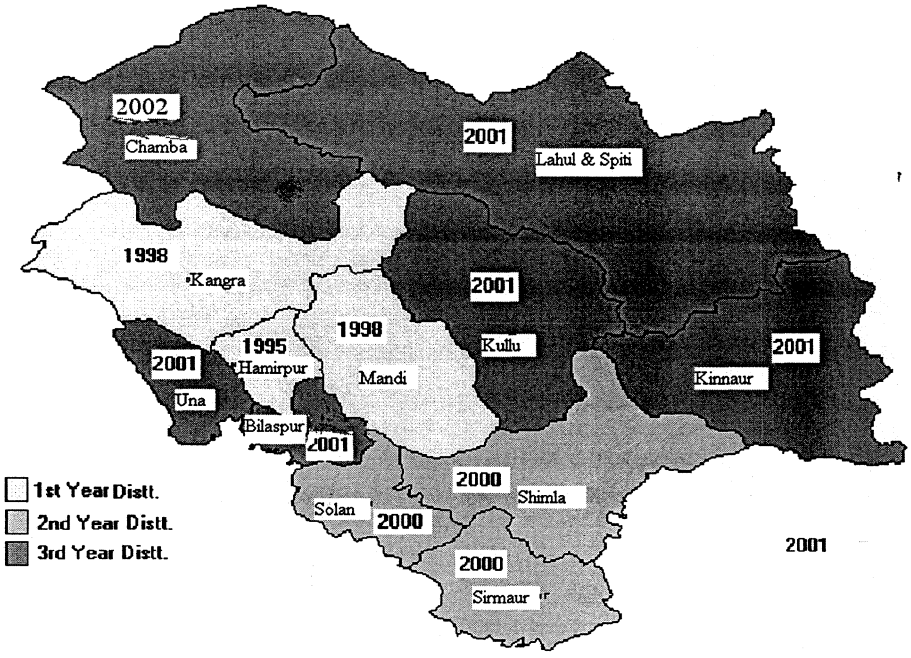
The two microscopic centers under the Tuberculosis Unit Shimla were selected for the evaluation study, as Tuberculosis Unit Shimla is one of the satisfactorily performing TU among the four TU in Shimla District. The health institutions selected were Microscopic center Shimla and Theog.

Data analysis:
Data generated was analysed by use of computer using Epi info and Excel.

Description of RNTCP

Background: RNTCP was implemented in Himachal Pradesh in phased manner. Out of twelve districts Hamirpur was the first District where RNTCP was implemented in 1995, followed by Kangra and Mandi in 1998. These three districts are collectively called as 1st year district. Shimla, Solan and Sirmaur have started the programme from 1st July 2000. These three districts are collectively called as 2nd year districts. Out of remaining six (collectively called as 3rd year districts) districts Lahul and Spiti, Una and Kullu have started service delivery from first quarter of 2001and Bilaspur in the 2nd quarter of 2001.Kinnaur and Chamba has also started service delivery in December 2001 and January 2002 respectively.

Fig 1 Status of RNTCP implementing District in HP



Source Directorate of health services Himachal Pradesh

RNTCP in Shimla District:

Structure :

The physical infrastructure is well developed at the State district and the sub district levels of the health system for RNTCP. The population covered under RNTCP in district Shimla is 7,21,745.There are four Tuberculosis Units and 19 Microscopic Centers in the district and 362 DOTS centers operational in the district.

State level: At state level, the **State Tuberculosis Officer** (STO) is responsible for planning, training, supervising and monitoring the programme in the state. He is responsible

administratively to the State Director of Health Services and technically follows instructions of the Central TB Division.

DTC level: RNTCP had been started in the Shimla District since 1st July 2000.At present the population under RNTCP is 7,21,745 in the District. The District Tuberculosis Officer (DTO) at the DTC has the overall responsibility of the Programme at the district level and is assisted by a Medical Officer, Statistical Assistant and other paramedical staff. District Tuberculosis Control Society with the District Collector as the Chairman, DTO as Member Secretary, with governmental and non-governmental representatives has been created and made functional. It is responsible for monitoring the programme implementation, arranging necessary logistics such as transport and procuring materials such as laboratory consumables.

Tuberculosis unit level: A team comprising a specifically designated Medical Officer-Tuberculosis Center (MO-TC), Senior Treatment Laboratory Supervisor (STLS) and Senior Treatment Supervisor (STS) is based at a sub-divisional level i.e. the Tuberculosis Unit (TU) level. The team constitutes the Tuberculosis Unit, and the STS and STLS are under the administrative supervision of the DTO. The STS is responsible for accurate maintenance of the Tuberculosis Register and timely submission of quarterly reports along with monitoring and supervision at the TU level. Detail of TU at Shimla is as follows:

Table 1 Detail of TU at Shimla:

Microscopy Centre	Functional	Area under TU
1. DTC Shimla	Yes	Mashobra
2.CH Theog	Yes	& Matiana
3. PHC Chailla	No (Doctor)	Blocks
4. PHC Sunni	Yes	
5. CH Junga	Yes	
6. IGMC Shimla	No	

Objective of the RNTCP in Shimla District:

3. To achieve > 85% cure rate in all new smear positive pulmonary patients. For this no active survey is recommended. Strategy is to examine all symptomatic patients presented to health system for routine checkup and it is recommended that district should be able to achieve minimum 85% cure rate in total diagnosed new sputum positive patients.
4. Sputum conversion rate of 90% after completion of intensive phase treatment.

To achieve the above said objectives, the strategies identified under the programme are:

1. Political and administrative commitment to ensure funds, staffing, procurement and contracting as necessary.
2. Diagnosis primarily by Microscopy among patients attending all health facilities.
3. Uninterrupted supply of good quality drug for short course chemotherapy.
4. Direct observation of treatment at a time and place convenient to patients by a trained observer who is accountable to the health system
5. Accountability: an intensive system of monitoring and supervision that tracks the diagnosis, progress and outcome of each and every patient treated.

Case Definition used in RNTCP:

Pulmonary tuberculosis, Smear-positive

Tuberculosis in a patient with at least 2 initial sputum smear examinations (direct smear microscopy) positive for AFB,

Or: Tuberculosis in a patient with one sputum examination positive for AFB and radiographic abnormalities consistent with active pulmonary Tuberculosis as determined by the treating Medical Officer,

Or: Tuberculosis in a patient with one sputum specimen positive for AFB and culture positive for Mycobacterium tuberculae.

Pulmonary tuberculosis, Smear-negative

Tuberculosis in a patient with symptoms suggestive of Tuberculosis with at least 3 sputum examinations negative for AFB, and radiographic abnormalities consistent with active pulmonary Tuberculosis as determined by an Medical Officer, followed by a decision to treat the patient with a full course of anti-tuberculosis therapy,
Or: Diagnosis based on positive culture but negative AFB sputum examination.

Extra-pulmonary tuberculosis
In tuberculosis of organs other than the lungs, such as the pleura (TB pleurisy), lymph nodes, abdomen, genitourinary tract, skin, joints and bones, tubercular meningitis, tuberculoma of the brain, etc. diagnosis should be based on one culture-positive specimen from the extra-pulmonary site, or histological evidence, or strong clinical evidence consistent with active extra-pulmonary Tuberculosis followed by a Medical Officers decision to treat with a full course of anti- Tuberculosis therapy. Pleurisy is classified as extra-pulmonary Tuberculosis. A patient diagnosed with both pulmonary and extra pulmonary Tuberculosis should be classified as pulmonary Tuberculosis.

Findings:

Structure of RNTCP:

State level

At this level, there is a **State Tuberculosis Officer** (STO) who is responsible for planning, training, supervising and monitoring the programme in the state. STO had been in this position since January 2000. At present more than 61 lakhs people are under RNTCP in the State. A meeting is held with the DTO once every quarter & as & when required. Quarterly reports are being received and analyzed TU wise. Last meeting was held on 7th of April 2003 He is responsible administratively to the State Director of Health Services and technically follows instructions of the Central TB Division. The building is well developed and maintained.

DTC Level

DTO is in place and conducts technical and administrative review with MO-TC & all STS/STLS monthly. DTO visits one TU and one MC center at least once in a month. Except for winter season when owing to snow, transportation becomes difficult he is unable to conduct the supervisory visits. The District Magistrate and the CMO are both actively involved with the programme. DTO sees the difficult topography of the district and shortage of manpower in different health institutions as the constraint in implementation of the programme

Tuberculosis unit level

At the TU level there was a team comprising of designated Medical Officer-Tuberculosis Center (MO-TC), Senior Treatment Laboratory Supervisor (STLS) and Senior Treatment Supervisor.

Table 2 Staff position in respect of TU Shimla & Civil Hospital Theog of District Shimla H.P.

Institution	Category	Sanctioned*	In position†	Vacant
TU Shimla	District Tuberculosis Officer	1	1	-
	Medical Officer TC	1	1	-
	Senior Treatment Supervisor	1	1	-
	Senior Treatment Laboratory Supervisor	1	1	-
	Female Health Supervisor	2	2	-
	Pharmacist	1	1	-
	Radiographer	1	1	-
	Data Entry Operator	1	1	-
	Laboratory Technician	1	1	-
	Clerk	1	1	-
	Driver	1	1	-
	Class IV	4	4	-
	Sweeper	1	1	-
Civil Hospital Theog	Medical Officer	7	8	-
	Pharmacist	2	2	-
	Staff Nurses	7	7	-
	Laboratory Technician	2	2	-
	Pharmacist	2	2	-
	Ophthalmic Assistant	1	1	-
	Female Health Supervisor	1	1	-
	Clerk	3	3	-
	Driver	1	1	-
	Class IV	5	4	1

*Source CMO office Shimla

†Finding during visit

Laboratories facilities.

The laboratory at the Microscopic Center (MC) level had been strengthened under the programme by supply of equipment and reagents. Minor civil works have been done to improve the available working space. Sputum collection rooms have been created at MC level. Adequate ventilation and light was observed in both the laboratories visited. Equipments in the form of functional Binocular Microscope were available and other consumables were as shown in the following table. Runnig water supply was there in both laboratories visited.

Table 3 Laboratory Equipments and other Consumables available under RNTCP at MC Shimla and Theog.

Laboratory Items	MC Shimla	MC Theog
Laboratory Manuals	Available	Available
Laboratory Registers	Available	Available
Microscope	Binocular Microscope (2)	Binocular Microscope (1)
Slides and Slide Box	Available	Available
Diamond Pen	Available	Available
Laboratory Reagents	Available	Available
Sputum Containers	Available	Available
Smear request Form	Available	Available
Disinfectant	5%Phenol and Bleaching powder	5%Phenol and Bleaching powder

- **Medicines and Stationeries:**

  The buffer stock of medicines and stationary in the form of treatment cards, identity cards, registers, laboratory diagnosis forms etc. were maintained at both the microscopic centers. STS and STLS ensured the supply of these consumables to the microscopic centers during their visit.

- **Electronic communication and Data Management**

  Telephone, along with fax facility has been provided at the state and district level thereby strengthening the communication. Computers have been installed at state and district level for electronic processing of data and rapid communication of reports directly to State and central TB division New Delhi through E-mails. Computer data entry operator post has been created for entry and analysis of data and was occupied

  .

- **Transportation:**

  Transportation has been strengthened by procurement of vehicle under the programme. Driver has been appointed on contractual basis and was in place. Contingency funds to meet the petrol and maintenance expenses were available.

- **IEC activities**

  In urban areas (MC Shimla) television cable network are being used for IEC. Hoardings were displayed at bus stand and in the premises of both the health institutions. Posters and flip charts have been provided under the programme and were displayed at the MC Shimla and Theog.

2. **Processes indicators: Processes indicator relate to the functioning of the system. The following process indicators were observed:**

   - Diagnosis of Tuberculosis:

     At both the MC diagnosis is being done by sputum Microscopy. In routine three sputum samples are ordered for TB suspect over two days period. Screening is done at the Microscopy center. If necessary, chest X-Ray is also being done. People are also seeking treatment in the private and their information is not available and DTC has no control over their prescription and method of diagnosis. For the 4th quarter 2001 and 2002 new patients diagnosed under Tuberculosis Unit are as given the Table 4. We collected this data from tuberculosis unit Shimla by going through their TB register and cross checking it with the treatment card and the laboratory register

Table 4. Patients registered during 4th quarter 2001 and 2002 at TU Shimla

Type of Patients	Total Registered	
	4th Quarter 2001	4th Quarter 2002
New Smear positive Patients	18	23
Relapse patients	4	9
New Smear negative patients	10	17
New extra pulmonary patients	8	17
Total	40	66

Total new smear patients diagnosed in the year 2002 have improved as compared to the year 2001. The proportion of new smear positive patients to other type in the year 2001 was 45% and where as in the year 2002 it was 34.8% only.

Table 5 Sputum Microscopic during 4th quarter 2001 and 2002 at TU Shimla

Type of Patients	**Microscopic Activities**	
	4th Quarter 2001	**4th Quarter 2002**
Number of new adult out patients	19000	16000
Number of Chest symptomatic whose sputum was examined	618 (2.3%)	406 (2.5%)
Number of smear positive patients diagnosed	40 (6.4%)	43 (10.6%)
Number of positive patients put on DOTS	18 (45%)	23 (57.5%)

The number of smear positive patients diagnosed during 4th quarter, 2002 have increased as compared to 4th quarter 2001, as well as the proportion of new smear positive patients put on DOTS. But the proportion of patients put on DOTS in 4th quarter 2001 is only 45%(n=40) and in 4th quarter 2002 it is only 57.5%. That means that in 4th quarter 2001, 55% of the smear positive patients were put on non-DOTS and in 4th quarter 2002, 42.5% were placed on non-DOTS. Which is a high proportion if we want to bring down annual risk of infection.

- **Treatment of Tuberculosis.**

Patients were treated at the DOT center during the intensive phase by giving tri-weekly regimen on alternate days as per as the RNTCP guidelines and weekly monitoring during the continuous phase at both the MC. DOTS is presently being given by the health officials only. The total number of patients started on treatment is given in Table.

Table 6. Patients treatment during 4th quarter 2001 and 2002,TU Shimla

Type of Patients	Total patients started on treatment	
	4th Quarter 2001	4th Quarter 2002
Category I	19	30
Category II	13	15
Category III	17	27
Total	49	72

- **Recording and reporting.**

Reporting system is well established in the state Headquarter, at the district tuberculosis office, Tuberculosis unit and at the Microscopic Centre with a fixed schedule for the flow of reports in the reporting formats provided as per guidelines of RNTCP. Data is collected from the government institutions only and the private sector is not involved. The reporting formats are printed and standardized and are uniform at the state and district level. Collection of data is passive only. Compilation, analysis and interpretation of data are done at the DTO level in the monthly and quarterly meetings. At TU Shimla TB register, laboratory register, and treatment card were checked for correct entries for the 4th quarter 2001 and 2002 (Table 7). As the record of all the microscopic centers is maintained at the TU level the recording and reporting registers were checked at the TU level only. Minor discrepancies in the form of missing entries were found between them. Treatment card are maintained in duplicate at the TU level. The other card is sent to the DOT center.

Table 7. Discrepancies checked in different registers and Treatment cards

Register checked	Discrepancies found
TB register	Two outcomes were not entered in the register for 4th quarter 2001
Laboratory Register	TB numbers were missing for patient of 4th quarter2001 and grading of positivity had not been shown for three patients of 4th quarter 2002
Treatment Cards	Treatment out come was not mentioned for one patient for the 4th quarter 2001.

- **Equipment and supply**

  Equipment and supply are indented monthly at both the TU level and the microscopic center level. STS and STLS are both responsible for indenting the supplies and to send to microscopic center level from the TU. On inspection of the medicinal store both at TU Shimla and MC Theog buffer stock was maintained. First expiry first out system is followed at the two levels.

- **Man Power Development:**

  Training under RNTCP has been conducted for Health officials in the district including Ayurvedic health officials. Background training material in the form of one training module and treatment charts have been provided to these trained health officials. The table 8 shows health staff trained as on 31-03-2003. This information was collected from the district tuberculosis center Shimla

Table 8 Staff position and status in regard to RNTCP training

Category of the Staff	In Position	Trained in RNTCP
Medical Officer	192	74%
Medical Officers TUs	3	100%
STS	4	100%
STLS	3	100%
Lab. Technicians	40	97%
Health Supervisors (M)	12	42%
Health Supervisors (F)	21	48%
Pharmacists	81	35%
Health Workers	432	73%
Ayurvedic Medical Officers	109	27%

To know the training status of the DOT provider we administered questioner and it was found that out of the 10 DOT provider questioned only four had received training (Table 9)

To assess the knowledge and practices of the activities done under RNTCP among the health officials we administered questioner to the MO-TC, medical officer incharge DOTS at CH Theog, laboratory technicians and DOTS provider and recorded the responses (Table9).

Table 9 Selected Indicators of RNTCP training activities

Indicator	Status
Medical Officers trained in RNTCP	Only two doctors were trained out of the four interviewed
Medical Officer having one of the three key RNTCP documents with them	Only two had out of the four
Medical Officer aware about the number of patient examined and those found smear positive each month in the MC	None of the four were aware

MOTC aware of smear conversion rate in the Tuberculosis Unit	Not aware
MOTC aware of Cure rate in the Tuberculosis Unit	Not aware
Laboratory technician aware of the importance of three sputum smears for the diagnosis	Both the interviewed technician were aware
Treatment observers correctly reporting when to provide sputum containers to patients for follow up sputum examinations	Only 6 DOTS provider were aware out of 10

Feedback:

As responded by the 10 DOTS provider who were interviewed 80% of them said that feedback was verbal and 20% said we have been not given any feed back. The feedback was given as stated in the monthly meetings or during the supervisory visits

Administrative Commitments:

On being asked about the administrative support both the STO and DTO reported that state health secretary and district magistrate were actively involved in the programme. However the vacancy of the health officials and frequent transfer in the peripheral institutions was the constrained cited by the DTO and the STO.

Out Come Indicators:

Patient Characteristics:

In the two MC centers selected 20 patients were sampled by lot method from the fourth quarter 2001 and 2002; five from each quarter from each MC. Of the 20 only 19 could be interviewed as 1 patient had defaulted by way of changing his residence and could not be traced. Mean age of patients affected was 30.7 years and 45% were females and 55% were males. All the 19 patients interviewed expressed their satisfaction with the programme and everybody received free treatment with microscopic services. All the 19 patients knew that they suffered from Tuberculosis. Knowledge about the disease Tuberculosis in terms of duration of treatment and consequences of incomplete treatment were 53% and 32%

respectively among the interviewed patients. Most of the patients affected were in the age group of 15-34 Years.

Fig 3.

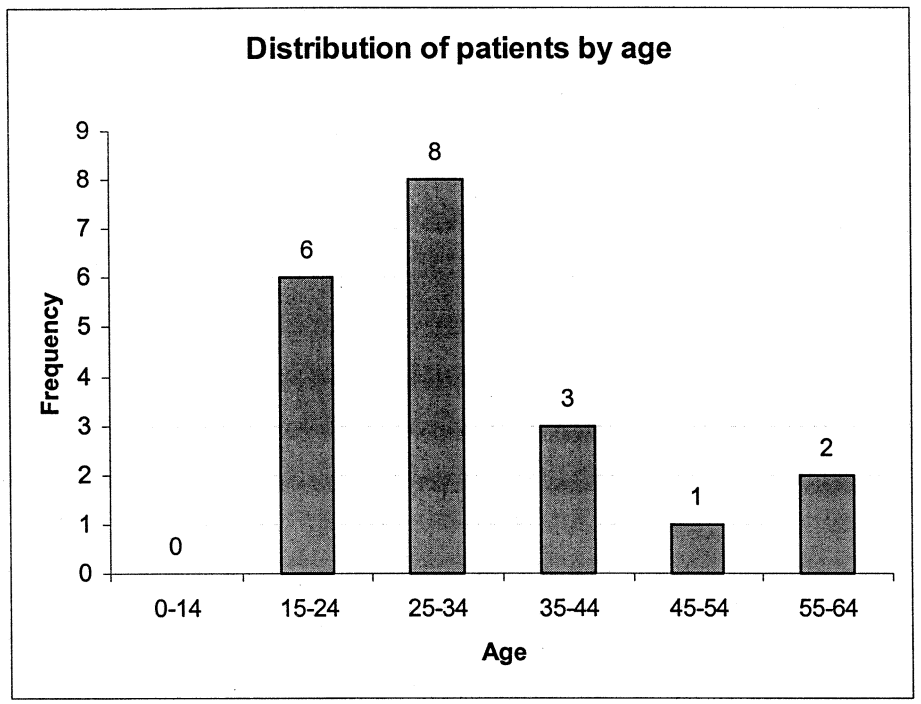
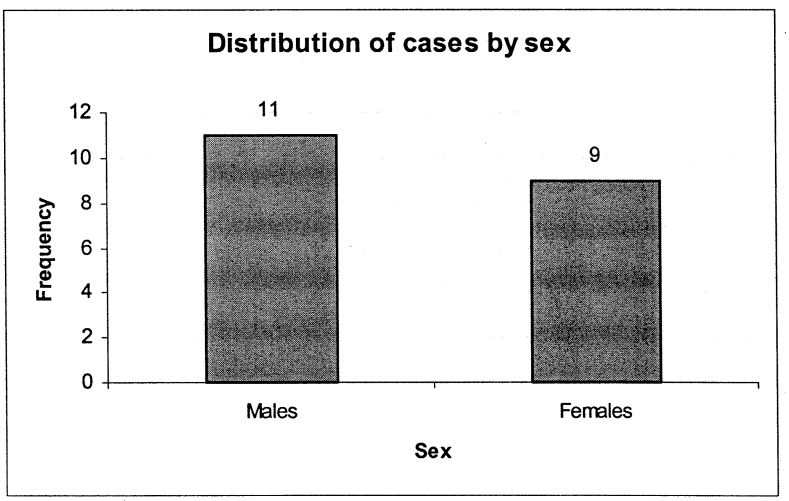


Fig 4.



Microscopy Services:

Of the two-microscopic centers visited the logistics for microscopy services were found to be good. They had functional binocular microscope and adequate laboratory consumables. All chests symptomatics that attended the laboratory had been examined for three sputum smears. Based on the laboratory and TB registers all patients had two sputum smears examined at the time of diagnosis. However it declined to 90% towards the end of treatment due patient default (Table 10).

Table 10 Selected indicators of RNTCP microscopy services based on review of laboratory registers and treatment card and interview of patients

Indicator	Status
Laboratory registers And treatment card	
Free microscopy services:	All 19 patients received free treatment
Patient's record:	All 20 patients had record of their initial sputum examination in the laboratory register All 20 patients had examined two samples before start of the treatment as documented in the laboratory register. Only for one out of 20 patients there was no mention about grades of bacterial load in the TB register All 20 patients had sputum examination at the end of intensive phase

Record consistency:	It was found that for All 20 patients sputum examination results at the end of intensive phase were consistent between the laboratory and the TB register. They had a record of sputum examination at the end of treatment Except one patient out of 19 patients, other cured patients had two sputum samples examined at the end of treatment. Except one, all 19 cured patients sputum examination results at the end of treatment were consistent between the laboratory register and the TB register.

Interview of patients: All 19 patients reported that they provided at least two sputum samples at the start of treatment, provided two sputum samples at the end of the intensive phase. All 19 cured patients reported that they provided two sputum samples at the end of the treatment

Treatment Observations:

All the DOT centers visited were maintaining a drug box for each patient. Satisfactory facilities for treatment observations such as clean water disposable cups and seating arrangements were not available at 50% of the DOTS centers. How ever it was also observed during the course of interview with the patient that that during intensive and continuous phases the DOTS was not properly adhered to because of the topography and extreme conditions of weather prevailing in the area.

Table 11 shows selected indicators of RNTCP treatment services based on evaluation of treatment centers, interview of treatment observers and review of records and interview of patients.

Table 11. RNTCP treatment service indicators, Shimla

Maintenance drug box at DOTS* centers:	All the 10 DOT centers were maintaining patient wise drug box satisfactorily
Reporting of DOT Provider	All 10 DOT providers who were interviewed reported: (i.) patients received every dose under direct observation during the intensive phase (ii) patient received at least one dose in a week under direct observation during the continuous phase.(iii) they updated treatments cards at the time of administering dose.(v) patient returned weekly blister pack during the continuous phase
Facilities at DOT center:	Only 5 out of 10 of the DOT center visited were having satisfactory facilities (clean water, disposable cups, privacy) for treatment observation
Consistency of drug boxes with treatment cards	Only five out of seven drug boxes were checked and it was found that Patient for whom the number of doses used in the drug box were consistent with those marked in their treatment cards

Based on review of treatment cards

Total 19 treatment cards were reviewed and it was found that for all patients treatment regimen in the treatment cards was consistent with the categorization in the TB register.

For all the 19 patients it was found that they were receiving at least 20 of 24 doses under direct observation during the intensive phase based on documentation in the treatment card and all were receiving at least once a weekly dose during continuous phase under direct observation based on documentation in the treatment card.

Based on review of interview of patients

All 19 patients recevied free treatment (at least 20 of 24 doses under direct observation during the intensive phase)

Out of 19 patents 18 took all 24 doses under direct observation and only one patient had taken medicines home during winter months

All 19 patients received at least one dose in a week under direct observation during continuous phase

*DOTS: Directly observed short course chemoerapy.

Outcome indicators:

Annualized total case detection rate/ one lac population was higher for the year 2002 for TU Shimla as compared to 2001.Sputum conversion rate was higher in 4th quarter 2001 as compared to 4th quarter 2002.

Table 12.RNTCP achievements for the 4th quarter 2001 and 2002, TU Shimla

Indicators	4th Quarter2001	4th Quarter2002
Annualized total cases detection rate/ lac population	76/Lac	125/Lac
Ratio of New Smear positive cases to New smear negative cases	1.8	1.35
Sputum Conversion rate (%)	95%	87.5%
Cure rate (%)	94.4%	NA

The cure rate for DTC Shimla was 91.6%, where as for Civil Hospital Theog was 100% for quarter 4th, 2001. The sputum conversion was 90% at DTC Shimla and 88.8% at Civil Hospital Theog for 4th, 2002.

Table 13. Total number of new smear positive patients registered in quarter 4th, 2001 at MC DTC Shimla and Civil Hospital Theog and the treatment outcome of this cohort

Name of MC	Total new smear positive patients registered in Qtr.4, 2001	Cured	Defaulted	Total number evaluated
DTC Shimla	12	11	1	12
Ch Theog	5	5	0	5

Table 14 Sputum conversion for the cohort registered in quarter 4th, 2002 at MC DTC Shimla and Civil Hospital Theog

Name of MC	Total Number of new sputum positive patients in Qtr.4th, 2002	Sputum at 2 months			Sputum at 3 months		
		Positive	Negative	NA*	Positive	Negative	NA*
DTC Shimla	10	0	9	1	0	0	0
Ch Theog	9	0	8	1	0	0	0

Not available*

Supervision and Monitoring:

Supervision was sub optimal at the peripheral institutions i.e. PHC and Sub Center level. Medical officer of MC and the Medical officers in charge of the programme are not conducting supervisory visits to the PHCs as per RNTCP guidelines. Weekly review with the health workers is not being carried out. Home visit by health worker was found to be the weakest point. Regular review of the programme on quarterly and monthly basis was cited as the most common factor for the success of the RNTCP by the STO and the DTO as well as the commitment from the Government. It was observed that feed back mechanism at peripheral level to the health functionaries was verbal only. One DOTS center out of the 10 visited did not have supervision / visit by the Supervisor for the last one year.

Table 15 Selected indicators of Supervision, Monitoring in RNTCP

Indicators	Actual performance
Supervision and monitoring at state level	
STO holding at least one meeting in a quarter with all the DTO	Once quarterly & as and when required

State reporting TU wise analysis on a quarterly basis	Quarterly analysis TU wise done
STO reviewing and sending feedback on quarterly reports to district	Quarterly feedbacks are sent
STO conducting at least one supervisory visit to each implementing district once a quarter	Yes
Supervision and monitoring at the district level	
DTO conducting monthly review with MOTC and all STS/STLSs	Monthly review meeting is held in first week of every month with dispersion of pay
DTO undertaking at least one supervisory visit to each TU once in a month	All the four TU are visited by DTO once in month except in winter.
DTO undertaking at least one supervisory visit to each MC once in a quarter	Not in winter months
DTO maintaining a documented record of supervisory visits to TUs and MCs	Yes in the form of tour diary
Supervision and monitoring at the TU/PHC level	
MOTC conducting supervisory visit to all PHCs at least once a quarter	Not all the PHC are visited
MOs reviewing patient treatment activities with MPWs at least once a week	No, only during monthly meetings
STSs visiting each PHC/CHC and hospital in the TU area once in a month	All the PHC/CHC are not visited
STSs reviewing patient treatment activities with MPWs regularly	Only during monthly meetings
STS s maintaining a dairy of field activities	Yes
LTs keeping slides for review by STLS	Both the technician were keeping

STLSs reviewing all positive slides and 10% of negative slides for quality control	Yes
STLSs maintaining a dairy of field activities	Yes
MOs making home visits to retrieve irregular patients	No
STS s making home visits to retrieve irregular patients	Yes
DOT provider making home visit to verify addresses of patients N(10)	Only 6 of the interviewed are making home visits
DOT provider making prompt home visits to retrieve irregular patients	Answer was Yes by all the 10 DOTS provider interviewed.

Recommendations:

Treatment Observation:

1. Patient should be counseled about the importance of directly observed treatment as it was observed during the course of interview that patients wanted to carry home these drugs.
2. Effective heath education material should be prepared for patient counseling so that dots provider is fully oriented and is able to counsel the patient effectively.
3. Facility at the DOTS Center should be improved like provision of disposable cups, water jugs as well as seating arrangements as these were pointed by the patients during interview.
4. Treatment Providers should be oriented about the importance of direct observation of treatment as it was observed that 40% of the DOTS providers were themselves not aware.

Trainings:

- Re-orientation trainings need to be started for the Medical Officers and other Para-Medical staff as we observed that <60% of the interviewed health officials were trained under RNTCP.

Supervision:

- Supervision should be strengthened at all levels as it was observed, no supervisor had visited one DOT center for the last one year.
- Chief Medical Officer should ensure that Medical Officers conduct weekly review meeting with MPWs of their area regarding the programme.
- Distribution of the Drug for the patient can be made monthly through the STS from the TU to ensure effective monitoring as well as DOTS. This will ensure at least one visit of the supervisors under the programme to the respective DOT center monthly.
- Use of the Supervisors checklist should be made mandatory for all the supervisors during their visits. It was observed that none of the supervisors visiting were using any kind of checklist during their field visits.

Administrative Commitment:

- The Medical Officers and other paramedical staff may be made more accountable towards the RNTCP. Written feed back should be given to all the officials visited by the Supervisory staff.
- Monthly newsletter may be started from the State Directorate to be circulated among all the health Officials to keep them updated about the programme achievements.

IEC Activities:

- IPC meeting with Mahila Mandals, Yuvak Mandals etc will create awareness among the community and bring down the social stigma which is still attached to tuberculosis.
- Involvement of the Kala Jatha people and holding plays at the village levels.

Involvement of the NGO and Private Practitioners:

- Private practitioners can help by ensuring that every person with cough for more than 3 weeks gets their sputum examined in a designated TB laboratory.
- Private practitioners can use sputum microscopy for diagnosis and follow RNTCP guidelines in managing patients

- Private practitioners can make use of their clinics as DOTS centers in co-ordination with the local health authorities
- NGO can spread awareness about TB in the community, and help in providing TB treatment services

Involvement of Panchayati Raj People:

- Panchayati Raj People can utilize its strength to ensure proper DOTS implementation.
- They can find local solutions to local problems in this difficult hilly terrain, such as the means of organizing local DOTS observer for the of treatment thus avoiding patient travel which becomes sometime difficult for the patient and also incase of female patients it becomes easy to take the treatment by avoiding travel to the distant health institutions. They can spread the awareness message in the community thus work towards removing the stigma attached to the disease

Annexure-1

Checklist for a visit to Microscopic Center

Interview with laboratory staff

- How many staff works in the laboratory?
- Have they received the RNTCP training? When?
- Do they have RNTCP laboratory manual?

Smear request form

- How are smear requested and reported?
- Is the RNTCP smear request form used?

Sputum containers

- Are there adequate supplies?
- Are they marked properly (laboratory number on the side)?

Laboratory register

- Is the RNTCP laboratory register used?
- Is it up to date?
- Is it filled in completely?
- Do negative suspects have three negative smears?
- Do positive cases have two positive smears?
- Are positive results written in red?
- How many smears (diagnosis and follow up) were examined recently?

Slides

- Are there adequate supplies?
- Are slides marked with a diamond pen?
- Is the laboratory number marked properly on the slide?
- Check some positive and negative smears for smear preparation, staining, and correct reporting?

Reagents

- Are there sufficient quantities of reagents?
- Are bottles labeled correctly with name and date of preparation?

Microscope

- Type (binocular / monocular electric/ light) and its condition?

Quality control

- Are slides kept for quality control?
- Are there sufficient slide boxes?
- How often are slides sent for quality control?
- How are slides sampled for quality control?
- Has the laboratory received results of quality control?

Disposal

- Method of waste disposal (burial/ burning)?

Annexure-2

Check list for TB Clinic

Interview with patient
Interview with staff

- Who sees the patients in the clinic?
- Have they received the RNTCP training? When?
- Do they have RNTCP manual?
- How do they supervise treatment?
- Who does late patient tracing?

Treatment cards

- Are cards stored properly?
- Check correctness completeness, consistency and credibility?
- Check categories, treatment, and medicine taken?

TB Register

- Is it up to date?
- Check correctness completeness, consistency, and credibility?
- Compare with laboratory register; any pretreatment defaulters? Any discrepancies?
- Compare with treatment card – any discrepancies?

Cohorts

- Check reports prepared by treatment center staff?
- Prepare case finding, two-month conversion and treatment outcome cohorts?
- Any discrepancies?

Store

Medicines

- Are there adequate quantities of anti-TB medicines?
- Are medicines stored properly?
- Check expiry dates. Is a FEFO system used?
- Are stock cards kept up to date?
- Do the stock card match the actual stocks (check at least one medicine)?

Annexure-3
Form-1

QUESTIONNAIRE FOR STAE TUBERCULOSIS OFFICER

Name ..... Designation.....

Name of the State.....

No. of service years in this position.....Date of Visit.....

GENERAL

Q. When was the RNTCP started in State of Himachal Pradesh?

Q. What is the population under RNTCP?

Q. What were the reasons for Developing RNTCP?

Q. What are the Objectives of RNTCP?

Q. When was the last RNTCP training for Medical Officers and health workers organised?

Q. How many meetings do you hold with all the District Tuberculosis Officers to discuss administrative and technical matters pertaining to RNTCP implementation in a year?

Q. On what basis is the state quarterly analysis report prepared?

Q. How often do you review quarterly reports and send feed back to the districts.

Q. How often do you visit each implementing District in a year?

Q. How often does state health secretary review the programme?

Q. Is the RNTCP being implemented successfully in the state?

Q. In your opinion what further steps can make the programme more successful?

Form -2

QUESTIONNAIRE FOR DISTRICT TUBERCULOSIS OFFICER

Name ..... Designation.....

Name of the State..... Name of the District.....

No. of service years in this District.....Date of Visit.....

Q. When was the RNTCP started in District Shimla of Himachal Pradesh?

Q. What is the population under RNTCP?

Q. What were the reasons for Developing RNTCP?

Q. What are the Objectives of RNTCP?

Q. When was the last RNTCP training for Medical Officers and health workers organized?

Q. How many technical and administrative review meetings do you hold with MO-TC and all STS/STLS in a year?

Q. How often do you visit Tuberculosis Unit of your district in a year?

Q. Is there documentary evidence of 2.2(e.g. trip report, diary)?
Yes ☐ No ☐

Q. How often do you visit the Microscopic Centers of your district?

Q. Is there documentary evidence of 2.4(e.g. trip report, diary)?
Yes ☐ No ☐

Q. How often does the District Magistrate review the programme and facilitates coordination with other sectors / programmes?

Q. How often does the Chief Medical Officer review the programme and facilitates?

Q. Has there been any drug stock out in the District in the past one year?

Q. Has there been any expiry of drugs in the District in the past one year?
Yes ☐ No ☐

Q. Is the RNTCP being implemented successfully in the state?

Q. In your opinion what further steps can make the programme more successful?

Form -4

Abstract the following information from **TB register** of each MC for the cohort registered in Quarter 4th, 2002 and the sputum conversion results of the same cohort.

Name of MC	Total Number of new sputum positive patients in Qtr.4th, 2002	Sputum at 2 months			Sputum at 3 months		
		Positive	Negative	NA	Positive	Negative	NA
DTC Shimla							
Ch Theog							

From **TB register** of each MC in the district, count the total number of new smear positive cases registered in quarter 4th, 2001 and treatment outcome s for the same cohort.

Name of MC	Total new smear positive patients registered in Qtr.4th, 2001	Cured (1)	Treatment completed (2)	Died (3)	Failure (4)	Defaulted (5)	Transferred to another district (6)	Total number evaluated (Sum of columns 1to6)
DTC Shimla								
Ch Theog								

Form-5

QUESTIONNAIRE FOR MOTC incharge of the TU

Name ..... Designation.....

Name of the District..... Name of the TU.....

No. of service years in this Institution.....Date of Visit.....

GENERAL

Q. What is the population of the area served by this TU?

Q. What are the private health services available in the area?

Q. What are the numbers of beds in the institution?

Sanctioned In Position

Q. What are the numbers of outpatients for last one year?

Q. What are the major public health problems in the area served by the institution?

Q. What are the services available in the institution?

Q. What is the staff available in the institution?

Diagnosis of Tuberculosis:

Q. What definition do you use for TB suspect?

Q. Where does screening of TB suspect take place?

Q. Who does the screening of TB suspect?

Q. How is the screening of TB suspect done?

Q. What routine investigation are ordered for TB suspects?

Q. How many sputum smear examinations are ordered for a TB suspect?

Q. Do people with respiratory symptoms use the private sector? If so how are they managed?

Treatment of TB:

Q. Where does patient get their treatment?

Q. What treatment categories, regimens and dosage are used?

Q. Who directly observe treatment?

Q. What quantity of medicines is dispensed in the intensive phase?

Q. What quantity of medicine is dispensed in the continuous phase?

Q. Who gives patient education and counseling?

Q. How often are patients called for follow up during treatment?

Q. How often are smear examinations ordered during treatment?

Q. By whom, when and how is the late patient tracing done?

Q. Do patient with TB gets treatment in the private sector? What treatment regimen does private practitioner use?

Q. Is preventive therapy used, if yes for whom?

Recording and reporting:

Q. Who maintains treatment cards and TB registers?

Q. Who prepares the quarterly reports?

Q. Is there a system for cross checking the TB registers with the laboratory register?

Training and Supervision:

Q. When was the last RNTCP training for health workers in the institution?

Q. How often health workers trained?

Q. How often do RNTCP supervisors visit the institution?

Q. When was the last supervisory visit from the RNTCP?

Q. What do supervisors do on their visits?

Q. Do supervisors use a supervision checklist?

Q. Is feedback verbal or written provided by the supervisors?

Medicines:

Q. How are anti TB medicines ordered?

Q. How often do supplies of medicines come?

Q. Are quantities sufficient?

Q. Has there ever been shortage of ant TB medicines?

Q. How many supervisory visits have you made in last one month to the Peripheral Health Institutions?

Q. What was the smear conversion rate reported for the TU in the last quarter?

Q. What was the cure rate reported for the TU in the last quarter?

Form-6

QUESTIONNAIRE FOR MEDICAL OFFICER of the MC

Name ..... Designation.....

Name of the District..... Name of the TU.....

No. of service years in this Institution.....Date of Visit.....

GENERAL

Q. What is the population of the area served by this MC?

Q. What are the private health services available in the area?

Q. What are the numbers of beds in the institution?

Sanctioned In Position

Q. What are the numbers of outpatients for last one year?

Q. What are the major public health problems in the area served by the institution?

Q. What are the services available in the institution?

Q. What is the staff available in the institution?

Diagnosis of Tuberculosis:

Q. What is the definition used for TB suspect?

Q. Where does screening of TB suspect take place?

Q. Who does the screening of TB suspect?

Q. How is the screening of TB suspect done?

Q. What routine investigation are ordered for TB suspects?

Q. How many sputum smear examinations are ordered for a TB suspect?

Q. Do people with respiratory symptoms use the private sector? If so how are they managed?

Treatment of TB:

Q. Where does patient get their treatment?

Q. What treatment categories, regimens and dosage are used?

Q. Who directly observe treatment?

Q. What quantity of medicines is dispensed in the intensive phase?

Q. What quantity of medicine is dispensed in the continuous phase?

Q. Who gives patient education and counseling?

Q. How often are patients called for follow up during treatment?

Q. How often are smear examinations ordered during treatment?

Q. By whom, when and how is the late patient tracing done?

Q. Is preventive therapy used, if yes for whom?

Recording and reporting:

Q. Who maintains treatment cards and TB registers?

Q. Who prepares the quarterly reports?

Q. Is there a system for cross checking the TB register with the laboratory register?

Training and Supervision:

Q. When was the last RNTCP training for health workers in the institution?

Q. How often are health workers trained?

Q. How often do RNTCP supervisors visit the institution?

Q. When was the last supervisory visit from the RNTCP?

Q. What do supervisors do on their visits?

Q. Do supervisors use a supervision checklist?

Q. Is feedback verbal or written provided by the supervisors?

Medicines:

Q. How are anti TB medicines ordered?

Q. How often do supplies of medicines come?

Q. Are quantities sufficient?

Q. Has there ever been shortage of ant TB medicines?

Q. Are you trained in RNTCP?
Yes ☐ No ☐

Q. Do you have a copy of any of the following documents?
1) Technical guidelines. 2) RNTCP at a glance. 3) Key facts and concepts. 4) Desk reference.
Yes ☐ No ☐

Q. What was the number of sputum smears examined last month in the MC and what percentages of them were positive.

Q. How often do you review patient treatment activities with Multi Purpose Worker?

Q. Have any irregular/defaulting patients brought back on treatment?
Yes ☐ No ☐

Form -7

QUESTIONNAIRE FOR S T S AT THE TU LEVEL

Name ..... Designation.....

Name of the District..... Name of the TU.....

Date of Visit.....

Q. How often do you visit each DOT center in your TU area?

Q. What do you do to bring irregular patient back on treatment?

Q. How often do you review patient treatment activities with Multi Purpose Worker?

Q. How do you maintain details of your field activities?

Form 8

QUESTIONNAIRE FOR S TLS AT THE TU LEVEL

Name ..... Designation.....

Name of the District..... Name of the TU.....

Date of Visit.....

Q. How do you review the slides?

Q. How do you maintain details of your field activities?

Form -9

QUESTIONNAIRE FOR LT AT THE MC LEVEL

Name ..... Designation.....

Name of the District..... Name of the MC.....
.....

Date of Visit.....

General:

Q. What are the numbers of staff working in the laboratory?

Q. What is the number of staff who does smear examination?

Q. What other investigations are done in the laboratory?

Q. What are number of sputum smears examined each day/month/year for AFB?

Q. Does the laboratory do any other investigations for TB (culture/sensitivity etc)?

Equipment and supplies:

Q. What is the type of Microscope and power supply the Laboratory has?

Q. What is the condition of the microscope?

Q. How are supplies (sputum containers, slides, reagents, and chemicals) ordered?

Q. How often are they supplied?

Q. Has there been any shortage of supplies?

Q. Are there adequate supplies of reagents, slides and other consumables for the next one-month?

Q. Who prepares the reagents, how are they prepared and where are they prepared?

Q. Are reagents labeled?

Q. How long are reagents used for?

Q. Any problems with old reagents?

Sputum Collection:

Q. Where do patients cough up their sputum specimens?

Q. Does any one observe them?

Q. Where is sputum collected in?

Q. How are sputum containers labeled?

Q. How many sputum specimens are collected for each TB suspect?

Smear preparation and examination:

Q. Who prepares the smears?

Q. Who stains them?

Q. What stains are used?

Q. Who examines the smears?

Q. How long does it take to examine a negative smear?

Q. For the previous quarter, were three sputum smears done for 80% of the chest symptomatic? Count from the Lab register.

Yes ☐ No

Q. For the previous quarter, were two sputum smears done for 80% of the follow up patients? Count from the Lab register.

Yes ☐ No ☐

Recording and reporting:

Q. Do you have a smear examination form?

Q. Who fills it in?

Q. Do you have an RNTCP laboratory register?

Q. Who fills it in?

Quality control:

Q. What quality control system do you have?

Q. Are slides kept for quality control after examination?

Q How do you preserve slides for review by STLS?

Q. How often are slides sent for quality control?

Q. Has the laboratory received any feedback on quality of smear examination?

Training and Supervision:

Q. How often do laboratory technicians receive training from RNTCP?

Q. When was the most recent training by the RNTCP?

Q. Do you have a supervision system for the laboratory?

Q. When was the most recent supervisory visit?

Q. What is the importance of 3 sputum exams for diagnosis and 2 sputum exams for follow up?

Form -9

QUESTIONNAIRE FOR DOTS PROVIDER

Name ..... Designation.....

Name of the District..... Name of the TU.....

Name of the PHC/CHC..... Name of the HSC.....

No. of service years in this area.....Date of Visit.....

General:

Q. What is the population of the area served by the institution?

Q. What other public health services are in that area?

Q. What other private health services are in that area?

Q. What are the numbers of outpatients per year?

Q. What are the major health problems in the area served by the institution?

Q. What are the services available in the institution?

Treatment of TB:

Q. Where does patient get their treatment?

Q. How do you maintain boxes for each patient?

Q. Who directly observe treatment?

Q. How do you mark the treatment cards at the time of giving each dose?

Q. How do patient receive every dose of drug during Intensive Phase?

Q. How do patient receive every dose of drug during Continuous Phase?
Q. When do patients bring back empty blister packs, when they collect weekly drugs?

Q. Check the consistency between number of doses on treatment card and drug box? Check any two boxes?
Box - 1 Yes ☐ No ☐
Box - 2 Yes ☐ No ☐

Q. Does the treatment observer make home visits to verify addresses of patient?
Yes ☐ No ☐

Q. Do you have clean water, disposable cups, and privacy for DOT patients?
Yes ☐ No ☐

Recording and reporting:

Q. Who maintains treatment cards?

Q. At what dose in intensive phase are you supposed to give the sputum container for follow - up examination?

Q. How do you bring irregular patients back on treatment?

Q. How often are smear examinations ordered during treatment?

Training and Supervision:
Q. When were you trained under RNTCP?

Q. How often do RNTCP supervisors visit the institution?

Q. When was the last supervisory visit from the RNTCP?

Q. What do supervisors do on their visits?

Q. Is feedback verbal or written provided by the supervisors?

FORM-10 Interview of patient registered in Quarter 4th, 2002(Mark 1 for Yes and 0 for No)

S.No	Indicator TB Number	P 1	P 2	P 3	P4	P5
Check Laboratory Register (Check consistency of recording between TB register and Lab register at the MC)						
1	In the laboratory register, is there a record of the patient's initial sputum examination?					
2	As per the Lab register, did the patient have at least 2 initial sputum samples examined before start of treatment					
3	Is the result (including grade) in the Lab register consistent with the result in the TB register					
4	Is there a record of patient's 2-month follow up sputum examination in the Lab register?					
5	Did the patient have at least 2 follow up sputum exams at the end of 2 months?					
6	Is the result (including grade) for 2 month follow up sputum exam consistent between Lab register and TB register					
Check Rx card (check consistency of information between Rx and Lab register)						
7	Is the patient's 2 month follow up sputum result on Rx card consistent with result and grade recorded in Lab register?					
8	Is the patient's treatment regimen on the Rx card consistent with the categorization in the TB register?					
9	As per the Rx card, is the patient reported to have been on DOT during IP? (at least 20 of 24 doses)					
10	As per Rx card, is the patient reported to have been on DOT during CP (at least one dose a week)					
Interview of patient Check consistency between recorded patient information versus actual patient information (Carry Rx cards for interview)						
11	Is the patient aware that he/she is/was undergoing treatment for TB?					
12	Does the patient know the correct duration of treatment for his TB?					
13	Did the patient take at least 20 of 24 doses under direct observation in the I P?					
14	Did the patient take at least one dose in a week under direct observation in the CP?					
15	Does the patient know that no taking drugs under direct observation can lead to unfavorable Rx outcomes?					
16	Does the health worker pay any home visits					
17	Is participating in DOT convenient to the patient? (In terms of DOT place, DOT provider DOT time)					
18	Did the patient have to pay for sputum examination at the MC?					
19	Did the patient have to pay for TB drugs after being registered in the RNTCP?					
20	Did the patient mention that he provided at least two sputum samples before the start of treatment?					
21	Did the patient mention that he provided at least two sputum samples at the end of 2 months of Rx					
22	Age of the patient(completed age in years)					
23	Sex of the patient(M= male, F=female)					
24	Is the patient Tribal					
25	Was the patient satisfied with the interaction and support provided by the programme staff					

FORM -11 Interview of patient registered in Quarter 4, 2001(Mark 1 for Yes and 0 for No)

S.No	Indicator TB Number	P 1	P 2	P 3	P4	P5
Check patient's end of treatment sputum examination result (check consistency of recording between the TB register and the Lab register at the MC)						
1	Treatment outcome of the patient as per the TB register (Cured/Completed/Died/Failure/Transfer/Default)					
2	In the Lab register, is there a record of the patient's end of treatment sputum examination?					
3	As per the Lab register, did the patient have 2 sputum examinations at the end of treatment?					
4	Is patient's end of treatment sputum result in the Lab register consistent with the result (including grade) in the TB register					
Check Rx cards (Check consistency of information between and with in Rx card and Lab register, and TB register)						
5	Is the patient's outcome in Rx card consistent with outcome in TB register?					
6	Is the patient's treatment regimen in the Rx card consistent with the categorization in the TB register?					
7	Is the patient reported to have been on DOT during IP? (at least 20 of 24 doses)					
8	Is the patient reported to have been on DOT during CP?					
Interview of patients Check consistency between recorded patient information versus actual patient information (carry Rx cards for interview)]						
9	Is the patient aware that he/she is/was under going treatment for TB?					
10	Does the patient know the correct duration of treatment?					
11	Did the patient take at least 20 of 24 doses under direct observation in the IP?					
12	Did the patient take at least 1 dose in a week under direct observation in the C P?					
13	Does the patient know that not taking drugs under direct observation could lead to unfavorable Rx outcomes?					
14	Was participating in DOT convenient to the patient? (In terms of DOT place, DOT provider, DOT time)					
15	Did the patient have to pay for sputum examination at the MC?					
16	Did the patient have to pay for TB drugs after being registered in the RNTCP?					
17	Did the patient mention that he provided at least two sputum samples at the end of treatment?					
18	Did the health worker pay any home visits					
19	Was the patient satisfied with the interaction and support provided by the programme staff?					
20	Age of the patient (completed age in years)					
21	Sex of the patient (M= male, F=female)					
21	Is the patient Tribal					

SECTION :3

OUTBREAK INVESTIGATIONS

1. OUT BREAK OF FEVER, KHAMADI, DISTRICT, SHIMLA HIMACHAL PRADESH

Disease Notification:

On dated 10th May 2002 when I had reported along with Director National Institute Epidemiology Chennai Dr. M D Gupte and CDC consultant Dr.Jason Weisfeld to the office of Chief Medical Officer District Shimla H.P. an outbreak of fever was being discussed there. The fever outbreak was going at Khamadi, which came under a community health center located at Nankhari. A team sent from community health center Nankhari had already confirmed the outbreak on 8 May 2002. I was asked to investigate further.

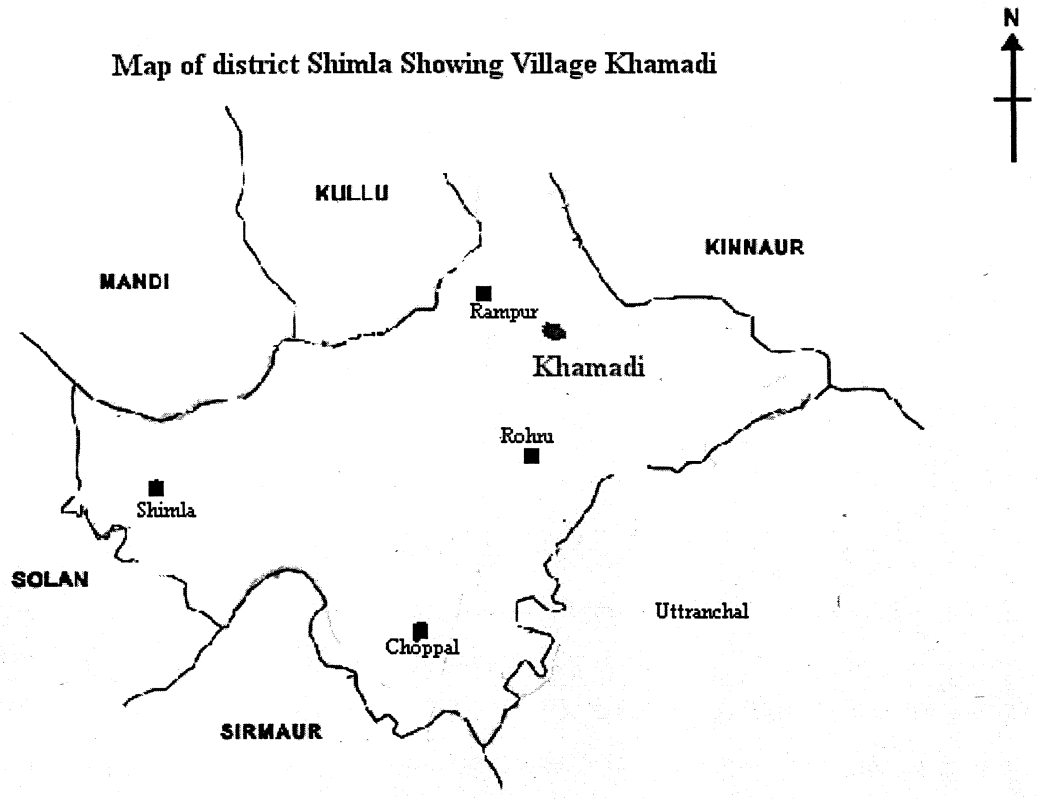
Preparation for Field visit:

I started my journey early morning of 11th May 2002 and reached community health center Nankhari .I met the medical officer as he had visited Khamadi. As per his version a local leader from Khamadi on 2nd of May reported to him about the unusual occurrence of fever in that area. On enquiry he found that people were suffering from fever and headache and cough. As per the first hand information medical officer had sent medicine through health worker on 3rd of May to Khamadi and to look at the problem. On 8th of May he himself along with health supervisor visited the said area and distributed medicines in the village. On 10th May 2002 a team from Referral hospital Rampur comprising of clinician, pharmacist, laboratory technician, and class IV visited the area and distributed the medicine. After taking this preliminary report from the medical officer I requested him to depute two health workers and one laboratory technician to assist me in investigations. Along with theses three staff I left for Khamadi.

Background Information:

Khamadi is located in Shimla District of Himachal Pradesh. The topography of the districts is mountainous with altitude ranging from 300 meters to 5000 meters above mean sea level. The total geographical area of the district is 5131sqkm and the population is 721745 as per censuses 2001. The economy of the district mainly depends on the agricultural and horticulture activities. District Shimla is known for it apple fruit. Means of communication is by roads or foot owing to topography.

Map of district Shimla Showing Village Khamadi



Khamadi is situated at the altitude of 8000 feet's above from sea level. There is a sub-center in this village. The population of the village is 351 with 48 households comprising mostly of agricultural people. The population is scattered over the hillock. The village is about 140Kms from District Head quarter Shimla

Objectives:

- To confirm the occurrence of an epidemic and ascertain its causes
- To search for cases and treat accordingly
- To institute control measures for preventing further spread and future outbreaks.

Methods:

Disease Verification:

On arrival, it was found that 142 people had got ill between 24th of April and 10th of May 2002 in the village with a population of 351. Though data was not available about the occurrence of similar cases in the previous years or months, it was learnt from members of the community and the health workers that similar cases had occurred in the previous year too during this time of year. Those mainly affected were adults and children but the number of cases and severity was less as compared to the current situation. It was thus established that an outbreak had occurred.

Outbreak Investigation:

Discussion were held with the Health workers, Anganwari worker and community health volunteer and it was thus established that most of the patients in the village had complaints of fever, headache, severe cough, running nose, myalgia and watering eyes. They seemed to have been affected from the third week of April 2002. The next nearest habitat was at distance of approximately 3 Km from these villages and it was not affected.

As the sub-center was located in Khamadi village which was catering to health needs of these villages the register was checked for immunization status and found that children were immunized against BCG, Polio, DPT and measles as per the schedule, however, immunization status of the children was not fully achieved as per the Universal Immunization Programme schedule.

Establishing a case definition:

It was therefore concluded that an epidemic had occurred and a probable case definition was formed: "all cases with fever, cough, headache, running nose, watering eyes, myalgia from 20th of April 2002 residing at Khamadi".

Identifying and counting cases:

A house to house search with the help of the Anganwari worker and community health volunteer, and along with two health workers was made. They were trained on the administration of the pre- prepared questionnaire, which contained information about the

identifying information, demographic information and information on clinical symptoms. Cases meeting the case definition were systematically collected and recorded in a line listing form.

Descriptive Epidemiology:

The cases meeting the case definition from the line listing, were abstracted and described in terms of person, place and time.

Persons affected:

The total household attack rate was 83.3% with no case fatality. At the time of the investigation, 120 (84.5%) of the affected cases were well and had fully recovered from the symptoms.

It was observed that all age groups were affected, and age group 10-14 was most affected both in males and females. However females were more affected than the males.

Table I: Age and sex specific (n=351) attack rate of suspected outbreak, Khamadi, April 2002.

Age	Male		Female		Total	
group	No	%	No	%	No	%
0-4	11	57.8	9	52.9	20	55.5
5-9	14	63.6	14	70.0	28	66.6
10-14	19	73.0	18	85.7	37	78.7
15-19	6	33.3	9	52.9	15	42.8
20	9	9.7	32	32.3	41	21.4

The secondary attack rate was 66.2%. All the cases had fever and cough was the 2nd. most frequent complaints of those affected. The common signs and symptoms that were encountered are described in table.

Table II. Distribution of symptoms (n=142) of suspected Fever outbreak, Khamadi, April 2002.

No	Signs & symptoms	No. of cases	%
1	Fever	142	100
2	Cough	140	98.7
3	Running nose	121	85.5
4	Headache	86	60.5
5	Watering eyes	56	39.5
6	Myalgia	87	61.2

Place:

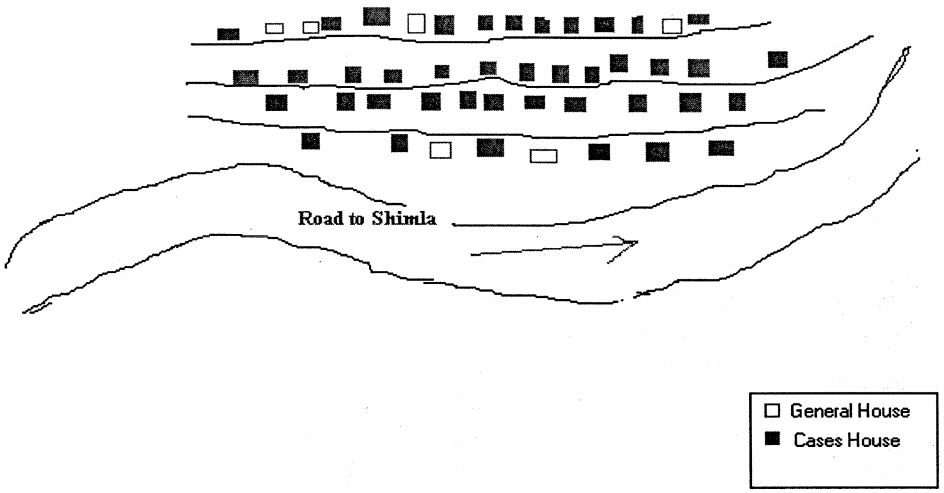
During the investigation the village was surveyed from the environmental aspect also. The following things were noticed:

The domestic animals like cows, bulls, and goats were kept in the floor below the dwelling floor.

Drainage and sanitation condition of the village was poor. Virtually there was no drainage system. People maintained poor sanitation. Hygienic practices in handling food and water were not being practiced.

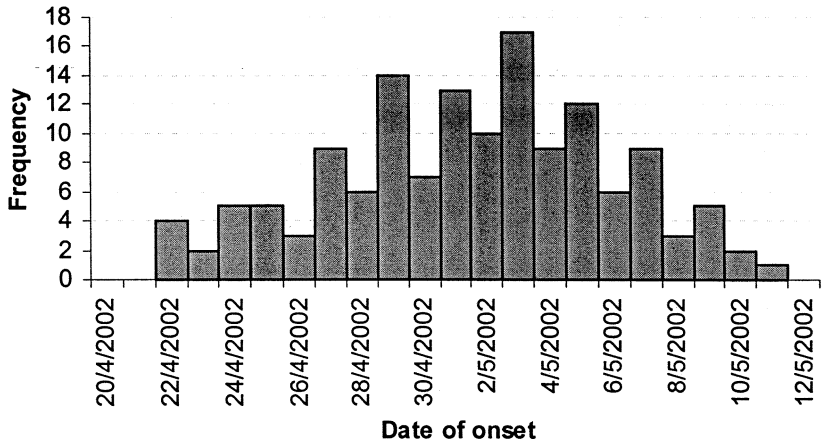
Almost all the households were affected but the clustering was more at the center of the village Khamadi. Probably the infection started at the center of the village and than spread to the neighboring houses located in the village. There were four cases initially for the outbreak to begin .The index could not be identified as none of them gave history of visit to other places.

Spot Map showing distribution of cases at Khamadi



Time:

Distribution of cases by date of onset of febrile illness Khamadi 2002



Epidemic curve shows propagative a curve with multiple peaks on dated 27/4/2002, 29/4/2002, 1/5/2002, 3/5/2002 and on 5/5/2002 thereby demonstrating person to person transmission. The persons that were affected after date 29/4/2002 onwards could be

suggestive of secondary attacks. The mean incubation period of the epidemic seems to be 2 days.

Developing hypothesis:

Primary source of the outbreak could not be identified. The mode of transmission of the suspected outbreak was through droplet infection from person to person. All age groups were affected but it was seen affecting 5- 14 years age group more than the others. The younger age groups seemed more susceptible to infection as they were more affected. This could perhaps be because this age group was the children who were school going and more exposed to infection.

From the description of the outbreak in terms of place, person and time and the clinical symptoms of the affected cases, a hypothesis suggestive of Influenza outbreak was developed.

Evaluating hypothesis:

In the present outbreak the index case could not be identified. Only clinical manifestation and the epidemiological description supported the hypothesis that the present outbreak could be Influenza. Six Blood samples were taken from cases that were in the acute stage of illness. The serum was separated and was sent for antibody detection to Central Research Institute Kassuali Himachal Pradesh for sero-diagnosis. Though these serum samples were sent to the Central Research Institute Kassuali and the preliminary results seemed like influenza, full confirmation of the cause of this outbreak could not be established due to constraints faced in the collection of a second convalescence sera. Throat secretion samples or naso-pharyngeal aspirates were not collected due to the unavailability of a suitable transport medium.

Implementing control measures:

During:

1. Symptomatic treatment was given in the form of Septran and paracetamol tablets syrup.
2. Reassurance about the spontaneous recovery from the disease was given to the patients.
3. Education about general personal hygiene and avoiding direct contact with the patients affected was given.

4. Adequate food and hydration to the patients along with adequate rest was advised.
5. Continued surveillance of the population, as well as the surrounding villages was constituted with the help of health workers and medical officer of the PHC.

Future:

A rapid response team should be constituted at the block level and trained under epidemic preparedness.

A networking with diagnostic laboratory where diagnostic tests for Influenza virus culture, serology, rapid antigen testing and immuno-fluorescence are available should be done, so that diagnosis can be established early and appropriate containment measures initiated.

Communication of the findings:

After reaching the community health center Nankhari we discussed with the Block Medical officer the findings of the outbreak investigations and the potential spread to other areas. We suggested the Block Medical Officer to continue active surveillance of the affected population as well as the surrounding villages with intensive health education. A copy of the report was also given to medical officer incharge Community Health Center Nankhari. We also submitted our written report with necessary recommendations to the Chief Medical officer Shimla for information and necessary action.

Lessons learnt:

1. As the outbreak occurred in remote rural area of Shimla district awareness about the outbreak and response by the health authorities both were delayed. There is a need for creating awareness among the community as well as rapid and efficient response on the part of health authorities.
2. No previous year data was available to assess the magnitude of the problem. A surveillance system is required to build the effective database.
3. Constraints faced during investigation of the outbreak were in terms of laboratory capacity. Non- availability of suitable transport medium for transportation of the naso-pharyngeal aspirates or throat secretion and a trained Microbiologist were the limitation of this outbreak investigation. Hence the Laboratory capacity of the district hospitals in terms of acquisition of equipment is to be strengthened in order to meet the challenges of the changing scenario.

2. OUTBREAK OF PNEUMONIC PLAGUE, GALLU HAMLET, HATKOTI, DISTRICT, SHIMLA HIMACHAL PRADESH- A REVIEW INDIA – FEBRUARY-2002

Notification about the outbreak:

On 11th of February 2002 in the afternoon Senior Medical Officer Incharge Rohru informed the Chief Medical Officer of District Shimla over telephone and later followed by fax. The message reported unusual clustering of cases of severe Pneumonia like illness at Hatkoti village. The fax message was discussed at the Chief Medical Officer office and a team comprising of district health officer, clinician, laboratory technician and other paramedical staff was sent to Rohru. A day after a team comprising of members of medical college was also sent to investigate the outbreak. At that time of year there was a heavy snowfall in the area.

The then Health Secretary to the government of Himachal Pradesh, on 13/02/2002 after admission of few cases presenting with fever and haemoptysis (severe Pneumonia like illness) in the two hospital of Shimla district that is Civil hospital Rohru and Indira Gandhi Medical College Shimla and Post Graduate Institute of Medical education and Research Chandigarh requested National Institute of Communicable Diseases New Delhi to depute team for investigation of the outbreak.

Background:

Himachal Pradesh is one of the northern State of India situated at the foothills of western Himalayas, some of its peaks reaches as high as 5000 meters and contains traces of snow throughout the year. The district of Shimla is bounded by Mandi and Kullu district in North, Kinnaur district in East and Solan district of Himachal Pradesh in West. Dehradun district of Uttaranchal forms its Southern boundary. (Fig-1) .The villages in this district are scattered on

the mountains slopes and valleys with small clusters of houses and sparsely populated. The terrain is rugged and mountainous with very poor communication facilities.

The affected hamlet Gallu is situated in Hatkoti village of the Jubbal-Kothkhai Block of District Shimla Himachal Pradesh. Hatkoti village is having a population of 94 and 28 houses. Houses are scattered over a large area on the hillock. The nearest health facility that is a Primary Health Center at Sarswati Nagar which is about 15 Km. from the affected village. A sub-divisional hospital is also located at a distance of 25 Km. from the affected village. This hamlet is at least 500 meters away from the next near inhabitation.

Fig-1

Investigations conducted by investigating agencies:

Investigation agencies involved in the outbreak were:

- Directorate of Health Services, Government of Himachal Pradesh.
- Indira Gandhi Medical College Shimla
- Post Graduate Institute of Medical education and Research Chandigarh
- National Institute of Communicable Diseases New Delhi

National Institute of Communicable Diseases New Delhi investigated the outbreak w.e.f. 14th to 17th February 2002. The investigating team reached Post Graduate Institute of Medical education and Research Chandigarh on 14th of February and examined the patients there, took samples, reviewed records of the deceased and held discussion with the heath officials involved in managing Plague cases. Then on 15th of February they reached Shimla and examined the patients, took samples, reviewed the record of patient and held discussions with different officials of Indira Gandhi Medical College and reviewed the facilities present in the laboratory of Indira Gandhi Medical College. On the evening of 15th February they reached Rohru. The investigating team after reaching Rohru discussed the situation with senior Medical Officer Rohru and other health official at Civil hospital Rohru, District health team at Hatkoti, Medical College team at Hatkoti and other local government officials. They examined the patients admitted in the hospital and took samples. They reviewed the medical records of the deceased and the patients admitted in the hospital. They collected epidemiological data and histories from family members of the deceased. They laid traps at Hatkoti village and collected rats. They could not go to Kalvi forest because of the heavy snowfall. The officials of the Health Department actively participated with the investigating teams and supported them in terms of logistic and manpower.

Findings of the investigating Teams:

The investigating team concluded that the illness was due to infection of ***Yersinia Pestis*** **(*Y.pestis*),** and it was pneumonic Plague. They hypothesized that Randhir Singh who has gone for hunting to Kalvi forest might have contacted the infection there from the infected animal while handling it.

Clinical materials collected from the cases were initially processed in the laboratories of hospital where the cases were admitted. Further laboratory investigations including confirmatory tests were carried out in the laboratories of National Institute of Communicable Diseases (NICD) New Delhi. Results are shown in (table 1).

Table-1Results of laboratory investigations for diagnosis of Plague in Hatkoti village

Name	Age/ Sex	Bacteriological	Molecular	Serological	Case classification as per WHO definition
Randhir	35M	-	-	-	Suspected
Sulochana	29F	No organism grown	Confirmed	Single sample positive	Probable
Naveen	26M	Y.pestis confirmed	Confirmed	Negative	Confirmed
Anu	31F	Y.pestis confirmed	Confirmed		Confirmed
Jyoti	27F	-	--	Negative	Probable
Rakesh	35M	-	-	Negative	Probable
Pradeep	35M	-	-	Negative	Probable
Stya Devi	38F	-	-	>4-fold rise	Confirmed
Purshottam	36M	-	-	Same titer in paired sera	Probable
Krishna	37F	-	-	>4-fold rise	Confirmed
Pushpa	40F	Y.pestis confirmed	Confirmed	Negative	Confirmed
Asha Devi	57F	Y.pestis confirmed	Negative	>4-fold rise	Confirmed
Damayanti	46F	-	-	>4-fold rise	Confirmed
Hapinder	22M	-	-	>4-fold rise	Confirmed
Bankru	60M	-	-	>4-fold rise	Confirmed
Kesarmani	47F	-	-	Negative	Probable

Source Directorate of health services Himachal Pradesh

Preventive and Control measures:

Once the disease was suspected to be plague by the local Health Officials, the state health authorities were informed about the outbreak, and the government came into action to control the outbreak. Surveillance reporting units were established in 84 health institutions of the area. A senior medical officer of the district was made responsible to report the cases and to carry out control measures. Following steps were taken

Immediate:

5. All cases were admitted to designated hospitals (isolated) and treated with antibiotics and supportive therapy.

6. Use of protective gear advised to all relatives, health professionals, attending the cases in the form of facemask, gloves, head caps and gown.
7. Quarantine of affected villages to prevent migration and there by prevent spread of the disease.
8. Epidemiological investigations were initiated and NICD teams were supported after their arrival in the affected area.

During:

6. Chemoprophylaxis was provided to all the possible contacts of cases in the family, neighborhoods and other people in the affected area in the form of Ciprofloxacine tablets, Doxycycline capsules, Septaran Tablets and Septran syrups. A total of 24215 were given prophylaxis's from 12-2-2002 to 26-2-2002
7. Workers went door to door to find out new cases, educate the community and to provide chemoprophylaxis.
8. Fumigation of residence of index case and the vehicles used to transport the cases was undertaken
9. A massive IEC camp was started in the district to make the people aware of the symptoms of plague and seek treatment, and to ensure community participation by means of mass-media dissemination of correct information
10. Guidelines for safe disposal of dead bodies were framed and advised to be followed.

Long Term:

3. District Shimla was included under the National Surveillance Programme for Communicable Diseases from 2002-2003
4. The state Government proposed to establish a plague surveillance unit in district Shimla under the guidance and training of NICD.

Present Review:

During the outbreak of Plague I was undergoing the first contact session for MAE- FETP course at National Institute of Epidemiology Chennai. It was suggested to me by Director National Institute of Epidemiology Chennai to conduct a retrospective review of the Hatkoti Plague outbreak. I conducted the review during my first field placement at district Shimla during June 2002.

Objective:

The objective of the present review was to characterize the outbreak of Plague illness at Hatkoti village district Shimla:

Methods:

The outbreak of Plague illness occurred at Gallu hamlet of village Hatkoti that is in North East to the District Shimla Himachal Pradesh. The distance is 120 Km from the district head quarter. The total population of the village is 90 and there are 28 houses. The house of the index case Mr. Randhir Singh Sautta is situated in Gallu hamlet having three houses and two families, having a population of 7 & 4 persons respectively. Socio-economic status of the people is average with Horticulture and Agriculture as there main occupation. The people are living in double story building and the houses are built of cement & bricks with wooden floor and false ceiling of wood and roof of tin sheets.

Procedure:

I discussed about the Plague outbreak with the members of Indira Gandhi Medical College team, Members of the team from District hospital Shimla, Health officials at Rohru, Block Medical Officer Jubbal & Kothkhai, Medical Officer Incharge Primary Health Center Sarswati Nagar and Medical Officer Incharge Civil Hospital Jubbal. I want to Gallu village and talked to the family members of the deceased index case. I reviewed the investigation

reports and medical records of the survivors at Indira Gandhi Medical College Shimla and Civil hospital Rohru.

Case Definition:

The investigators: Directorate of Health Services, Government of Himachal Pradesh, Indira Gandhi Medical College Shimla ,Post Graduate Institute of Medical education and Research Chandigarh ,National Institute of Communicable Diseases New Delhi used the following working case definition during their investigations:

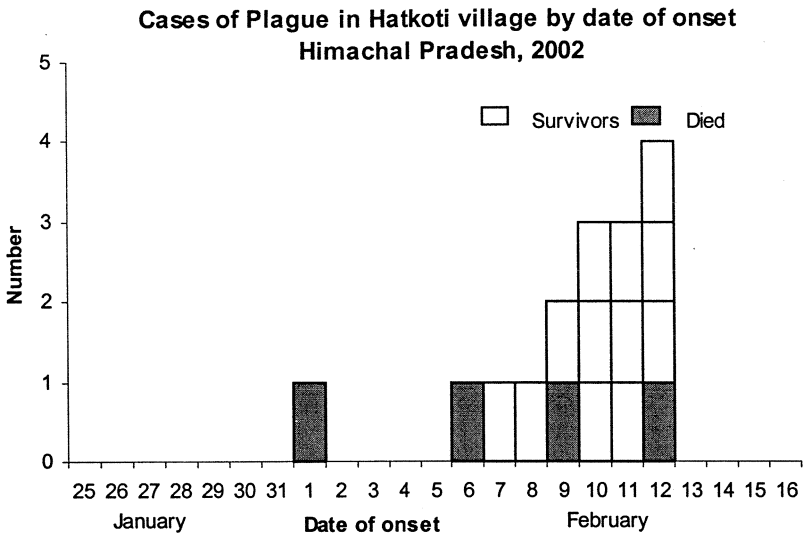
"Any resident of District Shimla presenting with fever of rapid onset, chills, with cough chest pain, breathlessness, headache, prostration and haeomptysis from 1st of February to 14th of February" or "having a history off coming in contact of such case or had gone to Gallu hamlet to attend the funeral ceremony".

Results:

Descriptive Epidemiology:

A total of 16 cases of acute febrile illnesses with haemoptysis have been reported at CH Rohru; IGMC Shimla & PGI Chandigarh. Of these a total of 4 cases died, between 5th and 18th of February2002.Out of the 16 cases, 14 belong to one family. Family tree of the index case is given as (annexure-2). Only two patients had acquired the infection from the hospital. After 12th February 2002 no case was reported from that area. All cases were adults with their age ranging from 22 to 60 years. Seven were males and nine were females. These sixteen cases of Plague were from different villages of district Shimla. The Epi-curve for the pneumonic plague outbreak is shown in figure-2

Figure-2



Exact source of outbreak to the index case is not clear.

Randhir Singh Sauhta, 35 year male resident of Gallu hamlet had gone to his father-in-law's house at Kalvi on 21st January. On 25th of January along with his brother in law Purshotam, he went to Kalvi - Mural forest area situated near Kalvi village for hunting & stayed there for six nights. He came back to Hatkoti on 31st of January2002.On 1st of February 2002 he developed fever headache, & chest pain & took treatment from a local doctor practicing indigenous system of medicine. On 3-02-2002 he had haemoptysis & visited Jubbal civil hospital where he was radiologically diagnosed as a case of pneumonia & given oral Augmentin tablet as an OPD patient. On 4-02-2002 he came to CH Rohru with symptoms, of respiratory distress & haemoptysis & got admitted. X - Ray chest done in the civil hospital Rohru showed massive consolidation of the right lung. However his condition deteriorated further & he expired after few hours of admission on 5-02-2002 and was cremated on the same day.

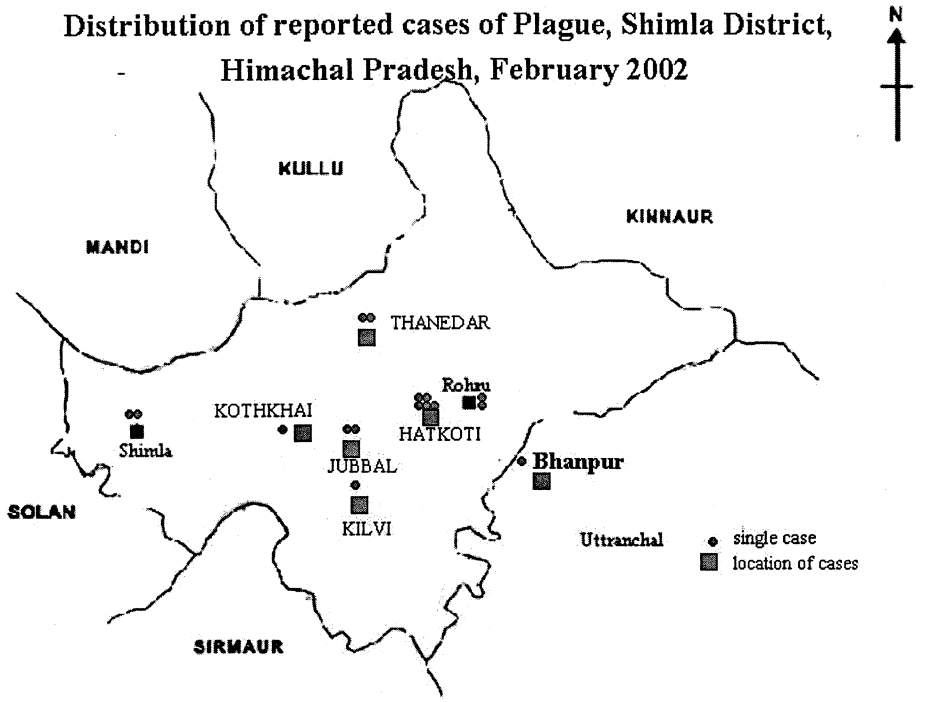
Salochana wife of Mr. Randhir developed similar illness on 6th and was brought to Civil Hospital Rohru with similar symptoms on February 8th. X –ray chest showed lobar pneumonia in the right lung. She was referred to Post Graduate Institute of Education and Medical Research Chandigarh where she was admitted on 9th February, and died on

February 14th .On the same day Hapinder a cousin of Randhir was admitted to Rohru Hospital with similar symptoms. Another Sauhta's kin Pushpa, who was visiting Randhir's family from Banpur district Dehradun Uttaranchal, was brought to Rohru on 10-02-2002 where she died on 14-02-2002. Similar type of illness was reported among other family members & relatives of Randhir (who attended his funeral & also visited his family) on 11th &12th of February 2002.

In the family of index case there were seven persons. In addition to the index case, his wife and brother were affected. Two of the four persons in the neighbor family were also affected. Thus there was a secondary attack rate of 40% (4/10) in the affected hamlet. Nine more persons who were related to index case were also affected. These relatives of the index case came from different villages of District Shimla. One of the relative belonged to Banpur village District Dheradun of Uttaranchal State. The line listing of the affected persons is given as (annexure –1)

Two patients namely Kesarmani and Bhankhru were affected in Civil Hospital, Rohru. Kesarmani was admitted to this hospital on 3rd February for treatment of Status Epilepticus .Her husband Bhankru was staying in the hospital as her attendant. They were probably exposed to Sulochna when she was admitted to civil hospital Rohru before being referred to Post Graduate Institute of Education and Medical Research Chandigarh. The distribution of cases by different places is shown in (Figuer-3)

Figuer-3



Clinical Features:

All cases presented with fever of rapid onset, chills, cough, chest pain, breathlessness, headache, prostration and haeomptysis. The illness was compatible with pneumonic Plague. The incubation period ranged from 4-7 days

Entomological observations:

A total of 15 rodent traps were laid in village Hatkoti. Only 2(13%) traps were found positive. Rodent's trapped included one Rattus rattus and one Mus musculus. No flea was retrieved.

Laboratory investigations:

Of all the 16 cases Index case was suspected one, 6 were probable, and 9 were confirmed cases of Pneumonic Plague as per WHO Plague classification of cases. Off the 9 confirmed cases1 was both serologically and Bacteriologically confirmed, 5 were Serologically confirmed and 3 were Bacteriologically confirmed (Table-2). These findings confirmed the outbreak to be that off Pneumonic Plague outbreak.

Table-2 **Case classification as per WHO definition**

Name	Age/Sex	Case classification as per WHO definition
Randhir	35M	Suspected
Sulochana	29F	Probable
Naveen	26M	**Confirmed**
Anu	31F	**Confirmed**
Jyoti	27F	Probable
Rakesh	35M	Probable
Pradeep	35M	Probable
Stya Devi	38F	**Confirmed**
Purshottam	36M	Probable
Krishna	37F	**Confirmed**
Pushpa	40F	**Confirmed**
Asha Devi	57F	**Confirmed**
Damayanti	46F	**Confirmed**
Hapinder	22M	**Confirmed**
Bankru	60M	**Confirmed**
Kesarmani	47F	Probable

Source Directorate of health services Himachal Pradesh

They concluded by saying that the clinico-epidemiological findings and laboratory tests (bacteriological, serological and molecular investigations performed as per the WHO criteria: Direct Smear, Fluorescent Antibody Test, Biochemical tests, PCR and Bacteriophage lysis test) have confirmed this localized outbreak to be "Pneumonic plague" caused by ***Y.pestis***.

Discussion:

Plague, the disease caused by the bacteria ***Y.pestis***, has a remarkable place in history. For centuries, plague represented disaster for those living in Asia, Africa and Europe. In AD 541, the first great plague pandemic began in Egypt and swept over the world in the next four years. Population losses attributable to plague during those years were between 50 and 60 percent of the total population. In 1346, the second plague pandemic, also known as the Black Death or the Great Pestilence, erupted and within 5 years had ravaged the Middle East and killed more than 13 million in China and 20-30 million in Europe that was about one third of the European population. The third Pandemic began in Canton Hong Kong in 1894 and spread rapidly to many countries by rats abroad the ships. Million of people died during the third Pandemic; an estimated 12.5 million in India alone were dead from 1898 to 1948

Over the Years Plague outbreaks have been reported from various states of India i.e. Gujarat, Tamil Nadu, Andhra Pradesh, Maharashtra, Karnataka Bihar, Uttar Pradesh, and Himachal Pradesh. Recent outbreak of Plague in 1994 at Surat Gujarat is a well-documented one. But over the years general decrease in the incidence of human plague has been reported from erstwhile endemic localities in India during the last four decades. (Table-3)

Table-3 Plague in India till 2002

Period	Deaths due to Plague
1898-1908	6032693
1909-1918	4221529
1919-1928	1762718
1929-1938	422880
1939-1948	368596
1949-1958	59059
1959-1966	211
1994	54
1995-2001	Nil
2002	4

Source :Nath(1998)

Himachal Pradesh has been known Endemic for Plague. Plague outbreaks have been at intervals in the state in the last four decades. In the year 1983 in the month of August-September an outbreak similar to the Pneumonic Plague had occurred when the index case after handling wild rat developed pulmonary infection .A well defined chain of inter human transmission of the disease ultimately involving 23 cases and 18 deaths occured. How ever this outbreak of Pneumonic Plague could not be confirmed because of lack of adequate laboratory facilities during that time. But a surveillance unit for Plague was established in Directorate of Health Services Himachal Pradesh than. Plague activity had been undergoing in Tehsil Rorhru of District Shimla since1959 as per the records available at the directorate of health services. Table-4

Table-4 Plague activity in Tehsil Rohru District Shimla Himachal Pradesh from1959-1983

Year	Place	Total Cases	Deaths	Rat fall
1959 (Sep-Oct)	Chendruwadi	13	5	Yes
1966 (Nov-Dec)	Lurot	8	5	Information not available
1969	Gajaiani	Details are not available		Yes
1971	Duedi	Details are not available	2	Yes
1983 (Aug-Sep)	Chairgaon	23	18	No

Source Directorate of Health Service's Himachal Pradesh

In the present outbreak which occurred at hamlet Gallu village Hatkoti there were unusual number of cases which were linked in time place and person in other words epidemiologically with high attack rate concentrated in the family of the deceased occurred in a very short span of time. It confirmed that this was an outbreak. The clinical, epidemiological and laboratory investigation confirmed the outbreak due to pneumonic plague. These cases were related to each other and to the index case. They had a common exposure either to the index case or to his wife. Two cases were hospital infected which were probably exposed to Sulochna wife of the index case when she was admitted to the hospital.

The epidemiological linkage in this outbreak was in terms of clustering in a family. There common attendance at the funeral ceremony of the deceased index case Mr. Randhir Singh.Age group of 22 to 60 were affected and both sexes were affected. Clinical presentation was that of severe Pneumonia.

It is suspected that the animal hunted by Randhir was infected with Plague bacillus *Yersina Pesttis* or fleas. There was heavy snowfall in the area & Randhir stayed indoor most of the

time. While this proved tragic for his family, but it prevented the disease from spreading to his neighbors. Since he died before plague was suspected and investigation began, it is not clear how the index case was exactly infected.

Entomological investigations did not provide any evidence of plague activity among rodents and animals in the Gallu hamlet or surroundings of Hatkoti village.

This Plague episode brings out issues related to surveillance system of Himachal Pradesh particularly to district Shimla where Plague has been endemic. Though a surveillance unit had been started for Plague after a plague like illness in 1983 but it had become defunct over the years. Though the State Directorate of Health Services and the district authorities responded effectively in containg the outbreak and prevented its spread to other areas of the district and state but preparedness at the peripheral was not satisfactory. Although the index case occurred on 1st of February 2002,the response initiated was on 11th of February. By this time 12 cases out of the total 16 cases had occurred and only death had occurred. As the area was known for plague endemicity and had the plague surveillance system functioning this morbidity and mortality could have been avoided.

Hence it is suggested; as the area is known for Plague endemicity the health officials may be oriented for identification of Plague cases. Setting up of appropriate laboratory in the area may provide prompt facilities for diagnosis of Plague bacilli. The Plague unit may be made functional with appropriate trained staff. Intersectoral co-ordination may be done with department like animal husbandry and forest department. So there is a need for continuous Plague surveillance activity in the area to prevent further morbidity and mortality due to Plague.

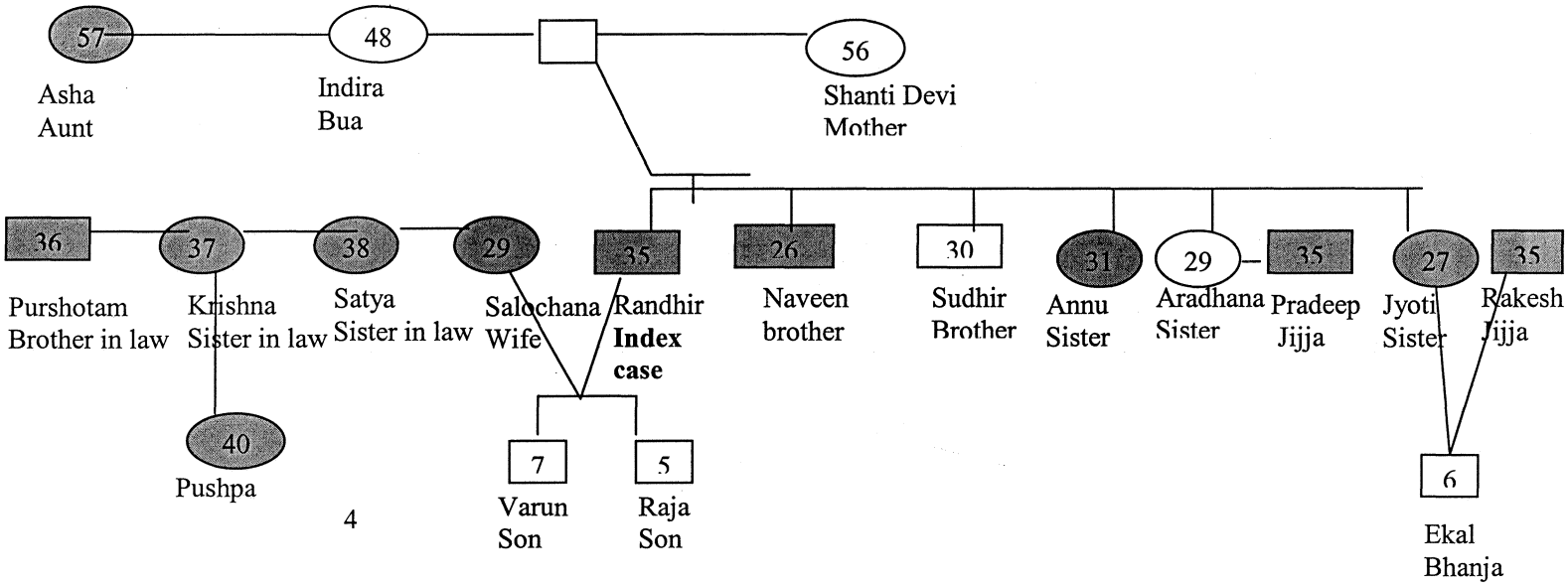
Annexuer-1

Epidemiological characteristics of Plague cases (Hatkoti outbreak)

Sr-No	Name	Age/ Sex	Address	Relation to index case	Date of onset of symptoms	Date of hospitalization	Outcome	Date of death/discharge
1	Randhir	35M	Hatkoti	Self	2nd Feb	4th CH R	Died	5th Feb
2	Sulochana	29F	Hatkoti	Wife	6th Feb	9th PGI	Died	14th Feb
3	Naveen	26M	Hatkoti	Brother	7th Feb	12th PGI	Cured	8th March
4	Anu	31F	Mandali/Shimla	Sister	9th Feb	12th PGI	Died	18th Feb
5	Jyoti	27F	Thanadhar	Sister	12th Feb	13th PGI	Cured	25th Feb
6	Rakesh	35M	Thanadhar	Husband of Jyoti	12th Feb	13th PGI	Cured	8th March
7	Pradeep	35M	Darkoti(Kothkhai)	Husband of Aradhana (sister)	10th Feb	13th PGI	Cured	21st Feb
8	Stya Devi	38F	Guntu/Jubbal	Sister of Sulochana	9th Feb	12th PGI	Cured	25th Feb
9	Purshottam	36M	Kalvi	Brother of Sulochana	10th Feb	12th PGI	Cured	28th Feb
10	Krishna	37F	Chandanpur Jubbal	Sister of Sulochna	12th Feb	13th CHR	Cured	11th March
11	Pushpa	40F	Bhanpur(Uttranchal)	Jethani of Krishna	12th Feb	14th CHR	Died	14th Feb
12	Asha Devi	57F	Shimla	Aunt(Bua)	10th Feb	11th IGMC	Cured	4th March
13	Damayanti	46F	Hatkoti	Neighbor	11th Feb	14th CHR	Cured	27th Feb
14	Hapinder	22M	Hatkoti	Son of Damyanti	8th Feb	14th CHR	Cured	27th Feb
15	Bankru	60M	Vill-Shaikhal Teh-Jubbal	Husband of Kesarmani	11th Feb	14th CHR	Cured	11th March
16	Kesarmani	47F	Vill-Shaikhal Teh-Jubbal	Wife of Bankru	11th Feb	14th CHR	Cured	8th July 2002

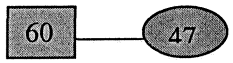
CHR=Civil hospital Rohru, **IGMC**=Indira Gandhi Medical College,**PGI**=Post Graduate Institute Chandigarh

Annexuer-2 FAMILY TREE
OF IDEX CASE



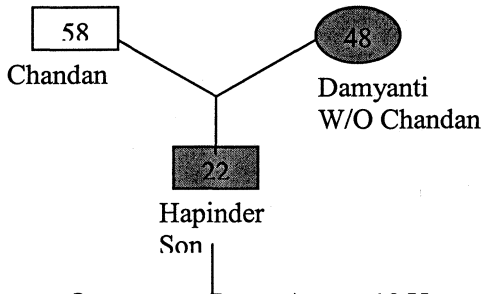
4

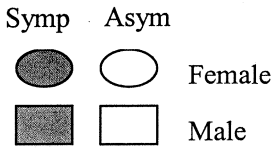
Family Tree of Hospital Infection



Bankru Kesarmani W/O Bankru

Family Tree of Neighbour





SECTION: 4

CRITIQUING AND REVIEW OF

SCIENTIFIC LITERATURE

JOURNAL CRITIQUING:

4.1 Zinc supplementation in young children with acute diarrhea in India

(The New England journal of medicineVolume 333, dated 28th September 1995)

Authors: Sunil Sazawal, RobertE.Black, MaharajK.Bhan, NitaBhandri, Anju Sinha, and Sanju Jalla

Introduction:

In order to practice evidenced based medicine reading of journals is required to update ones knowledge. But in today's sphere enormous amount of journals and journal articles are available. In order to select the appropriate article knowledge of critical reviewing is essential. More ever in the field of research for a researcher to have a clear understanding and to plan his activity accordingly knowledge of critiquing is essential to improve ones skill and potentials and get the optimum results.

Objectives

To critically review the given article

Methodology

By using the checklist of questions the papers have been reviewed.

Abstract

Objective: To evaluate the effects of daily supplementation with 20 mg of elemental zinc on the duration and severity of acute diarrhoea.

Design: Double blind, randomized, control trial

Setting: Kalkaji neighborhood of New Delhi, India

Participants: 937 children of 6- 35 months of age with diarrhoeal episodes.

Results: Among the children who received zinc supplementation, there was a 23 percent reduction (95 percent confidence interval, 12 – 32 percent) in the risk of continued diarrhea. Estimates of the likelihood of recovery according to the day of zinc supplementation revealed a 7% (95 % CI, -9 to +22%) in the risk of continued diarrhoea during days 1 to 3 and a reduction of 38%(95% CI, 25- 48%) after day 3.When zinc supplementation was

initiated within 3 days of the onset of diarrhoea, there was a 39% reduction (95%CI, 7-61%) in the proportion of episodes lasting more than 7 days. In the zinc supplementation group, there was a decrease of 39%(95% CI, 6-70%) in the mean number of watery stools per day (P= 0.02) and a decrease of 21%(955 CI, 10-31%) in the no. of days with watery diarrhoea. The reduction in the duration and severity of diarrhoea were greater in children with stunted growth than in those with normal growth.

Conclusions: For infants and young children with acute diarrhoea, zinc supplementation results in clinically important reductions in the duration and severity of diarrhoea.

The abstract is structured one and informative. The length of the abstract is 302 words, which are with in standard limits of international journal. Result section uses appropriate numbers and statistical tests. Section is interesting enough to capture the reader's interest but details of study subjects are not given. The study is important and worth knowing about as diarrhoeal diseases are very common in developing countries, including India. It effects infants and young children, more in those with malnutrition and impaired immune statue (by increasing its duration and severity) both of which factors may be associated with zinc deficiency. Therefore it would be helpful to know how zinc supplementation affects young children and infants with diarrhea

Introduction

Diarrhea is consistently found in children with zinc deficiency. Zinc deficiency can result in growth retardation, especially stunting and impairment of immune function. Introduction expresses the hypothesis that zinc deficiency is a link between these risk factors and the duration of diarrhea and supplementation of zinc helps in responding to diarrhea quickly. The literature review establishes a clear need for the study and catches the interest of the hypothetical reader. Need for the present study – supplementation of zinc in children with diarrhoea in addition to oral rehydration and normal diet has been made. Introduction begins at an appropriate level nor to general nor to specific.The purpose of the study is stated clearly. Diarrhea leads to excess zinc loss, which is associated with the immune status and stunted growth of the child therefore, the study is needed.

Methodology:

A double blinded, randomized control trial was conducted at Klakaji neighborhood of New Delhi between September 1992 and November 1994. A special diarrhea clinic was operated at the study area and children meeting the inclusion criteria that were well defined were recruited in the study. Inclusion criteria were children of 6- 35-month age group who were reported to have passed at least four unformed stools in the previous 24 hours, who had diarrhoea for less than seven days and who were permanent residents of Kalkaji.

Exclusion criteria were children who presented to the clinic a second time, those who were judged by the physician to have malnutrition requiring hospitalisation, and those whose parents denied consent. Zinc supplementation. Baseline assessment including a detailed physical examination was performed on each patient and their methods of examination and definitions of the operational variables were well described.

The methods of study participants recruitment were clearly stated and the total number of participants were 947 – 462 to zinc supplementation and 485 to control group. The cases and controls were stratified into 4 groups A1, A2, A3 and A4, based on the presence of wasting and stunting for weight for length or for length for weight for age respectively and the presence of breast feeding. The patients were randomly assigned to the treatment groups. The intervention that was given to the 'cases' was a preparation containing zinc gluconate (20mg of elemental zinc) and a multivitamin preparation to the 'controls' containing Vitamin A (1600 units), B_1 (1.2mg), B_2 (1.0mg), B_6 (1.0mg), D_3 (200IU) and E (6mg) and Niacinamide (20mg) in each 10 ml. solution.

Each enrolled child was visited at home by a trained field worker every 5^{th}. Day and information for each of the previous 5 days including the number and consistency of stools was recorded. Compliance was checked by other workers who visited to assess the child's condition and by study supervisors. Mothers were asked to contact the study physician at the clinic if they felt that their children were sick between the visits. Packets of ORSD were provided and mothers were advised about treating the child's diarrhea. Parents were also given a card to show to any non-study health worker stating that the child should not be

given any additional vitamin or mineral preparation. Children who had dysentery or who had diarrhea for 10 days or more after enrollment were given antibiotics.

Methods for tackling non-respondents / compliance at these follow up visits was not mentioned although the instructions that was given to the mothers was summarized. The uniformity of treatment at home by mothers in giving ORS, normal foods or in following the instructions that was given was not stated, but these factors are also important for improved health as well as for standardization. Methods for controlling measurement bias were not stated. Reasons for discontinuation in the study by some participants were mentioned and were satisfactory.

The statistical analyses were described fully and are appropriate given the study design, objectives and hypothesis. Relative risks and 95%CI were estimated by Taylor series method. Total duration of episodes was modeled with Cox survival regression with a time dependent covariate. A second model that allowed the effect of supplementation to change between days 1 through 3 and day 4 or later, after the beginning of supplementation was fitted with two time- dependent variables. Finally, a logistic regression model was used for the duration of diarrhea (>7 days vs. < or equal to 7 days) from the time of enrollment as the dependent variable.

It has been mentioned in the introduction section that zinc supplementation was given to those children who had more than 7% dehydration as clinically assessed and later on referred to AIIMS for rehydration. Though mention has been made that children with mild or no dehydration were advised to have 50 ml of oral rehydration solution per kilogram of body weight at home, it is not mentioned clearly whether they were given supplementation or not.

Ethical committee approval was got from the AIIMS, John Hopkins School of Public Health, and WHO. Written consent was obtained from the parent's of each enrolled child after reading the consent form.

Baseline assessment: Detailed physical examination of the child was done before enrollment in the study. Weight and heights were measured by adopting standard procedures. For children < 24 months of age length was taken. Stunting and wasting was defined adequately.

For estimation of zinc level in the blood venous blood was collected from each child and analysis were done using standard methods. Randomisation was done with permuted blocks of 10 and the children were categorised into 4 categories: those with a z score of 2 or greater for weight for length who were partially or exclusively breast fed (stratum A1), those with z scores below 2 who were breast fed (stratum A2), those z scores below 2 or greater who were not breast fed (A3), those with z score below –2 who were not breast fed (A4). Both the liquid preparations were made by Sandoz, India (Bombay). Each daily 10 ml dose contained vitamin A (1600 units), B_1 (1.2 mg), B_2 (1.0 mg), B_6 (1.0 mg), D_3 (200 IU), and E (6mg) and niacinamide (20 mg). The zinc preparation had zinc gluconate (20 mg of elemental zinc). Intervention strategy was well designed and monitoring and supervision was inbuilt in the study design. For control of bias and ensuring randomization the solutions were identical in taste and colour. The code was kept by WHO personnel and was not available till the end of the study.

Analysis

Statistical analysis was done using standard computer software packages SPSSPC+ (version 6.0), Epi info (version 6.0) and SAS (version 6.08). Relative risks and CI were estimated by Taylor series method.

We can conclude that the investigator ensured internal validity in the study.

Results:

The results have been presented under four-sub heading. They are duration of episode of diarrhea, persistent and severity of diarrhea, analysis of subgroups and adverse reaction. Presentation of the data is in tabular form. Out of total 931 episodes of diarrhoea, 44.4% resolved within 3 days after enrollment and 83.5% resolved by day 7.Supplementation with zinc was associated with 25% reduction among stunted growth, and for those who had low plasma zinc concentrations, it was by 27%. Using Kaplan- Meier curves, the relative risk of continued diarrhea in the supplementation group as compared with the control group was 0.93 (95% CI, 0.78 to 1.09) during days 1,2,and 3 of supplementation and 0.62 (95% CI, 0.52 to 0.73) after day 3.Using logistic regression model, the OR for diarrhea lasting more

than 7 days was 0.79 with zinc supplementation (95% CI, 0.64 to 0.96). The OR was 0.74 (95% CI, 0.57 to 0.95) when the model was restricted to children enrolled by day 3 of the episode of diarrhea. The overall finding of the study in the reduction of the mean number of watery stool per day in supplementation group was 39% (95% CI, 6- 70 %) (P= 0.002). There was 21% reduction (95% CI, 10- 31 %)in the number of days with watery stool. The effect of zinc on the number of days with watery stools was greater in children with stunted growth than with the normal growth, RR 0.59 (95% CI, 0.48 to 0.73) and RR 0.95 (95% CI, 0.79- 1.15) respectively.

The analysis is very much focused on the stated objectives- it quantifies the importance of zinc supplementation in children with diarrhoea.

Discussion:

The investigator have highlighted the positive findings of the result section and also discussed the limitations. The hypothesis made in introduction is well supported in the discussion part. In general the description and discussion of the importance of zinc supplementation in normal, stunted growth children with diarrhoea and those having low plasma zinc concentration is quite adequate. The investigator has mentioned about the earlier studies in which no significant results were found to support the theory of adding zinc to children with diarrhea but the limitations and strength of these studies has not been discussed in the present study. The investigator recommends for further studies in the developing countries before any policy change.

4.2 Cross sectional, community based study of care of newborn infants in Nepal

Authors

David Orsin and the team

Introduction:

In order to practice evidenced based medicine reading of journals is required to update ones knowledge. But in today's sphere enormous amount of journals and journal articles are available. In order to select the appropriate article knowledge of critical reviewing is essential. More ever in the field of research for a researcher to have a clear understanding and to plan his activity accordingly knowledge of critiquing is essential to improve ones skill and potentials and get the optimum results.

Objectives

To critically review the given article

Methodology

By using the checklist of questions the papers have been reviewed.

Abstract

Objective: To determine home based newborn care practices in rural Nepal in order to inform strategies to improve neonatal outcome

Design: Cross sectional, retrospective study using structured interviews

Setting: Makwanpur district, Nepal

Participants: 5411 married women aged 15 to 49 years who had given birth to a live baby in the past year

Main outcome measures: Attendance at delivery, hygiene, thermal care and early feeding practices

Results: 4893 (90 %) women gave birth at home. Attendance at delivery by skilled government health workers was low (334, 6%) as was attendance by traditional birth attendants (267, 5%). Only 461(8%) women had used a clean home delivery kit and about half of attendants had washed their hands. Only 3482(64%) newborn infants had been wrapped within half an hour of delivery and 4992(92%) had been bathed within the first

hour.5362 (99%) were breast fed, 4939(91%) within six hours of birth. Practices with respect to the colostrums and pre-lacteals were not a cause for anxiety.

Conclusions: Health promotion interventions most likely to improve newborn health in this setting include increasing attendance at delivery by skilled birth attendants, improving information for families about basic perinatal care, promotion of clean delivery practices, early cord cutting and wrapping of the baby and avoidance of early bathing

The abstract is structured in form and informative summarizing the key information's. Objectives of the study are clearly stated. It catches the reader's interest and can be understood without referring to the text of the study. Appropriate numbers have used. The length of the abstract is 251 words. The title of the study is not self explanatory as stated in the objective of the study and the research hypothesis is not clear. The study is important and worth knowing as neonatal mortality accounts for major part of infant mortality in the developing countries and appropriate strategies need to be developed to prevent these infants from dying.

Introduction:

The introduction begins at an appropriate level describing the problem statement of existing practice of newborn care in rural Nepal. It explains the WHO guidelines for newborn care and the need for such a study to understand the existing practices to form the hypothesis. Background description of Nepal is well-given and brief description of the health facilities and infrastructure has also been. It creates appropriate expectations about the study topic. The research question is clearly stated and need for the study justified as Nepal is having high neonatal mortality rate and high domiciliary deliveries.

Methodology:

It is a cross sectional retrospective study conducted at Makwanpur district Nepal. Closed cohorts of married women in the reproductive age group of 15-45 years completed on June 2000 were selected for the study. Each women of the cohort were allotted a unique identification number and visited by the field team to complete an individual questionnaire including questions about newborn care during any preceding birth. Data was collected between March and November 2001 by 44 field supervisors supported by nine coordinators

and one senior officer. The questionnaire was developed over 18 months through 11 cycles of piloting, evaluation and repeat piloting. Quality control of questionnaire administration was present as the supervisory team members observed a tenth of the interviews. Data was analyzed by using Microsoft SQL server7.0.

The study design used is a cross sectional retrospective which is appropriate for this study. The study design is described by appropriate numbers and creates interest in reader. The events have been described adequately. The sampling methods have been well described but the intended generalization of the study to rural women of Nepal is not appropriate as the results could be limited to Tamangs, which constitutes the majority i.e. 68% of the study group, and Artisanal, which constitutes 10% of the cohort.

Results: Results are stated clearly and subsequent inferences are drawn with respect to these findings in a logical manner. The data have been presented in four tables for the four different variables. The result sections have been subdivided in to five-subheading i.e. skilled attendance at delivery, cleanliness and hygienic practices at childbirth, thermal control, breastfeeding and Ethnic group comparison.

Place of delivery

Home delivery (inside, or in the court yard)	- 90%
District hospital	- 5%

Attendance at delivery

No attendant (alone)	- 11%
Family member or neighbour	- 78%
Mother-in-law	- 40%
Skilled attendance	- 6%
Semi-skilled	- <2%
Traditional birth attendants	- 5%

Cleanliness and hygiene practices

Hand washing of helpers	
Yes	- 55%
No	- 28%

Don't remember	- 14%

Use of clean home delivery kit

Used	- 8%
Recognised but hadn't used	– 12%
Did not recognize	- 80%

Instrument used for cutting the umbilical cord

Razor blade	- 56%(33% only clean blade)
Sickle or wood knife	- 36%

Dressing applied to umbilical stump

Nothing	- 73%
Oil	- 18%

Thermal control

Heating of birth place

None	- 22%
Before birth	- 10%
After birth	-52%
Throughout	-16%

Time of wrapping of the baby

<5 min	- 4%
<10 min	-12%
<30 min	-64%
<1 hour	-94%
<6 hours	100%

Time of bathing the baby

<15 min	-33%
<30 min	-72%
<1 hour	-92%
<6 hours	-99%

Breast feeding

Yes	-99%
First feed being breast milk	-85%

Within 1 hour of birth - 91%

Colostrum discarded - 45%

Foremilk discarded at every subsequent feed –69%

The analysis is focused on the stated objectives that are to quantify the rural delivery and newborn practices that are being adopted in the study area. The numbers and statistical rates are clearly mentioned. They were also aware of the potential bias like information bias. It had been taken care of by restricting to analysis by confining their analysis only to pregnancies that have occurred in the past one-year. The study shows consistency of their results with other qualitative research carried out in the same population.

Discussion and conclusion:

The research questions posed in the study is logically addressed like delivery site, who conducted the delivery, whether the five cleans were practiced are or not, maintain of warm chain. Breast-feeding practice and timings and pre-lactation practice are discussed adequately. The discussion with relevant result data is consistent with previous study but results are either same level, or more than the previous or less. The conclusion are justified based on the results and are generalized to the appropriate population like the married women in the child bearing age groups The shortcoming like recall bias have been admitted by the investigator are well taken care of by the researchers by including the pregnancies of last one year only. Consistencies with present knowledge has been discussed i.e. home birth 90%, attendance by government health staff 6%, trained birth attendants 55, and delivered alone 11%.

In the final paragraph of implications, statement has been made about some changes in delivery practices would be beneficial in terms of population attributable risk but it has not been quantified.

Moreover, no mention of neonatal deaths and their correlation to the delivery and newborn practices adopted in rural Nepal in this current cohort has been made any where in the paper. Without this particular detail and also the reasons for adopting these practices, we cannot

come to a conclusion of informing strategies to improve neonatal outcome in rural Nepal.

The shortcomings

1) The educational status, the economic status and the parity of the women and the availability of the health care facilities, other infrastructure facilities are not taken into consideration for analysis that may affect the results.
2) The potential confounders are multiparty and ages of the mother are not taken into consideration for analysis that may affect the results.
3) The compliance or non response rate are not taken into consideration for analysis
4) The other disadvantages of cross sectional study methods like analysis of cause and effect are analysis simultaneously, not able to calculate incidence rate and Non inclusion of those who have died because of the same cause or effect are applicable to this study also.

4.3 Risk factors for contralateral breast cancer in Chennai (Madras), India

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Accepted for publication in International Journal of Epidemiology:
20th January 1998

Introduction:

In order to practice evidenced based medicine reading of journals is required to update ones knowledge. But in today's sphere enormous amount of journals and journal articles are available. In order to select the appropriate article knowledge of critical reviewing is essential. More ever in the field of research for a researcher to have a clear understanding and to plan his activity accordingly knowledge of critiquing is essential to improve ones skill and potentials and get the optimum results.

Objectives

To critically review the given article

Methodology

By using the checklist of questions the papers have been reviewed.

Abstract:

The abstract has been described under four subheadings, i.e. background, methods, results and conclusion. Background is interesting as it starts with note that " This is the first cohort study conducted in India." The purpose of the study is clearly mentioned in the background i.e. to identify risk factors for contra-lateral breast cancer (CBC) among patients with first primary breast cancer. The method section describes the source of patient, the time period of study and place of study [Cancer Institute (WIA) in Chennai, India]. The follow up period was up to 31st December 1994 from 1960-1989. The risk of contralateral breast cancer (CBC) was assed among unilateral breast cancer (UBC) for patients who survived for >12 months following the diagnosis of breast cancer and did not develop a second cancer (n=2665) and patients who developed CBC >= 12 months after diagnosis of breast cancer (n=39). Results section describes the age adjusted incidence of CBC among women with

UBC was seven times the incidence (per single breast) in the general population. Among women with UBC the relative risk (RR) was 4.5 (95% CI: 1.1-19.6) comparing with those and without a history of a breast cancer in the mother, and 2.8 (95% CI: 1.2-6.7) comparing age at first birth 21-25 versus earlier. The RR was 0.3 (95% CI: 0.1-0.6) comparing those with and without hormone therapy for their UBC. Radiotherapy for the UBC had no significant effect on the incidence of CBC. Conclusion: Positive family history of breast cancer and later age at first childbirth emerged as stronger risk factor for CBC than UBC. Hormone therapy reduces the risk of CBC.

The abstract is a structured and informative. The title of the paper is precise with no dead words and specific. The text of abstract is limited to 233 numbers of words including the names of the authors. Conclusion clearly states that positive family history of breast cancer and late age at first childbirth are stronger risk factors for CBC than UBC and hormone therapy reduces the incidence of CBC. The study is worth knowing as the incidences of contralateral breast cancer are on the rise in India.

Introduction:

The background information has been described clearly, which inspires the reader to go further. It begins with a note that Breast cancer is the commonest cancer among females in developed countries. It is the second most common cancer among women in south India and most frequent among women in western India (Bombay). The age-standardised rates vary from 22 to 28 per 100,000 women years. Although the rates are lower to developed countries but are alarming for India. It states that the prompt treatment of Breast cancer increases the survival both in developed and developing countries.

The objective of the study were stated as:

1. To determine whether patients with first primary breast cancer are at an increased risk of developing CBC.
2. To identify and evaluate the risk factors associated with occurrence of CBC
3. To evaluate the carcinogenic effects of treatment administered for first primary cancer: radiation, chemotherapy and hormone therapy

Objectives are stated clearly but study hypothesis is not clear.

Material and methods:

It is a prospective cohort study and the study cohort were patients with carcinoma of breast as their first primary cancer diagnosed from 1960- 1989(n=3492) at the cancer Institute (WIA) in Chennai, India. They were followed up to 31st December 1994.The criteria followed for the exclusion from analysis was; those with three primaries (1), Sarcoma of breast as their first primary cancer (27), developed second cancer in sites other than in breast (40), developed CBC within the first year after initial breast cancer diagnosis (28), not completed at least one modality of treatment for the first primary breast cancer (194), and those with a single prime cancer who did not survive for <=12 months from the diagnosis of breast cancer(498).

In total 2704 number of patients were included for the analysis. The inclusion criteria were breast cancer patients who did not develop a second cancer during follow up (n=2665) and those who had CBC >= 12 months after the diagnosis of initial primary breast cancer (39).

As the study design is non-community based the selection bias cannot be ruled out. The sample size is adequate, as well as the follow up period which is 34 years. Exposed and non-exposed comes from the same population and are examined concurrently. The exposure has been defined and measured appropriately. The outcome is clearly defined though uniform guidelines were not available. The source of information about the disease was the hospital records which were maintained under supervision. Appropriate experts who were blind to subject exposure status did clinical and histological confirmation. The period of follow up was adequate.

Statistical analysis:

STATA software was used to calculate the women year at risk for all cohort. The period at risk was equal to the period from one year after the diagnosis of first primary breast cancer to date of diagnosis of CBC for those who developed a CBC following the first primary breast cancer and one year from the diagnosis of first primary breast cancer to the date of death or date last known to be alive for patients who are not known to have died, or 31 December 1994,which ever was earlier for those who did not develop a CBC.

External comparison: The age group specific incidence rates adjusted for world population were computed for both UBC in the general population of Chennai and CBC in the study

cohort. As the population based cancer registry in Chennai commenced from 1982 the cancer incidence data for the period before1982 was not available hence the average annual age specific rates adjusted for world population for the years 1982-1993 were used because there was no appreciable trend in the incidence rates of breast cancer in Chennai during the period 1982 - 1993.

Internal comparison: The risk of second primary within the cohort of patients with initial breast cancer was assessed for the known risk factors for breast cancer. Potential risk factors were grouped as social status, age at diagnosis of first primary breast cancer and reproductive variables. Rate ratio and their 95 % CI were calculated based on women years using STATA software. Attributable risk and population attributable risk were estimated for positive history of breast cancer in the family. The statistical analysis has been expressed in women year, univariate rate ratio, 95 % CI, and adjusted rate ratio

Result and Discussion:

The result section describes the cohort population, exclusion criteria from analysis and loss of follow-up among initial breast cancer patients. Synchronous (developed CBC with in one year following the diagnosis of initial breast cancer) and metachronous (developed CBC 12 months following the diagnosis of initial breast cancer) cancers in the contralateral breast represent 62 %(28/45) and 63 %(39/62) of all synchronous and metachronous second cancers seen in the cohort of initial breast cancer patients.

A seven fold risk per single breast (95% CI: 4.8-11.4) was seen among those who already had breast cancer and the risk appeared to be high among those who were <45 years of age compared to those >45 years at the time of CBC diagnosis. The data has been presented through eight tables. Table 1-5 illustrates risk factors like education level, age, religion, and positive family history, reproductive factors etc. Table 6 describes by year of diagnosis of first primary among patients with initial breast cancer diagnosed at the cancer institute, Madras in 1960-1989 and table 7 and 8 describes the effects of different cancer therapy in reducing the risk of CBC.

Discussion:

This is a hospital-based cohort study hence the results cannot be generalised. To avoid differential recall bias data on exposure information from the first primary breast cancer patients were collected at the institute by the oncologists. The oncologists at the cancer institute recorded all types of treatments, side effects and complications of treatment if any as part of the routine medical care. The treatment details checked by the first author did not show any lack of data or inadequate information regarding treatment details. The data was abstracted by two social scientists who were trained for the purpose. Data were collected in a prescribed form. About 10 % of the records were selected randomly and re-abstracted by the first author as a quality control measure. The treatment details for all patients and those who developed a second cancer or metastasis were checked by the first author.

Diagnosis: There were no uniform rules available to classify a second primary cancer from a metastasis to the contralateral breast. For the study four definite rules were followed to evaluate the second primaries. The longer the disease free interval the new lesion was a second primary rather than a metastasis. A pathologist / or a gynaecologist were consulted whenever there was difficulty in deciding weather the new lesion was a second primary or a metastasis. To minimise bias proportions of cases not histological confirmed were similar among both Unilateral Breast cancer and Contralateral Breast cancer. About 5% of the first primary breast cancer cases and 5%of CBC were not confirmed by histology. These cases were included in the study because they were cancer cases, confirmed clinically, and received cancer directed therapy. Strict patient registry and routine follow up methods were followed to maintain quality of information and to minimise possible biases

Detailed information on patient admitted for treatment and of their follow up was maintained by Cancer Registry at the Cancer Institute Chennai. This was done by periodic re-examination and correspondence with cancer patients. All treated cases irrespective of cancer site, were followed according to the institute's follow up procedure by the staffs of the Division of Epidemiology and cancer registry who were not aware of the study hypothesis. Follow up visits for breast cancer were schedule as, every 3 months for first 3

years, every 6 months from 3 to 5 years, every year between 5 and 10 years, Once in 2 years after 10 years

Risk evaluation:

In this study the incidence of metachronous contralateral breast cancer was 2.3 per 1000 women years. The wide variation (1-20%) in the reported incidence of bilateral breast cancer may be due to (1). Differences in the exclusion / inclusion criteria for computing the incidence rates, such as selection of high-risk group for monitoring, frequencies of simultaneous biopsy of the contralateral breast, inclusion of patients with *in situ* carcinoma or with only synchronous contralateral breast cancer or synchronous and metachronous contralateral breast cancer and especially differences in duration of follow up. (2) Lack of uniform guidelines to distinguish between second primary breast cancer and metastasis, which result in misclassification of the new lesion.

Age factors:

There was seven fold risk per single breast (95% CI: 4.8-11.4) seen among those who already had breast cancer and the risk appeared to be high among those who were <45 years of age compared to those>45 years at the time of CBC diagnosis. The finding was consistent with other studies done outside India.

It has been clearly depicted in table that the women years is highest among < 45 year age group having Risk ratio 20.2 with wide range of 95 % CI (11.8 –34.4).

Several studies have provided evidence that the risk of developing CBC associsated with family history of breast cancer is inversely related to age at diagnosis of first primary breast cancer. The risk of a contralateral breast cancer showed an exponential decrease with increasing age at diagnosis of first primary, which might be due to rapid exhaustion of a susceptible sub population. The current study of CBC shows a statistically significant threefold risk of developing CBC when the age at first childbirth was between 21and 25 years, which is excess to the risk associated with age at first childbirth and UBC. So far only three studies have been reported a non-significantly reduced effect of a later age at first childbirth for contralateral breast cancer. This finding was replicated in the present study. This was both seen among those who had first childbirth aged > 25 but also among

unmarried nulliparous women compared to those who had first childbirth before the age of 21. This reduced effect has not been seen in the literature for the initial breast cancer.

Family History:

The UBC patients with positive family history of cancer at any site had a 20 % (non significant) higher risk of developing contralateral breast cancer and risk was increased by 70% when their family members had breast cancer. A statistical significant fivefold risk of contralateral breast cancer was observed when the mother of unilateral breast cancer patient had breast cancer.

Reproductive factors:

The study shows that none of the women who had an initial menopause by bilateral oophorectomy with or without hysterectomy at initial breast cancer diagnosis developed contralateral breast cancer.

Effect of treatment of first primary breast cancer

1.Radiotherapy:

There was no significant increased risk of contralateral breast cancer after radiation for the initial breast cancer. In the present study the average age of women who had radiotherapy was 48 years. Hence the investigator had given the explanation that the higher age at exposures to radiotherapy might be one factor for not finding any risk following radiotherapy.

It have been demonstrated in several studies that radiogenic breast cancer is extremely rare among women who had undergone irradiation after 40 years of age.

2.Chemoherapy:

The study documents that women who received chemotherapy for the initial breast cancer showed a reduction risk of developing a contralateral breast cancer (decrease of risk in developing CBC is by 50 % with 95% CI 0.2 to 2.1). The finding of the current study is consistent with the findings of other studies

3. Use of Tamoxifen:

There was beneficial effect on the development of secondary breast cancer by the use of Tamoxifen. The findings are in consistent with other studies.

Summary findings of the present study:

There was seven fold risk per single breast (95% CI: 4.8-11.4) seen among those who already had breast cancer and the risk appeared to be high among those who were <45 years of age compared to those >45 years at the time of CBC diagnosis. In the present study the rate ratios with 95 % CI for CBC by educational level, income group, and religion among patients with initial breast cancer shows that the higher the education level the higher is the RR [illiterate 1.0, primary or middle school 2.3 with 95 %(CI 0.9 to 6.1, secondary school 2.2 with 95 % CI (0.8 – 5.7 and college 3.6 with 95 % CI 1.2 to 11.0]. Similarly higher income group have higher RR with wider 95 % C I. In high income group RR = 2.7 with 95 % C I, 1.2 –5.8. As per the religion Christians had higher RR (3.4) with 95 % CI, 1.6 –7.0 and Hindus have lowest RR (1). Positive family histories of breast cancer and late age at first childbirth have higher risk for contralateral breast cancer. The hormone therapy administered for first primary breast cancer reduces the risk of contralateral breast cancer significantly. Other risk factors like age at menarche, number of children, age at menopause, menopausal status, and radiotherapy treatment for development of primary breast cancer showed that their association with CBC was not significantly different from that observed for the first primary breast cancer.

Conclusion:

The study is important as incidences of primary breast cancer are increasing and there are chances of better survival because of the available interventions. This study showed a seven-fold increase risk in patients with initial breast cancer. Most of the Risk factors identified by the study are consistent with other studies. The positive findings regarding reducing incidence of CBC by medical intervention after first primary cancer is a great hope for patients with primary breast cancers.

LITERATURE REVIEW

4.1 Review of Literature 'Anemia In Urban And Rural School Girls Aged 12 –16 Years, Shimla - A Comparative Study'.

4.1 Introduction:

In the last two decades, the importance of anemia and iron deficiency as a public health problem has been recognised by health authorities and policy makers. Iron deficiency affects a significant part, and often a majority of the population in nearly every country in the world .The magnitude of the problem varies globally from 9% in Industarilised countries to 53% in non Industralised Countries[1]. The prevalence of anemia in developed countries is much less than that in developing countries and is mostly confined to women in general. The World Health Organisation (WHO) /World Bank supported analysis of the global burden of disease ranked iron deficiency anemia as the third leading cause of loss of disability adjusted life years (DALYs) for females aged 15-44 across the globe[2]. Using different but equally compelling criteria, United States Agency for International Development[2] produced a 1994 analysis estimating that in South Asia, a two third reduction in anemia would result in US$ 3.2 billion increase in agricultural production over the seven year period 1994-2000.

4.2 Historical Background:

Anemia was known to Ancient Greeks as muscular weakness. They recognised the benefits of iron salts to improve muscular weakness in injured war veterans. The weakened sufferers used to drink the water in which sword was rusted and hoped to assume some of the strength of this metal[3]. Anemia symptoms were identified by the term Chlorsis – a Greek term meaning green. In the 16th Century it was associated with a series of symptoms: pallor, fatigue, poor appetite and gastrointestinal, neurological, and menstrual disturbances, commonly found in adolescent girls. In the 18th Century blood was shown to contain iron, and from 1832 to 1843 Chlorosis[4] was noted to be associated with low levels of iron in the blood and a reduced number of red cells.

The merging of knowledge of the chemical composition of blood with the description of morphologic characteristics of red cells in health and disease was made possible by modern haematology. This has allowed significant advances in our understanding of the aetiology of anemia in modern times. Haemoglobin was discovered in the 19th Century by Hoppe-Seylers who showed that blood pigment was composed of haematin, which contained iron and protein. A means of estimating its concentration in blood by colour comparison to a standard was described by Gowers about 1880, and was followed quickly by more accurate methodology, i.e. Sahli hemoglobinometre, modification of which are still used today. Progress in understanding anemia was enhanced further around the 1890 when Hufner, Haldane, and Smith demonstrated stoichimetric relationships between haemoglobin and its iron content, iron, and oxygen, and haemoglobin and oxygen carrying capacity.

4.3 Epidemiology of Anemia:

4.3.1 Global:

Anemia[1] is a major public health problem world wide, particularly in women of reproductive age group of developing countries. Iron deficiency is believed to cause the largest part of anemia globally. About 2 billion Persons in the developing world suffer from iron deficiency anemia[5]. The trend in anemia among adult women in last two decades or so have deteriorated in all regions except South America, The Near East, and North Africa[6]. Among the school age children (5-14 years) the prevalence[5] has been estimated to be as high as 63% in South East Asia to 21% in Western Pacific as compared to industrialised countries where it ranges 5% in North America to 22% in Europe.

4.3.2 South East Asia Region:

According to 4th report of the world nutrition situation[6] 600 million people in the region are suffering from iron deficiency anemia, predominantly affecting adolescent girls, women of reproductive age and young children. The condition has a prevalence of 74% among pregnant women in the region with a wide range of 13.4% in Thailand to 87% in India.

4.3.3Indian scenario:

Anemia is a major nutritional deficiency disorder in India. Large population survey[7] in Rural India indicates that the prevalence of anemia ranges from 38% to 72% depending upon age and sex. In female child of 6-14 years it ranges from 55- 97% and in the age group of 15-22

it ranges between 63.7- 96.7% and these prevalence's are quite high. According to NFHS II[8], (1998-1999) prevalence of anemia among adolescents girls of age group 15-19 years was 56%. It was higher in the rural (53.9%) area than in the urban (45.7%) area. In Himachal Pradesh the prevalence of anemia was 43.2% in the age group of 15- 19 years with a similar prevalence of 38.5% in urban and 40.7% in rural area respectively.

Table 1. WHO *criteria for anemia diagnosis by estimation of Haemoglobin.

Age group	Haemoglobin (g/dl)
Children 6 months to 59 months	< 11g/dl
Children 5-11 years age	<11.5g/dl
Children 12-14 years age	<12g/dl
Pregnant women	< 11g/dl
Non pregnant women above 15 years of age	<12g/dl
Adult man	< 13g/dl

*Ref; [9]

Hence, anemia is a major public health problem with adverse consequences for women of reproductive age group and for children. Over 90% of the affected children live in developing countries. In infants and children it causes impaired physical and cognitive development[10]. In adults iron deficiency anemia is associated with weakness and fatigue, which reduces capacity for physical work and productivity[11]. In women of reproductive age group it can lead to low birth weight or pre-mature babies, perinatal and neonatal mortality, inadequate stores for the newborn and risk of maternal mortality and morbidity[10]. United Nations Administrative Committee on Coordination / Sub Committee on Nutrition[12], in 1991 documented that severe anemia may be a contributory factor in up to 50% of maternal deaths, and is the main cause of up to 20% of maternal death in developing countries. The most common causes of anemia are poor bioavailability of iron consumed, insufficient quantity of dietary iron intake, increased requirements at certain stages in life cycle, blood loss due to both menstruation and child birth and parasitic infestation most importantly Hookworm and to lesser extent *Schistosoma, Whiporm* and *Amoebiasis*[11].

4. 4 Anemia in adolescence:

4.4.1 Prevalence:

World Health Organisation (WHO) /United Nations Children's Emergency Fund (UNICEF) / United Nation University[13] (UNU) in 1993-documented that anemia is a public heath problem, not only among pregnant mothers, infants, and young children but also among school age children including adolescents. Growing children requires large amount of iron for continuous increase in body mass and are therefore vulnerable to iron deficiency and its consequences. At a meeting of the International Nutritional Anemia Consultative Group[14] at Durban in 1999, it was stated that school children aged 5-14 years must be recognized as a high-risk group because the percentage of anemic children is as high as that of pregnant women. As per WHO/UNICEF/UNU[13] over one third of the school population is anemic; the problem is most pronounced in South East Asia and Sub-Saharan Africa where anemia is linked to poverty.

4.4.2 Developed Countries:

Data from developed countries in America and Europe indicate a much lower prevalence of anemia among adolescent populations. In a Nationally representative cross sectional survey in United States[15] prevalence of anemia was found to be 2%-3% among adolescents girls aged 12 to 19 years. A study from England[16] documented that while overall prevalence of anemia among the adolescent girls was 20% it was 11% for Caucasian girls compared to 22-25% for Asian girls.

Jackson RT[17] and colleagues in a school-based study in Kuwait among adolescents girls documented the prevalence of anemia to be 30% as per WHO criteria.

4.4.3 Developing Countries:

Studies from developing countries indicate that the prevalence of anemia varies widely. Kurz[18] and colleagues documented in a multi-country study on the nutritional status of adolescents, anemia prevalence ranging from 32-55%. Cai Mq[19] documented 61.8% of prevalence of iron deficiency anemia among the adolescence Chinese girls. A study from Taiwan identified teenaged females at risk of iron deficiency anemia with the prevalence ranging from 9.38-26.4%. A nutritional survey conducted by Simon Tatala[20] and colleagues in 1992 at Lindi district of Tanzania documented the prevalence to be 66.8 among the school children with no difference between boys and girls.

4.4.4 India:

Studies conducted on adolescent girls in India have shown the prevalence of anemia ranging between 27% in rural Hyderabad[22] to 90.3% in rural area of Haryana[36].

In a multi-centric study done by National Nutrition Monitoring Bureau[21] Hyderabad in eight States of India covering eighty villages in each State in the year 2000-2001 the prevalence of anemia in adolescence girls in the age group of 12-14 years ranged from 53.7% in Tamilnadu to 90.1% in West Bengal. In the age group of 15- 17 years it ranged from 49.2 % in Kerala to 87.6 % in West Bengal (Table 2).

Table 2. Prevalence of Anemia 12-17 years Adolescents girls in

Eight States of India 2001	**Age group 12-14 years**		**Age group 15-17 years**	
States	**n**	**(%)**	**n**	**(%)**
Kerala	324	54.4	364	49.2
Tamilnadu	407	53.7	406	59.4
Karnataka	399	62.7	399	68.4
Andhra Pradesh	443	72.7	446	72.9
Maharashtra	399	56.6	403	64.3
Madhya Pradesh	327	71.9	326	74.8
Orissa	436	82.1	433	77.6
West Bengal	435	90.1	437	87.6
Pooled	3188	68.6	3214	69.7

G. Vasanthi[22] and colleagues in 1993 conducted an cross-sectional study among the adolescent girls aged 11-16 years attending local schools of rural area and urban slum of

Hyderabad documented the prevalence of anemia to be 27 and 22 % in rural and urban girls who had not attained menarche and 24.2 and 27.8% in those who had attained menarche. The overall prevalence was 25%. With increasing age urban girls who had attained menarche showed an increase in the prevalence of anemia.

A cross sectional study by Swapna Chaturvedi[23] and colleagues in 1996 among the poor group of rural area of Rajasthan in 18 villages of Jaipur District recorded the prevalence of anemia to be 73.7% among 941 adolescent girls aged 10-18 years belonging to lower socio-economic groups.

M Verma[24] and colleagues (1997) in a cross-sectional study amongst urban school children aged 5-15 years in Ludhiana, Punjab documented the overall prevalence to be 51.5% and the prevalence was inversely proportional to age.
Jolly Rajaratnam[25] and colleagues in 1988 conducted a cross-sectional study among adolescent girls of rural Tamilnadu and recorded the prevalence of anemia to be 44%.

A study done by K.Anand[26] and friends, among adolescent school children in September 1998 at government senior secondary school in village Chandawali of district Faridabad Haryana among student of class VI-XII recorded the prevalence of anemia as 51%(age group 12-14 years) and 38.5% (age group 15-18 years) among the girls.

Tiwari K[27]and friends (2000) conducted a cross-sectional study in urban areas of Kathmandu amongst school going adolescent girls aged 10-18 years and recorded the prevalence of anemia to be 60.5%.
In a cross sectional study by Binay Kumar Shah[28] and colleagues in 1998 amongst the adolescent girls aged 11-18 years of semi urban area of Nepal recorded the prevalence to be 68.8%.

A study done by Kapoor G[29] and friends in urban Delhi among 454 school girls aged 11-18 years among higher and lower socio-economic status girls documented the prevalence to be 46.6% and 56% respectively by cyanmethaemoglobin method.

Study done by Kanani S[30]and colleagues documented a prevalence of 81% among 203 adolescent girls aged 10 -16 years in the slums of urban Vadodara Baroda in the year 1998. She also recorded a prevalence of 75%; among 2090 school girls aged 10-19 years in urban Vadodara Baroda.

A study done by Raina N[31] and colleagues at rural Haryana among adolescent girls aged 13 – 17 years school going and non-school going girls documented the prevalence to be 80.8% and 90.3% respectively.

In a school based study[32] in urban area of Delhi and rural parts of Bhratpur Rajasthan among adolescents girls aged 11 to 18 years belonging to poor communities the prevalence of anemia was documented to be 61.9% and 85.4% in urban and rural areas respectively

All these studies indicate; despite all efforts little progress has been made in reducing the prevalence of anemia. It is now accepted that to prevent the overt anemia of pregnancy and there by preventing the intergenerational cycle of under nutrition the adolescent girls have to be targeted. The Tenth steering committee on nutrition in their tenth five year[33] plan have also foreseen this problem and advocates early detection of micronutrient deficiency through screening of all school children and initiating appropriate remedial measures. In an attempt to increase the awareness of policy makers to the seriousness of the problem, it has been proposed by the WHO[9] that countries may be classified with respect to the degree of public health significance of anemia. An anemia prevalence of $\geq$40% is severe; 20.0-39.9% is moderate; 5.0-19.9 is mild $\leq$ 4.9 is normal. These rates apply to all ages and physiological age group.

4.5 Causes of Anemia

Adolescence is a significant period of human growth and maturation, unique changes occur and many adult patterns are established. Following early childhood (<2yr), during the adolescent growth spurt, the risk of iron deficiency and anemia reappear for both boys and girls[34]after which it subsides for boys but remains for girls because of menstrual blood loss.

Iron deficiency is believed to cause the largest part of anemia globally[1]. While there are regional differences, prevalence across the globe are remarkably similar, reflecting the underlying determinants that includes diet low in heme-iron and high in phytes, parasitic infestation and frequent reproductive cycling that decreases iron stores[11] Although many causes of anemia have been defined it is agreed that nutritional deficiency[35] due primarily to low bioavailability of dietary iron accounts for majority of cases. Apart from phytate, tannins present in diets suppress iron absorption to a significant extent[36]. Dietary intake of iron in adolescent in India as compared to recommended dietary allowances is low[37]. The prevalence of anemia[38] is reported to be significantly higher in Indian adolescent consuming a vegetarian diet (45.8%) as compared to those consuming a mixed diet, which includes animal food. More ever, habitual consumption of tea / coffee immediately after meals by adolescent girls was associated with higher prevalence of anemia (50%) compared to those who did not consume tea or coffee after meals (34%)

Intestinal parasitism and anemia is a priority health problem. In India studies carried out in various parts have reported prevalence of intestinal parasitism up to 30-50% and anemia from 40-73% among school going girls. In a study done at Gulbarga Karnatka by Vinod Kumar[39] and colleagues demonstrated the prevalence of worm infestation as 86.66%, 68.16% and 82.97% in mild moderate and severely anemic groups. Overall worm infestation was found to be 76.8%. In a study conducted at Lindi district of Tanzania on low dietary iron availability by Simon Tatala[20] and colleagues 1998, it was found that anemia was associated with parasitic infestations in school children and adolescents. A study done by Stoltzfus RJ[40] and colleagues on epidemiology of iron deficiency anemia in Zanzibari school children concluded that infections with malaria, *Trichuris trichuria, Ascaris luumbricoides,* and *Hookworms* were all associated with worse iron status. Stoltzfus[40] reported that in school age children with more than 2000 hookworm eggs per gram of feces, the incidence of high protoporphyrin levels and moderate to severe anemia was significantly higher in Zanzibari. In a study conducted by Chakma T and colleagues[41] in Tribal area of Madhya Pradesh the prevalence of severe anemia was 30% and intestinal parasites were found in 50% of them under microscopic examination of stools.

Malaria increases risk of anemia. Acute and chronic Haemolysis, Secondary folate deficiency and Dyserythropoiesis has been implicated as a etiology of Malaria Anemia[10].A

significant association between severe anemia and malaria was documented in young children of Kassena-Nankana District of Northern Ghana[42]. A study in Tanzania confirmed the role of malaria as the largest contributor to the etiology of severe anemia in infants in highly endemic area accounting for 60% of all cases, compared with iron deficiency, which accounted for about 30% of severe anemia episodes[43].

Physiological Status: Following menarche, adolescent females often do not consume sufficient iron to offset menstrual losses. Menstrual bleeding causes an additional loss of 0.4 to 0.5 mg daily. As a result peak in the prevalence of iron deficiency frequently occurs among females during adolescence[34].

Socio-economic: Iron deficiency anemia is most common among groups of low socio-economic status. In a study done by Chaturvedi S[23] and colleagues in 18 villages of Jaipur among adolescent girls aged10-18 years belonging to low socio economic status the prevalence of anemia was 73.7%. Similarly in a study done by Rawat CMS and colleagues[44] among adolescent girls of rural area of Meerut District anemia was significantly associated with lower socio-economic status.

4.6 Consequences of Anemia:

Anemia impairs human functions at all stages of life. It has serious consequences including maternal death, and it can be prevented and treated. The consequences of iron deficiency are numerous as iron plays a central part in the mechanism for oxygen transportation and it is essential in many enzyme systems. In 1993, WHO/UNICEF/UNU consultations stated that even in mild to moderate forms of iron deficiency in which although anemia is absent, tissues are still functionally impaired. The health risks of severe anemia are profound. Although moderate degree of anemia may not seriously affect day to day work, most of which corresponds to sedentary to moderate levels of activity, impaired work capacity is seen only in those engaged in hard physical labour with moderate to severe anemia[10].

Iron deficiency anemia during childhood and adolescence has serious implications for a wide range of outcome. They can be further classified as impaired physical growth[45], weakened behavioral and cognitive development[46]; reduced physical fitness and work

performance/ capacity and diminished concentration in work and school performances[47]. Even moderate anemia (Hb < 10mg/dl) has been constantly shown to be associated with depressed mental and motor development in children[48].

It affects the immune status and predisposes for infections. The consequences of anemia for women of reproductive age group includes increased risk of low birth weight, or pre-maturity, peri-natal and neonatal mortality, inadequate iron stores for the new born, increased risk of maternal morbidity and mortality[49]. Anemia is associated with lowered physical activity, mental concentration and productivity. Women with even mild anemia may experience fatigue and have reduced work capacity[10].

In a study carried out by nutrition foundation of India[50] (n=469) there were a significantly higher proportion of children with Intelligent Quotient (IQ) above 110 and a significantly lower proportions of children with IQ below 90 in the non anemic group when compared to the severely anemic children. Both the verbal and performance IQ scores of the children decreased progressively with falls in haemoglobin levels. These finding suggest that all functions are not affected in anemia; and that among those affected, different functions are compromised at different levels of severity of anemia. (The statistical analysis indicated that the observed influence of anemia could be attributed to associated under nutrition *per se*). The children's mean arithmetic tests score were found to decrease with the severity of anemia.

4.7 Prevention and control

Iron deficiency anemia like most nutritional deficiency of public health concern is mainly a consequence of poverty and ignorance. Most countries have policy statements and directives regarding iron supplementation of pregnant women, but most of these directives are not fulfilled[12]. The availability of cost effective interventions forms the basis of growing advocacy for prevention and control of iron deficiency anemia[2]. In India, National Nutritional prophylaxis programme was initiated in 1970 to control iron deficiency anemia in the vulnerable groups through daily supplementation of iron folic acid tablets. The suggested prophylactic dose of iron and folic acid respectively were 60 mg and 500 μg for pregnant women and 20 mg and 100μg for children's per day for 100 days. An evaluation in 11 States during 1985-86 indicated very poor coverage and performance of the programme. After this evaluation, the dose of iron in iron folic acid tablet was increased from 60 to 100mg in 1992[51].

At present, there are three basic approaches to prevent iron deficiency anemia[9]. Iron status may be improved through food-based strategies (iron fortified foods and dietary modification) and non-food based strategies (primary iron supplementation and parasitic disease control).

.**Dietary diversification** has been recognised as the most effective long-term sustainable strategy for overcoming the multiple nutrient deficiencies that may play a role in nutritional anemia. To achieve this, promoting appropriate dietary habit through effective nutrition education has been reported to have a positive impact on reducing iron deficiency anemia. Studies undertaken in Baroda[52] demonstrated that children who consume green leafy vegetables frequently (once a week or more) tend to have higher haemoglobin level than those who are infrequent or non-consumers. Daily supplementation of guava fruit with two major meals resulted in significant increase in haemoglobin of 2.2g/dl in young anaemic women while the non- supplemented subjects showed non-significant increase of 0.3g/dl. Similar positive impacts of nutritional education have been reported in urban poor school girls (8-13 years) who were encouraged to improve their dietary practices using inexpensive local foods[38].

Food fortification: At the population level, food fortification is the best option if a suitable food vehicle can be identified. In a placebo-controlled trial in South Africa[53] micronutrient

fortified biscuits and cold drinks were given to 6-11 years old school children for 12 months. A significant improvement in serum ferritin, serum iron, transferrin saturation, haemoglobin, and hematocrit levels were seen in the experimental groups. The greatest benefits were for children with poor iron status. In India, two different technologies of fortification of common salt were developed at the National Institute of Nutrition Hyderabad. In depth studies carried out with these strategies have clearly shown that fortified iron salt improves haemoglobin status[54].

Supplementations: A study done by Viteri[55] proposed that weekly iron supplementation for school age children (36-50 doses of 60 mg of iron per year) could serve as cost effective, community based strategy, aimed at the primary prevention of iron deficiency as well as increasing iron reserves among adolescent and adult women. Similarly a study done by Anshu Sharma and colleagues[32] among adolescent girls concluded that, considering compliance, feasibility and cost factors, a public health approach consisting of once weekly distribution of iron/folate through schools and welfare centres can be aimed at prevention of anemia among adolescent girls. The Third report on the World[56] Nutrition Situation had documented that in countries where anemia prevalence exceeds 40% of pregnant women, universal supplementation of iron to adolescent girls and women of child-bearing age is warranted. WHO[9] recommends iron supplementation of 60m/day with 400 microgram of folic acid for three months in a year in pubertal girls where prevalence is more than 40%.

Control of parasitic infections: Control of infections, particularly those producing chronic blood loss is another important strategy to control anemia[10]. Preventive measures to break parasite transmission include keeping faeces out of the soil through using pit latrines, observing adequate hygiene and sanitation practices and avoiding skin contact with soil by use of foot wear. Routine de-worming has been recommended as a cost effective strategy to control anemia, especially in area where hookworm infestation is heavily endemic[40].

Summary

The prevalence of anemia is very high in India and other developing countries. The most common causes of anemia are iron deficiency, malaria and hookworm infection. Iron deficiency anemia is highly prevalent in India and other developing as a result of various causes, which can be summarised as:

1. Poverty and ignorance that leads to lack of purchasing power to afford foods containing heme iron.
2. Low socio-economic status leading to poor sanitation and hygiene.
3. Low iron intake, poor bioavailability of dietary iron.
4. Infections and parasitic infestation.

Consequences of anemia in can be summarised as: impaired physical growth, weakened behavioral and cognitive development, reduced physical fitness and work performance/ capacity and diminished concentration in work and school performances among the adolescents. In women of reproductive age it is associated with increased maternal morbidity and mortality.

At present there are three basic approaches to prevent iron deficiency anemia:

1. Iron fortified foods and dietary modification
2. Primary iron supplementation
3. Parasitic disease control.

SECTION: 5

PAPER PRESENTATION

5.1 Disease surveillance system in Himachal Pradesh: Abstract

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Introduction

Consequent to epidemiological transition, the Northern state of Himachal Pradesh is currently shouldering a triple burden of disease. Shortage of trained manpower in field epidemiology and a lack of reliable data on disease trends, signaled an urgent need for a sensitive Disease Surveillance System (DSS) in the state. In response, three systems for disease surveillance are operating in the state viz. National Surveillance Programme for Communicable Diseases (NSPCD), sentinel surveillance for HIV/AIDS and surveillance for individual diseases through the national / vertical disease control programmes.

Objectives

The objectives of this presentation are to:

(1) Describe critically the three different DSS in existence in the state.
(2) Identify existing lacunae in each system.
(3) Suggest appropriate remedial measures.

Methodology

Details for the three systems have been obtained through analysis of secondary and primary data using hospital medical records, outpatient registers, discussions and interviews.

The three different DSS are critically examined and described with respect to: case definition, data collection, analysis, and flow, feedback of information strengths and lacunae in the systems.

The Government of India has included Himachal Pradesh as one of the 10 states wherein the Integrated Disease Surveillance Programme (IDSP) is to be implemented. Issues relating to the IDSP in Himachal Pradesh will be discussed in brief.

(Presented at Joint Annual conference of the Indian society for malaria and other communicable diseases and the Indian association of epidemiologist, New Delhi

8th to 11th November 2002)

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