FIELD PROJECTS REPORTS

By

Madan Mohan Pradhan

(MAE-FETP Scholar 2002-2003)

NATIONAL INSTITUTE OF EPIDEMIOLOGY

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JANUARY 2004

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Submitted in partial fulfillment of the requirements for the degree of

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Mayor V.R. Ramanathan Road, Chennai-600 031.

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CERTIFICATION

This is to certify that all the field projects submitted in this Bound Volume are original work carried out by Dr. Madan Mohan Pradhan 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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Date **Dr. Madan Mohan Pradhan**

SECTION :1

FIRST FIELD POSTING

1.1.WORK PLACE SITUATION REPORT

I was posted to Cuttack district of Orissa to carry out my field projects as part of my Field Epidemiology Training Programme. Before conducting any public health study it is crucial to have an overall holistic understanding on the work place. With the following objectives I studied my work place situation.

Objectives:
1.To describe the existing health facilities of Cuttack district.

2.To identify other areas of concern so that it serves as a reference point for health planning of the district.

For any public health planning and implementation of public health programmes/activities in a district it is essential to study the existing public health system of the district. Before taking other Field Epidemiology Training Programme (FETP) activities in Cuttack district I have studied the existing district health system.

Methods:

- Collection and consolidation of informations that are available at the office of Chief District Medical Officer, Cuttack
- Consultation with District level programme officers.

Background of Cuttack District

Cuttack district belongs to the state of Orissa which is situated at the east coast of India covering 15,5,707 sq km of geographical area. Orissa is located at the latitude: - $17^0 19'$ to $22^0 34'$ and at the longitude: - 81^0 29' to 87^0 29' .It shares boundaries with West Bengal (north-east), Jharkhand (north),Chatisgarh (west), and Andhrapradesh (south-east) and Bay of Bengal on the eastern periphery.

The state has three main climatic conditions:

1. Hot and dry from March to early June.
2. Hot and wet from July to September.
3. Cold from October to February.

The Southwest monsoon lashes the state from middle of June to the end of September with an average rainfall of 1500 mm. The annual rainfall recorded in the year 2000 was 1034.00-mm. Agro climatic variation is observed from district to district and area-to-area and is very much favourable to yield varieties of crops.

The state comprises of 4.74 % of land mass and 3.574 % of the population as per 2001 census (provisional) of India respectively.

In spite of abundant natural resources, growth of industrialization and other potential income sources, the percapita income of Orissa stands behind most of the states of the country. Approximately 48% of the population lives below poverty line.

1.1.Population Profile of Orissa (As per 2001 census – provisional

		Total	Rural	Urban
Population	Persons	36,706,920	31,210,602	54,963 ,18
	Males	18,612,340	15,711,853	29,004 ,87
	Females	18,094,580	15,498,749	25,958 ,31
Sex Ratio		972	986	895
Ratio of Child population to Total Population (In percentage)	Persons	14.11	14.58	11.45
	Males	14.27	14.83	11.26
	Females	13.95	14.34	11.66
Literates (7years & above)	Persons	20,053,785	16,13,928	3,939, 857
	Males	12,118,256	9,845,113	2,273, 143
	Females	7,935,529	6,268,815	1,666, 714
Literacy rate (excluding Population 0–6 year)	Persons	63.61	60.44	80.95
	Males	75.95	73.57	88.32
	Females	50.97	47.22	72.68
Area in Sq. Km		155,707.00	152,912.87	2,794. 13
Density of Population (Per sq. Km)		236	204	1967
Decennial Population Growth	Absolute	5,047,184	3,785,849	1,261, 335
Percentage of Urban population to total population		14.97		

1.2.Administrative Division:

There are three revenue zones: Central, Northern and Southern

Total no. of districts are 30, Subdivisions 56, Tahasils 171, Blocks 314 and Towns 138.

There are 147 Assembly Constituencies.

1.3. Health indicators Of Orissa and India

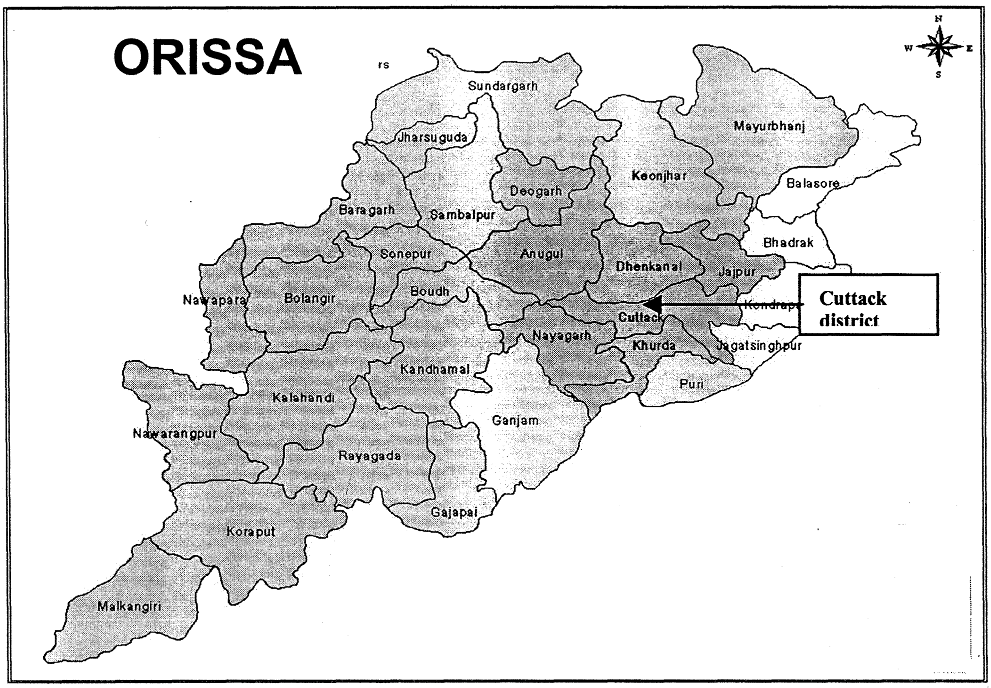
Sl. No.	Indicators	Orissa	India
1	Mean Age of Marriage (Female) 1996 SRS		
	Rural	19.5	19
	Urban	20.4	20.7
	Total	19.6	19.4
2	Total Fertility Rate		
	Rural	3.3	3.5
	Urban	3.4	3.8
	Total	2.5	2.7
3	Perinatal Mortality rate		
	Rural	63.1	42.5
	Urban	49.1	38.4
	Total	63.1	42.5
4	Neonatal Mortality Rate (1997 SRS)		
	Total	65.3	47.7
5	Post natal Mortality rate	14.4	8.9
	Rural	13.6	7.3
	Urban		
	Total	32.6	26
6	Still Birth rate		
	Rural	13.6	7.3
	Urban	21.6	19.6
p	Total	14.4	8.9

As per SRS Bulletin, 1999

7	Crude Birth Rate		
	Rural	24.6	27.6
	Urban	203	208
	Total	241	261
8	Crude death rate		
	Rural	11.1	9.4
	Urban	7.1	6.3

	Total	10.7	8.7
9	Infant mortality rate		
	Rural	100	75
	Urban	65	44
	Total	97	70

1.4.Cuttack District – An overview



Cuttack is one of the coastal districts of Orissa and is the land of antiquities, monuments and handicrafts. The vast areas of paddy fields with patches of hamlets, thickly shaded trees with its serene appeal to the eyes of the visitors.

In the year 1993 the original Cuttack district was divided into four districts as a part of Orissa district restructuring process. The newly formed districts are named as Cuttack, Jajpur, kendrapada and Jagatsingpur. Old Cuttack district is called as the granary of eastern Orissa as it yields bumper crop round the year.

General Information:

Total geographical area of Cuttack district is 39,32 Sq. Km.

Location: a) Longitude: 84^0 58' to 86^0 20' East

b) Latitude: 20^0 03' to 20^0 40' North

Altitude: 14.62 meters above sea level

Boundary: Cuttack district is surrounded by following districts: Jajpur towards north, kendrapada towards northeast, Jagatsingpur towards east, Dhenkanal (north west) Khurda (south) Anugul (North-west), Bouda (west) and Nayagarh (south west).

Climate:

Rainfall: Normal is 1501.3 milemeter and actual is 980.2milemeter in 1000 hector area as per 2001 metrological data. Average minimum temperature-22.2 degree centigrade and maximum temperature is 33.4 degree centigrade.

Natural calamities: Cuttack is prone to natural calamities like cyclone, flood and heat wave disorder. From 1998 onwards it has faced successively the heat disorder in summer 1998, super cyclone in October 1999 and flood in July – August 2001

Socio-cultural Aspects:

Spoken languages: Oriya in Rural areas, Kui in tribal areas, Oriya and Hindi in urban Areas.

Clothing: People use light cotton in summer and heavy woolen in winter.

Food habits: People of Cuttack district are mainly rice eaters.

The economy of the rural areas of the district is mostly agrarian and Cuttack city depends mostly upon business and enterpreneurship.

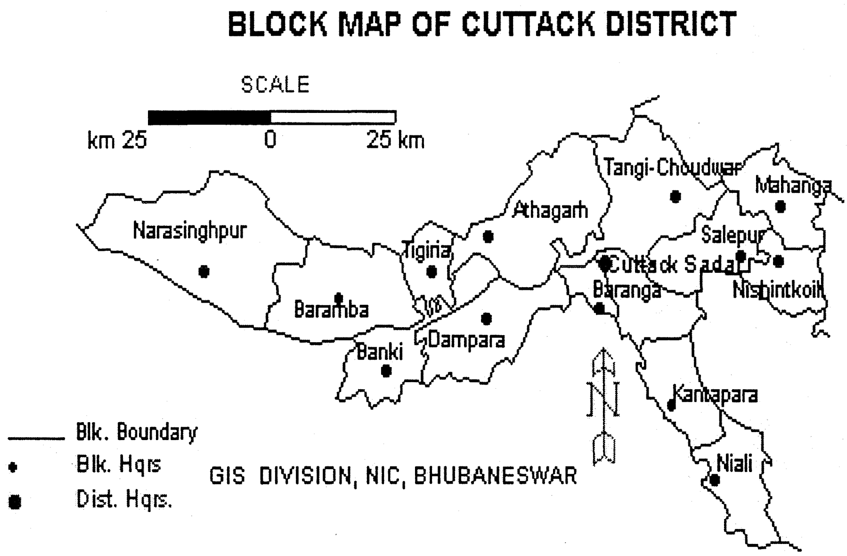
The growing industrial centers of Cuttack district are at Choudwar, Vyasnagar and Dhanamandal .The famous handicraft centers are at Maniabadh and Ghantimunda.

1.5.Population Profile:

As per the census data of 1991 and 2001 (provisional). Cuttak district population ranks second in the State.

		Cuttack	Orissa	Comparison of Cuttack District with state
Population (2001 census provisional)	Total	2341,000	36707,000	6.38 %
	Male	1208,000	18095,000	6.67 %
	Female	1133,000	18612,000	6.08 %
Child (0-6)population	Total	273,665	518,551	5.28 %
	Male	140,976	265,6046	5.30 %
	Female	132,689	252,4505	5.26 %
Decennial growth rate	1981-1991	19.37 %	20.06 %	There is no much Difference in decennial growth rate and sex ratio between the state and Cuttack district
	1991-2001	14.00 %	15.94 %	
Sex ratio (Female per 1000 male)	1991	922	971	
	2001	938	972	
Population Density	1991	522	203	Ranking in the state is third
	2001	595	236	

2. Administrative Set-Up of Cuttack District



Administrative Units		No.	Names
Sub - Divisions		3	Cuttack, Tangi and Banki
Tahasils		11	
Community Development blocks (CD Blocks)		14	1.Athagarh 2.Banki 3.Baramba 4.Baranga 5.cuttack (sadar) 6.dampara 7. Kantapara 8.mahanga 9.Narasingpur 10.Niali 11.Nischintakoili 12.Salipur 13.Tangi- Chudwar 14. Tigiria
Urban Areas	Municipalities	2	Cuttack and Choudwar (Cuttack is Municipal Corporation)
	Notified Area Councils (NAC)	2	Athagarh and Banki
	Other towns	3	Charbatia, Gopalpur and Nuapatna

Police stations (includes mahila PS) are 34 in number
Fire Stations are 7 in number
Assembly constituencies 10

Total no. of Gram Panchayats (G. P) : 342

Villages			Residential houses and households in Cuttack district (1991 census)	
	Total:	1967		
	Inhabited:	1865		
	Un-inhabited:	102	Residential houses	Households
			3,03,390	3,38,879

2.1.District Headquarter:

Cuttack city is the district head quarter of Cuttack District. Earlier it was the district Head quarter of the old Cuttack district.

Background of Cuttack City: Cuttack city is one of the oldest towns and the former capital of the state. The town is situated at the apex of the delta formed by the rivers Mahanadi in the North and Kathajodi in the South. This city was known as the nerve center of Orissa and the famous Ravenshaw College and the premier Medical College of the state are situated in this city The Orissa high court is functioning here.

It serves as a convenient base for touring the various places of interest in the district.

3.Infrastructure Facilities of Cuttack District

3.1.Communication and transport:

Communication: Cuttack city well communicated to other cities of India by rail and road. From out side state one can fly to Bhubaneswar, the state capital of Orissa and proceed to Cuttack by road or rail within an hour(Cuttack is 29 km from Bhubaneswar by road and rail).

Road Status: As per 1998-99 data the communication status of Cuttack district is as follows:

Categories of roads	Length in KM
National High Ways	64
State High Ways	56
Major District Road	308
Other District Road	312
Forest Road	156
Classified Village Road	2641
Gram Panchayat Road	144
P.S road	814
Village Road	961

Total number of post office units in the district is 375.

3.2.Industries:

Cuttack earlier known for crop yielding area is now enriched with different types of industries with employment opportunities. There are 165 registered factories with 10020 employees. The productive capital is 1505511,000 rupees as per the annual survey of industries 1998-99.

3.3.Drinking water and electricity:

Total number of inhabited villages is 3747 out of which 155 villages have no drinking water sources. There are 7472 working tube wells covering 3329 villages. Only two piped water project functioning in rural areas covering 10 villages.

98.36% of villages are supplied with electricity.

3.4.Agriculture

Agriculture, animal husbandry and fishery are rich source of income generation in cutack district.

Varieties of major crops	Production in Cuttack district (in Quintal) (2000-01)	Percentage (comparison to the production of state)
Paddy	2872276	4.11
Wheat	156	0.12
Maize	837	1.22
Raggi	1291	0.27
Mung (Green Gram)	29876	10.20
Biri (Black gram)	35028	12.85
Kulthi (horse gram)	15666	10.74
Til (gingle)	409	0.60
Ground Nut	15051	2.62
Mustard	85	0.56
Potato	149671	17.4
Jute	23848	36.28
Sugarcane	802725	8.33

3.5.Animal husbandry:

Animals and varieties		Production (in quintal) (2000-01)	Percentage to state production
Buffalo		62516	3.78
Cattle	Cross breed	79000	10.62
	Indigenous	561966	4.00
Cows	Cross breed	61575	11.72
	Indigenous	299434	4.6
Sheep		108303	5.80
Goat		190181	3.51
Poultry		302821	1.9
Pig		3856	0.67

Number of veterinary hospitals and dispensary in the district are 28, number of live stock Aid center are 122 and number of artificial insemination centers are 125.

3.6.Production of Animal food (2000 –01) in Cuttack district

Food variety	**Production**	
	Cuttack	***Orissa***
Milk	61.12 (in 000 MT)	883.52(in 000 MT)
Egg	48.70 (in million no.)	933.40(in million no.)
Meat	9836.50 9 in MT)	46000.00 9i MT)
Fish (fresh water)	5883 (in MT)	125114 (in MT)

3.7. Educational Institutions

Cuttack district is one of the highly educated districts of Orissa. There is wide network of educational institutions in the district.

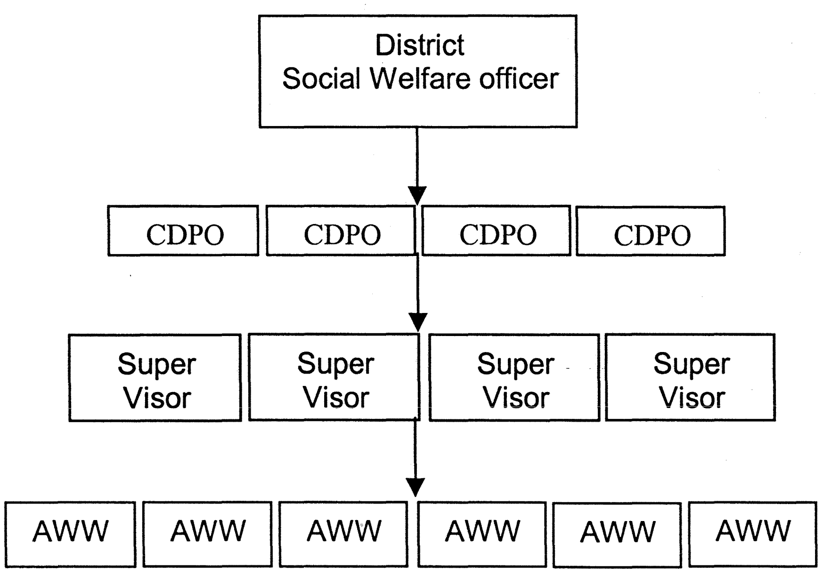
Educational Institutions	No. Of schools	Enrolment in 2000s.	No of teachers
Primary schools	2177	262	5761
Middle school	667	57	2055
Secondary school	388	68	3273
General Colleges	96	39	1184
Technical Colleges / institutions	One medical college, one engineering school and other vocational and technical training schools exist in the district.		

3.8.Integrated Child Development Scheme (ICDS):

The integrated Child development Scheme started in Cuttack district since 1988-89. The nodal department for ICDS in Orissa is the Department of Women and Child Development. The package of services provided by ICDS is as follows:

Supplementary nutrition, Vit- A, Iron and Folic Acid	Treatment of minor illness
Immunization	Nutrition and Health Education to women
Health check- ups	Preschool education in the age group of 3- 6 years.
Referral services	Convergence of other supportive services like water supply, sanitation etc.

ICDS Organizational structure



AWW: - AnganWadi worker covers 1000 population in both rural and urban areas and 700 populations in tribal areas.

Super visor or Mukhya Sevika: supervises 20 to 25 Aw centers.

CDPO (Child Development project Officer): she is incharge of one Community Block having 80,000 to 1,20,000 populations

District social Welfare Officer is the nodal officer for ICDS at district level.

3.8.1 ICDS projects; functional the district

4.District Health Status And Health Facilities:

4.1.Health indicators: The general health status of Cuttack district is better in comparison to most of the districts of Orissa. Some of the health indicators of the district are as follows.

Year	CBR	CDR	IMR	MMR
1997	17.77	6.61	37.12	0.28
1998	14.10	7.32	52.74	0.86
1999	17.74	6.86	37.06	0.69
2000	18.65	7.17	35.53	0.69
2001	16.24	6.66	33.11	0.66

*

CBR: Crude Birth Rate

CDR; Crude Death Rate

IMR: Infant Mortality Rate

MMR: Maternal Mortality Rate

Orissa and India health indicators for 2000 are follows:

Indicators	Orissa	India
CBR:	24.3	25.8
CDR:	10.5	8.5
IMR:	95.00	68.00

Source: Vital statistic Department, Directorate of Health Services, Orissa

In all the health indicator Cuttack district health status is better than Orissa average. In INMR and CDR its position is also better than the country average.

The district health system has been envisaged as per the norm set up for the state to achieve the objectives of primary health care, which comprises of preventive, curative and promotive health. The district Health system has a wide network of primary health care facilities starting from sub-center to tertiary level of healthcare institutions. The network of the health system is such that ideally it should be able to provide primary health care services at the doorsteps.

4.2. District Health Facilities:

There are 5927 numbers of heath facilities in Orissa and out of this 299 are in Cuttack district. The proportion of different health facilities available in Cuttack district in comparison to the state is as follows.

Name of the Health institutions	Orissa	Cuttack	(%)
Medical College and hospital	3	1	33.33
District Head Quarter hospital	31	1	3.22
Sub- divisional Hospital	21	2	9.52
Other hospitals	126	11	9.09
Total hospitals	181	15	8.28
Community health center (CHC)	158	5	3.16
Primary health Center (PHC)	183	9	4.91
PHC (New)	1166	52	4.46
Mobile Health Units (MHU)	13	0	0
Total health institution having doctors	1701	81	4.76
Health Sub-centers	5927	303	5.11

4.2.1.Status of availability of doctors in Cuttack District (n and % the State):

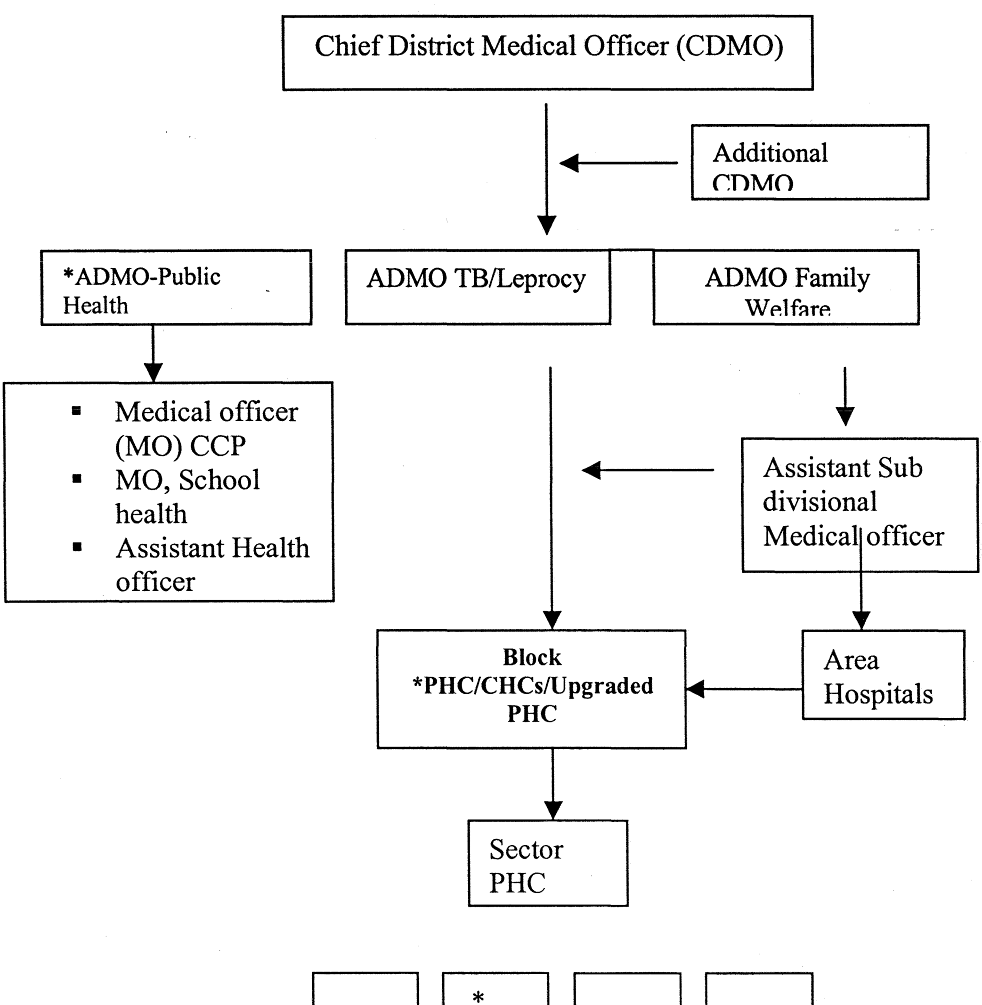
Doctors as per designations	Doctors		%to state
	Orissa	Cuttack	
Senior administrative grade	4	0	0
Junior administrative grade	48	2	4.16
Senior Clinical Doctors	39	5	10.41
Junior Clinical doctors	294	13	4.42
Specialist (Jr. Class I)	157	11	7.01
Specialist (Jr. Class II)	823	35	4.25
Assistant surgeon Class II	2728	194	7.11
Dental surgeon	15	1	6.67
Teaching Doctors (training institutes and Medical colleges)	812	336	41.37

Besides doctors the other categories of health staff in the district health system is as follows.

4.2.2.Different Categories of Health staff in Cuttack District (2002 December)

Name of the Posts	Sanctioned	In position	Vacancy
Medical officers (class-1) senior	2	1	1
Medical officers(Class-1) junior	23	22	1
Medical officers (class- II) specialists	34	28	6
Medical officers (Asst. Surgeon)	140	133	7
Pharmacist	99	98	1
Nurses	101	101	0
Multipurpose Health Worker (MPW - M)	250	214	36
MPW (F)	386	374	36
Laboratory Technician (LT)	50	50	0
Vital statistics (VS) staff (VS Clerk/SI/JS)	22	21	1 (JS)

4.2.3.Organogram of Cuttack District Health System



*ADMO: Assistant district medical officer

PHC: Primary health center

CHC: Community Health center

SC: Sub-center

4.2.4.Primary Health Care Facilities in Cuttack District:

Block	**PHC/ CHC**	**PHC (New)**	**Sub centers**	**Population covered**
1.Athagarh	Berhampur PHC			112759
		Berhampur	Mancheswar,Dhursia,Madhapur	16144
		Megha	Megha,Rajnagar,Bentapada Dahipur,Kandarpur	19286
		Jenapada	Jenapada,Khuntikata	14663
		Khuntuni	Khuntuni,Dalia,Kulaio	18577
		Joranda	Joranda,Samsarpur,Sathila	18269
		Gurudi-jhatia	Bali,Gorbara,Radhakishore pur kumarpur,Gurudijhatia	25820
2.Badamba	Maniabandha CHC			118961
		Gopalpur	Gpapur,Badakumbhira,Krushnapu, Beliapada,Ratapata,khorada	29663
		Khairamunda PHC	Baramba,Sankhamari,Lachhapur, Sunapal,Jharia,Sasang	38860
		Sanharsinga	Kankadajodi,Abhimanpur, Kashikiari,Mhulia,Saharsinga,Khuntikata	50433
3.Banki	Subarnapur PHC			111368
		Subarnapur	Ostia,Kadalibadi,Kantapanhara,Bandal,Baunsput	38623
		Brahmpur	Berhmpur,Nuagan,Baraput,Puichia,Botalam,Anuari	35700
		Baideswar, Baideswari	Baideswari,Kendapuli,Jaganathpur	16256
		kalapathar	kalapathar,Lemberi,kalipoli,Kantakoi,Karadapali	20789
4.Bararang	Mahidharapara			79067
		Mahidhara para	Arilo, Khandalo, Kurangapradhan, Ganeswar	19574

		Baranga Baranga	Baranga, Sribantapur, Mundamuhan, Belgochia	18481
		Kokara	Harianta, Khalarda, Bramhanda, Gobabasta, Usuma	22491
		Munduli	Bidyadharpur, Ramdaspur, Munduli, Naraj	18521
5.Cuttack Sadar	Bhetkar			133681
		Bhetkar	Naharpada, Dhuleswar, Berhampur, Kalapada, Barla	33311
		Telanga Pentha	Pratapangari, Nayahat, Saindha, Biswalpada	26724
		Arada	Khandeita	5907
		Subhadrapur	Subhadrapur, Poparada, Bidyadharapur, Gopalpur	26141
		Kandarpur	Gatiroutpatna, Kandarpur, Fakhipara, Paramahanse, Bamburi, Ayotpur	5350
		Kishornagar	Archili, Kosida, Barda, Teldia, Kisannagar, Bodhapur	36248
6.Block Dampara	Dampara PHC			84358
		Dampara PHC-New	Harirajpur, Ghasiput, Pathapur, Gayalbanka, Banara, Balipada)	36898
		Tulasipur PHC-New	Patrapur, Ramchandrapur, Naraganaga, Ragadi	26446
		Talabasta PHC –New	Govindapur, Dulhanpur, Talabasta, Padanpur)	(21014
7.Block – Kantapada	Adas pur CHC	Adaspur PHC New	Arada, Sundargram, Bairoi, Patsundar Noda,	76304
		Badhil PHC-New	Uttarana, Bvadbil, Sudusailo, Bramhansailo	25735
		Govindpur PHC- New	Govindpur, Taradapada, Nahalpur, Kamarasahi, Jharpad	(23275
Block	PHC/CHC	PHC (New)	Sub centers	Population covered
8.Block Mahanaga	Mahanga CHC			164639
		Mahanga PHC- New	(Kaudikola, Palisahi, Ranigoda, Osthapur	23446
		Nadhisaspur PHC -New	Nadhisaspur, Kusupur, Rahania, Lalitgiri,	30872

		Jaganathpur PHC- New	Mulabasanta Sasilo, Kaitha, Samsarpur, Jaganathpur, Kothapada)	25290
		Bhadreswar PHC- New	Gopalpur, Apilo, Gauda, Balipada, Sabalakana, Haldia)	33880
		Nurtanga PHC- New	Nurtanga, Mauda, Bheda, Kuanpal, Kantikiari	26642
		Erkana PHC- New	Manijori, Podamarai)	10565
		Basudevpur PHC- New	Basudevpur, Koliatha	13944
9.Block Narasingpur	Kanpur PHC			159952
		Kanpur PHC- New	Balijhari, Atanda, Staria, Champaswar, Ekdal, Padamal	44086
		Sagar PHC- New	Sagar, Bahali, Allara, Nukhapada, Godibandha, Paikabarabati	37821
		Narsighpur PHC- New	Narasinghpur, Kakudia, Ranasinghpur, Nuagarh	23329
		Judum PHC-New	Kamaldihi, Regeda, Basantapur, Judum, Saradhapur	29199
		Balisahi PHC- New	Balisahi, Kokalaba, Ghantapada, Badabhumi	25517

Block	PHC/CHC	PHC (New)	Sub centers	Population covered
10.Block – Niali	Niali PHC			128132
		Niali PHC - New	Nuagan, Anala, Purbakhaada, Balasuni, Bagalgarh, Athanga	36797
		Pahanga PHC- New	Pahanga, Pokharigan	11604
		Kasarda PHC- New	Kasarda, Raniola, Sansanpada, Sithalo, Erancha, Kulasree, .Barisana, Sagadailo	36639
		Krushnaprasad PHC- New	Madhab, Sarena, Binispur, Betenba	19765
		Badaro PHC- New	Kiranga, Sadansa, Kapasahi, Tampada)	23327

11.Block Nischintakoili	Nischintakoili PHC		133316
	Nischintakoili PHC- New	Natakai, Gopapur, Guhalo, Badathakan	23050
	Kendupatna PHC- New	Kendupatna, Jignipur, Jirampur, Kulia	21941
	Asureswar PHC- New	Katikata, Sankilo, Asureswar, Sakurpada	22350
	Nageshpur PHC- New	Naigua, Narua, Bandhakatia, Nemali, Nageshpur)	29514
	Orti PHC – New	Orti,Taratasasan,Narendrapur	18436
	Santapur PHC- New	Babarchand, L.Bhagaswanpur, Janardanpur)	18025

Block	PHC/ CHC	PHC (New)	Sub centers	Population covered
12.Block Salipur	Salipur- CHC			164447
		Salipur CHC(HQ)	Betai, Lunahar, Kalyanpur	13602
		TentoiPHC- New	Patapur,Bhatapara,Souri,Bahugram	27663
		Padmapur PHC -New	Padmapur, Mahajanpur, Purusotampur, Satyabhamapur, Gujarpur,Baragodia,Madhyagacha	40559
		Raisunguda PHC- New	Raisunguda, Kasumbi, Banahara, Pekoi, Chhanipur, Sido, Bhimdaspur, Mirja	38709
		Mala PHC- New	Mala, Odasingha, Jagulaipada	20100
		Rameshwar PHC –New	Raneshwar, Gopinathpur, Ramsrishnapur	17815
13.Block Tangi Choudwar	Tangi CHC			153291
		Tangi PHC – New	Kolsahi, Nimipur, Nirgundi, Nuasahi, Uchpada, Bainchua	31836
		Agrahat PHC New	Mangarajpur, Badasamnatrapur, Agrahat, Sankarpur, Berhampur	21291
		Bhatimunda PHC- New	Bhatimunda, Napanga, Jaripanda,Gohindpur, Adamturu	33927
		Chowdwar PHC New	Indrani Patna, Banipada, Nuapatna, Kakhari, Garudiga	29654
		Nakhara PHC New	Nakhara, Karanji, Bhagatpur, Badachancho	36583
14. Block	Bidhanima PHC			60148

Tigiria	Bindhanima PHC-New	Kalibiji, Basudevpur, Bisnupur	16004
	Badanoupt PHC New	Gadadhapur,Badanoupt, Khandhala	9724
	Tigiria PHC - New	Tigiria, Puruna Tigiria, Nuapatna	18780
	Bhiruda PHC-New	Bhiruda, Achalakata, Panchaga	15640

The hospitals are mainly as follows: District Head Quarter Hospital, Sub Divisional Hospitals, Area Hospitals, and Leprosy Homes. The SCB Medical college Hospital and Sishubhwan (Childrens' hospital) are the tertiary referral hospitals of the state, which are situated at Cuttack city. Due to easy accessibility people of Cuttack district get maximum benefits from these state level tertiary hospitals.

District Head Quarter Hospital

District head quarter hospital is situated at Cuttack city .It is the referral hospital for the primary health care system of the district. The administrative head of the hospital is Assistant district Medical Officer- Medical (ADMO-M), whop is a state cadre senior class-1 medical officer. Both outdoor and indoor services with diagnostic facilities are available in the district hospital. The Hospital buildings are old ones, some building are not used, as they are not safe. Eye ward is newly constructed and well furnished. Total bed strength of this hospital is 130. Out of this there are 30 beds in medicine,30 beds in Surgery,30beds in OBS& Gyne,10 beds in Pediatrics,10 beds in ENT and 20 beds in Eye indoors. Super specialized departments like Orthopedic Psychiatric, Skin & VD and Dental departments etc are not functiona. There is a Post Partum Center. Besides the ADMO-M as the administrative head of the hospital, there are 9 specialists doctors (medicine, surgery, Obs & Gyne, Paediatric,ENT, Eye, Radiology and Pathology) and 14 Assistants Surgeons working in this hospital.

Health Service Facilities

In the district head quarter hospital both indoor and outdoor facilities are available. Here all types of curative health services are provided except super-specialized treatments which are available at the SCB medical college and hospital situated in Cuttack city.

Diagnostic facilities like pathological investigations for routine blood haemogram, malaria, blood glucose, stool and urine, sputum -AFB, X-ray and ultrasound facilities are available. Culture facilities are not available in the hospital.

Due to unsafe building condition the Pediatric and ENT wards are not functioning. There is no sanctioned post for Skin and VD, Psychiatric and Orthopedic Departments. So the specialized services for theses are not available in this hospital. People get these services at S.C.B. Medical College Hospital. There is a proposal to have these departments at the District Head Quarter Hospital on behalf of World Bank assisted Orissa Health System Development Project (OHSDP).

Sub-Divisional and Area Hospitals

Sl.NO	Name of Hospitals	Location
1	Banki	Banki Head Quarter
2	Choudwar	Choudwar head Quater
There are 9 Area hospitals which are as follows:		
1	Baramba area hospital	Baramba
2	Kalapathar area hospital	Dampara
3	Jaganathpur area hospital	Mahanga
4	Nadia Sahaspur area hospital	Mahanga
5	Jorum area hospital	Narsingpur
6	Narsingpur area hospital	Narsingpur
7	Rajsunguda area hospital	Salipur
8	Bhagatpur area hospital	Tangichoudwar
9	Tigiria area hospital	Tigiria

Other Health facilities

Besides the peripheral Health facilities there are other health facilities in the district such as.

Leprosy hospitals and leprosy eradication units.

Peripheral health institutions for tuberculosis control programme.

Municipality hospital and dispensaries (at Cuttack city) and

Indian system of medicines.

i) Leprosy Eradication Units (LEU) in Cuttack district:

There are five leprosy eradication units inCuttak district headed by ADMO(Public Health /malaria, filaria and leprosy).

ii) Peripheral Health Institutions (PHI) for TB control programm

Name of the Block	Name of the PHI	Name of the place	Name of the PHI
Athagarh	Sub-divisional hospital	Narasinghpur	Kanpur PHC Khuntuni Dispensary Leprosy Home Hospital
Banki	Sub-divisional hospital	Mahanga	Mahanga PHC
Adaspur	City Hospital	Baranga	Mahidarpada PHC
Kantapara	Adaspur PHC Badamba Govt. Hospital	Badamba	Maniabandha PHC
Cuttack	Bentakar PHC Baranga Govt. Hospital Baranga ESI Hospital	Niali	Niali PHC Narasinghpur Govt Hospital
Athagarh	Berhampur PHC	Nischintakoili	Nischintakoili PHC Nadiasahaspur ispensary Padmapur Govt. Dispensary Paisunguda Dispensary.
Dampada	Jorum Govt. Hospital Kalapathar Govt. Hospital	Salepur	Salepur PHC Subarnapur PHC (N) Sailogobindapur PHC Tigiria Govt. Hospital Telingapentha PHC (N)
Tigiria	Bindhanima PHC Bhagatpur Dispensary Bagalpur NAC	Cuttack city	O.M.P Hospital Police-Hospital Brajarambha Dispensary City Chest Clinic, Buxibazar

iii) List of Health Facilities Under Cuttack Municipal Corporation (CMC)

There are 08 dispensaries of allopathic system of medicine and 04 numbers of Homeopathic dispensaries in Cuttack CMC.

There is one health officer for overall health supervision in the municipal corporation Health Office.

iv) Tertiary Referral Health Facilities.

SCB Medical College and Hospital, Cuttack situated at Cuttack municipality area

Sishu Bhaban (childrens' hospital) do

Regional Cancer Institute do

These institutions are also teaching hospitals for medical and nursing students.

v) Blood bank facilities in Cuttack district

The Blood banks in Orissa are functioning under Red-Cross banner. Following Blood banks are functioning in Cuttack district.*1.Central Red Cross Blood Bank at Cuttack, 2. Athagarh, 3.SCB Medical College, Cuttack*

vi) Indian System Of Medicine (ISM) and Homeopathy Health Facilities in Cuttack District.

Both Ayurveda and Homeopathy are well-accepted systems of medicine by the people of Orissa. Govt.ISM and homeopathy Health Institutions have been set up at various places in the state to cater the curative health needs of common people. Now the state Govt is planning to integrate this system of health care into public health system. The Health Facilities of ISM and Homeopathy of Cuttack district are enlisted below.List of Ayurvedic dispensaries

Block	**Dispensary**	**Block**	**Dispensary**
Baramba	Damangadia	Mahanga	Sahaniajpur(at Kuannal)
Baramba	Gopinathpur	Sadar	Amansaol(at Khandayat Gp)
Athagarh	Dhurusia	Banki	Similiput (at Similipur Gp)
Athagarh	Kandarpur	Banki	Bandal
Athagarh	Kandari	Niali	Raniola
Athagarh	Patenigaon (at Megha Gp)	Tangi	Dalizoda Berhampur
Narasinghpur	Olab (at Godibandha Gp)	Salepur	Balia (U)
Nischintakoili	Sungula (U) at Fagal Gp		

List of Homeopathic Dispensaries under District Health system

Block	Dispensary	Block	Dispensary
Niali	Erancha	Mhanga	Jatadhariashram
Niali	Sadans(at Sadanga GP)	Kantapada	(at Mouda GP)
Salepur	Gopinathpur	Sadar	Dhanmandal(at
Salipur	Ramakrishnapur	Nischintakoili	Brahmansailo GP)
Mahanga	Gunupur (at Mulabasanta)	Tangichoudwar	Dahigaon (at Kalapada GP)
Mahanga	Goudagpa (at mahanga GP)	Athagarh	Janardanpur (at Keklgmeri)
Mahanga	Nrutanga	Athagarh	Napanga
Mahanga	Pallisahi	Tigiria	Kumarpur
Mhanaga	Champatipur (at Podamorei)		Arakhpatna(Jenspada)
			Manpur (at Gadadharpur GP)

Homeopathic Dispensaries Under Cuttack Municipal Corporation

1. Sartol homeopathic (at Sartol)
2. Rajabagicha (at Rajabagicha)
3. Sikharpur
4. Deulsahi

vii) List of other sectors linked with the health system.

1.Women and Child Development department
2.Rural water supply
3.Urban water supply
4.Rural Development Department
5.Urban Development Department
6.Animal husbandry
7.Agriculture and Horticulture department
8. School and Mass Education Department
9.Electricity
10.Telecommunication
11.Public health engineering
12.Roads and Building
13.Revenue department
14.Home department
15.Special Relief commission
16.Orissa disaster mitigation Authority
17.Non governmental organizations
18.UNICEF and other UN organizations in the state

5.Conclusion:

Cuttack district is one of the developed districts of Orissa.The socioeconomic status and infrastructure facilities of the district are better in comparison to many other districts of the state. The rich cultural heritage of the district is a great attraction. The high literacy status as well as the education level is a great strength for implementing any people's friendly programme in the district.

The health facilities available in the district are among the first category districts. The wide net-work of primary health care system and existence state level tertiary referral health institutions are unique for the district. The communication system in the rural and urban areas of the district is very good so that common people avail the Govt. health care facilities with easy access.

The major weakness in the system is that there is no coordination mechanism between Rural and Urban health care system. The growth of urban population is expanding rapidly in the district. This creates increased public health problem. In Orissa the urban health system and the rural health system are functioning under two different ministries. For public health purpose a well-oiled coordination mechanism between the two ministry i.e urban and health is essential. At least this must be established at the district and sub district level.

Presently Govt. of Orissa is planning to include the ISM and homeopathy health institutions in public health programmes. This would increase the skilled manpower strength in public health activities.

The district is prone to natural disasters like flood and cyclone. Flood is a usual feature of the district. Both flood and water logging in rainy season create unhygienic environment in rural as well as in urban areas. Hence there is always apprehension of water and vector borne disease outbreaks. To manage the health situation in disaster situations and in the aftermath there should be a very good institutional coordination mechanism among the health and other related sectors.

1.2.LABORATORY FACILITIES IN CUTTACK DISTRICT, ORISSA

I. Introduction:

Laboratory has the unique role in pubic health. Public health laboratories make major contribution in strengthening the health care system. Laboratory is very much essential to confirm the clinical diagnosis particularly in outbreak and epidemic situations and monitoring the etiological agents. Timely and accurate laboratory report is essential for disease surveillance and control programme. Laboratory is the backbone of pubic health surveillance system. 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 objective of carrying out this study is:

To understand the existing laboratory facilities in the district of Cuttack.

To assess the possibility of improving the pubic health laboratory system

III. Methodology:

During my field posting for field Epidemiology activities in Cuttack district, I collected information regarding laboratory facilities from the records available at the Chief District Medical officer (CDMO), Cuttack and visited laboratories functioning at different levels in the district, and other referral laboratories situated in Cuttck and in the State .I consulted the district programme officers e.g ADMO-Public Health and ADMO- medical and met some laboratory technicians in person.

IV. Laboratory facilities in the district

In Cuttack district there are 9 block level Primary Health Centers (PHCs), 5 Community Health Centers (CHCs) , 2 Sub divisional Hospitals and one District Head quarter hospitals which have public health laboratory facilities.

A) Laboratory facility available at the district head quarter hospital:

The District head quarter hospital is situated at Cuttack city.The laboratory facilities available here is meant for the district referral services. The existing facilities are As follows.

Pathological investigations done in the laboratory are as follows

Types of lab investigations	Average number of tests done per *month*	Number of tests that can be done per month
Malaria	*900 to 1000*	*1200 to 1500*
Filaria	*20 to 25*	*30 to 40*
Leprosy	*20 to 25*	*25 to 30*
General pathology:		
Stool:Routine, microscopic And occult blood Urin:Routine, Microscopic, Billirubin salt and pigment	*900 to1000*	3000
Sputum AFB		
Seminal fluid analysis	*1150*	3000

Staff position in the district hospital laboratory

Nature of post	No of post	Wings
Laboratory Technician	One	Malaria
Superior Field worker	One	Malaria
Laboratory Technician	One	Filarial
Insect collector	Seven	Filarial
Laboratory attendant	One	Filarial
Lab Technician	One	Leprosy

Senior Technician	Four	General Pathology
Junior Technician	Three	General Pathology
Laboratory attendant	One	General Pathology

B) Laboratory facilities available at Peripheral Health institutions

Only at block PHC/CHCs, Sub-divisional and area hospital level laboratory facilities are available and they are as follows.

Institutions	Types of Laboratory tests conducted
Athagarh Sub-divisional Hospital	Routine pathological investigations – blood, urine and stool, Malaria parasite, Sputum AFB
Banki- sub divisional hospital	Do
Adasapur-PHC	Do
Badamba Govt hospital	Do
Brajarambha dispensary	Do
City chest clinic	Do
Dampara PHC	Do
Judum govt hospital	Do
Kalapathar Govt Hospital	Do
Leprosy Home Hospital	Do
Mahanga PHC	Do
Mahidharpada PHC	Do
Maniabandha PHC	Do
Niali PHC	Do
Narasinghpur Govt dispensary	Do
Nischintakoili PHC	Do
Nadiashaspur Dispensary	Do
Padmapur Govt Dispensary	Blood DC. TLC, ESR, HB% and sputum AFB
Raisunguda Dispensary	Do

Salepur PHC	Routine pathological investigations – blood, urine and stool Malaria parasite, Sputum AFB
Subarnapur PHC	Routine pathological investigations – blood, urine and stool Malaria parasite, Sputum AFB
Sailogobindapur PHC	Do
Tigiria govt Dispensary	Sputum AFB, Blood DC, TLC, HB%
Telengapentha PHC	Blood DC, TLC, ESR, HB% Urine and stool routine and microscopic tests Sputum AFB
OMP hospital	Do
Police hospital, Buxi bazaar, Cuttack	Do

C) Leprosy laboratories in the district of Cuttack

Leprosy laboratory facilities are available at following leprosy eradication units the.

Name of the institutions	Skin smear tests conducted- average per month	Sanctioned post of lab technicians	Lab technicians in position
ADMO-OH Cuttack	50	2	1
*LEU, Cuttack	50	2	2
**ULC, Cuttack	30	1	1
LEU Athagarh	50	2	2
LEU Banki	50	2	2
LEU Salipur	50	2	2
***LHH Cuttack	300	2	2

*LEU-leprosy eradication unit

**ULC- urban leprosy unit

***LHH-Leprosy home and hospital

D) Laboratory facilities In The Blood bank

The blood bank is situated in Cuttack city near the medical college campus. The following Laboratory investigations are conducted here.

Types of tests	No.of tests per month
HIV-ELISA -SPOT	900to 1000
HBS Ag-SPOT	900 to 1000
VDRL	900 to 1000
Blood sampling and cross matching	900 to 1000
DC, Peripheral smear, LCT	900 to 1000
Malaria parasite	900to 1000

Equipments: ELISA machine, Insulator, Centrifuge machine, Electrionic Microscope

Personnel: -3 doctors, 3 lab technicians and 6 attendants

E) Referral laboratories

Many state level laboratories including the premier medical college of the state i.e SCB Medical College, Cuttack are situated in the head quarter city of the district. It is great opportunity for the district health system to avail these facilities.

State Pathology Laboratory, Cuttack

There is a State Pathology Laboratory situated at Jobra area of Cuttack city, which is within one km from the SCB Medical College and 4 km from the district head quarter hospital. This laboratory has been set up since 1948 as the State public health laboratory. In earlier days vaccine testing was conducted in this laboratory. This laboratory functions under the Director of Health services, Orissa.

ollowing laboratory investigations are conducted here:

Types of tests	*Average No. Of investigations conducted per month*	*Types of tests*	*Average No. Of investigations conducted per month*
Pathological: -		Bio- chemistry: -	
Stool-Routine and	80 to 90	Blood sugar	150 to 180
microscopic	80 to 90	Blood cholesterol	50 to 70
Urine –Routine	3 to 5	Blood urea	50 to 70
and microscopic	40 to 50	Blood creatine	50 to 70
Stool for occult	40 to 50	N.P.N.	1to 2
blood	5to 10	Uric Acid	30 to 60
F.U.S	2to 5	Billirubin	20 to 40
P.P.U.S	1to 3	Direct Van Den	20 to 40
P.G.U.S	1to 3	Burgh	5 to 10
Sputum for AFB	10 to 15	Serum protein	5 to 10
Skin smear for	1to 3	Serum globulin	5 to 10
AFB	1to 3	Albumin-Globulin	1 to 5
Skin smear for	1 to 3	Ratio	1 to 5
fungus	1to 3	24 hour urine	5 to 10
Nasal smear for	1to 3	protein	
Eosinphil		24 hour Urine	
Vaginal swab		Creatine	
Vaginal smear		Serum Alkaline	
Seminal fluid		Phosphatase	
Urethral swab			
Urethral smear			

Haematology: -			
Blood D.C	150 to 180	Bacteriology: -	
T.L.C.	100 to 150	Stool culture	80 to120
Peripheral smear	100 to 150	Urine culture and	40 to 60
Hb%	100 to 120	sensitivity	1 to 15
TRBC	30 to 50	Sputum Culture an	10 to 20
PCV	30 to 50	Sensitivity	3 to 6
B.T.	30 to 50	Throat swab culture	5 to 10
C.T	30 to 50	and sensitivity	1 to3
M.P	120 to 150	Aural swab culture	
E.S.R	130 to 170	and sensitivity	
Platelets	1to 5	Pus culture and	
VDRL	5 to 10	sensitivity	
Urine For	2 to 5	Blood culture and	
pregnancy test		sensitivity	
Serology: -			
VDRL	10 to 15		
Widal	10 to 15		

Staff position: In this laboratory the staff position is as follows: One state Bacteriologist cum Pathologist, one assistant to state Bacteriologist cum pathologist, one mobile medical officer, one medical officer for biochemistry division, two senior microbiologists (now one post is vacant), two junior microbiologist (now one post is vacant), one media maker, one senior laboratory tehnician, three junior lab technicians (now two are in position and one is on deputation to medical college microbiology laboratory). Besides these technical staffs there are one peon, four sweepers and one watchman working in the laboratory.

Suggestions for up gradation of the laboratory: -

This laboratory is now facing lot of constraints due to shortage of staffs and funds. Due to such constraints many investigations, which were previously done, are not done now such as antigen typing tests for Salmonella, Shiegella, Vibrio cholerae etc. But in the context of emerging and remerging infectious diseases in the sate of Orissa this laboratory has the relevance and it needs to be strengthened. As this laboratory is situated in Cuttack City it is a great strength for Cuttack district.

This laboratory needs to be strengthened by modern communication facilities like FAX/ Internet besides the existing Phone facility.

Modern Laboratory equipments like spectrophotometer, Plain photometer, ELISA reader for HIV and Autoanlyser are needed for the Laboratory.

Continuous facility for skill up gradation of the staffs is essential.

There should be good coordination between the State pathology and SCB medical college laboratories. Adequate number of technical staffs as well as support staffs should be in position with well-defined work schedule.

2) Laboratory facilities in SCB Medical College Cuttack

SCB Medical college & hospital, Cuttack is the oldest Govt. Medical college and Hospital of Orissa. Medial college and hospital laboratories are the referral laboratories for the state .As this medical college is situated in Cuttack district, it caters the needs of the population of Cuttack district to a large extent.

Following Lab facilities are available here.

<u>Microbiology laboratory</u>

Bacteriology:

Culture of purulent fluids like, pus, CSF, Blood, Cynovial fluid, Urine, Sputum.

Bacteriological culture includes: aural swab, throat swab, conjunctival swab, nasal swab, and high vaginal swab.

Serology: In serology following tests are conducted: ASO, RA, CRP, DNA Test, ICT for malaria

(Pf & Pv), Brucella agglutination test, Widal test, VDRL.

Mycology:

In this section following investigations are conducted: Culture of fungus for nail, skin,hair and all other fungal diseases.

Virology:

Tests for HIV and AIDS, hepatitis A, B, & C are done in this section.

Spirochete:

Tests are conducted for Leptospirosis, Trepanoma pallidum, N. Gonorrhae (Fluorescent antibody test)

Microbiology Laboratory of SCB Medial College is the referral centre for

VTCT (voluntary blood testing and counselling centre sponsored by NACO)

Anthrax

Vibrio cholerae

Staining Reagents used in the microbiology Laboratory:

Stains used in the microbiology Laboratory of SCB Medical College, Cuttack are as follows:

Gm staining, Zn staining, LCB staining (lacto phenol cotton blue), Negative staining and Albort staining

Special tests:

CFT for JE virus, Haem agglutination tests for influenza and JE and other Arboviruses.

Types of tests conducted	*Average per month*	*Maximum per month*
Culture	*1000 to 1200*	*1200*
Serology	*600 to 700*	*800*
Virology	*200 to 250*	*300*
HIV /AIDS by ELISA	*2000*	*2500*
Hepatitis (A B C)	*300 to 500*	*500*
Fungus (Leptospirisis)	*300 to 500*	*500*
Staining	*500 to 700*	*800*

Available equipments:

Incubator, incipirator, autoclave, vertical laminar flow, mycology instrument such as hood, Anaerobic and Aerobic culture facility, double distiller plant, ELISA reader, ELISA machine for hepatitis investigations, colony count instrument, dark ground illumination microscope, fluorescent microscope, type II safety unit for Anthrax investigation, facility for CD4 and CD8 cell count for HIV and AIDS monitoring of treatment.

*Staff position:*4 Microbiologists, 3 Postgraduate microbiology students, 16 Laboratory technician, 6 Laboratory attendants and 6 Sweepers.

Communication Facilities: -

Phones, Fax, Computer with Internet facilities are available in this laboratory.

Laboratory records are maintained satisfactorily.

Pathology Laboratory

a*) Haematology section*

Types of investigations	Average no. of tests/month	Maximum no. of tests expected/ month
Hb%	300	400
DC	300	400
TLC	300	400
ESR	70	100
Total platelet count	200	300
Malaria parasite	150	250
Peripheral smear	150	250
comment	30	50
BT, CT	30	50
Reticulocyte count	8	20
Fragility	10	30
G6PD	10	20
LE (lupus erythrocyte)	2	5
Nasal smear for	50	100
Eosinophil (NE)	100	160
Sickling	2	5
CSF	8	5
Microfilaria	2	5
PCV	15	20
Bence Jone protein in	15	10
urine	15	10
Seminal fluid	20	30
Hb F	1	2
Serum electrophoresis		
Bone marrow		
Blood aldehyde		

Laboratory personnel available: -

There are 5 pathologists, 4 lab technicians, one attendant and one sweeper.

Lab equipments: There are one electrophoresis chamber, 15 Microscopes, one Incubator, one Hot woven, one, water bath, one centrifuge machine.

Reagents supply to the laboratory is adequate.

Lab records are well maintained.

Infrastructure facility is not adequate.

b) Chemical Section

Types of investigations	Average no. of tests / month	Maximum /month expected
Blood glucose	1900	2000
Blood urea	400	600
SGOT	230	300
SGPT	230	300
ALP	230	300
Bile	500	600
Creatinine	400	600
Cholesterol	240	300
TG	102	300
PTT	20	150
ALB	230	300
SGPT	63	100
PRO	67	100
CPK	36	50
CKMB	32	50
AMY	35	50
Uric Acid	20	30
Calcium	20	30
Phosphorous	10	30

Staff position: 5 Pathologists, one senior technician, one junior technician and one laboratory assistant.

Lab equipments: One auto analyser, one spectrophotometer, Auto pipettes, centrifuge machine, water bath, refrigerator etc.

Lab records are maintained satisfctorily.

c) Histopathological Section

In this section of the pathology laboratory, Histopathological investigations and special stains are done. Average number of investigations done per month is 550 and maximum that can be done is about 700.

Lab personnel: there are 5 pathologists to look after the investigations, one senior research assistant, One senior technician, one junior technician, one attendant, one sweeper.

Lab equipments: There are one histokinete, one microtome, one incubator, one water bath, and one hot plate and 8 microscopes.

Lab records are properly maintained.

Infrastructure facility is very inadequate.

d) Clinical pathology Section (at OPD)

Types of investigations	Average investigations done per month	Types of investigations	Average investigations done per month
HB%	750	Peripheral smear comment	5
TWBC	670	ESR	360
TPC	15	BT, CT	240
PCV	15	Stool-Routine and microscopic	150
DC	900	Urine Routine and Microscopic	450
MP	180	Nasal smear	0 to 1
MF	10	Conjuctival smear	0 to 1
		Seminal fluid	2

This section of the laboratory is with poor infrastructure but is over loaded. There are 3 lab technicians, 2 attendants and one sweeper for the lab works. Lab records are maintained properly with the available logistic supports.

3) Central laboratory (pathological section)

Types of test	Average No. Of tests per month
<u>Blood-</u>	
Hb%	2500
DC	2500
TLC	2500
Malaria parasite	1200
Total platelet counts	600
Bleeding time	700
Clotting time	700
ESR	1000
Packed Cell Volume	500
Peripheral smear comment	400
TRBC	100
Micro filarial	50

Laboratory staffs: - there are 3 senior lab technicians, 5 junior laboratory technicians and 4 sweepers

This Laboratory functions in two shifts i.e. from 8 am to 9 pm.

Lab records are maintained well.

4) Biochemistry Laboratory: -

This laboratory functions inside the Biochemistry Department of the Medical College.

Types of lab investigations	Monthly average tests done
Blood sugar	1600
Serum Urea	1600
Serum creatinine	1600
Serum lipid profile	300
Liver function Test	300
Serum Albumin	100
Serum Calcium and	100
Phosphate	120
Uric Acid	8 to 10
Serum Analysis	

Laboratory Equipments Available: One semi auto analyser, one colorimeter, 2 freezes,2 centrifuges, 4 auto pipettes ,2 incubators and 2 hot wire ovens

Laboratory staffs: -Besides the faculties of Biochemistry department there are 4 senior technicians, I junior technicians, I lab attendants, 3 sweepers and 3 attendants working in the laboratory.

Laboratory records are well maintained

5) Regional Medical Research Centre, Bhubaneswar

Regional Medical Research Centre (RMRC), Bhubaneswar is an ICMR branch functioning at Bhubaneswar situated at a distance of 40 km from the district head quarter hospital of Cuttack.This centre has well equipped laboratory facilities on the following aspects.

Types of laboratory investigations

Immunology	Leptospirosis, IGg & IGg
Clinical	Malaria, Filaria, OG C 4
Human Genetics	Sickle cell, G6PD
Microbiology	AIDS, Cholera
Pathology	Anaemia, Blood analysis,
Stool test, Urine test	
6) Molecular Biology	Anthrax

During outbreaks/epidemics, the Director of Health Services, Orissa seeks the help of this laboratory for confirmation of outbreaks. As Cuttack is a nearby district the laboratory facilities of this centre can be utilized for epidemiological investigations.

V.Suggestions for improving public health laboratory system

Laboratory plays an important role in public health especially during epidemics. Through laboratory confirmation only appropriate case management and containment protocols can be instituted. Establishment of suitable laboratory support will achieve

Early detection of cases

Reduction in morbidity

Reduction in mortality

Reduction in associated economic loss

Effective control

The State of Orissa as well as Cuttack district are prone to natural disasters like floods and cyclone. There is acute problem of potable drinking water and sanitation in rural areas which makes the district vulnerable to water and vector borne diseases. The Orissa Multi Disease Surveillance System

Has been established in this context after the super cyclone 1999 and it is functioning in the district of Cuttack since then. The major shortcoming in this surveillance system is public health laboratory facilities. There are State but in isolation. As there is no proper coordination and networking the existing strength is not optimally utilised during the time of need. Also there is there is no external quality control measures for the State run laboratories.

To strengthen the existing laboratories in the district following suggestions may be considered.

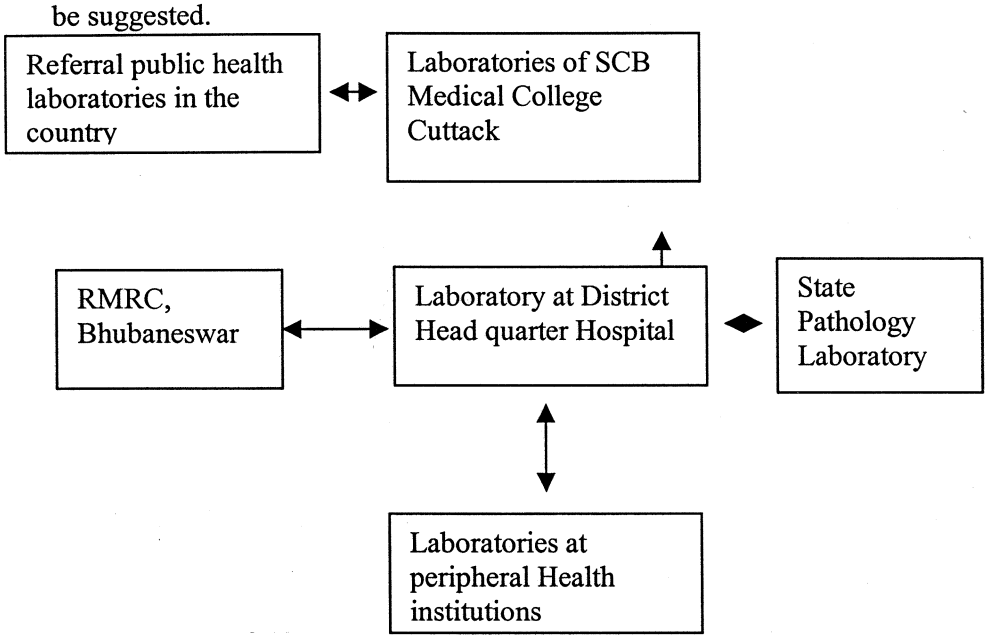
Laboratory training for medical officers and paramedical personnel

Up gradation of peripheral laboratory services with infrastructure, equipments, reagents and staffs.

Communication and data processing system for rapid transmission of information

Strengthening basic entomological services.

For networking of public health laboratories following schematic diagramme may be suggested.



1.3.DESCRIPTION OF ORISAA MULTI DISEASE SURVEILLANCE SYSTEM, CUTTACK DISTRICT

1.Introduction:

Disease Surveillance is getting greater importance in the last two decades due to emergence and re-emergence of many infectious diseases. Recently non-communicable diseases (Diabetes, Heart diseases, cancer, trauma, osteoarthritis, psychosocial distresses) are posing public health threat and drawing attention for surveillance. Pathogens responsible for causing diseases like Tuberculosis, Malaria, Cholera, Pneumonia have developed resistance to antibiotics thus adding to the existing burden. In Orissa the burden of traditional infectious diseases continues to be high. Although much has been done after independence in public health the State has to go a long way in providing health services to its people. An effective surveillance system forms the backbone to control diseases of public health concern. 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.

Thus disease surveillance system is a critical component of health system, providing essential information for optimal health care delivery and effective health strategies.

Disease Surveillance in India: Communicable diseases are still one of the most common causes of morbidity, mortality and disability in India and especially in the state of Orissa. They are the major causes of hospital admissions and account for high mortality and morbidity in children. Intensive single disease surveillance systems like that for Small Pox earlier and Acute Flaccid Paralysis at present have resulted in eradication or control of these diseases. Major infectious diseases like TB, Leprosy, Malaria and HIV/AIDS also have well-organized vertical surveillance systems. All states conduct surveillance for 17 notifiable diseases, but the operational efficiency of this system leaves much to be desired.

The first surveillance system for multiple diseases in the country was the National Surveillance Programme for Communicable Diseases (NSPCD). This programme started in 5 districts in 1997-98, and now extends to 101 districts in 28 States and Union Territories in the country. It has laid the foundation for basic surveillance activities including reporting and responding to outbreaks in the selected districts.

Integrated Disease Surveillance Programme" (IDSP):Currently, a multi disease surveillance system called "The Integrated Disease Surveillance Programme" (IDSP) including both communicable and non-communicable diseases is being considered for implementation in a number of states. IDSP is envisaged to cover a wider spectrum of diseases and syndromes. It is expected to include laboratory data as well, in order to be able to categorise cases into different levels of specificity, like suspected, probable and confirmed. It is envisaged that the medical college hospitals, urban government health facilities, the NGO health sectors and the private health sectors would be included in this surveillance system.

Recently the Government of Orissa has implemented a multi diseases surveillance system since 1999 to address the epidemic prone communicable diseases.

In the context of IDSP the Orissa Multi disease surveillance system (OMDSS) operational in the state has great relevance to be shared with public health planners of the country.

1.1.Objectives of the study:

1.To describe the Orissa multi disease surveillance system (OMDSS) in Cuttack district

2.Describe the process of implementation and the critical components of OMDSS in Cuttack district

3.Identify the shortcomings

4. Suggest for improvement of the system

1.2.Methodology:

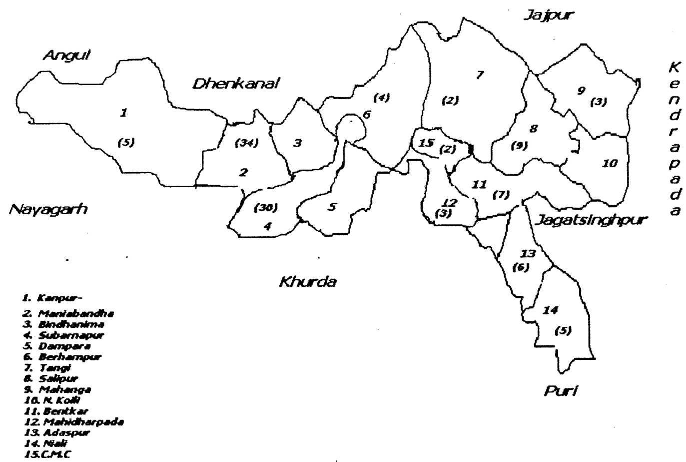
Studying the official documents to understand the background, the evolution & the present status of the surveillance system.

Discussion with the district nodal officer in charge of the surveillance system.

Observing the disease surveillance activities in the health institutions situated at district, hospital, and block and sub-block level.

(Background,population profile and health system of Cutack district has been described in first chapter).

Fig:1 Map of Cuttack District showing Block PHC/CHCs



OMDSS has been established in Cuttack district on the basis of existing district health system.

2.OMDSS in Cuttack District

The World Health Organisation defines surveillance as the "ongoing systematic collection, compilation, analysis and interpretation of data; and the dissemination of information to those who need to know in order that action may be taken."

Surveillance is the first step in interventions aimed at disease control and especially serves to detect early outbreaks of diseases.

2.1.Origin of OMDSS: Orissa being one of the coastal states of eastern India is always prone to natural disasters like floods and cyclones. Floods and cyclones & disasters due to other meteorological factors e.g. heat waves, draught etc becoming continuous features of the state. Infectious diseases being natural burden epidemics at different parts. Disasters when occur magnify the problem many folds.

The unprecedented Orissa super cyclone in Orissa,in October 1999, caused a great devastation in the coastal districts of the state. Out of 30 districts12 were badly affected. At the aftermath of super cyclone more than 8 million people were under stress and living in an unhealthy environment and there was great apprehension of epidemics of waterborne and food borne communicable diseases. The primary health care institutions were badly damaged in these districts and were not in a condition to respond to any epidemics, because the public health surveillance system in the state was not up to mark, prior to the super-cyclone. In this context Govt. of Orissa set up OMDSS to detect outbreaks/epidemics, follow the disease trends, predict epidemics and take timely action to control and prevent unwanted health events with the technical support from Medicine Sans Frontier (MSF) and financial & technical support from WHO. In November 1999 OMDSS covered all the Government Primary Health Care System in the 12 cyclones affected districts as the first phase activities. The new surveillance system gained strength week by week. Cuttack district being one of the 12 cyclone affected districts got the opportunity to be included in OMDSS in the first phase itself.

Government of Orissa got encouraged by observing the effectiveness of the new surveillance system and expanded it to all the districts in the second phase i.e., after one year, by integrating it with the World Bank assisted, Orissa Health System Development Project (OHSDP).

The OMDSS is currently operational in all the 30 districts of the state having 314 blocks with 5927 sub-centres, 1166 sector PHCs, 183 Block PHCs, 158 CHCs and 53 Hospitals, which includes Sub-divisional, Area and District Headquarter hospitals. All are under the jurisdiction of the Director of Health Services (DHS), Orissa.The system has made a significant change in the way disease incidence data is collected, compiled, transmitted, analysed and used for intervention.

2.2.Objectives of OMDSS

Epidemic (outbreak) detection and intervention.

Predicting potential outbreaks e.g. malaria

Monitoring trends in endemic illness e.g. measles

Monitoring progress towards a control objective.

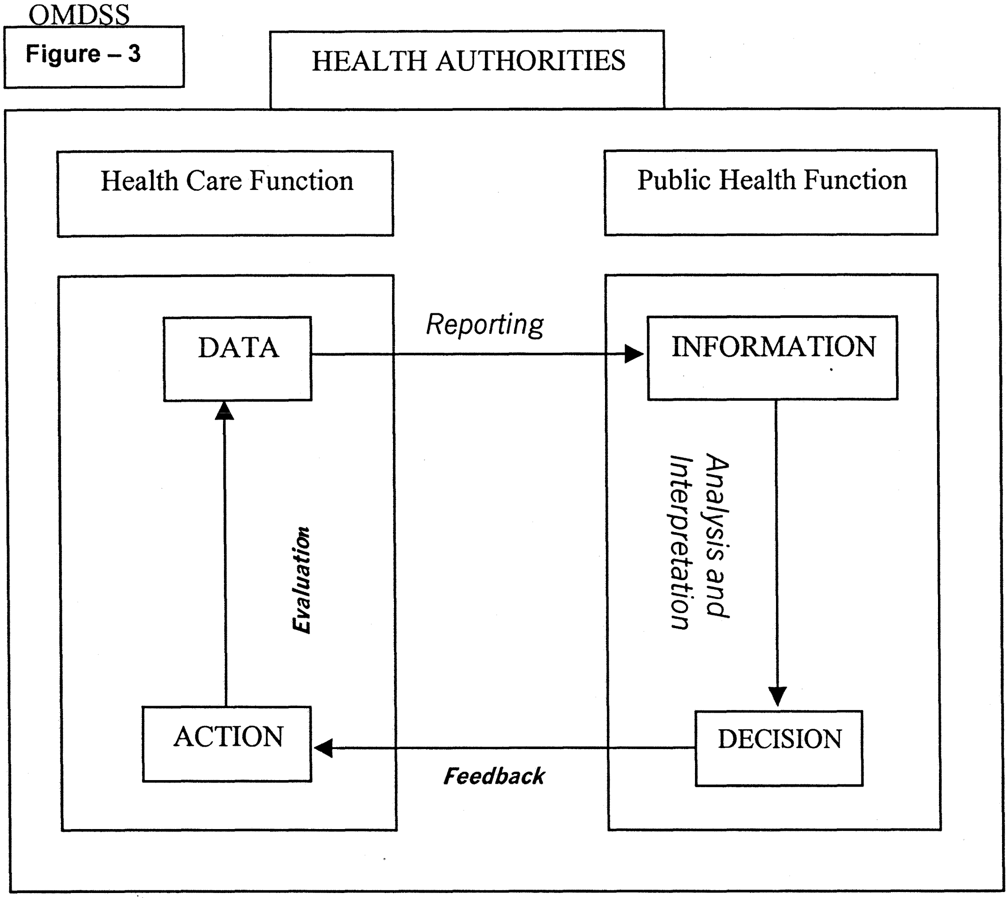
Monitoring programme performance.

Evaluating an intervention

Estimating future disease impact

2.3.Basic principles: The following diagram summarises the basic principles of OMDSS

Figure – 3



2.3.1.Data collection:

Data is collected for the following diseases/ syndromes: simple diarrhoea, severe diarrhoea, bloody diarrhoea, acute jaundice syndrome, suspected malaria, acute respiratory infection (upper and lower), measles, neo-natal tetanus, suspected meningitis and unusual severe syndrome. Heat disorders during summer and Skin infection and Snakebites during flood/cyclone are added to the list of diseases/syndromes under surveillance.

Primary data is collected on number of cases and deaths for two age groups (below five and five & above) due to the diseases / syndromes listed above. Uniform primary data collection format is used at all reporting units. The case definition for the diseases /syndromes under surveillance is same for all levels of health personnels in OMDSS.

Data sources: Outpatient door (OPD) and Inpatient door (IPD) registers of district/ subdivision / area hospitals and minor ailment registers of outreach health workers (male and female multipurpose health workers) are the major source for OMDSS data.

2.3.2.Reporting:

Reporting is on weekly basis during normal times, daily during emergency situation (disaster, outbreak or an epidemic situation and seasonally for heat disorder in summer).

Reporting is done manually through messengers and post, through telephone, fax, email, etc depending upon the availability of the communication facilities at the respecting unit.

Transmission of compiled data is done from one level to next higher level as per the fixed day in the week for each level.

2.3.3.Analysis and Interpretation

Validity of data (data is checked for missing values, expected/unexpected frequencies, cross-tabulation, bias, duplication)

Descriptive analysis (with respect to time, place & person)

Generation of hypothesis

2.3.4.Feedback and response for

Control: Rapid response, case management, containment measures.

Reports: Investigation reports, morbidity & mortality reports.

Policy: Policy change using MDSS data e.g. to initiate mass immunization for measles and planning for public health initiatives as in Malaria Control.

2.3.5.Monitoring and evaluation

Evaluation of surveillance objectives.

Evaluation of methods: qualitative and quantitative attributes, e.g. reporting completeness and timeliness, data transmission methods, data compilation methods etc.

Evaluation of operational aspects of the system inputs and outputs

Evaluation of usefulness of surveillance

Economic Evaluation of the system

2.4. Basic Ingredients of OMDSS:

Network of motivated people

Clear case definitions and reporting mechanisms
Data transmission/ Communication systems
Basic Epidemiology
Feedback and rapid response mechanism
Laboratory support

2.5.Attributes:

Attention is paid to achieve the following attribute of surveillance system in OMDSS.

1).Simple in design and operation 2). Flexible to admit changes in design and operation modes 3).Acceptable to health workers, administrators, policy makers and community 4).Sensitive to capture all disease events under surveillance 5). Predictive value to be high to avoid wastage 6). Representative of the population 7). Timeliness on in information processing, response and completeness of the surveillance reporting.

2.6.Components Of OMDSS

The core components are :

Case Detection
Data recording and Collection
Data compilation and Transmission
Analysis, interpretation and report generation
Response and follow-up
Laboratory investigation
Feedback

The support components are
Supervision and monitoring.
Training.

Each of the above components/ functions are described below.

2.6.1.Case Detection

Case detection is based on the clinical definition of cases of a disease or syndrome. Case definitions are designed to be:

Simple: so that it is easy for the health workers and paramedical personnel, who are the backbone of the system, to understand and use it for diagnosis,

Precise: so that there is no confusion while making a diagnosis, Uniform: It is uniform for all the level of health system, so that data can be compared, and interpreted in a similar manner anywhere.

Highly sensitive: The system is highly sensitive to 'catch' all the cases of the disease/ syndrome under consideration.

The clinical case definitions for the diseases /syndromes under the OMDSS have been developed as per the state protocol and are followed at all levels of the health system by all health personnel involved in disease surveillance. Participants in the system do not have the freedom to modify the case definitions or use their own definitions, as this will result in the loss of validity of the data being generated. Case definitions used in MDSS are mentioned at Annexure 1.

Where the cases are detected?

A patient seeks care at a health facility (OPD of hospitals / dispensary / CHC and PHC clinics).

The Multi Purpose Health Worker (MPHW) detects cases during his/her routine home visit / clinics day

District Task Force (DTF) identifies cases during field visits.

A community nodal person reports a suspect case of an epidemic prone disease, e.g. outbreak of measles / acute diarrhoea / unusual health events etc.

The media reports for clustering of cases in a community or area, e.g. acute diarrhoea / gastroenteritis outbreak in a village.

Cuttack medical college hospital may report a suspected outbreak to district authority if clustering of unexpected number of cases are received from a particular area of the district.

Laboratories may notify cases when they get positive investigation results for diseases/ syndromes under surveillance.

2.6.2.Person responsible for case detection

Usually most of the disease occurrence / events are detected at the reporting units.

The responsibility for detection of cases rests with the technically qualified person at each level of the health system.

Example: In a subcenter: it is the responsibility of the Multi Purpose Health Worker (Female & Male).

In a health facility with a doctor attending: it is the responsibility of the doctor. When the doctor is not available the trained and qualified paramedical person (e.g.

Pharmacist, Health Supervisor, Nurse) substituting, the doctor is responsible for case detection.

Data recording

Documentation or case recording is vital for effective surveillance.

Once cases are detected, they should be *clearly and legibly* recorded in the proper registers.

The health workers/ supervisors/ doctors/ pharmacists/ nurses maintain records of all the cases seen during house visits/in the OPD/ casualty/ emergency room respectively.

Particulars of cases including Name, Age, Sex, Geographical area of residence, the probable diagnosis and the treatment given and outcome (if relevant) are recorded on a daily basis.

Recording of the probable diagnosis using the disease/syndrome labels specified in the Clinical case definitions (Annexure 1) is followed for data collection.

Information on whether the particular patient is a new case of an illness or has come for follow-up (repeat case) is also recorded in the registers.

In the event of a death, whether the patient was brought dead or the patient died in hospital, with probable/confirmed cause of death, are meticulously recorded.

The person in charge of the laboratories also keeps records of all the investigations in the laboratory register.

2.6.3.Data Collection

Type of Data: Two types of data are collected for each of the selected diseases/ syndromes that are reportable. Number of cases & number of deaths are collected in the primary data collection format.

This data is collected for two age groups i.e. less than 5 years & 5 years and above.

MDSS Week: Data is collected over a one-week span i.e. Saturday to Friday (MDSS Week). This constitutes a reporting week. There are 52 reporting weeks in each calendar year.

The calendar of reporting weeks for the years 2001, 2002 and 2003 that is followed in OMDSS is provided in *Annexure – 5.*

Reporting format: A uniform weekly reporting format is supplied to all health facilities for documenting the data collected. A sample of this format is given in *Annexure*

Rules followed while Collecting Data

1.Only newly detected cases are counted.

During a reporting week or consecutive reporting weeks a patient with an episode of a particular illness is counted only once.

For example, if a patient having fever with chills and rigor seeks treatment at a health facility on a particular day, s/he would be counted as a case of suspected malaria according to the case definition of OMDSS. If s/he visits the health facility again for investigation, treatment or follow-up on subsequent days for the same episode of illness s/he will not be counted as another case of suspected malaria. Whereas if s/he visits the facility on subsequent days with other complaints unrelated to the episode of illness for which he initially visited, then depending upon his symptoms and signs he will be diagnosed to have another illness and counted as a new case for that particular illness.

In other words repeat visits/ admissions for the same episode of a particular illness is not counted as a new case. Only new visits/admissions for new episodes of illness of a person is counted as a new case.

This entails that the outpatient and inpatient registers which are the primary sources of disease surveillance data should have details that would enable clear identification of new visits for new episodes of illness from repeat visits for the same episode of illness as already mentioned in case recording.

For OMDSS reporting, a patient with multiple diseases is counted as a case of one disease only for a single visit/ admission. The disease/ syndrome for which he has to be counted as a case is decided using the following set of thumb-rules.

An OMDSS disease/syndrome (including unusual syndrome) to be counted in preference to a Non-OMDSS disease/syndrome.An OMDSS disease/syndrome with greater outbreak potential to be counted in preference to an OMDSS disease/ syndrome with comparatively lower outbreak potential.Among OMDSS diseases/ syndromes with similar outbreak potential the one with higher case fatality are counted as cases for that disease / syndrome.

2: Zero Reporting.

It is important that even if a reportable health event (case/death) did not occur in a particular place in a certain week, the respective space in the reporting form should be marked with a zero(0). It should not be left blank, or marked with a dash (-), slash (/) or cross (X) etc. and this has been emphasized during training as "*Zero Reporting*"

Table 2:

Persons responsible for data collection at the various levels in Cuttack district.

Reporting units	Primary person responsible	Alternative person responsible
Health sub centres	Health Worker (Female)	Health Worker (Male)
OPD of PHC (New)	Pharmacist	Health Supervisor
OPD/IPD of PHC/CHC	Pharmacist	Health Supervisor
IPD of Medicine and Paediatrics departments of Sub divisional hospital (SDH) and District Head Quarter Hospital (DHH)	Staff Nurse	Pharmacist

2.6.4.Data compilation and transmission

<u>Data Compilation</u>

Data compilation is the process of summing up or aggregating the primary data collected (the case and death counts) from the reporting units of lower level. Data is compiled at the next higher level of the reporting units.

MDSS data is compiled at all levels of health facilities that are coming under the district health system namely, the sub-centre, the sector PHC, the Block (PHC/CHC), the District (CDMO Office). The district level compiled data is transmitted to the State Disease Surveillance Cell. The processes of data compilation at various levels are shown in table:3.

Table 3: The data compilation process at various levels

Compilation Level	Main Report compiled from:	Additional Reports to be compiled from:	Reports to be compiled by:
Sub-centres	Data collected from each village covered by the sub-centre	None	Health worker (F/M)
Sectors	Data reported by each sub-centre under the sector and data collected at the sector PHC	Reports received from: *Govt. Health Facilities*	Health Supervisor (M/F) at PHC-New
Block	Data reported by each sector under the block and data collected at the block PHC / CHC	Reports received from: *Govt. Health Facilities*	Statistical Assistant /Vital Statistics Clerk / Pharmacist / Block Extension Educator at Block PHC/ CHC
District	Data reported by each block and area, sub-divisional and district headquarters hospital	Reports received from: *Govt. Health Facilities*	Data entry operator/ Statistical Assistant / Vital Statistics Clerk or any other person posted for that purpose at CDMO office

Data is compiled manually at the sub-centre, sector and block levels. Computer facility is available at district level only.

Specific compilation formats are used at different levels.

<u>Responsibilities of data compiler:</u>

To look for incompleteness in the reporting forms and inconsistencies in data and other errors before data is compiled.

To crosscheck errors and doubts with the original report before compilation.

To ensure that the immediate lower level compilation units have sent separate compilation reports for each different type of health sector sending reports to that level.

To ensure that the immediate lower level compilation units have sent the break-up reports. It is emphasized that there should not be any delay in transmission of the compiled report to the next higher level due to report cross checking procedures from the lower level. If the data found to be wrong then when the correct data is available it is sent to higher level after cross checking with a marking as "updated or corrected report".

2.6.3.Data transmission The completed data compilation reports and the necessary break-up reports are transmitted to the next higher level as described below.

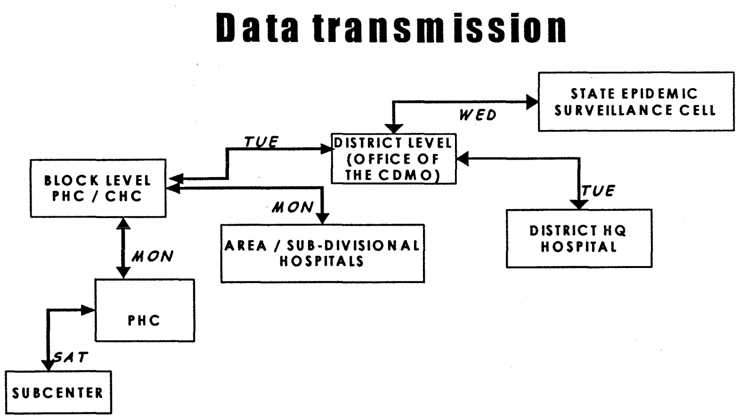
Report transmission mechanism

From	To	Person(s) responsible	Mode of transfer	Day
Health Sub-Centre	Sector PHC	Health Worker (F), Health Worker (M)	Manual	Sat
Sector PHC	Block PHC or CHC	Health Supervisor (M/F)	Manual	Mon
Block PHC / CHC	District Level	Pharmacist/SA/VS Clerk/ BEE	Electronic or Manual	Tue
Hospitals (SDH/ Area hospital/ DHH)	District Level	Pharmacist/ Staff Nurse/ Medical Records Staff	Electronic or Manual	Mon
District Level	State Level	DEO/SA/VS Clerk	Electronic	Wed

SA – Statistical Assistant, VS – Vital Statistics, BEE – Block Extension Educator, DEO – Data Entry Operator.

It is always emphasised to stick to the deadlines with respect to data transfer, by all the reporting units, so that the time delay between data collection and initiation of action is reduced as far as possible. The compiling units should not wait for all reports from the reporting units, in order to transmit data to the higher levels. Reports that arrive late should be marked "Supplementary Report", and sent to the higher level when received. It has been emphasised that at every level the supplementary reports should be entered into the actual week for which it was reported, and NOT the week it was received/sent. If any data has been transmitted over the phone, it should be followed by a hard copy, The person assigned to receive the weekly disease surveillance reports from the lower levels are supposed to maintain a log book by which it becomes easier to monitor the timeliness and completeness of data transmission as well as record problems in transmission, if any. One of the problems encountered with data transmission is the delay in transmission and poor reporting efficiency during government holidays.

Schematic diagram of data transmission is given below (Fig:4)



2.6.4.Data transmission in the event of a potential or a suspected outbreak

In normal situation reporting units transmit the Surveillance data every week. Immediate and daily reporting is necessary in the following circumstances.

When there is a threat of outbreak / epidemic or when already outbreak has occurred.

Whenever a case of an epidemic prone disease: Severe Diarrhoea, Measles, Dengue, Leptospirosis, Japanese Encephalitis and Plague etc is suspected by the health facility/worker. Whenever any unusual clustering of cases (more than expected number of cases with similar symptoms occurring close to each other in time and place) or any health related event that causes deaths in a short span of time is detected by the health facility/ health worker.

2.6.5.Communication facility during emergencies

Rapid mode of communication system like, telephone, telegraph, telex, fax, email, police wireless or special messenger are used to transmit the report immediately. When the reporting is given telephonically it should be followed by a written document.

2.7.Report generation, analysis and interpretation

2.7.1.Report generation:

The following reports are generated, maintained and updated using the compiled data at Block and District levels:

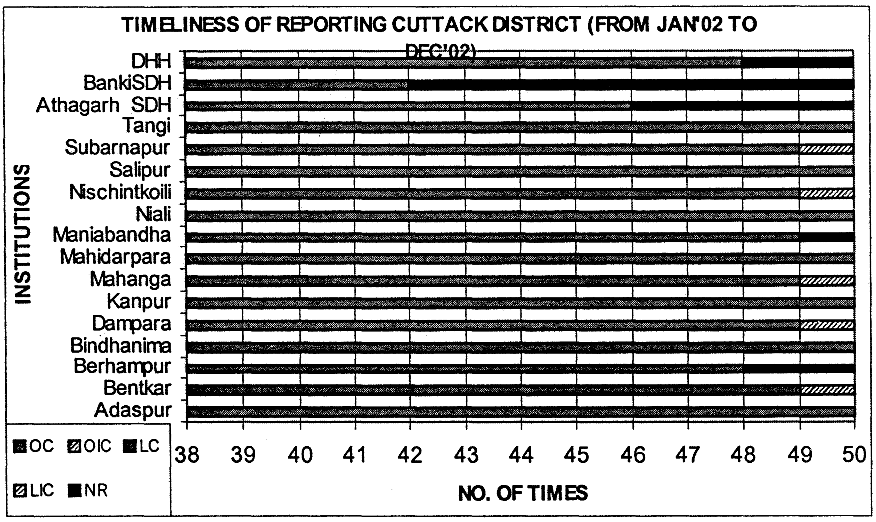
1.Timeliness of reporting: By the scheduled deadline for transmission of reports the reports must reach the next higher level. The timeliness of reporting is calculated by the following formula:

Number of reporting units transmitting reports by the fixed day in the week divided by the total number of reporting units under OMDSS for the district (if calculated for a Block then accordingly reporting units of the particular block is taken into account) × 100. *Presently this has not yet been practiced at block level.*

At the district level, a colour code-monitoring tool has been put in place to monitor the timeliness and completeness of reporting. There is plan to institute this at the block level in the near future.

Timeliness of reporting of Cuttack district is depicted in fig: 5.

Fig:5.

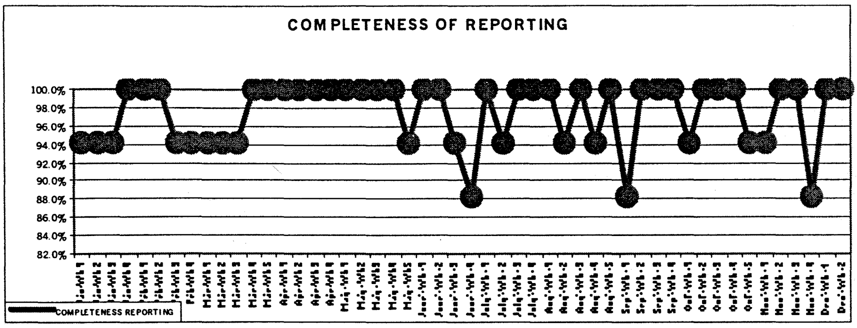


2.7.2.Completeness of reporting

This is calculated as follows: Number of units, which have actually sent reports in a particular week) divided by (Total number of reporting units under OMDSS for that particular block/district) × 100.

For example, there are 14 blocks and 3 hospitals in Cuttack district, so the total numbers of reporting units are 17. If in a certain week, 12 units send their reports to the district level, the percentage of reporting units that have actually reported is (12/17) × 100 = 70.58%. The target is to reach 100% reporting every week.

Fig: 6 showing completeness of reporting



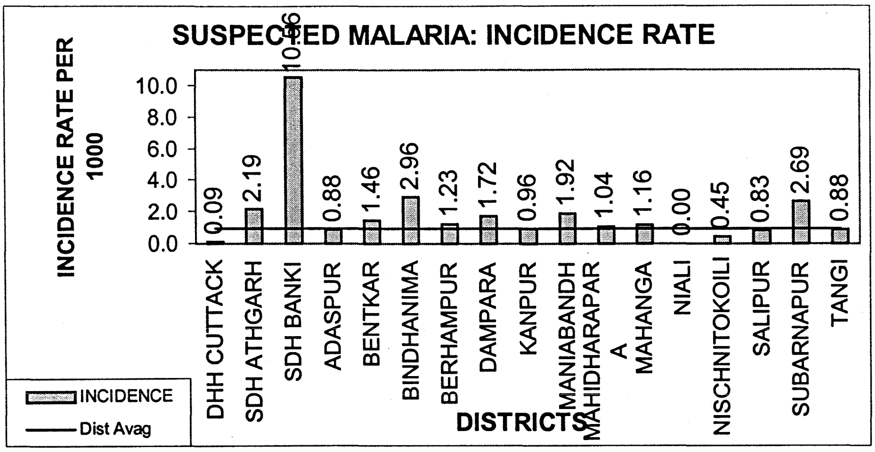
2.7.3.Summary tables: for number of cases, deaths and incidence rates (classified into under-fives and five & above, as well as the totals) for each disease/ syndrome at each level in the health system is generated for its own, as well as its immediate lower level. For example, the district generates summary tables for the whole district, as well as for each block.

Table 4: Summary table showing the number of cases and deaths, by age group, Cuttack district. Week Dt. 23rd Nov 29th Nov 2002

Disease/syndrome	< 5 Years		>= 5 Years		Total	
	Cases	Deaths	Cases	Deaths	Cases	Deaths
Simple Diarrhoea	790	0	1304	0	2094	0
Sever Diarrhoea	11	0	23	0	34	0
Bloody Diarrhoea/Dysentry	221	0	535	0	756	0
Acute Jaundice Syndrome	0	0	2	0	2	0
Suspected Malaria	411	0	1946	0	2357	0
Acute Respiratory Tract Infection	1748	1	3474	0	5222	1
Measles	3	0	7	0	10	0
Neonatal Tetanus	0	0	0	0	0	0
Suspected Meningitis	0	0	0	0	0	0
Heat Stroke	0	0	0	0	0	0
Any Unusal Severe Syndrome	0	0	0	0	0	0
Others	4862	7	17650	89	22512	96
Total	8046	8	24941	89	32987	97

Graphical presentations of the compiled data from lower levels, is made at district level. An example of a Block wise comparison graph for Suspected Malaria incidence rate is shown in the following figure.

Fig:7.Blockwise incidence of suspected malaria, Cuttack district,2002



At district levels the weekly incidence rate for each disease/ syndrome is updated graphically every week.

2.7.4.Analysis and Interpretation of Data

Data is analysed in order that information can be interpreted and utilized to initiate action. For this to happen, data is represented in a systematic, analysable manner, and segregated into well-defined, epidemiologically distinct groups. Data Analysis helps in: - Identifying outbreaks or potential outbreaks, predicting outbreaks, monitoring disease trends of disease occurrence rates over time, identifies problems in the health and related systems, identifies high-risk population, groups assessment of the impact of interventions, identifies the most appropriate and timely control measures.

Important Points In Data Analysis

A fixed day of the week has been earmarked for analysis.

Analysis is done before transmission of the reports to the next higher level

Validity of data is checked before analysis

After analysis reports are generated

Analysis should ideally be done at all levels i.e., from the periphery upwards. Data should be analysed every week at the sector, block and district levels.

At present mostly data analysis is done at district level. After the next round of training it is expected that analysis will be done at block and sector level also.

It has been planned that there should be designated supervisory level personnel at each level of the system, who will be responsible for the analysis and interpretation of the data. That person may then co-opt other members to form a 'technical committee' (TC), who will assist him/her, e.g. at the district level, the Assistant district medical officer –public health (ADMO -PH) with assistance from the Assistant Health Officer (AHO), Data Entry Operator (DEO)/ Statistical Assistant (SA) who are involved in data compilation and generation of reports. This team is expected to meet weekly to review, analyse and interpret the reports generated by the OMDSS.

At present, there is a District Task Force (DTF) for disease surveillance. DTF is headed by ADMO Public health .An Assistant Health officer (AHO) is the key functionary for execution of DTF work. Data analysis and interpretation is one of the responsibilities of the AHO under the supervision of the ADMO (PH) and with the assistance of the DEO/ SA posted to ADMO (PH) office.

Table 5:Persons responsible for data analysis at various levels:

Level	Person(s) responsible
District	ADMO (PH), AHO
Block	Medical Officer in charge
Sector	Medical Officer in charge

Data for each disease are analysed with respect to:

Incidence Rate = Number of new cases in a particular time period at a particular place / mid year population of the particular place × *K.*

Case Fatality Ratio = Deaths due to a particular disease within a time period/ Number of cases of that disease within that time period × K

It is now emphasised to analyse the data at the Block & Sector level, which can save a lot of valuable time in detecting and responding to outbreaks. Following minimum analysis is expected at block and sector level.

i) Monitoring timeliness and completeness of reporting of health facilities

ii) For detection of trigger events, some of which are listed below:

Clustering of cases of	Even one case of	Any unusual syndrome
Acute jaundice SyndromeBloody Diarrhoea Severe Diarrhoea Measles	Suspected Meningitis Neo-natal Tetanus	Causing deaths or affecting large populations.

2.7.5.Response and follow-up

The actions/ interventions that are initiated based on the interpretation of the analysed disease surveillance data constitute the responses of the system. The level, speed and scope of response depends on, the urgency of the situation, the transmission and availability of relevant additional information, connectivity and communication.

Regular response is the responsibility of the medical officer in charge at the block and sector levels and of the DTF at the district level. Regular response may be aimed at one or more of the following.

I outbreak investigations

Initiate disease control measures

Sorting out problems in system efficiency such as:

Inadequate data quality

Poor reporting efficiency

Lack of compliance to request for additional information or follow up

Outbreak investigation and response mechanism

One of the most important functions of the surveillance system is to generate *early warning signals* for detecting outbreaks of disease. There are various ways in which outbreaks can be detected. Some of which are followed in OMDDS in Cuttack district are as follows.

a)Review of routine surveillance data

One of the common ways of early detection is to review the data from routine surveillance and check if it exceeds expected incidence/baseline levels. The data analysis can be compared with nearby sector or blocks.

b)*To be alert for any unusual (trigger) events* that may be reflected in the routine data. Some examples are given below:

Clustering of cases or deaths in time and/or place

Unusual increase in cases or deaths

Even a single case of Measles, Severe Diarrhoea, Plague etc.

Acute febrile illness of unknown aetiology

Occurrence of two or more epidemiologically linked cases of meningitis, measles

Unusual laboratory isolate of an infectious agent

Shifting in age distribution of cases of a particular disease e.g measles

High vector density

Natural disasters

*c) Getting information from other sources e.g. c*ommunity nodal persons, informants NGOs, social organisations, public sector undertakings (PSU) and private sector institutions, other hospitals within the Government system, which are under the jurisdiction of other departments, e.g. the ESI hospitals and Government urban health facilities, media and other sectors.

Persons involved in outbreak investigation and response

At the PHC and CHC level, the MO of the concerned institution is the nodal officer who will respond to an outbreak. S/he can form a small investigating team comprising the Health Supervisors, health workers and the pharmacist/lab technician.

At the district level, the District Task Force (DTF) is responsible for investigating any reported/suspected outbreaks. At the state level, the State Task Force (STF) is responsible for handling any major outbreaks that have not been successfully managed by the DTF, epidemics occurring across district borders, outbreaks of unknown or unusual causes, or outbreaks with high Case Fatality Ratio.

Both the DTF and the STF work in close coordination along with the local health staffs in the event of an outbreak. While they will help and support the local staffs in the management and control of the outbreak, the primary responsibility for implementing control measures rests with the local health staff. A disease surveillance vehicle is available at the district level for the functioning of the DTF

Response to outbreaks

Control measures are instituted along with outbreak investigations, which are as follows.

General measures: - till the specific source and route of transmission is identified general measures are taken. For example, if an outbreak of water borne disease is suspected then a campaign should be started requesting people to use safe drinking water.

Specific measures: – depending on the causative agent, specific measures are instituted.

Equipment and supplies. Vehicles are kept ready. Special attention is given for establishing 24-hour *Communication channels* between the District and the team leader at the outbreak location.

Information education and communication (IEC) is strengthened to sensitise the community, transmit correct messages and ensure public cooperation in containing the outbreak.

Handling the media: A senior district health officer updates the press on a daily basis. This reduces the stress for the district managers and ensures communicating the right message to the community from one window

General measures are instituted immediately and specific measures after confirmation of diagnosis. The DTF should make a decision as soon as possible regarding the support of the State Task Force.

Outbreak investigation reports

It is important for the concerned officials to send appropriate and timely outbreak investigation reports to higher authorities. This has two main uses:

It keeps the authorities at the higher level informed so that they can make the appropriate decisions and provide adequate support.

It helps to review the outbreak and response, identify system failures and take corrective measures so that similar events are not repeated.

Following reports are expected

Preliminary report prepared by Nodal Medical officer and sent to higher level.

Daily situation updates: during the period of the outbreak the Nodal Medical officer continues to give daily situation updates of the outbreak to the next level.

Interim report by DTF: the DTF submits an interim report within one week of starting their investigation, response and control activities.

Final report: The local health authorities submit a comprehensive final outbreak investigation report within one week after the outbreak has ceased (double the incubation period of the disease without a single case).

Laboratory investigation

Rapid identification of the causative agent, and the likely source or mode of transmission is essential to initiate proper control measures, both under normal and in outbreak situations. Successful laboratory confirmation depends on:

Keeping in perspective the differential diagnosis and knowledge of tests needed to confirm a particular diagnosis.

Collection of appropriate and adequate specimens.

Correct storage, packaging and transport of specimens to an appropriate laboratory. Ability of the laboratory to accurately perform the diagnostic tests.

Though the concept of laboratory issue is very much there in the MDSS but the public health laboratory system in the district is not well developed as yet. Only microscopy tests to detect malaria parasite is available in district public health laboratory. For cholera and other weekly epidemic prone diseases, the district has to depend upon the laboratory of Microbiology Dept. of SCB Medical College Cuttack, Regional medical research centre (ICMR) Bhubaneswar and out state laboratory when necessary. The state pathology laboratory situated in the Cuttack city needs strengthening to meet the challenges of public health emergencies in the district

Feedback: Feedback is the process of providing acknowledgement, comments, explanations, instructions and comprehensive summary of data and data interpretation to levels below and above in the system. Feedback is very important during outbreaks/ epidemics. Each level in the hierarchy are supposed to give feedback to provide additional information/ clarification/ explanations that have been requested.

-Feedback is given to one level below in the system and one level above in the system

-Feedback is given to important administrators and agencies outside the system e.g. District Collector, BDO, CDPO etc should be keep informed of the activities in the health sector, so that they can assist appropriately when inter-sectoral interventions are required.

-Feedback to the media: It is essential to provide information on correct disease status to the media, to avoid transmission of informations from other sources, which causes unnecessary concern to the public and embarrassment to the health department. The nodal person at the district level for this purpose is the Deputy Mass Education and Information Officer. The DTF and ADMO (PH) are responsible to provide adequate feedback to the nodal person to discharge his responsibility efficiently.

-Surveillance related information is shared to those who are concerned. Both formal and informal feedback in the form of reports, review meetings etc. are given during monthly review meetings. Feedback is also given during regular training activities.

2.7.6.Supervision and Monitoring

For a system to be effective over a long term, and for its improvement, regular supervision and monitoring are essential. It has been emphasized to supervise and monitor the following aspects.

To check the knowledge of the personnel responsible, and whether they understand and appreciate the necessity of each procedure that they carry out, in OMDSS

To check if the various processes of the system are performing as per designated procedures.

To identify gaps in functioning and try to rectify them.

To receive first hand feedback and suggestions for improvement from the field regarding various aspects of the system.

By examining the OPD registers or the colour-monitoring tool one can assess the quality and efficiency of some of the processes. Others relevant points can be checked by asking appropriate questions to the concerned health personnel.

2.7.7.Roles and Responsibilities of Health Personnel:

Male and Female Health Workers: Health Workers are the first level of contact between the government health system and the community. They are the most peripheral link of the disease surveillance system.

Their role and responsibilities are as follows:

Case detection

They can help in case detection through various ways

Identify patients during their regular home visits.

Verify information supplied by the community nodal persons. In fact, it would be advisable for the health workers to develop a good network of community informants.

Trace the contacts of cases reported.

Data compilation and transmission

Once the cases are detected the details are entered in the minor ailment register. The data is compiled once a week in the Primary Data Collection format of MDSS. A copy of the compiled report then transmitted to the sector PHC manually on Saturday. However, if the disease/ syndrome is suspected to have outbreak potential, e.g. measles, severe diarrhoea, acute jaundice etc., s/he needs to inform the same to the Medical Officer of sector PHC / Block PHC (if MO of sector PHC is not available) immediately.

Response during outbreak

Helping the outbreak investigation team

Identify the households where the cases have occurred

Identify the contacts

Identify some of the risk factors, e.g. contaminated water sources, mosquito-breeding sites, etc.

Mobilizing the community for active participation in containing the outbreak.

Disinfections of water resources.

Health Education

Pharmacists: pharmacists are available at hospital,Block PHC/ CHCs and sector PHC level.

Pharmacists are entrusted with the responsibility of compiling OMDSS data from the OP/IP registers. They perform the following activities.

Data collection and compilation

They go through the OP/ Casualty registers every day and segregate the diagnosis (as made by the Medical officer into the various diseases by age group (i.e. < 5 and >/= 5) as per the OMDSS disease / syndrome list..

Data transmission

They aggregate the data on a weekly basis and enter into the data compilation reporting form and send to the appropriate level.

Medical Officers: Medical officers are available at hospital, Block PHC/ CHCs and sector PHC level.

Case Detection: They are the key qualified persons to clinically diagnose cases from the community level and to refer these cases for laboratory confirmation.

They document all OPD attendees and all inpatients under their care clearly and legibly.

They monitor the mass media daily and investigate any reports regarding outbreaks published innewspapers or reported in other media.

*Data compilation and transmission:*Medical officers are primarily responsible for ensuring that the data is compiled and transmitted in time (Weekly or daily as appropriate).

Analysis: Medical officers are responsible for conducting the preliminary analysis, which includes:

Monitoring the timeliness of the reporting units

Monitoring the completeness of the reporting units

Looking for clustering of cases with outbreak potential

Monitoring the trends of diseases with respect to time, place and person.

Investigation and response: Medical officers are responsible for the regular response mechanism and investigation of all outbreaks suspected and detected.She/he is responsible for informing the block level health authorities about suspected outbreaks and action that has been taken.

In the event of an outbreak s/he will have to make a preliminary visit to the area to confirm the outbreak. If outbreak gets confirmed, then s/he will have to ensure that:

Specimens are collected for lab diagnosis,

Containment measures are initiated.

An initial report is sent to the Chief District medical Officer (CDMO) / ADMO (PH)

Supervision and monitoring: Medical officers are expected to supervise the health workers and Health Supervisors. The main objectives of the supervision are:1.To support the health workers in their disease surveillance related work. 2.To understand their problems and look at viable solutions.3.To provide "On the job Training".

Training: The medical officer in charge of the PHC/CHC is responsible for ensuring that all the staffs under him/her are properly trained in OMDSS.

Feedback: The Medical officer is expected to provide regular monthly feedback to the health workers during the monthly meetings. S/he should also share any feedback that s/he has received from the District level. Other than this, the medical officer should give feedback during the supervisory visits.

Compilation of data: S/he is responsible for collating the data received from all the reporting sectors, when stationed at block level, and from the blocks, when stationed at the district level. Their functions include

Ensuring that data is received from all the reporting units. Data Transmission may be done manually or electronically. If data has been transmitted by phone, they need to ensure that a hard copy is received within a week, by post or by special messenger.

If data has been received manually, they need to enter the data into the master format and check the validity of the data reported. If there are any doubts about the validity of the data, the concerned reporting unit is to be contacted, and necessary corrections are made.

Updated and corrected reports and supplementary reports are entered in the appropriate reporting week and transmitted to next higher authority.

Report generation

Once the data is entered and checked, then the next step is to generate reports

Once the reports are generated, they are submitted to the Medical Officer-in-charge of the Health Facility / AHO/ ADMO (PH) [as per the respective level].

At the district level data is analysed by DEO / SA / VS Clerk with the help of computer software package. Then a comprehensive report is prepared which is submitted to the CDMO.

ADMO (PH) and AHO at the district level

Supervising the work of the DEO/SA at district level.

Ensuring that data is received on time, checked, entered into the master forms and all the required reports are generated.

Ensure that non-reporting units are given reminders.

Analysing the data and cross checking with the concerned reporting unit if there is a deviation from the expected data, regarding reasons for the same.

Discussing with the technical committee at district level before deciding on a plan of action.

Implementing the plan of action, which includes deployment of the District Task Force if necessary.

During outbreaks, ensuring that all stakeholders are kept well informed.

Ensuring that feedback on Disease Surveillance report is sent to the State as well as to block level.

District Task Force (DTF): The Orissa Health Systems Development Project (OHSDP) supports the DTF. Prior to the initiation of the OMDSS in the state one of the main roles of the DTF was to make advanced tour programmes to inaccessible and underserved areas to conduct active disease surveillance. *The composition of the DTF is*: The AHO (Assistant Health Officer), one Laboratory Technician, one Health Supervisor, one Assistant & one Driver.

The role of the DTF has now been redefined as follows:

The AHO, who is an integral part of the DTF, is responsible for the quality of weekly disease surveillance data, data compilation and analysis, interpretation and formulation of action plan on the basis of the analysis.

It is expected that the tour plan of the DTF for the succeeding week should essentially be based on the action plan drafted by the AHO in response to the interpretation of analysed disease surveillance data of the current reporting week.

The DTF is provided with a vehicle, and funds for fuel.

Wherever required (particularly in outbreak situations), the DTF should take the services of a medicine and paediatric specialists of district head quarter hospital.

The DEO and the SA/ VS Clerk assigned for the disease surveillance system in the district are critical actors for data compilation, computerisation, report generation and analysis of MDSS data. They also have a crucial role to play in the generation of analytical reports from the data collected during outbreaks investigatios.

2.7.8.Infrastructure Facility for OMDSS

A special computer room has been set up in the office of ADMO (PH) on behalf of OHSDP, where along with other health management information system (HMIS), OMDSS activities are conducted.

A computer Date Entry Operator & a Computer Assistant has been appointed.

ADMO (PH) is the Nodal Officer. Asst. Health officer (AHO) assist him in coordinating the disease surveillance activities in the district

One vehicle has been earmarked for DTF for surveillance activities, outbreak investigation.

Phone / fax are available at district level. At block level only phone is available

Internet facility is available at district surveillance cell.

Fund provision is made by OHSDP for OMDSS formats

Phone is available at PHC/CHC and Hospital level.

2.8.Shortcomings

Lack of continuous monitoring and supervision by district & block level team.

Proper analysis not done at block and below block level

Contingency expenditure support is from out side (presently from OHSDP & UNDP)

Staffs of District Health System have not yet taken over the responsibility of Computer Data Entry.

Surveillance system has not yet been operationalised in SCB medical college medical colleges, which receives a large number of patients from Cuttack district (process is on to start OMDSS in Medical College soon)

Other sentinel points have not been established which could help in crosschecking and ensuring the quality.

There is no established coordination mechanism with SCB Medical College and Hospital as well as Municipal Corporation Health System for surveillance purpose. But recently attempt has been taken to bridge the gap.

The ICDS, NGO/Corporate hospitals/Private Hospitals/Nursing homes/ Private Practitioners are not yet included in OMDSS of Cuttack district.

Poor laboratory facilities for confirmation of suspected cases.

No proper mechanism for ensuring quality of data.

Mortality Data is difficult to collect and there is chance of under reporting.

Till now only Govt health facilities are involved, hence the system is not ideally representing the whole population.

2.9.Future direction

The above-discussed shortcomings need to be looked after.

Analysis and action taken mechanism is to be strengthened up to sector level

Block level epidemic response team are to be constituted

Technical trainings are to be provided to the health personnel involved in disease surveillance to predict and manage outbreaks timely and effectively

Process is on to involve medical college hospital, urban body hospital/dispensaries, private dispensaries, mission hospitals, private nursing homes, Health-NGOs and other health facilities available in the district in OMDSS. Some of the selected health facilities may also be considered as sentinel points for surveillance.

A programme is to be devised for continuous up-gradation of the knowledge and skill of the health personnel at all level.

Medical officers with public health interest may be trained on "Epidemic Preparedness and Response and Basic Epidemiology."

Back up support of laboratories may be provided at various levels.

Communication system at sub block level is to be strengthened.

Interns of SCB Medical College, Cuttack posted to different PHCs / CHCs of the districts may be trained to monitor the surveillance activities of the concerned block which would upgrade their skill in public health and also help the system.

Model units of surveillance need to be established at least in at one sector in each block, which would be demonstration site for the health personnel of the block.

Quarterly review of performance of all blocks at districts level and monthly review of all sectors at block level should be a regularly activity.

2.9.ANNEXURE

Annex:1.

Clinical Case Definitions

The case definitions for the diseases/ syndromes included in the OMDSS have been formulated on the basis of clinical criteria only and have been simplified enough to maintain uniformity and consistency of case detection and reporting at various levels of health system by health personnel with different levels of training and capacity.

The stress is on detection of as many suspected cases of the disease/syndrome in question rather than ensuring that all cases of the disease/syndrome detected and reported would be confirmed on intense expert clinical/laboratory scrutiny.

The object is to have a system sensitive in detecting early warning signals of suspected outbreaks, the reliability of which can be ascertained through field level investigations.

The sensitive system would result in efforts/resources being wasted on unnecessary field investigations. This would be minimised once the system becomes robust with the availability of consistent baseline data, which can be used effectively to interpret the significance of changes in the frequency of occurrence of cases in subsequent periods.

The term "Acute" used in some of the case definitions refers to signs and symptoms of the particular disease/syndrome being present for duration of less than 3 weeks.

Routinely reportable diseases/syndromes

Simple Diarrhoea

Acute watery diarrhoea (passage of three or more loose or watery stools over a period of 24 hours) without dehydration.

Severe Diarrhoea

Acute watery diarrhoea with dehydration, with or without vomiting.

Common Symptoms & Signs of Dehydration
Dry mouth and tongue; Sunken dry eyes; Dry, wrinkled or blotchy skin; Scanty (less than six times per day in infants) dark yellow urine; Lethargy; Irritability; Cold hands and feet; Cramps in muscles of arms and legs; Sunken fontanel in infants in severe cases.

Bloody Diarrhoea :Acute Diarrhoea with visible blood in the stool.

(Patient or attendant must confirm that blood was visible in the stool.)

Neonatal tetanus:A neonate (*less than one month old*) with normal sucking & crying in first two days of life who develops difficulty in sucking; cries weakly; becomes stiff or has convulsions *(fits)* or both between the third and 28th day of life (both inclusive) is considered a case of neonatal tetanus.

(Note: While detecting the case, whether the mother was immunised with tetanus toxoid or not during her pregnancy need not be taken into account).

*Acute Jaundice Syndrome:*Acute onset of jaundice (*yellow colouration of eyes)* typically including deep yellow urine, anorexia (*loss of appetite*), generalised body aches and extreme tiredness with or without fever.

Acute Respiratory Infection (ARI): ARI includes both upper respiratory tract infections (URTI) and lower respiratory tract infections (LRTI)

A case of fever and running or stuffy nose; or sore throat; or ear discharge; or cough with or without expectoration (*production of sputum*) for less than three weeks can be labelled as URTI.

A case of fever and cough with acute onset of wheeze or chest in drawing or rapid breathing as defined below indicates lower respiratory tract infection, especially pneumonia

AGE	Rapid Breathing
Less than 2 months	More than 60 per minute
2 to 12 months	More than 50 per minute
12 months to 5 years	More than 40 per minute
More than 5 years	More than 20 per minute

*Suspected Meningitis:*A case of fever* usually of sudden onset and with one or more of the following:

Neck stiffness *(sign elicited by the health personnel)*,

Severe unexplained headache,Neck pain and 2 or more of the following:Photophobia (*discomfort looking into bright lights*)

Nausea

Vomiting

Lowered or altered consciousness (*confusion to coma*)

In children less than 2 years of age, a case is defined as fever* and one or more of the following:Irritability,Bulging fontanelle

* Axillary temperature - more than 38° in Centigrade scale; 100.5° or more in Fahrenheit scale.

*Measles:*Acute onset of fever and maculopapular (*flat or raised reddish spots*) skin rash with cough or coryza (*running nose*) or conjunctivitis (*redness of eyes*).

Suspected Malaria:A case of fever commonly but not always associated with chills, rigor (*extreme shivers*), myalgia (*muscle pain*), sweating, headache, backache, nausea or vomiting with or without blood smear collection will be considered a case of suspected malaria.

*Unusual Syndrom:*Cases with acute onset of symptoms that are unusual or unexplained and affecting more than one person residing in the area covered by a health worker or a health facility and not classifiable under any of the specific disease /syndrome labels of OMDSS.

[*The object of providing this case definition is to capture known and unknown communicable/infectious diseases, instances of illness due to food poisoning, chemical accidents and other diseases of public health importance, the impact of which can be reduced by rapid health management.*]

Do not report isolated instances of rare diseases, heart attacks, strokes, accidents (vehicle, drowning, fire, building collapse etc) and such under this label.]

*Others:*All instances of services (promotive/ preventive/curative) provided by the health facility/ health care worker to individuals who cannot be classified as cases under any of disease/syndrome labels of OMDSS including unusual syndrome, and all repeat visits by a patient for a disease/syndrome which has already been reported, should be included in “others”.

[Summation of the cases reported under the others category and the cases reported under each of the named disease/syndrome labels should equal the total number of persons to whom the health facility / health care worker provided services during the particular period for which the reporting form is being filled]

Diseases/Syndromes to be reported during particular seasons or disasters

In Summer :

Heat Disorder:-A person with history of exposure to or working in a hot environment with high to very high body temperature, associated with any of the following: nausea, vomiting, headache, dizziness, fainting and altered or lowered consciousness, is considered a case of heat disorder. Heat stroke is a very severe form of heat disorder associated with absence of sweating, and oral temperatures of more than 103 degrees Fahrenheit or 39.4 degrees Celsius.

During floods and cyclones

*Skin Infection:*This category includes bacterial skin infections (eg Impetigo), fungal skin infections (eg Tinea) and scabies.

*Snakebite:*History of snakebite with local symptoms and signs and with or without systemic manifestations.

Annex:2 **Primary Data Collection Form**

Health Facility: ______________________ Sub-Centre: ________

PHC: ______________________________Block: ______________

District: _________________Reporting Week No: ______________ From Date_____________ (Saturday) to _____________(Friday)

Sl. No.	Diseases/ Syndromes	Number of New Cases		Number of Deaths	
		Under 5 years	5 years & above	Under 5 years	5 years & above
	Routine Reporting				
1	Simple Diarrhoea				
2	Severe Diarrhoea				
3	Bloody Diarrhoea				
4	Suspected Malaria				
5	Acute Respiratory Infection				
6	Measles				
7	Neonatal Tetanus				
8	Acute Jaundice Syndrome				
9	Suspected Meningitis				
10	Unusual Syndrome				
11	Others				
	Seasonal/ Emergencies Reporting				
1	Heat Disorder (Only in Summer)				
2	Skin Infection (Only in Flood/ Cyclone)				
3	Snakebite (Only in Flood/ Cyclone)				
	Total				

Signature: ________________Date: _____/_____/__________

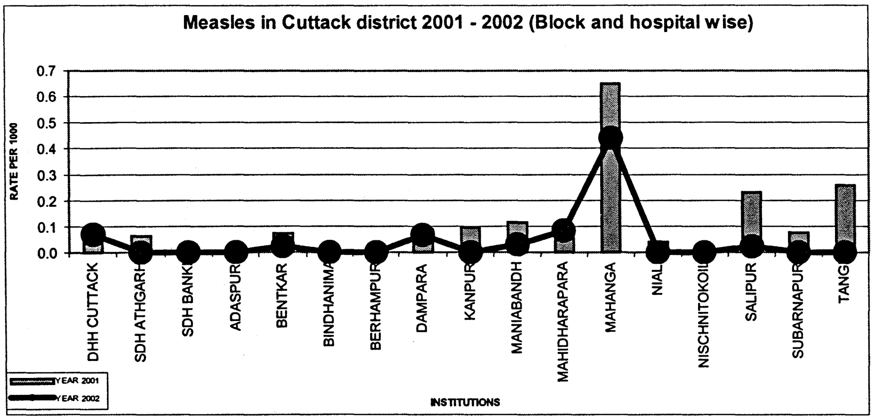
Name and Designation of the Reporter:

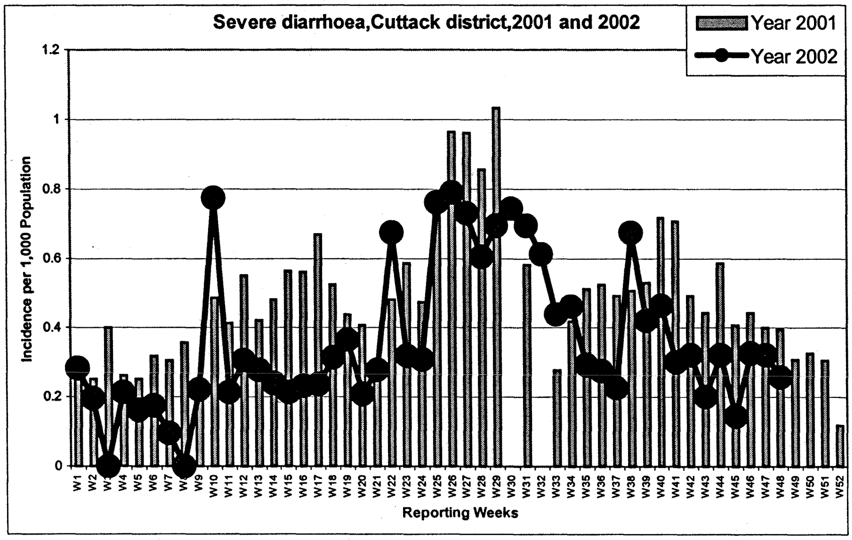
____

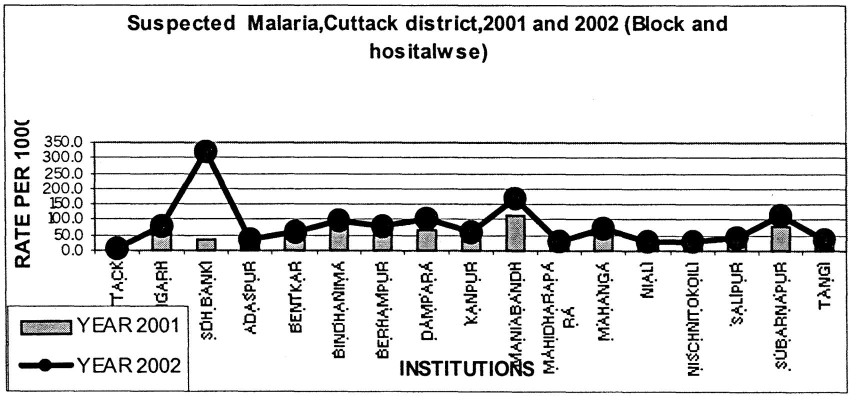
NB: This form is to be used for the collection of primary data at the Sub-Centre

Annex:3

Some examples of OMDSS analysis reports, Cuttack district (Block and hospital wise)







1.4. SECONDARY DATA ANALYSIS, CUTTACK DISTRICT

1.Introduction:

For any sort of public health planning in any defined geographic area one has to estimate the existing disease burden of the area. Disease burden can be estimated by analyzing the primary or secondary disease data.

Collection of primary data is expensive, time consuming and also cumbersome. The most feasible, inexpensive and quick method is to analyse the available secondary disease data. The disease data that are already collected through different surveillance and reporting systems and archived in some fashion are referred to as secondary data. This provides basic information on the epidemiology of diseases that are prevailing in the area and thereby one can generate hypothesis for further research on the disease problems and prioritize health planning, keeping in view the availability of resources.

Objectives :

To identify the disease burden in Cuttcak district

To identify the place and person (age & sex) distribution of different diseases

To recommend public health measures for prevention of communicable diseases.

Methodology:

Reviewing the secondary data available on different communicable diseases of Cuttack district

The data sources are: Multi Disease Surveillance System, vertical surveillance systems for national disease control programmes operational in Cuttack district.

Study area: Blocks and other areas served by Cuttack District Health System

Some general features of Cuttack distrci: Agriculture is main livelihood in rural area and business in urban areas. Sanitation, safe drinking water and environment remain major problems both in rural and urbans. Many blocks have tribal communities having their age-old cultural practices and beliefs on disease and death. The urban areas of the Cuttack district are among the oldest towns and cities of the state having different kinds of socio-cultural dynamics. Big festivals like Baliyatra, Durgapuja attract people from other parts of the sate and neighboring states in large number every year. In urban areas like Cuttack city migratory population is increasing rapidly and unplanned urban slums are coming up.

The premier medical college and Hospital (SCB medical College and Hospital) and Children's Hospital (Sishubhawan), Regional Cancer Institute are situated in the city of Cuttack. There are many private Nursing Homes and diagnostic centers in the city. People from all over the state and neighboring states come here to avail specialized and referral health cares both from Government and private health facilities. The speed of population dynamic in Cuttack city is very high giving rise to food water and sanitation problem.

There is no proper public heath legislation for restaurants and roadside food vendors and slaughterhouses and no adequate public health education and practices for food handling in hotels and restaurants.

Communicable diseases of Cuttack district are not the problem for the district in isolation but also a potential threat for the state and the country as there is there is continuous influx and out flux of population.

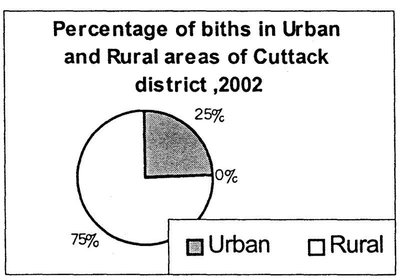
Considering all these factors, it is very essential to study the disease burden of the Cutack district, which would help in better planning to take public health measures.

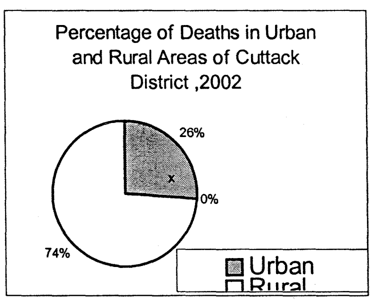
An overview of district health events.

The health indicators of Cuttack district reflect that the Crude Birth Rate (CBR) of the district has slightly declined in 2001 in comparison to previous four years. The 2000 data on CBR of Cuttack district is 18.65. This rate is very low in comparison to CBR of Orissa and India, which are 24.3 and 25.8 respectively. Though the Crude Death Rate (CDR) of 2000 has not been declined much in comparison to previous years, but it is less than the CDR of Orissa (10.5) and India (8.5). Infant mortality Rate (IMR) of Cuttack district in 2000 is 35.53 which is less than the previous years' IMR which was comparatively very high in the year 1998 i.e. 52.74 but low in comparison to Orissa (96 in 2000) and India (68 in 2000). Maternal mortality rate was 0.28 in 1997, which has increased significantly in the following years, in 1998 it was 0.86 and in the next three years it remains constant at a level of 0.69. During 1996 to 2001 there is no change in outpatient load except in the year 2000. Inpatient load is about similar in all these years.

Table: 1	Vital events of Cuttack district (rural and urban), 2002.							
Sl.No	*Registered units*	*Estimated Population*	*Expected*		*Vital Events Registered*			
A	URBAN		Birth	Death	Live birth	Still birth	Death	Infant death
1	Athagarh NAC	17000	425	136	674	12	131	14
2	Banki NAC	16000	400	128	198	3	35	5
3	Choudwar Municipality	43000	1075	344	0	0	0	0
4	Cuttack Municipality	491000	12275	3928	2391	0	1070	123
	Urban Total	*567000*	*14175*	*4536*	*3263*	*15*	*1236*	*142*
B	RURAL							
1	Adaspur	81000	2025	648	493	0	173	9
2	Bentakar	116000	2900	928	851	21	340	21
3	Berhmpur	136000	3400	1088	757	4	283	24
4	Bindhanima	71000	1175	568	543	2	180	8
5	Dompara	83000	2075	664	395	1	167	7
6	Kanpur	142000	3550	1136	2495	0	377	13
7	Mahanga	168000	4200	1344	904	0	268	13
8	Mahidharpara	79000	1975	632	633	7	192	13
9	Maniabandha	139000	3475	1112	1321	4	390	12
10	Niali	138000	3450	1104	677	15	235	25
11	N. koili	139000	3475	1112	654	0	204	0
12	Salipur	155000	3875	1240	1025	0	258	12
13	Subarnapur	103000	2575	824	592	0	172	9
14	Tangi	142000	3550	1136	756	4	267	26
	Rural Total	1692000	41700	13536	11096	58	3506	192
District Total		2259000	55875	18072	14359	73	4742	334

Fig: 1 Urban and Rural comparison of Births, Deaths and infant Deaths in Cuttack district, 2002





Percentage of Birth, Death and infant deaths in Urban and rural areas of Cuttack district shows a uniform pattern.

Table:2.Births and deaths In Urban and Rural areas of Cuttack district,2001

	Births	Deaths	Infant deaths
Urban	3663	1236	142 (43%
Rural	11096	3506	192 (57%)
Cuttack Total	14359	1236	334

Table 3. Vital events of Cuttack district, Orissa and India, 1997 to 2002

	Cuttack district			Orissa			India		
Year	CBR	CDR	IMR	CBR	CDR	IMR	CBR	CDR	IMR
1999	17.22	6.61	37.12	26.5	10.9	96	27.2	8.9	71
1998	14.10	7.32	52.74	25.7	11.1	98	26.5	9	72
1999	17.74	6.86	37.06	24.1	10.7	97	26.1	8.7	70
2000	18.65	7.17	35.53	24.3	10.5	96	25.8	8.5	68
2001	16.24	6.66	33.11	23.4	10.2	90	25.4	8.4	66
2002	18.65.	7.17	35.53	18.9	6.38	-	-	-	-

Source: Directorate of Health Services, Orissa and The Registrar General, India .

There is no much change in the trend of crude birth rate of Cuttack district during the period from 1997 to 2002 and though the rates are far below to the state and the country till 2001. During 2002 the CBR of Cuttack and Orissa are at about same level. Similarly Crude death rate trend is remains at a horizontal level and which is below the rates of Orissa and India till 2001 .In 2002 CDR is at little higher level than Orissa. There is no much change in IMR status of Cuttack district since last four years but the rate is far below the rate of the state and the country. This reflects that the health status of the district is better than the average health status of the state and country.

With a planned and coordinated effort the district can achieve the selected goal for Health and Family Welfare in India by 2000 (CBR-21.0, CDR-9, IMR- below 60) within a few years. MMR of the district is 0.60, which is already less than 2 (the selected goal in MMR for India by 2000).

Table :4. Maternal deaths in Cuttack district ,1997 to 2002

Years	Maternal Deaths (n & MMR)	Years	Maternal Deaths (n & MMR)
1997	11 (0.28)	2000	31 (0.69)
1998	28 (0.86)	2001	27 (0.69)
1999	29 (0.69)	2002	-

Maternal mortality rate was at higher level in 1998 than in 1997 and then there is slight decline but remains static in the following years (0.69). MMR level is below the National goal as expected by 2000 i.e. 2.

Table. 5. Status of treatment of patients in Cuttack district, 1999 to 2002

1999 -2000		2000-2001		2001-2002	
OPD (Old+New) (%)*	IPD (Old+New) (%)	OPD (Old+New) (%)	IPD (Old+New) (%)	OPD (Old+New) (%)	IPD (Old+New) (%)
1755082	154784	1772810	166332	1790538	167995
* 6.17%	4.08 %	6.17 %	4.36 %	6.17 %	4.36 %

Status of treatment of patients in Orissa state, 1999 to 2002

OPD	IPD	OPD	IPD	OPD	IPD
28463577	3795434	28751088	3815496	29038599	3853651

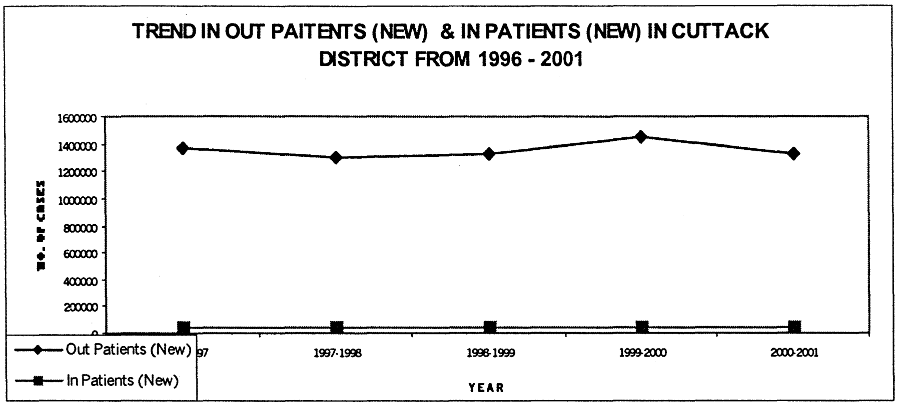
*Percentage to Orissa total.

During last three years the patient load in Cuttack district remains at about same level.

(Source: -District Medical statements from CDMO office)

The load of new out patient and inpatients in health institutions of Cuttack district remains at a similar level during the last 5 years which is shown in Fig:2

Fig:2.



2. Secondary Diseases Data Analysis of

Here non-communicable diseases like Diabetes, Hypertension, Cancer and Mental disorders are not included, as there is no proper record keeping mechanisms for these diseases at district level and hence it is difficult to get the secondary data. Though it is presumed that these diseases are in rising trend in the district but could not be reflected in this document due lack of adequate data.

Data Sources on Communicable Diseases:

Data on different communicable diseases have been collected from following sources that are available at district and state level

Orissa Multi Disease Surveillance System(OMDSS)

Routine Surveillance systems of various National Disease Control Programmes and monthly reporting systems

OMDSS

Table V: The block and district population profile of Cuttack district

Sl. No	Name of Blocks	<5 years	>= years	All age
1	Adaspur	13200	74800	88000
2	Bentakar	18300	103700	122000
3	Berhmpur	20850	118150	139000
4	Bindhanima	10500	59500	70000
5	Dompara	13350	75650	89000
6	Kanpur	21750	123250	145000

7	Mahanga	26100	147900	174000
8	Mahidharpara	12450	70550	83000
9	Maniabandha	20550	116450	137000
10	Niali	21750	123250	145000
12	N. koili	21900	124100	146000
13	Salipur	24450	138550	163000
14	Subarnapur	16050	90950	107000
15	Tangi	22500	127500	150000
16	Total (rural)	263700	1494300	1758000
17	District total(Rural + Urban)	369000	2091000	2460000

List of Diseases / syndromes in OMDSS, Cuttack district

1	Simple diarrhoea	7	Neonatal tetanus
2	Severe diarrhoea	8	Acute jaundice syndrome
3	Bloody dysentery	9	Suspected meningitis
4	Acute respiratory tract infection	10	Heat stroke
5	Suspected malaria	11	Unusual severe syndrome
6	Measles	12	Any other

* Skin diseases and snake bites are included during flood and cyclones

In MDSS disease data is collected on weekly basis

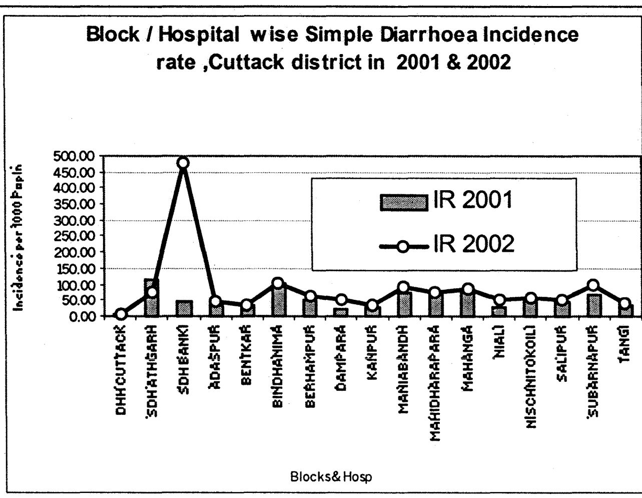
OMDSS disease data of two years i.e 2001 and 2002 (from month January to December) has been analysed in this section.

A) Diarrhoeal Diseases:Three types of diarrhea have been described under diarrhoeal diseases and they are: -

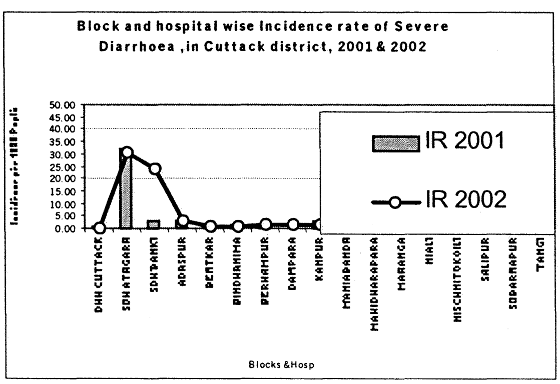
Simple diarrhea 2) severe diarrhea 3) Bloody Diarrhea

Morbidity status of Residents of Cuttack District due to Diarrhoeal Diseases by OMDSS Calendar Year 2002 (January to December)

2002	< 5 Years (n) & (%) to Orissa * n = number of cases	>= 5 years (n) & (%) to Orissa	All age (n) & (%) to Orissa
Simple Diarrhoea	39658 (5.15)	85474 (5.79)	125134 (5.58)
Severe Diarrhoea	709 (1.38)	3428 (3.02)	4137 (2.51)
Bloody diarrhoea	16415 (5.57)	38493 (5.03)	54908 (5.18)

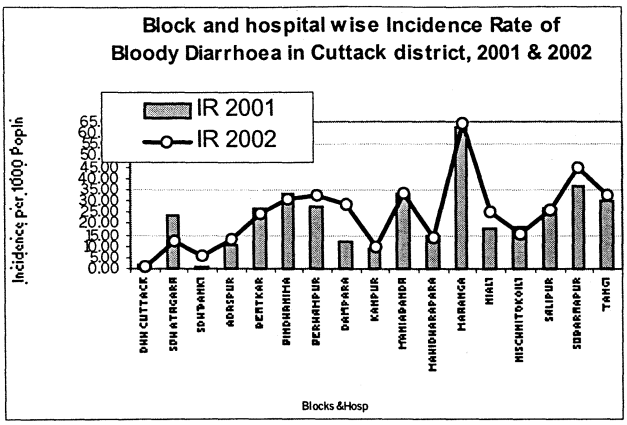


There was hardly any visible problem of simple diarrhoea in any area of Cuttack district in 2001 but it is excessively high in Banki area in 2002.

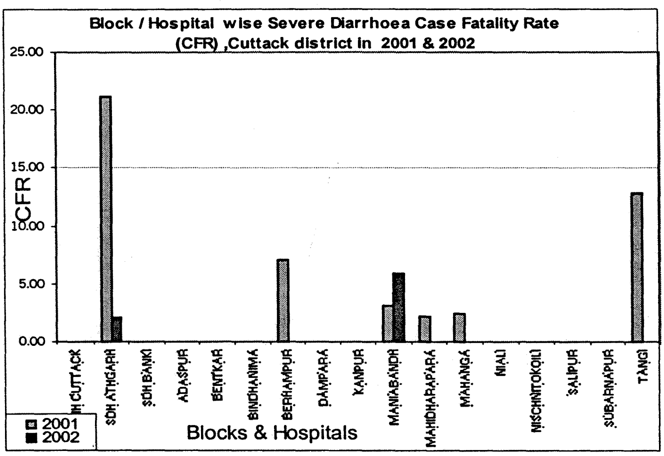


Severe diarrhoea incidence rate is very high in Athagarh and Cuttack sadar area in comparison to other areas of Cuttack district both in 2001 and 2002.

In 2002 the rate was also little higher in Subernpur Block.



Bloody diarrhoea seems to be the problem in most of the blocks and hospital areas both in 2001 and 2002.Mahanga block tops the list in both the years followed by Subernpur,Bindhanima, Bentakar, Berhampur, Salepur , Tangi and Athagar



Case fatality due to severe diarrhoea was very high in Athagarh subdivision area followed by Tangi and Berhampur Block in 2001.

But in 2002 these areas had very low case fatality in comparision to 2001 and other areas.

Case fatality was comparatively higher in Maniabandha block in 2002.

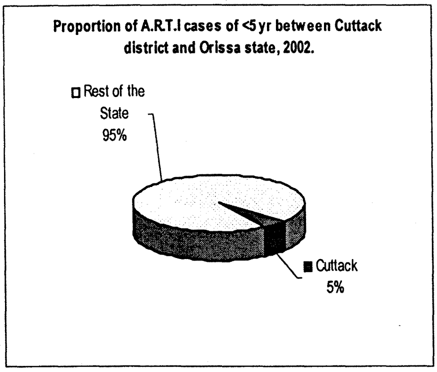
B) Acute Respiratory Tract Infection

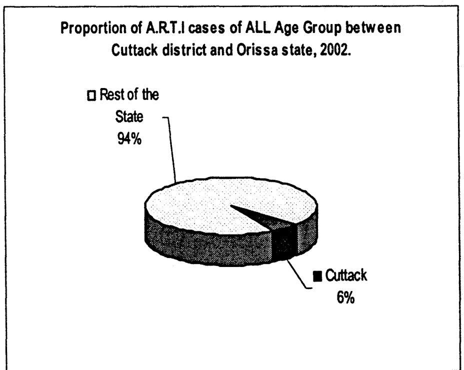
Number of cases due to Acute respiratory Disease in Cuttack district, 2001 and 2002

	< 5years (n) & (%) to Orissa *n=number	>= 5years (n)& (%) to Orissa	Total (n) & (%) to Orissa
2001	49614 (6.19%)	123049 (6.85%)	172663 (6.65%)
2002	64712 (5.1%)	151858 (6.03 %)	216570 (5.71%)

Age wise Comparison of Proportion of ARTI cases between Cuttack district and Orissa State, 2002.

Proportion of ARTI cases among < 5-year and among all age group between Cuttack district and Orissa state, 2002.





The proportion of ARTI patients both in <5 and all age group in Cuttack district in relation to Orissa state is almost equal i.e. 5 to 6 %

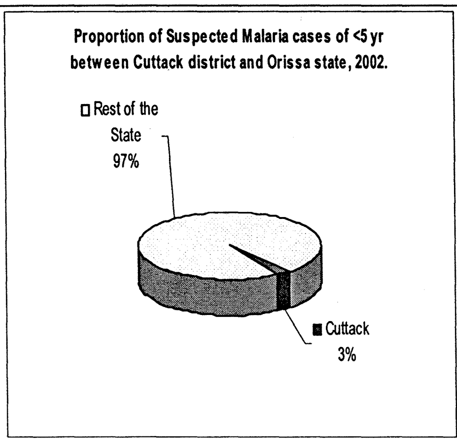
B) Suspected malaria

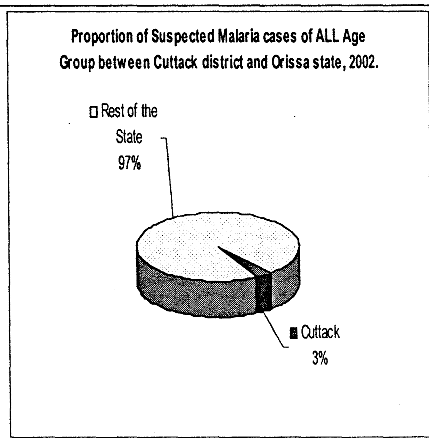
Number of cases due to Suspected malaria in Cuttack district in 2001 and 2002

	< 5years(n) & (%) to Orissa	>= 5years (n) & (%) to Orissa	Total (n) & (%) to Orissa
2001	14378 (2.56%)	89161 (3.66%)	103539 (3.45%)
2002	21273 (2.63%)	114241 (3.5%)	135514 (3.33%)

Age wise Comparison of Proportion of Suspected malaria cases between Cuttack district and Orissa State, 2002.

Proportion of Suspected malaria cases among < 5-year and among all age group between Cuttack district and Orissa state, 2002.





The proportion of suspected malaria among < 5year and among all age group in relation Orissa state is almost same i.e 3%

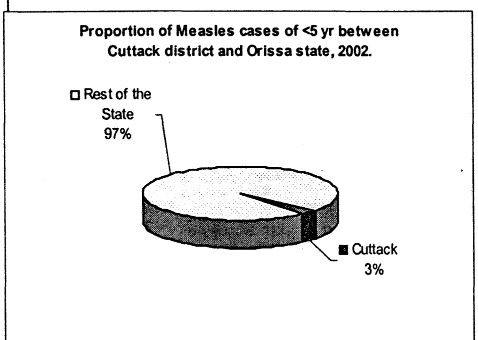
D) Measles

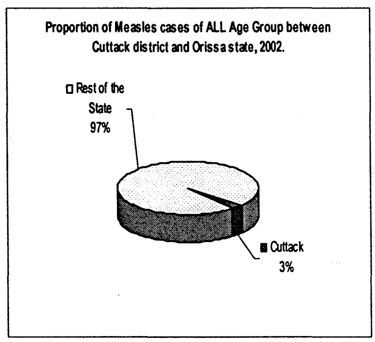
Number of cases due to Measles cases in Cuttack district in 2001 and 2002

	< 5years (n) & (%) to Orissa	>= 5years (n) & (%) to Orissa	Total (n) & (%) to Orissa
2001	281 (7.04%)	115 (3.09%)	396 (5.13%)
2002	91 (3.08%)	56 (2.7%)	147 (2.92%)

Age wise Comparison of Proportion of Measles cases between Cuttack district and Orissa State in 2002.

Proportion of measles cases among < 5-year and among all age group between Cuttack district and Orissa state, 2002.





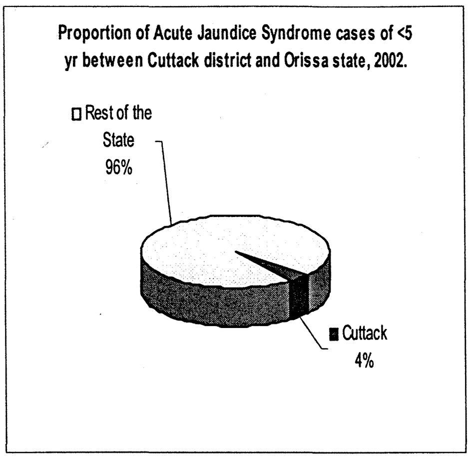
Proportion of measles cases in Cuttack district in relation Orissa is 3% both in, 5 years and all age group during 2002.This was almost double in 2001.

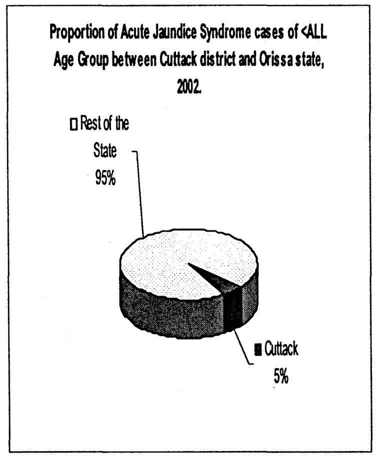
E) Acute Jaundice Syndrome

Number of cases and proportion to Orissa due to Acute jaundice syndrome in Cuttack district in 2001 and 2002

	< 5years (n) & (%) to Orissa	>= 5years (n) & (%) to Orissa	All age (n) & (%) to Orissa
2001	101 (2.4%)	474 (4.34%)	575 (3.8%)
2002	116 (3.78%)	454 (6.04%)	570 (5.39%)

Age wise Comparison of Proportion of acute Jaundice syndrome between Cuttack district and Orissa State in 2002 is depicted in the following figure.





Proportions of acute jaundice syndrome in Cuttack District in 2002 among < 5 years and in all age group in relation to Orissa are 4% and 5 % respectively. The proportion is higher in 2002 than in 2001.

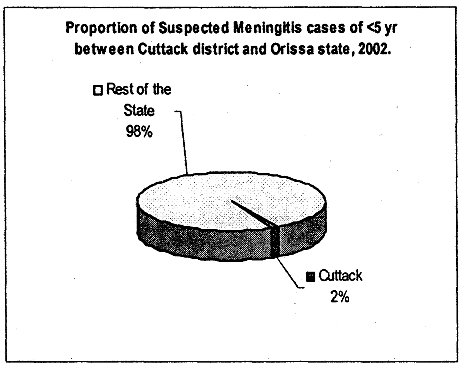
F) Suspected meningitis

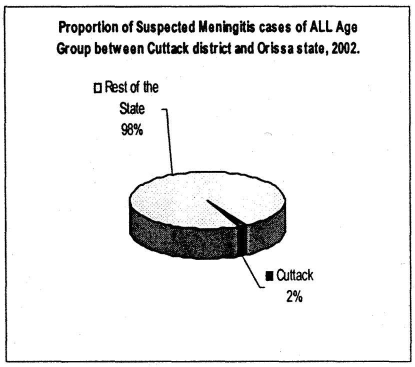
Number of cases and proportion to Orissa due to Suspected meningitis in Cuttack district, 2001 and 2002

	< 5years (n) & (%) to Orissa	>= 5years (n) & (%) to Orissa	All age (n) & (%) to Orissa
2001	6 (1.88%)	4 (0.89%)	10 (1.3%)
2002	2 (1.52%)	7 (2.14)	9 (1.96%)

Age wise comparison of proportion of suspected meningitis between Cuttack district and Orissa State in 2002.

Proportion of Suspected meningitis cases among < 5-year and among All age group between Cuttack district and Orissa state, 2002.





The proportion of suspected meningitis in Cuttack district in relation to Orissa among < 5 years and all age group is same i. e 2 %. There is no much difference between 2001 and 2002.

Diseases Under National Control Programme

In this section burden of some diseases under National control programme are discussed e.g. Filaria,Iodine deficiency Disprder(IDD), Leprosy, Cataract and Blindness,Tuberculosis and HIV / AIDS.

Malaria has been discussed in the next chapter.

Filaria:

Lymphatic filariasis (LF) is endemic in as many as 80 countries of the world. An estimated 1.1 Billion people are at risk of infection, and there are approximately 120 million people with patent infection or disease round the globe.

WHO has estimated that in South East Asia Region about 600 million people are at risk of filarial infection and 60 million are actually infected (WHO –SEARO 1999)

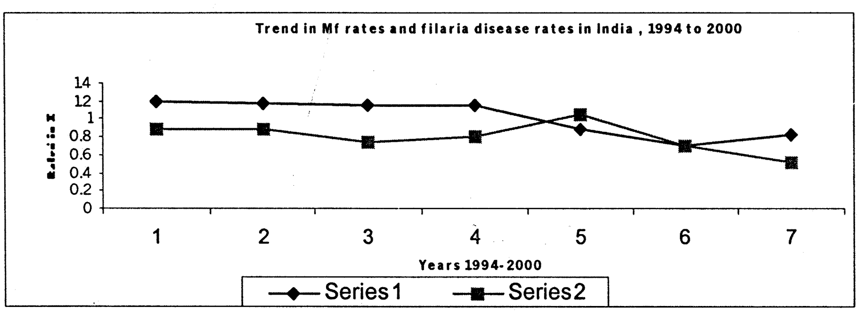
In India Filariasis is a major public health problem next only to malaria. As per recent estimates, about 428 million people with 28 million micro filarial carriers and 21 million clinical cases are spread in 13 States and 5 Union Territories.

India contributes about 74% of endemic population and 81% of the disease burden in the Region.

W. bancrofti is the most predominant infection comprising 99.4% of the problem in the country while B.malayi is confined to the western coast of Kerala and a few pockets in six other States.

Lymhatic filariasis is prevalent in 18 states and 5 union territories. Orissa is one of the highly endemic states infected both by bancroftician and brugian fialria.

According to reports collected from filaria Control units and clinics, Microfilaria (Mf) rates and Disease rates are declining the country during last many years.



Filarial problem in Orissa and Cuttack district

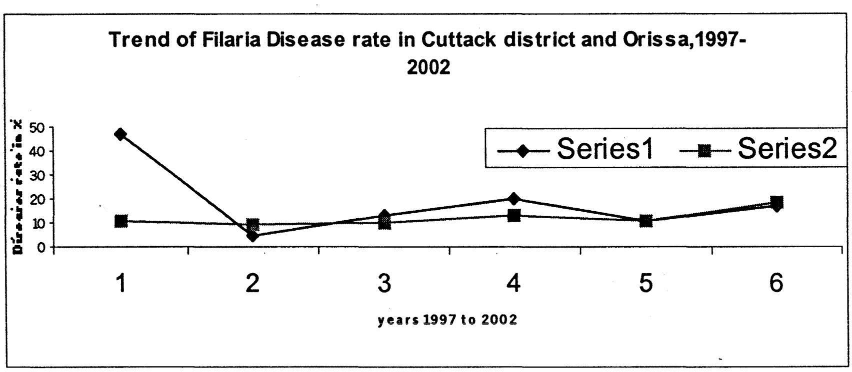
Orissa is one of the filaria endemic states in India. Coastal districts of Orissa are more prone for this disease. Cuttack being one of the coastal districts of Orissa is under high endemicity. In contrast to national scenario the burden of Filaria is on rising trend in Cuttack and Orissa .As per the last six years (1997 –2002) data from National Filarial Control Programme of Orissa the filarial Mf rates and disease rates of Cuttack are as follows.

Table:1. Problem of Filaria in Cuttack and Orissa, 1996 –200I

Year	No of blood slide examined	No of positive for Mf	MF rate	No of positive for disease	Disease Rate Cuttack	Orissa
1997	314	3	0.95	145	46.18	10.4
1998	130	-	-	16	4.53	9.2
1999	231	-	-	27	13.00	10.05
2000	217	-	-	43	19.80	12.97
2001	266	-	-	51	10.90	10.95
2002	333	0	0	56	16.8	18.22

Source: Directorate of Health Services, Orissa (Data from NFCP units)

Both the rates are at a very high level in Cuttack and Orissa in comparison to Country scenario. Disease rate in Cuttack was higher in all the years except 2002 where it is slightly lower than the Orissa average .The rate of Orissa in 2002 was very high in comparison to previous years.



The above figure shows that there was a sharp decline in filaria disease rate from 1997 to 1998 in Cuttack district and then it showed an increasing trend, which is continuing. Filaria disease rate for whole of Orissa remains at a horizontal level till 2001 and during 2001 it showed an increasing trend. The data available for Cuttack district is by passive surveillance and limited to only one Filaria clinic (Cuttack municipal corporation). Thus the disease rate of Cuttack cannot be generalized for whole district.

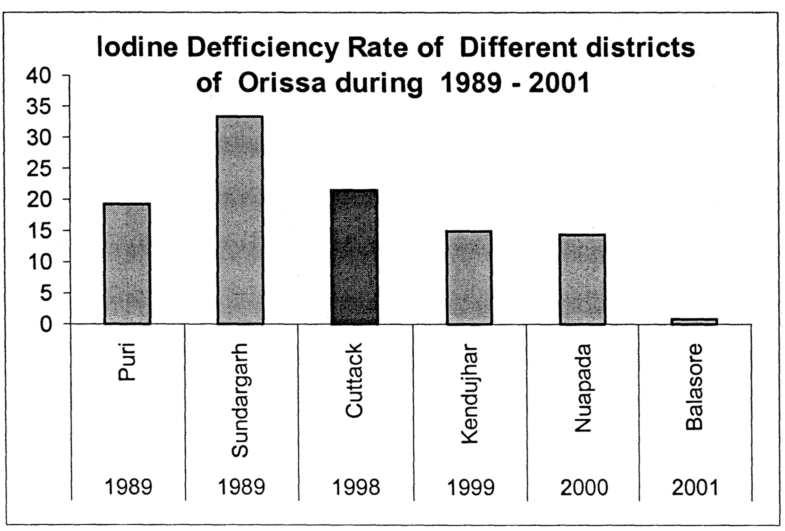
Iodine Deficiency Disorder (IDD) and Goiter

The magnitude of IDD has been increased manifold in India. In 1960 it was estimated that 9 million people were affected by goiter and current estimation is that 140 million people are living in goiter endemic zone of the country. It is now stated that no state in the country is goiter free.

The National Iodine Deficiency Disorder Control programme started in the state of Orissa since Dec,1989 and as per the survey conducted in 1998 in Cuttack district the Iodine deficiency disorder problem in the district is as shown in the table below. If we compare with other districts that have been surveyed for IDD (though time of survey is not same) Sundargarh IDD rate is at the top and IDD rate of Cuttack ranks second.

Table:2.IDD in Cuttack and other district of Orissa (1989-2001)

Year	District	Population Examined	Persons found with IDD	Rate of IDD(%)
1989	Puri	6672	1291	19.3
1989	Sundargarh	7045	2357	33.45
1998	Cuttack	11066	2392	21.61
1999	Kendujhar	7821	1168	14.93
2000	Nuapada	2467	357	14.5
2001	Balasore	35002	292	0.83



Leprosy:

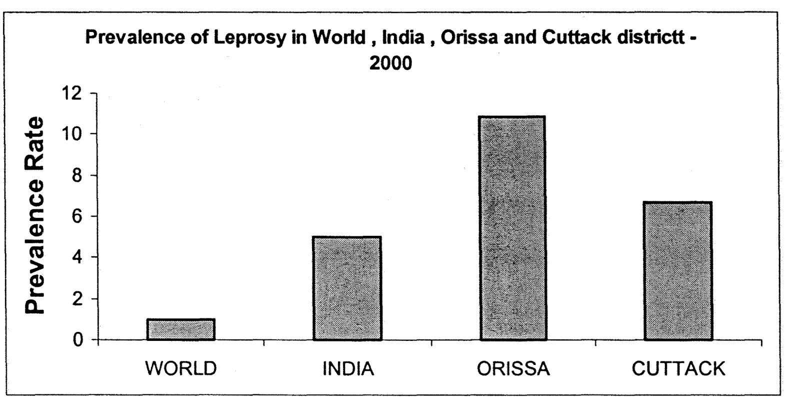
Leprosy is an age-old disease affecting the mankind, first mentioned in the writings of 600 B.C. Modern science has achieved a major breakthrough recently with the mapping of the genome of the bacillus Mycobacterium leprae. This has opened up new avenues for developing diagnostic tests for leprosy. Leprosy bacilli can incubate in human body for up to 20 years, before the telltale signs i.e. insensitive patches on the skin, are observed

Leprosy has been a public health problem in many developing countries including India. It is one of the commonest disabling diseases with many wrong notion and stigma attached to it. In the past people, related leprosy to curse of God, past sins, hereditary factors etc. A few patients develop deformities in the course of the disease due to the structural damage.

The bacteria Mycobacterium leprae, which causes leprosy, is transmitted via droplets, from the nose and mouth, during close and frequent contacts with untreated, infected persons. Leprosy mainly affects the skin and nerves, and if untreated can cause progressive and permanent damage to the skin, nerves, limbs and eyes. The germ mostly spread through coughing and sneezing.

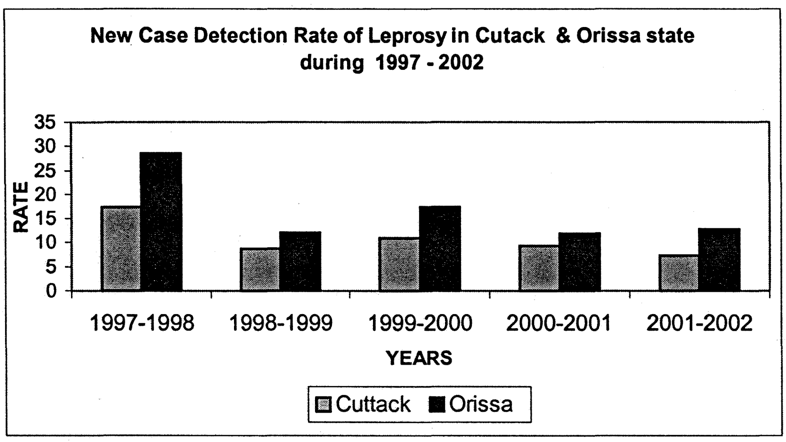
Leprosy affects all age groups and both sexes. The incubation period is very long (4 to 5 years) with latency period running into several years. Leprosy is directly transmitted from man to man through respiratory tract and skin but to acquire the disease one needs a prolonged time.

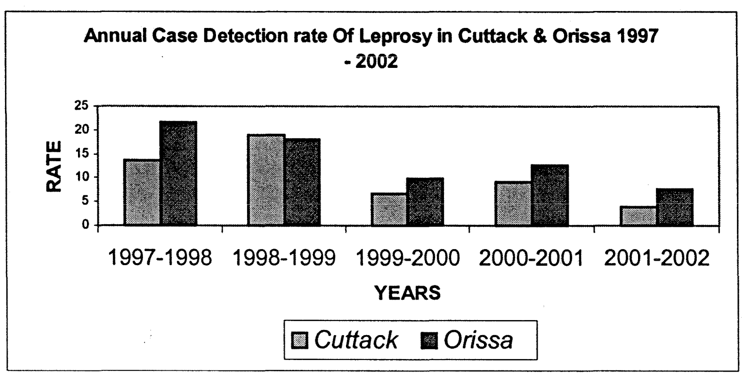
It is estimated that there are about 1.32 million cases of leprosy in the world. There are 23156 registered cases in India, 50383 registered cases in Orissa and 1553 registered cases in the district of Cuttack and the prevalence rate per 10,000 populations by the year 2000 is as follows:

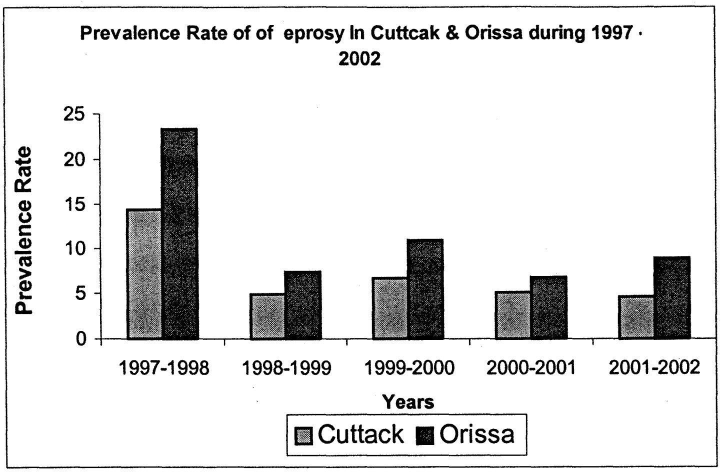


The Annual Case Detection Rate (ACDR) per 10,000 populations and the New Case Detection Rate (NCDR) are less than the state average when it is compared for the data of last 5 years.

With implementation of National Leprosy Eradication Programme, since 1983 Orissa is marching ahead towards the goal of leprosy elimination. Treatment with multidrug therapy is highly effective which stops transmission of the disease starting with the first dose, and prevents disabilities. Due to the effective implementation of the programme out of 10 districts, of central zone of Orissa, Cuttack ranks fourth with respect to the leprosy prevalence.







Cataract and Blindness

The principal cause of blindness in India today is cataract. Cataract is responsible for 81 percent of all cases of blindness depending upon the area. Cataract occurs more frequently with advancing age. As per 1995 data (WHO Regional Health Report-1996) in India prevalence of blindness of total population is 0.7 percent, blindness due to cataract is 77 percent and prevalence of blindness is 0.54 percent.

Table:3. Cataract operation in the Orisaa and Cuttack(1997-2001)

Year	Orissa	Cuttack	% of cataract operation in comparison to Orissa state
1997-98	74713	6306	8.44
1998-99	79271	9238	11.65
1999-2000	63399	7686	12.12
2000-2001	84231	12098	16.8

Disease Burden of Malaria*, Tuberculosis and HIV Infection

Threats of Malaria, TB and HIV:

Almost half of the morbidity and mortality in developing countries is due to infectious diseases. The most sufferer of these disease are the poor people who are illiterate and have less knowledge to take advantage of the Govt health facilities as well as to take preventive measures. Poverty debars them to avail proper treatment when fall sick.

In developing countries as per the WHO information, approximately half of infectious disease mortality can be attributed to Malaria, TB and HIV. These three diseases cause over 300 million illnesses and more than 5 million deaths each year. None of these diseases has an effective vaccine to prevent infection in children and adults. Beside the morbidity and mortality these diseases cause economic loss to the poor community who depend on daily labour for their livelihood. Poor face major setback when fall sick. Children's school drop out increases, financial involvement decreases in the society and there occurs increased social instability. For example, Africa's GDP would be up to $100 billion greater if malaria had been eliminated years ago. A nation can expect a decline in GDP of 1% per year when more than 20% of the adult population is infected with HIV. Many of the world's poor people live in countries with very low budgets for health care.

These highly infectious diseases cause both local and global problems and are matters of national security.

With all advanced medical knowledge these infectious diseases are standing with their teeth and nails before the mankind. Developed countries having all their wealth and technology are not also free from the clutch of these fatal diseases. Over 12,000 cases of malaria were reported among European travelers in the year 2001. Over half of TB cases in some wealthy countries are among foreign-born populations.

But it is estimated that with the present advancement in Medical science it is possible that each of these three diseases can be prevented or treated for between $.05 and $10.

Many low-income countries have shown that by using available tools both widely and wisely

reduced by 80% and malaria death rates can be halved

Considering the above facts regarding these three infectious diseases here the discussion has been made with special emphasis.

*(*Malaria has been discussed separatley in this chapter)*

Burden of Tuberculosis

TB imposes a considerable economic toll on patients and their families. Because more than three-quarters of people with active TB are in the economically active age group (15 to 54), the economic and social costs to them and society are huge. They are income providers of the family. They are the parents of young children who need their economic and emotional support in order to thrive. They have elderly parents and relatives who depend on them. They are the citizens whose productivity and talents are essential to their countries' development. The result of TB is that by which the "*access to opportunities and choices*" - a key principle of human development is blocked.

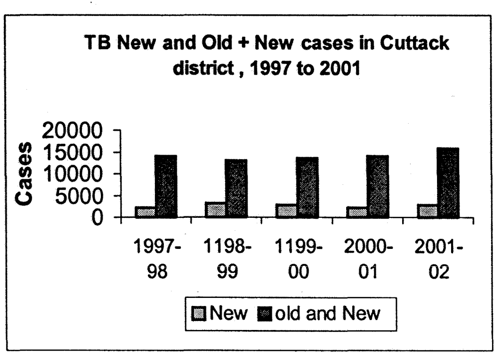
Today in Cuttack district as well as in whole state of Orissa TB remains a great public health problem. The following table reflects the trend in TB scenario in the district of Cuttack.

Table:4. New TB cases in Cuttack district, 1997 to 2002

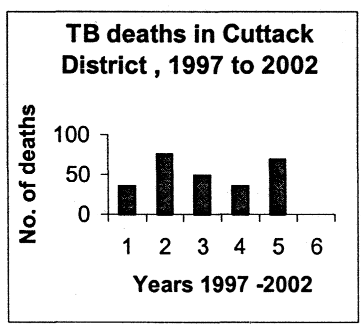
Year	TB New cases		
	Sputum + ve	Sputum – ve	Ext. Pulmonary
1997-98	776	868	532
1998-99	1452	1366	409
1999-2000	1121	1234	594
2000-2001	776	858	532
2001-2002	1024	1052	639

Source: Directorate of health Services, Orissa (TB section)

Trend of new and old TB cases in Cuttack district, 1997 -2002

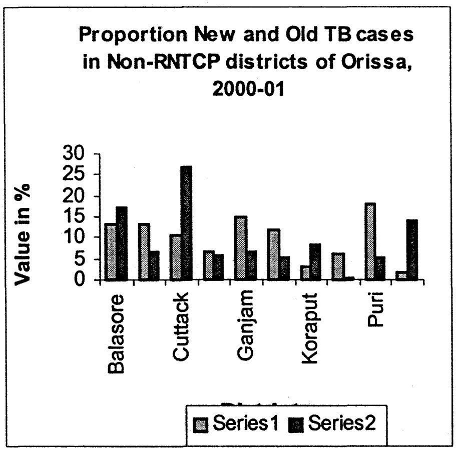


Trend of deaths due to TB in Cuttack district, 1997 -2002

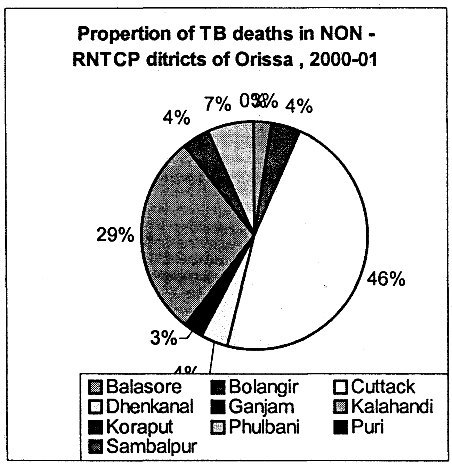


There is no decline of TB cases (both New and Old) in Cuattck district since 1997 till 2002 rather number of old cases are more in following years. Similarly there is no decline of TB deaths; rather there is more number of deaths in 2002 as it was in occurred in 1998.

Comparison between Cuttack and other NON RNTCP Districts of Orissa for Proportion of TB New and Old cases, 2000-01



Comparison between Cuttack and other NON RNTCP Districts of Orissa for Proportion of TB Deaths, 2000-01



Among the NON–RNTCP districts of Orissa in 2000-2001, proportion of TB old cases was highest in Cuttack district. Proportion of new TB cases was also at a higher level than many other districts. Proportin of TB deaths was also highest in Cuttack district (46 %).

India carries a third of global TB burden. Every year two million people develop active TB. TB accounts for nearly 4,50000 deaths every year and more than 1000 persons die of the disease every day. TB is inflicting enormous economic and social costs on the country. The estimated economic cost of TB is US $ 3 billion per year. In India 240 million people live below the poverty line.

Income poverty leads to ill health and ill health contributes to income poverty. The cost to the Indian patient for successful treatment of TB averages US $ 100 to US $150. Research shows that 20% of rural and 40% urban patients borrow money to pay for expenses due to TB.

Indian women have to pay much higher social and personal costs if suffering from TB. Besides poverty the shame and stigma associated with the disease, early marriage and social pressures to start a family early on and limited access to treatment facilities makes them more vulnerable to disease more so during the reproductive age group of 15 – 45 years.

The nation has not risen adequately to meet the twin challenge of TB and HIV/AIDS. The number of HIV positive persons has risen above 3.86 million.

Nearly 60% of AIDS cases are reported to be opportunistic TB infection. This is going to add to the national load of 14 million TB cases.

Effective TB control can help break the cycle of poverty and disease. It cures people and returns them to active, productive life, which in turn benefits their children and contributes to the economic and social development of the country.

Burden of HIV Infection

There are two sentinel sites in Cuttack district for HIV screening tests.

SCB Medical College Cuttack for the sentinel group of Antenatal Check-up (ANC)

SCB Medical College Cuttack for the sentinel group of Sexually transmitted diseases (STD)

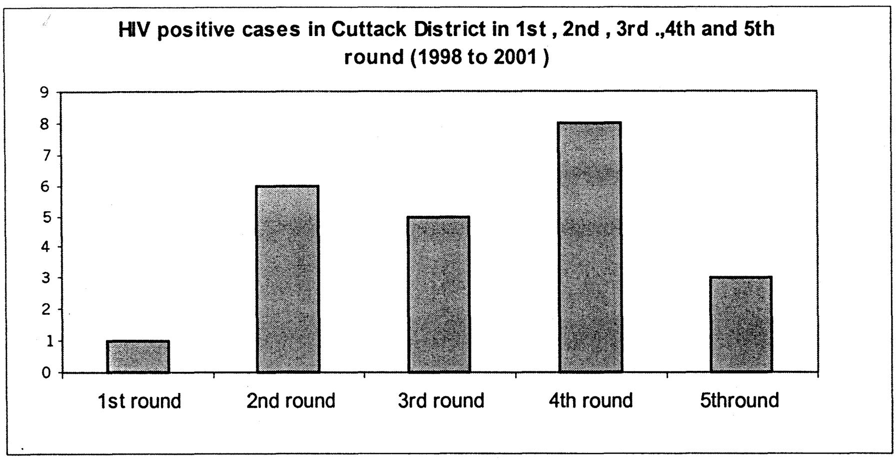
Five rounds of Screening has been conducted since 1998 to 2001 in Cuttack district.

First round	February 98 to August 98
Second round	August 98 to October 98
Third round	August 99 to October 99
Fourth round	August- 2000to October 2000
Fifth Round	August 2001 to October 2001

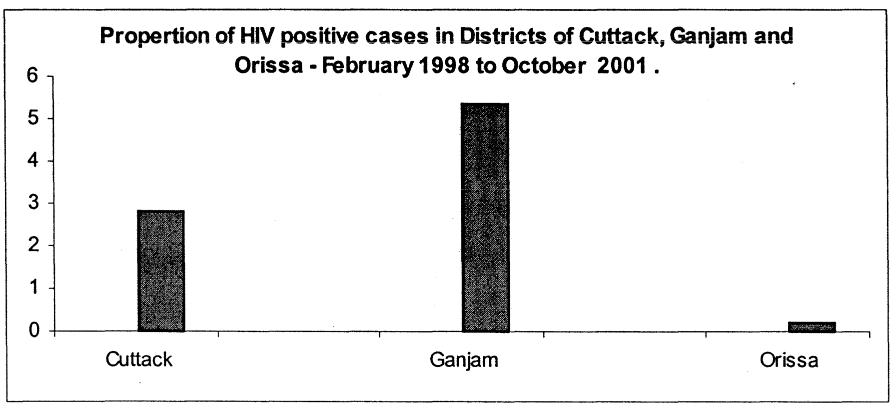
Table:5.The data on screening and posititivity of HIV , Cuttack district indifferent rounds of screening

Name of the sentinel sites	Sentinel groups	Rounds	Sample size tested	HIV Positivity
SCB Medical College Cuttack	ANC	First	132	0
	ANC	Second	305	1
	ANC	Third	400	0
	ANC	Fourth	400	0
	ANC	Fifth	400	0
SCB Medical College Cuttack	STD	First	33	1
	STD	Second	35	5
	STD	Third	250	5
	STD	Fourth	210	8
	STD	Fifth	250	3
Total			2415	23

Source: - State AIDS Cell, Bubaneswar



In summary HIV positive cases are in increasing trend from 1998 to 2001 .The positivity rate is very high among the STD sentinel groups. In ANC groups out of 1637 screened cases only one became positive in all the five rounds (1998 February to 2001 October) i.e. only 0.061 % positive where as in STD groups out of 778 screened cases 22 came out to be positive i.e % 2.8277 positive. In the whole state of Orissa during this period out of 471097 screened cases only 1061 cases became HIV positive i.e.0.225 % positive. This statistic shows that HIV in Cuttack district is in higher side in comparison to the whole state. In Orissa Ganjam district is having highest HIV positive rate. Out of 708 cases screened during the said period 38 cases are HIV positive i.e.5.367 % positive. As per the available sentinel surveillance data of Orissa, Cuttack is next to Ganjam.



The Disease burden of infectious diseases are increasing day by day though at the same time we are having most advanced knowledge of medical science to control, prevent and cure. Knowing the magnitude of the problem it is essential to radically divert the whole attention of medical professionals and district health system towards appropriate public health measures for control and prevention of infectious diseases. For this we need concerted action to use existing tools more effectively - i.e., both widely and wisely.

We need a new mechanism that would achieve internationally agreed targets to cut TB and malaria mortality by 50%, and HIV infection by 25%.

<u>It would lead to concerted action that:</u>

Enhances access to effective health care within the homes of those who are vulnerable to infection. Greater impact could be achieved through mass education, making mosquito nets widely available, ensuring access to condoms, and enabling people to use other essential health commodities.

Uses novel methods to ensure quality of health services whether provided through the private, NGO or public sectors- the use of a range of delivery organizations will increase the potential of getting to all those in need:

Offers an integration of five primary functions: - advocacy for health action, financing of health care, procurement of essential commodities, delivery of services and monitoring results for a seamless, efficient pipeline. This would lead to global catalysis of standardized and effective services that are properly co-coordinated, and provided in an efficient manner without duplication of efforts.

Ensures that when funds are allocated, preference is given to groups, well able to deliver effective services, backed up by rigorous surveillance and monitoring routines to document the health gains that result from financial investments.

The World Health Organization (WHO) is proposing a new framework for concerted action to tackle infectious diseases in developing nations:

- New mechanisms are coming into place to stimulate effective action against infectious diseases through public services, and supplemented where necessary through private channels.
- Financial support will reward the achievement of better health outcomes.
- Management systems will be accountable to national governments, in ways that are responsive to the interests of people and give communities more control.
- Focused partnerships will bring together public, private and voluntary organizations to provide services of consistent quality.
- Social marketing will get subsidized goods to those who need them through private channels.
- Service quality will be sustained through tightly managed franchises.

- Such innovation, increasingly supported by Heads of State of developing countries, and their governments, will increase access to effective technologies.
- Countries will be able to achieve the health outcomes they have desired for all their people.

At a global level, WHO has established incentives to stimulate research and development into new technologies – particularly vaccines and cost-effective drugs. WHO is working for international regulatory and legal systems, which balance the need to protect intellectual property and the need to ensure more equitable access to essential medicines .WHO will transform the ways in which the UN agencies work with governments, establishing new high performance efforts that get effective interventions directly to poor people.

WHO will take advantage of means commonly used by the private sector for economies of scale in the procurement and distribution of key health care commodities and services.

WHO is changing its tactics in the battle against communicable disease. Working with Heads of State and their governments, WHO is concentrating on getting essential goods and services directly to those in need. Working with those who can provide resources, WHO is offering mechanisms that link the funds invested directly to the results achieved. Working with those who market products, deliver services and monitor achievement, WHO is rewarding excellence.

WHO will ensure that the international system is well able to handle additional financial commitments, service innovative partnerships, and sustain efficient ways of working. The reward is clear - better health is key – not just to reducing peoples' poverty and increasing national prosperity, but also to global stability and, for everyone, greater peace of millions.

Secondary Data Analysis For Malaria

Secondary Data sources:

NAMP of Cuttack District

OMDSS of Cuttack District

Introduction:

Orissa is one of the poor states of India. The miserable health status of the state is symbolized by its highest infant mortality rate in the country, which is estimated to be 97 per 1000 live births in 1999 and 90 in 2001. Malaria is now a major public health concern in Orissa, which contributes a great deal to Infant mortality as well as the morbidity of general population. Though the hilly, terrain areas and tribal districts of the state are heavily burdened with the morbidity and mortality due to malaria, no part of he state is free from the clutches of the tiny malaria parasites (plasmodia). In spite of the National Anti Malaria Programme the disease has reemerged in a vigorous manner in all the districts of the State. Orissa contributes approximately 20% of the total cases, 40% of the Pf cases and 46% of the deaths due to malaria to the country's scenario (as per the data of 2000). Within the state itself, the Pf % is 85%, which is the major cause of public health burden. To tackle the malaria situation in the state Enhanced Malaria Control Programme (EMCP) has been implemented in 158 blocks out of identified 210 high-risk blocks spreading over to 21 districts of the state.No block of Cuttack district has been included in EMCP but some blocks of the adjacent districts like Dhenkanal, Anugul, Nayagarh and Jajpur are under EMCP.

The Orissa action plans for malaria control (2001 –2002), states that except 3 districts i.e. Jagatsingpur, Kendrapada and Puri all other districts of the state are high risk blocks. Government of Orissa has proposed for inclusion of all the blocks of Cuttack district in EMCP.

Earlier malaria was not a health problem in coastal districts of Orissa but now it has become a major public health concern in this part of Orissa. Cuttack being one of the coastal districts is facing the problem of malaria to a great extent.

If we analyze the last 10 years (1990 to 2001) data on malaria the plasmodium falciparum (Pf) percentage is increasing in Cuttack district from 50.18 to 74.95. We know that Plasmodium falciparum is the main cause of complications and deaths due to malaria. High Pf percentage in the district needs intensive public health attention fro control of malaria.

The Epidemiological Situation:

Epidemiological situations of malaria in Cuttack and Orissa during 1990 – 2001 and 2001 –2002 reveal that some parameters of malaria surveillance like ABER* and SPR** are far less in Cuttack district in comparison to Orissa situation. But the under reporting of malaria in coastal districts is to be taken into account.

Under reporting is a great constraint in planning for malaria control programme almost in all parts of the country. ICMR states that there is gross problem f under reporting of malaria cases and deaths. They estimate that there may be only 1 in 10 malaria cases and 1 in 200 malaria deaths actually make it to the official report. One has to look at different data sources to get an idea of the size of he problem of malaria in India, Orissa and district under study (Here Cuttack District).

The data from NAMP , 1990 to 2002 shows that ABER was highest (6.16) in Cuttack district in the year 2002.In1992 it was 6.06, which slowly came down in he following years. During the 1999 to 2000 it declined sharply from 5.74 (1999) to 0.52 (2001) but again it has gone up in 2002. SPR is increasing slowly but in comparison to Orissa SPR level is at lower side. In Cuttack district SPR was 1.38 in 1990 and in Orissa it was 8.66.SPR is highest in 2000 and 2000 in Cuttack district i.e. 2.89, which is 11.89 and 10.94 respectively in Orissa during the same period.

Table:1. Malaria parameters (ABER, SPR, Pf%), Cuttack and Orisaa, 1990 –2002

Year	Cuttack			Orissa		
	ABER	SPR	Pf%	ABER	SPR	Pf%
1990	5.78	1.38	50.18	11.13	8.66	84.72
1991	5.92	1.66	57.30	12.76	10.46	84.06
1992	6.06	1.34	60.31	11.89	9.67	84.75
1993	5.77	2.04	82.18	10.30	9.74	84.89
1994	5.67	2.13	85.89	8.73	10.17	85.63
1995	4.95	2.66	83.84	9.62	11.18	85.78
1996	5.70	2.66	72.27	11.05	11.83	86.33
1997	5.65	2.96	74.07	10.33	11.45	86.43
1998	5.20	2.71	70.95	10.82	12.14	85.45
1999	4.67	2.41	72.89	10.55	12.39	84.44
2000	5.74	2.89	71.31	11.27	11.89	84.00
2001	0.52	2.89	75.08	10.48	10.94	84.12
2002	6.16	2.83	66.49			

Alarming rise of Pf % in Cutack district

Parameter like Pf % is at an alarming state in Cuttack district. From 1993 to 1995 Pf% of Cuttack district was at par with Orissa, which has been slightly declined in the following years. From 1996 to 2001 Pf% in Cuttack district is ranging from 70 to 75% where as for Orissa it is 84 to 86 %.In 2002 he Pf % has been declined to 66.49 %.

ABER:Annual blood examination rate

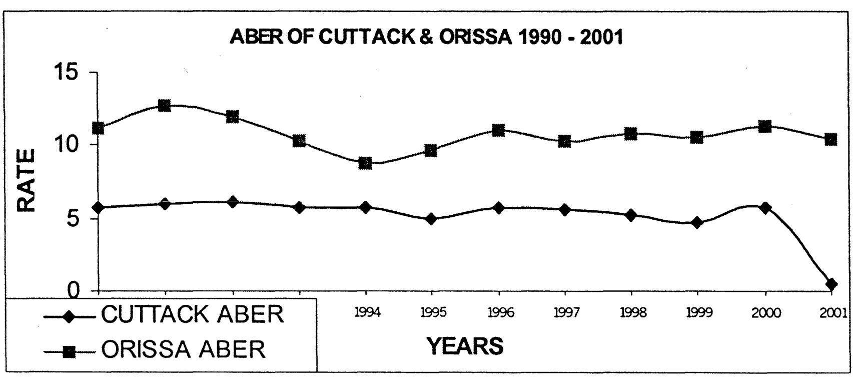
This parameter reflects the efficiency and adequacy of case detection mechanism. A minimum ABER of 10 % per year was fixed under Malaria Eradication programme based on estimate of fever in India.

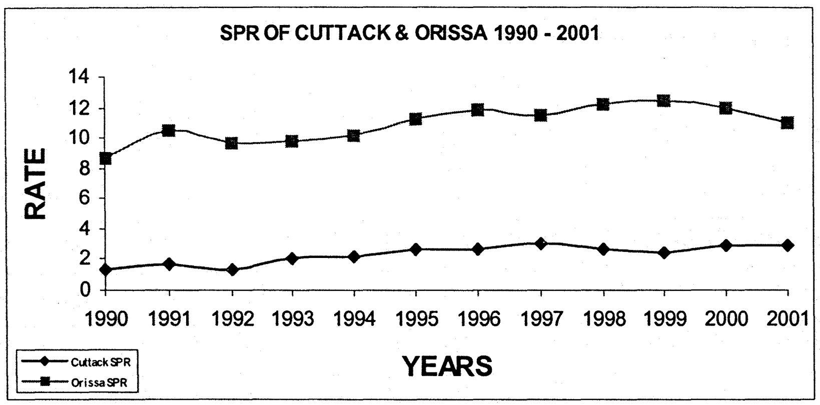
SPR: -Slide Positivity Rate. SPR provides information on the trend of malaria transmission. This is a dependable parameter for determining the progress of containment measures and gives information of parasite load in the community.

Pf%: Plasmodium falciparum Percentage:This parameter gives the relative proportion of P. falciparum and identifies trends of P. falciparum incidence in relation to total caseload of malaria parasite in the community.

Table:2.Malaria Pf percentage (epidemiological situation) of Orissa, Cuttack and near by districts (Dhenkanal and Anugul) from 1998 to 2001.

Years	Orissa	Cuttack district	Dhenkanal district	Anugul district)	Boud district
1998	85.45	70.92	78.21	73.43	46.00
1999	84.44	73.16	76.20	71.78	59.42
2000	84.00	71.31	73.66	67.48	52.10
2001	84.12	74.95	73.66	71.15	56.81





Plasmodium falciparum infection is the major cause for malaria mortality in India .The data on malaria parameter of Cuttack district for the year 2001 reflects that the Blocks: -Tigiria , Banki (II) , Narasinghpur , Badamba and Cuttack Municipality Corporation are having Pf% more than 80%. (District Pf% is more than 75%). SFR (slide falciparum rate) is 2.17 for the district of Cuttack . Blocks like Banki , Narasinghpur are having SFR more than 6%.Following table gives a detail picture of block wise malaria status of Cuttack district (2001).

Government of Orissa primarily focuses on EDPT i.e. early diagnosis and prompt treatment. Early diagnosis is done by microscopy and prompt treatment is done by treatment with chloroquin through the drug depot holders. Indoor residual spray with insecticides like DDT is done as anti-mosquito measures. This strategy has been tried since many years by different names of malaria control programme in the country. In the initial phase it showed excellent results but later it has failed to curb down malaria incidences. The present enhanced malaria control programme (EMCP) launched since 1998 in 153 blocks of 21 districts uses the same strategy with some variation and more inputs. Four years after it has been launched no remarkable change has been observed. Despite the money and other newer technology involved the morbidity and mortality due to malaria in Orissa is highest in the country.

Before launching EMCP in new districts and blocks we should look back why the NAMP strategy did not work. NAMP failed due resistance:- Resistance not only by malaria parasites to chloroquin and mosquito to insecticides but also resistance of people to the measures thrust upon them. There was also resistance of the health system to reform and scientific management.

Peoples' participation in controlling malaria becomes a daydream. Even today in rural areas of Cuttack district people do not have much idea about how to take control measures for malaria at personal / household and community level. Poor people loose their working days and get weaker and weaker as they suffer from malaria. At times the deadly falciparum malaria pose great problem to common people by complicating body physiology and draining the poor man's purse for specialized hospital treatments.

The traditional approaches to malaria control utilized by NAMP have failed due to Varity of reasons. Alternative strategies to control malaria have been experimented in different pars of the state, though in smaller scale both by Non-Governmental and Governmental organizations. They have produced significant but localized decrease in malaria.

The key in most of these new strategies appears to be empowerment of individuals and community with knowledge, skills and tools necessary to protect themselves from malaria and to control the problem in their locality.

Malaria control methodology should be peoples' friendly and be implemented as people's campaign against malaria.

Suggestions:

Assessment study should be conducted to estimate the functioning of NAMP to find out the Strengths and gaps and to plan for newer strategies.

Proper studies should be conducted to see whether resistance has been developed to chloroquin in any Block / area of Cuttack District.

Blocks and urban areas having high Pf % should be given adequate attention for public health measures.

There should be integration between MDSS and NAMP at Block and District level to estimate the real burden of Malaria in respective areas.

Before EMCP is launched in Cuttack district the experiences of newer strategies experimented in different parts of the state should be taken into consideration.

People participation and inter-sectoral coordination are key aspects for control of malaria and this should strengthened..

There should be exclusive planning for urban slums for control of malaria.

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SECTION :2

SECOND FIELD POSTING

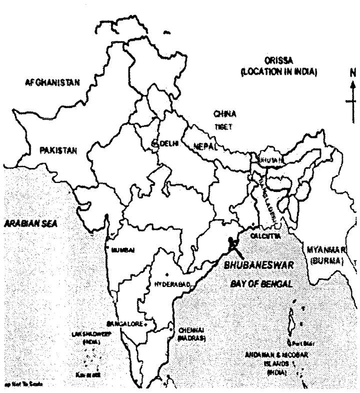
2.1.EVALUATION OF ORISSA MULTI-DISEASE SURVEILLANCE SYSTEM, IN A BLOCK OF CUTTACK DISTRICT

1.Introduction

Public health surveillance is the ongoing, systematic collection, analysis, interpretation, and dissemination of data regarding a health related event for use in Public health action to reduce morbidity and mortality and to improve health. Data disseminated by public health surveillance can be used for immediate public health action, program planning and evaluation, and formulating research hypotheses.

Disease surveillance is considered as the backbone of any public health system. Detecting cases of infectious diseases and their distribution in time and place offers clues to the salient background phenomena of amplification and transmission of infectious agents, knowledge of which is essential for disease control. Surveillance is the first step in interventions aimed at disease control and especially serves to detect early outbreaks of diseases. Surveillance is also essential for the early detection of emerging (new) and re-emerging (resurgent) diseases.

of natural resources.



Orissa is one of the east coast states of India having 36.7 million population out of which 87% are in rural areas.39% of population is Scheduled caste and scheduled tribe. The sex ratio s 972.There are total 30 districts and 314 blocks. Literacy rate is 63%. IMR is 90 % (2001), percapita income is 11 US dollar per year (1995-96). The state's economy is characterised by low percapita income, low capital formation, and inadequate utilisation resources.

The Orissa Multi Disease Surveillance System (OMDSS) is currently in operation in all the districts (30 districts) of the state. The Orissa State Health

Authority appreciated the effective functioning OMDSS both during normal time and natural calamities. In the Health Strategy "Orissa Vision 2010" - it has been highlighted as one of the important Orissa state specific health [orgrammes.

1.1OMDSS: an overview

The coastal states in eastern India are always prone to natural disasters like floods and cyclones. Among these Orissa is one of the most vulnerable states. Floods, cyclones, & disasters due to other climatic factors e.g. heat waves, drought etc are regular features of Orissa. Water and vector borne infectious diseases are as such the burden of the state, which pose epidemic threats at different point of time. Disasters when occur magnify this problem to manifolds. The unprecedented super cyclone that hit Orissa coast on 29th October 1999 caused great devastation in 12 coastal districts. More than 8 million people were under stress and living in an unhealthy environment. The Government health facilities were badly damaged and not in a position to deliver effective health care services. *The State public health reporting system was not strong enough to cater to the needs of such a mega scale emergency.*

There was great apprehension of epidemics of communicable diseases as a consequence to environmental degradation. In this context the Govt. of Orissa set up the Orissa Multi Disease Surveillance System for timely information on potential disease epidemics in the aftermath of super cyclone. State Health Department got technical support from the Medicine Sans Frontier (MSF), an international health agency and technical & training support from World Health Organisation to establish the weekly disease surveillance system. Within one month of the Super cyclone i.e. in November 1999, the OMDSS was operational in the Government health system functioning in rural set-up of the 12 cyclones affected districts. OMDSS operational on weekly cycle gained strength week by week.

Within one year of functioning State Health Policy Makers and Health Administrators found the system, very useful in getting timely information and taking timely public health action. The confidence in the ability of the system led to its expansion to all the districts of Orissa in 2001.OMDSS now covers all the health facilities under the administration of the Directorate of Health Services, Orissa in all 30 districts. The surveillance system includes 10 communicable diseases / syndromes.. The system is flexible to adopt more diseases as per the need of the circumstance e.g. heat disorder in summer, snakebite and skin diseases in flood and cyclone.

Following Objectives Have Been Set For OMDSS

Epidemic (outbreak) detection and intervention

Predicting potential outbreaks

Monitoring trends in endemic illness

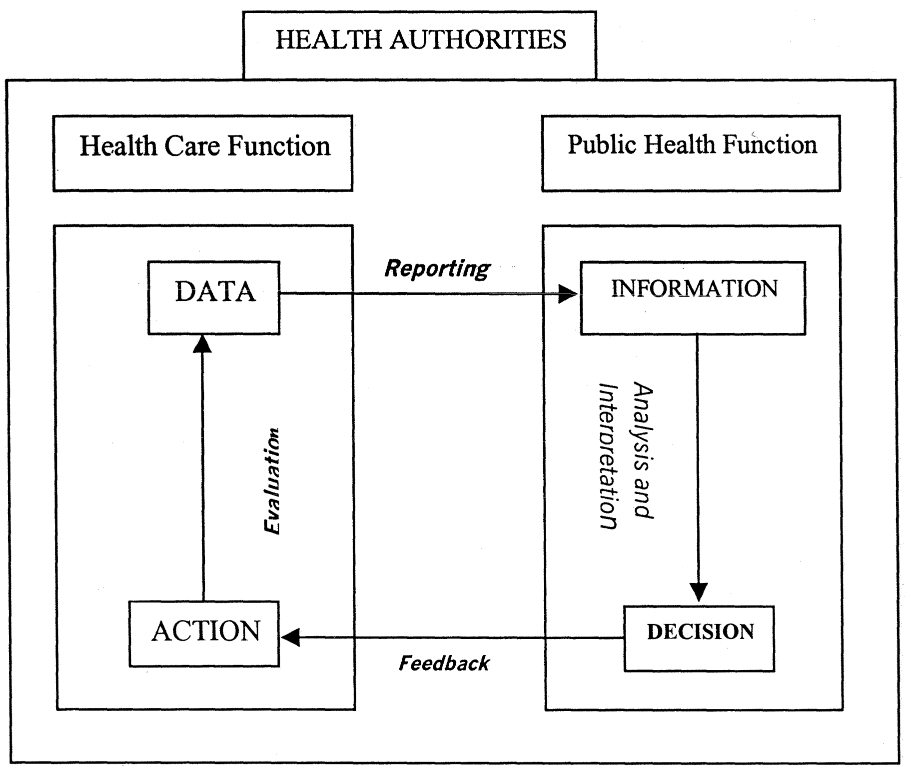
Monitoring progress towards a control objective e.g malaria

Monitoring programme performance e.g.. Vaccination (measles, antenatal tetanus

Evaluating an intervention

Estimating future disease impact

The Basic principles of OMDSS are as per the standard surveillance principles followed by WHO and CDC, which are depicted below.



Basic Ingredients of OMDSS

(1) Clear case definitions and reporting mechanisms

(2) Data transmission/ Communication systems
(3) Basic Epidemiology
(4) Feedback and rapid response mechanism
(5) Network of motivated people
(6) Laboratory support

OMDSS data collection at different levels

Reporting units	Primary Person responsible	Alternative Person responsible
Health sub centres	Health Worker (Female)	Health Worker (Male)
OPD of PHC (New)	Pharmacist	Health Supervisor
OPD / IPD of PHC / CHC	Pharmacist	Health Supervisor
IPD of Medicine and Paediatrics departments of Sub divisional hospital (SDH) and District Head Quarter Hospital (DHH)	Staff Nurse	Pharmacist

Data Compilation:

OMDSS data is compiled at all levels of health facilities that are coming under the district health system i.e. the Sub-centre, the Sector PHC, the Block (PHC/CHC), the District (CDMO Office). The process of data compilation at various levels is shown in the table below:

Compilation Level	Main Report compiled from	Additional Reports to be compiled from	Reports to be compiled by
Sub-centres	Data collected from each village covered by the sub-centre	None	Health worker (Male and Female)
Sectors	Data reported by each sub-centre under the sector and data collected at the sector PHC	Reports received from: *Govt. Health Facilities*	Health Supervisor Male and Female) at PHC-New
Block	Data reported by each sector under the block and data collected at the block PHC / CHC	Reports received from: *Govt. Health Facilities*	Statistical Assistant/Vital Statistics Clerk / Pharmacist / Block Extension Educator at Block PHC/ CHC
Districts	Data reported by each block under the district and data reported from the Area, Sub-Divisional and District Headquarters Hospitals	Reports received from: *Govt. Health Facilities*	Data entry operator/ Statistical Assistant / Vital Statistics Clerk or any other person posted for that purpose at the office of the CDMO .

Data is compiled manually at the sub-centre, sector and block levels. Only at district level, compilation and analysis is done by computer.

As per the design specific compilation formats should be used at different levels.

<u>Responsibilities of Data Compiler:</u>

Look for incompleteness in the reporting forms and inconsistencies in data and other errors before data is compiled.

Crosscheck errors and doubts with the original report before compilation.

Ensure that the immediate lower level compilation units have sent separate compilation reports for each different type of health sector sending reports to that level.

Ensure that the immediate lower level compilation units have sent the break-up reports. It is emphasized that there should not be any delay in transmission of the compiled report to the next higher level due to crosschecking of reports from the lower level. If the data found to be wrong then when correct data is available that should be transmitted to next higher level after cross checking as an "updated or corrected report".

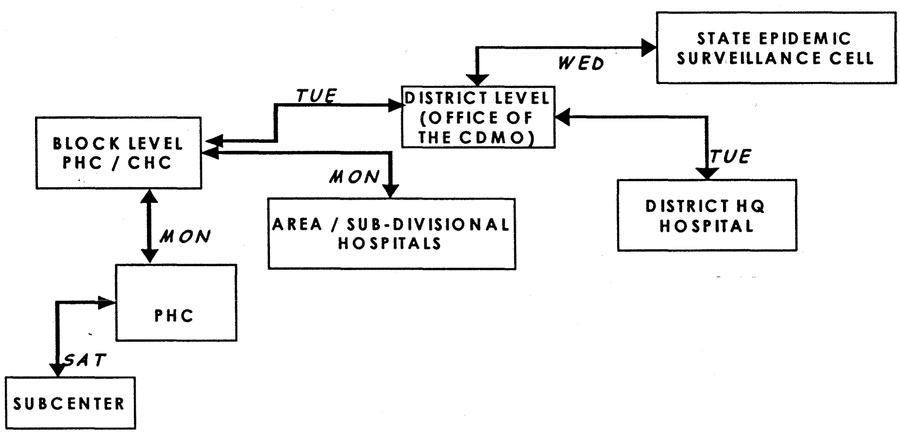
Data transmission:

From	To	Person(s) responsible	Mode of transfer	Day
Health Sub-Centre	Sector PHC	Health Worker (F), Health Worker (M)	Manual	Saturday
Sector PHC	Block PHC or CHC	Health Supervisor (M/F)	Manual	Monday
Block PHC / CHC	District Level	Pharmacist/SA/VS Clerk/ BEE	Telephone/postal/ messangerl	Tuesday
Hospitals (SDH/ Area hospital/ DHH)	District Level	Pharmacist/ Staff Nurse/ Medical Records Staff	do	Tuesday
District Level	State Level	Data entry Operator/ Statistical Assistant/ Vital Statistical Clerk	Email/FAX/telephone/postal	Wednesday

The completed data compilation reports and the necessary break-up reports are transmitted to the next higher level as depicted in the figure below:

It is always emphasised to stick to the deadlines with respect to data transfer, by all the reporting units, so that the time delay between data collection and initiation of action is reduced as far as possible. The compiling units should not wait for all reports from the reporting units to come in order to transmit data to the higher levels. Reports that arrive late should be marked "Supplementary Report", and sent to the higher level when received. It has been emphasised that at every level the supplementary reports should be entered into the actual week for which it was reported, and NOT the week it was received/sent. If any data has been transmitted over phone, it is should be followed by a hard copy. The person assigned to receive the weekly disease surveillance reports from the lower levels are supposed to maintain a log book by which it becomes easier to monitor the timeliness and completeness of data transmission as well as record problems in transmission, if any.

Data transmission



In normal situation reporting units transmit the Surveillance data every week. The system adopts daily reporting in following circumstances.

1.When there is a threat for outbreak / epidemic or when already outbreak has occurred.

2.Whenever a case of an epidemic prone disease – (Severe Diarrhoea, Measles, Dengue, Leptospirosis, Japanese Encephalitis and Plague) is suspected by the health facility/worker.

3.Whenever any unusual clustering of cases (more than expected number of cases with similar symptoms occurring close to each other in time and place) or

4.Any health related event that causes deaths in a short span of time is detected by the health facility/worker.

5.In disaster situations like Flood / Cyclones / Heat waves etc

Communication facility during emergencies:

Rapid mode of communication system like, telephone, telegraph, fax, email, police wireless or special messenger are used to transmit the report immediately during emergencies. When the reporting is verbal (telephonically) it is followed by a written report.

Staff Responsible for Data Analysis and Its Use: What about State level?

Level of Health system	Staff responsible
State	Joint Director–Public health and Surveillance medical
District	officer
Block	ADMO (PH) and Assistant Health Officer (AHO)
Sector	Medical Officer in charge
	Medical Officer in charge PHC (New)

The Data entry operator and the Statistical Assistant / Vital statistical clerk assigned for the disease surveillance system at district level are critical actors for data compilation, computerisation, analysis and report generation of OMDSS data. They also have a crucial role to play in the generation of analytical reports from the data collected during outbreaks investigation by the District Task Force (DTF).

At district level data is analysed by rates and ratio and presented in graphical forms.

Response and follow-up:

The actions/ interventions that are initiated based on the interpretation of the analysed disease surveillance data constitute the responses of the system. The level, speed and scope of response depend on the urgency of the situation, the transmission and availability of relevant additional information, connectivity and communication.

Regular response is the responsibility of the Block PHC Medical Officer and Sector PHC medical officer and of the District Task Force at the District level. Regular response may be aimed at one or more of the followings.

Investigate outbreaks

Initiate disease control measures

Sort out problems in system efficiency such as:

Inadequate data quality

Poor reporting efficiency

Outbreak investigation and response mechanism:

At the Block level, the Medical officer of the concerned institution is the nodal officer to respond to an outbreak. S/he can form a small investigating team comprising the Health Supervisors, Health workers, the Pharmacist/Lab technician and Attendant.

At the district, the District Task Force (DTF) is responsible for investigating any reported/suspected outbreaks. The DTF at the District level is constituted of the AHO (Assistant Health Officer), one Laboratory Technician, one Health Supervisor, one Assistant & one Driver.

The DTF is provided with a vehicle, and funds for fuel etc are provided by the Orissa Health System Development Project (OHSDP).

At the state level, the Rapid Response Team (RRT)) is responsible for handling any major outbreaks that have not been successfully managed by the DTF, epidemics occurring across district borders, outbreaks of unknown or unusual causes, or outbreaks with high Case Fatality Ratio. RRT is constituted taking senior faculties from the medical college:Department of SPM , medicine,pediatric. Microbilology and when needed forensic & toxicology.Both the DTF and the RRT work in close coordination along with the local health staff in the event of an outbreak. While they will help and support the local staff in the management and control of the outbreak, the primary responsibility for implementing control measures rests with the local health staff.

Recently guidelines for outbreak investigations and responses have been developed for DTF and RRT.

OMDSS Diseases / Syndromes:

Diseases/syndromes having epidemic potential during natural calamities are included in OMDSS. Except malaria other diseases having vertical surveillance system are not included in OMDSS (malaria is listed in OMDSS as suspected malaria and it is detected on the basis of clinical diagnosis). Neonatal tetanus has been included as a strategy to monitor immunisation programme of pregnant women keeping in view the high IMR in the state.

Case Definitions:

For all the diseases / syndromes enlisted in OMDSS, case definitions are available as per state protocol. The state protocol are modifications of the standard WHO case definitions.

All the staff have been explained regarding the importance of the case definitions during training on OMDSS. The case definitions followed in OMDSS are uniform for health providers functioning at all levels i.e. from Health workers to Medical officers. The case definitions are limited to clinical diagnosis only.

1.2: Rational Behind the Evaluation:

Currently the nationally proposed Integrated Disease Surveillance Programme (IDSP) will be implemented in phases all over the country. It is expected to be introduced in Orissa within the current decade. In 2nd December 2002 the OMDSS was presented at the Surveillance Task Force Review meeting conducted by the WR office of the WHO at New Delhi. The effort made in Orissa was well appreciated and experts present in the meeting opined that OMDSS is an excellent country experience deserving to be considered carefully in planning for implementation of IDSP. The inputs on financial, logistic and technical aspects are much lower in the OMDSS as compared to the IDSP. OMDSS has gained experience for more than three years and the IDSP will be initiated in near future. In this context, it is the opportune time for a systematic evaluation of the OMDSS to draw lessons, which may be of help in properly introducing the IDSP.

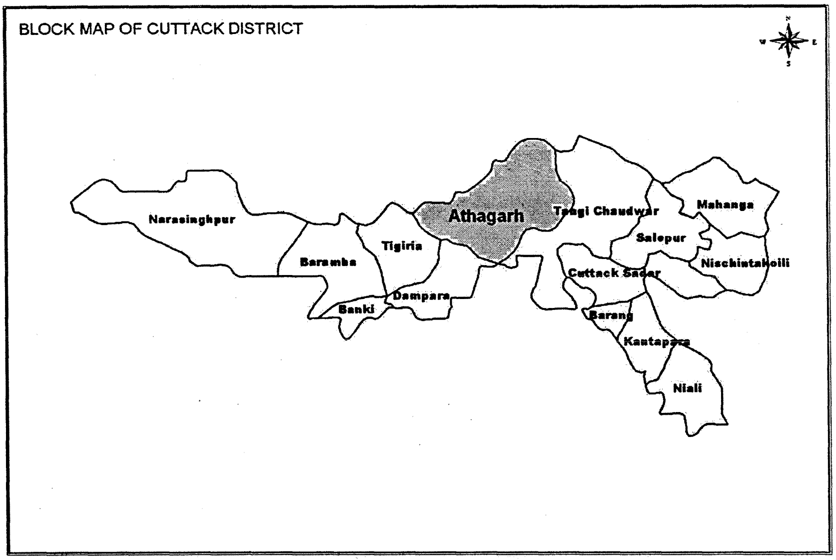
The Present OMDSS evaluation is a small-scale cross-sectional study, which though have several limitations would give an insight and critical overview of the system in operation in the state of Orissa. The study has been conducted in one Block area of Cuttack district with the objectives mentioned below.

2: Objectives of OMDSS Evaluation:

To assess the achievement of objectives of OMDSS in one Block area of Cuttack district To identify gaps and underlying contributing factors To suggest appropriate measure to narrow down the existing gaps

3: Background of the study area:

The evaluation was conducted in Athagarh Block of Cuttack District. Cuttack district was included in OMDSS in the first phase. The said Block was selected for the evaluation purpose as one of the satisfactorily performing blocks of the district. The name of the PHC of this Block is Berhampur.



3.1: Geography and Demographic profile of Cuttack district:

Total geographical area of Cuttack district is 3733 Sq. Km.

Location: a) Longitude: 84degree 58 minute to 86 degree 20minute b) Latitude: 20 degree 03 minute to 20 degree 40 minute North. Altitude is 14.62 meters above the sea level

Rainfall: Normal is 1501.3 millimetres and actual is 980.2milemeter in 1000 hector area as per 2001 data.

Minimum Temperature-22.2 degree centigrade and maximum temperature is 33.4 degree centigrade.

There are three Subdivisions, 14 Community Development Blocks 274 Gram Panchayats, 1865 inhabited villages and 102 uninhabited villages. There are 10 assembly constituencies.

Natural calamities:

Cuttack is prone to natural calamities like cyclone, flood and heat wave disorder. From 1998 onwards it has faced successively the heat disorder in summer 1998, super cyclone in October 1999 and flood in July – August 2001 & August- September 2003.

Demographic Profile of Cuttack District			
Total population	2,340,686	Population Density in 1991	522
Males	1,207,569	Population Density in 2001	595

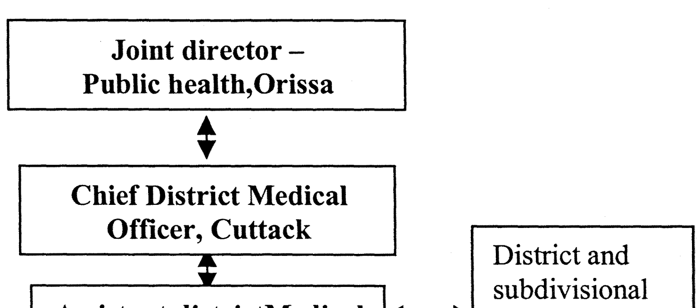
Females	1,133,117	Literacy Rate in 1991 Males	65.44
Decennial Growth rate (%) in year 1981-91	19.37	Literacy Rate in 1991 Females	77.30
Decennial Growth rate (%) in year 91-2001	14.00	Literacy Rate in Total (1991)	52.47
Sex Ration in Year 1991	922	Literacy Rate in 2001 Males	76.13
Sex Ration in Year 2001	938	Literacy Rate in 2001 Females	85.46
		Literacy Rate Total (2001)	66.19
Estimated Mid year population of Cuttack District			

Year 2001	Year 2002	Year 2003	Year 2004	Year 2005
2,353,092	2,390,741	2,428,993	2,467,857	2,507,343

3.2:Health Care Delivery System and Other Supporting Facilities of Cuttack District:

There is a wide network of primary health care system in Cuttack district. There are 10 hospitals, 4 Community Health Centres (CHCs), 9 Block level Primary Health Centres (PHCs), 67 sector PHCs and 296 sub centres in the district. The CHCs and block PHCs are the main administration units for public health activities and they are situated mostly at the Block Head Quarters catering a population of more than one lakh in average. At the Sub block level there are Sector PHCs, which cater about 30,000 populations. There are about 2 to 4 sector PHCs under each CHC / block PHC. Under each sector PHC there are 4 to 6 sub centres. Sub-centres are the grass root level Government health facilities. The Sub centres are manned by the Health workers (female and male). The District Head Quarter Hospital is situated at Cuttack city where other District and sate level Government referral hospitals exist. The premier Government Medical College and Hospital (SCB Medical College Hospital, Cuttack) of the State, the Postgraduate Institute of Paediatrics and Regional Cancer Institute are situated at the District Head quarter city.

The public Health Organogaram of Cuttack District



Primary Health Care System. The overview of the health reporting system is reflected in the following table.

FREQUENCY AND TYPE OF REPOTING

Surveillance programme	Weekly reporting *	Monthly reporting **	Special survey	Remark
Epidemic prone diseases	Yes	Yes	-	
Malaria	Yes	Yes	-	Malaria is reported both in vertical programme (NAMP) and in OMDSS (as suspected malaria)
T. B	-	Yes	-	
Leprosy	-	Yes	Yes	
Vaccine preventable diseases	Yes	Yes		Measles and neonatal tetanus are reported weekly through OMDSS, the weekly disease surveillance system. Measles and neonatal tetanus also reported on monthly basis under Reproductive Child Health programme(RCH)
Acute Flaccid Paralysis	SOS			
HIV / AIDS	-	-	Yes	
65disease conditions	-	-	Yes	
Epidemic	SOS			
Disaster situation (Flood, cyclone, heat waves)	Daily reporting	All the epidemic prone diseases included in OMDSS (normal time) + infectious skin diseases and snake bite are reported daily during flood and cyclone, Heat disorder is reported in summer		

N. B: Quarterly Reporting: Reporting of morbidity and mortality of OPD and IPD cases of 65 disease conditions of communicable and non- communicable diseases is done on quarterly basis from PHC/CHC and district Hospital.

**Weekly reporting:* In OMDSS the reporting interval is on weekly basis. The data reported is on new cases/ deaths detected between two age groups i.e. < 5 years and >= 5 years. The diseases / syndromes includes in this system are listed below.

List of diseases / syndromes under surveillance in OMDSS in a district

Sly. No	Disease / syndromes	Sl.No	Disease / syndromes
1	Acute Simple Diarrhoea	7	Measles
2	Acute Severe Diarrhoea	8	Neonatal Tetanus
3	Bloody Diarrhoea	9	Suspected Meningitis
4	Acute Jaundice Syndrome	10	Heat disorder
5	Suspected Malaria	11	Any Unusual Severe Syndrome
6	Acute Respiratory Tract Infection	12	Others
N. B. Another two seasonal diseases are added during Flood and cyclone i.e. Snakebite and skin diseases			

***Monthly reporting*: Monthly reporting is done on morbidity and mortality data collected from OPD and IPD for 18 disease conditions and some diseases targeted by the National Health Programmes e.g. malaria, tuberculosis, Polio, measles etc.

The 18 disease conditions that are reported on monthly basis are as follows					
1	Acute Diarrhoeal diseases	7	Typhoid	13	Viral hepatitis
2	Acute poliomyelitis	8	Measles	14	Diphtheria
3	Neonatal tetanus	9	ARI	15	Pneumonia
4	Other tetanus	10	Rabies	16	Syphilis
5	Meningococcal meningitis	11	Japanese Encephalitis	17	Gonococci infection
6	Whooping cough	12	Pulmonary Tuberculosis	18	All other diseases

4. Study Design:

A Cross-sectional study was designed in consultation with State Multi Disease Surveillance Cell of Govt. of Orissa, Faculties of National Institute of Epidemiology, Chennai, Faculties of Community Medicine, SCB Medical

College Cuttack, WHO/ UNDP Health liaison (Orissa) to evaluate existing OMDSS in Athagarh block of Cuttack District and to find out the issues related to the processes of the OMDSS.

The evaluation was conducted in the month of September and October 2003.

4.1: Methodology:

Study team

Review of literature

Quantitative methods

Review of registers and records (mention a few)

House hold survey

Qualitative method

In depth interview etc

Both quantitative and qualitative methods have been adopted for the evaluation of OMDSS. A large proportion of secondary data containing various reports and registers from the selected health institutions were reviewed. Apart from this a number of literatures on evaluation of surveillance system has been reviewed for refreshing the knowledge. Community level rapid survey was conducted to compare the case detection efficiency of OMDSS.

An evaluation team was formed which consisted FETP-MAE scholar (NIE, Chennai) as principal investigator, Health Information System Analyst of UNDP, Orissa as co-investigator, one retired male health worker as field supervisor. Self-administered questionnaires were developed both for quantitative and qualitative data collection, which were field tested prior to the evaluation.

Following qualitative methods were adopted for the study.

1. In-depth interviews:

Separate checklists have been developed for different health personel like doctors, other clinical staff, Para-medical workers and field staff for in-depth interview to understand their perception and views towards OMDSS and its implications.

Following categories of personnel were interviewed during the study.

Health workers male and female

Sector-Health Supervisors (male and female)

Block Extension Educator (BEE)

Laboratory Technician

Pharmacist

Vital statistics clerk (VS clerk)

Medical officer at Block PHC and PHC (N)

Anganwadi workers of the Block

Assistant District Medical Officers- Public health (ADMO-PH)

Medical Officer In -Charge of State Disease Surveillance Cell, Directorate of Health services, Orissa

2. Observation:

Different level of health institutions likes Sub-centres, PHC (new), Block PHC, and District Surveillance Cell have been visited during the study to understand the way they (different persons involved in OMDSS) maintain the OMDSS registers and prepare the reports. Besides this, Sector and Block level review meetings have been attended to understand the usefulness of OMDSS.

3. Free listings:

Free listing method has been adopted at the beginning of the study at Sub centre, Sector and Block PHC level. Female Health workers at Sub-Centre and other staffs at PHC were asked to list the OMDSS reports they prepare and registers they maintain.

4. Review of secondary data:

Besides the above methods a large proportion of secondary data containing various reports and registers from the selected health institutions were reviewed to find out the quality and quantity of data collection and processing, transmission and storing, time spent to maintain information system, duplication of information and the usefulness of OMDSS in decision making and taking public health action.

4.2: Selection of health institutions:

We selected the Primary Healthcare system of Athagarh Block for the evaluation study, as it is one of the satisfactorily performing blocks on OMDSS in Cuttack District. The health institutions we have selected for review were as follows: Block PHC, two PHC (New) belonged to two different sectors, and 6 sub-centres. Besides the Block and Sub block level health institutions we visited the ADMO-Public Health Office at district level and the District and State Surveillance Cells.

4.3: Limitation of the study:

Incomplete records/registers/Reports

Poor record storing facility

Unavailability of some of the reports and registers

Chances of recall bias

5. Study findings and discussions:

Public health surveillance is an important tool for any public health system particularly in the context of a disaster prone zone. Orissa Multi Disease Surveillance System was established to pre-empt epidemic situations at the aftermath of super cyclone, 1999 and it then proved its timely need in a resource poor state. Though the system is not fully strengthened in many aspects still it indicates that it is much more efficient to handle public health problems than mere reporting systems which was operating previously. At the national level it has been planned to implement Integrated Disease Surveillance System (IDSP) in all the states the country in a phased manner. In this context the Orissa Multi Disease Surveillance System can give an insight about the operational issues of a system keeping in view the system strength to accept a new programme. In the present evaluation study we have reviewed block and sub block level activities, assessed the strength and weaknesses of OMDSS, which would help us to build up strategies for improving the system. We have observed the system at different level and some of the observation and assessment findings are mentioned below.

Table:5.1: Strength of Manpower and Health Infrastructure involved in OMDSS, Athagarh block

Man power	No. of Sanctioned post	No. of vacancies	
Male Health worker	18	3	
Female Health worker	27	5	
Male Health Supervisor	5	3	
Female Health Supervisor	4	0	
Pharmacists	6	0	
Vital statistic clerk	1	0	
Block education educator	1	0	
Medical officers	7	1	
Attendant and other 4th class employee	19	6	
Health Infrastructure			
	Sub centre	PHC (New)	Block PHC
Own building			
Separate space for Disease surveillance	Not needed	Not needed	Needed but not specified
Record storing facility	Not available in 20%. of sub centres	Available in all PHC (New)	Available

5.2: Data Collection and Transmission:

Health Sub-centre level: Data collection is done both by health workers (male and female) both passively and actively. Female health worker maintains the patient record. During one OMDSS week period(Saturday to Friday) the health workers are able to cover only 40 % villages. Patients from head quarter village of the Sub-centre area generally come to the sub centre clinic to avail free treatment (passive surveillance). After interviewing the health workers we found that, the low attendance of patients to sub centre clinics is *due to non availability of adequate medicine for many of the common ailments*.

There are inadequate primary data collection formats and no supply of minor ailment registers (since last two years) for the Health workers, which put them in constraints for proper data collection and storing.

No systematic analysis of the data using Incidence rate and Case fatality ratios for <5and >= 5 age group is done at Block and sub Block level.

Other factors:

There is lack of pre-designed format for outbreak investigation.

The health institutions under Indian system of medicines for data collection have not yet been included.

Poor laboratory facility at Block and District level.

Feedback is only during the weekly and monthly review meetings. Other feed back mechanisms are used very less.

5.3: Observation at District level:

At district level OMDSS data is compiled and analysed by computer. Trained data entry operators are in position to handle OMDSS data. Connectivity to State Disease Surveillance Cell is established through Phone / FAX and Internet. There is Phone connection up to Block PhDs / CHCs. The Disease Surveillance Cell gets converted to control room, during natural disasters like flood/cyclone and during these situations it functions round the clock.

The software package for Health Management Information (HMIS) installed on behalf of OHSDP is not functional to handle the OMDSS data. Data storing is not done in a systematic manner. Huge OMDSS data bank is available at district level but it is not optimally used for public health purposes. There is no proper understanding on data analysis, interpretation. Though there is every possibility to predict outbreaks by analysing and interpreting the data collected as well as observing the disease trend, it is not happening due to lack of adequate training on Epidemiology. District Task Force (DTF) often losses the opportunity in detecting the outbreaks early. At District level the Assistant Health officer (AHO) is the Key person to lead DTF and monitor OMDSS activities. But many a times the post is filled up very casually. Most of the time the DTF action plan is not based upon the OMDSS data. By proper use of OMDSS data, manpower time and money can be saved substantially.

There is no proper coordination between different disease surveillance systems in operation in the district and OMDSS, that could save duplication of efforts.

The disease surveillance vehicle available at distinct level on behalf of OHSDP is not on the road most of the time due to lack of POL and contingency fund.

The public health laboratory facility is very weak. Except some routine laboratory investigations, Malaria and TB nothing more can be invested for confirming communicable diseases in case of outbreaks. There is no facility for culture of organisms and no defined mechanism for laboratory net working.

5.4: Rumour Register: Though OMDSS has all strength and potentiality to help managing disaster situations and health emergencies; many times the views of public and the political people carry away the decision making process of the District Public Health Authority. There is no mechanism to keep track of the public rumours.

Rumour register concept is very good idea during disaster situations. But this has not yet been introduced in OMDSS. The Medical Officer In charge of Berhampur PHC has a clear concept on it.

5.5: Staff training: Three rounds of training have been conducted for Medical officers and two rounds of training have been conducted for other health staffs since the establishment of OMDSS in Athagarh Block. More than 80 % health staffs have served more than 2 years in Athagarh Block. Out of them more than 90 % of the staffs have undergone training at least once. After interviewing and assessing the knowledge of health staffs we found following gaps and training needs for different health personnel.

Health Personnel	Gaps observed and the training needs
Medical officers (At Block PHC and Sector PHC level)	Maintaining the OPD registers legibly Writing the diagnosis on the OPD register as per the OMDSS case definitions Proper data analysis and report preparation Epidemic preparedness and outbreak investigation Utilisation of OMDSS data for public health planning Supervision and monitoring for quality assurance Biological sample collection, transportation to referral laboratories Use of Rapid Diagnostic Kits to diagnose Unusual syndromes and Suspected infectious diseases in the field situation Inter-sectoral coordination

Pharmacist (At Block PHC and Sector PHC level)	No clarity on case definitions Maintenance of OMDSS records is very crude but the weekly data compilation and transmission to sector supervisor is on time No clarity on data analysis and report preparation- need special training for all the above aspects.
Health supervisors (Male & Female) At sector level	Sector level data analysis using rates and ratios Report preparation for the sector using the OMDSS data Sector level public health planning on the basis of OMDSS data No clarity on some case definitions like unusual severe syndrome, suspected meningitis. Knowledge on Proper outbreak investigation and response is lacking. Data compilation is not done on the designed compilation format
Health worker (Male& Female) at Health Sub Centre level	Lack of clarity on case definition: None has clarity on unusual severe syndrome.70%do not have clarity on Suspected meningitis.30% do not have clarity on neonatal tetanus and heat disorder. Data analysis: Data analysis is done in a crude manner. Only 40 % of health workers look back to their collected data to compare the data with previous weeks by observing the absolute numbers. 100 % of health workers transmit the data to their respective supervisors in time. The sector medical officer/ supervisor in the sector review meetings gives feedback. None of the health workers and supervisors have idea on rates and ratio and graphical presentation, but when explained (all most all staff interviewed i.e.10 health workers and 4 supervisors) could appreciate the process and its utility. Epidemic preparedness and response: there is no proper understanding regarding utilisation of OMDSS data for prediction an detection of outbreaks at sector level.

	There is no improved skill for epidemic response and management
** Training Venue: All most all the health workers and health supervisors expressed that the training should be conducted at sector level instead of conducting it at Block head quarter. Interactive and demonstration methods will be more meaningful. Case definitions, data analysis, interpretation and action should be thoroughly dealt with. On the spot training will be helpful.	

The laboratory facility is very poor at the Block PHC for confirmation of the communicable diseases (enlisted in OMDSS). There is no laboratory facility at Sub Block level PHCs. Laboratory facility available at Block level is for Malaria Blood slide examination and routine examination for stool, urine and Haemogram.

There is no contingency arrangement for biological sample collection and transportation to referral laboratories. No laboratory protocol is available at the PHC level.

Training on laboratory investigation that may be appropriate for the Block and Sub-Block level is absolutely lacking.

5.6: Assessment of Knowledge, Attitude of the Health Staffs involved in OMDSS:

	Health Workers (Male and Female)	Health supervisor (Male and Female)	Pharmacist, Block Extension Educator (BEE), Statistician	Medical officers
Average No. of years involved in OMDSS	80 % > 2 years > 19 % more than 1 year & < 1% less than 1 year	All > 2 years	All > 2 years	All > 2 years
Knowledge on different aspects of OMDSS				
Knowledge on the context on which	Fully know: 90% Partially know: 10 %	Fully know: 100%	Fully know: 100%	Fully know: 100%

OMDSS was established				
* Objectives of OMDSS	80% are aware on 60% of the objectives 20 % are on 30 % of the objectives	All know about 80 % of the objectives	Aware on 80 % of the objectives	Aware on 100 % of the objectives
Knowledge on the components of OMDSS 1.Data Collection 2.Data compilation 3.Data transmission 4.Data analysis 5.Feed back 6.Action Taken	100 % said data collection, compilation and transmission. Only 60 % added action taken Only 40 % said on feed back and 20% on data analysis	100% said data collection, compilation, data transmission, feed back and action taken None was clear on Data analysis	All said data collection, compilation and transmission BEE is aware of other components but none has clarity on data analysis	Medical officers are aware of components but nut fully conversant on data analysis & Outbreak investigation
Reporting time interval (weekly) and OMDSS week (Saturday to Friday)	100 %	100%	100%	100%
OMDSS method (Simple or difficult)	100 % simple	100 % simple	100 % simple	100 % simple
OMDSS is accepted because: 1.Job responsibility 2.useful for the health	100% agreed that OMDSS is useful for the health system 40% agreed that OMDSS is useful for	All agreed that OMDSS is accepted due to job responsibility and useful for the health	Out of 4 person interviewed 2 said OMDSS accepted due to useful for	Out of 4 Medical Officers interviewed (both Block PHC and PHC – New)

system 3.creates interest	the health system and creates interest 20 % said OMDSS is accepted due to job responsibility and it creats interest	system	the health system only 1 said OMDSS accepted due to useful for the health system and job responsibility and one said OMDSS accepted due to useful for the health system, job responsibility and creates interest	2 MOs agreed OMDSS accepted due to useful for the health system one told OMDSS accepted due to job responsibility &useful for the system and 1told it is accepted due to job responsibility ,useful for the system & creates interest
Case definition not understood	100% unusual severe syndrome 90 % suspected meningitis 20% neonatal tetanus 10 % heat disorder	100% unusual severe syndrome 60% suspected meningitis	100% unusual severe syndrome 30% suspected meningitis	All understood
Filling of Primary data collection format	> 90 % well versed	All are well versed	All are well versed	All are well versed
Job responsibility	100 % aware	100 % aware	100 % aware	100 % aware

*Objectives of OMDSS: Interview was conducted on the following objectives of OMDSS-

(1). Detecting and monitoring outbreaks / epidemics (2). Monitoring disease trend (3). Identifying contacts and administering prophylaxis (4). Generating hypothesis about aetiology of the disease (5). Estimate morbidity and mortality (6). Contribute to the prevention and control of disease condition (7). Identify disease risk factors (8). Leads to improve Health planning (9). Helps in research (10). Influencing policy makers.

5.7: Comments and Suggestions of Health staff involved in OMDSS:

	Health Workers (Male and Female)	Health supervisor (Male and Female)	Pharmacist, BEE, Statistician	Medical officers
Whether OMDSS needed in the district	100 % said needed	100 % said needed	100 % said needed	100 % said needed
Is OMDSS useful in addition to vertical surveillance system	100% said yes	100% said yes	100 % said yes	100% said yes

Diseases that should be included in OMDSS	100% said Scabies should also be included in Normal time 60% said TB and leprosy 30 % said AFP 20 % said snake bite to be included in normal time	100% said Scabies in Normal time 50% said snake bite in normal time 30% said TB and Leprosy 20% said AFP	100% said Scabies in Normal time 60% said TB and leprosy 30 % said AFP	100% said Scabies in Normal time & TB, Leprosy AFP also
Diseases that should be excluded	100% said None	100% - None	100% - None	100%- None
Main constraints	100% said inadequate supply of format, minor ailment register and common medicine	100% said inadequate supply of format, minor ailment register and no mobility support	100 % said inadequate supply of format, register and contingency for stationeries, phone etc	All said inadequate supply of format, No supply of minor ailment register, inadequate supply of common medicine for health workers, contingency fund for report transmission, phone. Mobility support for Supervision and outbreak investigation is

				inadequate
Need of additional training	100% said yes	100% said yes	100% said yes	100% said yes
Aspects of training need	Data analysis and use Case definitions Data analysis for the sub centre and its use Managing an outbreak situation	Data analysis and use Case definitions Data analysis at sector level Managing out break situation and report preparation	Data analysis and use Case definitions Data analysis Feed back and action taken measures in outbreak situations	Data analysis and use Data analysis and report preparation Proper out break investigations and reporting Lab sample collection and transportation Surveillance in disaster situation Media/public management in disaster situation

Does the system	At Different levels of the Health System				
	Health sub centre	Sector and sector PHC	Block PHC	District	Remarks
Detect Diseases enlisted in OMDSS	Yes	Yes	Yes	NA	Health workers are the major reporting source of OMDSS data but they are not clear about some case definitions
Provide estimates of the magnitude of morbidity and mortality	Yes	Yes	Yes	Yes	Needs improvement in knowledge of the stakeholders at all levels.
Identifies factors associated with the health events	No	Only in outbreaks	Only in outbreaks	Only in outbreaks	Needs training at all levels
Detects trends that signals changes in the occurrences of diseases	Yes	Yes	Yes	Yes	Training is needed to improve the skill and capacity.
Epidemics Detection	Yes, but not always Some times the epidemic like situations are addressed by verbal communication from the peripheral health staff and community leaders				Proper data analysis and presentation can address this issue effectively and it needs special training
Permits assessment of the effect of prevention and control programmes	There is possibility	There is possibility	There is possibility	Partially used for the purpose	Field level health managers needs special training.
Leads to improved clinical, behavioural, social, policy or environmental practices	There is possibility	There is possibility	There is possibility	There is possibility	No attention has been given in this direction. Needs special training at all levels
Stimulate research intended to lead prevention and control	Yes	Yes	Yes	Yes	Only when a public health researcher comes across the data and the process.

5.8: Some major findings on surveillance attributes:

5.8.1: Usefulness of the system:

A public Health system is useful if it contributes to the prevention and control of adverse health related events, including an improved understanding of the public health implications of such events. Public health surveillance system can also be useful if it helps to determine that an adverse health related event previously thought to be

unimportant is actually important. In addition, data from a surveillance system can be useful in contributing to performance measures including health indicators that are used in need assessments and accountability system (MMWR weekly report July 27. 2001).
We assessed the OMDSS in the Block area and district level keeping in view the objectives set for the system. The overall findings are as follows.

Epidemic Detection

Block PHC level					
Some health events detected	Reporting source	Reported to	Date of detection	Date of action	Feed back to stake holders
Severe Diarrhoea (10 cases in the village)	A key person from village	MO incharge	15.10.2002	15.10.2002	Information to district level on the same day
Severe Diarrhoea (4cases in 2 adjacent families)	Patient's relatives	HW (M)	31.8.2003	31.8.2003	Immediate feed back to the sector Medical officer
Discussion: The system is able to detect the outbreak like situations early and take the necessary action situation; community members have *trust* on the system so that they send information early to the nearest health facility for necessary action.					

5.8.2: System Attributes:

5.8.2.1: Simplicity:

OMDSS is well accepted by the health personnel at all levels of the PHC set up due to its simple methodology. 100 % of the health personnel (those who were interviewed) expressed that the system is very simple than any other health programmes in operation in the Block with respect to data collection, information flow, structure and the case definition. Almost all the health staffs expressed that they are able to comprehend the system easily and they are able to function without much difficulty in spite of their workload.

Following observations confers that the system is simple.

Structure and operation	The existing infrastructure of the health system has been used which dos not create any confusion and 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 (New) and Block PHC. At each level there are trained health staffs who routinely detect cases as part of their job responsibility.
Data collection procedure	Cases are detected and recorded on a register manually giving importance to name address, age, sex and diagnosis as per OMDSS case definitions. A very simple data collection format is used which has only 2 major columns: i.e. for :1) number new cases and 2) number of deaths. These columns are subdivided as <5year age and >= 5year age. The diseases / syndromes enlisted are printed in the format with necessary instruction at the bottom. The form filling procedure is very simple and only with simple training one should not commit mistakes.
Case definitions	Case definitions are as per the WHO and state protocol for syndromes diseases. Case definitions sheets are available both in English and Oriya (local language).
Communication	Communication system for data transmission and feedback are very simple. From sub centre to sector and from sector to Block PHC the communication is manual and it is designed in the line of the regular routine activities of the PHC system by which extra cost is avoided.
Organisations involved	At present only the Government Health System is involved, though there is plan to involve other health related sectors.
Staff training	Two rounds of training have been imparted since the OMDSS got operational in the Block. Training content and procedure are simple as opined by the health personnel participated in the. Training manual is available in local language. There is demand for updated information.
Data analysis procedure	Though data collected is not systematically analysed, but through group discussion and individual interview with health staffs it is realised that the analysis method adopted in OMDSS can be followed at different level manually. Only more inputs on training

	and instruments like calculator and graph papers are needed.
Type of users	The health staff who are in public health activities (i.e. Health workers, Health Supervisors, Medical Officers of PHC- New, Medical Officer I/C of Block PHC, ADMO-Public Health and the CDMO at district level are the main users of the OMDSS . As per the design they can use the data for public health action at their level and influence policy decisions at the higher level based on the ground evidence.
Feed back	Staffs at sector level get feed back from their respective supervisors at the weekly sector meetings and monthly PHC review meetings. In epidemic situations feedback is given on daily basis. Feed back from District level to Block level is available in monthly district review meetings and through phone during emergencies. As per OMDSS guidelines the public health authority can also use memos and letters, which are not used frequently at Block level. Though newsletter is another channel for feedback, it has not yet been adopted even at district level.
Time spent on different activities	It is estimated that OMDSS activities take another 10 % time in an average beyond the routine activities of a health staff, but in return it enables the concerned health staff to act on the other activities smoothly.

Disease Detection level	Number (%) of Health facilities assessed	Number of Weekly formats checked (For 12 weeks)	Number (%) correctly filled up	Number of (%) forms showing Blank or wrong entry or any other defects	% Not tallying with the patient register
Health sub centre (Total 21 sub centres)	10 (50%)	120	100(83%)	20(17%)	Could not be assessed. *
PHC (OPD) s (Block + sector PHC) Total 6 PHC-OPDs	3(50 %)	36	32 (89 %)	7 (19%)	16% not tallying with patient register. **

* Proper minor Ailment registers meant for patient registration are not available at sub centre level **This is due to illegible handwriting which the pharmacist ignore and OMDSS diagnosis is not properly written in the OPD Register

5.8.2.4: Acceptability of the system:

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

We assessed the acceptability as follows.

(a)

Health staffs	Number of persons approached for interview/administered questionnaire	Number responded	Rate of refusal
Health Workers	18	18	0 %
Medical Officers (total 5)	3	3	0%
Health Supervisor (4)	4	4	0%
Pharmacists and Block Extension Educator	4	4	0%
District level (ADMO-PH. MO I/ C of surveillance Cell and data entry operator)	3	3	0%

(b) Maintaining Timeliness and Completeness of reporting: These reflect the acceptability of the system by the stakeholders:

Timeliness of Reporting: There are 21 sub centres, 5 PHC (New) and one Block PHC where OMDSS disease data are collected on a weekly cycle. We assessed the completeness and timeliness of reporting in 50 % of sub centres 30 % of PHC (New) and at the Block PHC for one-year period (August 2002 to August 2003). We found that both the timeliness of reporting is 100 % in all the sub centres. Out of 5 PHC (New) 4 PHC (New) are sending weekly OMDSS report in time. We found that the PHC (New) that does not report is very much under staffed and runs without pharmacist and Medical officer.

Completeness of Reporting: in each week at sub centre level the health workers are able to cover only 40 % villages. So the weekly data available in the OMDSS represents only 40 % villages.

At Sector level the completeness of reporting is almost 100 % as the reporting units for the Sector are the Health Sub Centres and OPDs of PHC (New). Except one PHC (New) all others send their weekly reports timely and regularly.

Block PHC level: The Timeliness OMDSS report transmission to District is more than 98 % and completeness of reporting is more than 96% during the above mentioned one-year reference period.

(c) Use of data: We found that all staffs those are involved in collection and compilation of data are very much interested to utilise the data. They also use it in a crude manner. They lack the skill to use the data effectively.

(d) Community Participation: The system has not attempted for direct involvement of the community. So the acceptability of the community could no be assessed.

(e) Sensitivity and specificity of the system:
We could not assess these attributes properly.

We conducted a rapid fever survey with OMDSS cases definition for suspected malaria in two villages under two different sub centres with the help health workers, who are involved in OMDSS. We detected 30 fever cases in the population of 1800.We collected 30 blood slides for malaria microscopic examination. Out of the 30 blood slides 6(18%) were found to be positive

f) Representativeness:

To assess representativeness is difficult. Attempt has been made to assess whether some deprived sections are paid attention by the system or not. Samples of 30 Davit families of a village under Brhampura sub-centre area situated within 10 km distance from the Bock PHC head quarter was surveyed. The village was selected randomly. Almost 90 % of Davit families could be covered in the survey. It was found that almost 90 % of the families said that they are getting timely service for fever, diarrhoea and other simple ailments from the male and female health workers. Only complaint they made was that when treatment is costly they are not getting free medicine. Non-has complained of paying money to the health worker or medical officer for getting treatment

We compared it with another sample of 40 families from upper castes in another village under same sub centre situated within 10-to12 km from Block PHC. We could not observe any difference in service. Though we could not do the survey in other sub-centre areas, still it gives some impression that the health service and cases detection are representative.

g) Critical examination of some disease components of the surveillance system:

The time interval from onset of illness to detection and reporting by the system. In case of outbreak time interval between onset of illness and action taken will be assessed.

5.8.2.5: Stability of the System:

Stability refers to the reliability (i.e. the ability to collect, mange and provide data properly without failure) and availability (the ability to be operational when it is needed) of the public health surveillance system.

OMDSS has been established in the context of a disaster. Initially it was supported by the WHO assistance for a period of 3 months. It showed its strength and got fully accepted by the Ministry of Health. Then the system was integrated with already existing World Bank Assisted "Orissa Health System Development Project". The positive outputs of the system attracted other donor agencies to enhance the capacity of the health manpower involved in the system. The system has run more than three years without any interruption in the Block and Sub block levels.

It is observed that the system could run with its own strength substantially. There was apprehension that the system might collapse when transportation cost was not available for the special messenger who was used to carry the report from Block to district level in each week. The system adopted alternative methods to carry on this component of the surveillance activities. It is note worthy that such a robust system has shown its effective functioning during heavy floods that occurred in 2001 and 2003.

Almost all health staffs interviewed expressed that the system is beneficial and needs to be strengthened by all means.

We observed that at sub centre level if female health worker remains on leave on a particular sector meeting day (Saturday) the male worker submit the weekly report without fail.
The arrangement has been made in the PHC Health system that even if the Saturday falls on a holiday, then also the sector meeting is not stopped (though it might not be true for other blocks). So the weekly reporting at sector level is not interrupted for a particular week due to holidays.

At state health policy level (Orissa Health Strategy, 2003) OMDSS has been given due importance. Government has shown interest to provide recurring budget to continue OMDSS as one of the regular state health programme.
From the above observations we assume that the system is much more stable and can be continued with minimum Government resources, but for some more years technical support may be needed from outside.

5.8.2.6: Cost factor in OMDSS:

Estimation of the cost for the system in the PHC

Activity	Estimated cost per one year(2001-2002) (In rupees)	Average Cost (% to estimated cost) Incurred in the same one year (Rupees)
Personnel	Rs 46,00000	
Forms	Rs 1400	700 (50% of estimated cost)
Registers	Rs 3200	Nil
Communication Telephone Messenger	 Rs 520 	 Nil Nil

	Rs 600	
Mobility for Supervision	Rs 100000	Nil
Outbreak investigation		Nil
Contingency	Rs 21000	Nil
Total	Rs 47,26,720	

6.Strength and weaknesses of OMDSS in Athagarh Block:

6.1: Strengths:

1 A weekly multi-disease surveillance system is in operation at the block and sub block level

2 Multi disease surveillance system could be established in the context of a disaster situation

3 Regular process for multi disease surveillance is in operation

4 The manpower and infrastructure facility of the government Primary Health Care system is available from village / G.P to block level

5 Reporting is continuing on weekly basis without interruption since more than three years

6 Reporting channels are clearly defined and established

7 Case definitions of the diseases are clearly defined and most of the case definitions are understood by the health staff easily

8 Case definitions are as per the state protocol which avoids confusion during various training programmes

9 Timeliness and completeness of reporting is maintained satisfactorily at all level of healthcare system

10 Staffs are motivated for implementing OMDSS

11 Staffs show interest to learn the system properly

12 Regular weekly feedback is given to staffs by the supervisors at all levels i.e. health supervisors/ medical officer of PHC (New) at sector level and medical officer at block level. Various aspects of OMDSS are discussed in the monthly staff review meeting conducted at the block PHC level.

13 There are other vertical surveillance programmes operating in the block like NAMP, RNTCP/ NLEP/ RCH where same health staffs are

involved.

14 OMDSS is very effective tool for the Health Department which helps to keep an eye upon the public health emergencies in disasters like floods in monsoons and heat wave in summer

15 There are available space at Block and sub Block level for imparting training to the staffs

16 There is space to run a good laboratory

17 *Connectivity*: Distance from District to Block Head quarter is 60 kms. Both Public and private bus services are available. Railway communication to State capital, other parts of the state and outside state is available. Motorable roads connect more than 80 % of villages. National Highway, 42 pass through the Block area.

Postal facility: there are 2-sub post office and 24-branch sub post office in the Block.

18 ICDS Block: There is a wide network of Anganwadi workers under ICDS, which is in operation in the Block. Various health activities meant for mother, and children are done in close collaboration with the Health staffs and Anganwadi workers at the field level.

19 OMDSS weekly activities keep the health staff alert and sensitised on communicable diseases

20 OMDSS helps to keep the Health Care Delivery System in readiness during disaster situations like floods and heat waves

6.2: Weakness:

1.Reporting system	There are duplications efforts in reporting due to existence of other vertical surveillance system and monthly reporting systems Some of the case definitions used in OMDSS are not clear to the health staffs involved in case detection . The surveillance system includes only the epidemic prone communicable and seasonal diseases The system receives data only from Government Primary Health care system PHC (New) and Block PHC -OPD Registers are not maintained properly / legibly by which Pharmacist gets difficulty in

collecting disease / syndrome data

Data Transmission is done manually from sub centre to sector and then to block level. From Block level it is mostly done over phone followed by a hard copy.

There is no contingency fund for OMDSS report transmission.

Logistic for transmission of OMDSS report from block to district level is adjusted with other programmes

Forms and registers for surveillance data collection, transmission and recording are not available at all levels.

Though skin diseases like scabies are very rampart in all parts of the block this has not been included in the OMDSS.Almost all health workers suggested to include scabies in OMDSS.

In OMDSS malaria data is collected as suspected malaria i.e. not confirmed by laboratory. In NAMP the DDC holders detect fever patients and treat patients with Chloroquin tablets. The case definition of fever that is followed by DDC holders is similar to the OMDSS case definition for suspected malaria. But the cases detected by the DDC holders are reported to PHC on monthly basis and this data is not included in the OMDSS data compilation.

2. Analysis and interpretation

Data analysis is poor at all level. No data analysis is done at sub centre level. At sector level data analysis is done in a very crude manner. At block level the weekly trend of diseases are not systematically examined by calculating rates. Information on deaths is not very clear.

Tool, knowledge and skills for data analysis are lacking even with medical officers and supervisors.

Prediction of outbreak from OMDSS data is not clear as most of the outbreak like situations are detected by verbal communications from the field staffs and community.

3.Epidemic Response Mechanism

There is no formal Block level response team, as it is defined at State and District level in the name of Rapid Response Team (RRT) and District Task Force (DTF) respectively. As and when needed the Block Medical Officer In Charge forms

	an investigation team for any event of outbreak
4.Weak connectivity during monsoon	The Biggest River of the state i.e. "Mahanadi" and a few small rivers cut across the block area. During heavy rains many villages get cut off from administrative head quarter. It becomes difficult to monitor the health events with the available private country boats.
5. OMDSS Processes	
Data collection	The health workers within an OMDSS week cover only 40 % of the villages under a Sub centre area. Urban area (Athagarh NAC) is not included in the Block OMDSS. At present record keeping and response mechanism are not followed in a systematic manner.
Supply of formats and registers	*Primary Data Collection Formats:* There is inadequate supply of printed primary data collection formats. When about 60 number of data collection format are needed per one year per one health facility, only about 12 number of format are available. The concerned health staffs manage either by Xeroxing the from his / her pocket money or by preparing the format manually on a plane sheet of white paper-this gives scope for wrong data entry. *Data Compilation Formats*: Data Compilation Formats to show break up of health facilities at sector and PHC level are no available. Data compilation is done with the same data collection format. *Minor Ailment Registers*: Minor Ailment Registers are essential to keep patients' record at Sub-Centre level. Minor Ailment registers should be on regular government supply. But this is not so. It was observed that Minor Ailment Registers in the name of "Weekly Disease Surveillance Register" were supplied only once after OMDSS was established in 1999 and this was supported by WHO.

	At sub centre level, female health workers keep the record of patients on an ordinary notebook.
Data analysis and storing facility	No computer facility is available at the Block level for data analysis, report generation and data storing. Data analysis with basic epidemiological knowledge is not done at Block level. Data is also stored manually in a master register, which needs to be improved with proper formatting.
Laboratory facility	There is lack of laboratory facility for the epidemic prone diseases except malaria blood slides examination. Laboratory facility for TB under RNTCP is coming up. There is no minimum facility for biological sample collection, transportation to laboratories at the Block level. No special training has been given to Medical officers and other health staff who are supposed to be involved in outbreak investigation.
Coordination with National Diseases Control Programmes:	There is no meaningful coordination between the national programmes for communicable diseases (Tuberculosis, Leprosy, Polio, HIV-AIDS and Vaccine Preventable Diseases) with OMDSS. Only some coordination is there with NAMP as suspected malaria has been included in OMDSS. There can be synergy of different disease surveillance systems in operation in the Block and by same financial availability, manpower strength and time can be saved considerably as well as it would help in better programme monitoring and supervision. This opportunity has not been capitalised.
Existing reporting system	The ongoing reporting system on 65 formats for different disease conditions leads to confusion among health personnel. Each and every health staff of the block involved in OMDSS opines that such reporting system is no way helping them rather it is unnecessary. Integration on many aspects is essential.
Epidemic reporting and	There is no special format for epidemic reporting and also no special training of the PHC health staffs for epidemic

training preparedness and response.

7. Summary of the Existing OMDSS in Athagarh Block and Cuttack District:

Different Aspects Of OMDSS	Activities At Different Level of Health Facility			
	Sub-centre	Sector level	Block PHC level	District level
Case detection				
Case detection of 11 disease / syndromes	Yes	Yes (At PHC – New)	Yes (PHC-OPD)	-
Data compilation and transmission	Yes	Yes	Yes	Yes
Case definition (Uniform for all level)	Available	Available	Available	-
OMDSS manual	Available	Available	Available	Available
Data reporting				
Reporting forms	Manual	Manual	Manual	Manual and electronic
Transmission channel	Clearly defined i.e. Health Sub centre to Sector to Block PHC to District to State Disease Surveillance Cell			
Mechanism of Transmission	Manual	Manual	Manual /post & Telephone	Electronic (Telephone / FAX / email)
Reporting Frequency	Weekly	Weekly	Weekly	Weekly
Specific staff for Reporting	Yes	Yes	Yes	Yes
Data compilation				
Register / manual	Yes	Yes	Yes	Yes
Computer software facility	No	No	No	Yes
Specific person available for compilation	Yes	Yes	Yes	Yes
Analysis				
Analysis done in crude form	No	Yes	Yes	-
Use of software for data analysis	No	No	No	Yes
Is there any action threshold defined for Each	No	No	No	No

Disease				
Use of GIS in Analysis	No	No	No	No

Laboratory				
	Sub-centre	Sector level	Block PHC level	District level
Lab facility available	No	No	Only for malaria And routine Haemogram, stool and urine examination. TB lab will be started soon under DOTs programme	Malaria, TB, Heamogram, routine stool urine
Manpower available	Nil	Nil	One LT for malaria and one Pathology technician	Malaria LT and pathology Technician
Capacity to collect Lab samples	Nil	Nil	Blood slide for malaria	Blood slide for malaria
Lab guidelines for collection and transportation :Not available Transport media :Not available Response Mechanism: Availability of DTF:When required available on behalf of the District				
Person identified for coordination	Male health worker	Medical office I / C PHC (New)&Male supervisor	Medical officer I/ C o the PHC	Assistant medical officer
Any manual available for response	No	No	Yes	Yes
Is there any plan for Epidemic response	No definite plan	No definite plan	Plan during or if there is threat of epidemic. Contingency plan is prepared for heat waves and flood/ cyclone	DTF Plan monthly Contingency plan is prepared for heat waves and flood/ cyclone

Availability of epidemic Cell	No	No	No	District Surveillance Cell gets converted to Epidemic Cell
Mechanism for feed back	Direct visit of Health worker	Direct visit by supervisor And sector review meeting	Monthly review meeting Letter / memo Phone Sending messenger	Monthly review meeting Letter / memo Phone DTF visit

Infrastructure And Other facilities	Sub-centre	Sector level	Block PHC level	District level
Special Room	Out of 21 sub centres--- have their own building	All sector have PHC (new) Building for public health surveillance activities	Block level PHC has space for surveillance activity but no space has been specially allotted for it.	At District level a special room has been allotted in the Office of ADMO – public health for Disease surveillance activity
Special communication system	Nil	Nil	Phone line	Phone / Fax and internet
Computer facility	Nil	Nil	Nil	One computer with HMIS soft ware is available for surveillance activities.

Man power	Existing health workers	Existing health supervisor	Existing staff like Medical officer I/ C Head quarter health supervisor BEE Vital Statistic person (post is vacant presently)	Data entry operator (specially engaged) Vital statistic clerk
Budget for surveillance			Budget as sanctioned at district level	Budget is prepared at state level (OHSDP support for logistic & training and WHO/ UNDP support for training)
Urban surveillance	Urban areas in the block area have not yet been included in the OMDSS. At district level the Cuttack Municipality Corporation area has been included on pilot basis and is in a crude form.			

8. Recommendations:

The Multi Disease Surveillance System operational in Athagarh Block needs inputs on various aspects to fulfil the objectives that are set for it. It is expected that Integrated Disease Surveillance Programme (IDSP) will be implemented within this decade in the state of Orissa. IDSP has the strength to provide inputs on logistic and technical aspects. This preliminary assessment of the Multidisease Surveillance System gives an insight to some of the gaps and the possibility for improvements in the system. Such an evaluation study should be conducted on a larger scale to obtain the statewide representation.

From this small evaluation study we recommend the following few things for the improvement of the OMDSS in Block and Sub-block area of Athagarh and also in Cuttack district

8.1: Inputs required:

Regular logistic support like data collection formats, patient registers, surveillance manual, mobility support and contingency fund to maintain the available communication system

Training of health staffs involved in OMDSS on quality data collection, data analysis, data storing, epidemic preparedness and response.

Establishing formal Disease Surveillance Cell at Block level and later at Sector PHC level

Formation of an Epidemic Response Team at Block level by OMDSS design.

Computer and FAX facility at Block level for data management (analysis and storing) and report transmission.

Strengthening the communication facility like telephone from Sector to Block level

Involving the community and potential health sectors like Government run Indian System of Medicines (Ayurveda and Homeopathy), ICDS, and Panchayat bodies in surveillance system

Strengthening laboratories at Block and District level and building up laboratory network mechanism with referral laboratories available inside the state (e.g. Medical College Laboratory and Laboratory of Regional Medical Research Centre, Bhubaneswar).

Introduction of rumour register during disasters and health emergency situations

8.2: Strengthening the system:

Following areas have been identified for strengthening the OMDSS at Block and Sub Block level.

Integration and coordination with other surveillance systems that can be handled with OMDSS like malaria.

Facility for supervision and monitoring

Existing communication system should be fully strengthened both in normal time and in disaster situations.

Strengthening of laboratory services at least for biological sample collection and transportation to referral laboratories in time. Strengthening the district lab using rapid diagnostic kits (malaria, etc)

Training programmes for different aspects of the surveillance i.e. case detection using the OMDSS case definitions, data storing and data analysis and its use for predicting disease trend and disease outbreak, outbreak investigation and management.

Dealing with community and involving community in surveillance system both in normal time and during epidemics and /disaster situations.

Identifying community link volunteers and upgrading their skill for OMDSS activities.

Orienting and involving Panchayat Semite members in OMDSS activities

Strengthening Information Communication and Education (IEC) activities with respect to OMDSS.

Involvement of medical college: SCB Medical college and hopital is situated in the head quarter city of Cutack district and it receives considerable number of patients from Cutack district and Athagarh block.8.3: Reporting units:

Along with the existing reporting units, other Government health institutions belonging to Ayurveda and Homeopathy system may be included. Linkage should be established to get disease data from Anganwadi workers who are available at village level and participating in many of the women and child health activities. Special trainings may be conducted for Anganwadi workers. Health workers should be oriented how to get the best help of the Anganwadi workers who are treated as volunteers based at village level.

8.4: Data collection:

Disease data collection is the first but important step of any surveillance system. Quality data is essential. Case definitions should be strictly followed while diagnosing the cases. There should be proper understanding on new and old cases. The patients' registers should be maintained properly.

Proper training on case definition, case detection, and case registration and disease data compilation should be imparted at all level.

One of the major constraints in OMDSS is inadequate supply of data collection formats and patient registers. It should be mandatory to supply primary data collection formats and minor ailment registers/ patient registers to all the reporting units in adequate amount

8.5: Data transmission and communication system:

The mechanism for data transmission at Block and Sub-Block level is well accepted. The available communication system is not properly maintained due to fund constraints. The communication system needs strengthening at least at block level. Besides the Phone line a FAX machine will save time and worry for report transmission to district level. Minimum communication facility like phone should be available at Sector level.

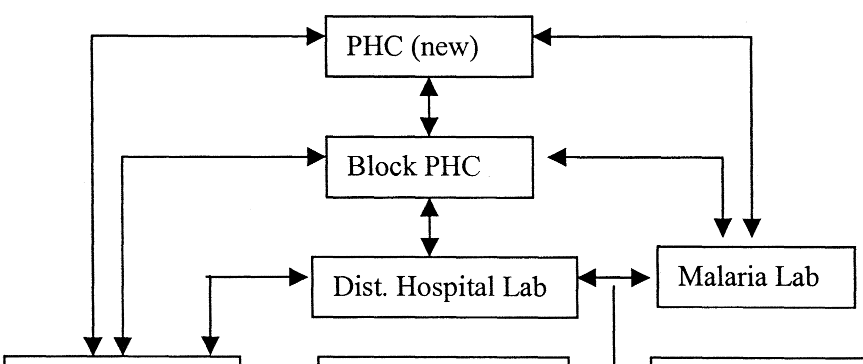
8.6: Data analysis:

Block PHC caters to more than one lakh population and Sector PHC caters to more than 30,000 populations. Data collected at respective level is huge. If proper data analysis could be done at the peripheral levels, it could help the public health system to act locally and timely. Qualified Medical officers are available at these levels. The health supervisors are also technically sound to handle the public health data. Both the medical offices and supervisors should be trained on basic aspects of data analysis and action response as per the analysis.

8.7: Laboratory Facilities:

Reliable laboratory support is essential in investigation of communicable diseases. At least there should be facility for collecting biological samples in proper media and transportation of the same to the designated laboratory. Non-supply of media should not be a constraint to collect biological samples during an outbreak/epidemic situation. Rapid diagnostic kits should be available at block level for some of the epidemic prone diseases like malaria, enteric fever, leptospirosis, dengue and viral hepatitis etc. Laboratory Training should be imparted to all Medical officers and Laboratory Assistants.

Networking of laboratory facilities should be established when inputs would be available from programmes like IDSP. Strategic planning for this should be: (1) to identify laboratories under Orissa Health Services, laboratories under Medical Colleges, other referral laboratories like that are under Regional Medical Research Centre, Bhubaneswar (2) Strengthening of existing laboratories at district and state level by providing necessary instruments, media reagents, kits and other required materials and technical personnel for the laboratories. (3) Strengthening Block PHC level capacity in collecting biological samples and transportation to identified referral laboratories. Laboratory linkages can be visualised as follows:



8.8: Health emergency and disaster response:

Athagarh Block as well as Cuttack district are prone to floods and cyclones. Since 1998 heat wave has become a major metrological problem in all parts of Orissa. Hence water and vector borne diseases as well as heat disorders are potential threats. To address the public health demands in disaster situations is a major task. Health, Revenue, Panchayat, Women and Child Welfare and Rural Development Departments should function in close collaboration. There should be regular review of the block and district level capacity to handle the disasters. Feasible contingency plans must be prepared well ahead. Keeping in view the implementation of IDSP, the State should prepare its plan of action to avail the facilities of modern equipments to address health needs in disasters like floods, cyclones (emergency boats, rapid diagnostic kits, water quality testing kits, emergency health kits). By incorporating the modern electronic software like GIS health mapper in OMDSS, the response to disaster can be strengthened.

8.9: Training:

All the health workers opine that training should be imparted at sector level. Method of training should be based on small group interactions and use of local data and field experiences. This would reduce transmission loss and make the training programme very effective. Major aspects of the training should be on case detection, data collection, simple data analysis and steps for outbreak investigation and management. Training should be meticulously planned and training manuals must be supplied during the training.

8.10: Coordination and Decentralisation:

Disease surveillance system to be effective should involve other sectors that influence the health events. Main responsibility lies with health Department. For coordination of disease surveillance activities in the Block area the Block PHC has to function as main official centre. There should be close coordination between, Indian System of Medicine, Pinhead bodies, Rural Development; Urban, Women and Child Development, Education, Animal husbandry and Revenue Departments, NGOs and Village Community for effective functioning of the OMDSS. Role of each sector should be identified. Administrative and technical bodies should be formed for coordination.

Coordination with other disease surveillance activities: Various national disease control programmes are operational in the Block area. There should be defined coordination system between NAMP, Diarrhoeal Control Programme, RNTCP, NLEP, RCH and Vaccine Preventable Diseases.

Decentralisation: Decentralisation can be achieved by establishing monitoring unit at Sub-block levels. Delegation of powers to these units will help in timely management of unwanted disease events.

Stake holders	Involvement	Role Definition
Village and community	Identification contact person e.g. health guide, traditional healer, volunteer of village club or mahila samiti, school teacher etc.	To coordinate with Health worker in disease surveillance To monitor water purification Sharing information about early warning signals with Government agencies
Panchayat bodies	Elected members from village wards to Panchyatsamiti level.	Coordination at respective level Decision making for drinking water and sanitation Helping in health education and awareness building Key role in epidemic and health management in disaster situations
Women and Child Development	Anganwadi workers ICDS supervisors	Monitor vaccine preventable, waterborne diseases and malaria Monitor water purification Information, Education and communication
Rural Development	To ensure safe water supply and sanitation in rural areas	Regular supervision of drinking water sources and establishing regular purification mechanism Village latrine / community latrine To establish sewage system
Urban Development	Set up multi disease surveillance system in the urban area Coordination with Block PHC	Decision making body Epidemic preparedness team IEC activities
Revenue Department	Set up coordination cell for managing disaster situations Identifying responsible officer to liaison with Block PHC	Mapping disaster zones and vulnerable area Prioritising areas for Health service during disaster situations
Education	Teacher should be identified for imparting health education to community through students both in normal and epidemic / disaster	Health education on use of safe drinking water and sanitation Vaccine and vaccine preventable diseases Health messages during epidemic situations as given by health team

	situation	
Animal Husbandry	To identify prevalence and trend of zoonotic diseases	Sero-conversant of rodents Animal vaccination
Medical College	Identifying laboratories for linkages and identifying laboratory trainers	Act as the Referral laboratory and providing laboratory training to PHC medical officers and lab. technicians
State and National labs (Existing in the state)	To provide diagnostic services To provide necessary guidelines for control measures	Lab investigation during epidemic of unusual syndromes To impart lab training on sample collection, transportation and field lab investigation with the help rapid diagnostic kits.
NGOs	To establish linkages between Govt health sector, private sector and community	Health education Reporting during disaster situation Helping health staff at respective level Coordination

9. Conclusion:

The Multi Disease Surveillance System operational in Athagarh Block of Cuttack district is a reflection of the Orissa Multi Disease Surveillance system operating in other BLOCK areas Orissa. Though the system depends on clinical diagnosis to detect cases, still it gives a better understanding to estimate the epidemic prone disease burden of a Block. The system is simple enough to be handled by the existing health personnel at the grass root level and health department infrastructure, which is a major strength for a resource poor state to make the system sustainable. The system is flexible to accept changes and improvements. From the background of a disaster it has its origin and it has proved its efficiency in managing public health needs in the successive disaster situations. With more logistic and technical and laboratory inputs the system can be the real forerunner for the public health activities in the State of Orissa. IDSP when implemented is expected to capitalise the lessons learned by Orissa multi-disease surveillance system.

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2.2.EVALUATION OF NATIONAL ANTI-MALARIA PROGRAMME, CUTTACK DISTRICT, ORISSA

1.Introduction

World scenario: Malaria is endemic in 101 countries worldwide. Globally 300-500 million clinical cases of malaria occur resulting 2.7 million deaths. In 1960, only 10 % of world population was at risk of malaria, but now about 40 % of world population (2400 million) is at risk (WHO 2001). World picture of malaria shows that children aged 1-4 years are more vulnerable to malaria infection and death. Malaria kills 3 million people each year and few hundred in each hour. It is estimated that, each minute 3 to 5 children die and WHO estimates (2001) that malaria kills around 40 % of toddlers each year.

WHO Southeast region: Malaria in South-East Region of WHO remained static from 1994 to 1997 at about three million cases annually. About 80% of the total population (1,2025 million) is at risk of malaria.

Malaria in India: Malaria has been a public health problem in India for centuries. Details of this disease can be found even in the ancient Indian Medical literature like the "Charak Sahinta". Prior to the National Anti Malaria control Programme in 1953, India was having 75 million cases of malaria every year with 0. 8 million deaths. After significant decline in the 1960's malaria re-emerged as a major communicable disease burden in the country with an increasing trend of 2 to 2.5 million-malaria cases annually. Malaria epidemiological picture reveals that, there is a stiff increase in the malaria related morbidity and mortality in India in the last decade. Sharma et al in 1998 reported that there was a total of 2.15 million cases of malaria and 653 deaths occurred in India and Plasmodium falciparum being the main cause of severe malaria which accounts for 30 to 40 % of malarial deaths in India.

Malaria in Orissa: States like Orissa and Northeastern states of India contribute most to the National malaria figure. Orissa alone contributes almost 50% of malaria deaths of the country. Orissa is one of the poor states of India and the miserable health status of the state is symbolized by its high infant mortality rate (IMR), which was estimated to be 97 per 1000 live births in 1999 and 90 in 2001. Malaria in Orissa, contributes the major share to the high IMR. Though the hilly, terrain areas and tribal districts of the state are heavily burdened with the morbidity and mortality due to malaria, no other part of he state is spared. Despite the ongoing National Anti Malaria Programme (NAMP) in Orissa, the disease has re-emerged in a vigorous manner in all the districts. Orissa contributes approximately 38 % of malaria cases to the country. Number of malaria cases recorded in Orissa during 2001 was 4.4 lakhs.

The earlier picture of malaria has been changed in India and Orissa. Of the four human malaria strains now plasmodium falciparum predominate the parasite rate through out the globe and it is the most deadly form of malaria parasite. 95 % malaria deaths and 1 to 3% mortality worldwide is due to plasmodium falciparum (WHO 2001).

Within the state of Orissa itself, malaria due to Plasmodium falciparum is around 85%, and it is one of the major public health concerns. To tackle the malaria situation in the state Enhanced Malaria Control Programme (EMCP) has been implemented in 158 blocks out of identified 210 high-risk blocks spreading over to 21 districts.

Earlier malaria was said to be the rural disease but now it is no more so. It affects both rural and urban populations without any discrimination.

Malaria in Cuttack district of Orissa: Cuttack is one of the coastal districts of Orissa. Once in coastal districts of Orissa malaria endemicity was low. But now the scenario has been changed. Malaria has become a public health concern in districts like Cuttack. Plasmodium falciparum dominate the parasite rate and there are recorded deaths due to malaria in some blocks of the district.

Public Health importance:

Plasmodium falciparum is the main cause of complications and deaths due to malaria. Last 10 years (1990 to 2001) data on malaria shows that the proportion of malaria cases due to plasmodium falciparum has increased in Cuttack district (from 50.18% to 74.95%.).

The Orissa action plans for malaria control (2000 –2002), states that except 3 districts i.e. Jagatsingpur, Kendrapada and Puri all other districts of the state are having malaria high risk blocks. Till now no block of Cuttack district has been included in EMCP but some blocks of the adjacent districts like Dhenkanal, Anugul, Nayagarh and Jajpur are under EMCP. Government of Orissa has proposed for inclusion of all the blocks of Cuttack district in EMCP.

When a very high percentage of the population in the district is affected by plasmodium falciparum, it needs intensive public health action for control.

2.Objective of Present Evaluation of NAMP in Cuttack district is to:

Describe the National Antimalaria Programme in the district and in a block PHC area

Estimate the burden of malaria in one Block PHC area of Cuttack district

Analyse the current programme services, achievements and problems.

Discuss on leading issues and constraints that the programme is facing.

Recommend steps to improve the programme

3.Methods

The main arms of an effective programme evaluation are: asking good questions, collecting good data, using the findings to plan and build political as well as administrative support for programme improvements. In this evaluation study we have attempted to take care of the above.

Sources of Information: We have collected data and information from the following sources.

Information from medical records

Discussion with programme officers at various levels.

Collection of information by the evaluation team

3.1.Steps followed for the evaluation:

Planning and preparation

Conducting the evaluation

Follow up

3.1.1Planning and Preparation

Evaluation team: FETP –MAE scholar at NIE (principal investigator), a health system research scholar (as co-investigator), one retired male health worker as field coordinator and three local volunteers.

Technical guidance: Technical guidance was obtained from faculties of NIE, Chennai, Head and professor and faculties of SPM Department of SCB medical college Cuttack and Health coordinator of UNDP-Orissa.

The task of the evaluation team was:

To prepare data collection tools

To prepare to get background information for evaluation

Field visits and collecting information

Preparation of final report

Presenting the results in appropriate forum of the health department, Orissa

Sharing the information to scientific community

Training and preparatory workshop:

A preparatory meeting was held for the evaluation team to understand the nitty-gritty and preparing the date line for each activity. The evaluation tools were finalized in three sittings.

Following data collection tools were developed: case detection, laboratory facility/constraints, case management, control measures, rapid community survey, interview with health staffs and public. A checklist was developed for the evaluation team.

Study area selected for evaluation

The Evaluation for NAMP was conducted in one Block PHC (Primary Health Center) area of Cuttack district. The name of the block is Athagarh, which is situated within 30 km towards west to Cuttack district head quarter. The name of the Block PHC is Berhampura and it is one of the better performing PHCs with respect to NAMP as per the assessment of the district programme officer (ADMO-PH/Mal/Fil/Lep).

Evaluation team visited the following sites: District Health office, District and block malaria laboratories, Block CHC/PHC and other heath facilities (30 %) located in the block, multipurpose health workers (30 %) working in the block, 30 % of the DDC and FTDs functioning in the PHC area, NGOs and other private health facilities, fever patients within a 15 days period in one Sector area of the block.

Following logistics were arranged for the evaluation team: travel, stationeries, photocopying, phone / fax / email etc.

Before proceeding for evaluation activities all the team members and volunteers were briefed about their roles and responsibilities. Data collection tools and other handouts or briefing materials were provided to each member.

Field visits gave the evaluation team an opportunity to observe the malaria control programme directly. By this also they could interview the health staffs and programme officers as well as the beneficiaries at the field, which added quality to the study.

Components observed in the field visit were:

Case detection and laboratory diagnosis

Treatment facilities

Training, supervision and monitoring

Logistics

Case recording and reporting mechanism

Health education

Coordination with other general health care services and other disease control programme as well as the Orissa multi-disease surveillance system (OMDSS), other treatment providers.

All the team members were instructed to keep a clean record of the data collected, staff and public met and places visited.

After collecting the relevant data and information we analyzed the same and prepared the

report.

4.Malaria Epidemiological Situation:

Epidemiological situations of malaria in Cuttack during 1990 – 2001 and 2001 – 2002 reveal that some indicators of NAMP like ABER, SPR and API are far less than Orissa average though the trend in plasmodium falciparum(Pf%) is at a higher level. Once Cuttack district was considered as one of the malaria non-endemic districts of Orissa. But one has to consider seriously about the under reporting of malaria in coastal districts of Orissa.

(Under reporting is a great constraint in planning for malaria control programme almost in all parts of the country. ICMR states that there is gross problem of under reporting of malaria cases and deaths. ICMR estimates that there may be only 1 in 10 malaria cases and 1 in 200 malaria deaths actually make it to the official report. One has to look at different data sources to get an idea of the size of the problem of malaria in India, Orissa and the district under study.)

Besides NAMP, the Orissa Multi Disease Surveillance System (OMDSS) is operational since 1999 i.e. after the super cyclone. In OMDSS the disease events are detected based on clinical diagnosis. Laboratory diagnosis facility has not yet been incorporated into it. The clinical case definitions followed for malaria by both NAMP and OMDSS are same. Malaria in OMDSS is recorded as suspected malaria.

The suspected malaria cases detected by OMDSS is about three times higher than the laboratory confirmed malaria cases detected by the NAMP/EMCP.

Table:1. Comparison between NAMP / EMCP and OMDSS data on Malaria cases in Cuttack district and Orissa, 2001

Year 2001	NAMP / EMCP confirmed malaria cases	MDSS suspected malaria cases	Remarks
Cuttack	3,790	10,3539	Suspected malaria is about 3 times higher than confirmed malaria
Orissa	45,4541	29,86766	Suspected malaria is 6 times higher than Laboratory confirmed malaria cases

4.1.Basic Indicators of NAMP

The basic indicators used in NAMP are as follows:

ABER: Annual Blood examination Rate i.e $\frac{\text{No of slides examined}}{\text{Population}} \times 100$.

This parameter reflects the efficiency and adequacy of case detection mechanism. A minimum ABER of 10 % per year was fixed under Malaria Eradication Programme based on estimate of fever in India.

SPR: Slide Positivity Rate.

$$\frac{\text{Total no of Blood Smears Found positive for malaria Parasite}}{\text{Total no of blood smears examined}} \times 100$$

SPR provides information on the trend of malaria transmission. This is a dependable parameter for determining the progress of containment measures and gives information of parasite load in the community.

Pf%: Plasmodium falciparum Percentage.

Total no. of Blood slide found positive for P. falciparum X100

$$\frac{\text{Total no. of Blood slide found positive for P. falciparum X100}}{\text{Total No. of Blood smears positive for malaria parasite}}$$

This parameter gives the relative proportion of P. falciparum and identifies trends of P. falciparum incidence in relation to total caseload of malaria parasite in the community.

API: Annual parasite index is defined, as confirmed cases during one year/population under surveillance X 1000.API is sophisticated measure of malaria incidence in a community. It is based on intensive active and passive surveillance and cases are confirmed by blood examination.

In this section the epidemiological situation of malaria in Cuttack district and Berhampura PHC area has been described with basis of the NAMP indicators.

Table: 2 shows that ABER is in rising trend (6.16 in 2002) in Cuttack district though lower than Orissa total. SPR remains almost constant and when compared with Orissa total the level is low.

Table: 2

Comparison of epidemiological situation of malaria (by basic indicators) between Cuttack district and Orissa total, 2001-2002.

	Cuttack				Orissa			
Year	*ABER	SPR	Pf%	API	ABER	SPR	Pf%	API
1997	5.65	2.96	74.07	1.66	10.33	11.45	86.43	11.83
1998	5.20	2.71	70.95	1.41	10.82	12.14	85.45	13.14
1999	4.67	2.41	72.89	1.13	10.55	12.39	84.44	13.02
2000	5.74	2.89	71.31	1.66	11.27	11.89	84.00	13.41
2001	5.59	2.89	75.04	1.62	10.48	11.05	84.05	12.20
2002	6.16	2.83	66.44	1.74	11.17	10.31	83.31	12.55

Source: Office of Joint Director Malaria, Directorate of Health Services, Orissa

When compared with all NAMP indicators malaria epidemiological situation is found better than the state average but very high as per the national scenario.

Table: 4 Epidemiological situation of ABER of Orissa, Cuttack and adjacent districts from 1997 to 2002

Years	Orissa	Cuttack district	Dhenkanal district	Anugul district)	Boud district	Khurda Disrtrict
1997	10.33	5.62	11.81	8.50	8.13	4.54
1998	10.82	5.20	13.17	7.73	7.43	4.20
1999	10.50	4.69	11.51	6.66	4.70	4.16
2000	11.27	5.74	12.41	7.28	4.67	4.43
2001	11.23	5.59	11.00	6.06	5.54	4.49
2002	11.17	6.16	12.56	6.23	7.97	5.44

From 1997 to 2002 the ABER is about half of Orissa situation and the nearby Dhenkanal district. The rate is more or less consistent in all the years (1997-2002).

Table 5:Malaria deaths and case fatality rate (CFR) in Cuttack District and Orissa, 1997 to 2002

	Cuttack District			Orissa state		
Year	Population	Deaths (n &% to Orissa)	CFR	Population	Deaths	CFR
1997	3699	3 (0.9%)	0.811	421928	350	0.830
1998	3198	1 (0.3%)	0.313	471928	367	0.778
1999	3198	5 (1.3%)	1.564	483095	399	0.826
2000	3918	1 (0.3%)	0.255	509497	367	0.72
2001	3790	1 (0.3%)	0.264	454541	305	0.671
2002	4139	7 (1.5%)	1.691	468046	465	0.099

Deaths due malaria in Cuttack district was higher than total Orissa both in1999 and 2002 (2 times in 1999 and 15 times in 2002). Considering the case fatality, high pf %, malaria problem in Cuttack district appears to be in alarming state though other epidemiological parameters are at lower level than state average.

5.Malaria Epidemiological situation of Berhampura PHC area:

In the district of Cuttack Berhampura PHC area is one of the malaria endemic areas. Table: 6 shows that API of Berhampur PHC is rising since last 2 years. Though far less than the State average, it is higher than the district average .The increase of API more than 5 is one of the public health concerns.

Table:6.

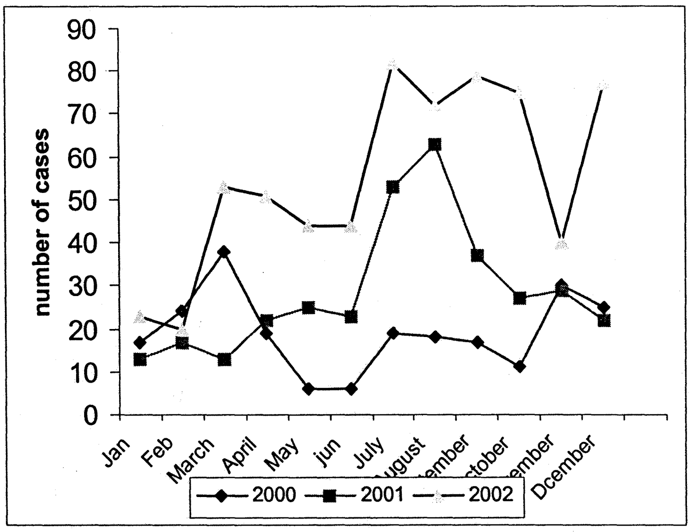
Comparison of Malaria API with Cuttack District and Orissa State, 1997 to 2002

Years	Berhmpur	Cuttack	Orissa
1997	1.77	1.66	11.83
1998	1.29	1.41	13.14
1999	1.78	1.13	13.02
2000	1.60	1.66	13.41
2001	2.22	1.62	12.38
2002	3.97	1.74	12.55

Data source: Directorate of health services, CDMO office Cuttack, Berhampur PHC

Fig:1 shows that peak months for malaria are July to September and also in summer months and the incidences shows increasing trend from 1999 on wards. In 2002 there was also high incidences in December.

Fig: 1.Month wise malaria positive cases in Berhampura Block, Year 2000-2002



Source: Berhampura PHC

Table:7. Malaria epidemiological situation in different sub-center area of Berhampura PHC, year 2002

Sector	Sub-centers (SC)	API >2 to 5	API >5	Pf %	Pv %	Remark
Berhampur	*Dhurusia			26	48.2	In other 3 SCs, API < 2
Khuntuni	Khuntuni			2	30	In other 3 SCs,
	Dalua			2	30	API < 2
Megha	Megha			1	22	In other 4 SCs , API < 1

The other two sectors i.e Gurudijhatia and Samsharpur had <2 API with very low percentage of positive malaria cases.

6.Description of the programme(NAMP):

Malaria control programme has been implemented in the state of Orissa since 1953.Now it is functioning under the name of NAMP/ EMCP (in the blocks having high incidences of malaria and in tribal blocks)

The overall objective of NAMP in the state of Orissa and in Cutack district is to decrease the morbidity and mortality due to malaria. The main strategy adopted in NAMP is

Early Detection and prompt treatment

Insecticide residual spray

Information Education and Communication

Capacity Building of the health staffs involved in Antimalaria programme.

6.1.1.Early detection and prompt treatment:

Following activities are going on in the state to achieve the objectives of NAMP beside the case detection and presumptive as well as radical treatment provided by the PHC structure,

Drug distribution centers (DDC) and Fever treatment depots (FTDs) are functioning at the village level to detect fever cases that are suspected to be malaria and provide chloroquin tablets to each patient promptly to prevent fatal malaria complications. At FTDs blood slides are collected in addition to treatment by chloroquin. Malaria Link Volunteers (MLVs) function only in EMCP blocks. As EMCP has not yet been implemented in Cuttack district there are no MLVs. Multi purpose health workers in high-risk areas give presumptive radical treatment. Chemoprophylaxis for pregnant women is going on throughout the state. Prompt referral of fever cases is done at DDC/FTDs and health worker level and special attention is paid to malaria patients at referral health institutions. Capacity building programmes on different aspects of NAMP are going on. Training on microscopy, spray and training to health workers and DDC/ FTDs is the part of capacity building activities.

6.1.2.Insecticide residual spray and other measures: As per the Operational Manual for Malaria Action Programme (MAP), 1995 of Govt. of India the insecticides residual spray(IRS) of human dwellings is as important for malaria control in the community as is the early case detection and prompt treatment for an individual cure. Therefore it is essential that insecticide residual spray should be planned and implemented with sound technical skill and under expert guidance.

As per NAMP guideline the planning of spray operation is done by the district programme officer (ADMO-PH /MAL/ FIL/LEP) of Cuttack district. He involves the Medical officer of the PHC/CHCs in the planning process. As per the statement of the Berhampura PHC medical officer, before the planning for the spray operation the Malaria epidemiological data of the block is analysed. NAMP guideline says that while planning for spray, the epidemiological data of preceeding three years should be considered for selecting the population to be protected. When the API is more than 2 or there occur a death due to malaria (Blood slide confirmed plasmodium falciparum malaria) spray operation is taken up. Advance tour programme is prepared for the spraying operation.

Biological measures: recently hatcheries are being constructed in a many districts for breeding mosquitocidal fishes.

*Impregnated mosquito net*s are distributed in some selected EMCP blocks.

6.1.3.Information Education and Communication (IEC): Following IEC activities are taken up at state, district and block level –

Awareness generation in the community on prevention and control of malaria.

Demand generation for anti-malarial services provided.

Encourage community participation in malaria control

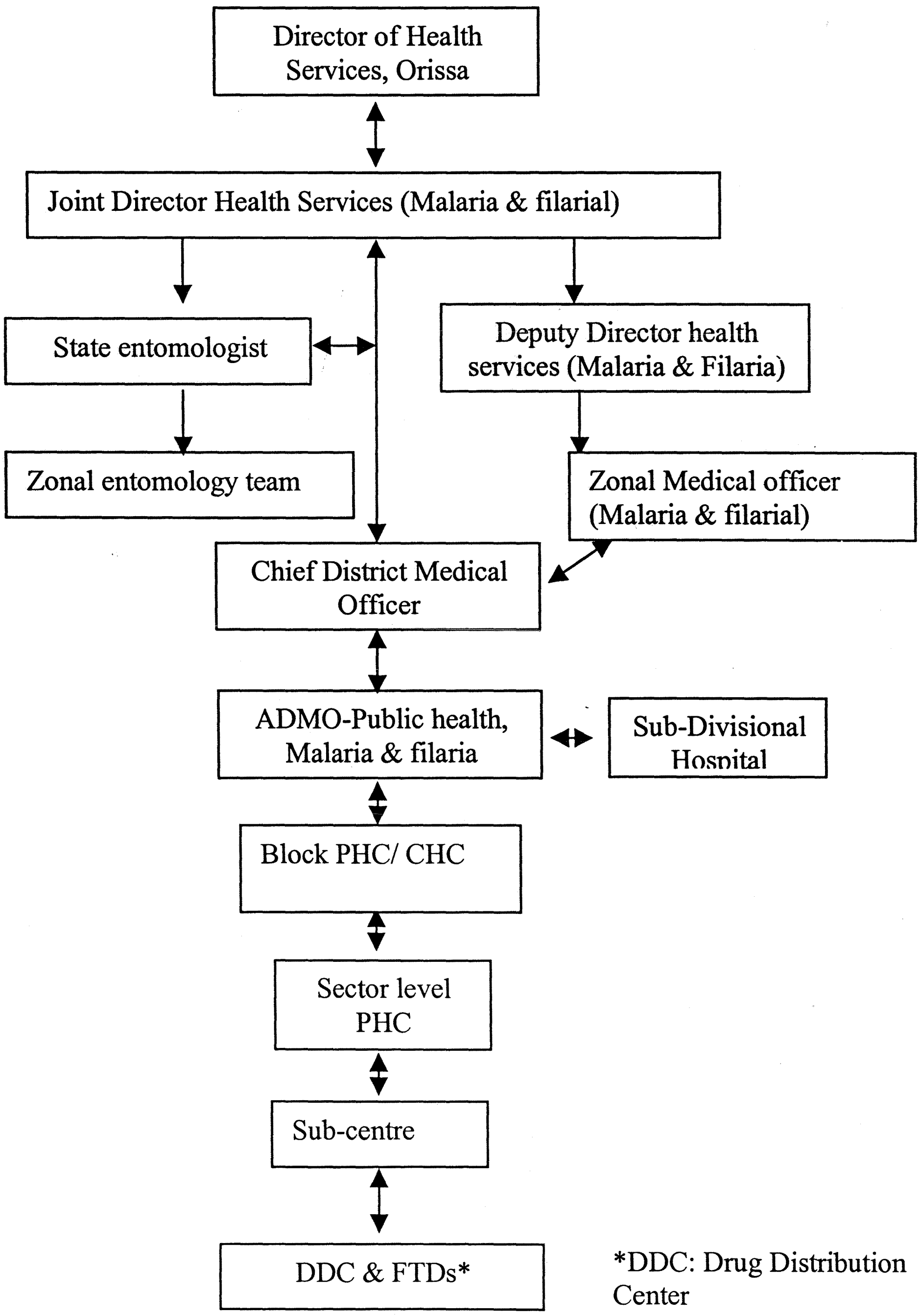
Behavioral change in terms of access to and utilization of services.

6.1.4.There are ongoing training programmes on different aspects of NAMP like case detection and updated treatment protocol, insecticide residual spray, microscopic examination and IEC.

6.2.Public Health Infrastructure for NAMP in Orissa and Cuttack district

The public health infrastructure of Orissa function under Directorate of Health Services. As regard to NAMP, Joint Director Malaria & Filaria is the state level programme officer. There are three Zonal Medical officers, one Deputy director malaria & filaria, state entomologist and zonal entomology team to assist him at state level. NAMP is implemented at district level by the district health infrastructure under the supervision of district programme officer. In Cuttack district Assistant district medical officer (ADMO)-public health, Malaria and filarial is responsible for NAMP.Block PHC/ CHC Medical officers in charge are the nodal persons for NAMP implementation at Block level. Chief district medical officer (CDMO) is the overall authority of NAMP implementation in the district.

Organogrm of NAMP in the state, district and block



*DDC: Drug Distribution Center
FTD: Fever Treatment Depot

7.Basic Information of the Berhampura PHC:

Berhampur PHC was established in the year 1958. The PHC is situated in Athagarh Block. Total area of the Block is 422.02 square Kms. There are 29 Gram Panchayatas and 184 revenue villages. Total population in the PHC area is131024 and Child population from 0 to 1 year is 3232, >1 to 3 years is 6883 and >3 to 5 years is 6883.

7.1.2.Vital statistics:

Table:7.Year wise vital statistics status of Berhampur PHC vs Cuttack district (1999-2002)

Year	Still birth (n & % to district)	Birth rate	Death rate	IMR	Birth rate	Death rate	IMR
1999	15 (3.6)	14.57	5.52	*54*	17.70	6.72	*37*
2000	33 (9.2)	16.85	7.98	*49*	18.66	7.17	*36*
2001	7 (3.9)	12.22	5.67	*34*	16.46	6.73	*33*
2002	13 (7.6)	12.30	5.54	*50*	13.61	4.56	*24*

IMR remains on higher side in Berhampura PHC area in comparison to district average.

8.Review of the structure for NAMP

8.1.1.Health infrastructure and manpower of Berahmpura PHC:

There are 4 sectors and 21 sub-centers under Berhampura PHC. Under ach sector there are 4 to 6 sub-centers. Each sector caters to more than 30, 000 population and each sub-center caters to more than 5000 population. In each sector there is a PHC (New) having OPD clinic facility runs under the supervision of a medical officer. One male and one female supervisor assist the sector medical officer in implementing and supervising the public health activities including malaria. A male and female health worker man the sub-center level activities. Both the health workers are the backbone of NAMP at the grass root level.

A senior medical officer is in charge of the block PHC. There are another two medical officers (one is from ICDS) working in the Block PHC who look after the OPD/IPD and family welfare activities.

Though the overall staff position in the PHC is better than many other PHCs in the state the vacancies of two male supervisors and 5 male workers put difficulty in implementing NAMP in some sub-centre areas.

The supporting staffs available at the PHC head quarter are Block extension educator (BEE), Pharmacist, malaria laboratory technician and pathology laboratory technician, vital statistic clerk, computer, male and female supervisors (of the head quarter sector). Besides this there are attendants and sweepers.

8.1.2.Building condition: The condition of the Block PHC building is good but the OPD functions in an old building that need repairs. There is a spacious hall where meetings and trainings are conducted. Malaria laboratory functions in an asbestos room with very poor infrastructure.

We visited two sector PHCs out of four and found that buildings are in good condition with adequate space and infrastructure.

20 % sub-centers do not have their own buildings and in 30% sub-centers the available buildings are not in good condition.

8.1.3.PHC manpower position

Man Power position in the PHC (Category of posts)	Sanctioned	In position	Vacant
Medical officers	7	7	0
Pharmacists	5	5	0
Health Assistant	1	1	0
Block Extension Educators (BEE)	1	1	0
Statistical Assistant (SA)	1	0	1
Multipurpose Health Worker super visor	5	2	3
(Male)	4	4	0
Multipurpose Health Worker supervisor	19	14	5
(Female)	26	21	5
Multipurpose Health Worker (Male)	1	1	0
Multipurpose Health Worker (Female)	1	1	0
Laboratory Technician (Malaria)	1	1	0
Laboratory Technician (Pathology)	1	1	0
Junior Clerk	1	1	0
Vital statistic clerk	19	16	3
Driver			
Class –IV employees			

Supporting man power:

Traditional Birth Attendant (TBA): 50 and Anganwadi workers: 100 of ICDS

For malaria control programme besides the established Govt . Health facilities there are 285 Drug Distribution centers (DDC) and 4 Fever treatment Depot (FTD)

8.2.Reporting system: There are both weekly and monthly review and reporting system operational in the PHC. Weekly review meetings are conducted at sector level on Saturday under the supervision of the sector medical officer. Along with family welfare activities anti-malaria programme and activities of Orissa multi-disease surveillance system (OMDSS) are reviewed. It is note worthy that in Orissa state OMDSS is functioning after the super-cyclone –1999 and malaria is included in OMDSS though the data collected in OMDSS is done by clinical diagnosis (suspected malaria). OMDDS weekly reports are submitted at sector and Block PHC and then transmitted to district level by the designed weekly cycle. Monthly reports are submitted at Block PHC on malaria and other family welfare activities. Monthly review meetings are conducted at the PHC head quarter under the direct supervision of medical officer in charge of the Block PHC on 9th of each month. In this meeting public health staffs and sector PHC medical officers participate. NAMP, OMDSS, family welfare activities and all other programmes are reviewed sector wise. The PHC medical officer gives appropriate feedback to the sector PHC medical officers, sector supervisors and all health workers. 8.3.Logistic and supplies: NAMP is centrally sponsored programme. Logistic and supplies are met from the central government fund. The salary of staffs is borne by State Government.

Supply status of Logistics and Antimalaria Drugs in Berhampur PHC for 2003 March is as follows:

Items	Indent	Supply
1.Registers /paper etc		
Bound registers for lab work (MF2, MF 6, MF 7, MF 8, MF 9, (log book and stock registers)	10	Nil
White paper sheet for laboratory and field use	20 Dozen	Nil
Registers for DDC	210	Nil
MF 2 binding register or exercise note book	47	Nil
Register for recording slide positive cases	2	Nil
Receipt register	2	Nil
Carbon paper, refills, pins etc		
2.Slides, needles etc		
Prickling needle	18,000 per	Nil
(People buy disposable needle)	year	Nil
Clean Slides for blood collection	2000	Nil
Slide Box (25 for Multi purpose health workers and 25 for PHC OPDs)	50	
3.Stain and spirit		
JSB stain ½ litre /month X 12months =	6 litre/ year	2 litres
Spirit for cleaning finger for pricking	25 litres / year	Nil

4.Antimalarial Drugs Requirement of the PHC

a) Chloroquin:

Against slide collection

High risk @ 8 tablets in average = 40,000

Low risk @ 3 tablets in average = 30,000

Opening DDC village no. 185 total requirement: 26,000

(High risk- 75 @ 200 tabs = 15000 and others 110 @100 tabs = 11,000

Replacement at DDC (185): requirement= 77,000

100 case / year X 100 = 7500@ 8 tabs =60,000

110 other places – 50 cases / year=5,500@ 3tabs =17,000

For PHCs OPD clinic 5000/ PHC X 6000=30,000

Pregnant women chemoprophylaxis: total requirement =30,000

(4 tabs after 12 weeks of LMP + Weekly

2 tabs X 32 weeks = 68 tabs)

Thus total chloroquin requirement for the PHC is =224,000

b)Primaquin

For Presumptive Radical Treatment (PRT) in High risk area 5000 X 6

(Tab 7.5 mg) =30,000

Slide positive cases (624 PV cases X 10 (7.5 mg tabs) =62 00 + 36 Pf cases

= approx 62,000

Total Primaquin required=92,000

c) Quinine

Quinine injection 105 amples were supplied and all have been used. Quinine Tabs 2000 that were supplied have been used.

4:Artemethr: Total 45 injections were supplied and all have been used

(Emal)

During the survey no shortage of chloroquin, primaquin and supporting drugs like paracetamol was found. But there were acute shortage of IEC materials, forms, and registers, pricking needles, staining reagents, detergent, new micro-slides and contingency fund. As per instruction from CDMO the Block PHC medical officer has submitted the requirement for 2003 –2004 in due time but there was no supply. DDT has been indented for IRS in one Sub-center area but could not be supplied by the district before the spraying season.

9. Review of Process indicators:

9.1.Action plan: District malaria programme officer (ADMO-Public health, malaria & filaria) in consultation with block medical officers prepare the annual action plan for the district which contains the budget for logistics, training, IEC, drugs, reagents, IRS and other supplies to the Joint Director, malaria and filaria of Directorate of Health Services. This action plan is prepared as per the NAMP guidelines. The Block medical officer in consultation with his sector medical officers, health supervisors and BEE prepare the Block action plan and submit to the district programme officer.

9.2.Surveillance and reporting :In NAMP both active and passive surveillance are instituted.

Active surveillance: Multi purpose male health workers during their fortnightly domiciliary visits search for fever cases suspected for malaria (case definition: cases of fever unless other wise proved). Female health workers during their antenatal and postnatal visits search for malaria cases in antenatal and post natal mothers and infants. Besides that they search others suffering from suspected malaria in the same household.

Both male and female health workers collect blood slides for malaria parasite examination and give presumptive and radical treatment. The first dose of medicine is given under direct supervision of the health worker.

Passive surveillance: Fever patients are detected at DDC/ FTD level, at sub-center clinic by the female health workers and at OPDs of PHCs.At DDC level only presumptive treatment is given and at other levels blood slide is collected and presumptive and radical treatments are given. Male health workers collect the report on case detection and treatment given from DDC/ FTDs of his sub centre area on monthly basis.

Health workers maintain family register (MF-1). They submit 2 copies of MF-2 along with collected blood slides to the sector supervisor at weekly sector meetings on Saturday. Pharmacists of sector PHCs prepare MF2 weekly report. Sector supervisors collect the sub-center and sector PHC report and the blood slides and submits them to the laboratory technician at the Block PHC. At Block PHC the patient record is directly maintained by the lab technician as well as blood he collects slides along with giving anti-malarial treatment. After getting the MF2 reports from sector supervisors laboratory technician record them in MF8 register. After slides are examined the results are recorded in MF9 register.

The blockhead quarter health supervisor maintains return of MF-2 with results from PHC laboratory at Block PHC level. Respective sector supervisors maintains the records(in MF-7) for his sector(sub-center wise positives with period of radical treatment, mass survey and focal spray). Health supervisors maintain current stock registers of tablets, slides, service postage etc.
Following reports are sent from Block PHC to the district: weekly epidemiological report on Saturday by post, MF-4 for age group change and monthly technical report (MF-5) i.e sub-center surveillance data and remedial measures. If there is spray then as soon as possible reporting is done on the assessment of spraying to the district by MF-6.Progress on DDC/FTDs is sent by MF-10/. Besides this overall progress with epidemiological situation of the block is submitted to the district annually.

Record keeping at all level was found to be satisfactory but the health workers, supervisors and laboratory technician at their level, prepare both registers and formats manually, as the supply of printed registers and formats from district level are very much inadequate and some times the supply is nil.it

9.3.Early Case Detection and Prompt Treatment (EDPT):
This is the single most important activity at the periphery for preventing malaria morbidity and mortality. For EDPT, all multi purpose health workers, sector level PHCs and Bock PHC as well as Drug Distribution Centers, Fever Treatment Depots and malaria laboratory are involved.

Review of EDPT: The team visited 10 sub-centres out of total 21 to see the NAMP records and interviewed 20 health workers (14 female and 10 male) and 2 female and 2 male supervisors at weekly sector meetings. The team visited two sector PHCs out of 4 and the Block PHC OPDs and also interviewed the respective pharmacists. Three sector meetings and one Block PHC level review meetings were attended to observe the reviews on NAMP activities.

Out of 199 functional DDCs and 4 FTDs 80 DDC holders and 2 FTD holders were interviewed. Besides this the team interviewed 40 adult villagers spreading over to 10 villages of 2 sub-centres belonging to different social class. 2 villages were surveyed.

The findings were as follows:

Multipurpose h eaealth workers:

Both male and female health workers are involved in NAMP and they work in coordination with each other. Male worker transmits the collected blood slides of the sub-centre to the PHC malaria laboratory through the male supervisor of the sector. Both the workers maintain the malaria records of the sub-center. Mostly male health worker supervises the DDC and wherever exist the FTDs and replenish chloroquin.

i.100% sub-centers have village wise population register and MF-1 is updated. The health workers prepare the registers manually in bound notebooks.

ii. Fortnightly domiciliary visits are regular in more than 80 % cases

iii. Blood slide collection: Both thick and thin blood slides are collected from all fever cases or cases with fever history during domiciliary visits.

As per the assessment only about 40 % fever cases are covered for blood slide collection during domiciliary visits. All most all health workers expressed that they do not get adequate micro slides and disposable sterile pricking needles.

iv. All health workers give presumptive treatment to the patients from whom blood is collected for malaria examination. Radical treatment is administered to all positive cases. 30 % health workers admitted that they do not always ensure that patients to swallow the tablets in their presence.

v. More than 90 % of health workers have the knowledge on complicated malaria and they know when and where to refer the patents.

vi. Male health worker replenish the stock of drug to DDC (drug and slides to FTD) wherever necessary. Only 60% DDCs and all FTDs said that they get medicine regularly.

vii. Almost all admitted that they do not put stencil on the wall of each household with date and signature at the time of fortnightly domiciliary visits though most of them know it.

vii. All female health workers collect blood slides from antenatal and post-natal mothers and infants if they suffer from fever and keep record in MF 2 during their antenatal and post natal follow up visits.

9.4.Drug Distribution Centers (DDC) and Fever Treatment Depots (FTD)

Profile of DDC and FTD holders: There are 206 DDCs out of which 199 DDCs are functional (96%) and out of 4 FTDs all are functional as per the PHC record.

DDC and FTDs holders are volunteers and residents of the village/locality. Anganwadi workers run 43% of DDCs and 57 % are run by other village volunteers. FTDs are run by village health guides and they reside in the same village. The medical officer in consultation with villagers selects DDC/FTD holders.

The team interviewed 40% of DDC holders and 50% FTD holders. All are found to be permanent residents of the locality. Ideally they should be from same village. But more than 40 % of DDCs are Anganwadi workers out of which 70 % reside in same village and others stay in a near by convenient places.

Nowhere the DDC sign board was found.in DDCs this is mentiond by Chalk.More than 70 % of DDC holders have education qualification above higher secondary level. All have under gone training on administration of presumptive treatment. Mean training hours was 4 hours though ideally it should be one to two days). Almost all DDC and FTD holders have knowledge on malaria case definition and presumptive treatment and all know when and where to refer complicated malaria patients. It was found that during one-month period about 10 % of the patients have been refereed by the DDCs to the nearest health facilities.

The functioning of Both DDC and FTD is better in Berhampur PHC than the District average for the years 1999 to 2003. But in 2003 number of FTDs is found to be very less (only 4).PHC medical officer informed that potential people do not take interest to work with complete voluntarism for this purpose and as anganwadi workers are getting some honorarium from ICDS their functioning as DDC holders is sustaining where as in other volunteers and for FTDs it is sustaining for a short period.

Table: 8 .DDC and FTD status in Berhampura PHC in comparison to district (1999-2003)

	DDC			FTD		
Year	Berhampur PHC		Cuttack District	Berhampur PHC		Cuttack District
	Existing (n)	Functional (%)	Functional (%)	Existing (n)	Functional (%)	Functional (%)
1999	49	89	46	2	27	21
2000	140	63	62	11	100	39
2001	105	73	59	18	100	65
2002	140	100	59	25	100	44
2003	201	96	60	4	100	58

All FTD holders have knowledge on blood slide collection. But it was observed that they have inadequate skill of preparing correct blood smear as well as taking adequate precautionary measure for sterilsation. Almost all FTDs face difficulties in getting disposable sterile needles.

About 40 % DDC holders and 100 % of FTD holders ensure that patient take medicine in front of her/him.

Only 40 % of DDC holders maintain patient and drug distribution records properly. Supervision by health workers is found to be regular on fortnightly basis.

It was found that all DDC holders had adequate amount of Chloroqiuin during the survy. But 30 % of DDC holders complained that sometimes they do not get adequate supply.

Peoples' view:

After interviewing 60 adults (>18 years) randomly in 10 villages it was found that 70 % knew their DDC holders and they prefer to get the treatment from them due to easiy accessibility in odd hours. Others had no knowledge and they get medicine from PHC, health workers or village quack.

9.5.Block and Sector PHCs: Adequate attention is given for patients suspected for malaria in PHC OPDS and IPD. At Block PHC OPD immediate blood examination is done and radical treatment given. Complicated malaria cases are referred to Sub-divisional Hospital of Athagarh and SCB Medical College & Hospital Cuttack.In IPD patients NAMP treatment protocols are followed.

50% medical officers are trained in malaria epidemiology and control activities Block PHC medical officer in-charge is well versed with the NAMP. He plans in consultation with the ADMO public health. Health supervisors monitor the NAMP activities in their respective sub-centers and mitigate the constraints in consultation with the Block PHC medicalfficer.

The BEE has adequate knowledge and skill for health education aspects of NAMP.

9.6.Laboratory issues:

For success of malaria control programme, scientific and functional diagnostic laboratory facilities is one the most important components of the National Anti Malaria programme. It is to be noted that though various newer diagnostic tools are now available, there is no replacement to the microscopic examination of the stained blood films in the diagnosis of malaria. Important aspects of the laboratory are:

The condition of the laboratory room, microscope, reagents, slides and other laboratory equipments and logistics.

Manpower: Skilled Laboratory Technician and other personnel for maintaining the laboratory.

Training on malaria microscopy

Time lag between blood slide collection and examination

Information on Malaria laboratory of Berhampura PHC

1.Type of Lab. facility and Staff

Malaria Blood slide examination facility available only at Block PHC level.There is one Trained malaria laboratory technician for blood slide examination and laboratory maintenance. The PHC Sweeper cleans the slides.

2.Microscopes

There are 4 microscopes (2 uniocular and 2 binocular) available in the laboratory and only one binocular microscope is functional. The microscope is more than 10 years old.

On observation it was found that the condenser and mirror are admitting proper light and are free of dust and dirt.

Working status of the coarse and fine adjustments: functional but not satisfactory.

Mechanical stage of the microscope is moving without jerk. Knowledge on handling the microscope is adequate.

3.Laboratory room

Working table has no adequate space. Natural light comes from East side but not from North side, which is the standard norm. Tube light is not available to compensate the deficiency of natural light. There is no revolving stool for the sitting of the laboratory technician. He sits on a non-movable hard chair. There is no proper facility for keeping the laboratory records. One old Almirrha is used for this purpose.

There is no slide boxes to keep slides, no rack to keep reagents and other stationeries.

4.Micro slides

Slides meant for blood examination are cleaned once in a fortnight. Cleaning is nor properly done. Mode of cleaning slides is by surf and water but surf is not supplied adequately and regularly. Adequate number of new slides is not available. Average number of slides required is 13,000 per year and the supply is within 10,000.

5.Blood slide examination and crosschecking

In one-year period (January to December 2001 –2002) total; 15244 slides were collected and same number of slides were examined. All slide have been examined by both thick and thin smear (as per the laboratory record). About 100 fields are checked in each slide. All the blood slides were found to be having the code number specified for PHC by the Zonal officer.

Lab technician mentions the species and stages of the parasites detected.

During our observation out of 40 slides all were examined both by thick and thin smear methods.

Out of the above number of slide examined 36 were positive for Plasmodium falciparum and 514 were positive for Plasmodium vivax.10% of slides were (both from positive and negatives were sent for cross checking to district laboratory and slide examination accuracy was found to be 100%).

6.Stain used

Though Giemsa is the ideal stain to get the best result, JSB Stain is used as per the NMEP recommendation (JSB is appropriate and practical for field situation).Leishman stain is not supplied.

7.Time lag between staining and blood slide examination: Time taken from staining to examination is only 30 minutes.

8.Slide preservation: There is no special provision for slide preservation to prevent degenerative changes and microbial contamination. Even slide boxes are not available to keep the slide safe.

9.Lab. training

Only the malaria lab technician is trained on blood slide examination, lab maintenance and lab record keeping. The supervising authority i.e. the Medical officers of the PHC is not trained. Medical officers monitor the lab functioning from his theoretical knowledge and experiences.

10.Lab registers

MF 2, MF 7, MF 8 and logbook are available. All these are not available in printed from. The Lab technician prepares them manually on lined bound notebooks.

Blood smear examination information for the year 2002 –2003 (January to December) is as follows.

Number of Blood slide Collected: 15244

Number of slides examined: 15244

Both thick and thin smear prepared: 15244

Number of +ve slides: 560, Pf= 36(6.4)

and Pv =514 (94.6)

Number of slides sent for crosschecking

to district laboratory=360

% of accuracy =100%

Laboratory record: Laboratory record maintenance is found to be satisfactory but registers are not supplied regularly from district level. Since last two years registers / papers etc have not been supplied to the laboratory from NAMP support.

PHC medical officer spends money from PHC contingency fund to buy the registers and papers and the laboratory technician prepares the formats manually on the white paper sheets.

Laboratory supervision: PHC medical officer in-charge supervises the laboratory fortnightly. Some times district level authorities (CDMO and ADMO –PH) also supervise the laboratory. No supervisory visit by any laboratory technicians from district level has been made for cross checking the laboratory functioning. Laboratory record keeping is found to be update. Charts are not maintained regularly.

As per the version of the laboratory technician, the main bottleneck in functioning of the laboratory is logistic constraints i.e inadequate supply of registers/ forms /papers and reagent and pricking needles.

Malaria blood slide collection and examination status: Both blood slide collection/ examination and the slide positivity rate (SPR) has increased substantially in 2001 and 2002.It was almost double to the district average in 2002.

Table: 9 Status of blood slide collection/examination and SPR

Year	Berhmpur PHC		SPR of Cuttack district
	Blood slide collected/ examined	SPR	
1997	11355	2.25	2.96
1998	11615	1.63	2.71
1999	10223	2.60	2.42
2000	13012	1.88	2.89
2001	11071	3.11	2.89
2002	14022	4.39	2.83

Plasmodium falciparum (pf%) detected: The trend in Pf% has followed a drastic reduction after 1999 (98%) and it came to remarkable low level in

2002 i.e around 6 %. As SPR is at a higher level than previous years this shows that the parasite scenario has been has been reversed to plasmodium vivax. Such drastic reduction in Pf% and rapid increase in Pv% is not seen in nearby blocks. Possible reasons for this could not be determined due to lack of entomological studies in this area.

Year	Berhmpur PHC	Cuttack District
1997	98.43	74.07
1998	93.12	70.92
1999	98.12	73.16
2000	61.48	71.31
2001	35.47	75.04
2002	5.76	66.44

3.1.5.Insecticidal residual spray

Insecticidal spray (DDT) operation conducted in 1999-2000								
Sector with subcenters(SC)	No. of villages	Total no. of House holding	Total population	No. of working days	No. of squad	No. of pumps allotted	SFWS	IFWS
Joranda SC:Sathilo,Kualo,Amrutmanahi patana, Baidehipatana, Talbasta	6	570	4836	10	10	20	10	50
Berhmpur SC:Dhurusia, Madhapur	13	924	5628	15	15	30	15	75
Megha SC:Rajnagar	5	427	2887	7	7	15	7	38

In March 2000 Cyfluthrin solface was sprayed in folowing sub-centres of Berhmpur PHC and the achievement status was as follows.

Sub-centre	Population	% Population Covered against the target	% Holdings Covered against target	% Rooms Covered Against target	% Rooms refused Against Target	% SFW Used Against target	% IFW Used Against target	% Pumps Used Against target	Insecticides consumed (Gm)

Sathilo	4848	100	103.4	70.3	31.0	100	100	100	25071
Rajnagar	3287	94	102.5	77.5	20.6	100	100	100	15980
Madhpur	7019	91	100	62.3	29.0	100	100	100	31270
Dhurusia	6921	99	100	68.4	25.2	100	100	100	34395
Total	22075	96	101.2	65.7	27.1	100	100	100	106716
N.B: All the above mentioned sub centres were under DDT spray operation in the previous year (1999)									

In the year 2003-04 ADMO (PH/MAL/ FIL/LEP), Cuttack has selected 30 sub-centres spreading over to seven PHC / CHC area of the district for insecticidal spray.It is note worthy here that the sub-centre selected from Berhampur Block i.e Dhurusia was having API 88.80, which was highest in the district.

As per the instruction of ADMO (PH/MAL/ FIL/LEP), Cuttack in he month of 4^{th} week March the Medical Officer of Berhampur PHC prepared an action plan with the help of his Sector supervisor and Block Extension officer for the spraying activities in Dhurusia subcentre. The action plan was sent to the district malaria office in the 2^{nd} week of April 2000. The action plan contained the following aspects,

No. of teams - 6

No of spray man in each team-2

No. of pump man in each team – 2

No. of Mix man in each team –1

No. Stencil man in each team –1

Supervisor-1 (the sub-centre male health worker was assigned the responsibility of supervision)

Approximately 40 house holding were to be covered per day

Wages per person was fixed as Rs 40 /-

The duration was from 1^{st} May to 31^{st} May (total 23 number of spraying days)

Village route chart with date and Map was also prepared.

Due to non-supply of the insecticidals and funds the spray activities could nod not be conducted.

3.1.6.Training and capacity building: It was found that 60 % of medical officers have undergone formal train on NAMP. None has been trained on microscopic examination.

More than 80 % health workers have been trained on NAMP during their service carrier. BEE and health supervisors are trained on IEC and surveillance mechanism.

Laboratory technician is trained.

3.1.7. Information education and communication (IEC):

IEC activities are mainly conducted during observance of malaria week (May first week) Planning for observing malaria month id done by discussion with field staff in monthly meeting, discussion at Mahila Swasthya Samiti and discussion in Panchayat meeting.

There is no use of poster and essay competition, exhibition at schools, hoarding and banners, clay model on malaria vector, life cycle, DDT spray and treatment etc.

10.Outcome Indictors:

A community level survey was conducted in two villages to assess the service utilization and people' knowledge on the available health services for malaria. One village was nearer to a Sector PHC and another was remote to the Sector PHC. In both villages 30 % of upper caste and 30% of lower caste households were surveyed. Total house holds surveyed 96 (50 in the village nearer to Sector PHC and 46 away from the Sector PHC).

The findings were as follows:

1. Village nearer to the sector PHC:

i) Service utilsation: More than 70 % get the treatment from the Sector PHC for malaria treatment.20 % go to health worker and only 10 % go to DDC holder. Both upper caste and lower caste people get equal opportunity in getting treatment from the PHC. Very low proportion of people from lowercase utilizes the services of DDC and one major cause found was that the DDC holder happened to be from upper caste.

ii) People are generally aware about the symptoms and signs of malaria. Main source of information was found to be in the following order: Radio and Television and health workers. The IEC activities conducted by the PHC appeared bearing very little effects. In more than 90% households of upper caste and about 60 % of lower caste adults know about malaria blood examination and chloroquin as malaria drug. In general both groups are conscious about the malaria and its complications. Though people know that mosquito is the main culprit for malaria transmission, still there is a strong belief among older generation and women that taking bath in stream water causes malaria.

Almost all know that malaria treatment is available freely in all Government health institutions.

iii) Health seeking behavior: in an average upper caste people seek treatment within a day of suffering from fever whereas it is 2.5 days among lower caste people.

In both upper and lower caste community women seek treatment later than men.

iii) Use of anti mosquito measure at household level: about 30 % of upper case and only 3 % in lower caste households use mosquito net though they are aware of it.

iv) No community action has been taken in the village for control of mosquito during last several years.

2.Village away from Sector PHC:

i) Service utilization: Among upper caste houses 56 % get services from the DDC and 30 % from the health worker and others from village quacks .In lower caste 70 % get service from health workers and 20 % from DDC and 10 % from village quacks. Besides the availing the modern treatment people also go for traditional treatment.

ii) People are generally aware about the symptoms and signs of malaria. Main source of information was found to be same as in other village. More than 60% households of both sections know about malaria blood examination and Chloroquin as the drug. Hardly people use mosquito net in both groups. Only 30 % in upper caste and 10 % in lower caste households know that mosquito transmits malaria. There is firm belief that malaria occurs due to bathing in stream water. In Both sections people have very partial knowledge on the health services available for malaria. All are aware that treatment for malaria is free in Government health facilities.

It was observed that many people have the idea that for malaria treatment injection is better than tablets.

iii) Health seeking behavior: in an average upper caste people seek treatment within 2 to 3 days and lower caste people seek treatment after 3 days. In both group women seek treatment later than men.

iii) Use of anti mosquito measure at household level: Only 5 % households of upper caste use mosquito net. 10 % houses of lower caste often use neem oil

iv) There is no village level community action for malaria control.

Malaria Epidemiological situation:

1.API: overall API has increased in the block in 2001 and 2002 than previous years and district average. API is almost twice that of the district in 2002. The API wise sub-centre status of the PHC is as follows.

API	Number of Sub-centres out of 21 (Year 1998-2002)				
	1998	1999	2000	2001	2002
<2	19	16	16	18	18
>2 to 5	1	4	3	2	2
>5	1	1	2	1	1

Mainly 2 sub-centers are showing high API i.e Dhurusia and Dalua. The startling feature is with Durusia where the API is very high and is even higher than many high-risk blocks of the state. The year wise API status of Dhurusia sub-centre is as follows:

Year	API
1998	16.33
1999	22.78
2000	13.72
2001	34.70
2002	88.80

2.SPR: Slide positivity rate has increased substantially in 2001 and 2002. Pf % has decreased.

3.Blood slide collection and examination rate has increased.

4.Measure taken in High API area: Massive health education, activating all concerned for active case detection, mass blood slide collection and administration of chloroquin has been taken up by the PHC staffs. Action plan for insecticide residual spray (DDT) in 11 villages having 1025 holdings (population: 5721) was submitted to CDMO, Cuattack.But due to fund constraints this could not be materialized

10.Summay of the findings:

10.1.Malaria parasite: Out of four species of malaria parasites that are known to cause malaria in human beings only two i.e P. vivax and P. falciparum affect he population of Cuttack ditrsict. Though P.falciparum is the main problem for Cuttack district(Pf 70% vs Pv 30%), it is found that P.vivax as main parasite in Berhampura PHC area (Pf 6% vs Pv 94%). With present study it was not possible to trace the possible cause / causes of such an unusual reversal picture.

In spite of ongoing NAMP , API remains on higher side.

10.2.Strength:

i.The public health infrastructure and staff position in Berhampur PHC is better than many other blocks of Orissa. All staffs have basic knowledge on NAMP and the performance as per the schedule is satisfactory.

ii. Adequate numbers of DDCs have been opened and more than 90% are functional.

iii. Block medical officer has adequate knowledge and personal involvement in NAMP iv. Supply of chloroquin, primaquin and other supportive drugs are available at all level

iv. Quality of blood slide examination is satisfactory.

v. Besides NAMP, Orissa multidisease surveillance system is very much in place in the Block

vi. State health policy is very much concerned about the problem of malaria.

10.3.Weakness:

Supply of logistic is inadequate and irregular

No entomological surveillance

No study on drug resistance

Involvement of other sectors including NGO and private sectors is very low.

Mobility constraint for medical officers for supervision and monitoring

When there is need of IRS it is not instituted due to non supply of DDT/other insecticides and fund

Public awareness on self-protective mechanism is low in remote villages.

Involvement of community in NAMP is lacking

Health education programmes are not effective.

11.Discussion and Suggestions:

In past years malaria control was organized as a military operation with clear guidelines for each level of the vertical programme. After achieving a spectacular reduction in malaria incidences, the vertical programme was made a horizontal integration with primary health care system (PHC) so that it could be sustainable.

Malaria control has been integrated with PHC before the commitment of India to the Alma Ata declaration but even more so after it. Here the multipurpose health workers, the health supervisor, laboratory technicians under the leadership of the PHC medical officer form the crucial team to fight against malaria. For this team the major arms are: early case detection ad prompt treatment, laboratory diagnosis,health education and community participation.

In spite of the full involvement of the PHC by infrastructure and manpower malaria control becomes a daydream.

The logistic constraints matter but more so is poor public involvement and very little or no study on vector dynamics.

The crucial challenges before the PHC for malaria control: (i.) Community participation (ii) Appropriate technology (iii) inter-sectoral coordination (iv) social equity (v) capacity building of staffs and up-keeping the motivation (vi) reaching the population in time

After studying the findings of the present study carefully,following suggestions are made.

There should not be any lax in supplying logistics/ drugs / laboratory needs/equipment to the PHC from district level.

Laboratory is very crucial component for the success of NAMP. Population has been increased to a great extent but the lab facility has not been expanded or strengthened.

Medical officer as supervisor should undergo training on laboratory issues.

Entomological study should be conducted without delay

DDCs should be prominently displayed with proper signboards by which people can know their nearest drug centre easily.

Filling-up of male worker posts is very crucial for active surveillance.

IRS should be instituted in areas with API > 5 without any laxity

OMDSS and NAMP should be closely monitored with full coordination for studying the actual situation of malaria.

IEC should be peoples' friendly so that it reaches people with proper message on EDPT , self-protection from mosquitoes, availability of health services etc.

Inter-sectotral coordination and approaches are essential for malaria control.

The community and /or representatives both formal and informal leaders should be involved in the planning and organization of the activities at all stages of the programme.

The large number of human resources available in the community: Traditional birth attendants, folk healers, Panchayat leaders, Mahila Swasthya Samiti, Mahila samitis, youth clubs, school teachers, opinion leaders, general practioners, and practioners of other system of medicine etc.

School children can be better transmitter of malaria message if they are given adequate information/education on the subject.

12.Conclusion:

Malaria occurs as a product of the interaction between the parasite, the vector, and man (the host). Malaria becomes endemic when these players interact freely. Malaria control strategy seeks to manipulate these three factors and their interrelationship.

Different efforts have been taken to control malaria in Cuttack district as part of National malaria control programme (NAMP). Through NMAP approach the Government of Orissa primarily focuses on EDPT. Despite the money, manpower involved with the traditional NAMP strategies the morbidity and mortality due to malaria has not been reduced in Blocks of Orissa.

Alternative strategies to control malaria have been experimented in different parts of the state, though in smaller scale both by Non-Governmental and Governmental organizations. They have produced significant but localized decrease in malaria.

The causes of persistence of malaria are multi faceted and to control such a complicated disease multi - prong coordinated approach is essential.

The key in most of these new strategies appears to be empowerment of individuals and community with knowledge, skills and tools necessary to protect themselves from malaria and to control the problem in their locality.

Malaria control methodology should be peoples' friendly and be implemented as people's campaign for malaria.

SECTION:3

3.1.JOURNAL CRITIQUING

AND

LITERATURE REVIEW

2.3.1.CHOLERA OUTBREAK INVESTIGATION IN A TRIBAL VILLAGE OF KASHIPUR, RAYAGADA, ORISSA 2002.

1.1.Disease notification:

Increased number of diarrhoeal cases (3650) was reported to the Multi Disease Surveillance System (MDSS) of the Directorate of Health Services, Orissa from Kashipur Block of Rayagada district during the month of July and August 2002. The MDSS technical committee alerted the joint Director-public health to assess the diarrhoea situation in the block and to take necessary public health measures if necessary.

Kashipur is a tribal block of Rayagada district, situated in Southern Orissa at a distance of 500 km away from the State capital and 60 km away from the District head quarter.

1.2.Preparation for field visit:

Formation of investigation team: As per the suggestion of MDSS technical committee. Joint Director (Public Health) formed an investigation team consisting of MDSS ex-surveillance medical officer (FETP scholar, at National Institute of Epidemiology, Chennai), microbiologist of Regional Medical Research Centre (ICMR) Bhubaneswar and a Post Graduate student of SPM Department, SCB Medical college, Cuttack.

As per the direction of Joint Director (Public Health) we proceeded to Kashipur Block of Rayagada District on the morning of 4th September 2002 to assess the diarrhoeal situation in Kashipur block and conduct outbreak investigation if necessary.

Before leaving the state head quarter we consulted and discussed with the surveillance medical officer of Multi Disease Surveillance Cell at Directorate of Health Services, Joint Director (Public Health) and Director, Regional Medical Research Centre (RMRC), Bhubaneswar. We collected requisite equipments and forms from the microbiology section of RMRC for collection of stool and water samples.We carried with us the Clair Blair media, sterilised containers and sterilised cotton swabs for sample collection.. We developed a rapid survey format for water / food borne illnesses and carried with us adequate number of Xerox copies. Director RMRC provided the vehicle to the investigation team.

We informed the chief District Medical officer of Rayagada and medical officer of Kashipur Community Health Centre (CHC) regarding our visit.

We reached Kashipur Block at 8 pm on 4th September. We discussed with the medical officer in charge of Kashipur CHC regarding the overall diarrhoeal situation in the block and got the impression that the severity of diarrhoea has been declined to a great extent in comparison to previous weeks. We verified the medical records of the CHC for the months of June, July and August 2002 and for the same months of previous three years for incidence of diarrhoea. We assessed that the overall trend in diarrhoea has been increased through the above months in the year 2002. We got the information from the medical officer that though diarrhoea incidences have been decreased still there are sporadic cases through out the block. He also informed us that more cases are being reported from Gorakhpur sector since last week. We went through the weekly disease surveillance report of the concerned sector and found increased number of diarrhoea cases than the usual incidences.

With the above background information we decided to visit Gorakhpur sector on the next day morning i.e. on 5th September 2002.

1.3.Disease verification:

On 5th September we reached Gorakhpur sector head quarter in the forenoon. We visited the Gorakhpur sector Primary Health Centre (PHC-New). There we found two diarrhoea patients with severe dehydration on intravenous drip and treatment. Both the patients were from Pitazodi Village. We examined the patients and recorded the clinical history, symptoms and signs. The attendants of the patients informed us that a 40-year-old woman had died in their village in the morning and she was suffering from loose motions since last night.

Then we visited the Gorakhpur sub-centre to discuss with the male and female multi purpose health workers. We verified the sub centre weekly disease surveillance register. We found increased number of diarrhoea cases in the previous week in Pitazodi village and sporadic cases in other villages. The male health worker confirmed about the death of the woman in Pitazodi village in the morning hours. The deceased was 40 years old and suffering from diarrhoea since previous night.

With these background informations we decided to review the situation on the spot and proceeded to Pitazodi village by accompanied by the male health worker. We reached Pitazodi village in the afternoon. After reaching the village we discussed with the village head and the youths regarding the diarrhoea situation in the village. We came to know that there were active cases of diarrhoea. They also mentioned about the death of the 40 years old woman that occurred in the morning. Villagers informed us that there were one to two cases of diarrhoea occurring daily since last two months. The sub-centre weekly surveillance report also confirmed this.

We found from the sub-centre register that number of diarrhoea cases were in excess in Pitazodi village in comparison to previous three years during these months.

1.4.Outbreak Investigation:

Keeping all the above points in consideration we decided to conduct an outbreak investigation of diarrhoea in Pitazodi village.

1.4.1.Case definition: After taking the history of five active diarrhoea patients in the village we decided to follow the existing case definitions of the Multi Disease Surveillance System of Orissa.

The case definitions were as follows:

Simple Diarrhoea: -Three or more loose motions over 24 hours without dehydration is called simple diarrhoea. But in children passage of even one large loose motion can be labelled as simple diarrhoea.

Severe Diarrhoea: -Acute diarrhoea with dehydration falls in this category. If it is severe watery diarrhoea it may be suspected as cholera.

The time period we took for our case detection in Pitazodi village by using the above case definition was from last week of June to September second week, 2002.

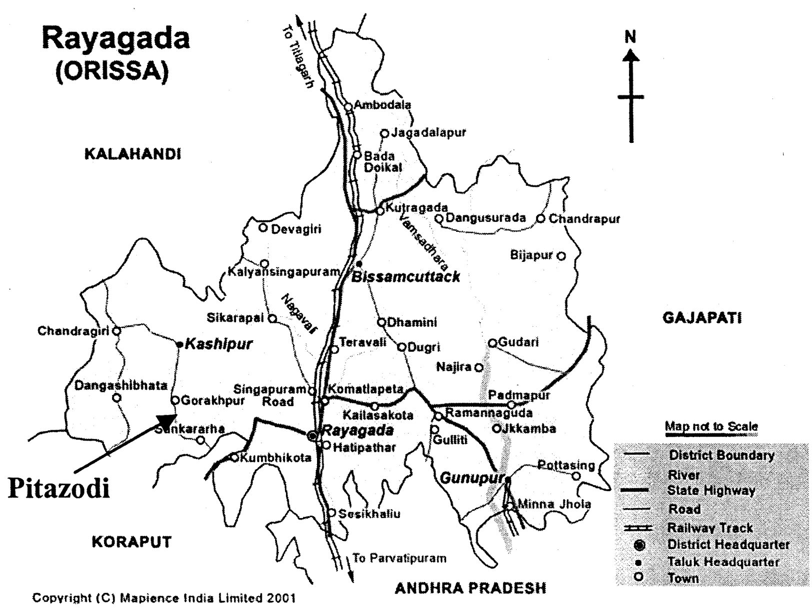
1.4.2.Active search: We conducted house-to-house survey and detected all the active cases and registered them by name, sex and age. We also listed the patients who were well at the time of interview but had suffered from diarrhoea since last week of June 2002. We followed the clinical case definition mentioned above for the case detection. Active surveillance was continued up to two weeks after the last case of diarrhoea occurred in Pitazodi village i.e.10th September 2002. All the cases and deaths due to diarrhoea were line listed by date of onset (annexure).

<u>Sample collection</u>: During the active search we collected rectal swabs from the active cases and the water samples from all the drinking water sources of the village for laboratory investigation at RMRC, Bhubaneswar. The first case occurred in the village was on 30th July 2002.

1.4.3.Descriptive epidemiology

Pitazodi is a small tribal village of Kashipur block. It belongs to Tikiri Gram Panchayat (G.P). The health services are provided by the Gorakhpur sub-centre, which is situated at Gorakhpur G.P.head quarter. The village is situated in a valley surrounded by hills and forests at a distance of 3 km from Gorakhpur G. P head quarter and 15 km from Kashipur block and CHC head quarter.The village is not motorable during rainy season.

Fig:1



1.4.3.1.Demography of Pitazodi village:

There were 99 households and a total population of 480 in the village. Under five populations was 61 and above five was 419. The scheduled tribe population was 450 and the scheduled cast and general population were 20 and 10 respectively. Mostly villagers depend upon agriculture and forest produces for their livelihood. About 90 % of households are below poverty line.

Literacy and socio-economic status of the village is very low. Literacy rate is 25% (Female literacy is <10 %).

1.4.3.2.Village environment:

During our investigation we also surveyed the environmental aspect of the village. We went around the village and noticed the following things: -

People keep domestic animals like cows, bullocks, buffalos, goats, pigs, chicken etc adjacent to their dwelling places.

Drainage and sanitation condition of the village was very bad. Virtually there was no drainage system. People maintained poor sanitation. There was not a single latrine in the village and villagers were habituated with open defecation. Hygienic practices in handling food and water was lacking.

People in general and women in particular did not have the general knowledge and basic understanding on causation of water and food borne diseases. Villagers did not have the basic knowledge of home treatment and correct use of ORS in diarrhoea and dehydration.

Health seeking behaviour of the villagers was low. All households solely depended upon the public health staffs for their treatment. Women and girl children get low priority for availing timely medical treatment than the male members.

1.4.3.3.Drinking water sources:

There were three types of drinking water sources: - (1). Dug wells (two common dug wells and two private dug wells (2) one tube well and (3) one spring. Majority of households were drawing water from common dug wells for drinking and cooking purpose. Six scheduled caste households were using the spring as their drinking water source. These houses were not allowed to draw water from the village wells. Villagers were not using tube well water for drinking purpose due to its disagreeable taste and smell. Villagers used to wash clothes; utensils and take bath near the drinking water sources. Maintenance of cleanliness around the drinking water sources was very poor.

1.4.3.4.Persons affected: Diarrhoea affected all age groups and both sexes. Out of 29 cases 7 were from < 5years age group and 22 were from >= 5 years age group. Out of the 22 (>=5) 16 were male and 13 were female. Total deaths occurred due to diarrhoea were 3 (1 male and 2 female).

1.

4.3.5.Time period

The first case occurred on 30th July and the last case was on 10th September 2002 and a total of 29 cases of diarrhoea occurred within one and half-month period with 3 death. Line list of cases and deaths is given in the annexure.

1.4.4.Hypothesis generation: The last three-year data for diarrhoeal illness in Pitazodi village was analysed. The diarrhoeal cases, deaths, attack rates and case fatality ratios in Pitazodi village during the month of July, August and September from 1999 to 2002 is shown in Table:1

Table 1: Diarrhoeal cases and deaths in Pitazodi village, Kashipur of Rayagada District during July to September 1999-2002

Year	Cases	Population	Attack Rate per 1000	Deaths	CFR
1999	14	473	29.59	0	0
2000	11	476	23.11	0	0
2001	28	469	59.70	0	0
2002	45	480	93.75	3	6.7%

From the last three-years data it is found that there were no such increased incidence and attack rates of diarrhoea cases in Pitazodi village during the month of July, August and September in comparison to the year 2002. The case fatality ratio (CFR) in 2002 is very high (6.7%) in comparison to previous three consecutive years.

Table: 2 shows that the weekly incidence rate (IR) of severe diarrhoea per 1000 population in Pitazodi Village during the MDSS reporting weeks (week 31 to 36 in 2002) is very high in comparison to Kashipur Block, Rayagada District and Orissa State respectively during 31st August to 6th September 2002.

Table 2: Weekly* comparison of Severe Diarrhoea (IR/1000) of Pitazodi Village, with other areas of District and State, 2002

Dates of the week	Week No	Pitazodi Village	Kashipur Block	Rayagada District	Orissa State
27th Jul to 2nd Aug	Wk-31	4.1	0.11	0.10	0.13.
3rd Aug to 9th Sept	Wk-32	0.0	4.46	0.13	0.12
10th Aug to16th Aug	Wk-33	2.0	4.17	0.09	0.12
17th Aug to 23rd Aug	Wk-34	4.1	2.95	0.13	0.12
24th Aug to 30th Aug	Wk-35	4.1	3.66	0.25	0.11
31st Aug to 6th Sept	Wk-36	39.5	0.77	0.23	0.09

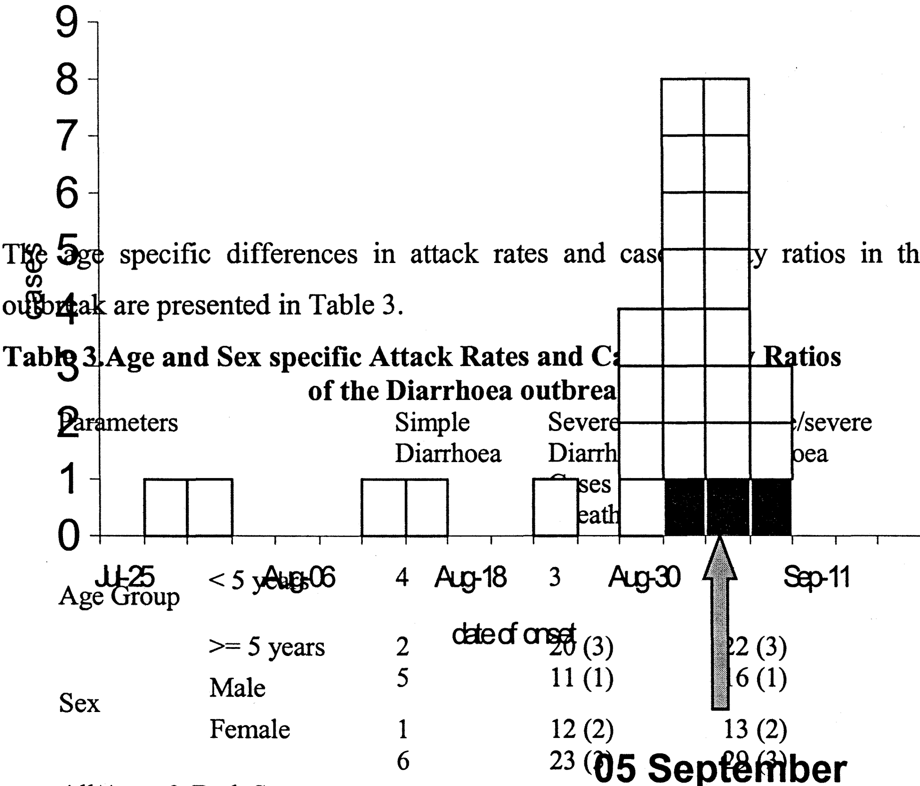
*MDSS reporting weeks (31st to 36th week), 2002.

This clearly indicated that it was an outbreak of diarrhoeal illness in Pitazodi village during the period of last week of Jun to second week of Sept'2002.

The epidemic curve (Fig:2) shows that this was a common source outbreak having the index case on 30th July 2002. Up to third week of August 2002 there were sporadic cases of diarrhoea and towards first week of September there was a sharp up-slope of diarrhoeal incidences. We investigated and intervened with containment on 5th September 2002. After two days of our intervention there was sharp decline in the incidence diarrhoea. The average incubation period was estimated to be within a week.

Fig:2

Diarrhoea cases by date of onset among residents of Pitazodi village,Kashipur, Orissa,2002



The age specific differences in attack rates and cas y ratios in the outbreak are presented in Table 3.

Table 3.Age and Sex specific Attack Rates and C Ratios of the Diarrhoea outbrea

Parameters		Simple Diarrhoea	Severe Diarrh ses eath	/severe oea
Age Group	< 5 years	4	3	
	>= 5 years	2	20 (3)	22 (3)
Sex	Male	5	11 (1)	16 (1)
	Female	1	12 (2)	13 (2)
All Ages & Both Sexes		6	23 (	29 (3)
Attack Rate				
Age Group	< 5 years	6.6%	4.9%	11.5%
	>= 5 years	0.5%	4.8%	5.3%
All Ages & Both Sexes		1.3%	4.8%	6.0%

Parameters		Simple Diarrhoea	Severe Diarrhoea	Simple/Severe Diarrhoea
Case Fatality Ratio				
Age Group	< 5 years	-	-	-
	>= 5 years	-	15.0%	13.6%
Sex	Male	-	9.1%	6.3%
	Female	-	16.7%	15.4%

All Ages & Both Sexes		-	13.0%	10.3%

Population

Age Group	< 5 years	61
	>= 5 years	419
All Ages & Both Sexes		480

1.4.5.Clustering of cases

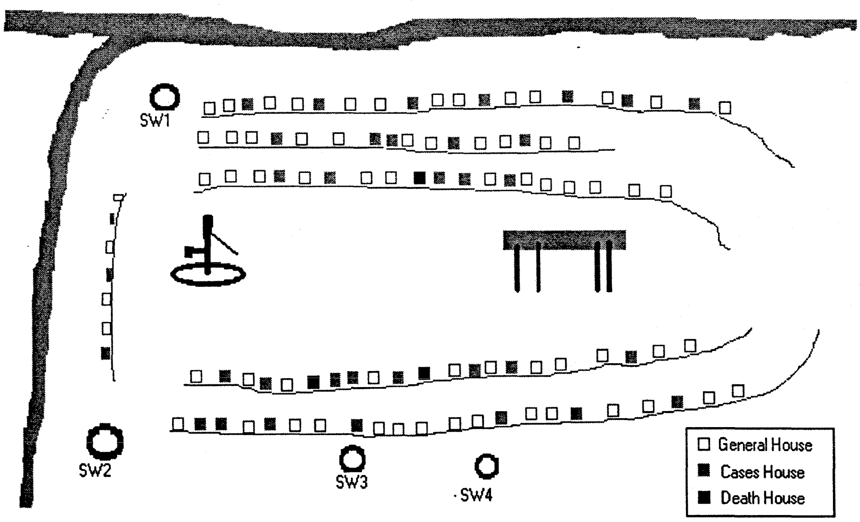
The spot map of Pitazodi village shows that there are four streets in the village. Maximum number of households is situated in the Main Street and maximum numbers of diarrhoea cases occurred in these households. More than 90 % of households from this street were drawing drinking water from the common dug well No. 2 (Shown in the spot map). There was clustering of cases. In the first street there was clustering of cases among the scheduled caste households who use spring water for drinking purposes. Scheduled caste households were not allowed to draw water from the village common dug wells.

All the houses were very close to each other. The distance between the schedule caste community and other community was hardly 10 to 15 feet.

The attack rate by households was 33.8 % among in the main street. Attack rate among the 6 households belonging to scheduled caste community was 53.6%. The first case of diarrhoea occurred in the scheduled caste community.

Fig:3 Spot Map of Pitazodi Village

Spring



The above results suggested that there was epidemiological link among cases. The CFR was very high and the symptoms and signs indicated that the disease to be suspected cholera. From the course of the disease it was suspected that a person of scheduled caste community might have contracted the disease from outside and during socialisation process the disease agent might have contaminated the village wells. The poor environmental sanitation and the unhygienic practices in the village were also favourable for water contamination. Possibility of well water contamination by the spring water cannot be denied as spring water was flowing near the unprotected dug wells.

A total of 29 diarrhoea cases occurred in 27 households of Pitazodi village. The distribution of households with cases by drinking water sources and water source specific household attack rates are shown in Table 4.

Table 4. Distribution of affected households by drinking water sources with Household Attack Rates and Risk Ratios, Pitazodi village, Kashipur - 2002.

Water sources	Number of Households Affected	Total Number of Households using the water source	Household Attack rate	Risk Ratio
Shallow Dug well No .1	3	25	12.0%	1 (Reference)
Shallow well Nos. 3 & 4	2	15	13.3%	1.11

Shallow Dug well No .2	19	53	33.8%	2.98
Spring Water	3	6	53.6%	5.55
All sources	27	99	28.3%	-

The water source specific household attack rates suggest that the spring water followed by well no. 2 were probably the main contaminated water sources, which might have caused the disease outbreak. The epicurve indicates that it was a point source outbreak. With this we hypothesised that this was an outbreak of acute severe diarrhoea and suspected to be cholera.

1.5.Laboratory confirmation

The rectal swabs and water samples collected were tested at the laboratory of RMRC (ICMR) Bhubaneswar for identification of the pathogen.

The laboratory criteria for confirmation of diagnosis of cholera were as follows.

Isolation of toxigenic (cholera toxin producing) Vibrio cholerae O1 or O139 from stool

Serologic evidence of recent infection

Vibrio cholerae- O1 was isolated from stool culture.

The strain isolated was found to be sensitive to tetracycline, ciprofloxacin and norfloxacin (sensitivity to doxycycline has not been tested).

No contamination could be detected from the water samples. This could be due to chlorination of water sources by the male health worker on the previous day during his routine visit to the village.

1.6.Containment measures

Case management: During our door-to-door survey we detected the active cases and treated them with ORS and antibiotic. Under five children suffering from diarrhoea were treated with ORS and mothers were advised to provide home available fluids. Two adult' patients with severe dehydration were referred to CHC for administration of intravenous fluids.

Chlorination: We instructed the male health worker to chlorinate all the wells in the village on the very day and continue the same twice a week for one month along with active surveillance. We supervised the chlorination during our stay in the village.

Health education: We demonstrated the use of ORS to villagers and mothers in particular and advised them through group discussion to take boiled / chlorinated water and avoid the spring water.

1.7.Communication:

After reaching the Kashipur block headquarters we discussed with the CHC Medical officer of regarding the diarrhoea (suspected cholera) outbreak and the potential danger of spreading to other areas. We suggested the medical officer to continue active surveillance in Pitazodi and nearby villages with intensive health education and regular chlorination of drinking water sources.

We also submitted our written report with necessary recommendations to medical Office in charge of CHC Kashipur, CDMO Rayagada, and Joint Director (Public Health), Orissa, MDSS Medical officer and Director,Regional Medical Research Centre, Bhubaneswar for information necessary action.

1.8.Recommendations

We recommended the following things for immediate and future action

Immediate:

Active surveillance for diarrhoea to be continued at least for a 2 weeks from the occurrence of the last case and vigilance to maintained in near by villages.

Regular chlorination of drinking water sources at least twice a week in Pitazodi and near by villages.

All severe diarrhoeal cases in this region should be managed in the line of cholera.

Persuading people not to drink the stream water.

Intensive health education to use chlorinated or boiled water, proper hand washing before eating, feeding children and serving food.

Demonstration by health workers for correct use of ORS to treat dehydration.

Public awareness regarding safe water & safe food in market places and festival grounds.

Alerting for timely intervention by the multi-purpose health workers.

Stocking of adequate ORS, antibiotics (Tetracycline, Ciprofloxacin and Norfloxacin, IV fluids at the CHC and Sector PHC level

District mobile health unit and district task force should remain alert to help the CHC team to manage and contain any further outbreak of acute diarrhoea.

Future action:

Involving malaria link volunteers, DDC holders, Anganwadi workers, teachers and community volunteers for transmission of information on diarrhoea to the nearest health facility.

Training village women for chlorination of drinking water sources and use of safe drinking water.

Trained health personnel at sector PHC level for management of severely dehydrated cases.

Epidemic preparedness trainings should be conducted at Block and Sector level for capacity building at local lvel

Annexure: Line list of Diarrhoea Cases Sorted by Date of Onset

Sl. No.	Name	Age years	Sex Male (1) Female (2)	Date of onset	Provisional diagnosis: Simple (1) Severe (2) Diarrhoea	Patient Outcome: Alive/ Recovered (1) Dead (2)	Rectal Swab collected Yes (1), No (2)
1	Susila Naik, Head of the House	42	2	30.07.02	2	1	2
2	Kanti D/ O Navi Majhi	1.5	2	01.08.02	1	1	2
3	Renu Majhi D/O Arjun Majhi	3	2	12.08.02	2	1	2
4	Kartika Majhi S/O Niru Majhi	8	1	17.08.02	2	1	2
5	Balaram Kumbhar (HOH)	28	1	23.08.02	2	1	2
6	Nara Nayak (HOH)	70	1	26.08.02	1	1	2
7	Kalimani Majhi W/O Dharama Majhi	30	2	30.08.02	2	1	2
8	Gangadhar Nayak S/O Siba Nayak	0.5	1	31.08.02	1	1	2
9	Renu Majhi D/ O Magena Majhi	2	2	01.09.02	2	1	2
10	Lalita Majhi D/O Sana Majhi	20	2	01.09.02	2	1	2
11	Tada Majhi W/ O Genu Majhi	70	2	02.09.02	2	1	2

12	Lalita Majhi C/O Sura Majhi	18	1	02.09.02	2	1	2
13	Dharama Majhi (HOH)	40	1	03.09.02	2	1	2
14	Bibhisan Majhi S/O Sadhana Majhi	25	1	03.09.02	2	1	1
15	Ashok Majhi S/O Dibakar Majhi	20	1	04.09.02	2	1	1
16	Gunja Majhi	40	2	04.09.02	2	2 (5.9.02at 7am)	2
17	Lala Majhi (HOH)	55	1	04.09.02	2	1	2
18	Subai Majhi C/ O Malati Majhi	45	2	04.09.02	2	1	2
19	Jala Majhi HOH)	70	1	05.09.02	2	1	1
20	Puruna Majhi C/O Anant Majhi	12	1	05.09.02	2	1	1
21	Kusumi Majhi D/O Kia Majhi	14	2	05.09.02	2	1	1
22	Limbai Majhi C/O Kia Majhi	70	2	05.09.02	2	2 (7.9.02 at4pm)	1
23	Bhagaban Kumbhar S/O Balaram Kumbhar	1.5	1	05.09.02	1	1	1
24	Sundarmani Nayak (HOH)	50	1	05.09.02	1	1	1
25	Khagwswar Majhi C/O Nai Majhi	4	1	05.09.02	1	1	1
27	Sripati Majhi C/O Lai Majhi	1	1	05.09.02	2	1	1
28	Ambala Majhi	25	2	09.09.02	2	1	2
29	Kacha Majhi	40	2	10.09.02	2	1	2
27	Asudu Majhi	35	1	10.09.02	2	2(11.9.02)	2

2.3.2.NUTRITIONAL STATUS AND DIETARY HABITS OF TRIBALS OF KASHIPUR BLOCK, ORISSA

2.1.Background:

In the year 2001, the Southern districts of Orissa were badly affected by drought. This was immediately followed by flood. During this time food-borne outbreaks occurred in three villages of Kashipur, an under developed tribal block of Rayagada District. Various agencies in the State investigated the outbreak. One of us (MMP) conducted a follow up survey in these villages. The findings indicated that unusual number of cases occurred with the clinical presentation of gastrointestinal and neurological symptoms. These cases were epidemiologically linked with high attack and fatality rates concentrated in three villages of Kashipur and occurred in a short span of time. The epidemiological linkage in this outbreak was in terms of clustering in families as well as common exposure i.e., consumption of mango kernel gruel just before the onset of symptoms. There were media reports and reports from other agencies hypothesizing that the deaths were due to starvation as a result of drought and delayed implementation of "food for work". They further concluded that the tribals resorted to mango kernel consumption to avoid starvation. The gruel with mango kernel had been traditionally eaten for many years.

The entire episode brought out many issues related to the surveillance system as well as the health system at large in Orissa. The local authorities initiated control measures without any credible scientific evidence for mango kernel as the offending agent for the illness. The socio-cultural implications were not considered. This was important in view of the traditional food habits of the tribals of this region.

Available information on food habits, dietary pattern and nutritional status of the tribal population was deficient and did not warrant conclusions. The food consumption pattern was dependent on vagaries of nature and varied from extreme deprivation (in lean seasons) to high intakes in the post-harvest period.

The State Government of Orissa requested Regional Medical Research Centre (RMRC), Bhubaneswar to assess the nutritional status and dietary habits of tribals of the affected villages to ascertain the true picture. Later RMRC, and National Institute of Epidemiology (ICMR) in collaboration with Health and

Family Welfare department Orissa conducted a nutrition survey in Kashipur block during 2001.

2.2.Objectives:

To assess the dietary habits and nutritional status of population in the three tribal villages of Kashipur Block

To determine factors associated with occurrence of frequent diarrhoel episodes in the tribal community.

2.3.Methods:

2.3.1.Study Setting:

Kashipur block is under the jurisdiction of Rayagada district (Figure 1). It has a total geographical area of 1,505.90 sq km with 17 village panchayats and about 412 villages. Out of the total population 62 per cent belong to scheduled tribes, 23 per cent scheduled castes and the rest 15 per cent are other castes. Over 75 per cent of population in the region belongs to the Khond tribe.

2.3.2.Sample size and Sampling methods:

There were 371 households with 1343 population in the three villages. Twenty percent of the households (i.e 75 house holds) were selected by systematic sampling procedure. All the individual in the selected house holds were contacted for the purpose of the study. In total 376 individuals were covered.

2.3.3.Environmental assessment

Inspected the village surroundings and assessed the environmental conditions.

2.3.4.Nutritional anthropometric measurements:

Assessment of nutritional status:

For pre-school children 1-4 years age group, a simplified method to estimate the prevalence of malnutrition from summary data[2] . Based on Z-score, prevalence of under nutrition for males and females is estimated. Z-score is computed for boys and girls separately using formula

M-m/s (where in M stands for reference weight and m stands for mean weight of boys and s stands for reference standard deviation).

For children in the age group 5-14 years, weight for height was computed and compared with WHO/NCHS reference standards[2]

For adults, nutritional status was assessed by computing body mass index [BMI] [3] by the formula given below:

$$BMI = WEIGHT(Kg)/\ HEIGHT^2(m)$$

BMI 18.5 is used as cut off point to estimate the proportion of children with under nutrition.

Clinical assessment of nutritional status:

A senior medical officer (TVR) conducted clinical assessment for nutritional status.

Dietary assessment

a) Food frequency method (FFQ) – One month recall period. This method is used to estimate long-term average intake of food items per consumption unit per day.

b) Oral questionnaire method – 24 hours recall period. This method is used to estimate current nutrient intake per consumption unit per day.

Due to difficulty in communicating and getting data on individual dietary intake, we calculated intakes per consumption unit (C.U.)[4,5,6]

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2.3.5.Statistical analysis:

The data collected was verified for completeness. We used Epi Info 6.04d for data entry and analysis. Statistical tests for comparison of proportions (χ^2 test) and p value of less than 0.05 was considered as statistically significant.

2.4.RESULTS

After the request from the local state government, the data was collected about 8 months after the occurrence of outbreak .The information was collected on 376 persons from 75 households in the last week of May 2002,. Ninety six percent of them (373) were covered for the dietary assessment. Three individuals were not available, for the dietary assessment.

2.4.1.Age-sex distribution of tribal population in the study area

In all 373, individuals were covered from the three tribal villages. Among them males were 169 and females were 204. The age distribution was 3%, 8%,24%,and65% among males from the age groups under 1 year,1-4 years,5-14 years and above 15 years respectively. The comparable figures for females was3%, 15%,25%and57% respectively.

2.4.2.Village environment:

During our investigation we also surveyed the environmental aspect of the village. We went around the village and noticed the following things: -

People keep domestic animals like cows, bullocks, buffalos, goats, pigs, chicken etc adjacent to their dwelling places.

Drainage and sanitation condition of the village was very bad. Virtually there was no drainage system. People maintained poor sanitation. There was not a single latrine in the village. People were habituated with open defecation. Hygienic practices in handling food and water was lacking.

People in general and women in particular did not have the general knowledge and basic understanding on causation of water and food borne diseases. Villagers did not have the basic knowledge of home treatment and correct use of ORS in diarrhoeal illness.

Health seeking behaviour of the villagers was low. All households solely depended upon the public health staffs for their treatment. Women and girl children were neglected to get timely treatment in comparison to male members.

2.4.3.Drinking water sources: There were three types of drinking water sources: - (1). Dug wells (two common dug wells and two private dug wells (2) one tube well and (3) one spring. Majority of households were drawing water from common dug wells for drinking and cooking purpose. Six scheduled caste households fetch drinking water from the spring flowing near the village. These houses were not allowed to draw water from the wells used by other communities. Villagers were not using tube well water for drinking purpose due to its disagreeable taste and smell. Villagers were washing clothes; utensils and taking bath near the water sources and not maintaining cleanliness.

2.4.4.Socio demographic characteristics of households: (Table 1

Education: Fifty six percent of people were illiterate in the study area.

Food culture

Source of food : Sixty three percent of households obtain their food items mainly from the forest.

Food storage (uncooked)

It is observed that cereals such as Rice and Ragi were stored in pots for 3-4 months. The second commonest item stored was mango kernel. It was stored in baskets for about 2 months.

Food preparation

In almost all households, food preparation is done mainly by boiling.

2.4.5.Dietary assessment

Food consumption pattern (Table 2)

Out of 76 households, 67% consumed Ragi. It was their staple diet. Apart from cereals very few food items were consumed daily.

In large number of households it was found that they never consumed milk and milk products as well as the other non-vegetarian foods such as eggs, mutton, fish, chicken etc., 21% of the tribal population was consuming mango kernel daily.(>20g/c.u. / day). Generally, mango-kernel was used as supplementary food as mango kernel kanji along with the cereals in the rainy season from July to October every year in the tribal population.

Dietary assessment by oral questionnaire method (24-hour recall)

Dietary assessment of 363 individuals was done by 24-hour recall method. It is observed that consumption of all the nutrients are below recommended dietary allowances (Table -3).

The intake of fat and iron was deficient by 89% and 70%, respectively, compared to Recommended Dietary Allowances (RDA). The deficiency varied from 15% to 77% for other nutrients. The tribal population is endowed with rich fruit- bearing trees. Fruits like mangoes were eaten in raw and ripe form. They provide considerable amount of minerals and vitamins and also energy, which is difficult to estimate by diet surveys. In spite of this limitation ,our diet survey showed the average intake of energy per c.u. per day as 1820 Kcl as against recommended 2400 Kcl per day. .

Nutrition status of pre-school children (1-4 years)

In all, 43 pre-school children aged 1-4 years were examined by recording height and weight measurements. It was estimated that about 6% (1-boy) of boys and 28% (7-girls) of girls were undernourished (Table -4) based on the estimation procedure recommended by WHO (1995).

Nutritional status of school going children (5-14 years)

The heights and weights of 70 children were recorded and weight for height were computed and compared with WHO / NCH reference standards. It is observed that 52% of boys and 38% of girls were undernourished (Table -5).

Nutritional status of adults

The height and weight of 84 males and 91 females in all three villages were recorded and Body Mass Index (BMI) for each individual was computed. It is observed that 30% of both males and females were undernourished (Tables 6 & 7).

Association of consumption of Mangokernel and Nutritional status

As the number of children from households consuming mangokernel was not sufficient for comparative analysis, this analysis was limited to adults. It was observed about 30% of adults taking mangokernel were undernourished and the proportion was same among persons not consuming mangokernel. Consumption of mangokernel and nutritional status of adults, males and females were not related ($p>0.2$).

2.4.6.Clinical Nutritional Status

Distribution of clinical signs and symptoms among 373 individuals(Table-8). It was observed that night blindness was 4.6% and dental caries 6.4%, the other nutrition deficiency signs such as Angular stomatitis (0.5%), Glossitis (0.5%) phrynoderma (0.2%) thyroid gland enlargement (1.3%). It was observed that the micronutrient except Vitamin –A deficiency and Iodine deficiency was minimal among the above population. However, under nutrition was widely prevalent among children due to energy deficiency.

2.5.Discussion

The tribal population is recognized as socially and economically vulnerable. The food consumption pattern is dependent on vagaries of nature[1]. The assessment of nutritional status of tribal population was conducted in Kashipur Block during May 2002.

Except cereals, intake of other food items are found to be far below the Recommended Dietary Allowances. Assessment of food intake distribution by households by FFQ method showed consumption of mango kernel was limited to lean season. Only 21% of the tribal population were consuming mango kernel (>20g / c. u./ day). Average intake of energy/person/ day was 1820 Kcal .Consumption of other nutrients except calcium, the deficiency varied from 28% to 89%. Under nutrition was prevalent in all age-groups,It was 43%,and 30% in adolescents and adults respectively. However, no significant difference in nutritional status was observed between Mangokernel consumers and non consumers among adults. Clinical Nutritional assessment showed dental caries (6.4%), night blindness (4.6%), and thyroid enlargement(1.3%) as the main problems.

To conclude occurrence of frequent diarrhoel out-breaks in the Tribal community may be due to twin problems of under nutrition and bad un-hygeinic practices of the people. Hence it should be dealt with diarrhoel management as in any other incidences.

ACKOWLEDGEMENT

The authors thank all the field staff of Kashipur primary health center for their enthusiastic co- operation in data collection. They also thank Mr.Paul Tamby systems analyst and also his team for their help in processing ,the data. And Mr.Manickam for his guidance in reviewing literature. Finally the authors thank the respondents of the study for their patience and kind co-operation extended during the conduct of the survey.

<u>The recommendations were as follows:</u>

As the under nutrition and bad hygienic practices root causes of diarrhoeal illnesses inthese areas , the following recommendations are made:

Regular chlorination of drinking water sources at least twice a week near by villages. Persuading people not to drink the stream water.

-Intensive health education to use chlorinated or boiled water, proper hand washing before eating, feeding children and serving food.

- Public awareness regarding safe water & safe food in market places and festival grounds.

- Stocking of adequate ORS, Antibiotics (Tetracycline, Ciprofloxacin and Norfloxacin) IV fluids at the CHC and PHC (New) level.

-Timely intervention for case management by the multi-purpose health workers.

-Trained health personnel at PHC (New) level for management of severely dehydrated cases.

-District mobile health unit and district task force should remain alert to contain any such further outbreak of acute diarrhoea.in the community.

ACKOWLEDGEMENT

The authors thank all the field staff of Kashipur primary health center for their enthusiastic co- operation to in data collection. They also thank Mr.Paul Tamby systems analyst and also his team for their help in processing ,the data. Finally the authors thank all the investigators and the respondents of the study for their patience and kind co-operation extended during the conduct of the survey..

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Figure 1. Kashipur Block in Rayagada District, Orissa

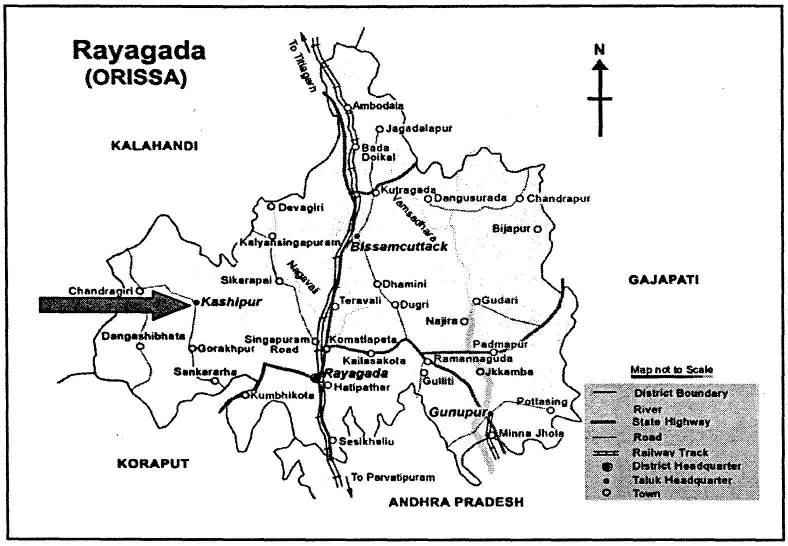


Table 1 Socio-demographic characteristics of tribal households of Kashipur Block, Orissa, 2002

Variable	%
Family size	
2-5	62
6-10	38
Type of house	
Kutcha	35
Semi-pucca	50
Pucca	15
Occupation	
Agriculture labour	37
Own agriculture	17
Unskilled worker	17
Skilled worker	1
Others	28
Land holdings (acres)	
Nil	57
0.1 – 0.5	5
0.6-- 3.0	22
4.0-- 10.0	16

Table 2 : Food consumption pattern (% households) in three tribal villages of Kashipur Block, Orrisa,2002

Food items	Frequency of consumption (%) among households		
	Daily	Occasionally	Nil
Cereals	53	47	0
Ragi	67	29	4
Pulses	4	93	3
Oil	5	90	5
Vegetables	5	93	1
Milk/milk products	1	20	79
Eggs	0	51	49
Mutton	0	84	16
Fish	0	68	32
Fish(dry)	0	86	14
Chicken/birds	0	86	14
Fruits	0	95	5
Tea/coffee	1	36	63
Toddy/Alcohol	0	72	28
Mangokernel	21	79	-

Table- 3 . Nutrient deficiency in three tribal villages of Kashipur Block, Orissa, 2002

Nutrients	RDA	Average intake	% Deficiency
Protein (g)	66.6	40.8	38
Fat (g)	66.9	7.2	89
Fibre (g)	40.0	9.1	77
Carbo (g)	460.0	330.5	28
Calcium (mg)	781.6	661.9	15
Iron (mg)	62.2	18.8	70

Table- 4. Nutritional status of children aged 1-4 years in three tribal villages of Kashipur block, Orissa, 2002

Factor	Male (n=17)	Female (n=26)
Mean weight (kg) = m	12.20	9.10
Mean height (cm)	87.80	79.10
Reference weight (kg) = M	12.70	10.60
Reference S.D. (kg) = S	1.15	1.05
$Z = (M - m) / S$	0.43	1.43
Prevalence of under nutrition (%)	5.90	28.0

Table- 5. Nutrition Status of children aged 5-14 years as per WHO/NCH standards in three tribal villages of Kashipur Block, Orissa, 2002

	Under nourished		Well nourished		
Sex	No.	%	No.	%	Total
Male	13	52	12	48	25
Female	17	38	28	62	45
Total	30	43	40	57	70

Table- 6. Nutritional status by Body Mass Index (BMI) for males in three tribal villages of Kashipur Block, Orissa, 2002

Age (yrs)	BMI				Total
	< 18.5		>= 18.5*		
	n	%	n	%	
15 – 24	4	21	15	79	19
25 – 34	6	26	17	74	23
35 – 44	5	20	20	80	25
45 – 74	10	59	7	41	17
Total	25	30	59	70	84

* *WHO Technical report series (1995)*

Table- 7. Nutritional status by Body Mass Index (BMI) for females in three tribal villages of Kashipur, Orissa, 2002

Age (yrs)	BMI				Total
	< 18. 5		>= 18.5		
	n	%	n	%	
15 – 24	8	24	25	76	33
25 – 34	8	32	17	68	25
35 – 44	3	23	10	77	13
45 – 74	8	40	12	60	20
Total	27	30	64	70	91

Table –8. Prevalence of clinical micronutrient deficiencies in three tribal villages of Kashipur Block, Orissa, 2002

Clinical sign	% (n=373)
Night blindness	4.6
Angular stomatitis	0.5
Glossitis	0.5
Phrynodema	0.3
Thyroid enlargement	1.3
Others	1.6

2.3.3.RISK FACTORS ASSOCIATED WITH SUSPECTED CUTANEOUS ANTHRAX OUTBREAKS IN HUMANS,ORISSA 2002

- A Matched Case Control Study

1.Introduction:

1.1. Disease Notification:

On 5th May 2002 the Orissa Multi Disease Surveillance Cell at the Directorate of Health Services, received information from Chief District Medical Officer (CDMO) of Koraput district by fax regarding suspected cutaneous anthrax cases in Dasamanthapur block.

A patient named Hari Saunta, 40 years old male of Tentuliguda village of Dasamanthapur block was reported seriously ill on 2nd May 2002.He had carried a dead cattle on his back on 20th April 2002. He developed itching on the back on 27th April followed by pustules and ulcer on the back within the next 3 days. On 1st May he had fever, breathlessness. He became unconscious in the early morning of 2nd May and immediately was brought to the Dasamanthapur Primary Health Center (PHC). The patient died within 15 minutes after reaching the PHC. The medical officer while examining, found a malignant pustule on the back of the patient

The medical officer suspected the disease to be cutaneous anthrax primarily, affecting the central nervous system leading to death.

Suspecting some more cases in Tentuliguda village, the medical officer proceeded to the village with his PHC staff on the same day morning. The team detected 18 clinically suspected cutaneous anthrax cases in the said village.

This was reported to the CDMO, Koraput on the same day. The CDMO verified the event by sending the District Task Force (DTF) for investigation on 4th May 2002 and after getting confirmation report form the DTF, transmitted the information to the State Disease Surveillance Cell by Fax on 5th May 2002.

1.2. Immediate Response:

The Dasamanthapur PHC Medical officer with his staff conducted active search for case detection and case management from 2nd May onwards. The DTF team was stationed at Dasamanthapur block to assist Block PHC staff for containment measures and monitor the situation. Active search was conducted in all the villages of

Dasamanthapur Block from 17^{th} May to 19^{th} May 2002. All cases and contacts were examined by the PHC staff and DTF team .The cases were treated with Penicillin / Tetracycline / Ciprofloxacillin.Health staff suspected the outbreak to be due to exposure to dead animals and animal products like meat, skin, hides etc. Health education was imparted to persuade people not to handle dead animals. Block administration forced people to dispose of the raw dead cattle meat that were hung in the walls of their houses for drying.

1.3.The episodes of suspected cutaneous anthrax occurred in seven villages of two nearby blocks (Damanthapur and Laxmipur) within an interval of one month.

Dasamanthapur block:

43 cases were detected from four villages of Dasamanthapur block, within 2^{nd} April to 17^{th} May 2002. There was only one death in Tentuliguda village. A state level Rapid Response Team from MKCG Medical College, Berhampur was sent by Director of Health Services, Orissa on 16^{th} May 2002 to assess the situation. Following active case management and adequate containment measures, the incidence subsided within one month. Active surveillance was continued for another two weeks by the local PHC staff in and around the affected villages of Dasamanthapur Block.

Containment measures such as health education, removal of raw beefs, which were hung on the walls of the houses for drying, mass cattle vaccination and active surveillance, were initiated.

Laxmipur block:

Laxmipur block is adjacent to Dasamanthapur block. Within an interval of one month of the last case in Dasamanthapur block, suspected cutaneous anthrax cases were detected in three villages of Laxmipur Block. Containment measures and case management activities were instituted in Laxmipur block by the Laxmipur Community Health Centre (CHC). Incidence of cases subsided within a month.

2:The epidemiological study

I could not participate in the outbreak investigation directly, as at the same time I was involved in a nutritional study in a tribal block of Southern Orissa. We reviewed the disease outbreak from available medical records and conducted a retrospective a case control study.

2.1. Study objectives:

To describe the outbreaks of suspected anthrax in two blocks of Koraput District, 2002.

To identify the possible risk factors for the causation of the disease outbreaks.

To suggest measures that would prevent similar outbreaks in future.

As a FETP-MAE scholar, I conducted the case control study as a learning exercise for selection of cases and controls, analysis and interpretation of the study findings.

2.1.Methodology:

2.1.1.Review of available information: We reviewed the available investigation reports of DTF and State Rapid Response Team, collected the secondary data from Dasamanthapur PHC, Laxmipur CHC and Koraput District Multi Disease surveillance cell. We consulted the CDMO, Assistant District Medical Officer (ADMO)-Public health and Assistant Health officer (AHO).

We did a descriptive epidemiological study and drew our hypothesis.

We conducted a retrospective community based matched case control study to determine the risk factors of suspected anthrax that occurred in two blocks of Koraput district.

2.1.2.Study design: We conducted a case control study within 2 months after the outbreak got subsided.

We formed an investigation team consisting of FETP scholar (myself), a Post graduate student of Social Preventive Medicine, SCB Medical College, Cuttack, three interns from MKCG Medical College; Berhmapur. We included two social scientists, local volunteers and PHC health staff during our study.

We developed questionnaires, in consultation with staff of National Institute of Epidemiology (NIE), to collect relevant information like exposure factors, including socio-economic and cultural practices. We collected data/information by interviewing cases/controls, household members neighbours and community leaders.

Before interacting with the affected villagers we first got ourselves acquainted with the local field situation and the community. We discussed with the medical officers of each block and collected the available information from the PHC/CHC records regarding the cases and management of outbreaks. Team members were oriented regarding the interview methods, data collection / recording procedure and the checklist to be followed to minimize biases. All measures were taken so that the interviewers were not influenced by their own impressions. The local volunteers and the local health staff helped mobilizing the community for their full cooperation and participation. They interpreted the local dialect wherever needed.

2.1.3.Selection of Cases:

We included all the persons who were clinically diagnosed as suspected anthrax. We collected the data from the PHC/CHC records of Dasamanthapur and Laxmipur respectively. We excluded those who did not satisfy our case definition (based upon WHO case definition).

2.1.4.Selection of Controls:

Controls were selected from the same village and community from where cases were identified. Controls were selected from those who had apparently no clinical symptoms and signs of suspected anthrax. Efforts were taken to select one control for each case. A control was preferably chosen from the same house or neighborhood to which the case belonged. Age, sex, religion, community, literacy level and occupation of cases were matched with controls. The age group was matched for + /- 5 years of difference.

Both cases and controls had never been out of the village during the time of outbreak.

2.1.5.Data collection:

For both cases and controls we interviewed them or a close relative or a person from neighbourhood. Parents were interviewed for children less than 10 years. For the deceased person we interviewed his wife.

2.1.6.Data analysis:

We used in Epi info (Version 6), SPSS, STATA for analyzing the data. Statistical significance for difference between proportions was determined using Chi-square tests. Statistical significance of difference between means was tested using student's 't' test. The association between risk factors and disease outcome was expressed by Odds ratio along with the 95 % CI. Conditional logistic regression was carried out to assess the independent association of risk factors with the disease.

We matched the cases to controls:

-to decrease the possibilities of confounding, or mixing of effects of exposure to risk factors of interest with the effect of exposure to other risk factors.

-to increase statistical precision of estimates with the given sample size.

3. Descriptive Epidemiology

3.1.Background:

A total of 20 cattle had died in Gllimusa village of Dasamanthapur block between 15th to 20th April 2002. The villagers of Gllimusa threw the dead cattle away in the open. Villagers from Sukraput and Tentuliguda collected those dead cattle and consumed the meat after cooking. Some households processed the skin and hides, stored them for trading. Villagers also hung dead animal meat on the walls of their houses to dry and preserve for later consumption.

As per the reports of DTF and State Rapid Response Team, both sexes (male > female) and all ages (adults >children) were affected. There was history of exposure to dead animals, either by handling the skin, hides of dead animals and / or consuming the dead animal meat by the affected persons. The disease was clinically diagnosed as "suspected cutaneous anthrax".

Biological samples from the skin lesions were collected and examined in the district and MKCG Medical College (Berhampur) laboratory. The samples were collected more than 24 hours after antibiotics were administered and the laboratory findings were not conclusive.

3.2. Study area and population characteristics:

Dasamanthapur and Laxmipur Blocks are situated in Koraput district, which belongs to Southern part of Orissa . Tribal and schedule caste populations dominate Koraput district. The area of the district is 8379.3 Sq.kms. and covers the most difficult terrain in the state.

The district forms a part of the Eastern Ghats region consisting of plateau land broken by hills with high rocks. The plateau has wide expanses of open country, fringed by forest and hills, the elevation ranging from 200 feet to 4000 feet above sea level. There are large numbers of perennial streams flowing in the district. The district has many inaccessible areas.

Temperature varies between 35°C to 42° C in summer and 6°C to 15° C in winter. The average rainfall of the district is 1358 mm and humidity is 44%. The landmass of the district is favourable as a pasture ground for grazing animals.

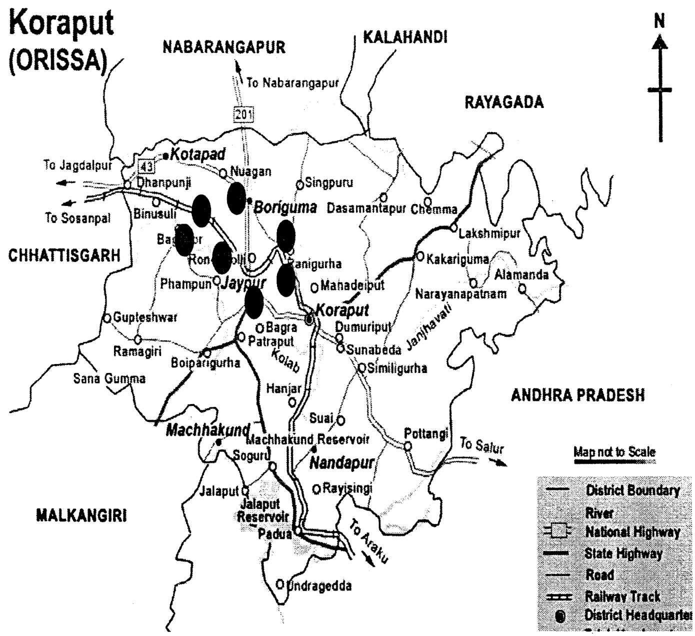
There are 1997 revenue villages and a population of 11,77,954 as per provisional 2001 census. The district population is 3.21 percent of the state. Child population (less than 6 years) is 3.73 percent of the child population of the state. Sex ratio is 998 female per 1000 male, which is 972 in the state. Literacy rate is low and the socio-economic condition of tribal and schedule caste population is poor. Main occupation of people is agriculture and agricultural labour. People collect forest produces in lean period to sale in the market for their livelihood.

Malaria, Diarrhoea, Acute respiratory tract infection, Scabies, Tuberculosis, Anemia, Sickle cell anemia, anthrax and leprosy are the diseases of public health importance I the district.

Table 1: Sociodemographic profile of Koraput district

Characteristics	
Population: total	1178, 000
Male	589,000
Female	589,000
Child population(0-6)	193,317
	(16.41 % of total population)
Decennial growth rate (1990- 2001)	14.41
Sex ratio (per 1000 male)	998
Population density (2001)	134 per sq km
Literacy rate	
Total	31.26
Male	41.21
Female	21.28
Socio-economic status	Below poverty line (BPL)

Fig:1



District boundaries:East: Vizianagaram, District of Andhra Pradesh,West: Malaknigiri district of Orissa and Bastar district (MP),North: Nowrangpur district and South :Rayagada district of Orissa.

⬮ Affected villages in Dasamanthapur and Laxmipur Block of Koraput District by suspected Anthrax in 2002.

Table 2:Health indices and health services of Koraput District,2001

Indicators	Koraput	
Crude Birth rate	22.7	(24.1)*
Crude Death rate	8.4	(10.7)
Infant Mortality Rate	56.0	(97)
Maternal Mortality Rate	1.75	(0.73)
Doctor population ratio	1:7744	(1:7560)
Bed population Ratio	1:3391	(1:2662)
Health worker (female) and population ratio	1:2400	(1:5200)
Area served per medical institutions	1:135	(1:92 Sq km)

* The corresponding figure for the State of Orissa

Table 3: Basic Information of the two affected blocks

	Dasamanthapur Block		Laxmipur Block	
		% to district		% to district
Geographical area	216sq km	2.5	286sq kms	3.2
Cultivable area - Rabi - khariff	25364 hectors 3196 hectors 4251	9.5	17674 hectors 4251 hectors 13413 hectors	6.6
Gram panchayats	16	7.07	13	5.8
Villages	166	8.3	100	5.0
Revenue hamlets	333		75	
Population		%to Block total		%to Block total
Schedule tribe	34,454	53.24	32,873	68.13
Schedule caste	5,505	8.51	7,101	14.73
Others	23,750	36.70	8,158	16.90
Over all	64,709		48,248	
Socioeconomic				
*APL Families	16964 (26%)		12688 (26%)	
**BPL Families	47745 (74%)		35560 (74%)	

* APL: Above poverty line

**BPL: Below poverty line

3.3.Place, person and time distribution

We included all the persons clinically diagnosed as suspected anthrax, which were recorded in Dasamanthapur PHC and Laxmipur CHC. We developed our case definition based on WHO case definition. We excluded those who did not satisfy the case definition.

3.3.1.Case definition:

After discussing with the medical officers involved in managing the outbreaks, reviewing the investigation reports of the State Rapid Response Team and District Task Force and interviewing with 15 affected persons we enlisted the symptoms and signs and formulated the case definition as follows: -

"Any person suffering from cutaneous lesion having a papule with any of the following clinical features e.g. itching, oozing, eschar, swelling, lymphadenopathy, pain / tenderness/ fever during the months of April and June 2002 in any village of

Dasamanthapur and Laxmipur Block of Koraput district was considered as a case of suspected cutaneous anthrax".

Other case definitions like probable and confirmed were not adopted in our study as neither the allergic skin test nor proper laboratory tests for isolation of bacteria could be performed. Though laboratory tests have been done for a few samples at the Microbiology Department of MKCG medical college they turned out to be negative for anthrax bacilli and the possible explanation is that the samples were collected more than 48 hours after administration of antibiotics.

Based on above case definition we enlisted 89 cases of Suspected Anthrax suffered during April to June 2002 in seven villages of the two blocks of Koraput District. We line listed the cases village wise by name, age, sex and date of onset of the disease after reviewing the medical records and conducting field surveys in the affected villages.

Table 4: Distribution of suspected anthrax cases by clinical features (symptoms, signs), Koraput , 2002

Symptoms / signs	N	%
Papule	89	100
Itching	88	98.9
Oozing	88	98.9
Swelling	87	97.8
Eschar	58	65.2
Lymphadenopathy	28	31.5
Fever	47	52.8
Pain / tenderness	79	88.8

Table 5: Distribution of suspected anthrax cases by sites of lesions, Koraput,2002

Sites of lesions	n (%)
Right hand only	30(33.7)
Left hand only	21(23.6)
Other sites	40(44.9)

Table 5 shows that percentage of both right hand plus left hand involvement as well as right hand plus other site involvement is same. Left hand and other site and both hands plus other sites involvement was very negligible (2.25%)

Table 6: Distribution of Suspected anthrax cases by age and sex, Koraput 2004

Age Group	All		Male		Female	
	(n)	(%)	(n)	(%)	(n)	(%)
1 to 15	11	12.359	5	7.576	6	26.086
16 to 30	18	20.225	13	12.696	5	21.739
31 to 50	37	41.573	33	50.000	4	17.391
51+	23	25.843	15	22.727	8	34.782
Over all	89	100	66	74.157	23	25.842

Table 7: Distribution of suspected anthrax cases by community and sub-caste, Koraput 2002

Caste	Subcaste	n	%
Scheduled caste (45.0%)	Dama	20	22.5
	Ghasi	20	22.5
Scheduled tribes and others	Kanda	46	51.7
(55.%)	Paraja	2	2.3
	Mali	1	1.1

Most of the affected persons were agriculture labourers followed by unskilled labourers and cultivators.

Table 8: Distribution of suspected anthrax cases by occupation, Koraput, 2002

Occupation	Cases	
	(n)	(%)
Agricultural labour	51	57.3
Unskilled labour	17	19.1
Skilled labour	1	1.12
Petty business	1	1.12
Cultivator and others	19	20.0

Table 9: Duration of illness among suspected anthrax cases, Koraput, 2002

Duration in Week	No. of cases (%)	Mean days	Std. Deviation
Within one week	5 (5.6)		
>1 week to < 2weeks	17 (19.1)	19.843	9.783
>2 weeks to < 3weeks	37 (41.6)		
>3 weeks	30 (33.7)		

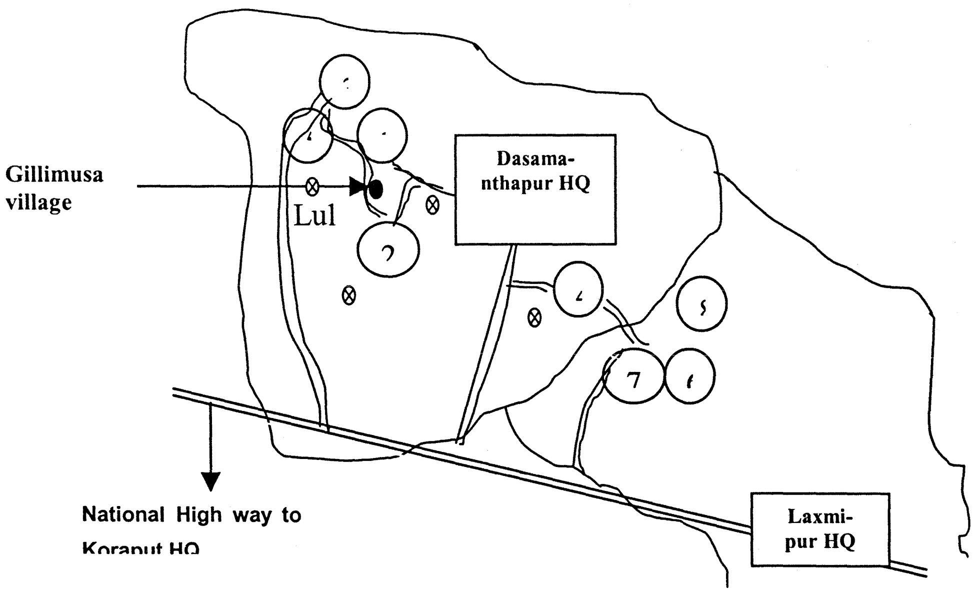
Table 10.shows that poor people have lost average 6 working days for earning their livelihood.

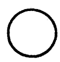
Table: 10. Loss of working days by the suspected anthrax patients.

No. of days	Frequency	%	Mean days	Standard Deviation
0	2	2.3		
2	6	6.8		
3	6	6.8		
4	13	14.8	6.352	3.206
5	15	17.0		
6	2	3.4		
7	17	19.3		
8	10	11.4		
10	9	10.2		
12	3	3.4		
14	1	1.1		
15	3	3.4		

* 2 children (< years) are not included here as loss of working days can not applicable to them

Fig:2.Schematic diagramme of villages affected by suspected anthrax in Dasamanthapur and Laxmipur Block of Koraput District, 2000





Affected villages of Dasamanthapur and Laxmipur Block in 2002

⊗ Affected villages of Dasamanthapur and Laxmipur Block in 2001

Table 11:Village wise distribution of suspected cutaneous anthrax cases, Koraput

Village	Male (Age in years)		Female (Age in years)		Total		Total	
	<14	>=14	<14	>=14	Male (Cases & AR%)	Female (Cases & AR%)	No. of cases	Attack rate (AR%)
*1.Sukraput	1	9	1	3	10 (9.1)	4 (3.6)	14	12.8
2.Nerkaguda	1	2	0	0	3	0	3	-
**3.Tentuliguda	1	11	0	5	12 (100)	5 (41.7)	17	43.6
4.Jhodipai	0	13	1	2	13 (5.2)	3 (2.3)	16	4.2
5.Sargiguda	0	1	0	0	1	0	1	-
6.Jhirjhira	0	9	0	5	9 (8.2)	5 (3.3)	14	5.4
7.Bastrabandha	0	3	0	0	3 (3.6)	0 (0)	3	1.5
8.Maligan	2	13	0	6	15 (11.5)	6 (4.0)	21	7.5
Total cases	5	61	2	21	66	23	89	

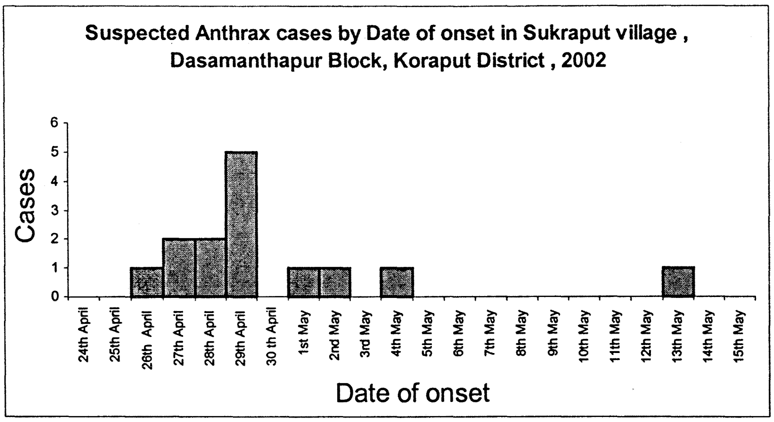
district, 2002

*In Sukraput village only the SC community was affected. So when only SC population is considered (total 69, male 39 and female 30) then sex wise attack rate would be: male 25.6 % & female 13.3 % and over all attack rate 20.3%.

** CFR: One case died in Tentuliguda village and CFR for the village was 5.9 %

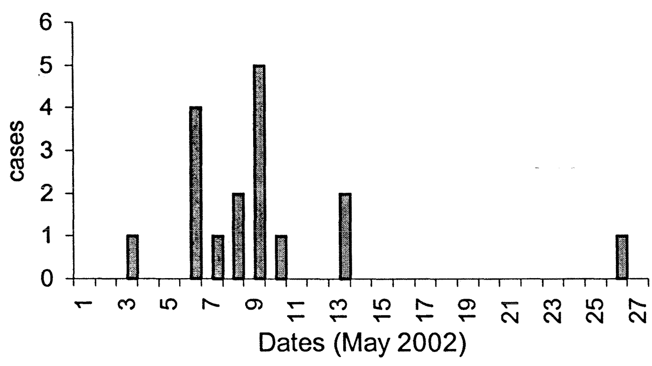
The attack rate was highest in Tentuliguda village (43.6%). In almost all villages proportion of adult males affected were more than females and children respectively. Attack rate among males was highest in Tentuliguda village (100%) followed by Maligan (11.5%), Sukraput (10%),Jhirjhira (8.2%), Jhodipai ((5.2 %) and Bastrabandha village (3.6%).

Fig:3.Village wise distribution of suspected anthrax cases by date of onset in two Blocks of Koraput district, 2002

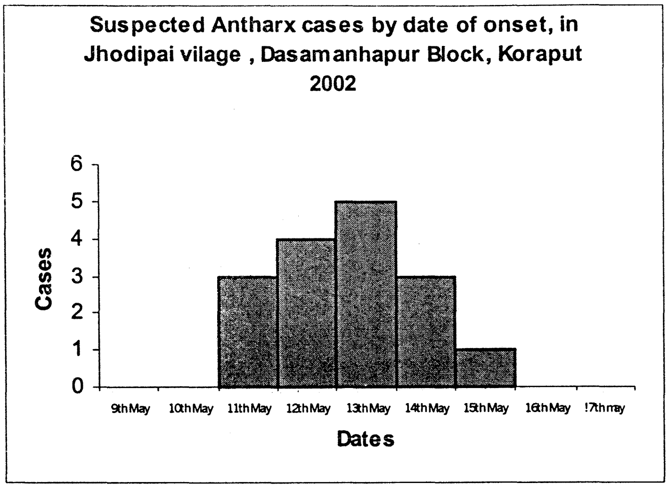


In Sukraput village the epicurve for the suspected anthrax cases shows that there was gradual up-slope and the peak was on 29th April 02.Then there was slow decline of incidences of cases. After a long gap the last case occurred on 13th May-02.Epicurve indicates that it was a common source infection and the incubation period was 4 days.

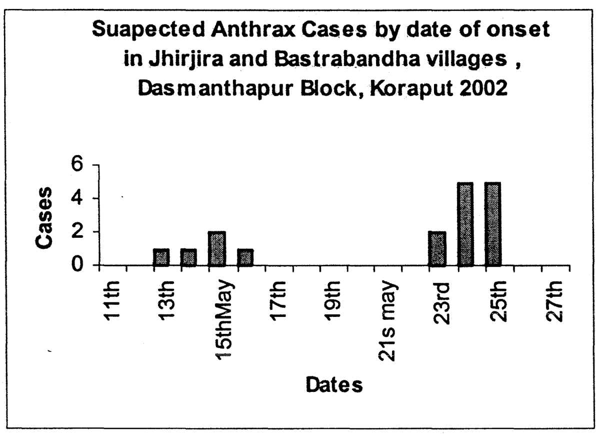
Suspected anthrax cases by date of onset in Tentuliguda village, Dasamanthapur Block , Koraput 2002



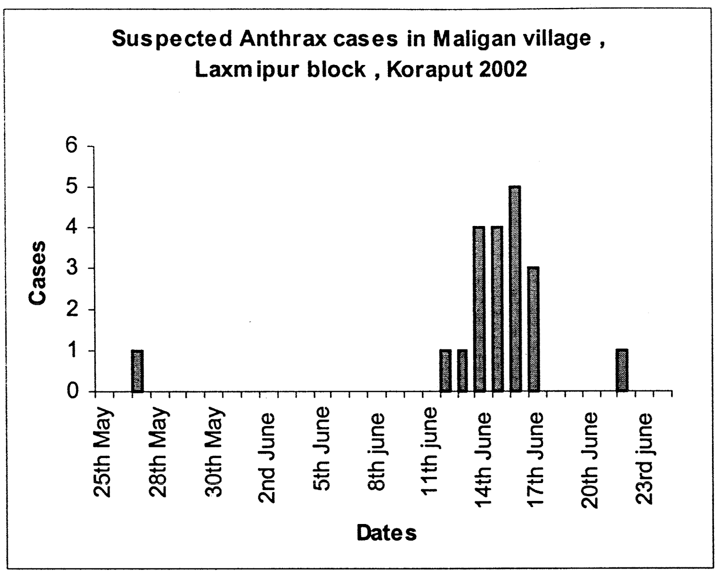
The epicurve for Tentuliguda village shows no pattern.



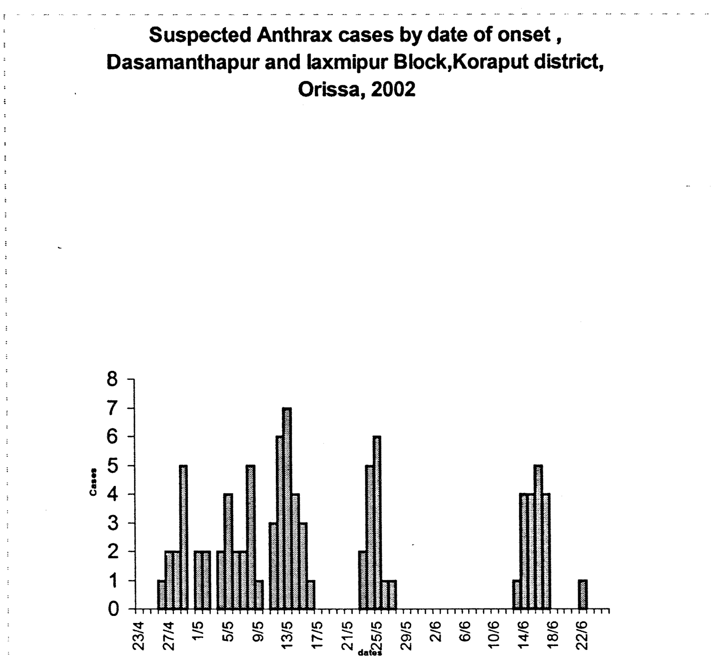
The epicurve for the village Jhodipai shows that there were high incidences of cases in first three days with the peak on the 3rd day. Then incidences gradually declined and the outbreak subsided within next two days. Epicurve shows that it was a common source infection and the incubation period was about 3 days



Jhirjhira and Bastrabandha are two nearby villages of Laxmipur Block. The epicurve for both the villages shows that there were two peaks and there were no cases in-between The sources of infection appeared two and the incubation period was 3 to 10 days



The epicurve for Maligan village shows that after the first case there was a wide gap after which the main bulk of cases occurred. The upslope was sudden with peak on 5th day and decline was also sharp there after.



The epicurve for all the suspected anthrax cases of both the blocks shows several peaks. It infers that the source of infection is infection was not common for both blocks.

4. Summary

There was no past history of suspected cutaneous anthrax in human population during previous 10 years in the affected villages of both the blocks.

Medical records revealed the history of occurrence of suspected human cutaneous anthrax in the summer season of previous year (2001) in some nearby villages, which were as follows:

Village	No. of cases
Narayan patana	25
Dasamanthapur	4
Biriguda	3

People of Jhodipai village informed that similar illness had occurred in a nearby village i.e Nuagad in 2001, which is 2km from Jhodipai.

(Villages affected in previous years in the two blocks are shown in fig:2).

4.1.Epidemiological link of the disease

Villagers of Tentuliguda and Sukraput had collected the dead cattle from Gillimusa village. They had processed the skin and hide of the dead cattle in traditional manner and also consumed the dead cattle meat. Within a week the disease manifested among the villagers who got exposed to the dead cattle.

In other affected villages also there was definite history of exposure of human being to dead cattle.

In each affected village the incubation period was found to be 2 to 6 days.

In nutshell:

The disease that affected the human population in seven villages of Dasamanthapur and Laxmipur block of Koraput district during April to June–2002 was clearly in excess than previous years in the same geographical area.

The clinical history suggested that the human infection had epidemiological link to exposure to dead cattle.

The clinical symptoms and signs of the disease, the incubation period and the above said epidemiological link with cattle deaths suggest that it was a zoonotic disease- "suspected cutaneous anthrax".

Adults were affected clearly in excess than children and attack rate was more among males than females.

health awareness, beliefs, cultural practices, food habits, contact with domestic animals, cleanliness etc. were collected from both cases and controls.

Table 13: Characteristics matched for cases and controls

Characteristics	Cases n	& %	Controls n	& %	Chi-square	p
Age group:						
1to 15	11	(13.6)	10	(12.3		
16 t0 30	14	(17.3)	17	(21.0)		
31 to 50	36	(44.4)	39	(48.2)	0.30	0.58
51 to 70	16	(19.8)	12	(14.8)	(Linear trend)	
70 +	4	(4.9)	33	(3.7)		

Sex: There were 62 (76.5%)Males and 19(23.5%)females in each group

Religion: In both groups about more than 96 % belong to Hindu families.

Community: 41 (50.6%) cases,39(48.1%) controls belonged to scheduled tribe and 40(49.4%) cases ,42(51.9%) controls belonged to scheduled castes and other community(chi square 0.1 and p=0.806).

Schooling:

1.Noschooling- 65(80.3%) cases and 58(71.6%) controls

2.schoolong 1 to 3 years-8 (9.8%) and 11 (7.4%) controls

3.schooling 4 to 7 years- 8(9.8%) and 17 (21%)controls

4.schooling 8 year and above- 1(1.2%) and 6(7.4%)

[chi-square$_{\text{(linear trend)}}$ 3.72 and p=0.054]

Occupation:

Agriculture labour: cases 43(53.2%) and controls 47(58.2%)

Unskilled labour: cases 18(22.2%) and controls 18(22.2%)

Others: Cases 19 (24.6%) and controls 16 (19.6%)

Table 14:Distribution (n & %) of family members in the households of cases and controls

No. of family members	Cases (%)		Mean	Std Dev	Controls (%)		Mean	Std Dev
< 3	28	34.6			21	25.9		
4-6	40	49.4	4.53	1.871	40	49.4	4.99	2.33
7-10	13	16.0			19	23.5		
Residual variance 4.46,F=43.91,p <0.001								

Table 15:Distribution of earning members in the households of cases and controls

No. of earning members	Cases n (%)		Mean	Std. Dev	Controls n (%)		Mean	Std. Dev
1	49	60.4			40	49.4		
2	24	29.6	1.49	0.727	34	42.0	1.642	0.795
>3	8	9.8			6	8.6		
Residual variance 0.58, F=1.61 and p=0.205								

Table: 16 Habitation and socio-environmental variability

House type	Cases	Controls	Chi Square	p
Pucca	5	3		
Semipucca	20	18	0.74	0.6896
Kutcha	56	60		
Mosquito proofing				
Yes	0	3	3.06	0.0804
No	81	78		
Separate bedroom				
Yes	0	1	1.01	0.3158
No	81	80		
Separate kitchen room				
Yes	18	15		
No	63	66	0.34	0.5583
Room ventilated				
Yes	8	12		
No	73	69	0.91	0.3394

Drainage system				
Open	75	75	0.00	1.000
Closed	6	6		
Electricity				
Yes	15	13		
No	66	68	0.17	0.148

Table 17. Hygienic practices among cases and controls

	Cases	Controls	Chi square	p
Practice hand washing after handling animals				
Yes	7	15		
No	74	66	3.37	0.0665
Practice hand washing before taking food				
Yes	79	80		
No	2	1		
Defecation				
Open field	80	81		
Latrine	1	0	1.01	0.315
Brushing teeth				
After each major meal	12	20		
Daily once	69	61	4.11	0.1283
Material used for hand washing after toilet				
Mud / Ah	76	76		
Detergent	5	5	0.00	1.000
Animal sharing same dwelling place				
Yes	12	8	0.91	0.339
No	69	73		

Table 18: Food habit and other household variables

Food habit	Cases	Controls	Chi Square.	P
Vegetarian	5	4	0.12	0.731
Non-vegitarian	76	77		
Using cooking fuel				
Collected woods	81	80		
Bought woods and others	0	1	1.01	0.3158
*Costly materials				
Yes	4	4		
No	77	77	2.09	0.148

*TV, Radio. Tape recorder, bicycle

Table: 19. Health knowledge and beliefs of cases and controls
(Children < 12 year are excluded from analysis)

General belief on causation of diseases	Cases (%)	Controls (%)	Chi square	P
Fate	10(12.5)	11(13.8)		
Karma	2(2.5)	6(7.5)	4.07	0.539
Spirit	19(23.8)	18(22.5)		
Black magic	1(1.25)	1(1.25)		
Improper food	42(52.5)	42(52.5)		
Bad habits	6(7.5)	2(2.5)		
<u>Belief on germ theory</u>				
Yes	14(17.5)	20(25.0)	1.34	0.246
No	66(82.5)	60(75.0)		
<u>Know about diseases transmission</u>				
Yes	20(20.0)	24(30.0)	0.50	0.479
No	60((75)	56(70.0)		
<u>Belief on human vaccination</u>				
Yes	55(68.8)	58(72.5)	0.27	0.602
No	25(31.3)	22(27.5)		
<u>Belief on animal vaccination</u>				
Yes	47(58.8)	52(65.0)	0.66	0.416
No	33(41.25)	28(35.0)		
<u>Belief on Allopathic medicine for human</u>				
Yes	74(92.5)	75(93.8)	0.10	0.754
No	6(7.5)	5(6.3)		
<u>Belief on Allopathic medicine for animals</u>				
Yes	61(76.3)	60(75.0)	0.03	0.854
No	19(23.8)	20(25.0)		

No difference was found between cases and controls with regard to their health knowledge and beliefs.

5.1. Results:

We have selected the cases and controls very judiciously to eliminate confounding factors that may distort the study results. In Tables: 19 univariate-matched analysis has been done on different possible exposure factors that might cause of the disease.

Table 20: Risk of getting infection of suspected anthrax (comparison between cases and matched controls)

Exposure factor	Patients exposed		Controls exposed		Matched OR_{MH} and 95 % CI	Chi-square	p
	n	(%)	n	(%)			
Eating sick animal meat	45	55.6	13	6.2	1·857(0.745, .9618)	1.250	0.26
Eating dead animal meat	49	60.5	16	19.8	2.667(1.069, 7.426)	3.681	0.05*
Eating partially coked meat	5	6.2	4	4.9	1.00(0.226, 4.433)	0.125	0.72
Eating sick animal and dead animal meat	66	81.5	10	12.3	5.00(1.219, 33.545)	4.083	0.04*
Involved in slaughter	29	35.8	13	16.0	2.167(0.835, 6.186)	1.895	0.16
Involved in hiding	23	28.4	10	12.3	1.667(0.603, 4.944)	0.563	0.45
Involved in hiding and skinning	33	40.7	11	13.6	1.571(0.606, 4.303)	0.500	0.48
Handle fur	1	1.2	5	6.2	1.250 (0.317, 5.232)	0.000	1.00
Exposed to any	74	91.4	5	6.2	Undefined	3.20	0,07

Table 21: Risk factor analysis by conditional logistic regression

Term	Odds Ratio	95% CI		Z-statistics	p-value
Eat (Yes/ No) (Both sick and dead animal meat)	0.8655	0.1261	5.9401	-0.1470	0.8831
Handle (Yes/ No) (Skin and hides)	1.8374	0.3182	10.6113	0.6800	0.4965
Handle Fur (Yes/ No)	0.7833	0.1153	5.3197	-0.2499	0.8027
Eat undercook meat (Yes / No)	0.5313	0.1114	2.5355	-0.7931	0.4277
Taking raw milk (Yes / No)	2.3930	0.0657	87.1470	0.4757	0.6343
Days involved in slaughtering	1.1629	0.8488	1.5934	0.9395	0.3475
Days involved in Eating sick animal meat	1.1735	0.9895	1.3917	1.8381	<u>0.0660</u>
Days involved in hiding	0.9628	0.7212	1.2854	-0.2568	0.7973
Days involved in eating dead animal meat	1.2106	1.0255	1.4290	2.2578	0.0240**

* Days means: number of days the cases or controls were exposed to the possible risk factor before the disease occurred in the village

The above tables shows that the risk of getting infected with suspected anthrax is significant (**) among those who consume dead animal meat.

5.2.Literature review:

<u>Historical background</u>

Anthrax is one of the oldest recorded disease of animals, being mentioned by Moses in Exodus 9:9, and among the classical authors of Greek and Roman antiquity, by Homer, Hippocrates, Ovid, Galen, Virgil and Pliny. Many medieval and modern writers have recorded devastating epidemics of the disease. In the 18th and 19th centuries, it sometimes spread like plague over the southern part of Europe, taking a heavy toll of human and animal life. Anthrax was the first disease of humans and other animals in which the causative agent was definitely demonstrated as a specific microorganism by the French biologist Casimir-Joseph Davaine in 1863, and by the German bacteriologist Robert Koch in 1876 who isolated the organism in pure culture. It was also the first infectious disease against which a bacterial vaccine was found to be effective by Louis Pasteur in 1880. These discoveries led to the origin and development of the modern sciences of bacteriology and immunology.

Global Scenario

Anthrax is known to occur globally, though it is more often a risk in countries with less standardized and less effective public health programs. Anthrax is most common in agricultural regions where it occurs in animals. These include South and Central America, Southern and Eastern Europe, Asia, Africa, the Caribbean, and the Middle East.

During the past three decades, the disease has seen a progressive global reduction. In 1958, the annual world incidence was estimated at 20,000 to 100,000 cases. In 1990s, the estimate decreased to about 2000 cases annually.

Several unusual outbreaks have been reported since 1970s. A severe outbreak of anthrax occurred in Zimbabwe where more than 10,000 cases were reported between 1979 and 1985. Of these, more than 6000 cases occurred between October 1979 and March 1980. The majority of cases had cutaneous infection, mostly on the exposed parts of the body. Some also had gastrointestinal anthrax. The transmission to humans occurred through contact with the diseased animals or their carcasses.

An unusual outbreak of anthrax occurred in Sverdlovsk (Russia) in 1979 due to accidental release of spores from a military laboratory. At least 77 human cases of inhalation anthrax occurred up to 4 Km in the south of the laboratory. Some cases were also reported among grazing sheep up to 50 Km from the laboratory.

Current Indian Scenario and recent outbreaks in the country

Anthrax is enzootic in southern India but is less frequent or absent in the northern Indian states. In the past years the anthrax cases have been reported from Andhra Pradesh, Jammu and Kashmir, Tamil Nadu, Orissa and Karnataka. India has seen two consecutive outbreaks since 1999.

Mysore oubreak, 1999:

Eight cases, including 5 deaths, due to anthrax were reported from Jenukuruba Hadi hamlet of 22 families about 80 Km from Mysore. Symptoms of gastro-intestinal anthrax occurred in five cases following ingestion of deer meat on 8 July 1999. The first death occurred on 12 July and the last on 19 July. 3 cases with cutaneous anthrax recovered following treatment.

Midnapore outbreak, 2000:

In early May of 2000 an outbreak was reported from Bandhughutu, an agricultural village of 300 tribal population in Midnapore district. Cattle, goats and pigs started dying in the village owing to bloody diarrhoea and inability to swallow anything. The tribals feasting on roasted meat of dead animals had blisters on their body. A culture prepared from the peritoneal fluid of one patient with suspected gastro-intestinal anthrax was confirmed to be Bacillus anthracis by microscopy, biochemical tests, animal pathogenicity test and PCR in the laboratories of National Institute of Communicable Diseases (NICD), Delhi.

Disease agent and transmission mechanism:

The causative organism of anthrax is B.anthracis. It is a gram-positive, non-motile, haemolytic, and spore-forming bacillus. The virulence of the organism is determined by the capsule and exotoxins; oedema toxin and lethal toxin.

In economic and public health terms, the importance of Anthrax lies in its ability to affect large numbers at one time. Carcasses then pose a hazard to humans and other animals both in the vicinity and at a distant through their meat, hides, hair, wool or bones. Livestock may acquire the disease through contaminated feedstuffs or from spore that have reached fields in sewage sludge.

Although Anthrax has been recognized for centuries, much remains unknown about the disease, including the precise manner by which the grazing animals acquire the disease.

Disease transmission in humans:

Animals usually become infected by ingestion of contaminated soil or feeds. Infected animals shed the bacilli during terminal haemorrhage or if the blood of the dead animal is spilled accidentally. On exposure to the air, the vegetative forms sporulate. These spores are markedly resistant to many disinfectants and adverse environmental conditions and remain viable in the contaminated soil for many years. Dried or otherwise processed skins of infected animals may also harbours the spores for years. Thus, the spore forms are predominant in the environment and it is very largely through the uptake of spores that anthrax is contracted.

Cutaneous anthrax is the most common anthrax infection in human. Transmission occurs after exposure to infected animals and contaminated animal products such as meat hair, hides, wool, bones, or skin.

The disease mostly affects adults, especially males. It is due to high exposure rate among these groups.

Anthrax is a seasonal disease. Evidences show that the conditions, which predispose to outbreaks differ widely from location to location. Climate probably acts directly or indirectly by influencing the way in which the animal comes into contact with the spores, (for example, grazing closer to the soil in dry periods when grass is short and sparse, or movement of herds to restricted sites when water become scarce) or by affecting the general state of health of the hosts and there by affecting their level of resistance to infection.

Much has been written and hypothesized about the effect of seasons, rainfall, temperature, soil, vegetation host condition and population density on the epidemiology of anthrax, but little agreement exist on the roles played by these factors in the incidence of the disease.

There is no one model satisfactory explanation for the relationship between the factors described above and the incidence and persistence of anthrax in a locality.

The incubation period , symptoms and signs;

In animal: in the susceptible herbivores the incubation period ranges from 36 to 72 hours. The first signs of an anthrax outbreak are one or more sudden deaths in the affected livestock. Other signs include going off feed, or producing less milk than usual. During the systemic phase, the animals become distressed, appear to have difficult breathing and cease eating and drinking. Swellings in the sub-mandibular fossa may be apparent, and temperature may rise. If the animal fails to respond to the treatment, it lapses into coma followed by death from shock.

In humans: Incubation period in humans is from a few hours to seven days. Incubation period up to 60 days is possible. Most cases occur within 48 hours of exposure.

Anthrax infection in humans occurs in three forms: cutaneous, inhalation, and gastrointestinal depending on the mode of transmission. Symptoms of disease vary depending on how the disease was contracted, but symptoms usually occur within seven days.

WHO recommended case definition in humans

Suspect: A case that is compatible with the clinical description and has an epidemiological link to confirmed or suspected animal cases or contaminated animal products

Probable: A suspected case that has a positive reaction to allergic skin test (in non-vaccinated individuals)

Confirmed: A suspected case that is laboratory confirmed by one or more of the following:

Isolation of B.anthracis from a clinical specimen (e.g., blood, lesions, discharges)

Demonstration of B.anthracis in a clinical specimen by microscopic examination of stained smears (vasicular fluid, blood, CSF, pleural fluid, stools

Positive serology (ELISA, Western blot, toxin detection, chromatographic assay, FAT)

Cutaneous anthrax: Most anthrax infections occur when the bacterium enters a cut or abrasion on the skin, such as when handling contaminated wool, hides, leather or hair products of infected animals. The incubation period for cutaneous anthrax is 1-7 days. Skin infection begins as a painless, pruritic papule that resembles an insect bite but within 1-2 days develops into a vesicle (usually 1-3 cm in diameter) and then a painless ulcer with a characteristic black necrotic (dying) area in the centre. Systemic symptoms are mild and may include malaise and low-grade fever. There may be regional lymphangitis and lymphadenopathy. Occasionally more severe form of cutaneous anthrax may occur with extensive local oedema, indurations and toxaemia. The infection can also spread to the bloodstream with overwhelming septicaemia. About 20% of untreated cases of cutaneous anthrax will result in death. Deaths are infrequent with appropriate anti-microbial therapy.

Anthrax meningitis:

Meningitis due to anthrax is a serious clinical development, which may follow any of the three primary forms of anthrax. It resembles meningitis due to other causes although it is frequently hemorrhagic. Diagnosis is confirmed by demonstration of the organism in the CSF by microscopy or culture or both. The case fatality rate is almost 100 % in anthrax meningitis. The clinical signs of meningitis with intense inflammation of meninges, markedly elevated CSF pressure and the appearance of blood in the CSF are followed rapidly by loss of consciousness and death (Levy et al., 1981; Koshi et al 1981; Laitha et al 1990; George et al 1994; Laitha et al; 1996) Only a few instance of survival as a result of early recognition of the problem and prompt treatment are on record (Khanne et al; 1989; Laitha et al 1996)

The suspicion of anthrax depends largely on awareness on the part of the physician as to the patient's history and to the likelihood that he/she had consumed contaminated food or drink.

Differential diagnosis should take into account acute meningitis of other bacterial etiology. The definitive diagnosis is obtained by visualization of the capsulated bacilli in the CSF and / or by culture.

Case fatality rates

While inhalation anthrax is almost always fatal, intestinal anthrax results in death in 25% to 60% of cases. The case fatality rate of untreated cutaneous anthrax may be up to 20%, but is considerably reduced with early treatment.

5.Discussion:

The results of the present study in Koraput district of Orissa shows that the suspected Anthrax outbreak occurred in human population in seven villages in two block areas of Koraput district of Orissa during summer months of 2002 .The human infection followed the illnesses and deaths among domestic animals in the same geographic area. There was clustering of diseased animals in few villages with unexpectedly high case fatality. No laboratory diagnosis could be done to confirm the diagnosis in animals. The clinical history of human illness was suggestive for association with the animal diseaths.

The clinical features and possible epidemiological link with dead and sick animal led to diagnose the disease clinically as suspected cutaneous anthrax in the human population. The ratio of incidence of animal cases to human cases was estimated to be 20:1, which is consistent with the WHO report (WHO/ EMC/ZDI/98.6). In animal population the case fatality was high but in human population there was one death, which was recorded with symptoms and signs of meningitis. No CSF test could be done for further confirmation. There were no other reported cases having features of such severity and this could be due to prompt administration of antibiotics to all the suspected cases by the respective PHC/CHC health staff.

Cutaneous anthrax is generally get neglected by the health system as fatal consequences are apparently less. In the present study it was found that inspite of antibiotic administration, the suspected anthrax cases had severe pain / tenderness and lymphadenopathy in their affected body parts which did not permit them to go for work. The loss of workdays (mean 6 days) is a great economic loss for the poor people. We have analyzed all possible risk factors to determine factors responsible for the causation of the disease. The Odds ratio was highest (OR_{MH} 2.67) when there was exposure to dead animal meat and it is highly significant when number of days of exposure was more in consuming the dead meat (OR1.2, 95 % CI 1.0255- 1.4290, z-22578 p=0.0240).

The study results are supported by other studies conducted in general community of Chikupo and Ngandu villages of the Nyamutumbu area of Murewa distruct in Mashonland East Province of Zimbawae by Mwenye KS, et al (Cent Afr J Med. 1996, Nov) where it was reported that factors associated with the disease are skinning and cutting meat of animal alleged to have shown symptoms of anthrax (OR 29, 95 % CI 3 to 707. p< 0.001), eating contaminated meat (OR 20, 95 % CI 2 to 470, p < 0.001) belonging to religious sect which does not restrict its followers from eating meat from a carcasses (OR 6, 95 % CI 1to 21 . p=0.003) and attending a gathering (OR 4 , 95 % CI 1 to 21 ., p =0.028)

Anthrax in domestic animal population is known to be endemic in Koraput district. Most of the Scheduled caste(SC) and Scheduled tribe(ST)populations are agriculture labourers. They consume the meat of carcasses of cattle, buffalo, deer etc. People of general communities do not consume dead animal meat, but when domestic animals die they do not properly dispose the carcasses, rather throw them in open. The SC and ST community of Koraput District, consume the meat of these carcasses, they handle their skin, hides; dry the meat for eating later. Thus the SC and ST communities of the district are prone to contact the disease from carcasses.

The health awareness among the SC and ST population of Koraput district is very low. People do not have the basic understanding regarding causation and transmission of communicable diseases.

There is no proper surveillance system for diseases like anthrax or other enzoonotic disease in Koraput district as well as in Orissa state. The existing multidisease surveillance system could not detect the said disease event in its routine schedule. Only after the patient with fatal signs brought to Dasamanthapur PHC, the medical officer could suspect the outbreak and took initiative for appropriate containment measures otherwise it would have gone unnoticed for several more days as the health seeking behavior of the population is low.

Almost all suspected anthrax cases detected in the two blocks, were administered with antibiotics. About 90 % patients were treated with penicillin injection and a few who were reluctant to take injections were treated with ciprofloxacillin tablets.

It was observed that there was no proper coordination mechanism between health department and veterinary department to take adequate preventive measures for such outbreaks of enzootic diseases.

Annual Anthrax vaccination to domestic animal population is not done regularly. Animal vaccination is done only when such outbreaks come to surface. In the present outbreaks mass animal anthrax vaccination was instituted in Dasamanthapur block only after the human cases were detected.

With proper surveillance for anthrax both in animal and human population anthrax outbreaks can be pre-empted and timely containment measures can be instituted.

6.Recommendations:

Anthrax is an endemic disease in Koraput district of Orissa.

The problem of anthrax continues in the district due to following possible reasons:

The practice of handling and eating dead animal meat.

Poor understanding of the local people on disease causation and transmission

Poor surveillance mechanism for animal and human anthrax.

Delay in diagnosis due to poor communication, low health seeking behaviour and inadequate laboratory facilities.

Poor coordination between medical and veterinary departments.

No policy on disposal of carcasses, subsequent disinfections and decontamination

Control measures aim at breaking the cycle of infection. It is primarily around proper disposal of carcasses, disinfections, decontamination and disposal of contaminated materials, not eating and handling the dead or / and sick animal skin and hides, and regular annual vaccination to susceptible animals.

To control Anthrax following suggestions may be considered for implementation by the district and state health authorities.

1.Health education: Health education on anthrax risk factors may help to minimize the chances of contracting the diseases and enhance the health seeking behaviour of the population to get prompt treatment. Health education should include, diagnosing a suspected case of anthrax in animal and man, not to eat or handle dead or sick animal meat (suspected of anthrax) or their body parts and seeking for early treatment from the nearest health facility. All health staff of the district must be trained on anthrax diagnosis, reporting and management.

2. Surveillance: Reporting of sudden deaths among livestock should be mandatory and when anthrax is suspected in humans the reporting should be done both through multi disease surveillance system and community institutions. All unexplained livestock deaths or suspected cases in humans must be investigated.

3. *Laboratory facilities*: Laboratory facilities for quick field test should be made available at the block level health institutions.

4. *Vaccination:* Livestock vaccination for anthrax must be mandatory on annual basis. If animal has got e disease it should be immunized after the treatment

5. *Disposal of carcasses:* After suspecting an animal being a case of anthrax, its carcass should not be thrown open or should not be slaughtered. It should be disposed of by incineration or rendering deep burial after disinfections (a less favoured option). Blood from the dead animal should be collected aseptically for confirmation of diagnosis. Necropsy should not be done, as this has the risk of spreading the infection.

5. *Disinfections:* Disinfectants should be available in reasonable quantities at veterinary hospitals. Veterinary assistants, surgeons and livestock owners should be trained to use this. Soil seeded by carcass should be properly decontaminated.

6.*Treatment:* All symptomatic animals and humans should be treated promptly. Pencillin remains the drug of first choice in the treatment of anthrax.

7.*Intersectoral co-ordination:* Good communication and cooperation including sharing laboratory facilities and knowledge between veterinary, medical and wild life services are essential to control anthrax.

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2.3.4.SUSPECTED FOOD BORNE OUTBREAKS IN THREE TRIBAL VILLAGES OF ORISSA, 2001:REVIEW OF EPIDEMIOLOGICAL FINDINGS

(Paper submitted for publication)

Background:

Floods in Orissa, July 2001:During the last half of July, 2001 three fourth Districts of Orissa State were inundated due to heavy flood resulting in loss of human lives, livestocks and property. The State administration in handling this emergency situation felt apprehensive that water borne or food borne epidemics may erupt any time. The Epidemic Disease Surveillance Cell (EDSC) at Directorate of Health Services, Bhuvaneshwar, the capital of Orissa, monitored the situation round the clock. Daily morning, meetings were conducted, with the Principal Secretary (Health), in the Chair to review the surveillance reports received by the EDSC to take prompt appropriate action.

Notification about the outbreak:

On the evening of 29th July 2001 a fax message was received by the EDSC from the Chief District Medical Officer (CDMO) of Rayagada District. This is a tribal District in the Southern part of the State, nearly 500 km away from the State capital. This District was partially affected by flood. The fax message reported 9 cases of gastroenteritis including 7 deaths during 27th to 29th of July in Panasguda village of the Kashipur block of the Rayagada District. This report was discussed on the morning of 30th July in the meeting presided by the Principal Secretary (Health). A decision was taken to send a Senior Health Officer (SHO) to Kashipur block to make an on the spot assessment. The SHO left for Kashipur on the same day.

Report of the SHO:

On the evening of 31st July, the SHO confirmed over phone the occurrence of the outbreak during 27th to 29th July. His first impression was that it was probably a food-borne outbreak. On 1st August, SHO reported from the field that no additional cases or deaths had occurred in that area and that the situation was under control. However, between the midnight of 7th August and noon of 8th August, 8 more cases of similar illness including 5 deaths were reported from another village, Billamala. This village is 15 km away from Panasaguda in the same block. This was followed again by a third report, from yet another village, Pitazodi, of 3 cases between 15th and 16th August, all of whom died. This village is 10 km away from Billamala in the same block.

Formation of a special field investigation team:

On 17th August, the State Government formed a special field investigation team (SFIT) of experts from MKCG Medical college of Behrampur from the departments of Preventive medicine, Internal Medicine, Microbiology, Forensic Medicine and Toxicology. On the 18th August, the team visited the village from where the cases and deaths had been reported. Hand in hand with the visit of this team, the curative health services were strengthened at the block and sub-block level with additional manpower from the health system and with the medical doctors (hereafter, Non-UNV doctors) deputed from the UN House II in Bhuvaneshwar.

Investigations conducted by SFIT & Non-UNV Doctors:

Senior health officers and District Task Force camped at the block head quarters for continuous monitoring of the situation. The field investigation team after reaching Rayagada District discussed with CDMO, District and block health officials. The team reviewed the medical records and post mortem reports. They collected epidemiological data, histories from the family members of victims, clinical examination of survivors who had similar illness. The team collected the materials obtained during the treatment and / or postmortem examination of the affected victims, collected suspected food ingredients from the houses of victims as well as from the neighbouring houses for laboratory investigation.

The investigation of Non -UNV doctors contained general description of the episode with collection of data regarding cases and deaths and collection of stored mango kernels used for preparation of gruel in the affected houses.

Findings of SFIT and Non-UNV Doctors:

The field investigation team concluded that the reported illness and deaths in the three villages were due to the consumption of cooked mango kernel gruel. It was hypothesized that some contamination must have occurred with the stored mango kernels or with the cooked mango kernel gruel that were kept in the earthen vessel for fermentation.

Control measures:

All the stored mango kernels from villagers were taken away by the administration and rice was given to all the households. 'Food for work programme' was implemented in these villages to avoid any food scarcity.

The cooking vessels were exchanged. Earthern cooking pots used by the villagers were demolished by the administration. Health education for maintaining cleanliness in cooking and storing the food as well as drinking boiled or chlorinated tubewell water was given.

Active surveillance was maintained for one month during which period no further cases of similar illness were reported from these areas.

<u>Present Review:</u>

During the outbreak of illness that occurred at Kashipur, I was working as the Surveillance Medical Officer at EDSC. I was keeping track of the investigations done at Kashipur. I got selected for Field Epidemiology Training Programme (FETP) at National Institute of Epidemiology, Chennai. The Director, NIE suggested me to conduct a retrospective review of the Kashipur outbreak, prior to joining FETP. The Health Secretary, Orissa allowed the same. I conducted the review in the month of January 2002

<u>Objectives:</u>

The objective of the present review was to characterize and determine the cause(s) of the outbreak of illness that occurred in three villages of Kashipur in the month of July and August of 2001.

Materials and methods:

Kashipur Block of Orissa

The outbreak of illness occurred in Kashipur block of Rayagada District in the Southern part of the State of Orissa. Kashipur block is 70 km away from the District head quarter towards west. Kashipur block is mostly populated with scheduled tribes and scheduled castes. Total population of Kashipur block is 1,02,083 of which almost 65% of them are scheduled tribes. Literacy level and socioeconomic conditions are low. Literacy rate is only 15%. Villagers live primarily as marginal agricultural laborers and through selling the forest products. People migrate seasonally to other cities for livelihood. When rice is scarce during rainy season villagers cook and eat gruel with mango kernel, as described later. They also take ragi and millet.

Traditional Food habits of the tribals

Collection of mango kernels:

Tribal people of these areas collect the mango seeds during summer season and after drying these seeds in sun they store them in bamboo baskets. They use the mango kernels for preparation of gruel, which they consume as food during the rainy season frequently. Tribal people follow traditional methods of preparing the mango kernel gruel. The hard skin of the mango seed is beaten to bring out the kernel. These mango kernels are kept in a basket made up of bamboo for about eight days. Then these mango kernels are put in river or stream to allow water to flow over the kernel for a day to soften the kernels and drive out the astringent part. They bring the mango kernels out of the water and allow the water to dry. Then they crush the kernels. The crushed mango kernels are kept in a sieve and kept under river or stream water for a day to wash away the astringents. Then they grind the crushed mango kernels to paste and use this for preparation of the mango kernel gruel.

Preparation of the gruel:

The gruel is prepared by cooking the mango kernel paste in boiling water either separately or mixed with raggi, millet or maize flour. Only salt is added to this preparation. They keep this gruel in an earthen vessel, where the gruel gets fermented. They eat the gruel three to four times a day .The left over fermented gruel is mixed with the fresh gruel prepared on the next day. The earthen vessel, where the gruel is stored, is not properly cleaned. This vessel is destroyed, only when somebody from the village dies.

Procedures used by the investigator:

I discussed with the investigation team members of MKCG medical college, health coordinator of UN House II, Bhubaneswar , Chief District Medical officer and District level Health Officials of Rayagada District, Block and Sub blocklevel medical officers and health staff of Kashipur block and other key government officials of Kashipur ,community leaders and volunteers, anganwadi worker etc. Reviewed the investigation reports and medical records of the survivors and deceased both at District Head quarter hospital, community health center of Kashipur and additional PHC at Tikiri. Also reviewed the postmortem reports of deceased. Then I interviewed survivors of the reported illness, relatives of the deceased and survivors, neighbours, villagers regarding the food intake, history, signs and symptoms and other related information of the said illness.

Case definition:

The investigators used the following working case definition during the survey after interviewing the survivors and reviewing the reports.

Any resident of villages, Panasguda, Billamala and Pitazodi of Kashipur block who died from or survived with gastrointestinal symptoms of nausea or vomiting or abdominal cramp and or one or more neurological symptoms like unconsciousness, prostration, headache, reeling of head, blurred vision or convulsion during the period from 15th July to 31st August 2001.

Results:

Descriptive epidemiology

Totally 23 persons were affected by this illness in three villages (namely, Panasaguda, Billamala and Pitazodi) of Kashipur Block at three different points of time, separated by narrow intervals during the period 26th July to 16th August, 2001(Figure 1). Overall case fatality rate was close to 70%. The case fatality rates in Panasaguda, Billamala and Pitazodi were 64%, 63% and 100% respectively. Since the cases and deaths were clustered in families the attack rates based on population are not presented in this report.

Panasaguda:

In Panasguda village, maximum number of persons became ill during the midnight of 27th July of 2001. In this village total 11 persons were affected out of which 7 died. On 27th July all these 11 persons had taken the food that was cooked in one household. Out of 11 victims 6 persons were from the family where the food was cooked. Out of these 6 persons 3 died. Other members who have partaken the common food were from 5 other families of Panasguda village. Members from other families who had not taken this common food that the victims had taken did not suffer. Out of 11 victims 9 had taken food at the agricultural field and 2 had taken food at home. The pattern of epidemic curve in Panasaguda is indicative of point source epidemic.

Billamala:

In Billamala, the outbreak started 11 days after the outbreak in Panasaguda. Here only one family was affected. Out of the 9 members in the family 8 members who had history of taking the family food on 7th August, August 2001, all became ill and out of them 5 died.

Pitazodi:

In Pitazodi, the outbreak occurred during 15th to 17th August, 2001.In this village also only one family was affected. Out of other 6 members of the family

5 gave history of taking family food on 15th August. Out of these 5 persons 3 became sick and all three died One adult member of this family died 20 days before i.e. on 26th July, 2001 with similar history of illness. This death occurred as an isolated case. The food history for this case could not be elicited.

Clinical features:

The clinical features of this illness are shown in figure 3. This illness is characterized by a combination of upper gastrointestinal and neurological symptoms.

Distribution of cases and deaths by age and sex

The age and sex distribution of the cases and deaths is given in Table 2. Overall, the case fatality rate was very high. All age groups and both sexes were affected by the illness. Out of total 16 deaths 7 were male and 9 were female deaths. There were 6 females only one male who died in the hospital. The place of death for other 6 males was home.

Laboratory results:

Microbiological findings:

The microbiological analysis was conducted at the MKCG medical College. The results are given in Table 4. No bacteria could be found either in direct Gram film or in culture from any of these samples. Cooked samples revealed no living organisms. No parasites were found. Most of the samples showed over growth of the fungus Aspergillus niger.

The post mortem blood sample from the deceased in a vial (sterility of the container questionable) on culture showed growth of no pathogenic bacteria but had contaminated growth.

Postmortem and histopathological findings:

Summary of 6 Post mortem findings were as follows:-

External examination:

All the deceased were of average body built. Blood mixed frothy discharge from the mouth and nostrils in 2 cases. White frothy discharge from the mouth and nostrils in 2 cases.

Internal organs:

All internal organs of abdomen and chest were congested in all the deceased.Lungs were found to be congested in all the deceased except in one. Mucosal wall of stomach revealed congestion along with patchy haemorrhages in all the deceased. Stomach contents contained semi digested food materials except in one patient where it was coffee ground like materials. There was no characteristic smell of he stomach contents to suggest about any poisons/intoxicating substances. Table 4 shows the histopathological findings of two patients.

Summary and Discussions:

Unusual number of cases, which were epidemiologically linked with high attack and case fatality rates concentrated in three villages occurred in a short span of time. Similar illness has not been apparently reported from these villages before. It confirmed that this was an outbreak. We do not know whether this outbreak affected other persons (probably manifested as mild cases) besides those identified in these clusters of 3 villages.

We do not know whether three clusters of cases and deaths are related to each other or not. Any unrecognized exposure common to these villagers cannot be excluded. The only common place where the residents of these villages meet is in two market areas, namely Tikiri and Kashipur.

The epidemiological linkage in this outbreak, was in terms of clustering in families as well as common exposure i.e., the preparation and consumption of food item preceding the onset of symptoms. All ages and both sexes attacked. Clinical presentation was a mix of gastrointestinal and neurological symptoms that lasted for one or two days.

The exact source of this outbreak remains unclear. The mango gruel taken before the onset of symptoms was associated with a strong risk of developing the illness/death. The gruel with mango kernel had been traditionally eaten for many years. It was most likely contaminated. However, laboratory evidence as well as postmortem findings neither correspond to presentation of the illness nor the fatality associated with it.

The type and the source of contaminant (which could trigger clinical features with neurological symptoms), the reasons and the mode of contamination are not known. We have hardly any evidence at all to suggest that the contamination was deliberate. Further laboratory investigations are necessary to assess the exact nature of the contaminant, if present in the samples. The Non-UNV Doctors collected some food samples from the left over food during the outbreak. The investigator is sending the samples to a WHO collaborating laboratory in Birmingham. Results are expected to throw some light on the toxin angle.

The findings of this investigation are not compelling enough to justify a lot of generalizations and recommendations. However, the entire episode brings out many issues related to the surveillance system as well as the health system at large in Orissa. Though the EDSC identified and responded to the outbreak at a very early stage, the preparedness and response at the local level was not satisfactory. The surveillance system in this part of the State needs to be oriented towards diseases specific to tribal communities, especially that of suspected food borne diseases. Laboratory facilities at the State level need to be strengthened in this aspect.

The local authorities initiated control measures without any credible scientific evidence for mango kernel as the offending agent for the illness. The socio-cultural implications were not considered. This is important in view of the traditional food habits of the tribals of this region. Small-scale industries or self-help groups for processing the mango kernels would definitely help the tribals in their socio-economic development. We suggest that there should be culture friendly health education programme on hygienic way of food preparation and storage.

SECTION:3

3.1.JOURNAL CRITIQUING

AND

LITERATURE REVIEW

3.1. Title: Risk Factors For Falls As A Cause of Hip Fracture In Women

<u>Authors: Jean Ann Grisso and et al.</u>

[The New England Journal of Medicine ,May 9, 1999]

Objective: To review the scientific literature.

Methodology:

Critical study of the literature

Study of related research papers

<u>Overview of The Report</u>

1.Purpose of the study:

A) Nature of effect being studied:

Exposure to fall in elderly women

Outcome: 90 % of hip fractures in women are the result of a fall

B) Target population: Elderly Women

2. Study Type: Hospital Based Case Control Study.

3. Findings:

A) Effect of exposures:

Major Risk Factors Associated With Increased Risk of Hip fracture	Odds Ratio	95 % Confidence Interval
Lower limb dysfunction	1.7	1.1 to 2.8
Visual impairment	5.1	1.9 to 13.9
Previous stroke	2.0	1.0 to 4.0
Parkinson's disease	9.4	1.2 to 76.1
Longitudinal barbiturate	5.2	0.6 to 45.0

B) Association with height of fall in younger (< 75) and older age (> 75) groups: -

Younger patients with Hip fracture were more likely than older patients to have fallen on a hard surface (odds ratio 1.9 with 95 % confidence interval of 1.04 to 3.7)

4. Conclusions: Programmes to prevent hip fractures should include measures to prevent falls in addition to measures to slow bone loss.

Critical Reading of The Paper

Abstract:

The abstract is a structured one and it summarises the key information in the body of the paper. The abstract also creates interest to go through the paper in detail. Objective of the study is understood from the introduction of the abstract but it could have been expressed explicitly.

The abstract uses appropriate statistical figures like number of cases and controls and the odds ratio for different exposure factors. The length of the abstract is within standard limit of scientific journals. There are 335 numbers of words in the abstract including the Title and Name of the authors.

The abstract does not reflect about the measures taken to minimise biases and the other weaknesses in this case control study.

Body of the paper:

1) The paper begins with the information that Hip fracture is the most serious consequences of osteoporosis and more than 90 % of the hip fracture in elderly (70 years) occurs due to this. The cause of osteoporosis is mostly postmenopausal and age related. Over 90% of hip fracture in elderly women is due to a fall. But there are few studies to assess the influence of the risk factors for falls in causing hip fracture.

Again most of these studies have focused on the role of psychoactive medications.

The purpose of the present study: is to determine whether risk factors for falls and circumstances of falls are predictive of hip fracture in elderly women.

Comments:

The background description is relevant to introduce the study and the reader can make out the hypothesis.

The purpose of the study is clearly stated at the end of the introduction. The introduction creates appropriate expectation about the study topic and catches interest of the reader.

2. Methods:

The method of the study has been described in following headings.

Study design and the subjects

Data collection methods

Statistical analysis

Study design and the subject:

The study design is a CASE CONTROL study.

Case patients	Controls
Case patients were white women	Controls were white women
Age: 45 years of age or older	Age within 10 years strata was used to select control for a case.
Physical deformity: Radiologically confirmed diagnosis of a first hip fracture	No previous hip fracture or hip replacement
Selection method: Random selection. The cases were selected one in ten participating hospitals in Philadelphia from September 1987 through July 1989.	Controls were selected from the hospitals who were hospitalised either to general surgical or an orthopaedic service.
Criteria for selection: All the subject were required to have resided before hospitalisation in one of the five boroughs of New York City or one of the five countries surrounding and including Philadelphia County.	Residing in same geographic areas as it is for the case patients.

Exclusion from the study: 143 women were excluded form the study. Reasons for exclusion were as follows: Cognitive impairment (82) residing in same geographic areas Death before the interview (28) Pathologic fracture due to cancer (14) Severe impairment of speech or hearing (10) Severe medical instability (9)	44 subjects were excluded. The reasons for exclusion are: 14 were due to cognitive impairment, 30 due to death before interview, medical instability or severe impairment of speech or hearing.
Eligible cases who declined to participate: 286 were eligible for selection as case patients. Out of this 174 (61%) participated in the study, 82 declined to participate, 14 declined on behalf of their patients and16 could not be traced after hospital discharge.	311 were eligible as controls. Out of this 174 (56%) were interviewed, 59 declined to participate, 53 physicians declined on behalf of their patients and 23 could not be followed after discharge from the hospital.

This infers that due care has been given in the study to avoid selection bias.

Limitations of the study can be envisaged as follows.

As the study is hospital based the cases are restricted to persons who were severely injured and needed hospitalisation.

Those potential candidates who could not participate in the study, their social background have not been highlighted.

Only white women were the participants in the study.

So this study alone is not sufficient enough for generalisation for all women.

Data collection methods:

<u>Questionnaire:</u> Standard questionnaire were used for interview. Interviewers were trained to use the questionnaires especially on asking questions on specific aspects of impairments.

Median period of interviews: 9 days for the case patients and 10 days for controls.

The strength for quality of data:

All the subjects were interviewed directly except one (which was done by proxy over phone.)

Inpatients medical records were abstracted for 38 randomly selected case patients and controls.

Agreement between the results of the interview and medical records were assessed with respect to the major classes of medications and the disease under study. The kappa statistics were 0.75 or higher for each factor assessed.

After critical analysis of the medical records of potential cases and controls it was observed that there is no difference with respect to age, underlying medical illnesses or major classes of medications.

Statistical Analysis:

Precautionary measures have been taken to control biases and confounding factors in this case control study by using the statistical analysis..

Large number of hospital (30 in no.) had participated in the study. So conditional regression was used to remove the effect of matching case patients and controls according to hospitals.

Other precautions taken:

A set of indicator variables for age categories was included in the regression model to account the frequency matching according to age.

An additional set of potential confounders was also included in the regression model.

To test whether odds ratio differed according to age - the second order interaction were included with age for each risk factor.

Evaluation was made to know:

Whether there was significant difference in odds ratio between the subjects interviewed directly and the subjects of whom a proxy was required by testing the significance of interaction terms of risk factors according to proxy status.

Whether the inclusion in the control group of patients with specific conditions could bias the study results.

Comparison was made between:

The circumstances of the falls resulting in hip fractures in the case patients with the circumstances of the falls in the subgroup of controls (25 %) who reported a fall in previous 6 months.

The younger case patients with the older ones in relation to the circumstances of the falls resulting in a hip fracture.

Results:

Summary of the result section is as follows:

Two tables have been used:

Table 1. Depicts the demographic profile of the case patients with hip fracture and the controls.

Table 2. Depicts Multi Variate Adjusted Odds Ratio for the major risk factors for hip fracture. The tables are clear and informative for the readers.

Analysis of the data shows that:

90% hip fractures are due to fall.

71 % of hip fractures were in 75 years of age and older age group.

Marital status: Proportion who had never married was higher among the case patients (18 %) than among the controls (10 %)

Factors associated with increase in risk factors are: lower limb disfunction, visual impairement, and the use of an ambulatory aid.

The Odds ratios were elevated for the two neurological disorders i.e. stroke and Parkinson's disease.

The Risk of Hip fracture was elevated among users of long acting barbiturates.

Increased body mass was associated with a significantly reduced risk.

Some of the shortcomings shown by the authors are:

Parkin's Disease Odds ratio could not be computed with adjustment for potential confounders, because the disease was uncommon (only 6 % in cases patients and one control). Information on Estrogen use was missing from one interview with an exposed control.

Circumstances of falls:

Difference in Findings Between Case- patients and Controls:	
Case patients were more likely fall from a standing height than controls.	Odds ratio = 2.4 and 95 % CI interval 1.0, 5.7
No difference between the case patients and the controls in the proportion who stroke a hard surface during the fall.	
The proportion of falls involving hard surface was higher among the case patients younger than 75 years than among those 74 or older	Odds ratio: 1.9,and 90 % confidence interval, 1.04 to 3.7
The relation between age and hardness of the surface persisted for falls that occurred indoors but was not apparent for outdoor falls.	
The younger case patients appeared more likely have fallen from a standing height or a greater height than their older counter part.	Odds ratio; 1.7 But the confidence interval is wide (0.6 to 4.8)

Summary of the Discussion Section:

Major findings:

Risk factors identified for falls and circumstances of fallows:

(i) Impaired neuromuscular function, (ii) impaired vision, (iii) barbiturate use.

These factors also impair the protective responses when a fall occurs.

Height of fall: the height of fall is more in case patients than the controls.

Factors that could act as local shock absorbers were found to affect the risk of hip fracture

Case patients were thinner than the controls, which infer that obesity may provide a protective layer around the hip.

Younger case patients were more likely to have landed on a hard surface in the fall that has resulted the hip fracture than the older case patients, which implies that more trauma is required for a hip fracture to occur in younger women.

Limitation of the study identified by he authors:

The response rate in younger patients seems low.

Lower response rates are common in studies of very old people.

All data is mainly based on interviews, so there is apprehension that the result of this study could be biased if the recall by cases and controls differed.

But the authors strongly believe that the possibility of recall bias in cases and controls on risk factors for falls is rare because these factors were usually not perceived as risk factors for hip fracture.

Hospitalised control subjects may have greater prevalence of risk factors than the general population and the comparison of case patients with hospitalised controls is likely to underestimate the effect of theses factors on the risk of hip fracture.

The result of this study cannot be generalised to the women with severe cognitive impairment as some persons were excluded because of severe cognitive impairment and some factors could not be assessed through proxy interviews.

The available data is not adequate to determine whether the identified risk factors from the study like: - lower limb dysfunction and previous stroke are more important among patients with severe cognitive impairment.

The study results support the notion that an increased risk of falls increases the risk of hip fracture.

Findings linked with other studies

Previous study findings	Possible Explanation as per the present study
There is protective association between hip fracture and increased body weight	Greater bone mass among heavier persons Conversion of adrenal androgens to estrogens in adipose tissue Protection offered by fatty tissue during a fall.
Height of fall may be a important factor for fracture of Hip	Lotz and Hayes have documented that a fall from a standing height has the potential energy to fracture even a normal hip
Ray et al had reported that there is association between the use of long acting benzodiazepenes medication and hip fracture	Taggart study finding did not agree to this The finding of this study is consistent with Taggart study.
But some studies have found association between alcohol use and hip fracture	It is NOT found by this study.
The risk factors for falls are the risk factors of Hip fracture.	This finding is consistent with most of the other studies.

Recommendations given by the authors:

Effective programmes to prevent falls will prevent hip fracture. Necessary preventive interventions should be instituted especially among elderly women for prevention of falls.

Examples of some interventions are clearly mentioned by the authors.

Studies should be conducted to evaluate these interventions in various settings.

Summary Findings of Similar Other Studies:

1.Risk Factors for Hip fracture in Black Women (A parallel study by the same group i.e. Jeane and the team)

"Thinner women were at substantially higher risk for hip fracture than their heavier counterparts" – this finding is consistent with those findings in the above study on white women.

In Black women the major determinants of the risk factors of Hip fracture is body mass. The increased rates in hip fracture due to this, explain that probably there is some racial difference.

Risk factors for falls also appear important risk factors for hip fracture, and this is also the main conclusion of the present study.

2.The Study on " Risk Factors For Hip Fracture In White Women" by Steven R. Comings and the team. (This was a community based prospective case control study)

The study findings are as follows: Many factors increase the risk of hip fracture in older white women living in the community. Though the effect of individual factor is moderate but the impact of factors together is substantial. Women with multiple risk factors and low bone density are at especially higher risk. A woman may be able to minimise her risk of hip fracture in a number of ways, notably by walking for exercise, avoiding long acting sedative – hypnotic agents, reducing caffeine intake, quitting smoking, treating impaired vision and taking measures that maintain bone density.

Review Comments:

The study is a hospital based Case control study.

And the description has been made in simple language and catches the interest of the reader.

1.Title: The title is informative and concise without grammatical and other errors. But

The study is confined to particular geographic area.

The study population is from elderly white women

The study population is not the representative of the community

The Title misleads, as it has not reflected the above said limitation and expressed as "*Risk Factors For Falls As A Cause of Hip Fracture In Women".*

Cause of Hip fracture in Women"

Considering the study population the Title could have been reframed as "*Risk Factors For Falls As A Cause of Hip Fracture In elderly White Women".*

2.Abstract: The abstract summarises the key information in the paper. Appropritae nos. have been used and the reader can understand the abstract without referring to the body of the paper. The length of abstract is within standard limit. The conclusion is clear and focused.

3.Introduction: The introduction begins at an appropriate level and it is not too general and not too specific. The background description is relevant. The hypothesis is presented in specific terms. Introduction creates appropriate expectations about the study topic and catches the interest of the reader.

4. Materials and methods: The study design is clear. Case patients, controls and settings etc. have been described and defined clearly. The methods used in the study have been adequately cited. The descriptions are in logical order i.e. study design, materials / subjects/ population, procedures and analysis methods.

The format used for the description with subheadings is very much helpful. The two tables used in the text are very much informative about the findings of the study.

adequate attention has been given to minimise the biases, which usually occurs in case control studies. The statistical analysis has been given due care.

5.Results: The results are presented in a sequence that logically answers the research questions. All the results have methods and every method has a result.

6. Discussion: This section describes how this study helps in solving the general problems. The strongest evidence from the study has been presented first. All the discussion points are clearly related to findings of the study. The limitations of the study have been presented objectively.

The ending gives a sense of completeness. The information has been presented with perspectives. The topics presented at the beginning are discussed and concluded at the end of the section.

<u>*Remarks*:</u>

1.*This study alone cannot be sufficient to recommend for the general women population.*

2.*Further studies are needed on different settings of racial and sociocultural variations to evaluate the interventions recommended in the study.*

3. 2 Risk factors for contralateral breast cancer in Chennai (Madras), India

Authors: Chittukadu K Gajalaxmi, Vishwanathan Shanti and Matti Hakma

Accepted for publication in International Journal of Epidemiology:
20th January 1998

Methodology: Study of the present research paper and related epidemiological studies / reviews searched from MEDLINE and other websites.

The title of the paper is precise carrying specific meaning. There is no spelling mistake and unnecessary dead words.

Abstract: The abstract is a structured one written in simple and direct English. The text of abstract is limited to 233 no. of wards including the names of the authors.

The background of the abstract creates interest in readers by saying that " This is the first cohort study conducted in India."

In this background section the purpose of the study is clearly expressed i.e. to identify risk factors for contra-lateral breast cancer (CBC) among patients with first primary breast cancer.

The material method section is clear and gives the brief information regarding the source of patient, the time period of study and place of study (Cancer Institute of Chennai, India). The follow up period was upto 31st December 1994 i.e. about 34 years. Cancer patients assessed have been stated clearly with quantitative and qualitative terms as mentioned below.

2665 number of patients having Unilateral breast cancer (UBC) who survived for >12 months following the diagnosis of breast cancer and did not develop a second cancer.

39 number of patients who developed CBC >= 12 months after diagnosis of breast cancer

The result section of the abstract reflects the important findings of the study.

<table>
<tr><td colspan="4">The age-adjusted incidence of CBC among women with CBC was 7 times the incidence (per single breast) in general population.</td></tr>
<tr><td>Among women with Unilateral Breast Cancer (UBC</td><td>Relative Risk (RR)</td><td colspan="2">95%confidence interval</td></tr>
<tr><td>a.) Comparing with those women with and without history of breast cancer in mother</td><td>4.5</td><td>1.1 –19.6</td><td rowspan="3">As per 95 % C I: - only first one (a) has importance in comparison to (b) and (c)</td></tr>
<tr><td>b. Comparing age at first birth 21-25 verses earlier</td><td>2.8</td><td>1.2 –6.7</td></tr>
<tr><td>c. Comparing with or without hormone therapy for their UBC</td><td>0.3</td><td>- 0.6
.</td></tr>
<tr><td colspan="4">Radiotherapy had no significant effect on the incidence of CBC</td></tr>
</table>

The conclusion section clearly spells that

Positive family history of breast cancer and late age at first child birth – are stronger risk factors for CBC than UBC

Hormone therapy reduces the incidence of CBC

The conclusion section of the body of the paper repeats the main points that are mentioned in the abstract.

Body of the paper

The paper has been described under following sections:

1. Introduction 2. Material and methods 3.Data collection 4. Statistical analysis 5. Results and 6. Discussion.

The introduction / background create interest in reader to go through the paper.

The background information has been described step-by-step with clarity.

The starting point is interesting, which says that:

Breast cancer in women is commonest in developed countries. It is the second most cancer in south India and most frequent in western India (Bombay).

It highlights that the rates of breast cancer are alarming in India though lower than the developed countries.

3. It says that the prompt treatment of Breast cancer increases the survival both in developed and developing countries. But in developing countries there is higher risk to develop second primary breast cancer compared to develop first primary breast cancer in the general population.

In the introduction it has been highlighted that it is the first cohort study on CBC conduced in India. The aims of the study were stated as follows

1. To determine whether patients with 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 e.g. radiation, chemotherapy and hormone therapy

Material and methods:

I undertook the search in MEDLINE to find out epidemiological studies /reviews conducted outside India which examined the frequency of a second primary breast cancer and risk factors related to the development of the disease. I compared the study design and results of the present cohort study of India. I examined the recent review works done on similar studies.

The present study design is cohort study. Study cohort is a patient with carcinoma of breast as their first primary cancer diagnosed in 1960- 1989 at the cancer Institute (WIA) in Chennai, India. Total no. of patients was 3492.The follow up was done up to 31st December 1994 i.e. almost 34 years.

Epidemiological studies of contralateral breast cancer differ in the extent to which the criteria are followed. Some studies include all women with contralateral breast cancer where as others have excluded women with CBC diagnosed within certain time intervals e.g. 6 months, 1 year or even larger. In the present study the exclusion has been made mentioned in the following table.

The criteria followed for the exclusion from analysis		Total no.
1	Those with three primaries	1
2	Sarcoma of breast as their first primary cancer	27
3	Developed second cancer in sites other than in breast	40
4	Developed CBC within the first year after initial breast cancer diagnosis	28
5	Not completed at least one modality of treatment for the	194

	first primary breast cancer	
6	Those with a single prime cancer who did not survive for <=12 months from the diagnosis of breast cancer	498
	Total number of patients who were excluded from the analysis	788

Inclusion: 2704 number of patients was included in the analysis. The criteria of inclusion were as follows:

Breast cancer patients who did not develop a second cancer during follow up (2665) and

Those who had CBC >= 12 months after the diagnosis of initial primary breast cancer (39).

Statistical analysis:

Appropriate statistical software was used for analysis. STATA software was used to calculate the women year at risk.

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. The authors have explained why the incidence figures from 1960 could not be used. The authors have pointed out that the non-availability of such registry system before 1982 is the main cause.

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 and reproductive variables. Rate ratio and their 95 % C I were calculated based on women years using STATA software.

The analysis shows that the rate ratio increases as per the increased educational level. Women having college level of education have Rate ratio 3.6 with 95 % CI 1.2 –5.8.

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 cases. Synchronous and metachronous cancers in the contralateral breast represent 62 % and 63 % of all synchronous and metachronous second cancers seen in the cohort of initial breast cancer patients.

The data has been presented through adequate numbers of tables (total 8 tables).

Risk factors like education level, age, religion, and positive family history, reproductive factors etc have been shown in table no. 1 to 5.

Besides risk factors the effects of different cancer therapy in reducing the risk of CBC have been shown in tables no.7 and 8.

Table no.6 describes by year of diagnosis of first primary among patients with initial breast cancer diagnosed at the cancer institute, Madras in 1960-1989.

Discussion:

This is a hospital-based cohort study. The results cannot be generalised. Many cohort studies conducted outside India are on population based cancer registries and some by selected study groups.

- The degree of completeness of registration is an important factor affecting the occurrence of the frequency estimation.

- Selection bias is a limitation in non-population based studies.

To increase the degree of completeness and quality of registration following precautionary measures were taken for data collection in the present study.

The oncologists at the cancer institute record all types of treatments, side effects and complications of treatment if any as part of the routine medical care.

The data were recorded by the treating oncologist at the time of giving treatment for the first primary: - from this the authors imply that the quality of data on the treatment modalities may not be different in those who developed a second cancer and those who did not.

As checked by the first author the treatment details did not show any lack of data or inadequate information.

Data abstraction:

Two social scientists were trained for the purpose of data collection. Data were collected in a prescribed form. About 10 % of the records were selected randomly and re-abstracted by the first author to maintain quality.

First author checked the treatment details for all patients and those who developed a second cancer or metastasis.

Diagnosis: definitive diagnosis of contralateral breast cancer is also an area of uncertainty. These difficulties may result in biases in the frequency estimation, which are difficult to assess. There were no uniform rules for differentiation of a second primary cancer from a metastasis to the contra lateral breast. But in the current study the following four definite rules were followed to evaluate the second primaries.

1 Histological: About 5% of the first primary breast cancer cases and 5% of CBC were not confirmed by histology
2 Clinical evidence: The above cases were confirmed clinically and received cancer directed treatment
3 Length of disease free interval time
4 Consultation with Pathologist and / or a gynaecologist

The logics behind non-bias between 1 & 2, given by the authors are that: -

The proportions of cases not histologically confirmed were similar among both Unilateral Breast cancer and Contralateral Breast cancer.

To maintain the quality of information and to minimise the possible biases strict patient registry and routine follow-up methods were followed.

Detail information on patients, who were admitted for treatment and their follow up was properly maintained.

This was done by periodic re-examination and correspondence. 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. These staffs were not made aware about the study hypothesis.

Follow up visits for breast cancer were done as per the following schedule

1. In every 3 months for first 3 years	3. Every year between 5 and 10 years
2. In every 6 months from 3to 5 years	4. Once in 2 years after 10 years

The purpose of the routine follow up was to determine the vital status of the patient and not to detect second cancer.

Risk evaluation:

In this study the incidence of metachronous contralateral breast cancer was 2.3 per 1000 women years .The authors have suggested the possible causes for the wide variation in the reported incidence of bilateral breast cancer. They explain that this 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 *insitu* 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 is seven fold risk per single breast (95 % C I 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 of age at the diagnosis of CBC.this finding is consistent with other studies conducted outside India.

Table 1: -clearly shows 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).

A number of studies have found that the age at time of first diagnosis is the most important predictor for contralateral breast cancer. The earlier a woman develops an initial breast cancer in her lifetime the greater the risk of developing a second primary. 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.

Hankey *et al* found that the incidence density of bilateral breast cancer was 1005 per 100,000 person- years in the < 45-year age group (811 in the 45- 54 age group, and 55 age group during the study period from 1960 through 1975). When age was analysed by decade, the relative risk for older patients compared with younger patients was 0.79 with 95 % CI 0.62 – 1.10.

<u>Reduced effect of a later age at first child birth:</u>

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.

Most of the other studies found no relationship between nulliparity and contrlateral breast cancer.

Family History:

Several studies demonstrated that a family history of breast cancer is associated with increased risk of CBC. The effect of family history was particularly noted among women with affected first-degree relatives. The present study has also similar findings. The unilateral breast cancer 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.

Breast cancer in first-degree relatives :In some other studies it was found that there is increased risk of contralateral breast cancer when sister of the patient had breast cancer than mother of the patient with breast cancer.

But in the current study the finding that there is fivefold risk of contralateral breast cancer when the mother of unilateral breast cancer patient suffered from breast cancer.

In this study no matched analysis has been done for sister and mother of the patient being affected by cancer.

Reproductive factors:

<u>Menopausal factors</u>

Cook *et al* found little variation related to menopausal status, except that women who were post menopausal because of bilateral oophorectomy at initial breast cancer diagnosis had a reduction in the risk of contralateral breast cancer compared with premenopausal women (OR 0.25 with 95 % CI 0.09 – 0.68).

The current study of Madras 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

<u>1.Radiotherapy:</u>

The findings in other studies are consistent with the present study. There is no significant increased risk of contralateral breast cancer after radiation for the initial breast cancer.

Several studies have shown that radiogenic breast cancer is exceedingly rare among women who had undergone irradiation after 40 years of age.

Harvey and Briston examined the data for 41,109 women diagnosed with breast cancer between 1935 and 1982 and found that women treated with radiation were at higher risk of developing a second breast cancer than were non-irradiated women.

<u>Radiotherapy and Age of menopause:</u> Storm and Jensen studied 56,237 women with a first primary breast cancer in Denmark and found that the association between radiation and contralateral breast cancer was obvious among

premenopausal (age 45 years) and peri-menopausal (age 45 – 54 years) women with primary breast cancer.

In the present study the average age of women who had radiotherapy was 48 years. So the authors have given the explanation that the higher age at exposures to radiotherapy might be one factor for not finding any risk following radiotherapy.

2.Chemoherapy:

A number of studies have documented that women who received chemotherapy for the initial breast cancer showed a reduction risk of developing a contralateral breast cancer (decrease in CBC ranges from 18.1 to 70 % among those who were given chemotherapy.

The finding of the current study is consistent with the findings of other studies. Here the decrease of risk in developing CBC is by 50 % with 95% CI 0.2 to 2.1.

3. Use of Tamoxifen:

In most of the clinical trials it has been documented that there is beneficial effect on the development of secondary breast cancer by the use of Tamoxifen. The present study result is in agreement with it.

Findings of different studies are as follows: -

- In a randomised, double blinded and placebo controlled trial of post operative therapy with Tamoxifen in 2644 women with breast cancer Fisher *et al* found that Tamoxifen group demonstrated a significant reduction of contralateral breast cancer than the placebo group.

- Findings of Meta-analysis: Early Breast Cancer Trialist Collaborative Group conducted meta analysis on the data from 75,000 women and it was found that there was a reduction of 39 % in the risk of development of contralateral breast cancer.

-Rutqvist *et al* provided similar estimation for reduction of contralateral breast cancer with Tamoxifen therapy based on the data from 1846 post menopausal breast cancer women and found that the benefit of Tamoxifen therapy as greatest during the first 2 year.

-Findings of the studies by Scottish Cancer Trials Group and the Cancer Research Campaign Breast Cancer Trial group is that there is overall beneficial effects of adjuvant Tamoxifen therapy on the incidence of contralateral breast cancer.

-The odds ratio for Tamoxifen therapy associated with contralateral breast cancer ranges from 0.5 to 0.6 in both clinical and population based studies.

Tamoxifen and menopausal status.

Current study has not discussed on this aspect but several studies have demonstrated that beneficial effects of tamoxifen therapy may be dependent on menopausal status and disease status. One study performed a subgroup analysis according to menopausal status and founds that there is reduction in the risk of contralateral breast cancer for postmenopausal women and a marginal increase in risk for pre-menopausal patients.

Summary of the findings:

Several studies have shown that the risk of developing a second breast cancer among patients with initial breast cancer is 2 to 5 times higher than the risk of developing a first primary breast cancer in the general population. The RR for single breast of 4-10 as compared with 7 in the present study, with higher risk when the age at diagnosis of CBC was < 45 compared to > 45 years.

In the present study the rate ratios with 95 % CI for contrlateral breast cancer by educational level, income group, and religion among patients with initial breast cancer (diagnosed at the cancer institute, Madras from 1960- 1989) 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 have higher RR (3.4) with 95 % CI, 1.6 –7.0 and Hindus have lowest RR (1)

Risks:

There is sevenfold risk (per single breast) seen among patients with initial breast cancer. (This study population was limited to number of breast cancer women patients admitted to one cancer Hospital of Madras).

Positive family histories of breast cancer and late age have higher risk for contralateral breast cancer.

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 has no significant association with the risk of contralateral breast cancer.

Review summary

1	Hypothesis And objectives	Study hypothesis is not clearly stated but the objective is clear in the introduction itself. It addresses the question of both epidemiological and clinical interest.
2	Study Design	The study design is cohort study and it is appropriate for the question to be answered in the study. The cohort study is non community based which has the inherent problem of selection bias. Cohort study is feasible for such a study as it is hospital based. Similar studies have conducted in other parts of the world. More than 30-year follow- up period is adequate.
3	Study population	The study yields a fair comparison between the exposed and the unexposed. The sample size is adequate to answer the question of interest. The exposed and unexposed come from the same population Both exposed and unexposed subjects are examined concurrently. The investigator presents a rationale for the choice of study population. The study population is chosen from the hospital so the diagnosis etc. is reliable.
4	Exposure	The exposure has been defined and the exposure is a chronic one Source of exposure information is available Exposure has been measured appropriately

		There are objective measures to substantiate subjective measures
5	Disease	The disease of interest i.e. contra lateral breast cancer is clearly defined, though there is no uniform guideline for the same. The source of information about the disease is hospital records of a cancer institute where records are maintained with proper supervision. There is histological and clinical confirmation of the disease The presence of the disease has been assessed in similar fashion for the exposed and unexposed group Those who assessed the disease status were blind to subject exposure status.
6	Follow up	The period of follow up was adequate. The mean follow up time was 7.4 years. Appropriate measures were taken to maintain subjects in the study. As per the exclusion criteria 788 cases were excluded out of 3492 breast cancer cases diagnosed. There is discussion of losses to follow up. Among initial breast cancer patients the loss to follow up was 10 % and among patients with CBC 7.5 %
7	Analysis	Appropriate analysis has been performed with help of computer software package. STATA software was used for analysis of women years. The results are statistically significant. The results are clinically meaningful.

Conclusion: The study of contra lateral breast cancer is becoming an important public health issue because of the increased incidence of first primary breast cancer and improved survival by medical interventions. The present cohort study conducted in Madras, India shows that there is sevenfold risk (per single breast) seen among patients with initial breast cancer compared with other women in Chennai. Most of the risk factors identified in the study are consistent with the studies conducted outside India. The objective of the present study was to provide an overview of the risk factors and the protective factors for development of contra-lateral breast cancer. The positive findings regarding reducing incidence of CBC by medical intervention after first primary cancer is a great hope for Indian women. But the current study has limitations as the findings are restricted to Madras only and the study was non-community based. There is ample scope for further epidemiological studies on the subject both at hospital and community level in India as well as in other developing countries.

3.3. Zinc supplementation In Young Children With Acute Diarrhea In India

Authored by: Sunil Sazawal and *et al*

Published in New England Journal Medicine 1995; 333:839-4.4

Purpose: Learning objectives

Methods: Reviewing the journal article after in depth study of the article and going through other similar studies conducted in different settings.

Review

The Title of the paper: is very much informative and it reflects the topic of the paper appropriately. The relationship between different parts of the title is logical and together they express the comprehensive meaning without any ambiguity.

Parts of the title:

"Zinc supplementation ► In Young Children ► With Acute Diarrhea ► In India"

There is no dead word in the title and the sentence is clear and specific, focusing the objective of the study. The sentence is grammatically correct.

The Abstract: The abstract of the article is a structured one. It proceeds step by step: - Background,Methods,Results, and Conclusion. There are 302 numbers of words in the abstract, which is within the standard limit of many of reputed international journal.

Background:

The background presents the general problem of diarrheal illness, the problem of Zinc deficiency among infants and young children with malnutrition and impaired immune status who are prone to diarrhea in developing countries. The background information expresses the hypothesis that diarrhea is common among children with zinc deficiency and it responds quickly to zinc supplementation.

Methods:

The method section expresses the study objectives, study design and study cohort.

The study objective: To evaluate the effects of daily supplementation with 20 mg of elemental zinc on duration and severity of acute diarrhea.

Study design: Double Blind Randomized Control Trial

Study Cohort: 973 children (6 to 35 months age) in New Delhi, India

Results:

The result section uses appropriate numbers; statististics to prove that zinc supplementation in acute diarrhea has a significant effect in reducing the severity and duration of diarrhea. It also clearly expresses that the reduction in the duration and severity of diarrhea were greater in children with stunted growth than in those with normal growth.

Conclusion

The conclusion section of the abstract repeats the contents of the conclusion section of the main paper.

It says that: - zinc supplementation results in clinically important reduction in duration and severity of diarrhea among infants and young children (preschool children).

The Body of the Paper

The body of the paper has been described as per the following sections: - Introduction (background),Methods,Results and Discussion.

Introduction:

In this section the diarrhoeal health problems among children in developing countries has been described. The hypothesis has been built up from the general problems and the concerned risk factors.

At the beginning of the introduction the authors have described the prolonged diarrhea as one of the important causes of growth retardation and death among young children in developing countries. Diarrhea illness persists longer in children with malnutrition, impaired cellular immunity or recurrent diarrhea.

The hypothesis has been presented in the second phase of introduction. It says that zinc deficiency is a link between the above risk factors and the duration of diarrhea.

The objective of the study is to evaluate this hypothesis and the study is community based and the design of the study is "*Double Blind Randomized Control Trial*".

In this study the effects of zinc supplementation on the duration and severity of diarrhea was investigated.

Critical comments:

- ✓ The introduction is not too general or too specific.
- ✓ It begins at an appropriate level.
- ✓ The background description is relevant.
- ✓ The hypothesis has been presented in specific terms.
- ✓ The general problem of diarrhea has been presented early in the introduction.
- ✓ The introduction catches the interest of the hypothetical reader
- ✓ The introduction catches and keeps the interest of the hypothetical reader.

Methods:

This section describes the general picture of the population where the study was conducted. The format used in this section is appropriate. The description has been made under following headings, which are in logical order:Screening and selection bias,baseline assessment,randomization,intervention,follow-up visits,study groups,definition of primary outcomes,statistical analysis.

Comments:

Representation of study population:

The population selected for the trial was an urban population of low socioeconomic status near New Delhi, India. This population cannot represent the general population of India.

Selection of patients for the clinical trial:

It was very selective. Patients who were reporting to the special diarrhea clinic only were screened for enrolment in the trial. There is no mention about the proportion of patients who were reporting to the special diarrhea clinic.

This puts a question mark whether the sample is representative of the community?

Inclusion criteria:

Specific criteria were fixed for inclusion of cases. (i) Children of 6 to 35 months age reported to the diarrhea clinic (ii) Children who had passed at least four unformed stools in the previous 24 hours and the length of diarrhea was less than seven days (iii) children who are permanent residents of the study area.

Exclusion criteria:

Authors have vividly described the exclusion criteria that they followed in the trial. The exclusion criteria were as follows.

Children who were presented to the clinic a second time.

Children who were judged by the physician to have malnutrition requiring hospitalization

Children whose parent did not provide consent.

In brief the study group was as follows:

960-children were scrutinized for enrollment. Parents of 13 children did not provide consent. Thus total (960 – 13) = 947 children were assigned for treatment. Out of this 947-zinc supplementation group consisted of 462 and 485 children were in control group.

Ethical issue:

Authors have duly discussed on the ethical issues that have been taken into account in the study design.

The Human research review committee at the All India Institute of Medical Sciences, Johns Hopkins school of Hygiene and Public Health and WHO, has approved the study.

The consent form was read to parents and written informed consent was obtained for children enrollment

Baseline assessment:

Before proceeding for clinical trial on Zinc supplementation baseline assessment has been done as mentioned below.

Detailed physical examination of the child before enrollment.

Weight, length (For 24 months children) and heights were measured by standard procedures.

Stunting and wasting were defined adequately.

For estimation of zinc level in venous blood sample was collected from each child and zinc level was analyzed with standard methods.

Study technique:

The authors have discussed regarding the randomization and blinding techniques used in the study. Children screened for enrollment were grouped into four strata. Each stratum had its own characteristics. Within each structure, children were assigned sequential serial numbers including whether they would receive zinc preparation or placebo.

Both zinc preparation and placebo were identical in appearance and taste. WHO personnel kept investigators blind about the code that was t.

Intervention strategy:

Intervention strategy was well deigned. Monitoring and supervision was inbuilt in the study design.

There was hardly any difference found in the percentage of days the supplementation was actually fed by the field workers to zinc supplementation group (78 %) and placebo or control group (79%).

Trained health workers conducted follow up visits and systematic recording was followed.

Authors had taken care for outside influences:

In any community based study external influences are always expected. To check one such influence from non-study health workers parents were 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.

Antibiotics were strictly avoided. Only children having dysentery / diarrhea more than 10 days duration were given antibiotics. But strict measures were taken to see that none of the medication used contained zinc. Hence there was no chance of receiving higher amount of zinc supplementation in severe diarrhea cases.

Primarily outcomes of diarrhea were well defined for the study purpose.

Statistical analysis:

For statistical analysis standard computer software packages were used e.g. SPSSP+ (version 6.0), Epi info (version 6.0) and SAS.

In summary we can say that the investigators have ensured the internal validity of the study.

Results

The result section has been presented the sequences in a logical order. The presentation has been made under following sub headings:

Duration of episodes of diarrhea.

Persistent and severity of diarrhea.

Analysis of sub groups and

Adverse reactions.

The data has been clearly presented in tabular form with relevant characteristics.

In nutshell the results are as follows: -

1. *Duration of episodes of diarrhea:*

Total episodes of diarrhea - 931

Time interval by which diarrhea resolved after enrollment: 44.4 with 3 days, 83.5 % by day 7

Reduction in risk due to zinc supplementation

25 % reduction among children with stunted growth, 27 % reduction among children who had low plasma zinc concentration, 21 % reduction among children in the risk of continued diarrhea.

Relative risk of continued diarrhea (diarrhea in supplementation group as compared to the control group)

- 0.93 with 95 % CI, 0.78 to 1.09 during 1,2, and 3 days.
- 0.62 with 95 % CI, 0.62 to 0. 75 after day 3.

2. *Persistence and severity of diarrhea*

There is significant reduction in persistent diarrhea among children supplemented with zinc. The investigators have evaluated the effects of multivariate analysis by 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 with 95 % CI 0.57 to 0.95 when the model was restricted to children enrolled by day 3 of the episode of diarrhea.

The over all findings of the study are very encouraging in zinc supplementation group. There was 39 % reduction (95 % CI 6 % to 70%) in mean number of watery stool / day

(P-value 0.002) which is highly significant. There was 21 % reduction (95 % CI 10 % to 31 %) in the number of days with watery stools.

3. *Analyses of Subgroups*: The findings of these analyses are very encouraging.

In children with stunted growth having diarrhea for < 4days before enrollment, the reduction in the likelihood of diarrhea lasting > 7 days was 65 %. The results are depicted in a tabular form.

By subdividing the stunted growth further analyses have been done in children with wasting (z – score for weight for height for length <-2), there was greater reduction in the number of days of watery diarrhea.

There was no clear trend with respect to the effect within subgroup defined according to the plasma zinc level.

Authors have also discussed about the adverse reactions though the reactions were not life threatening and the number is very small i.e. 2 in zinc supplementation group and 2 placebo group)

Discussion:

Summary of the present study:

Sazawal *et al*, conducted this definitive field study in Delhi (Double Blind Randomized Control Trial) among 931 children with acute diarrhea for a duration of seven days or more, for supplementation with either zinc or a placebo. In the zinc group, there was a significant reduction of 39 per cent in episodes lasting more than seven days after supplementation when supplementation was started within three days of the onset of diarrhoea. In the logistic regression model, the odds ratio for reduction in the risk of diarrhoea lasting more than seven days with zinc was 0.79 (95 per cent CI 0.64-0.96). The odds ratio was 0.74 (95 per cent CI 0.57-0.95) when the model was restricted to episodes enrolled by three days of onset. The reduction in diarrhoea lasting more than seven days was 65 per cent in the subgroup of stunted children. There was 39 per cent reduction in the mean number of watery stools per day in zinc-supplemented children ($p<0.02$) which is highly significnt.

Comments on the discussion section the authors have highlighted the positive findings of the result section and also discussed the weak points of the study. The hypothesis of the introduction section gets full strength in discussion. The strongest evidence from the study has been presented first. The discussion points are clearly related to the findings of the study. The ending of the discussion section gives sense of completeness.

Authors have expressed the following relative weaknesses and strengths in the study.

1.Effect of zinc supplementation could not be measured. Authors have explained that this could not be done as ORS was given from the day of enrollment.

2.Relatively few visits were made to assess the morbidity.

a) This was strength in one sense as due to this no medical intervention was done during the course of disease. Children were treated at their natural home environment with their usual diet.

b) This was also considered as a weak point because by practicing only few visits might have limited the precision of the information on daily basis.

The findings of this study are corroborated by other similar studies:

Researchers at the Johns Hopkins School of Public Health have found that zinc supplements help children suffering from acute and persistent diarrhea significantly reduce the duration of their symptoms.

(Ref:-December 2000 issue of the American Journal of Clinical Nutrition). The study design of John Hopkins School of Public Health was similar to the present study under review.

Results of the study showed that the children who were given a zinc supplement during the acute-diarrhea trials were 15 percent less likely than controls to still have diarrhea by a given day; children in the persistent-diarrhea trials had a 24 percent lower risk of the diarrhea continuing. The authors said that their meta-analysis showed that zinc apparently offers comparable benefits to all subgroups, a finding that indicates the nutrient needn't be aimed only at certain narrow populations but is feasible for wide use in the developing world. While being underweight or stunted is recognized as an important factor for increased prevalence and severity of infection and high mortality rates, there is increasing evidence for an independent role for micronutrient deficiency. Several studies have shown beneficial effects of zinc supplementation in malnourished children with acute and persistent diarrhoea. Children with PEM are often deficient in zinc and vitamin A. Micronutrient deficiency such as zinc deficiency may be a possible factor for increasing diarrhoeal severity, incidence and growth retardation. Although supplementation of one micronutrient may be beneficial to the subject, its effect on and interaction with other micronutrients needs to be evaluated. Zinc supplementation is therefore a strategy to improve growth. There is also evidence that zinc plays an important role in preventing attacks of diarrhoea and respiratory infection. These evidences together offer zinc supplementation to be a key strategy for improving growth and reducing morbidity in malnourished children of the community where zinc deficiency is present. Improving vitamin A status reduces mortality among older infants and young children and reduces pregnancy-related mortality; it also reduces the prevalence of severe illness and clinic attendance among children and improving zinc status reduces morbidity from diarrhoeal and respiratory infection (Tompkins, 2000).

Dietary supplementation or therapeutic treatment with vitamin A and zinc may be a cheap yet effective means of preventing or treating infections in highly susceptible populations. Several clinical trials have examined the efficacy of supplementation with zinc and vitamin A administered during acute diarrhoea, on the outcome of the supplemented episode.

Initial studies by Roy et al in Bangladesh and present Indian study by Sachdev et al in Delhi suggested that in the subgroup of children who are severely malnourished or who have a subclinical zinc deficiency indicated by low zinc levels in rectal mucosa, zinc supplementation shortens the duration of illness and reduces the frequency of watery stools.

Conclusion:

Diarrhea is a very serious public health problem in developing countries, resulting in millions of deaths each year. Those who survive are often left with malnutrition. This study on zinc supplementation was important because it measures the effect of supplemental zinc given in conjunction with oral rehydration therapy during the recovery from acute or persistent diarrhea. .

Although future studies are still needed to examine the effect of zinc supplementation on other measures of severity, such as diarrhea output, occurrence of dehydration, treatment failure or death, different researchers believe that attention should now focus on the best means of providing zinc during diarrhea, as well as on other ways to increase the zinc intake of children in developing countries

3.4. literature review for the Dissertation:

Anthropometric status and obesity in adolescent schoolboys of lower and higher socioeconomic strata, Bhubaneswar, Orissa,2003

-A cross sectional study

2.1.Background:

Since ages overweight/ obesity is commonly perceived as overt manifestation of body weight gain. Overweight/obesity in children and adolescents have been considered as signs of health, an indicator of wealth and prosperity of the family. Increase in body weight and girth have been often perceived as being attractive. Presence of plump children in the family reflects that the parents are well to do and good providers. Only recently these perceptions are changing, as overweight / obesity related health problems are increasing in young adults.

Clinical evidence of obesity can be dated as far back as Graeco- Roman times, but little scientific progress was made towards understanding the condition until the 20th century. In 19th century, the work of Lavoisier and others indicated that metabolism was similar to slow combustion, and that obese and lean humans obeyed the laws of thermodynamics. Also, the discovery that fat is stored in "cells", the basic unit of biology, led to the idea that obesity could be caused by the process of too many fat cells. Interestingly, the 19th century also saw the publication of the first diet book, entitled 'Letter on corpulence addressed to the public', by W. Banting. In 20th century, analysis of life insurance data indicated that obesity was associated with an increased death rate [18].

Regardless of different methods used to classify overweight and obesity, studies have shown that since mid 1960s the rate of prevalence in adolescence of overweight/obesity continues to rise dramatically [6][20]. Due to the emergence of adolescence obesity and its health consequences in adult life particularly in developed countries there is renewed interest in the subject.

2.2.Definition of overweight/obesity:

Nancy [5] in 2003 said that the terms obesity and overweight are often used interchangeably, but they are two distinct conditions. Obesity refers to excess adipose tissue, while excess overweight refers excess weight for height. The normal processes of growth, pubertal development and body composition complicate defining overweight/obesity in children and adolescents [5].

Obesity is often defined as a condition of abnormal or excessive fat accumulation in adipose tissue, to the extent that health may be impaired [13]. Stated in simple terms, overweight/obesity is the result of an energy imbalance due to energy intake having exceeded energy expenditure over a period of time. As the modern civilization advances with more industrialization and urbanization processes there are powerful societal and environmental influences, which tend to overwhelm and upset the physiological mechanisms that balance the intake with expenditure to maintain stable body weights.

Till date no uniform international standard has been followed to assess overweight/obesity in different parts of the world. Among all indicators BMI is now mostly used in anthropometric assessment worldwide.

2.2.1.Concept of BMI and its use: Quetlet in 1869 was the first person to observe that among adults of normal built but different height, weight was roughly proportional to height square and he developed the Quetlet's Index *(weight in kg / Height in meter^2)* which was later renamed as *BMI* by Keys et al in 1972.

BMI provides the most useful, albeit crude, population-level measure of obesity. It can be used to estimate the prevalence of obesity within a population and the risks associated with it. Many studies have been conducted on anthropometric assessment of nutritional status in preschool children [21] but much less information can be obtained about older children and adolescents. One reason for this gap in knowledge is the lack of internationally agreed upon methods for assessing nutritional status of adolescents. The WHO in 1995 made provisional recommendations for the interpretations of anthropometric data during adolescence using the National Health Examination Survey (NHES) reference data.

Due to various limitations for estimating overweight and obesity in adolescents, BMI for age was recommended as the best indicator for use in this age group. It incorporates the required information on age; it has validity as an indicator of total body fat at the upper percentile [(22)] as it provides continuity with recommended adult indicators. Although BMI has not been fully validated as an indicator of thinness, or under nutrition in adolescents, it provides a single index of body mass applicable at both extremes [(3)].

Usefulness in international epidemiological studies: According to Malina RM et al [(24)], the overall efficiency of BMI in predicting percentage body fat as measured by skin fold thickness or densitometry in adolescents of different ethnic origin was >0.8, suggesting that BMI could be useful in international epidemiological studies.

Recently Mary C Bellizz and William H Dietz (23) described that the measurement derived by BMI as an assessment of adiposity in children and adolescents are reliable and non intrusive; furthermore, BMI has been validated against measures of body density. Many countries have published BMI for age charts for their populations, and some have also defined cutoff points on theses charts to define overweight and obesity.

An additional function of gender allows for children to be categorized according to these international cut-off points.

Limitations of BMI: Although weight was considered one indicator of fatness, children of same weight but at different stages of height can have widely different level of adiposity. BMI partially adjusts weight for stature by using the square power for height. One effect of this correlation between BMI and height is that taller populations will appear to have higher prevalence of obesity [(24)]. Use of BMI in a clinical setting requires additional measures to confirm that a high BMI reflects excess body fat and not height.

2.2.2.Other anthropometric measures to assess overweight/obesity:

Before BMI was introduced anthropometrics variable like weight, height, skin fold thickness, mid upper arm circumference (MUAC), waist and hip circumferences were measured to assess the degree of overweight and obesity of an individual. Most of the present information on the health effects of obesity is derived from data on weight and height. Due to the simplicity and ease for data collection on these anthropometric variables, they are the most commonly employed measures of nutritional status in epidemiological studies. When using combination of weight and height to assess obesity, BMI is as strongly correlated with overall body fat as alternative indices and provides considerable advantages of comparability across studies. Despite the widespread use of obesity indices based on weight and height, their error in representing percent body fat is considerable, not because of failure to measure weight and height accurately but because the lean body mass can vary considerably among persons of the same height.

2.3.WHO recommendations for assessment of nutritional status in adolescents:

The WHO expert committee (1995) recommended BMI for age cut off values for adolescents to be considered "at risk of overweight" [(21)] because BMI is an inexact measure of total body fat, use of term obesity was limited to those who are at risk of overweight and have high level of subcutaneous fat. Designating individuals as at risk for overweight favours efforts to prevent obesity and provide guidance on weight control. Adolescents who are at risk of overweight may show other risk factors for future obesity related disease, e.g high blood pressure, elevated serum lipoproteins, and elevated insulin and glucose. In the absence of these risk factors, adolescents at risk of overweight should not require additional therapy or advice.

Table:1. WHO-recommended cut-off values for adolescents for nutrition assessment are as follows [(21)].

Indicators	Anthropometric variable	Cut-off values
Stunting or low height for age	Height-for-age	< 3rd percentile or <-2 Z scores
Thinness or low BMI for age	BMI-for age	< 5th percentile

At risk overweight	BMI-for age	≥ 85th percentile
Obese	BMI- for age *TRSKF- for age **SSKF for age	≥85th percentile BMI and ≥90th percentile TRSKF and >= 90th percentile SSKF

* TRSKF= Triceps skin fold thickness ** SSKF= Sub scapular skin fold thickness

Now there are recent international studies available to establish a standard definition for childhood overweight and obesity based on BMI. Tim J Cole et al (2000) recommended international cut-off points by body mass index (BMI) for overweight and obesity by sex between 2 to 18 years, defined to pass through BMI of 25 and 30kg / m2 at age 18 obtained by averaging data from Brazil, Great Britain, Hong Kong, Netherlands, Singapore, and United States (25). The cut-off points are given in the annexure II.

2.4.Global scenario overweight/obesity:

The world is facing a global epidemic of obesity. Evidence is emerging now to suggest that prevalence of overweight and obesity is increasing worldwide at an alarming rate. Both developed and developing countries are affected (19).

As of 2000,the number obese adult has increased to over 300 million, which is more than seven percent of the world's adult population. A recent analysis of the National Health and Nutrition Examination Survey (NHANES) data (1988-1994) using BMI $\geq$ 30 to classify obesity showed that around 20% of all men and 25% of all women are obese (19). The 2000 WHO technical report series (19) has mentioned that obesity in developing countries coexists with under nutrition (BMI<18.5). In economically advanced regions of the developing world, prevalence may be as high as industrialized countries.

2.5.Overweight/oesity scenario in Southeast Asian Region:

Good quality, nationally representative, secular trend data for countries in South-Asia Region are not available (19). However, data from two studies conducted in Thailand suggest that diet related chronic diseases, including obesity are increasing in affluent populations. Prevalence of overweight (BMI 25 -29.9) was considerably higher (15.2 % in men and 23.2 5 in women)(26). The 2003 cross-sectional study conducted by N Krishna Reddy and his team in

Andhra Pradesh showed that obesity was prevalent in 36 % of the population [27].

2.6.Overweight/obesity among adolescents:

Adolescence is the crucial period in the individual's life. Adolescents represent about 20 % of the world's population and around 85% of them are found in developing countries [28]. Although the world is facing a global epidemic of obesity little attention has been given to the nutrition of adolescents and there is not much published literature on the subject.

It becomes difficult to give an overview of the global prevalence of obesity in younger age groups, as there is lack of consistency and agreement between different studies in classifying obesity in this age. Irrespective of the classification system used different studies have reported that prevalence of childhood and adolescence obesity has increased [19].

World scenario: In the USA the prevalence of overweight defined by the 85th percentile of weight-for-height among 5-24 years old from biracial community of Louisiana increased approximately two fold between 1973 and1994. Further the yearly increases in relative weight and obesity during the latter part of the study period (1983-1994) were approximately 50% greater than those between 1973 and 1982 [29]. Similar trend has been observed in Japan; the frequency of obese school children by > 120% Standard body weight (SBW) aged 6-14 years increased from 5% to 10 %, and that of extremely obese (>140 % SBW) children from 1 % to 2 % during the 20 years between 1974 and 1993. The increase was most prominent in male students aged 9-11 years. Early obesity leads to an increased likelihood of obesity in later life, as well as to an increased prevalence of obesity-related disorders. In the Japanese study, approximately one third of obese children grew into obese adults [28]. The third National Health and Nutrition Examination Survey (NHANES III) in United States reported that there is rise of overweight among adolescents aged 12-17 years(Table.2) as follows.

Table: 2. Prevalence of overweight among different ethnic group by sex in America(NHANES III)

Characteristics	Males (%)	Females (%)
White, non-Hispanic	11.6	9.6
Black-non-Hispanic	12.5	16.3
Mexican American	15.0	14.0
Total	12.3	10.7

Here the overweight is defined as a BMI (kg/m^2) at or above gender and age specific 95^{th} percentile BMI cut-of points calculated at 6 months interval, derived respectively from NHES, cycles 2 and 3. Broussard and colleagues reported that prevalence of overweight in 1990-91, by BMI >= 85^{th} percentile was remarkably high among the adolescents of Native Americans, which is around 40 %(30). The cross-national comparison study on childhood obesity conducted by Youfa Wang in 2001(31) revealed that the prevalence of obesity and overweight was 11.1 % and 14.3 %, respectively, in the US, 6.0 % and 10.0 % in Russia, and 3.6 % and 3.4 % in China. Obesity was more in higher socio-economic status in China and Russia, but in the US low- socioeconomic groups were at a higher risk. Obesity was more prevalent in urban areas in China but in Russia it is more in rural areas. Thus it was concluded that childhood obesity is becoming a public health problem worldwide, but the prevalence of obesity varies remarkably across countries with different socioeconomic development levels. Data from National Longitudinal Survey of Youth has showed that there is an overweight prevalence of 21.5% among African American children, 21.8 % among Hispanic children and 12.3% among Non-Hispanic whites. This represents a 12% increase in the prevalence of overweight among African American and Hispanic children and a 50% increase among whites from 1986 to 1998.In Australia at least one in five children and adolescents are overweight or obese (32).

In developing countries: High rates of childhood obesity are already evident in many developing countries. The prevalence of obesity among school children aged 6-12 years in Thailand, as diagnosed by weight for height exceeding 120 % of the Bangkok reference, rose from 12.2 % in 1991 to 15.6 % in 1993 (11).

It was found in a recent study of 6-18 years old male schoolchildren in Saudi Arabia, the

prevalence of obesity was found to be 15.8% [33]. A recent cross-sectional study conducted in secondary schools of Pakistan
(Karachi) showed adolescent overweight to be 18% [12].

India: Limited data are available from India on prevalence of obesity among children and adolescent group. In India like many other developing countries overweight and obesity coexist with under nutrition. This constitutes a double burden for the country. Following few studies give an overview of the rising prevalence of overweight/obesity in India.

The study conducted by Umesh Kapil et al, (2001) reveals that prevalence of obesity amongst affluent adolescent school children in Delhi is 7.4 % (8 % in boys and 6% in girls) [7].

Ramachandran and his co-workers (2002) conducted a study among Indian adolescent school children (13 to 17 years n= 4700, M: F 2382:2318), and used BMI for assessing overweight/obesity. The study showed the age-adjusted prevalence of overweight as follows: 17.8 % boys and 15.8 % girls were overweight [8].

Gupta AK and colleagues in 1990 conducted a study amongst 3861 school children and reported the prevalence of obesity as 7.5% [10].

2.7.Consequences of childhood and adolescent obesity:

As described by Lee Yung Seng [34] obesity is now considered as a chronic disorder and root of many other chronic diseases. Unfortunately, there is no uniform consensus on the definition of adolescence overweight/obesity. The consequences of childhood/adolescent obesity can be classified as: a) Medical and b) Psychosocial

a) Medial consequences: medical complications can be broadly classified into mechanical and metabolic complications.

Mechanical complications:- i). Obstructive sleep apnea syndrome and ii). Orthopedic problems.

Metabolic syndromes:-Insulin resistance, hypertension, dyslipidemia, and visceral obesity. Central obesity and insulin resistance are believed to be the chief abnormalities. Visceral fat depot enters the portal system and the free fatty acids induce significant insulin resistance at the liver and muscles, and abnormal insulin secretion by the islets cells. These metabolic complications lead to early cardiovascular disease and premature death and aggressive intervention can reduce the risk of life threatening events.

For most overweight children, the complications do not become apparent till years later, but the metabolic consequences of obesity may be already evident in some, even in young children. The more severely obese will be at higher risk of serious morbidity.

The medical consequences of childhood and adolescent obesity include:

- Glucose intolerance
- Hperlipidemia
- Hepatic steatosis or steahepatitis.
- Hypertension
- Obstructive sleep apnea
- Gallstones
- Orthopedic-blount disease, slipped capital femoral epiphysis
- Pseudotumour cerebri

As per Nacy E. Sherwood [5] there are evidences to suggest that there is long-term morbidity due to medical complications. Whether childhood-onset obesity leads to an increase likelihood of obesity in later life is an important issue with clinical implications. The likelihood of persistence of obesity from childhood to adulthood is related to the degree and duration of obesity, family adiposity and age of the child. The likelihood of an overweight infant becoming overweight adolescent or adult is small. Less than 15 % of overweight infants and only about 25 % overweight preschool children will remain overweight into adulthood. Obesity is more likely to persist if it is present during the adolescent years. In general the later into adolescence overweight persists, the more severe the degree of obesity, and the presence of parental obesity, increases the likelihood that obesity will persists in adulthood. A recent study by Whitaker et al [ref] (1997) in Washington State tracked 850 infants over 21 -29 years. Among obese 6 years olds about 50 % remained obese. By the age of 10-14 years 80% of obese children with at least one obese parent remained obese [35]. A study conducted by Maffeis and colleagues in 2002 reported that 43% of obese children persisted to be obese adults, and another 29% were overweight as adults. The severity of obesity in childhood increases this likelihood and childhood BMI and insulin resistance that are significant predictors of subsequent development of metabolic syndrome X [36].

b) Psycho-social consequences: The 1998 WHO report [3] says that many obese individuals face psychological distress due to stigma attached to obesity. Psychological and social consequences are probably more prevalent than medical complications in overweight/obese persons. Childhood obesity has significant impact on the emotional development of the child or adolescent, who suffer from discrimination and stigmatization, as the obese individuals are commonly regarded as glutton and greedy, weak minded and ill disciplined. They may have fewer opportunities in school, at work, and social circle. As a consequence many obese individuals have less schooling, lower income, and higher poverty rates. Obese children were unfortunately uniformly ranked by other children as least desired friends [34]. Montello and colleagues in 1963[37] reported that individuals who were obese in childhood are more likely to have poor body image, and low esteem and confidence, even more so than those with adult onset obesity, as mid childhood is the critical period of development of body image and self esteem. A case- control study matched by gender and age conducted by Sunita et al at St.John's Medical College Hospital showed that proportion of pre-obese and obese adults (as per WHO definition by BMI) were significantly higher among the psychiatric patients (29% vs 5%) admitted to the hospital than the controls [38].

2.8.The public health burden:

Rising prevalence of adolescent overweight/obesity is public health burden. The cost attributable to obesity is high not only in terms of premature death and health care but also in terms of disability and diminished quality of life. Guijing Wang and his colleague reported [39] that in the past 20 years (1979-1999) among all hospital discharges, the proportion of discharges with obesity-associated diseases has increased dramatically. This increase has led to significant growth in economic cost. Center for Disease Control (CDC) researchers found that obesity related annual hospital costs increased three-fold over the 20 year period from 1979 to 2000. During that time, annual hospital costs for obesity related conditions in youths aged 6-17 increased from 35 million US dollar to 127 million US dollar (in 2001 dollar)[(40)].

India is undergoing rapid economic transition and is burdened by both communicable and non-communicable diseases. Heema Shukla in 2002 reported "The World Bank estimates that malnutrition costs India 10 billion US dollars each year due to lost productivity, illness and death. But the results of the largest ever survey of urban adults in India show there is also a significant level of obesity. Health policy makers must develop a dual approach to tackle these problems"[(41)].

2.9.Prevention:

Obesity and overweight are multi-determinant chronic problems resulting from complex interactions between genes and environment characterized by energy imbalance due to sedentary lifestyles and ready access to an abundance of food. Research suggests that obesity runs in families and some individuals are more vulnerable than others to weight gain and developing obesity. Genetic susceptibility towards overweight has been proposed to occur through several mechanisms, including low resting metabolic rate, low level of lipid oxidation rate, low fat free mass, and poor appetite control[(42-43)]. Genetic research holds considerable promise for understanding the development of obesity and identifying those at risk for obesity. However, the rapid increases in rates of obesity and overweight have occurred over too brief a time through out the globe for there to have been significant genetic changes in the population. Although body weight regulation is primarily regulated by series of physiological processes, it is also influenced by behavioural and environmental factors [(44)]. Recent epidemiological trends in obesity have been linked to behavioural and environmental changes that have occurred in recent years. The increasing proportion of calories from fat and increase in calories of diet in combination with reduction in physical activity levels and increase in sedentary behaviour have been implicated as significant contributors to the obesity epidemic [27].

Nutritional Foundation of India (NFI) reported that greater consumption of fat, oils and sugar and lower consumption of fiber in the diet is the cause of overweight and obesity. Fast food centers are multiplying in the urban areas of India and these find increasing clientele, particularly from adolescent children. The change in dietary habits accompanied by a sedentary life style like watching television for prolonged periods by children compounds the issue. Technological improvements add to this by replacing manual labour by machines in several areas of life [9].

It is important that to adopt preventive measures, health policy makers need to know the burden of childhood obesity. International experiences would help in tackling this emerging health problem at local level. For international comparison internationally acceptable standard definition for overweight and obesity is very much essential. WHO mentions: "the value of estimating the prevalence of, and secular trends in overweight and obesity cannot be overemphasized [10]. Knowledge of the level and changing distribution of overweight and obesity can be:

Used to identify populations at particular risk of obesity and its associated health and economic consequences.

Used by Health policy makers and public health planners in the mobilization and reallocation of resources for the control of diseases.

Used to provide baseline data for monitoring the effectiveness of nutritional programmes for the control of obesity.

Since little research has been conducted on the primary prevention of obesity there is an urgent need for studies in this area particularly with subgroups at high risk of obesity [5].

SECTION:4

4.1. PAPER PRESENTATIONS

4.1.1.ABSTRACTS OF DIFFERENT SCIENTIFIC PRESENTATION

Abstract:1

Outbreak of Cholera in Pitazodi village of Orissa, 2002

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[2]Research Officer, Regional Medical Research Centre, Bhubaneswar , Orissa

[3]SCB Medical College, Cuttack, Orissa

Introduction

Between late-July and mid-September 2002 increased number of diarrhoeal cases and deaths in Pitazodi village of Kashipur Block were reported to the Multi-disease Surveillance System (MDSS) cell of Orissa. The FETP Scholar led a team (with members from a research institute and medical college) formed by the State Government to investigate the outbreak and institute control measures immediately.

Methods

The team conducted an active survey in the village to identify all the cases with MDSS case definition. A questionnaire was used to get information on exposure factors. Laboratory and environmental investigations were done simultaneously. Control measures instituted include chlorination of drinking water sources, health education and active case management.

Results

During the epidemic 29 cases developed diarrhoea (attack rate of 6%). The case fatality ratio was 10.3%. The age specific attack rate was 11.5% and 5.3% for those aged below and above 5 years respectively. It was identified as a common source outbreak, due to contaminated water from a spring and shallow dug wells. The attack rate was very high (67%) for those households using water from spring. *Vibrio cholerae 01* was isolated from stool of patients.

Discussion and conclusion

The high attack rate, clustering of cases in place and time and the epidemiological linkage between cases and the drinking water sources and laboratory investigations confirmed that this is an outbreak due to common source. The causative organism was *V.cholera O1*. MDSS was instrumental in identifying and containing the outbreak.

[Presented at Joint Coference of the Indian Society for malaria and other communicable diseases and the Indian Association of Epdemiologyist, New Delhi: Dated 9th –11th November 2002]

Abstract:2

Food Borne Outbreaks in Tribal villages of Southern Orissa, India

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[1] FETP scholar, [2]Research Officer, [3]Assistant Director, [4] Director
National Institute of Epidemiology (ICMR), Chennai

Background: In the year 2001, Southern Orissa was affected by drought, followed by floods during July and August. Suspected food borne illnesses with high case fatality were reported from three tribal villages of Kashipur, Southern Orissa through the existing Multi Disease Surveillance System. We conducted an epidemiological review of the outbreak and assessed the nutritional status of the affected tribal community.

Methods: We reviewed all available investigation reports and medical records of the survivors and deceased and discussed with district, block level senior health officers, local health staffs regarding the outbreaks. We developed a questionnaire and conducted a field survey. We collected epidemiological data from the survivors, the neighbours and the community members in all the affected villages, which was followed by a nutritional survey.

Results: Unusual number (n=23) of cases was reported from three tribal villages within a month. The clinical presentation was a mix of upper gastrointestinal and neurological symptoms and signs. The incubation period was within 4 to 24 hours. In each of the villages cases were clustered in a single family. All ages and both sexes were affected.

Case fatality was 16 (69%). All victims had history of taking food prepared of mango kernel just before the onset of illness. District administration disposed of stored mango kernels from the households, supplied rice and implemented food for work programme. However according to the nutritional survey, nutritional status had no relationship with the consumption of mango kernel.

Conclusion: The outbreak could be due to presence of lethal food toxins. Available laboratory facilities in the State could not confirm the food toxins. Food surveillance with strong laboratory backup support is needed to prevent such outbreaks in future.

[Presented at Epi conference of National Institute of Epidemiology , Chennai, December 2002]

Abstract:3

Overview of Multidisease surveillance system in Orissa State, India

Pradhan M.M,Gupata M, Gupte MD

Background:
Orissa is a resource poor state situated in east coast of India. It is prone to natural disasters and communicable diseases are major problem of the state.

National Surveillance Programme for Communicable Diseases (NSPCD) has been initiated in India in 1997-98, which is now operational in 100 districts in country. Currently, "The Integrated Disease Surveillance Programme" (IDSP) which includes both communicable and non-communicable diseases is being considered for implementation in a number of states.

Government of Orissa has established the Multi Disease Surveillance System (MDSS) after the super cyclone 1999, integrating with the existing public health system to pre-empt the epidemics of communicable diseases with the initial support of international agencies.

Methods:

Experiences of author who is personally involved in implementation process, of MDSS, studying the official documents, visiting state disease surveillance cell and some

surveillance-reporting units, discussion with programme implementers of Government and supporting agencies.

Result:

The system is now operational in all the 30 districts of the state covering all the 314 blocks [5927 sub-centres, 1166 Primary Health Centres (New), 183 Primary Health Centres, 158 CHCs (Community Health Centres)], and 53 sub-divisional, area and district headquarter hospitals, all under the jurisdiction of the Director of Health Services (DHS). The flow of information in the system is more than 90% of reporting units sending timely and complete reports every week to the districts from February 2002 onwards and the system has made a significant change in the way disease incidence data is collected, compiled, transmitted, analysed and used for intervention in a timely manner.

MDSS now gets 90 % support from the Govt itself.

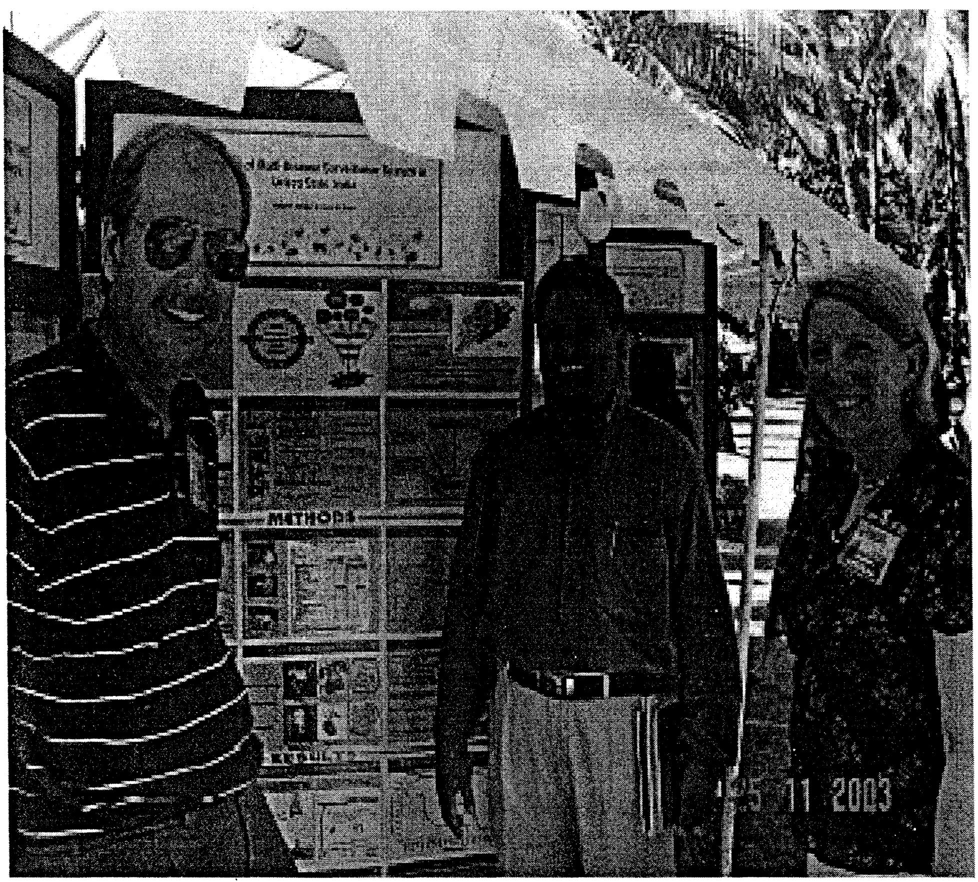
Conclusion:

MDSS is evolved out of a disaster situation. It is possible to make a multi disease surveillance system sustainable and operational without interruption in a resource poor state. In the context of implementation of IDSP in the country, MDSS of Orissa state has great relevance to be shared with public health planners and decision makers.

Poster presentation at Second South East Asia and Western Pacific Bi-regional Tephinet Conference, Manila. , Philippines

24-28 November 2003

Overview of Multidisease Surveillance System, Orissa State, India



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