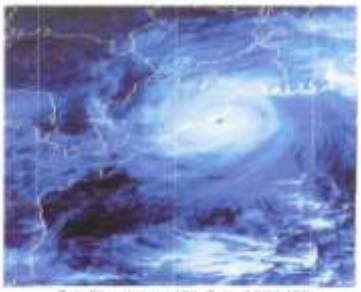


Satellite picture (29 Oct., 0930 IST)
of 1999 Orissa Super Cyclone

DISASTER MANAGEMENT AND MITIGATION PLAN

2013

DEPARTMENT OF HEALTH & FAMILY WELFARE,
Government of Odisha

PREFACE

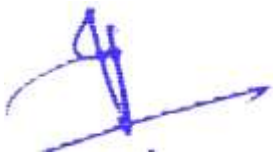
The Disaster Management Act 2005 mandates to lay down policies, plans and Guidelines for disaster management and for ensuring timely and effective response to disasters. The relief centric approach in the past years have shifted its focus to more proactive approach in a coordinated manner within a framework of timeline to achieve the goals.

Odisha is perennially affected by natural disasters like flood, cyclone, heat wave conditions & infectious disease outbreaks. I am pleased to present this guideline on Disaster Management & Mitigation plan which is more relevant, practical and user friendly. The experience over the past years made us realize that the one guideline is essential to guide our health managers at district and sub district level. Thus to deliver improved health services in a coordinated manner, this will support them in implementing the programme components in tandem with related deptts. in the community during disaster. The consortium of efforts will result in reduction in avoidable loss of life and suffering of the people.

I take this opportunity to express my thanks to all who have extended their cooperation in formulating the guidelines.

Bhubaneswar

August 2013



Principal Secretary,
Health & Family Welfare Deptartment,
Govt of Odisha

ACKNOWLEDGEMENT

I would like to thank the members of Core Group and the extended core group whose support has resulted in these guidelines on disaster management and mitigation plan.

I would like to place on record the significant contribution made by Dr. Bikash Patnaik, Joint DHS (PH), Dr. S. K. Swain, Deputy DHS (SS& ME) and Dr. Prameela Baral, Deputy DHS (IDSP) in developing the guideline for Disaster Management and Mitigation Plan for Odisha.

The efforts of Shri H. K. Behera, IAS, Addl. Secy. to Govt. Health & F.W Deptt., Director Public Health I/C, Shri Sibanarayan Sahu, Under Secretary to Govt., H&FW Deptt., Dr.Bijay Ku Swain, Jt DHS(SHRMU), Dr. Bishnu Mohapatra, Deputy Director, Nutrition, HRD Manager-NRHM, Mrs. Mithun Karamakar, Sr. Consultant-NRHM(M&E), Shri Guru Prassad Ratha, IT Consultant-NRHM, Shri Debasis Sahoo, Programme Asst, Shri Sisir ku Grahacharya, Consultant UNFPA and Dr. Tattwamasi Bharadwaj respectively for their technical inputs to the core group is highly appreciable.

I am happy to acknowledge the support and cooperation of Dr. Sarbeswar Satpathy, Shri Subhashish Jena, Shri Basanta Ku Swain, Mr. Sudhansu Sekhar Nayak of SSU, IDSP in compilation of the guideline.

Bhubaneswar

August, 2013

Director of Health Services,
Odisha

ACRONYMS

ADD	Acute Diarrhoeal Diseases
ADMO(PH)	Assistant District Medical Officer (Public Health)
ADMO(Med)	Assistant District Medical Officer (Medical)
ADMO (FW)	Assistant District Medical Officer (Family Welfare)
AIDS	Acquired Immuno Deficiency Syndrome
ASHA	Accredited Social Health Activists
AWW	Anganwadi Worker
ANM	Auxiliary Nurse & Mid-Wife
CDC	Centre for Disease Control
CDMO	Chief District Medical Officer
CHC	Community Health Sub Center
CNS	Central Nerves System
DHH	District Head Quarter Hospital
DHS	Director of Health Services
DMO	District Malaria Officer
DNA	Dioxy Ribo Nuclic Acid
DPH	Director of Public Health
DPM	District Programme Manager
DSMO	District Surveillance Medical Officer
DSU	District Surveillance Unit
DTO	District Tuberculosis Officer
ELISA	Enzyme Lined Immuno Sorbent Assay
FP	Family Planning
FRU	First Referral Unit
GKS	Gaon Kalayan Samiti
GoI	Government of India
H& FW	Health & Family Welfare
H & UD	Housing & Urban Development
HAZMAT	Hazardous Material
HEPA	High Efficiency Participate Airfilter
HIV	Human Immuno deficiency Virus
IDSP	Integrated Disease Surveillance Project
ICMR	Indian Council of Medical research
IPD	In Patient Department

L Form	Reporting format for Laboratory
MO	Medical Officer
MCH	Medical College & Hospital
MISP	Minimum Initial Service Package
MPHS	Multi-Purpose Health Supervisor
NCDC	National Centre for Disease Control
NDMA	National Disaster Management Authority
NRHM	National Rural Health Mission
NVBDCP	National Vector Borne Disease Control Programme
OSDMA	Odisha State Disaster Mitigation Authority
OPD	Out Patient Department
ORS	Oral Rehydration Solution
P Form	Reporting format for Health Facility
PAPR	Powered Air Purifying Respirator
PCR	Polymerase Chain Reaction
PHC	Primary Health Centres
PRI	Panchayat Raj Institution
RD	Rural Development
RMRC	Regional Medical Research Centre
RRT	Rapid Response Team
RWSS	Rural water Supply & Sanitation
SDH	Sub Divisional Hospital
SRH	Sexual & Reproductive Health
SC	Sub Centers
S Form	Reporting format for Sub Center
SEB	Staphyloccal entertoxin B
SSU	State Surveillance Unit
School & ME	School & Mass Education
SSU	State Surveillance Unit
SIHFW	State Institute of Health & Family Welfare
STI	Sexually Transmitted Infection
USA	United State of America
V. Chloerae	Vibrio Chloerae
VEE	Venezuelan Equine encephalomyetities
WCD	Women and Child Development
WHO	World Health Organization

CONTENTS

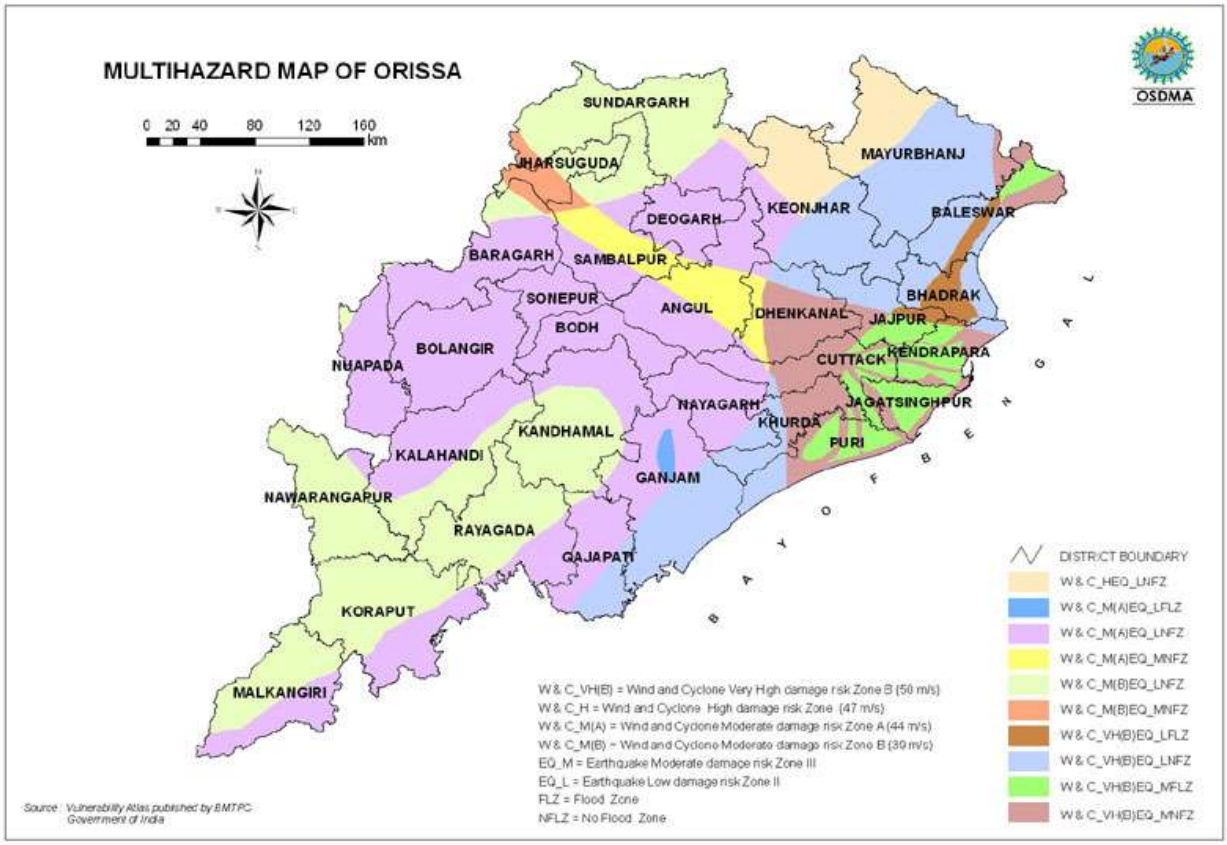
CHAPTER1: DISASTER MANAGEMENT & MITIGATION PLAN

1. Introduction

The State of Odisha is located between 17^0 48' 'N and 22^0 35' N latitudes and 81^0 47'E and $87^0$32' E longitude and spreads over an area of 1, 55, 707 Sq kms with a forest cover of 58,136.23 Square kms. located in the eastern coast of India. It is bounded by Jharkhand on north, West Bengal on the Northeast, Chhattisgarh on the West, Andhra Pradesh in the south and the Bay of Bengal in the east. It is bounded by Bay of Bengal on the East (with a coastline of about 480 Kms). The Natural hazards like Flood/Cyclone/drought/heat wave etc. which leads to diseases, disability, injuries and deaths in the community. Frequent occurrences of natural calamities also stand as a barrier to overall progress in the state.

Natural disasters are common in Odisha due to its specific geo-climatic condition that makes the state vulnerable for Flood, Cyclone, tornadoes, epidemics, drought and Heat wave. Odisha is the fifth most flood prone State of the country followed by Uttar Pradesh, Bihar, Assam & West Bengal. The southwest monsoon brings heavy rainfall within June to August every year with run off to excess to its normal channel capacity a river attains at flood stage causing enormous damage to the life and property.

Map Showing vulnerability of Odisha to different Types of Natural calamities



1.1: STATE PROFILE

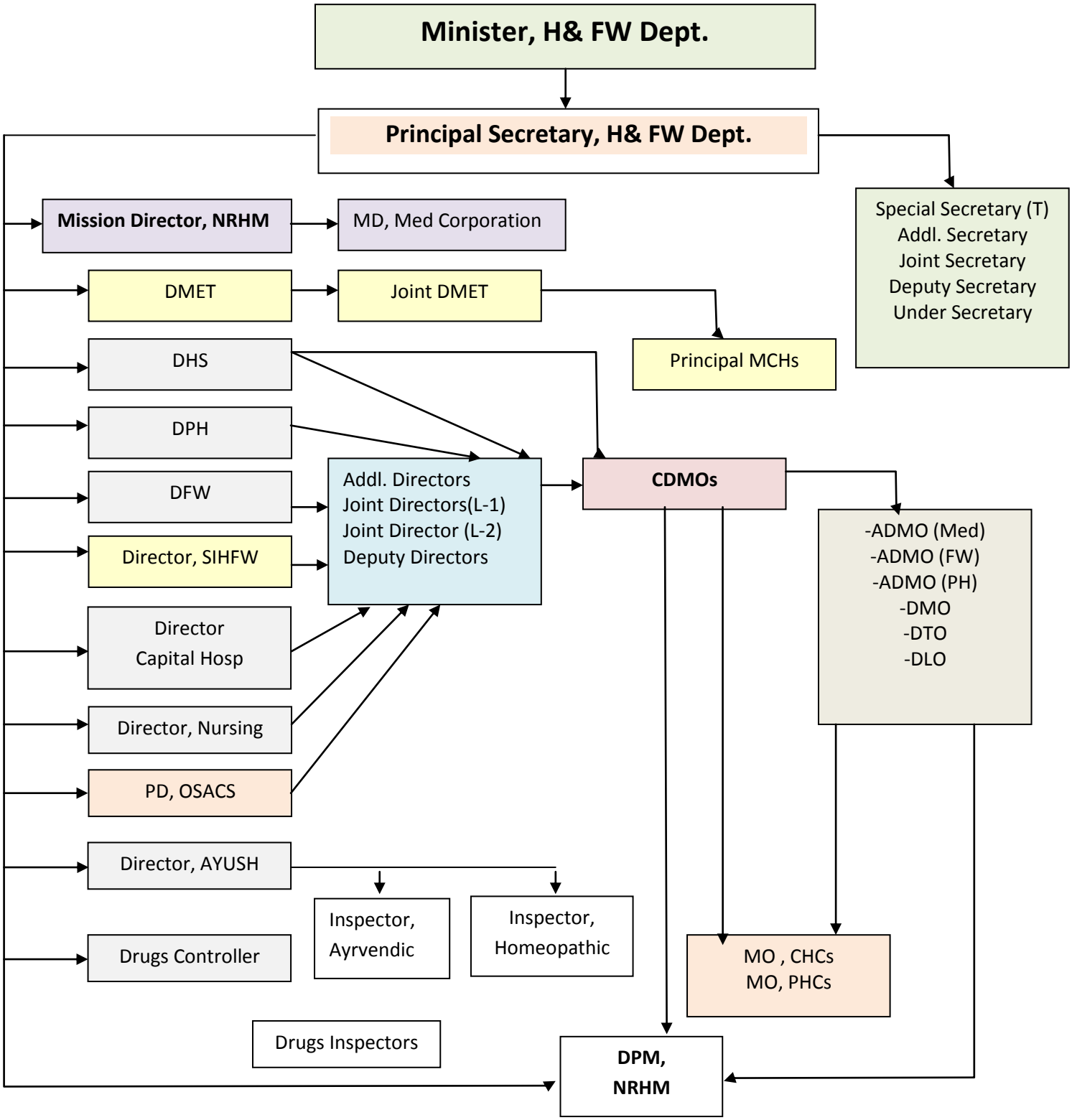
Date of Creation of Odisha State	1st April 1936
State Capital	Bhubaneswar
Geographical Area	155,707 square kms
Forest cover(total)	58,136.23 Sq. Kms
No. of Districts	30
Urbanization Ratio	14.97%
Religion	Hindu, Muslim, Christian and Buddhist
Official Language	Oriya
Temperature	Max 48^0 C (summer); Min 0^0 C (winter)
Annual average rainfall	150 cm
Population (2011) - Male - Female	41947358 21201678 20745680
- Rural - Urban	34951234 6996124
Sex Ratio	978 Females per 1000 Males
Decadal Growth Rate	13.97%
Density of Population	269 per Sq. Km.
District Population (2011 Census) - Highest (Ganjam) - Lowest (Deogarh)	 35,20,151 312164
Total Literacy Rate	Total: 73.45% Male: 82.40% Female: 64.36%
Highest Literacy Rate (Khurda)	87.51%
Lowest Literacy Rate (Malkanagiri)	49.49%
No. of C.D. Blocks	Total: T314 Tribal: 118 Non-Tribal: 196
No. of Tahasils	314
No. of revenue villages	51313
No. of Towns	223
No. of Panchayat	6235
No. Of Urban Local bodies	103
No. Of GKS	45490
No. Of ASHAs	43060
No. Of AWWs	60918

1.2:DEPARTMENTAL PROFILE

No. of Medical College and Hospitals (Government)	3
No. of District Hospitals (Capital Hospital & Rourkela General Hospital)	32
No. of Sub-Divisional Hospitals	27
No. of Community Health Centres	377
No. of Other Hospitals	79
No. of Primary Health Centres (N)	1226
No. of Rural Family Welfare Centres	314
No. of Urban Family Welfare Centres	10
No. of Postpartum Centres	79
No. of Sub-Centres	6688
No. of Health Posts (Revamping) (Bhubaneswar, Cuttack & Rourkela)	3
No. of Health & Family Welfare Training Centers (Cuttack &Sambalpur)	2
No. of Rural Health Centres (Jagatsinghpur, Attabira & Digapahandi)	3
No. of A.N.M. Training Schools	16
No. of G.N.M. Training Schools	7
No. of M.P.H.W.(Male) Training School	3
No. of Ayurvedic Hospitals	5
No. of Ayurvedic Dispensaries	619
No. of Homoeopathic Hospitals	4
No. of Homoeopathic Dispensaries	a
No. of Unani Dispensaries	9
No. Of Urban Local Bodies	103

Departmental Profile – Human resources

Human Resource Status as on July, 2013			
Category	Sanctioned	In position	Vacancy
Medical Officers	4362	4042	320
Staff Nurse	2124	1872	252
Laboratory Technicians	843	635	208
MPHS(M)	1597	1272	325
MPHS(F)	1128	953	175
Pharmacist	1945	1865	80


Minister, H& FW Dept.
Principal Secretary, H& FW Dept.
Special Secretary (T)
Addl. Secretary
Joint Secretary
Deputy Secretary
Under Secretary
Mission Director, NRHM
MD, Med Corporation
DMET
Joint DMET
Principal MCHs
DHS
DPH
DFW
Director, SIHFW
Addl. Directors
Joint Directors(L-1)
Joint Director (L-2)
Deputy Directors
CDMOs
-ADMO (Med)
-ADMO (FW)
-ADMO (PH)
-DMO
-DTO
-DLO
Director
Capital Hosp
Director, Nursing
PD, OSACS
Director, AYUSH
Inspector,
Ayrvendic
Inspector,
Homeopathic
Drugs Controller
MO , CHCs
MO, PHCs
Drugs Inspectors
DPM,
NRHM

CHAPTER 2: HAZARD ANALYSIS & VULNERABILITY MAPPING

Year	Nature Of Disasters	Entity	Stimulus	Outcome
2001 2006 2008 2011	Flood	Vulnerable Districts(GPs& Villages) in flood prone areas	Submergence, Flash Floods, coastal flood/urban floods/Heavy rains/ cloud bursts, breach of embankmentetc	2008- 18 districts, 89 blocks,734 GPs,3703 villages 2011- 29 districts, 178 blocks,1902 GPs, 9260 villages were affected with damages to Health Institutions, loss of property & life
1999	Super Cyclone	Vulnerable Districts(GPs& Villages) along the coastline	Submergence in coastal tracts, Saline inundation, Hail storm, Heavy wind, storms,	Mass Casualty Incident, Post traumatic disorders, waterborne disease outbreaks, damage to property &Health institutions, disruption of communication system
1999-2012	Heat wave	Vulnerable Districts(GPs& Villages) in Western Odisha	High rise of environmental temperature	Heat stress Disorders, disability &Loss of Lives
	Disease Outbreaks & Epidemics	Anywhere in the state	Contaminated water & food, Zoonotic disease outbreaks	Loss of lives, disability
	Drought	Southern & Western Odisha	Less food produce	Nutritional deficiency disorders
	Earth quake	Seismic Zones	Waves & shock	Mass Casualty Incident, Post traumatic disorders, waterborne disease outbreaks, Extensive damage to property &Health institutions
	Tsunami	Coastal belt of Odisha	High Tides	Extensive loss to Lives And Property
	Pest attacks	Pest attack in endemic areas, Migratory pest attack (eg.,- Locust),	Reduction in yield and quality of produce	Extensive loss of crops leading to food shortage and nutritional deficiency
Man made	Accidents	Road Traffic Accidents, Burn accidents	Multi factorial (speedy driving, Stampede, Over-crowding, Mass Gathering, fairs & festival, collapse of dilapidated buildings, bridges, Train accidents)	Extensive loss to Lives And Property
	Spurious liquor and drug tragedy	At any place	Adulteration of Liquor/drugs	Extensive loss to Lives, disability, PTSD
	Chemical or Gas leaks/ poisoning	Industrial areas	Ash pond leakage, industrial waste	Respiratory distress, Acute emergency conditions and loss of life, Flurosis, Skin Diseases
	Others(Explosions/ train derailment/ Air Crash/ Bio-terrorism / wars/ civil unrest/ radiation leak	At any where		Mass Casualty Incident, injury, death disability, PTSD Extensive loss to properties

Flood Scenario Of Odisha

Five major rivers of Odisha Mahanadi, Brahmani, Baitarini, Subernekha,and Rushikulya and their branches have the potential of causing severe floods in their delta region. The rivers like Vansadhara & Budhabalanga also cause flash flood due to sudden run off from its hilly zones. Basing on the data of actual damage, flood prone areas of the state has been assessed as 3.34 Million Hectares out of the total arable land of 6.165Million Hectare. An average annual damage (during 1972-2010) by flood is Rs.105.00 crores.

Rainfall combined with the factors of the flow of water from western part of the state, upper catchment areas of neighbuoring states of Jharkhand and Chhattisgarh, flat coastal belt of poor drainage, high degree of siltation of the rivers, lack of upper catchment area, want of embankment treatment, breaching and spilling over the embankments causes severe flood in the river basin and delta areas. The vulnerability to flood is heightened due to high population density; encroachment of the flood plains, poor socio economic condition, weak infrastructure and mud houses. The State has experienced high flood during the year 2001, 2003, 2006, 2008 & 2011.

CHAPTER 3:Plan of Action by the state for management of Flood/Cyclone/ Epidemics/Heat Wave for the year 2012

State preparedness for flood starts in the month of April each year ahead of monsoon like all other related departments for activities like:

3.1:Experience with Disasters &Preparedness at State level 2012

- One high level meeting conducted under the chairmanship of Hon'ble Minster of H&FW on 30.06.12 to review waterborne and vector borne disease situation & plan further course of action for preparedness in 2012.
- Chief Secretary, Odisha convened a video conferencing of the Collectors & District Magistrates of high focus districts on 06.07.12 to sensitize them about Waterborne and Vector Borne diseases and instructed them to undertake necessary preventive measures during the monsoon season.
- One high level meeting convened under the chairmanship of Hon'ble Minster of H&FW on 9.7.12 where Hon'ble Ministers of Forest & ARD / Hon'ble Minister of Panchyati Raj & Secretaries of other Govt. Departments like H&UD/ PRI/ Forest/Works/ W&CD/ ST&SC / Education etc. were present to discuss regarding Multi-Sectoral approach on waterborne and vector borne diseases that commonly occur during monsoon & post monsoon period.
- Commissioner-cum Secretary, H & FW communicated to the Collectors & District Magistrates regarding preventive measures to be undertaken for water borne diseases during monsoon and post monsoon.
- One State level Technical Task force meeting is being held on 17th of each month to review and assess the current status of Waterborne & Vector Borne diseases and plan further activities during occurrence of outbreaks.

- One Multi Sectoral meeting convened on 5.10.12 under the chairmanship of Hon'ble Minister of Health & family welfare of other line Deptts. like PRI/RD/H&UD/WCD/ST&SC/School & Mass Education etc to explore modalities for inter sectoral convergence on preventive measures for outbreaks/disasters.
- The State Surveillance Unit, IDSP assumes responsibility of State Health Control Room during disaster (Flood, Heat Wave, Cyclone etc) in addition to its regular responsibility of disease surveillance/outbreak response.
- It functions from March 1st or Heat Wave, June 1st till Oct 31st for flood & other disasters.
- Daily print & electronic media scanning undertaken at State level and daily situation update after due investigation is shared with Health Secretary, Minister of Health & FW, MD NRHM,DHS/DPH(O), RD ROH&FW,PRO higher & lower stake holders.
- Guidelines & protocols of treatment shared with all the districts.
- During 2012, out of 354 rumours received, 257 outbreaks were investigated by RRT teams at district & sub district level

3.2 Information, Education and Communication / Behavioural Change Communication

- IEC/BCC activities intensified through Electronic / print media/outdoor display media
- One Health Awareness Campaign conducted from 1st to 15th August 2012 to upscale health awareness of the community through – Dengue, diarrohea, Malaria(Nidhi Ratha), Folk arts, jatras & video shows.
- District level activities such as disinfection measures, case management and referral facilities, IEC/BCC activities, resource allocation, preposition of anti diarroheals, ORS, Halazone & bleaching powder are being prioritized in district reporting cases and deaths. GKS are being involved at village level for community ownership.
- Sensitization meetings of DSOs/ MOs/MPHS/DM/DEOs were conducted to improve surveillance and outbreak response activities.
- Demonstration of Hand washing procedure conducted for 25 tribal schools in each district in the month of August to upscale health awareness among students.
- Sensitization of health service providers regarding imparting health education on safe drinking water, personal hygiene, environmental sanitation, disinfection of drinking water sources etc.

3.3 District Level Response

- Control Rooms 24X7 in place from 1st June - Oct 31st in ADMO(PH) Section.
- District Rapid Response Teams (30) functioning under the leadership of ADMO (PH) at District level. The team comprises of clinicians, pathologists, Epidemiologist, PHEIO, and Pharmacist – in Charge & HQMPHS.
- Block Rapid Response Teams (377) are kept in readiness under the leadership of Block Medical Officer comprising of PHEIO,2nd MO, Pharmacist, Lab Technicians, MPHS, MPW etc to address any disaster.

- 14000 GPs in 190 blocks of 21 districts identified as hazard-prone areas for preparedness, response, monitoring & effective supervision during emergency.
- Micro-plan of all 30 districts for response to Flood/Cyclone/epidemics available with the state Surveillance unit.
- Casualty Services are being provided at 30 DHQs, 27 SDHs, 377 CHCs, Three Govt. Medical College Hospitals, Capital Hospital, BBSR & RGH Sundergarh to ensure early case management & timely referral.
- 150 Mobile Health Teams, 950 Medical Relief Centres(MRC) have been identified to be made functional during time of emergency.
- More than 181 ambulances, 109 motorboats, OEMAS ambulances have been identified for transport of cases to the nearby hospital as & when required.
- The Camp site expenditure of MRC, mobility support for mobile health teams will be met from earmarked funds for disaster response from NRHM.
- Additional Drugs & logistics will be procured by the districts as per need of the situation following the procurement guidelines.
- Deployment of staffs from within and outside the districts will be undertaken as per need of the local situation by the concerned CDMOs during disasters.
- At present 1246 Mobile Health units work at strategic places for case management, early referral, monitoring of preventative disinfection measures & other IEC/BCC activities.
- While triaging at Medical Relief Centers, early case referral to appropriate health facility site will be done by the concerned treating physician/surgeon to prevent delay if the situation arises.
- Prepositioning of drugs, logistics, disinfectants& other supplies are being done at ASHA/SC, PHC(N), CHC/SDH/village volunteers level since the month of May.
- State Drug management unit is functional at State and district ware house at district level to maintain the drug inventory status.
- Mapping for Disinfection of drinking water sources in flood affected areas have been completed by the district teams. Preventive maintenance & preventive disinfection of Tube-wells by RWSS is being done from the month of April onwards.
- Additional Safety measures like motorboats, life jackets, VHFs etc are in place at district level.
- Inter-Sectoral Coordination meetings with related departments conducted to review , assess & further Plan for preparedness and response.
- Districts are divided into zones for sending samples of Blood, Stool & water for laboratory testing at three State Referral laboratories.
- Daily Reports are received about flood situation/health events/unusual events at District Surveillance units (DSUs) and further transmitted to State Surveillance units(SSU)
- Guidelines & protocols of treatment shared with all the CHCs before the monsoon to keep them in readiness.
- At district level the district health officials prepare their action plan and submit the same to their respective District Magistrate & Collectors and this is placed in the natural calamity relief meeting.

3.4 Human Resources & Training Epidemic Preparedness & response

- One State Surveillance Unit (SSU) and 30 District Surveillance units (DSU) are functional with IT personnel, Hardware, Software & Video Conferencing set up.
- IDSP unit functions under the administrative control of State Surveillance Officer (SSO) and ADMO (PH) at district level in all the 30 districts. In addition to this 30 District Surveillance Medical Officers, 21 Epidemiologists, 2 Microbiologists are trained and placed at SSU & DSU for monitoring and supervision of IDSP components at district & sub district level.
- 31 Data Managers and 36 Data entry operators are trained & placed at state and district level for data collection, compilation, analysis and onward transmission for report generation and follow up action.
- Additional man powers such as Consultant Training, Epidemiologists, Microbiologists, Entomologist expertise is being utilized for strategic planning of programme components at state & district level.
- 2265 MOs, 54 Lab technicians, 12754 paramedical staffs, 28 ADMO (PH) in FETP courses, 149 (Spl in Paed. & Spl in Med.), 90 Medical Officers of three medical Colleges, 14Epidemiologists have been trained in Disease Surveillance & out break Response & management since 2008-09.
- State Surveillance Unit, District Surveillance Units & 3 Govt. Medical Colleges& hospitals of the state have been identified as training centers for IDSP.

3.5 Disease Surveillance

- From 8815 reporting units, Surveillance reports on selected diseases of public health importance are compiled and transmitted from Sub Center level to the State level on fixed days every week.
- Disease surveillance units that report on weekly basis include 1745 health facilities [CHC (377) + SDH (27) +DHH (32)], 6688 Sub Centers & 382 laboratories.
- These reports are received in three types of reporting formats – 'P' format from Health Facility, "S' format from Sub Centers, "L" format from Laboratories.
- Completeness of reporting in 2012:
    - Form S (Health Worker level) - >80 % -
    - Form P (Health Institution level) - > 90 %
    - Form L (Laboratory level) - > 78 %
- Timeliness of reporting: All the districts are reporting on fixed day each week. Weekly data is analyzed at district and state level to monitor the trend and detect early warning signs for impending outbreak if any.
- Guidelines on prevention & management of Acute Diarrhoeal Diseases, Heat stress disorders, Jaundice, Dengue, Measles, swine flu are circulated to districts sufficiently ahead to undertake preparedness activity by the districts during outbreaks.

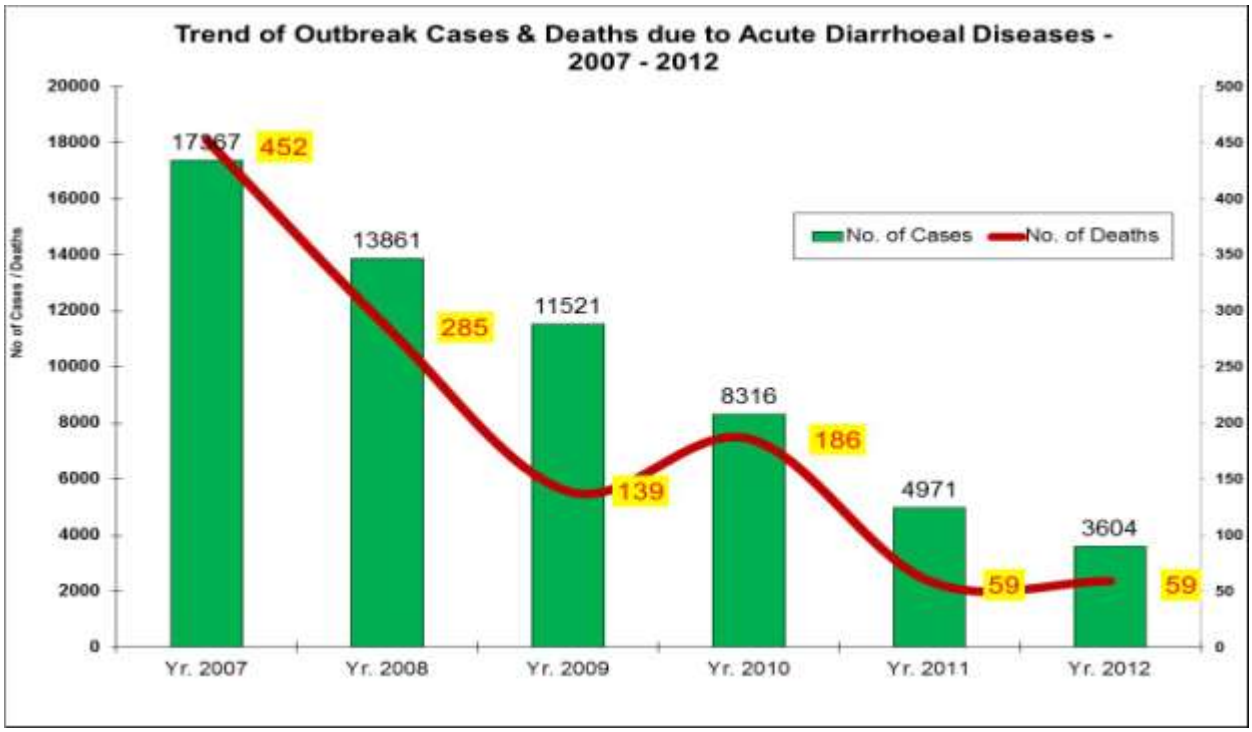
- In district like Sundergarh, Koraput, Rayagada, Nuapada, Private & Industrial Hospital are also involved in weekly disease surveillance reporting.
- Urban area dispensaries under Capital Hospital Bhubaneswar are also involved in weekly routine disease surveillance reporting.
- In 2012, in total Cases & deaths reported due to Acute Diarrhoeal Diseases is 3604 and 59 respectively. Of the total Outbreak only 38% were laboratory confirmed.

3.6 Outbreak Investigation & Response

- State Surveillance Unit functions as state health control room during outbreaks/disasters.
- One State Technical Task Force team, 31 District RRT, 314 RRT conduct outbreak investigation as per situation for immediate containment measures. Suitable samples are collected for lab confirmation at State referral laboratory, ICMR laboratories at BBSR, Kalahandhi & Rayagada for confirmation of diseases causing organisms for the outbreak.

Major Outbreak Investigated by State/District RRTs in 2012:

Type of Outbreaks	Affected Districts
Acute Diarrhoeal Diseases	Angul, Ganjam, Dhenkanal, Kalahandi, Nuapada, Nabarangapur, Baragarh).
Hepatitis	Khurda, Jagatsinghpur, Sonepur, Bolangir, Nayagarh & Baragarh
Measles	Nawarangapur, Koraput, Rayagada, Mayurbhanja, Ganjam, Deogarh
Swine Flu	Angul, Jagatsinghpur
Anthrax	Koraput, Malkangiri



3.7 Laboratory Surveillance

- The three Medical College & Hospitals, Capital Hospital, State Public Health Laboratory at Bhubaneswar, State Pathologist & Bacteriologists laboratory Cuttack, ICMR Institute (RMRC), Field unit at Kalahandi & Rayagada, District Public Health Laboratory, Koraput support the state in laboratory testing of epidemic-prone diseases as well as routine lab surveillance to confirm the diseases causing organisms.
- During 2012,129 water samples182 rectal swab samples, 5925 blood samples were collected at tested for pathogenic organisms.
- Out of which 77 rectal swab samples & 4 water samples were found positive for V. Cholerae.

3.8 Role of State Rapid Response Team

- Coordinate with Government of India, State Government and other related Departments from time to time as per demand of the situation for resources, assistance, information sharing, logistic support, Apex laboratory- support.
- Rapidly assess the magnitude of the problem, population at risk, source of infection, vehicle of transmission, probable cause of the disaster from the data available from the field and share the information with control room at state & districts.
- Assess & train the staff provide technical support to the field functionaries as & when required as per situation
- Ensure availability of funds at District and block level to meet contingency expenses.
- Plan & ensure availability of Drugs/logistic/equipments/instruments/mobility support to the district RRTs and other health service providers for response measures.
- Ensure deployment or reallocation of manpower in the affected areas of disaster as per situation demands.
- Daily Update state database about the cases & Deaths occurring during the disaster
- Develop the media messages & up to date status of disaster mitigation and response work to the control room.
- Maintain an inventory of all related guidelines, procedures, action plans, district maps and Contact numbers, financial records
- Document the lessons learnt from the disaster and share with higher stake holders

3.9 Role of District Rapid Response Team

- Coordinate with Directorate, State RRT and District Authority for needful action & instructions from time to time as per situation.
- To activate the chain of commands for disaster response plan in accordance to the protocol & guidelines available in response to early warning sign

- Rapidly assess the magnitude of the problem, population at risk, source of infection, vehicle of transmission, probable cause of the disaster and share the information with control room at district, state and CHC.
- Rapidly prepare a health aid plan and procure required resources
- Management of the overall response activities and providing hand holding support in the field
- To develop the media messages on field updates& share it with State Control room/district control room spokesperson
- To mobilize resources for response measures (Manpower /Mobility support/ drugs/ logistics/ funds/ others)
- To collect and store disaster related information for post incident analysis

3.10 Monitoring & Supervision:

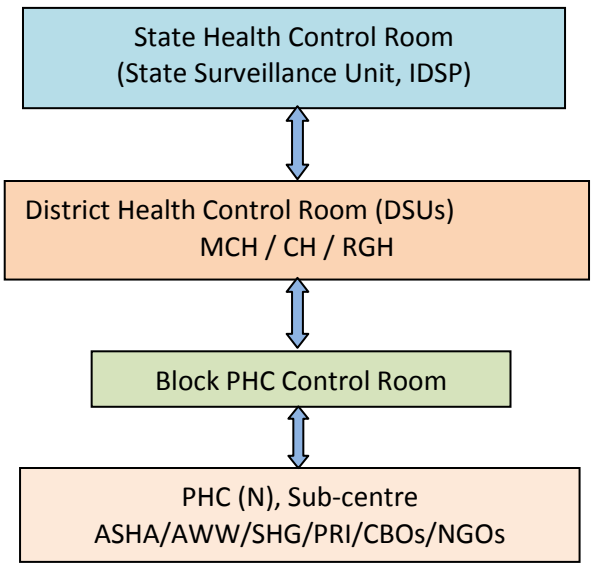
- Regular monitoring and supervision is being under taken by the State and District Officials of the different IDSP Components implemented in the field level.
- State nodal Officers are identified for all the 30 districts to monitor and supervise the ongoing preventative measures for diarrhoea in the district.
- Principal Secretary Health & FW conducts review of Water borne & Vector Borne Disease each month to assess the implemented programme components further plan for future months

CHAPTER4: CALENDAR OF ACTIVITIES IN 2013

- Multi-Sectoral approach meeting conducted under the Chairmanship of Hon'ble Minister of Health & Family Welfare on 17.04.13 regarding connectivity, safe drinking water supply, sanitation, health education activities, key informant system at village level to minimize the morbidity & mortality due to Water borne diseases & vector borne disease outbreaks.
- Sensitization meeting of State Nodal Officers of the districts conducted on 10.05.13 regarding Heat Wave Preparedness, Water borne & Vector Borne diseases
- Video Conferencing convened by Principal Secretary of all CDMOs and wing Officers on 30.05.13 for further plan for preventive measures for Heat Wave, preventive disinfection of drinking water, preposition of supplies, outbreak alerts during the monsoon period.
- SDMU Communicated on 25.05.13 for prepositioning of supplies of drugs and Logistics at district & sub District Level for anticipated disasters during monsoon months.
- Sub- Collectors of the districts are made as the nodal officers to monitor & supervise the preventive measures for waterborne & Vector-borne disease outbreaks at district level.
- State Technical Task Force action committee formed to review & assess the preparedness of districts regarding water borne diseases/ Vector borne diseases/disaster preparedness each month.

- One District Public Health Laboratory unit is functional at Koraput. Additional 2 District Public Health Laboratory will be established at Kandhamal & Mayurbhanj district shortly to strengthen Laboratory Surveillance at zonal level.
- Convergence with NVBDCP on 19.06.13 has been done for better surveillance & outbreak management of vector borne diseases.
- Proposal given to Deptt. Of Environment regarding state preparedness micro plan for Climate Changes from 2013-2017
- Proposals developed & submitted to SHRMU for pilot studies to gather evidence with regards to risk factors responsible for diarrhea outbreaks
- Booklets on roles & responsibilities of different related departments for their field functionaries have been shared with deptts. like Panhayat Raj, ST&SC development, School &Mass Education, Rural Development, Forest & Environment, H & UD, Fisheries & ARD, Works Deptt., Industry Deptt.
- State Control room Functioning since June 1st at the State Surveillance cell of IDSP to monitor the early warning signs. (EWS) Annexure attached.
- On a fixed day each month from June to October, sensitization meeting will be conducted of Zilla Parishad members/ Cooperators / Councilors/ Sarpanches for Dengue, Diarrhea, Malaria Campaign under the chairmanship of Sub- Collector, Zilla Parishad President, BDO / Panchayat Samiti Chairman.
- Rural Water Supply & Sanitation department has been communicated about preventative disinfection and preventive maintenance of the tube well.
- Prototypes of the IEC/BCC material such as hand washing, safe drinking water, use of ORS, personnel Hygiene have been shared with State Institute of Health and Family Welfare (SIHFW) and uploaded in electronic/print media to spread awareness in the community.
- In all districts the Disaster management & mitigation meeting has been completed and action plan has been submitted to the state.

Flow of Information during flood / cyclone / Epidemics



CHAPTER-5:DISASTERRISK ANALYSIS

Sl No	Hazards/Disaster	Risk
1.	Flood /Cyclone / Thunderstorm/ Flash-flood	High due to loss of life, injury, disability, waterborne& vector-borne disease outbreaks, psychosomatic disorders. Damage to health facilities, equipments, instruments, essential drugs & logistics
2.	Heat wave & Drought	HighPublic Health Importance due to climate change, Sudden rise of temperature, heat regulatory system of human unable to maintain body temperature around 37^0C. Heat Stress disorders are common following high environmental temperature. Food & water shortage during Drought, Nutritional deficiency disorders & Water borne disease outbreaks due water scarcity.
3.	Infectious disease outbreaks	High public health importance. If not contained it may lead to high mortality & morbidity in a short time.
4.	Chemical poisoning/earth quake/Tsunami/ Accidents/Others	High as Mass Casualty may occur. Department does not have adequate capacity to handle such disaster. This requires a multidisciplinary approach & hospital preparedness

CHAPTER- 6:PREVENTION & MITIGATION MEASURES FOR FLOOD/CYCLONE/DISASTERS IN 2013

Our experience of flood in 2011

During September 2011, unprecedented flood came in Mahanadi river system. There was massive devastation in district of Sambalpur, Baragarh, Sonepur, Boudh, Angul, Nayagarh, Dhenkanal, Cuttack, Jagatsinghpur, Kendrapara, Puri, Khorda, Jajpur. Besides this the state experienced floods in 2 to 3 phases in river Subarnarekha, Budhabalanga and Baitarani between July & September 2011, affecting the districts of Balasore, Bhadrak, Kendrapara, Jajpur & Mayurbhanj.

In the September 2011, floods affected 19 districts, 102 blocks, 1067 GPs, 4897 villages, 21 Urban Local Bodies and a total of 34.44 lakhs population were affected.

During 2011, 135 Medical Teams were deployed and 482 Medical Relief Centres were opened (MRCs) in the flood affected districts. Due to timely intervention & effective response there was no outbreak of water borne disease in the flood affected districts.

CHAPTER - 7: DISASTER PREPAREDNESS FOR 2013

7.1 Contingency plan for deployment of Medical/Para Medical Staff from State HQ

During disaster situation like flood/epidemic etc there is plan to mobilize in service PG students from the 3 Govt. Medical Colleges in batches of 10 for 10 days duration. Besides this in service trainee health workers (male) are mobilized from Health & FW training Center, Cuttack/ Jagatsinghpur & Sambalpur. The staffs are provided with mobility, accommodation & per diem etc. During 2011, within 24 hours staff were mobilized and placed at the disposal of the district authority and deployed in the field.

7.2 Prepositioning of supplies

Drug procurement, storage & distribution are managed by State Drug Management Unit. There are 36 ware houses in the State i.e., Central Drug Store (CDS)-1, District HQ Hospital-32 and 3 Govt. Medical College & Hospital. Buffer stock of essential drug & disinfectants are maintained at CDS, Bhubaneswar. Besides the stock & store at the field, stock position is monitored daily and supplies are sent to different district ware houses sufficiently ahead of monsoon. Besides this 20% of drug budget is placed with Chief District Medical Officers to procure essential item as per the requirement. District Authorities are instructed to preposition the supplies from ASHA onwards up-to health institutions sufficiently ahead particularly in areas likely to be partially / completely marooned.

7.3 Health Education

Contingency plan for IEC & BCC is prepared by SIHFW, Bhubaneswar particularly about use of safe drinking water, use of ORS & Halazone, personal hygiene, environmental sanitation and snake bit etc. The health messages in simple language are propagated through print, electronic & outdoor display media. Besides this, leaflets and posters etc are provided to districts for distribution and Gaon Kalayan Samiti (GKS) who have been empowered to undertake health education activities as per the requirement.

- Control Rooms in place 24X7 at State & Districts from 1st June - Oct 31st
- Daily scanning of print & electronic media & preparation of daily situation update
- Identification of Flood / Cyclone Prone areas (Hazard Mapping) & Formation of Zones for preparedness, monitoring & effective supervision
- Casualty Services & Contingency Plan for Medical Relief Centres prepared.
- List of MRCs , Casualty beds, trauma centers, blood banks, Regional diagnostic Centers, ICUs, Mobile Health Units available with SSU

- List of District RRTs/Block RRTs/ Key informants with contact numbers available with SSU
- List of district wise marooned GPs/villages available with SSU
- Positioning of ambulances, OEMAS &MHUs at strategic places during disasters have already planned
- Triaging of affected patients in each flood prone CHC and the population at risk has already been planned
- Prepositioning of drugs, logistics, disinfectants& other supplies done
- Contingency plan for deployment of staff , mobility support etc during disasters have already been prepared
- Mapping for Disinfection of drinking water sources in flood affected areas completed
- Sensitization of health service providers and health education on safe drinking water, personal hygiene, environmental sanitation, disinfection of drinking water sources etc regularly undertaken
- Additional Safety measures like motorboats, life jackets, VHFs etc contingency plan prepared and available with the state/districts
- Inter-Sectoral Coordination meetings with other related deptts conducted to address the challenges during the disaster
- Flow of Daily Reporting data about flood situation/health events/unusual events ongoing with daily monitoring of drug status. (Drug inventory report). Annexure is attached
- Micro plan for Flood/Cyclone available with State /district health officials.
- 90 Medical Officers of Medical Colleges, 14 TOTs, 600 paramedical workers of 10 vulnerable districts trained in disease surveillance & outbreak investigation & response.
- Guidelines, protocols of treatment, Standard Operative procedures for outbreak prone diseases like diarrhea, dysentery, jaundice communicated to the district and sub district levels
- State referral Laboratories kept in readiness for conducting outbreak prone diseases.
- Creation of a pool of Resource persons (TOTs) done for capacity building of health service providers.
- District level sensitization meeting on management of flood/ Cyclone/Epidemics of state/district nodal Officers conducted in the month of May.
- Disaster management & Mitigation funds are made available at district level by NRHM with Activity & financial guidelines

CHAPTER8:MASS CASULITY INCIDENT MANAGEMENT PLAN

8.1Management at Health facility Level:

During Disaster

- Assoon as any information is received regarding disaster, the CDMO immediately convenes a meeting of Disaster Committee members to discuss the different modalities of operation for the mass casualty incident.
- CDMO himself becomes the Incident Commander and coordinates all the activity from the control room located at ADMO (PH) Office. ADMO (PH) is second in command or the operation asChief in Charge supported by a team who are assigned different roles and responsibilities- transportation, store – in charge, liasioning Officer, logistic chief, planning chief etc. during any disaster with mass casualty.
- Immediately one ambulance with a team of MOs, Pharmacist, Attendant/Staff Nurse is dispatched to the site of Occurrence. Information is also sent to the nearby CHC/SDH/DHH from within or outside district to reach the spot.
- A control room is opened in the office of ADMO (Med) for all the necessary communication, case management, referral & coordination with other related deptts.(Blood bank, Radiology, Pathology)
- Control room has telephone, computer, printer, e-mail for transmission of information to the higher level and other related deptt. The list of contact numbers of Medical Officers & Paramedics of the hospital along with Police, Fire services, water, Electricity, Blood Bank, NGOs, Private Physicians are available with ADMO (Med).
- Immediately Inter Sectoral coordination is established with other related deptt. like Police, fire services Red Cross, Corporate & private hospital, ambulance services, NGOs, Voluntary Organization, Water, Electricity, Sanitation Deptt., Civil Defense, ESI, Railways, transport etc to seek their assistance
- ADMO (Med) alerts ADMO (Med)/Specialists in Surgery /Orthopedics /Anesthesia /other ancillary staffs for the emergency
- Verification of preposition of drugs/logistics/other supplies, deployment of MOs & Paramedics, status of basic life support equipments, Operation Theater are being kept in readiness.

On Site:

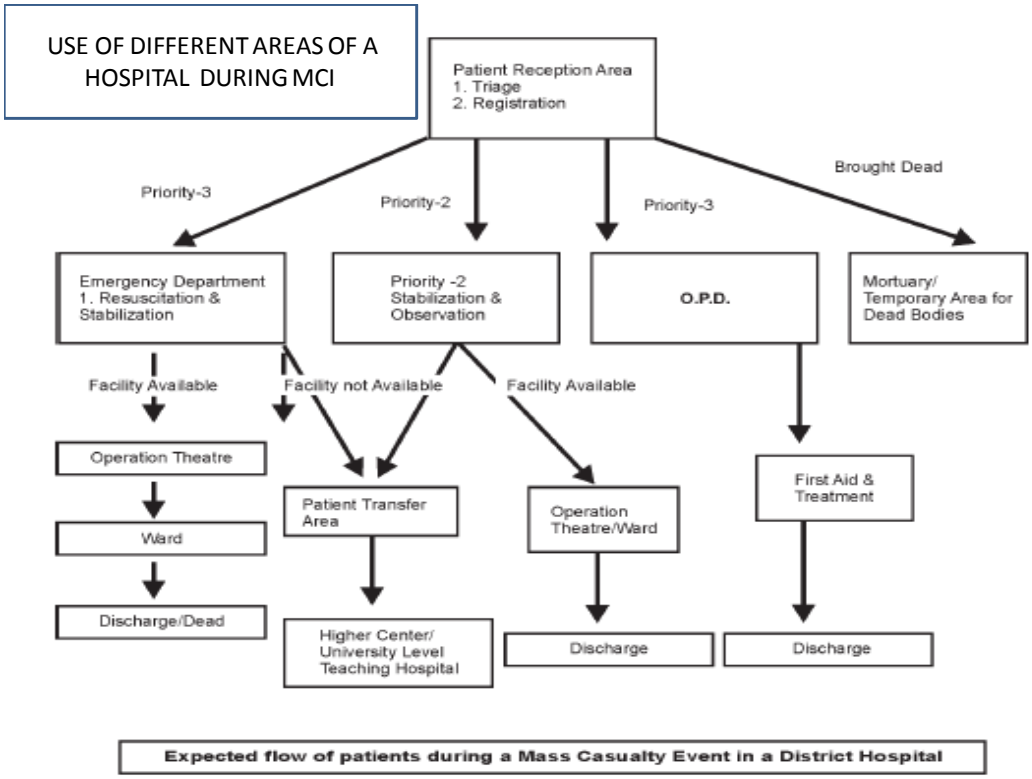
- The cases are triaged by the attending doctor on the site. The cases are screened, minor injuries are given first aid, and prioritized cases are given preliminary treatment and then referred to nearby DHQ hospital/secondary/tertiary care. This depends upon the number of casualty and site of occurrence. After further resuscitation and stabilization of the cases they are further referred to nearby accredited hospital if required.

- When the number of mass casualty are overwhelming, one Medical Relief Center is opened in a Govt PHC/ CHC/Private/School/Panchyat Office for immediate management
- Mobile Medical Units with advanced life support systems & team of Doctors are being sent to the site.
- Ambulances, 108 ambulances, other mode of transports are being used for transportation of cases to & fro & to nearby hospitals after triage at the site camp.
- The nearby CHC/SDH/DHH of parent district or neighbor district supports in triaging & transport of cases to nearby hospital for resuscitation and stabilization.

At Hospital:

- When the disaster patient arrives doctor on duty at casualty receives and attends to them. After examination the case is re triaged and send to the ward or given treatment for minor injuries and discharged or else referred to the next higher health facility if required
- The OPD /IPD Deptt. is being alerted regarding the incident and more MOs are pulled from other wards to manage the ongoing situation.
- Separate wards/beds are arranged on priority basis to address the surge of casualty
- If the Mass casualties extend beyond 24 hours, MOs are deployed from other areas within and outside the district.
- Reception area with registration facility and help desks are opened nearer to the casualty.
- Patient Resuscitation area is located in the casualty where priority 1 patients are treated and stabilized immediately.
- Patient Observation area is located in the casualty where priority patients are kept for some time before getting definitive management
- Minor Treatment area: This area is the dressing room located near the casualty where the priority 3 (walking wounded) can be managed and discharged.
- **Operation Theatre**: When disaster is declared, all the elective cases are deferred and OT is prepared for emergency victims.
- **Organization of Wards**: To vacate some Emergency ward, Surgery ward & Orthopedic ward will be required vacate some beds of elective patients by temporarily discharging them. In case some other beds are vacant, these patients can be taken up those beds.
- **Organization of the Mortuary**: The ADMO (Med)/Med Supt along with the mortuary services organizer will arrange for the preservation of the dead bodies.
- **Organization of Patient Transfer after stabilization** : Patient who cannot be further be treated are transferred to higher secondary/tertiary care hospital/accredited hospital by 108 ambulances for further treatment.

8.2 Use of Hospital during Mass Casualty Incident:



Expected flow of patients during a Mass Casualty Event in a District Hospital

8.3 Disaster Mitigation Activities- 2013:

Disaster Committee formed and further strengthened at all the Three Medical Colleges & Hospital, Capital hospital, RGH, Sundergarh and all the DHQs to review, assess and further plan for other activities quarterly.

1. **State Disaster Response Steering Committee**
   - Principal secretary to Health & FW, Govt. of Odisha- Chairperson
   - MD, NRHM- Executive Member
   - Managing Director, Drugs Corporation (SDMU) - Executive member
   - Director Health Services - Executive Member
   - Director Public Health – Nodal Officer
   - Director, Medical Education & Technology - Executive member
   - Dir. SIHFW – Executive Member
   - Dir. Nursing - Executive Member
   - Director Family Welfare – Executive Member
   - Director, Veterinary – Member
   - Additional Secretary – Executive Member
   - General Manager - OSDMA- Advisor
   - Joint Director Public Health – Member
   - Joint Director (SHRMU) – Member
   - Deputy Director (IDSP)- Member

2. Disaster Response Committee at Medical College & Hospitals:

- Director/Dean/Medical Superintendent - Chairman
- Medical Superintendent - Member
- Head of Deptts.(Surgery, Medicine, Orthopedic, Anesthesia, Neurosurgeon)
- Head of Ancillary Deptts. (Radiology, Blood Bank, Laboratory)
- Public Relation Officer
- Officer I/C Medical Store
- Nursing Superintendent
- Engineer CPWD (CIVIL)- Member
- Engineer CPWD (Elect.)- Member
- Blood bank Officer - Member
- Chief Medical Officer I/C Casualty & Transport – Member secretary

3. Disaster Response Committee at District Head Quarters Hospital

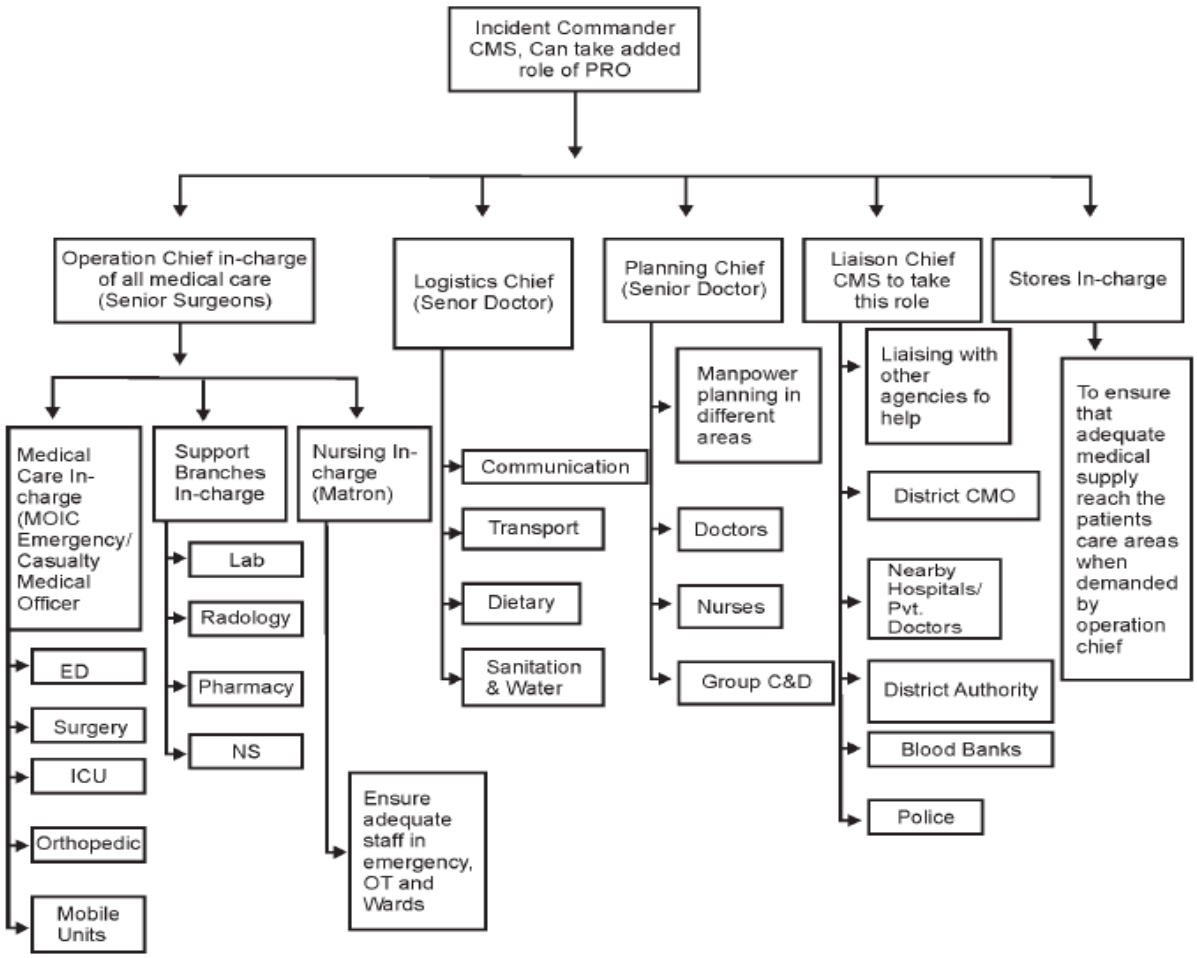
- Asst. District Medical Officer (Medical)/ Medical Superintendent
- Casualty Medical Officer
- Surgery Specialist
- Orthopedics Specialist
- Anesthetist
- Medicine Specialist
- Pediatrician
- Blood bank Officer
- Radiologist
- Nursing Superintendent
- Store Officer, Radiographer, Account Officer
- Hospital Manager

- State Health Control Room functioning in the Directorate of Public Health, Odisha. Bio Terrorism emergency Toll Free number is 1800-345-6776
- Bio Terrorism Toll free number at Central Surveillance Unit, New Delhi is 1800-11-9377 or 1075
- Control Room functioning in ADMO (PH) Office / Casualty for Epidemics/flood/Cyclones
- While Control room functions in the Office of ADMO (PH) during Mass Casualties.
- Emergency care services for mass casualty are being provided :24X7
- SOPs and Guidelines are being followed
- 30 DHQs, 27 SDHs, 3 Govt. Medical Colleges & Hospital, one Capital Hospital & One RGH are providing casualty services in the state 24X7.No. of functioning Casualty bed - 35 with1304 beds.
- Drugs & Logistic management for additional mass casualties for which Buffer stocks of medicine is made available at district level.

- 108 Ambulances are deployed at strategic places in 15 districts i.e., Ganjam, Khurda, Cuttack, Dhenkanal, Angul, Sambalpur, Sundergarh, Keonjhar, Mayurbhanj, Balasore, Bhadrak, Jajpur, Rayagada, Koraput & Puri
- Additional makeshift beds are arranged at all levels of hospital to accommodate the surge of casualty.
- Inter-sectoral coordination established with other related deptt. like Police, Civil Defence, armed forces, Red Cross, Railway, Corporate & private hospital, ambulance services, NGOs, Voluntary Organization, RD, H&UD, PRI Deptt. Water, Electricity, Sanitation Deptt. , during emergency.
- There are 81 blood banks functional in the state with additional 28 nos. of blood storage units. There is provision of e-blood bank services to know the status of blood in each blood bank during the time of need. The Toll Free Number for e blood bank is 1800-345-7777
- Accredited Hospitals/Accredited Laboratories are in place for case management and laboratory diagnosis.

8.4

Figure below shows the model incident command structure for a district level hospital.



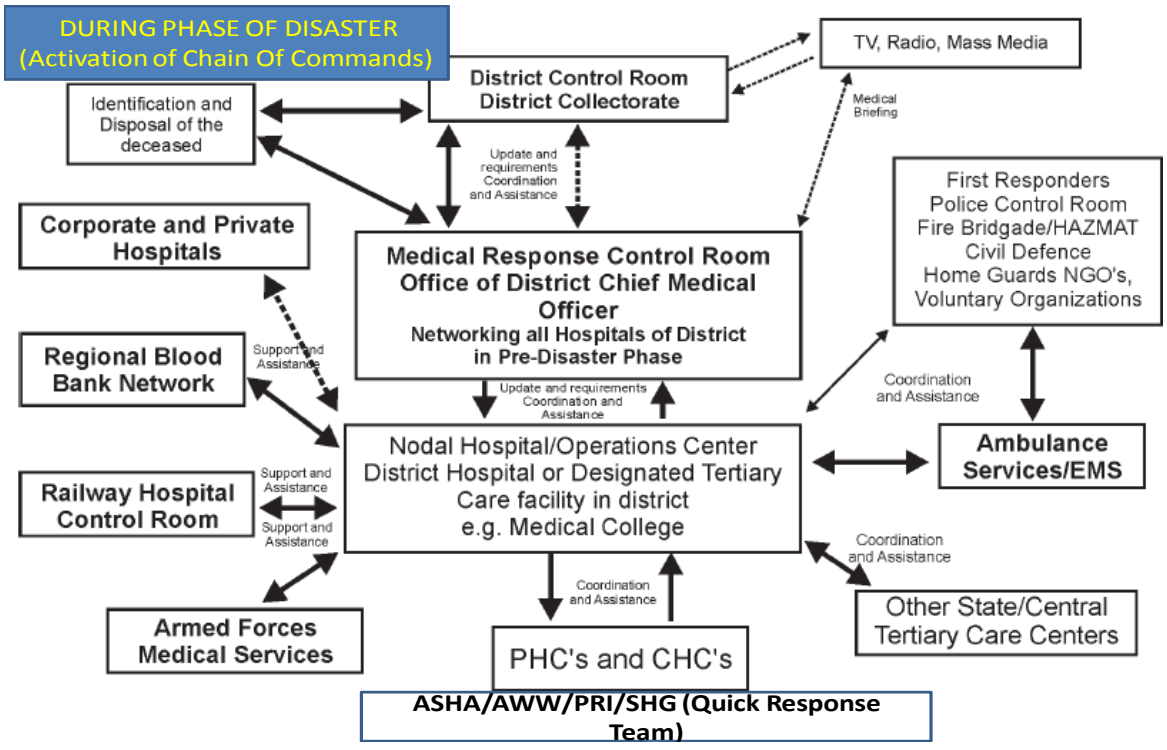
8.5 Operational Planning:

Area	Person responsible / logistics	Work assigned
1.Registration area/ Triage Area	-Registration Officer on desk -Triage Doctors/Nurses - Adequate # MOs in Emergency room - Adequate trolleys/stretchers/wheel chairs - Hospital attendants	- Registration of case - Screening by Triage Criteria (1,2,3)
2.Emergency Deptt	- Casualty MO/Doctor in Charge - Oxygen, IV Fluids, lifesaving drugs	Emergency case management
3.Definitive Care(O T s, WARDS)	Surg Spl/Ortho Spl/Neuro Surg/Cardiac Surg/other clinicians	Case management
4. Intensive Treatment area Activation(ICUs)	Head of Anesthesiology/Critical Care/Medicine	Case management
5.Minor Treatment Areas	Nurses, attendants familiar with first aid, splinting & dressing	First Aid
6. Holding areas for relatives/Non injured	Social service providers/NGOs/CBOs	
7. Decontamination Area	If needed as per Protocol	
8. Essential ancillary services (Lab, Radiology, Pharmacy, radiology services, blood bank	-Deployment or reallocation of radiographer Lab Tech, Pharmacist/ nursing staff from Other non-affected areas	
9.Mortuary Service	Mortuary In Charge, & a forensic Personnel	-Dead body preservation (DOA),Disaster tagging -Record maintenance
10. Hospital Dietary System	Kitchen staff	Diet Provision to ambulatory in house patients
11. Sanitation Services	Ward attendants/Sweepers	Clean hospital linen, sterile dressing
12. Hospital Laundry & Sterile Supply	Laundry in charge	Clean hospital linen, sterile dressing
13. Water/electricity	Public Health Engineering Deptts. Electricity Department	Maintenance of Water & Electricity Supply
14 Staff education & trg.	MOS,ADMO PH, State Health officials	
15. Disaster drills		

8.6 Emergency Response in first 24 hours:

Immediate (0-2 hrs)	Intermediate Response (2- 6 hrs) Rapid Assessment	Intermediate Response (6-12 hrs)	Extended Response (12-24 hrs)
State technical task force meeting	Health surveillance systems	Collection and analysis of information available through health surveillance and laboratory systems	Address mental and behavioral health support needs
Assessing the magnitude of impact	Laboratory functionality	Prepare and update information for shift change and executive briefings	Prepare for transition to extended operations or response disengagement
Resource mapping	Population at risk including vulnerable population	prepare for state / national / international assistance	
Sharing of information with other concerned departments (RD, H&UD, PRI, School & ME, W&CD, Revenue, Food & supplies, RWSS, OSDMA, Civil Defenses, Red Cross, UNDP, Surface transport, National Org).	Coordinating risk communication messages, Networking with other hospitals/agencies, Health related volunteers	Assess and acquire health resources as per need	

8.7 Activation chain of Commands:



8.8 Hospital Evacuation Plans & Guidelines during Disaster:

1. Purpose:

Evacuation - the removal of patients, staff and/or visitors in response to a situation which renders any medical facility unsafe for occupancy or prevents the delivery of necessary patient care.

2. **Policy statements**

- **Partial Evacuation** - patients are transferred within the hospital.There are two levels of a partial respnse

1. Horizontal - first response; patient movement occurs horizontally to one side of a set of fire barrier doors.
2. Vertical - movement of patients to a safe area on another floor or outside the building.

This type of evacuation is more difficult due to stairways which will require carrying of non-ambulatory patients; elevators cannot be used.

- **Full Evacuation** : Patients are transferred from Hospital to an outside area,other hospital or other alternative areas
  - Paramedic escorted patients will be diverted from the Emergency Department due to internal disruption.
  - The building should be evacuated from the top down as evacuation at lower levels can be easily accelerated if the danger increases rapidly.

3. Responsibility

- Authorization of Evacuation –

a) Evacuation of the facility or portion thereof can only be authorized by:

1. Public Safety Officer (Fire or Police)
2. Chief Executive Officer or Administrator on call
3. Nursing Supervisor

b) The decision to evacuate from unsafe or damaged areas shall be based on the following information

- The Engineering Department's evaluation of the utilities and/or structure of the department.

- The medical staff and/or Nursing Department's determination whether adequate patient care can continue

- Evacuation should only be attempted when you are certain the area chosen for the evacuees is safer than the area you are leaving

- **Communication of Evacuation**:

-This evacuation plan is based on the premise that an event has occurred, causing the Hospital to be in an internal disaster mode

4. Procedure

a) **General Instructions**

1. Evacuate most hazardous areas first (those closest to danger or farthest from exit).
2. Use nearest or safest appropriate exit. Sequence of evacuation should be

i) Patients in immediate danger

ii) Ambulatory patients

iii) Semi-ambulatory patients

iv)Non-ambulatory patients

3. Close all doors. If time permits, shut off oxygen, water, light & gas, if able
4. Elevators may be used, except during a fire or after an earth quake

b) Hospital Emergency Incident Command Structure -

a. All available information shall be evaluated and evacuation schedule established in coordination with the Section Chiefs. This information shall include:

i. Structural, non-structural, and utility evaluation from Engineering/Damage Assessment & Control Officer.

ii. Patient status reports from Planning Section Chief.

iii. Evaluate manpower levels and authorize activation of staff call-in plans, as needed.

b) Disaster Evacuation scedule

i. Planning Section Chief

ii. Liaison Officer

iii. Safety and Security Officer

iv. Logistics Chief (Store in Charge)

v. Operation chief

2. Liasioning Officer

i) Maintain Contact with Public Safety Officials, Health Deptt, and Ambulance Agency

ii) Complete hospital evacuation sheet

3.Logistic Chief

a. Assign Transportation Officer to assemble evacuation teams from labor pool

b. Notify Planning Section Chief of plans.

4. Transportation Officer

a. Assemble evacuation teams from Labour Pool.

b. Ensure coordination of off-campus patient transportation

c. Confirm implementation of Transportation Action Plan.

d. If able, assign six people to each floor for evacuation manpower.

e. Brief team members on evacuation techniques, (attached)

f. Arrange transportation devices (wheelchairs, gurneys, etc. to be delivered to assist in evacuation).

g. Report to floor being evacuated and supervise evacuation.

h. Report to Nurse Manager/Charge Nurse for order of patients being evacuated and method of evacuation.

5. Nursing Sister

a) Designate Holding areas for critical, Semi Critical, and ambulatory evacuated patients
b) Organize efforts to meet medical needs and Physicians staffing Evacuation holding areas
c) Distribute evacuation schedules to nurse sisters
d) Verify that the nursing sisters have initiated the evacuation procedures.
e) Request Medical officers to notify the physicians of need for trans for orders
f) Assign holding areas coordinators, and adequate number of holding areas
g) Contact list of pre-established hospital, extended care facilities, school etc. to determine places to relocate patients. Forward the response to Planning section Chief.

6. Medical Staff Officers
    a) Notify the physicians of need for transfer orders
    b) Assist the matron/nursing sister as needed
7. Hospital managers/Matrons /Asst matrons Nursing Sister
    a) Determine patient status
    b) Communicate the Patient Status on the patient chart according to the following criteria
        i)Non – Critical/Ambulatory
        ii) Non – Critical/ Non Ambulatory
        iii) critical/requires ventilation or special equipment
    c) Report patient status to Nursing Officer
    d) Assign specific Nurses to maintain patient care
    e) Assign two nurses to prepare for evacuation
1. Place personnel belongings in a bag labelled "Belongings" with name Patient No. with medications, prosthetics, and special patient need items the s inside bag
2. Place a tag with pt. address in Patient chart secured by a tape
    f) Designate a safer exit after determining location of patients to be evacuated
    g) Assign a person to record evacuation activity
        1. Name of the person
        2. Method of evacuation
        3. Time of Evacuation
        4. Evacuation Status
        5. Evacuation from Room /area
    h) Forward the documentation of evacuation and patient disposition to patient tracking coordinator or patient information manager

8) Patient information manager
    a) compiles patient information on Inquiry sheets
9) Cardio pulmonary Officer
    a) Assign staff members to perform ventilation on required patients
    b) assess no of positive Pressure breathing devices/bag valve masks available

10 Safety & Security Officer
    a) If possible assign a security person to each area being evacuated for traffic control/safety
    b) Turn of the gas/lights s situation demands
    c) Check complete evacuation have taken place and no patient/ staff remain
    d) Place ' Evacuated at' (date/time) sign up at main area exit/entrance after evacuation is complete

11. Facility Operation Officer
    a. Obtain equipment/supplies needed for structred safety during evacuation
    b. Obtain portable toilets and privacy screens for use in areas where evacuated patients are relocated, if necessary

12. Labour Pool Officer

    a) All available Engineering, Housekeeping, Security Staff etc not previously assigned to incident will assist in the movement of patient.

CHAPTER 9:BIOLOGICAL DISASTER-SPECIFIC PLANNING

A biological agent in an aerosolized state presents the agent=s greatest potential for mass dissemination and large-scale impact. In some countries, biological agents have been engineered for optimal dispersal and dissemination as small-particle aerosols.

In the event of a bioterrorism attack, an effective response will require focusing necessary public health resources on managing the outbreak of an infectious disease. These resources include surveillance and epidemiologic expertise; use of specialized drugs, vaccines, and other medical supplies; laboratory diagnosis skills; and medical recommendations, such as prophylaxis guidelines and various quarantine-related issues.

Definition

CDC defines biological terrorism as an intentional release of viruses, bacteria, or their toxins for the purpose of harming or killing people. In addition to aerosolization, food, water or insects must be considered as potential vehicles of transmission for biological weapons.

The highest-priority agents, Category A Agents, include organisms that pose a risk to national security because they

- Can be easily disseminated or transmitted person-to-person;
- Cause high mortality and subsequently have a major public health impact;
- Might cause public panic and social disruption; and
- Require special action for public health preparedness.

CDC's list of critical biological agents includes the following Category A Agents:

Category A Agents

- *Variola major* (smallpox)
- *Bacillus anthracis* (anthrax)
- *Yersinia pestis* (plague)
- *Clostridium botulinum* toxin (botulism)
- *Francisella tularensis* (tularemia)
- Hemorrhagic fever (e.g., Ebola, Marburg, Lassa viruses)

CDC recommends that other less critical agents (Category B and C Agents) also receive attention for bioterrorism preparedness. These categories include new or a emerging pathogens. A subset of Category B agents includes pathogens that are foodborne or waterborne.

Category B agents

- Are moderately easy to disseminate;
- Cause moderate morbidity and low mortality; and
- Require specific enhancements of CDC's diagnostic capacity and enhanced disease surveillance.

Category B Agents

- *Coxiella burnetti* (Q fever)
- *Brucella* species (brucellosis)
- *Burkholderia mallei* (glanders)
- Alphaviruses :
  -Venezuelan encephalomyelitis
  -Eastern and western equine encephalomyelitis
- Ricin toxin from *Ricinus communis* (castor beans)
- Epsilon toxin of *Clostridium perfringens*
- Staphylococcus Enterotoxin B

Category B Agents

Food-borne or Waterborne

- *Salmonella* species
- *Shigella dysenteriae*
- *Escherichia coli* O157:H7
- *Vibrio cholerae*
- *Cryptosporidium parvum*

Category C agents include emerging pathogens that could be engineered for mass dissemination in the future because of their

- Availability
- Ease of production and dissemination
- Potential for high morbidity, mortality and major health impact.

Category C Agents

- Nipah virus
- Hantaviruses
- Tick-borne hemorrhagic fever viruses
- Tick-borne encephalitis viruses
- Yellow fever virus
- Multidrug-resistant *Mycobacterium tuberculosis*

Preparedness for Category C agents requires ongoing research to improve disease detection, diagnosis, treatment, and prevention. Knowing in advance which newly emergent pathogens terrorists might employ is not possible. Therefore, it is imperative to link bioterrorism preparedness efforts with ongoing disease surveillance and outbreak response activities as defined in CDC's emerging infectious disease strategy.

9.1:STEPS

Step 1- **Surveillance and Epidemiologic Investigation**

An observant physician, veterinarian, laboratory technician, or surveillance data-entry person is critical to early detection.

The two broad goals of surveillance related to bioterrorism preparedness and response are early detection of an event and enhanced disease tracking in the population during an emergency response. Surveillance data is linked to the appropriate authorities who will investigate unusual instances of health service utilization and unusual clusters of illness or deaths.

Healthcare facilities are the initial sites of recognition and response to bioterrorism events. If a bioterrorism event is suspected, local emergency response systems is activated. Notification is done immediately to the local infection control personnel and the healthcare facility administration, and prompt communication with the local and district health departments, local police, and medical emergency services.

Each health-care facility includes a list containing the following telephone notification numbers inits readiness plan:

INTERNAL CONTACTS:

-Infection Control Personnel (RRT) at district &block level

-Epidemiologist

-District Administration/Public Health

EXTERNAL CONTACTS:

-District Response Officer (District health Control room)

-State Response Officer (State Health Control Room)

-BIOTERRORISM EMERGENCY NUMBER (1800 -375- 6776)

9.2: Detection of Outbreaks Caused by Agents of Bioterrorism:

a) Syndrome-based criteria:

Each of the agent-specific plans in Section II includes a syndrome description (i.e., typical combination of clinical features of the illness at presentation), that should alert healthcare practitioners to the possibility of a bioterrorism-related outbreak.

b) Epidemiologic features:

Features that should alert healthcare providers to the possibility of a bioterrorism-related outbreak include:

- A rapidly increasing disease incidence (e.g., within hours or days) in a normally healthy population.
- An epidemic curve that rises and falls during a short period of time.
- An unusual increase in the number of people seeking care, especially with fever, respiratory, or gastrointestinal complaints.
- An endemic disease rapidly emerging at an uncharacteristic time or in an unusual pattern.

- Lower attack rates among people who had been indoors, especially in areas with filtered air or closed ventilation systems, compared with people who had been outdoors.
- Clusters of patients arriving from a single locale.
- Large numbers of rapidly fatal cases.
- Any patient presenting with a disease that is relatively uncommon and has bioterrorism potential (e.g., pulmonary anthrax, tularemia, or plague)

After an event, a proper emergency response to an epidemic enhances surveillance activity to manage the outbreak and to monitor progress. Planning involves contingencies for augmenting existing surveillance activities and the surveillance workforce, active reporting, and enhanced information management capacity.

Step-2:Laboratory Diagnosis

Laboratory confirmation of a specimen is extremely important during a bioterrorism response. Plans are in place to facilitate testing of the critical agents for biological preparedness. The Laboratory Response Network exists to facilitate sample collection, transport, testing, and training for laboratory readiness for bioterrorism. Clinical and public health laboratories in the network are identified by increasing levels of sophistication ranging from Level A through LevelD.

9.3:Laboratory Capacity for Biological Agents

Level A Laboratory

Level A laboratories are public health and hospital laboratories with a certified biological safety cabinet as a minimum. These laboratories have the ability to rule out specific agents and to forward organisms or specimens to higher-level laboratories for further testing.

Level B Laboratory (Core Capacity)

Level B laboratories are state and local public health laboratories with Biosafety Level (BSL) 2 facilities that incorporate BSL-3 practices and maintain the proficiency to appropriate higher-level laboratories and can forward samples to them for further testing.

Level C Laboratory (Advanced Capacity)

Level C Laboratories are BSL-3 facilities with the capability to perform nucleic acid amplification, molecular typing, and toxicity testing. Level C laboratories conducts all tests performed in Level B laboratories and can provide surge capacity, when needed. Additionally, these laboratories evaluate reagents and tests to facilitate their transfer for use in Level B laboratories.

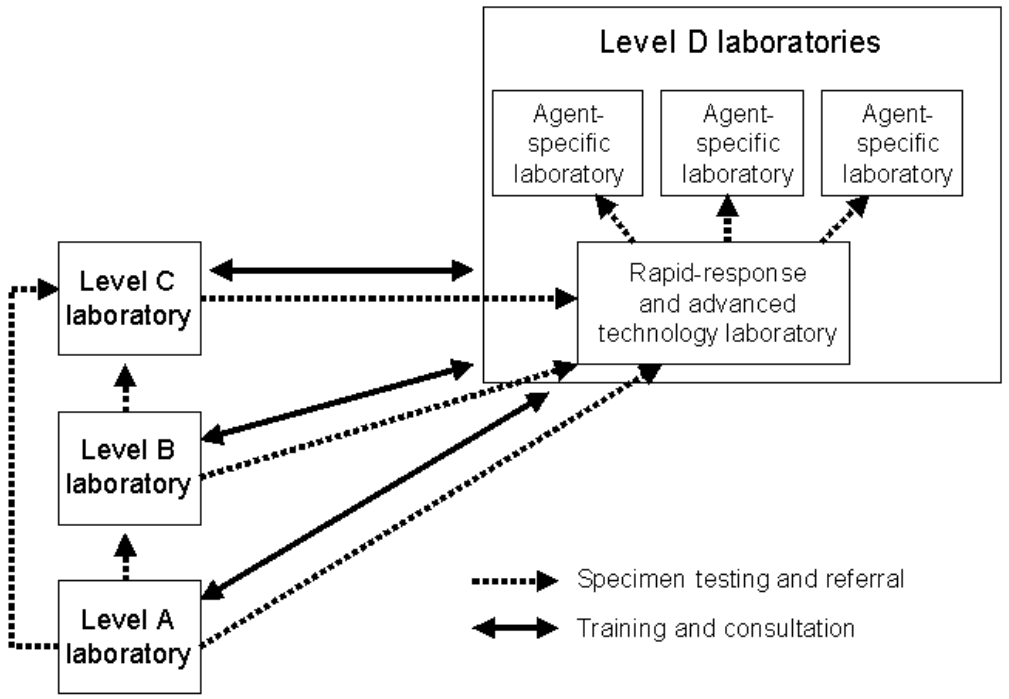
Level D Laboratory

Level D Laboratories can conduct all tests performed in Levels A, B, and C laboratories. They can validate new assays, detect genetic recombinants, provide specialized reagents, securely bank isolates, and possess BSL-3 and BSL-4 bio-containment facilities. For bioterrorism events

affecting civilian populations, CDC is the Level D laboratory. Adequately process environmental samples, rule in specific agents, and perform confirmatory and antibiotic susceptibility testing.

9.4:

FIGURE 1. Multilevel laboratory response network for bioterrorism that will link clinical labs to public health agencies



Functional Levels of the Laboratory Response Network for Bioterrorism

Level A: Early detection of intentional dissemination of biological agents — Level A laboratories will be public health and hospital laboratories with low-level biosafety facilities. Level A laboratories will use clinical data and standard microbiological tests to decide which specimens and isolates should be forwarded to higher level biocontainment laboratories. Level A laboratory staff will be trained in the safe collection, packaging, labeling, and shipping of samples that might contain dangerous pathogens.

Level B: Core capacity for agent isolation and presumptive-level testing of suspect specimens — Level B laboratories will be state and local public health agency laboratories that can test for specific agents and forward organisms or specimens to higher level biocontainment laboratories. Level B laboratories will minimize false positives and protect Level C laboratories from overload. Ultimately, Level B laboratories will maintain capacity to perform confirmatory testing and characterize drug susceptibility.

Level C: Advanced capacity for rapid identification — Level C laboratories, which could be located at state health agencies, academic research centers, or federal facilities, will perform advanced and specialized testing. Ultimately, Level C laboratories will have the capacity to perform toxicity testing and employ advanced diagnostic technologies (e.g., nucleic acid amplification and molecular fingerprinting). Level C laboratories will participate in the evaluation of new tests and reagents and determine which assays could be transferred to Level B laboratories.

Level D: Highest level containment and expertise in the diagnosis of rare and dangerous biological agents — Level D laboratories will be specialized federal laboratories with unique experience in diagnosis of rare diseases (e.g., smallpox and Ebola). Level D laboratories also will develop or evaluate new tests and methods and have the resources to maintain a strain bank of biological agents. Level D laboratories will maintain the highest biocontainment facilities and will be able to conduct all tests performed in Level A, B, and C laboratories, as well as additional confirmatory testing and characterization, as needed. They will also have the capacity to detect genetically engineered agents.

Step 3. Transportation of samples

-All suspected or confirmed biological threat agents are transported in accordance with the procedures for general packaging requirements for transport of biological agents and clinical specimens as set forth in address

-Before sending samples or if you have questions about or problems with samples or sample shipment, call

1. State Health Control Room, IDSP Cell

2nd Floor, Heads of Department Building,

Bhubaneswar, Pin – 751001

Ph no. 0674 -2390466

E-mail: dirhealtho@gmail.com

2. NCDC, New Delhi

HOD, Division of Microbiology or Division of Zoonosis

National Center for disease Control, 22 Sham Nath marg, Delhi -110054

idsp- lab @nic.in. , idsp-npo@nic.in

Step 4- Medical Management:

The key issues associated with medical management of bioterrorism victims are the provision of preventive services and the medical treatment of patients. Preventive services involve the provision of antibiotics, vaccines, or other medications to prevent disease and death in exposed victims. The management of patients following suspected or confirmed bioterrorism events mustbe well organized and rehearsed. Strong leadership and effective communication are paramount.

1. Isolation precautions

Agents of bioterrorism are generally not transmitted from person to person; re-aerosolization of these agents is unlikely. **All** patients in healthcare facilities, including symptomatic patients with suspected or confirmed bioterrorism-related illnesses, should be managed utilizing **Standard Precautions**. Standard Precautions are designed to reduce transmission from both recognized and unrecognized sources of infection in healthcare facilities, and are recommended for all patients receiving care, regardless of their diagnosis or presumed infection status. **For certain diseases or syndromes (e.g., smallpox and pneumonic plague),additional precautions may be needed to reduce the likelihood for transmission.** See Section-II for specific diseases and requirements for additional isolation precautions.Standard Precautions prevent direct contact with all body fluids (including blood), secretions, excretions, non intact skin (including rashes), and mucous membranes. Standard Precautions routinely practiced by healthcare providers include:

- **Hand-washing**

Hands are washed after touching blood, body fluids, excretions, secretions, or items contaminated with such body fluids, whether or not gloves are worn. Hands are washed immediately after gloves are removed, between patient contacts, and as appropriate to avoid

transfer of microorganisms to other patients and the environment. Either plain or antimicrobial-containing soaps may be used according to facility policy.

- **Gloves**

Clean, non-sterile gloves are worn when touching blood, body fluids, excretions, secretions, or items contaminated with such body fluids. Clean gloves are put on just before touching mucous membranes and non-intact skin. Gloves are changed between tasks and between procedures on the same patient if contact occurs with contaminated material. Hands are washed promptly after removing gloves and before leaving a patient care area.

- **Masks/Eye Protection or Face Shields**

A mask and eye protection (or face shield) are worn to protect mucous membranes of the eyes, nose, and mouth while performing procedures and patient care activities that may cause splashes of blood, body fluids, excretions, or secretions.

- **Gowns**

A gown is worn to protect skin and prevent soiling of clothing during procedures and patient-care activities that are likely to generate splashes or sprays of blood, body fluids, excretions, or secretions. Selection of gowns and gown materials should be suitable for the activity and amount of body fluid likely to be encountered. Soiled gowns are removed promptly and hands are washed to avoid transfer of microorganisms to other patients and environments.

2. Patient placement

In small-scale events, routine facility patient placement and infection control practices should be followed. However, when the number of patients presenting to a healthcare facility is too large to allow routine triage and isolation strategies (if required), it will be necessary to apply practical alternatives. These may include cohorting patients who present with similar syndromes, i.e., grouping affected patients into a designated section of a clinic or emergency department, or a designated ward or floor of a facility, or even setting up a response center at a separate building. Designated cohort sites should be chosen in advance by the IC Committee (or other appropriate decision-making body), in consultation with facility engineering staff, based on patterns of airflow and ventilation, availability of adequate plumbing and waste disposal, and capacity to safely hold potentially large numbers of patients. The triage or cohort site should have controlled entry to minimize the possibility for transmission to other patients at the facility and to staff members not directly involved in managing the outbreak. At the same time, reasonable access to vital diagnostic services, e.g., radiography department, should be maintained.

3. Patient transport

Most infections associated with bioterrorism agents cannot be transmitted from patient-to-patient. Patient transport requirements for specific potential agents of bioterrorism are listed in Section II. In general, the transport and movement of patients with bioterrorism-related infections, as for patients with any epidemiologically important infections (e.g., pulmonary tuberculosis, chickenpox, measles), should be limited to movement that is essential to provide patient care, thus reducing the opportunities for transmission of microorganisms within healthcare facilities.

4. Cleaning, disinfection, and sterilization of equipment and environment

Principles of Standard Precautions should be generally applied for the management of patient-care equipment and environmental control.

- Each facility should have in place adequate procedures for the routine care, cleaning, and disinfection of environmental surfaces, beds, bedrails, bedside equipment, and other frequently touched surfaces and equipment, and should ensure that these procedures are being followed.
- Facility-approved germicidal cleaning agents should be available in patient care areas to use for cleaning spills of contaminated material and disinfecting non-critical equipment. Secretions or excretions should be handled in a manner that prevents exposures to skinand mucous membranes, avoids contamination of clothing, and minimizes the likelihoodof transfer of microbes to other patients and environments.
- Policies should be in place to ensure that reusable equipment is not used for the care of another patient until it has been appropriately cleaned and reprocessed, and to ensure that single-use patient items are appropriately discarded.
- Sterilization is required for all instruments or equipment that enter normally sterile tissues or through which blood flows.
- Rooms and bedside equipment of patients with bioterrorism-related infections should be cleaned using the same procedures that are used for all patients as a component of Standard Precautions, unless the infecting microorganism and the amount of environmental contamination indicates special cleaning. In addition to adequate cleaning, thorough disinfection of bedside equipment and environmental surfaces may be indicated for certain organisms that can survive in the inanimate environment for extended periods of time. The methods and frequency of cleaning and the products used are determined by facility policy.
- Patient linen should be handled in accordance with Standard Precautions. Although linen may be contaminated, the risk of disease transmission is negligible if it is handled, transported, and laundered in a manner that avoids transfer of microorganisms to other patients, personnel and environments. Facility policy and local/state regulations should determine the methods for handling, transporting, and laundering soiled linen.
- Contaminated waste should be sorted and discarded in accordance with National, state and local regulations.
- Policies for the prevention of occupational injury and exposure to blood-borne pathogens in accordance with Standard Precaution and Universal Precautions should be in place within each healthcare facility.

5. Discharge management

Ideally, patients with bioterrorism-related infections are not discharged from the facility until they are deemed noninfectious. However, consideration should be given to developing home-care instructions in the event that large numbers of persons exposed may preclude admission of all infected patients. Depending on the exposure and illness, home care instructions may include recommendations for the use of appropriate barrier precautions, hand-washing, waste management, and cleaning and disinfection of the environment and patient-care items.

6. Post-mortem care

Pathology departments and clinical laboratories should be informed of a potentially infectious outbreak prior to submitting any specimens for examination or disposal. All autopsies should be performed carefully using all personal protective equipment and standards of practice in accordance with Standard Precautions, including the use of masks and eye protection whenever the generation of aerosols or splatter of body fluids is anticipated. Instructions for funeral directors should be developed and incorporated into the Bioterrorism Readiness Plan for communication.

E. Post Exposure Management

1. Decontamination of Patients and Environment

The need for decontamination depends on the suspected exposure and in most cases may not be necessary. The goal of decontamination after a potential exposure to a bioterrorism agent is to reduce the extent of external contamination of the patient and contain the contamination to prevent further spread. Decontamination should only be considered in instances of gross contamination. Decisions regarding the need for decontamination should be made in consultation with state and local health departments. Decontamination of exposed individuals prior to receiving them in the healthcare facility may be necessary to ensure the safety of patients and staff while providing care. When developing Bioterrorism Readiness Plans, facilities should consider available locations and procedures for patient decontamination prior to facility entry. Depending on the agent, the likelihood for re-aerosolization, or a risk associated with cutaneous exposure, clothing of exposed persons may need to be removed. After removal of contaminated clothing, patients should be instructed (or assisted if necessary) to immediately shower with soap and water. **Potentially harmful practices, such as bathing patients withbleach solutions, are unnecessary and should be avoided**. Clean water, saline solution, or commercial ophthalmic solutions are recommended for rinsing eyes. If indicated, after removal at the decontamination site, patient clothing should be handled only by personnel wearing appropriate personal protective equipment, and placed in an impervious bag to prevent further environmental contamination.

2. Prophylaxis and post-exposure immunization

Recommendations for prophylaxis are subject to change. Current recommendations for post-exposure prophylaxis and immunization are provided for relevant potential bioterrorism agents. However, up-to-date recommendations should be obtained in consultation with local and state health departments and NCDC. Facilities should ensure that policies are in place to identify and manage health care workers exposed to infectious patients. In general, maintenance of accurate occupational health records will facilitate identification, contact, assessment, and delivery of post-exposure care to potentially exposed healthcare workers.

3. Triage and management of large scale exposures and suspected exposures

Each healthcare facility, with the involvement of the Incident Casualty committee, administration, building engineering staff, emergency department, laboratory directors and nursing directors, should clarify in advance how they would best be able to deliver care in the event of a large scale exposure. Facilities should incorporate into their Bioterrorism Readiness Plan processes for

triage and safe housing and care for potentially large numbers of affected individuals. Facility needs vary with the size of the regional population served and the proximity to other healthcare facilities and external assistance. Triage and management planning for large-scale events may include:

- Establishing networks of communication and lines of authority required to coordinate onsite care.
- Planning for cancellation of non-emergency services and procedures.
- Identifying sources able to supply available vaccines, immune globulin, antibiotics, and botulinum anti-toxin (with assistance from local and state health departments).
- Planning for the efficient evaluation and discharge of patients.
- Developing discharge instructions for patients determined to be non-contagious or in need of additional on-site care, including details regarding if and when they should return for care or if they should seek medical follow-up.
- Determining availability and sources for additional medical equipment and supplies (e.g., ventilators) that may be needed for urgent large-scale care.
- Planning for the allocation or re-allocation of scarce equipment in the event of a large-scale event (e.g., duration of ventilator support of terminally afflicted individuals).
- With assistance from the Pathology service, identifying the institution's ability to manage a sudden increase in the number of cadavers on site.

4. **Psychological aspects of bioterrorism**

Following a bioterrorism-related event, fear and panic can be expected from both patients and healthcare providers. Psychological responses following a bioterrorism event may include horror, anger, panic, unrealistic concerns about infection, fear of contagion, paranoia, social isolation, or demoralization. IC professionals should develop prior working relationships with mental health support personnel (e.g., psychiatrists, psychologists, social workers, clergy, and volunteer groups) and assist in their collaboration with emergency response agencies and the media. Local, state, and federal media experts can provide assistance with communications needs.

Consider the following to address patient and general public fears:

- Minimize panic by clearly explaining risks, offering careful but rapid medical evaluation/ treatment, and avoiding unnecessary isolation or quarantine.
- Treat anxiety in unexposed persons who are experiencing somatic symptoms (e.g., with reassurance, or diazepam-like anxiolytics as indicated for acute relief of those who do not respond to reassurance).

Consider the following to address healthcare worker fears:

- Provide bioterrorism readiness education, including frank discussions
- Invite active, voluntary involvement in the bioterrorism readiness planning process.
- Encourage participation in disaster drills.

Fearful or anxious healthcare workers may benefit from their usual sources of social support, or by being asked to fulfill a useful role (e.g., as a volunteer at the triage site).

Step 5. Restriction of Movement

1. **State and Local Quarantine:**

These may include quarantine, isolation, closing public places, seizing property, mandatory vaccination, travel restrictions, and disposal of the dead. Because the most critical public health responses probably will be those taken immediately at the state and local levels, health officials and their lawyers should review the statutes, regulations, and ordinances that authorize these emergency public health measures and develop legally sound procedures for executing them.

2. National Quarantine:

a. *Restriction of People Moving Interstate:* There should be regulations which contain a number of permitting and reporting requirements for people who travel from one state or possession to another, and they authorize the apprehension, detention, or conditional release of such people to prevent the spread of specified communicable diseases. In addition, these regulations authorize action in the event that measures taken by health authorities of any state or possession are insufficient to prevent the interstate spread of communicable diseases.

b. *Foreign Quarantine of Persons, Carriers, Animals, and Articles: in airports, ports etc.*

Step 6-Consequence Management

Worker Protection

Worker protection in response to biological terrorism should be determined by the type of hazard. CDC anticipates that worker exposures to biological terrorism will likely fall into two scenarios: an occupational contact with an infected patient during a bioterrorism-related outbreak; or a potential occupational exposure involving recovery of a biological dissemination device.

To protect workers when the presence or nature of a bioterrorism agent is not known, all workers should adhere to Standard Precautions whenever they have contact with broken or moist skin, blood, or body fluids. This includes the use of disposable non-sterile gloves with hand-washing immediately after removal; and the use of a disposable gown or apron, and a face shield if any splashing is anticipated. Protective gear is changed between patients to prevent the worker from transmitting infection from patient-to-patient. Once identified, additional precautions based on the agent=s specific mode of transmission are applied, e.g., airborne, droplet or contact transmission. Supervisors should contact the local health department for additional instructions for worker vaccination, prophylactic antibiotic therapy, or other measures that may be appropriate for a given disease & use of disposable non-sterile gloves with and washing immediately after removal; and the use of a disposable gown or apron, and a face shield if any splashing is anticipated.

The interim recommendations for personal protective equipment, including respiratory protection and protective clothing, are based upon the anticipated level of exposure risk associated with different response situations, as follows:

- Responders should use protective suit in responding to a suspected biological incident where any of the following information is unknown or the event is uncontrolled:
    - The type(s) of airborne agent(s)
    - The dissemination method;

- If dissemination via an aerosol-generating device is still occurring or it has stopped but there is no information on the duration of dissemination, or what the exposure concentration might be.

- Responders may use protective suit if the situation can be defined in which:
  - The suspected biological aerosol is no longer being generated;
  - Other conditions may present a splash hazard.
- Responders may use a full face piece respirator with a P100 filter or powered air-purifying respirator (PAPR) with high efficiency particulate air (HEPA) filters when it can be determined that:
  - An aerosol-generating device was not used to create high airborne concentration,
  - Dissemination was by a letter or package that can be easily bagged.

These type of respirators reduce the user's exposure by a factor of 50 if the user has been properly fit tested.

Care should be taken when bagging letters and packages to minimize creating a puff of air that could spread pathogens. It is best to avoid large bags and to work very slowly and carefully when placing objects in bags. Disposable hooded coveralls, gloves, and foot coverings also should be used. It is recommended against wearing standard firefighter turnout gear into potentially contaminated areas when responding to reports involving biological agents.

Decontamination of protective equipment and clothing is an important precaution to make sure that any particles that might have settled on the outside of protective equipment are removed before taking off gear. Decontamination sequences currently used for hazardous material emergencies should be used as appropriate for the level of protection employed. Equipment can be decontaminated using soap and water, and 0.5% hypochlorite solution (one part household bleach to 9 parts water) can be used as appropriate or if gear had any visible contamination. Note that bleach may damage some types of firefighter turnout gear (one reason why it should not be used for biological agent response actions). After taking off gear, response workers should shower using copious quantities of soap and water.

First responders and others involved in out-of-hospital patient transport will be in closer proximity to the patient during transport. They should comply with the infection control guidelines described above and can take the following additional precautions:

- Run the ambulance ventilation system on its highest setting using outside air circulation, which will maximize air changes in the vehicle;
- For diseases which are transmitted by respiratory transmission (droplet or aerosol), the patient should wear a surgical mask, disposable respirator (one without an exhalation valve) or, if needed for respiratory support, an oxygen mask that does not exhaust to ambient air;
- Responders transport patients with different diseases requiring different levels of worker respiratory protection. It may simplify inventory selection to standardize on the more protective N95-class respirator.

9.5: *Potential occupational exposure involving recovery of a biological dissemination device:*

A determined biological terrorist probably will try to avoid discovery while disseminating the infectious agent. This will maximize the disease impact of the act. Nonetheless, it is possible that a suspected dissemination device may be discovered before or after it releases its contents. The worker risk involved in recovering this device and, if possible, mitigating its threat will determine the appropriate safety measures and personal protective strategies. For incidents of relatively low potential hazard, such as envelopes claimed to be filled with Anthrax spores,@ guidelines for containment and identification exist

Other incidents may need to be approached with additional concern for exposure to the contents and for other hazards. These other hazards include a possible "secondary device"explosive, timed to detonate during the response to the first event and injure responders. On-scene commanders must evaluate the potential threat in consultation with local health and law enforcement resources and select appropriate strategies for worker protection, including personal protective equipment.

Patient Decontamination

When determining the need for decontamination in a biological setting, balance the risk that decontamination poses to the patient against the benefits it could provide. Unless gross contamination is evident, decontamination is unwarranted. Instead, begin by removing clothes and placing them in a plastic bag pending agent identification. Taking a shower with soap and water should suffice to prevent illness. Where gross contamination is found, only those areas of the skin that have been grossly contaminated should be decontaminated. When the involved agent is unknown and could be either a chemical agent or biological agent, follow patient decontamination procedures for chemical agents.

- Quickly remove clothing
- Wash
- Dispose of clothing.
- *Removing clothing:*
    - Quickly take off clothing that has a chemical on it. Any clothing that has to be pulled over your head should be cut off instead of being pulled overhead.
    - If you are helping other people remove their clothing, try to avoid touching any contaminated areas of clothing, and remove the clothing as quickly as possible.
- *Washing :*
    - As quickly as possible, wash any chemicals from the skin with large amounts of soap and water. Washing with soap and water will help protect from any chemicals on your body.
    - If eyes are burning or vision is blurred, rinse eyes with plain water for 10 to 15 minutes. If wearing contacts, remove them and put them with the contaminated clothing. Do not put the contacts back in eyes (even if they are not disposable

contacts). If wear eyeglasses, wash them with soap and water. Can put eyeglasses back on after washing them.

- *Disposing of clothes:*
    - After having washed, place the clothing inside a plastic bag. Avoid touching contaminated areas of the clothing. If you can't avoid touching contaminated areas, or you aren't sure where the contaminated areas are, wear rubber gloves or put the clothing in the bag using tongs, tool handles, sticks, or similar objects. Anything that touches the contaminated clothing should also be placed in the bag. If you wear contacts, put them in the plastic bag, too.
    - Seal the bag, and then seal that bag inside another plastic bag. Disposing of your clothing in this way will help protect you and other people from any chemicals that might be on your clothes.
    - When the local or state health department or emergency personnel arrive, tell them what you did with your clothes. The health department or emergency personnel will arrange for further disposal. Do not handle the plastic bags yourself.

After you have removed clothing, washed, and disposed of the clothing, you should dress in clothing that is not contaminated. Clothing that has been stored in drawers or closets are unlikely to be contaminated, so it would be a good choice for you to wear. You should avoid coming in contact with other people who may have been exposed but who have not yet changed their clothes or washed. Move away from the area where the chemical was released when emergency coordinators tell you to do so.

Mass Care

Where a contagious biological agent has been dispersed, special care must be taken to prevent the mass care facility from becoming a focal point for further spread of the disease. Effective medical screening of incoming people, rapid identification of ill people and their prompt removal from the mass care facility, and provision of antibiotics to others in the facility (if appropriate) will minimize the spread of any communicable disease.

Environmental Issues

Many biological agents live for only a short time outside the human body. These agents are sensitive to environmental conditions, including heat and light, which makes bio-decontamination unnecessary as a rule. Spore forming agents (e.g., anthrax) are more persistent; however, these biological agents occur naturally throughout without causing outbreaks. Where these agents occur naturally, background levels are rarely known; thus, sampling is of little value. In general, environmental issues are not critical in a biological event.

9.6: Agent-Specific Recommendations

A. Anthrax

1. Description of Agent / Syndrome

a. Etiology

Anthrax is an acute infectious disease caused by *Bacillus anthracis,* a spore forming, gram-positive bacillus. Associated disease occurs most frequently in sheep, goats, and cattle, which acquire spores through ingestion of contaminated soil. Humans can become infected through skin contact, ingestion, or inhalation of *B. anthracis* spores from infected animals or animal products (as in "woolsorter's disease" from exposure to goat hair). Person-to-person transmission of inhalational disease does not occur. Direct exposure to vesicle secretions of cutaneous anthrax lesions may result in secondary cutaneous infection.

b. Clinical features

Human anthrax infection can occur in three forms: pulmonary, cutaneous, or gastrointestinal, depending on the route of exposure. Of these forms, pulmonary anthrax is associated with bioterrorism exposure to aerosolized spores. Clinical features for each form of anthrax include:

I. Pulmonary

- Non-specific prodrome of **flu-like symptoms** follows inhalation of infectious spores.
- Possible brief interim improvement.
- Two to four days after initial symptoms, **abrupt onset of respiratory failure** and Hemo dynamic collapse, possibly accompanied by thoracic edema and a **widened Mediastinum on chest radiograph** suggestive of mediastinal lymphadenopathy and hemorrhagic mediastinitis**.**
- Gram-positive bacilli on blood culture, usually after the first two or three days of illness.
- Treatable in early prodromal stage. Mortality remains extremely high despite antibiotic treatment if it is initiated after onset of respiratory symptoms.

2. Cutaneous

- Local skin involvement after direct contact with spores or bacilli.
- Commonly seen on the head, forearms or hands.
- Localized itching, followed by a papular lesion that turns vesicular, and within 2-6 days develops into a depressed black eschar.
- Usually non-fatal if treated with antibiotics.

3. Gastro-intestinal

- Abdominal pain, nausea, vomiting, and fever following ingestion of contaminated food, usually meat.
- Bloody diarrhea, hematemesis.
- Gram-positive bacilli on blood culture, usually after the first two or three days of illness.
- Usually fatal after progression to toxemia and sepsis.

c. Modes of transmission

The spore form of *B. anthracis* is durable. As a bioterrorism agent, it could be delivered as an aerosol. The modes of transmission for anthrax include:

- Inhalation of spores.
- Cutaneous contact with spores or spore-contaminated materials.
- Ingestion of contaminated food.

d. Incubation period

The incubation period following exposure to *B. anthracis* ranges from 1day to 8 weeks (average 5days), depending on the exposure route and dose:

- 2-60 days following pulmonary exposure.
- 1-7 days following cutaneous exposure.
- 1-7 days following ingestion.

e. Period of communicability

Transmission of anthrax infections from person to person is unlikely. Airborne transmission does not occur, but direct contact with skin lesions may result in cutaneous infection.

2. Preventive Measures

a. Vaccine availability

- Inactivated, cell-free anthrax vaccine – limited availability.

b. Immunization recommendations

- Routinely administered to military personnel. Routine vaccination of civilian populations not recommended.

3. Infection Control Practices for Patient Management

Symptomatic patients with suspected or confirmed infections with *B. anthracis* should be managed according to current guidelines specific to their disease state. Recommendations for chemotherapy are beyond the scope of this document. For up-to-date information and recommendations for therapy, contact the local and state health department.

a. Isolation precautions

Standard Precautions are used for the care of patients with infections associated with *B. anthracis.* Standard Precautions include the routine use of gloves for contact with nonintactskin, including rashes and skin lesions.

b. Patient placement

Private room placement for patients with anthrax is not necessary. Airborne transmission of anthrax does not occur. Skin lesions may be infectious, but requires direct skin contact only.

c. Patient transport

Standard Precautions should be used for transport and movement of patients with *B. anthracis* infections.

d. Cleaning, disinfection, and sterilization of equipment and environment

Principles of Standard Precautions should be generally applied for the management of patient-care equipment and for environmental control.

e. Discharge management

No special discharge instructions are indicated. Home care providers should be taught touse Standard Precautions for all patient care (e.g., dressing changes).

f. Post-mortem care

Standard Precautions should be used for post-mortem care. Standard Precautions include wearing appropriate personal protective equipment, including masks and eye protection, when generation of aerosols or splatter of body fluids is anticipated.

4. Post Exposure Management

a. Decontamination of patients / environment

The risk for re-aerosolization of *B. anthracis* spores appears to be extremely low in settings where spores were released intentionally or were present at low or high levels. In situations where the threat of gross exposure to *B. anthracis* spores exists, cleansing of skin and potentially contaminated fomites (e.g. clothing or environmental surfaces) may be considered to reduce the risk for cutaneous and gastrointestinal forms of disease. The plan for decontaminating patients exposed to anthrax may include the following:

- Instructing patients to remove contaminated clothing and store in labeled, plastic bags.
- Handling clothing minimally to avoid agitation.
- Instructing patients to shower thoroughly with soap and water (and providing assistance if necessary).
- Instructing personnel regarding Standard Precautions and wearing appropriate barriers (e.g. gloves, gown, and respiratory protection) when handling contaminated clothing or other contaminated fomites.
- Decontaminating environmental surfaces using a registered, facility-approved sporicidal /germicidal agent or 0.5% hypochlorite solution (one part household bleach added to nine parts water).

b. Prophylaxis and post-exposure immunization

Recommendations for prophylaxis are subject to change. Up-to-date recommendations should be obtained in consultation with local and state health departments and NCDC.

Prophylaxis should be initiated upon confirmation of an anthrax exposure (Table 1).

Table1. Recommended post-exposure prophylaxis for exposure to *Bacillus anthracis*Antimicrobial agent

Adults /Children

Oral Fluoroquinolones

One of the following:

i)Ciprofloxacin : 500 mg twice daily

ii) Levofloxacin : 500 mg once daily

iii) Ofloxacin : 400 mg twice daily

(20-30 mg per kg of body mass daily, divided into two doses)

If fluoroquinolones are not available or are contraindicated

Doxycycline 100 mg twice daily 5 mg per kg of body mass per day divided into two doses Pediatric use of fluoroquinolones and tetracyclines is associated with adverse effects that must be weighed against the risk of developing a lethal disease. If *B. anthracis* exposure is confirmed, the organism must be tested for penicillin susceptibility. If susceptible, exposed children may be

treated with oral amoxicillin 40mg per kg of body mass per day divided every 8 hours (not to exceed 500mg, three times daily).

Prophylaxis should continue until *B. anthracis* exposure has been excluded. If exposure is confirmed, prophylaxis should continue for 8 weeks. In addition to prophylaxis, post-exposure immunization with an inactivated, cell-free anthrax vaccine is also indicated following anthrax exposure. If available, post-exposure vaccination consists of three doses of vaccine at 0, 2 and 4 weeks after exposure. With vaccination, post-exposure antimicrobial prophylaxis can be reduced to 4 weeks.

c. Triage and management of large scale exposures / potential exposures

Advance planning should include identification of:

- Sources of prophylactic antibiotics and planning for acquisition on short notice.
- Locations, personnel needs and protocols for administering prophylactic post-exposure care to large numbers of potentially exposed individuals.
- Means for providing telephone follow-up information and other public communication services.

Intensive care unit managers will need to consider in advance:

- How limited numbers of ventilators will be distributed in the event of a large number of patients arriving with abrupt pulmonary de compensation.
- How additional ventilators can be obtained.
- In the event of severely limited ventilator availability, whether and when ventilator support will be discontinued for a terminally ill individual.

See for additional general details regarding planning for large-scale patient management.

5. Laboratory Support and Confirmation

Diagnosis of anthrax is confirmed by aerobic culture performed in a BSL -2 laboratory.

a. Diagnostic samples

Diagnostic samples to obtain include:

- Blood cultures.
- Acute serum for frozen storage.
- Stool culture if gastrointestinal disease is suspected.

b. Laboratory selection

Handling of clinical specimens should be coordinated with local and state health departments, and undertaken in BSL -2 or -3 laboratories. They would coordinate collection of evidence and delivery of forensic specimens to Deptt. of police or state referral laboratories.

c. Transport requirements

Specimen packaging and transport is coordinated with local and state health departments, and the Police. A chain of custody documents should accompany the specimen from the moment of collection. For specific instructions, contact the state surveillance unit, BBSR advance planning includes identification of appropriate packaging materials and transport media in collaboration with the clinical laboratory at individual facilities.

6. Patient, Visitor, and Public Information

Fact sheets for distribution should be prepared, including explanation that people recently exposed to *B. anthracis* are not contagious, and antibiotics are available for prophylactic therapy along with the anthrax vaccine. Dosing information and potential side effects should be explained clearly. Decontamination procedures, i.e., showering thoroughly with soap and water; and environmental cleaning, i.e., with 0.5% hypochlorite solution (one part household bleach added to nine parts water), can be described.

B. Botulism

1. Description of Agent / Syndrome

a. Etiology

Clostridium botulinum is an anaerobic gram-positive bacillus that produces a potent neurotoxin, botulinum toxin. In humans, botulinum toxin inhibits the release of acetylcholine, resulting in characteristic flaccid paralysis. *C. botulinum* produces spores that are present in soil and marine sediment throughout the world. Foodborne botulism is the most common form of disease in adults. An inhalational form of botulism is also possible Botulinum toxin exposure may occur in both forms as agents of bioterrorism.

b. Clinical features

Food-borne botulism is accompanied by gastrointestinal symptoms. Inhalational botulism and food-borne botulism are likely to share other symptoms including:

- Responsive patient with absence of fever.
- *Symmetric cranial neuropathies (drooping eyelids, weakened jaw clench, difficulty swallowing or speaking).*
- Blurred vision and diplopia due to extra-ocular muscle palsies.
- Symmetric descending weakness in a proximal to distal pattern (paralysis of arms first, followed by respiratory muscles, then legs).
- Respiratory dysfunction from respiratory muscle paralysis or upper airway obstruction due to weakened glottis.
- No sensory deficits.

c. Mode of transmission

Botulinum toxin is generally transmitted by ingestion of toxin-contaminated food. Aerosolization of botulinum toxin has been described and may be a mechanism for bioterrorism exposure.

d. Incubation period

- Neurologic symptoms of foodborne botulism begin 12 – 36 hours after ingestion.
- Neurologic symptoms of inhalational botulism begin 24- 72 hours after aerosol exposure.

e. Period of communicability

Botulism is not transmitted from person to person

2. Preventive Measures

a. Vaccine availability

A pentavalent toxoid vaccine has been developed by the Ministry of Defense. Completion of a recommended schedule (0, 2, 12 weeks) has been shown to induce protective antitoxin levels detectable at 1-year post vaccination.

b. Immunization recommendations

Routine immunization of the public, including healthcare workers, is not recommended.

3. Infection Control Practices for Patient Management

Symptomatic patients with suspected or confirmed botulism should be managed according to current guidelines. Recommendations for therapy are beyond the scope of this document. For up-to-date information and recommendations for therapy contact state health department, NCDC,New Delhi.

a. Isolation precautions

Standard Precautions are used for the care of patients with botulism.

b. Patient placement

Patient-to-patient transmission of botulism does not occur. Patient room selection and care should be consistent with facility policy.

c. Patient transport

Standard Precautions should be used for transport and movement of patients with botulism.

d. Cleaning, disinfection, and sterilization of equipment and environment

Principles of Standard Precautions should be generally applied to the management of patient-care equipment and environmental control.

e. Discharge management

No special discharge instructions are indicated.

f. Post-mortem care

Standard Precautions should be used for post-mortem care.

4. Post Exposure Management

Suspicion of even single cases of botulism should immediately raise concerns of an outbreak potentially associated with shared contaminated food. In collaboration with local /state health departments, attempts should be made to locate the contaminated food source and identify other persons who may have been exposed. Any individuals suspected to have been exposed to botulinum toxin should be carefully monitored for evidence of respiratory compromise.

a. Decontamination of patients / environment

Contamination with botulinum toxin does not place persons at risk for dermal exposure or risk associated with re-aerosolization. Therefore, decontamination of patients is not required.

b. Prophylaxis and post-exposure immunization

Trivalent botulinum antitoxin is not available with state health departments. This horse serum product has a <9% percent rate of hypersensitivity reactions. Skin testing should be performed according to the package insert prior to administration.

c. Triage and management of large scale exposures / potential exposures

Patients affected by botulinum toxin are at risk for respiratory dysfunction that may necessitate mechanical ventilation. Ventilator support is required, on average, for 2 to 3 months before neuromuscular recovery allows unassisted breathing. Large-scale exposures to botulinum toxin may overwhelm an institution's available resources for mechanical ventilation. Sources of auxiliary support and means to transport patients to auxiliary sites are planned in advance with coordination among neighboring facilities (if necessary).

5. Laboratory Support and Confirmation

a. Obtaining diagnostic samples

Routine laboratory tests are of limited value in the diagnosis of botulism. Detection of toxin is possible from serum, stool samples, or gastric secretions. For advice regarding the appropriate diagnostic specimens to obtain, contact state health authorities or NCDC,GoI.

b. Laboratory selection

Handling of clinical specimens should be coordinated with local and state health departments. The police will coordinate collection of evidence and delivery of forensic specimens.

c. Transport requirements

Specimen packaging and transport must be coordinated with local and state health departments, and the Police. A chain of custody document should accompany the specimen from the moment of collection. For specific instructions, contact the **Bioterrorism EmergencyNumber (toll free no-1075 /1800-11-4377, 1800-345-6776)**. Advance planning may include identification of appropriate packaging materials and transport media in collaboration with the clinical laboratory at individual facilities.

6. Patient, Visitor, and Public Information

Fact sheets for distribution should be prepared, including explanation that people exposed to botulinum toxin are not contagious. A clear description of symptoms including blurred vision, drooping eyelids, and shortness of breath should be provided with instructions to report for evaluation and care if such symptoms develops.

C. Brucellosis

Brucella species, which may also be regarded as different strains of a single species, are non-motile, gram-negative, aerobic, un encapsulated cocci or short rods measuring approximately 0.5-0.7 by 0.6-1.5µm. The bacteria are able to grow intracellularly in infected hosts. Infective cells can persist in the environment for weeks and dried preparations can retain virulence for years.

Occurrence

World wide.

Reservoirs

Diverse mammals especially cattle, goats, sheep, pigs, camels and buffaloes. Preferred hosts exist for each species: B. abortus commonly infects cattle; B. suis commonly infects swine and B. melitensis, a particularly virulent strain for humans, commonly infects goats, sheep and camels.

Mode of transmission

Most human infections result from ingestion of raw animal products, especially milk and milk products. Infection may also result from entry of the bacteria from diseased animals through skin lesions or mucus membranes or from inhalation of contaminated dust or aerosols. Laboratory infection is common, especially by inhalation of aerosols. Inhalation of only a few organisms is sufficient to cause a significant likelihood of infection. Person to person transmission occurs very rarely, if ever, many countries are now essentially free of bovine brucellosis, owing to vaccination of cattle.

Incubation period

Highly variable, usually 5-60 days but can be as long as several months, with shorter periods expected after severe exposure.

Clinical features

Onset may be gradual or acute with variable symptoms, consisting most frequently of undulating fever, chills, exhaustion, depression, back and leg pains, sweating, headaches and loss of appetite. Cutaneous and soft tissue manifestations may include contact lesions, rash and soft tissue abscesses. Splenomegaly and hepatomegaly with associated organ tenderness occur in some patients. Without treatment, patients usually recover within 2-3 months but there may be cycles of relapse and remission extending over years, accompanied by liver, spleen, bone, genitourinary, central nervous system and cardiac complications. Fatality among untreated patients is approximately 2 percent or less, although somewhat higher for B. melitensis, and is usually from endocarditis. All age groups are susceptible, although children may be somewhat less so.

Laboratory diagnosis

Laboratory identification to the genus level, sufficient for treatment of patients, may be made in acute cases by microbiological and biochemical identification of the pathogen isolated from venous blood, bone marrow, other tissues. Serologic tests, particularly serum agglutination and ELISA are useful detecting acute infection, although antibody titres tend to be low in chronic or recurrent cases. Reliable identification of individual strains by PCR with genus-specific primers has been demonstrated. Biosafety -Level 2 practices, equipment and facilities are recommended for manipulations involving clinical specimens. Bio safety- Level 3 practices equipment and facilities are recommended for all manipulations of cultures.

Medical management

As there is no evidence of person to person transmission patient isolation is not required. Standard precautions should be observed against infection from splashes or other direct contact with draining lesions and contaminated discharges or other contaminated materials. Exudates and dressings should be disinfected by autoclaving, incineration or treatment with standard disinfectants.

Prophylaxis and therapy

Veterinary vaccines protect animals to a substantial but not unlimited extent. No human vaccine is available. A six-week course of oral doxycycline concomitant with either six weeks of oral rifampicin or three weeks of intramuscular streptomycin is usually successful if begun early. Even prolonged antibiotic treatment is only moderately effective in cases of chronic infection.

D. Burkholderia mallei / Glanders

Formerly classified in as Pseudomonas mallei, the organism is a small, aerobic, non-motile, gram-negative rod.

Occurrence

The disease in humans is rare or absent in most parts of the world. Enzootic foci exist in Asia, some eastern Mediterranean countries and parts of the Middle East and Central and South America.

Reservoirs

Primarily a disease of equines,including horses, donkeys and mules, for which it is highly contagious.

Mode of transmission

The disease is acquired by humans by direct contact with infected animals or contaminated animal tissue, the agent entering the body though skin lesions or through conjunctiva, oral or nasal mucous membranes. The disease is not considered to be very contagious from person to person. It is likely to be infectious by aerosol exposure.

Incubation period

Variable although most human cases appear 1-14 days after exposure, the disease can remain latent for many years.

Clinical features

Glanders infection can present in several forms, depending on the route of entry and the site of infection. Initial symptoms may include fever, malaise, myalgia, and headache. Localized infection may become apparent a few days after exposure, with pus-forming ulcerations on the skin that may spread over most of the body or as purulent ulcerations of the mucosa of the nose, trachea, pharynx and lungs. Pulmonary infection is associated with pneumonia, pulmonary abscesses and pleural effusion. Localized infection in the lobes of the lungs may be apparent in chest X-rays. Bloodstream infections are usually fatal within a few days, even with antibiotic therapy. Chronic infections are associated with multiple abscesses in the muscles of the arms and legs, or in the spleen or liver. Subclinical infections are sometimes detected at autopsy.

Laboratory diagnosis

Identification may be made by isolation of the micro-organism from skin lesions, pus, sputum or blood, followed by direct fluorescent antibody staining or by polymerase chain reaction. Serological tests include complement fixation and agglutination tests. Biosafety Level 2 practices, equipment and facilities are recommended for manipulations involving clinical specimens or experimentally infected laboratory rodents. Biosafety Level 3 practices, equipment and facilities are recommended for manipulations involving the concentration of cultures or activities with a high potential for aerosol production.

Medical management

Standard precautions should be observed against infection from splashes or other direct contact with draining lesions, blood and contaminated discharges or other contaminated materials. Exudates and dressings should be disinfected by autoclaving, incineration or treatment with standard disinfectants. The organism is not highly resistant to environmental conditions.

Prophylaxis and therapy

No vaccine is available. Owing to the rareness of the disease, the medical literature regarding its therapy is sparse Sulfadiazine and ceftazidine are recommended for therapeutic use. The organism is also sensitive to tetracyclines, ciprofloxacin, streptomycin, novobiocin, gentamycin, imipenem, and sulfonamides. There may be relapses even after prolonged antibiotic therapy.

E. Burkholderia pseudommallei / Melioidosis

Formerly classified in as Pseudomonas Pseudomallei, the organism is a small, aerobic, motile, gram-negative rod.

Occurrence

The disease is prevalent in Southeast Asia, particularly in wet rice-growing areas, and, less commonly, in northern Australia. A number of cases have also been reported from central and south America.

Reservoir

A. Pseudomallei is found in soil and water in tropical and subtropical regions and infects many species of mammals, including marine mammals.

Mode of transmission

Humans become infected through skin lesions as a result of contact with contaminated soil or water. Infection can also occur by aspiration or ingestion of contaminated water or by inhalation of contaminated dust Person to person transmission may occasionally occur but is rare.

Incubation Period

The incubation period may range from a few days to years.

Clinical features

Clinical features resemble those of glanders and are highly variable. Cutaneous infection may give rise to subcutaneous infected nodules with acute lymphangitis and regional lymphadenitis, generally with fever. Inhalation or ingestion or hematogenous spread from cutaneous lesions may result in internal involvement, with chronically infected suppurating abscesses in lungs, liver, spleen, lymph nodes, bone or joints. Pulmonary involvement is associated with consolidation and necrotizing pneumonia, and may vary from mild to fulminant. The disease can resemble tuberculosis or typhoid fever. A fulminant septicemia with shock may occur and is probably invariably fatal. Asymptomatic infection has been detected serologically and may cause disease long after exposure.

Laboratory Diagnosis

Identification may be made by isolation of the organism from sputum or purulent exudates & followed by microbiological identification. Serological testing may be done by ELISA. Bio safety Level -2 practices, equipment and facilities are recommended for manipulations involving clinical specimens. Bio safety Level -3 practices, equipment and facilities are recommended for manipulations involving the concentration of cultures or activities with a high potential for aerosol productIon.

Medical management

Standard precautions should be observed against infection from splashes or other direct contact with draining lesions, blood and contaminated discharges or other contaminated materials. Exudates and dressings should be disinfected by autoclaving, incineration or treatment with standard disinfectants. The organism is not highly resistant to environmental conditions.

Prophylaxis and therapy

No vaccine is available. Ceftazidine and tetracycline have been used successfully. **Further reading on melioidosis**

F. Franclsella tularensls Tularaemia

The organism is a small, non-motile, gram-negative, aerobic coccobacillus, measuring 0.2 by 0.3 - 0.7 µm of the several strains that have been described, F.tularensis tularensis or type A is more virulent than F. fularensis palaeartica or type B. The organism can survive for up to several weeks in the natural environment.

Occurrence

F.tularensis tularensis is found in North America, while tularensis palaeartica occurs in Asia, Europe and North America.

Reservoirs

Many wild animals, especially rabbits, hares,voles, muskrats and beavers, also some hard ticks. The disease has been reported in many other animals, including various rodents, birds, reptiles, amphibians and marine mammals. It is also found in soil and water.

Mode of transmission

Tularemia is primarily a disease of a wide variety of wild mammals and birds. The natural cycle of infection also involves ticks, mosquitoes, flies and fleas. Humans become infected mainly through the bite of certain, arthropods, particularly certain species of hard ticks, and through the skin conjunctival sac or nasopharyngeal mucosa, by direct contact with infected animals or animal materials and by ingestion of contaminated food or water or inhalation of contaminated dust. Tularemia is easily transmitted by aerosol and inhalation of only a few organisms is sufficient to cause a significant likelihood of infection. Person to person transmission has not been documented.

Incubation period

The incubation period varies from 1 to 14 days, averaging 3-5. Its duration depends upon the strain, the dose and the portal of entry. Infection through skin and conjunctiva gives longer incubation periods than infection via the respiratory and alimentary systems.

Clinical features

Clinical manifestations depend on the route of entry and the virulence of the agent. Infection through the skin or conjunctiva usually produces an ulceroglandular form, with an indolent ulcer at the site of entry and painful swelling of local lymph glands, which may suppurate. In some cases the site of entry is inconspicuous, there being only local lymph gland involvement. Infection resulting from ingestion is characterized by a painful pharyngitis, with abdominal pain, diarrhoea and vomiting. Both forms are usually accompanied by an abrupt onset of fever, accompanied by chills, malaise and joint and muscle pain. Ulcero glandular tularaemia caused by virulent strains, if untreated, has a case fatality rate of about 5 percent and lasts 2 to 4 weeks, with a convalescent period of up to three months. Depending "on the position in the respiratory system where infection occurs, inhalation tularaemia may take the form of a primary pneumonia or of tracheitis and bronchitis. The initial manifestation, however, may be influenza-like without evident signs of respiratory involvement. Pleuro pulmonary tularaemia with a virulent strain has a high case fatality rate (40-60 percent) if untreated. The organism may also enter the bloodstream, causing toxemia and tularemia sepsis, which is almost invariably fatal.

Laboratory diagnosis

Direct microscopic examination of clinical specimens showing the characteristic small bacteria and specific staining with fluorescent antibody can provide a rapid diagnosis which may be confirmed by polymerase chain reaction, ELISA or by the appearance of specific serum antibodies that usually appear a week after onset. Biosafety -Level 2 practices, equipment and facilities are recommended for manipulations involving clinical specimens from humans or animals. Biosafety -Level 3 practices, equipment and facilities are recommended for all manipulations of cultures.

Medical Management

There is no requirement for quarantine of patients or immunization of contacts. Standard precautions are indicated where there are open lesions and discharges from ulcers, including autoclaving, incineration or disinfection of discharges and contaminated materials.

Prophylaxis and therapy

Live attenuated vaccines applied intradermally have proved effective in preventing infection in humans following exposure by scarification or inhalation. For antibiotic prophylaxis and post-exposure therapy streptomycin given intravenously for 7-14 days is highly effective if administered soon after exposure to the agent, and works well even if started within 48 hours. If streptomycin resistance is indicated, doxycyciine and ciprofloxacin are recommended. Other antibiotics, including gentamicin, tetracyclines and chloramphenicol, are also effective. Antibiotic therapy must be continued for at least 14 days to prevent relapses.

G. Yersinia pestis / Plague

Pestis is a gram-negative non-motile, non-sporeforming cocco- bacillus measuring approximately 1.5 by 0.75µm capable of both aerobic and anaerobic growth. The pathogen can remain viable for days in water or moist soil and can resist drying if protected by mucous of other substances but is killed by a few hours of direct exposure to sunlight.

Occurrence

During the 1990s there were human outbreaks in Africa, Asia, and South America and sporadic cases in many countries, including the USA. Known historically as the Black Death and still a serious problem, it is limited to sporadic cases where adequate surveillance and modern public health measures are practiced.

Reservoirs

The pathogen is present in animal reservoirs, particularly in wild rodents, in endemic foci world-wide, with the exception of Australia.

Mode of transmission

Plague is transmitted between rodents and to other animals via fleas, cannibalism or, possibly, contaminated soil. Plague occurs sporadically among people who come into contact with wild rodents. Outbreaks affecting large numbers of people can occur in cities when plague infects populations of urban rodents particularly rats of the genus Rattus. The usual form of the disease in humans, bubonic plague, is spread mainly by the bite of fleas regurgitating blood from infected rodents or by entry of the pathogen from infected fleas through a skin lesion. If the lungs become infected, as may occasionally occur in patients with the bubonic form, a much more virulent form, pneumonic plague, ensues and can be transmitted directly from person to person by droplet infection.

Incubation period

The incubation period in humans is 1-7 days in bubonic plague and somewhat less for the pneumonic form.

Clinical features

Initial symptoms may be nonspecific, with sudden onset of fever, chills, malaise, myalgia, nausea, sore throat and headache. Cases, acquired by aerosol inhalation would probably present as primary pneumonia. Infection spreads from the inoculation site via the lymphatics to regional nodes, which become swollen and painful (buboes). In a minority of cases, the pathogen enters the bloodstream giving rise to plague Septicaemia. Haematogenous spread of the pathogen to the lungs causes the pneumonic form of the disease which then can spread directly from person to person by droplet infection. As the disease progresses, patients experience shock, delirium and coma. Untreated bubonic plague has a case fatality rate of 25-50 percent while untreated pneumonic plague is almost always fatal. Less common forms are plague meningitis and plague pharyngitis.

Laboratory diagnosis

Strong suggestive evidence of Y. pestis in sputum, blood or material aspirated from a bubo is provided by observation of gram-negative ovoid baciiii that stain preferentiality at their ends with Giemsa or wayson's stains, although such bipolar distribution of stain may not always be clearly evident. The bacillus may be identified by direct fluorescent antibody stain for the Y. pestis capsular antigen and by lysis by specific bacteriophage. Various serological methods are also available. Biosafety Level -2 practices, equipment and facilities are recommended for all activities involving Infective clinical materials and cultures. Biosafety Level -3should be used for activities in which there is a high potential of aerosol or air droplet production or for work with antibiotic resistant strains.

Medical management

Emphasis must be placed on preventing epidemic spread. For patients with pneumonic plague, strict precautions against airborne droplet spread are essential, including patient isolation and wearing of surgical masks by patients and caregivers. Patients with confirmed pneumonic plague may be placed together in shared rooms if private rooms are not available. For patients with any type of plague, standard precautions must be taken against contamination from discharges and contaminated articles, including hand washing and the wearing of gloves, gowns and face protection. If there should be an outbreak of the pneumonic form, people should be advised to avoid crowded places, to report any definitely elevated fever or unusual rodent mortality and to institute measures of flea control if indicated.

Prophylaxis and therapy

Preventive vaccination with killed or live attenuated Y. pestis is moderately effective against bubonic but not against pneumonic plague. With killed vaccine, protection is relatively short-lived (3-12 months) and periodic revaccination is necessary. Vaccination is of little use during a plague outbreak, as at least a month is needed for immunity to build up. As with various other pathogens, massive infection can overcome vaccine- conferred immunity. Persons in close contact with pneumonic plague patients or who are likely to have been exposed to infected fleas, to have direct contact with body fluids or tissues of an infected mammal, or who for any other reason are suspected to have been exposed to the pathogen should receive antibiotic

prophylaxis for a week after the last suspected exposure. Doxycycline and ciprofloxacin are recommended for such use. Antibiotic therapy is effective if begun early in the disease and continued until 3 days after temperature returns to normal. Streptomycin and gentamycin are known to be effective and ciprofloxacin has proven effective in animal studies. Aggressive supportive management is essential. Multidrug resistance imparted by a transferable plasmid has been reported in a clinical isolate and antibiotic resistant strains have been developed in the laboratory.

H. Coxiella burnetii I Q Fever

C.burnetii is a pleomorphic gram-negative spore-forming obligate intracellular coccobacillus measuring 0.2 by 0.7 µm. The spore form, produced in infected host cells, is resistant to drying and environmental influences and can survive for months in water and food. It is extremely infective to humans.

Occurrence

World wide.

Reservoirs

The pathogen exists as a zoonosis in a wide range of animal hosts, including domesticated livestock and poultry, dogs, rodents, baboons and wild birds and especially cattle, sheep and goats. The zoonotic cycle includes numerous species of ixodid and argasid ticks, mites and parasitic flies. Arthropod vectors, however, do not play a role in transmission to humans.

Mode of transmission

Transmission to humans occurs primarily by inhalation of droplets, dust or aerosols from dried parturient fluids and excreta of infected livestock. Contaminated droplets and dust may also infect the conjunctivae and abraded skin. Inhalation of only a few organisms is sufficient to cause a significant likelihood of infection. Contaminated aerosols released to the atmosphere may cause infection at distances up to several kilometres from their source. Sporadic human infections may also result from ingestion of raw milk. Low temperature vat pasteurization is insufficient to kill the organism. Person to person transmission has been reported but is rare.

Incubation period

The incubation period in humans is usually 18-21 days, but can be less if large doses of the organism are inhaled.

Clinical features

The onset is sudden, with chills, fever, sweating,headache, loss of appetite, malaise and muscle and chest pains. There may also be nausea, vomiting and diarrhoea. In severe cases the disease progresses to extreme stiffness of the neck and back, disorientation and pneumonia. The fatality rate is usually less-than 1 percent, although somewhat higher rates have been reported in some outbreaks. Weakness and fever may continue for months. Long-term complications are uncommon but may include endocarditis. Asymptomatic infections also occur and may be revealed by serology.

Laboratory diagnosis

Isolation and microbiological identification of the organism from blood or other clinical materials is diagnostic but is hazardous to personnel. Specific and relatively rapid identification of the organism in blood or paraffin-embedded may be accomplished by polymerase chain reaction. Serological diagnosis may be performed by microaggiutination, complement fixation, indirect

immune fluorescent antilbody test or ELISA. Biosafety Level -2 practices, equipment and facilities are recommended for activities not involving propagation of the pathogen and involving only limited manipulation of infected materials, such as microscopic and serological examinations. Biosafety Level- 3 is recommended for activities involving the handling of infected human or animal tissues or isolation of the pathogen.

Medical management

Patient isolation is not required. Patient materials and contaminated articles should be autoclaved, incinerated or disinfected with solutions containing hypochlorite, peroxide or phenol.

Prophylaxis / treatment

A formalin-inactivated vaccine has been developed for laboratory workers and others at high risk but is not commercially available. Tetracyclines, particularly doxycycline are effective if given early and may abort the infection if administered before symptoms appear.

I. Rickettsia prowazeki / Typhus Fever

R. prowazeki is a small obligately intracellular gram-negative bacterium measuring approximately 0.4 by 1.5 µm.

Occurrence

The great epidemics of typhus that plagued-humans since ancient times ceased shortly after the Second World War with the widespread application of insect control procedures and other hygienic measures. Endemic foci exist in certain regions where louse infestation is common, including parts of Mexico, Central and South America, central and east Africa and various regions of Asia. Epidemics could reappear during time or war or famine.

Reservoirs

Humans, flying squirrels

Vector(s)

Transmitted from person to person by lice and fleas.

Mode of transmission

The disease is transmitted particularly by the body louse

Pediculus humanus corporis. Infection of humans occurs by contact of mucous membranes of abraded skin with the faeces of lice or fleas that have bitten a person with acute typhus fever. Infection probably also occurs by inhalation of dust contaminated with infected insect faeces or body parts. Patients are infective for lice during the febrile phase of the disease and perhaps for 2-3 days afterwards. Direct person-to-person transmission does not occur.

Incubation period

Usually 1-2 weeks.

Clinical features

The disease has a variable onset, often sudden, with chills, body aches, fever, headache and weakness. During the first week a macular rash appears, initially on the upper trunk and then spreads. The symptoms grow progressively more severe, with the critical period in the second or third week. Stupor and coma may be interrupted by attacks of delirium. Recovery is marked by abrupt cessation of fever, usually in the Second febrile week, but, if untreated, mortality ranges from 10 to 40 percent, increasing with age. The disease may reappear years after the initial infection, usually in a milder form.

Laboratory diagnosis

Sera become positive about two weeks after infection, when diagnosis may be obtained by immunofluorescent antibody test. More rapid diagnosis may be obtained by immunohistological identification of the organism or by polymerase chain reaction, using blood collected during the acute phase of the disease. Biosafety Level- 2 practices, equipment and facilities are recommended for activities not involving propagation of the pathogen, such as microscopic and serological examinations. Biosafety Level -3 is recommended for activities involving the handling of infected human or animal tissues.

Principles of medical management

Isolation of patients is not necessary. If lice are present, insecticide should be applied to patient clothing, bedding, living quarters and patient contacts in order to prevent spread of the disease. Louse infested individuals likely to have been exposed to typhoid fever should be deloused and placed under quarantine for 15 days after insecticide application and close patient contacts should be kept under fever watch for 2 weeks.

Prophylaxis / treatment

Antibiotics including doxycycline are effective in prophylaxis and treatment and should be given if typhus is suspected.

J. FUNGI

A. Coccidiodes Immitis / Coccidioidomycosis

The agent is a dimorphic fungus that propagates as a mycelial mould in soil and as spherules bearing endospores in mammalian tissue. Mature hyphal filaments of the mycelial form develop arthroconidia which detach and may then become wind born. Arthroconidia are light-weight barrel-shaped cells measuring approximately 3 by 6µm that are stable to drying but are killed by exposure to sunlight.

Occurrence

The fungus occurs in soil, especially in arid and semiarid regions of Southwestern United States, Northern Mexico and Central and South America. A substantial percentage of cattle, swine, sheep, dogs and humans in endemic regions have had asymptomatic infections, as revealed by immunophoresis and skin tests. The fungus has also been reported in the former Soviet Union.

Reservoirs

Soil, especially in arid regions.

Mode of transmission

Infection usually takes place by inhalation of contaminated dust or free arthroconidia. A dust storm originating in an endemic region of California in 1977 caused an elevated incidence of the disease over an area of thousands of square kilometres. Mammals, including humans, inhaling even small numbers of arthroconidia may become infected, whereupon these may develop into 30·60 µm diameter spherules that contain thousands of 2-3µm ovoidal endospores which themselves may develop into endospore-bearing spherules, spreading the disease throughout the body.

Incubation period

Usually 1·4 weeks.

Clinical features

The initial symptoms of the disease resemble those of other upper respiratory infections, including cough, fever, night sweats, chills, chest pain, sputum production and headache. Less often there may also be various forms of erythema with or without pus formation. The initial form of the disease usually resolves without therapy within several weeks. Persistent coccidioidomycosis, seen with increased frequency in AIDS patients and other immunocompromised persons, may appear a few weeks, months or, less often, years after primary disease or asymptomatic infection. It is characterized by progressive destructive pulmonary disease with continuous low-grade fever, weakness, cough with sputum production, cyanosis and dyspnea. In some cases, extrapulmonary dissemination occurs, with abscesses and involvement that may include skin, subcutaneous tissues, bones, joints and the central nervous system. Without treatment, the disseminated form, which may follow a rapid or a prolonged course, has a mortality rate of more than 50 percent, approaching 100 percent if meningitis develops. In endemic areas the majority of infections are asymptomatic, but may be detected by skin tests. The percentage of persons residing in endemic areas found to react positively to skin tests ranges from 5 percent to more that 50 percent. Recovery from clinical disease appears usually to be accompanied by lifelong immunity. It may also be that persons who have had subclinical infections have partial immunity, and that the disease takes a more severe course in individuals with no previous exposure.

Laboratory diagnosis

Direct microscopic visualization of spherules and endospores in the presence of 10% potassium hydroxide in biopsy tissue, pus or centrifuged cerebrospinal fluid. Sputum or material from the digestive or urogenital tracts may contain spherule like artefacts. Skin tests for hypersensitivity to preparations derived from the fungal mycelia or from spherules (coccidioidin or spherulin) are useful for epidemiological studies but may give false negative results in individual cases, especially if the disease is advanced. Biosafety Level- 2 practices, equipment and facilities are recommended for activities with clinical specimens. Biosafety Level -3 practices, equipment and facilities are recommended for activities with sporulating cultures identified as C. immitis and with soil or other materials known to be contaminated with the fungus.

Medical management

As the disease is not contagious, quarantine and patient isolation are not indicated. Manipulation of clinical specimens should be done under BL-2 safety conditions. As the arthroconidia easily become airborne and are highly infective, manipulations involving sporulating cultures and soil or other materials contaminated with infective arthroconidia should be conducted under BL-3 conditions. Contaminated specimens and materials may be sterilized by autoclaving or by treatment with iodine or glutaryl aldehyde based disinfectants.

Prophylaxis and therapy

No vaccine against coccidioidomycosis is available. Prolonged therapy with intravenous Amphotericin B is moderately effective in persistent cases, unless there is meningitis, In which case fluconazole is recommended.

B.Venezuelan equine encephalomyelitis

The agent is a member of the genus Alphavirus of the family Togoviridae. The virion is M-75µm in diameter; consisting of a positive single-stranded RNA enclosed in an icosahedral capsid, surrounded by a lipid bilayer membrane in which surface glycoproteins are embedded. Subtypes

lA, IB and IC are pathogenic for equines and are responsible for major outbreaks in humans. Other variants do not normally cause encephalitis in equids and, although sometimes encountered in humans, have not been isolated from major outbreaks.

Occurrence

Epidemics were first registered in the 1930s in the northern part of South America and then spread to Central America, reaching southern states of the USA in the 1970s. The disease is endemic in central and northern South America.

Reservoirs

The virus is maintained in a rodent-mosquito-rodent cycle. During major outbreaks affecting humans, the disease is transmitted in a cycle involving mosquito vectors and horses or other equines as hosts. For this reason, natural outbreaks are normally preceded by equine epizootics. Humans also may develop sufficient viremia to serve as hosts in human-mosquito-human cycles. Epidemic and non-epidemic strains may be distinguished antigenically.

Mode of transmission

Humans become infected from the bite of infected mosquitoes. The major species of mosquito that transmit epidemic VEE are Psorophora confinnis, Aedes sollicitans, Aedes taeniorhynchus, and Deinocerites pseudes. There is no evidence of direct person to person transmission or of direct transmission from horses to humans. Although natural aerogenic transmission is not documented in humans, primary aerosol Infection in laboratories is well known and inhalation of only a few organisms is sufficient to cause a significant likelihood of infection.

Incubation period

The incubation period in natural or aerogenic infection is usually 1·6 days.

Clinical features

Clinical manifestations of the naturally occuring disease are influenza-like, with abrupt onset of severe headache, high fever, chills, myalgia in the legs and lumbosacral area and retroorbital pain. There may also be photophobia, sore throat, nausea, diarrhoea and vomiting. Conjunctival and pharyngeal congestion are the only external signs. Most infections are fairly mild, with symptoms usually lasting 3-5 days. The overall case fatality rate in the 1962--63 epidemics in Venezuela, among some 30,000 cases, was approximately 0.6 percent. In some patients there is a second wave of fever and, particularly in children, CNS involvement ranging from somnolence and disorientation to personality change, convulsions, paralysis and death.

The initial symptoms of respiratory infection are like those of insect-born infection but central nervous system involvement appears to be more frequent.

Laboratory diagnosis

The disease exhibits leukopenia during a period usually limited to 1-3 days after onset. During this time, the virus may be sampled from serum or nasopharyngeal swabs and propagated in cell culture or in newborn mice. A variety of serological tests are applicable, including specific IgM ELISA, haemagglutination inhibition, immune fluorescence and complement-fixation. Polymerase chain reaction of can provide definitive identification of the specific strain and may be applied to serum and cerebrospinal fluid without prior propagation of the pathogen. Neutralizing antibodies appear in convalescent sera from the 5th day upto 2 weeks after onset of symptoms. Biosafety Level -3 practices, equipment and facilities are recommended for activities using infective clinical

materials. "although Biosafety Level- 2 may be used for activities in which there is little likelihood of aerosol or air droplet production.

Medical management

Persons caring for infected patients should wear gloves, caps, gowns and surgical masks. Infective virus may be present in fresh or dried blood, exudates, cerebrospinal fluid and urine. Such materials should be decontaminated by heating or by chemical disinfection, as with hypochlorite or chloramines. If mosquito vectors are present, patients should be kept in screened or insecticide-treated rooms to prevent mosquito transmission to healthy persons and general mosquito control measures should be instituted.

Prophylaxis and treatment

Attenuated cell-culture propagated live vaccine TC-83 produced In the USA is moderately effective against both natural infection and aerosol challenge but is somewhat reactogenic and fails to induce a minimum neutralizing antibody response in approximately one-fifth of persons receiving it, presumably leaving them unprotected. Two other attenuated live virus vaccines, strains 15 and 230, reported to offer good protection against aerosol challenge, were developed in Russia. An inactivated vaccine designated C-84, prepared by formalin-inactivation of the TC-83 strain, is currently used to immunize TC-83. non- responders and as booster for individuals who have declining titers after TC-83 vaccination.

C.Variola virus / Smallpox

Variola virus is a member of the genus Orthopoxvirus, subfamily Chordopoxvirinae of the family Poxviridae. Other members of the genus include cowpox, camelpox, ectromelia virus, vaccinia and monkeypox, the pox virus regarded as the cause of the most serious human poxvirus infections since the eradication of variola. The variola virus measures 260 by 150 nm and contains a molecule of double stranded DNA putatively coding for some 200 different proteins, one of the largest viral genomes known. There are at least two epidemiological strains of the virus, the more virulent designated variola major and the milder variola minor or alastrim. The variola virus is relatively stable in the natural environment and, if aerosolized, probably retains its infectivity for at least several hours if not exposed to sunlight or ultraviolet light.

Reservoir

The only known host of the virus was humans, facilitating the world-wide eradication campaign conducted by the WHO. The last naturally acquired case occurred in Somalia in 1977 and there was a laboratory acquired case in England in 1978. The global eradication of smallpox was certified by the WHO Assembly in 1980. Pending its possible ultimate destruction, all stocks and work with variola virus are authorized only in high containment Biosafety Level- 4 laboratories at the CDC in Atlanta, Georgia, USA and at VECTOR, Koltsovo, Novosibirsk Region, Russian Federation.

Mode of transmission

The virus gains entry into the body vie respiratory or oropharyngeal mucosa. It is transmitted by aerosols and air droplets from close contacts with infected patients, particularly if the symptoms include coughing, and also by contaminated clothes and bedding.

Incubation Period

The first clinical symptoms appear between 7 and 19 days after exposure, commonly 10-14, with rash appearing 2-5 days afterwards. Patients become infectious only after the appearance of rash and remain so until all scabs have detached.

Clinical features

Onset is sudden, with influenza-like symptoms including fever, malaise, headache, prostration, severe back pain, and less often, abdominal pain and vomiting. Two to three days later, the fever may drop and a rash appears, first about the face, hands and forearms and then after a few days progressing to the trunk. Such centrifugal distribution of lesions is an important diagnostic feature. Lesions progress from macules to papules and to pustular vesicles and all lesions in a given area progresstogether through these stages. From 8 to 14 days after onset. the pustules form scabs which leave depressed depigmented scars upon healing. Variola major and variola minor are characterized by similar lesions but variola minor is accompanied by milder symptoms and a case fatality rate of less than 1 percent, while the fatality rate of variola major is 20-40 percent. Variola is sometimes confused with chickenpox, caused by the varicella-zoster virus, a member of the family Herpesvirideae. Chickenpox is a world-wide infection especially of children that is seldom lethal. It is distinguished from variola by its much more superficial Iesions, there presence more on the trunk than on the face and extremities and by the development of successive crops of lesions in the same area. There are two rare forms of smallpox, haemorrhagic and malignant. In the former, invariably fatal in both vaccinated and non-vaccinated patients, the rash is accompanied by haemorrhage into the mucous membranes and the skin. Malignant smallpox is characterized by lesions that do not develop to the pustular stage but remain soft and flat. It is almost invariably fatal for non-vaccinated patients and often fatal even for vaccinated ones.

Laboratory diagnosis

Confirmation of clinical diagnosis may be accomplished by immune fluorescent microscopy or electron microscopic observation of the virus. Definitive confirmation and discrimination of variola major from other pox viruses may be accomplished by sequencing of amplicons from polymerase chain reaction with viral DNA extracted from clinical specimens. If virus-containing specimens are not available, anti-smallpox antibodies may be detected in serum by various tests, including virus neutralization, hem agglutination inhibition, Western blot or complement fixation. Scabs, vesicular or pustular fluids and other specimens for diagnosis should be collected only by vaccinated persons. Laboratory manipulations with infective materials should be done in high containment facilities at Biosafety Level 4, authorized only at the two WHO designated laboratories in the USA and the Russian Federation.

Medical management

Emphasis must be placed on preventing epidemic spread. In doing so, it should be kept in mind that smallpox patients are not infectious during the early stage of the disease but become so from the first appearance of rash and remain so until all scabs, have detached. Also, immunity develops rapidly after vaccination against smallpox, so that even post exposure vaccination can prevent or ameliorate the disease so long as it is done within approximately 4 days after exposure and before rash appears. Patients diagnosed with smallpox should be physically isolated and all persons who have or will come into close contact with them should be

vaccinated. As hospitals have proven to be sites of epidemic magnification during smallpox outbreaks, patient isolation at home is advisable. This also reduces the risk of infecting persons incorrectly diagnosed with smallpox during an outbreak. Patients who developed rash before their isolation should be asked to recount all recent contacts and, if feasible, these should either be vaccinated or placed on daily fever watch for at least two weeks after contact and vaccinated if fever appears. All specimen collectors, care givers and attendants coming into close contact with patients should be vaccinated as soon as smallpox is diagnosed and all other known contacts not previously vaccinated should be placed on daily fever watch and vaccinated if fever appears if there is a major outbreak, people should be advised to avoid crowded places, to report any definitely elevated fever and to observe hygienic precautions such as frequent hand washing, medical caregivers, attendants, and mortuary workers, even if vaccinated, should wear gloves, caps, gowns and surgical masks All contaminated instruments, excretions, fluids and other materials should be decontaminated chemically or by heat or incineration. Contaminated clothing and bedding, if not incinerated should be autoclaved or washed in hot water containing hypochlorite bleach. Fumigation of premises may be done with formaldehyde. Cadavers should be cremated whenever possible and all persons coming in contact with them should be vaccinated or at least placed on daily fever watch.

Prophylaxis / treatment

Most existing vaccine stock and the vaccine used in the WHO eradication campaign consist of pulp scraped from vaccinia-infected animal skin, mainly calf or sheep with phenol added to a concentration sufficient to kill bacteria but not so high as to inactivate the vaccinia virus. This is then freeze dried and sealed in ampoules for later re-suspension in sterile buffer and intradermal inoculation by jet injector or multiple puncture inoculation with a bifurcated needle. A 19 INSERT survey conducted by WHO estimated that there may be approximately 60 million doses of vaccine available world-wide, including- 500,000 doses held by WHO and 6 or 7 million under the control of the CDC in Atlanta, Georgia, USA. Vaccination usually prevents smallpox infection for at least ten years and even if symptoms appear, they are milder and mortality is less than in nonvaccinated persons. Vaccination is contraindicated for certain groups, including pregnant women and persons with immune disorders or under immunosuppression, HIV infection or history of eczema. Nevertheless, if there is danger of epidemic spread it may be advisable to vaccinate such persons and to attempt to limit adverse effects by intramuscular administration of vaccinia immune globulin, if available, from vaccinia-infected sheep or calves. A less reactogenic vaccinia-based vaccine, produced in cell culture, is expected to become available within a few years and there is interest in developing monoclonal anti- variola antibody for passive immunization of exposed and infected individuals. A number of compounds are under investigation as chemotherapeutic agents against variola infection. One of these, Cidofovir, a broad spectrum inhibitor of Viral DNA polymerase, appears to protect mice against cowpox and cynomolgous monkeys against monkey pox and inhibits variola virus replication in vitro.

Bacterial Toxins

Staphylococcal enterotoxins

These toxins are a common cause of diarrhetic food-poisoining after ingestion of impropertly handled food. They are proteins that range in size from 23 to 29 kilodaltons. They are thought

to work by stimulating massive release of a variety of cytokines that then mediate the different toxic effects. The toxins are known in at least five antigenically district forms. Type B is the most studied. It is heat stable and in aqueous solution, can withstand boiling. It is heat stable and in aqueous solution, can withstand boiling. It is active by inhalation, by which route it causes a clinical syndrome markedly different, and often more disabling, than when ingested. It has been studied as a warfare agent of the incapacitating type. The median disabling dose for human beings by inhaltion has been estimated at 0.0004µg per kilogram body weight. The corresponding lethal dose is estimated as being 50times larger.

Main Clinical features

When staphylococcus aureus contaminates food products and the resulting pre-formed toxin is ingested, symptoms, which are usually nausea, vomiting and diarrhoea, occur within 1-6 hours of eating the contaminated food.

After inhalation of staphylococcal enterotoxin B(SEB), intoxication becomes manifest within 3-12 hrs as through the sudden onset of fever, headache, chills, mayalgias and a non-productive cough. More severe cases may develop dyspnoea and retrosternal chest pain. If toxin is swallowed, nausea, vomiting and diarrhoea will occur in many patients, and fluid losses may be substantial. The fever, with variable degrees of chills and prostration, may last up to five days, and the cough may persist for as long as four weeks.

Diagnosis and detection

The diagnosis of inhalation SEBintoxication is clinical and epidemiological. Patient samples are unlikely to test positive for the toxin following aerosol exposure is large and samples are obtained rapidly. Enterotoxins may be detected in environmental samples using a variety of antibody based tests.

Medical management

Supportive therapy has proved adequate in cases of accidental respiratory exposure to SEB aerosol. Hydration and oxygenation will require close attention. In severe cases, where pulmonary oedema develops, ventilation with positive and expiratory pressure and diuretics may be necessary. Most patients would be expected to do well after the initial acute phase of theire illness. But would remain unfit for normal activities for 1-2 weeks. The illness being an intoxication, no isolation or other quarantine measures are required.

Prophylaxis

There is no human vaccine available although several are in development, including ones that, in animal studies, have been shoen to protect against inhalation exposure to SEB. Passive protection has also been demonstrated.

Stability / neutralisation

SEB can be detoxified by treatment with 0.5 percent hypochlorite for 10-15 minutes.

Ricin

Ricin is a highly toxic glycoprotein (a lectine) of approximately 65,000 dalton that occurs in the seed of the castor plan, Ricinus communis. Ricin consists of two protein chains, the larger (B chain, 34Kda) attaching to cell surface receptors and facilitating entry of the smaller (A chain, 32

Kda) which affects cellular ribosomal activity. It inhibits protein synthesis in eukaryotic cells. It is toxic by all routes, including inhalation, but least so by ingestion. Horses are the animals most susceptible to ricin, cattle and pigs less so, with ducks and hens the least susceptible. In mice the systemic LD_{50} is 2.7μgKg^{-1}.

Main clinical features

Following exposure there is a latency of many hours, sometimes days. After inhalation, significant lung pathology is evident with increased cytokine concentrations, marked inflammation and pulmonary oedema. Ingestion results in severe gastro-enteritis, often haemorrhagic, convulsions, shock and renal failure may develop. Nerve cells, the heart and spleen are all affected by ricin. Ricin dust exposure will cause local irritation of eyes, nose and throat. Sub lethal lung pathology has been described in immunised mice following inhalation challenge to aerosolised ricin. Survivors of a ricin aerosol challenge may, therefore, experience some injury, particularly to the lungs.

Diagnosis and detection

The primary diagnosis would be by the clinical and epidemiological setting. Specific ELISA testing on serum or immunohistochemical techniques for direct tissue analysis can be used to confirm the diagnosis.

Medical Management

Management is supportive and should include maintenance of intravascular volume. No antitoxin is yet available.

Prophylaxis

There is no currently approved prophylaxis for human use, though both active immuniation and passive antibody prophylaxis have been under study. Formaldehyde toxoids against ricin have ben used successfully to immunise rats : toxoid was administered subcutaneously in 3 doses at 3 weekly intervals and prevented deaths in animals exposed to 5 LCt50s by inhalation challenge.

Stability / neutralisation

Ricin is soluble in water, in which state it is less stable than dry product. In the dry state it is normally stable at room temperature but denatures at elevated temperature. The stability decreasing with increasing moisture content.

CHAPTER 10:CHEMICAL DISASTER – SPECIFIC PIANNING GUIDANCE

This section is about incidents involving chemical terrorism. Hazardous chemical releases & site exposure are the two important issues along with surveillance, laboratory diagnosis, medical management & consequence management.

During 1995 sarin nerve agent attack on TOKYO subway system, roughly 3800 people were affected with 12 deaths. In 1984, the accidental release of 40 tons of methyl isocyanate from a pesticide factory in Bhopal, India injured hundreds of people and killed about 4000. Thus the respiratory inhalation of volatile chemicals can present a major danger of mass casualties.

Many of the chemical of concern can be arranged under following cataegories

1. Millitary agents
2. Pulmonary (lung Damaging agents)
3. Irritants
4. Vomiting agents
5. In capacitating agents

The main difference between industrial chemical accidents & chemical terrorism may be intent & magnitude. Efforts to enhance hazardous material (HAZMAT) preparedness & response activities for chemical spills will better prepare communities to respond to terrorism events. Likewise chemical terrorism preparedness activities should collaterally benefit a community ability to effectively respond to HAZMAT emergencies.

1. Surveillance and Epidemiological Investigation

In a chemical event, surveillance is most useful for tracking exposed individuals for long term physiologic difficulties, chronic illness, cancers etc. Effective post event surveillance will require the establishment of a registry or database that includes the names and contact information of exposed people. To be most effective the registry should include at least the following information:

- Name, Age & sex
- Address & telephone number
- Occupation & where the registrant was located at the time of event?
- Where the registrant can be contacted?
- Date & time of onset of symptoms
- Medical treatment received if any

Problem statement

Many presume that an explosion will lead to dispersion of chemicals that will precipitate a chemical terrorism event. Between the resulting fire and the rapid onset of symptoms, chemical incidents are assumed to be overt, easily identifiable events. During the time of event, it is important not to discount immediately chemicals as the source of an unexplained syndrome. Contamination of food and water supply with a hazardous chemical could sicken many people. Premature elimination of chemicals as a potential causative agent could delay effective treatment.

2. Laboratory Diagnosis

The state establishes linkages to appropriate authorities at local, state & National levels to ensure its ability to take and test environmental samples when required to characterize the site. Blood, Serum and urine specimens are analyzed for breakdown products to quantify human exposure to selected chemicals.

As with the biological agents, state focuses its preparedness efforts on prioritized hazardous chemicals. The priority agents include

- Millitary nerve agents
- Sulfur and Nitrogen Mustards
- Lewisites
- Ricin
- Saxitoxin
- BZ
- Hydrogen Cynide
- Cyanogen chloride

Most of the state public health chemical laboratories do not possess necessary equipments or expertise to rule out the level 4 biological agent that potentially could be present in a human sample collected from a suspected victim of a chemical attack.

State laboratories do not have the irradiators necessary to neutralize the hardiest of the biologic agents. Therefore safety dictates that biological samples from chemically contaminated victim be sent directly to level 4 laboratory.

1. Specimen Collection

   It is important that first thirty (30) samples from the most contaminated (exposed) people be sent to the laboratory following standard operative procedures. Expeditious shipment of first samples will allow lab personnel to help identification of the causative agent and speed the determination of whether or not a second chemical agent is involved in the exposure. After the first 30 samples are collected and transmitted as many as samples may be collected either directly or by laboratory personnel.

   Samples transmitted must not contained personnel identifiers but they must have unique identifiers. Samples collected for chemical analysis should confirm to the following.

   For urine samples: at least 20ml. Use screw-capped plastic container.

   For Serum samples:the yield from two 10ml. no-anticoagulant tubes in plastic screw – capped vials.

   For whole blood: one 5ml. or 7ml. NaOxalate / anticoagulated tube / one 5ml.or 7ml. heparinised tube unopened, plus an empty tube to check as a blank.

2. Sample transporation

   Secure specimens in Zipper locking plastic bags surrounded with obsorbent material for cushioning then put them storage boxes and transport the samples maintaining the cold chain. Each sample container top must be rapped with waterproof, tamper-proof security

tape. The sample should be accompanied with proper lab requisition format. All the samples need to be sent to the designated referral laboratory.

3. Medical Management

The treatment of exposed people by clinical syndrome rather than specific chemical is more useful for public health and emergency medical response planning. Public health agencies and first responders may render the most aggressive, timely and clinically relevant treatment possible by using treatment modalities based on syndromic categories (buns and trauma, respiratory failure, cardiovascular shock and neurological toxicity).

The guidelines detailed below are intended to aid health care professionals involved in emergency response to decontaminates patients effectively, protect themselves and others from contamination, communicate with other involved personnel, efficiently transport patients to a medical facility, and provide competent medical evaluation and treatment to exposed persons.

10.1:Emergency Medical conditions and Needs Associated With Chemical Exposures

Syndrome and Causative Agents	**Medical therapeutic Needs**
Burns and Trauma Corrosives,Vesicants, Explosives, Oxidants, incendiaries, radiologicals	• Intravenous fluid and supplies • pain medications • Pulmonary products • Splints and bandages
Respiratory Failure Corrosives, military agents, explosives, oxidants, incendiaries, asphyxiants, irritants, pharmaceuticals, metals	• Pulmonary products • Ventilators and supplies • Antidotes (when available) • Tranquilizing medications
Cardiovascular Shock Military agents, pesticides, asphyxiants, pharmaceuticals	• Intravenous fluid and supplies • Cardiovascular products Antidotes (when available)
Neurological Toxicity Military agents, pesticides, pharmaceuticals, radiologicals	• Antidotes (when available)

4. Consequence Management

(a) When responders deal with a known or suspect chemically contaminated area, they should rely on personal protective equipment and respiratory protection standards described to help ensure their safety. Health departments should work with responders to ensure that they are properly protected in the field. Strategies include having appropriate resources to decontaminate patients and utilizing appropriate personal protective equipment while decontaminating patients or treating patients who require care before decontamination.

(b) Patient Decontamination liquid or aerosolized chemicals can pose a dermal threat and must are moved as rapidly as possible. For these exposures do not require decontamination . It is essential to remove the exposed person clothing and rapidly decontaminate by using copious amounts soap & water. Decontamination solution may be used, if available and appropriate.

(c) Secondary Contamination from chemicals may be possible but is unlikely when gross contamination is absent.

(d) Effective Screening of those arriving at the mass care facility to ensure that contaminated people are identified and effectively decontaminated before entering should be sufficient to prevent contamination of the facility or those temporarily residing in it.

(e) Care must be taken to isolate bodily fluids(including vomitus) to prevent secondary illness from off gassing after the ingestion of some chemicals.

5. Mental Health

The exposure to hazardous chemicals can lead to psychosocial responses different from and in some instances greater than, other emergency situations." The inability to quantify exposure along with concerns about developing illnesses well into the future result in special feelings of vulnerability and loss of control. The unique mental health concerns caused by a chemical event must be considered during the planning process.

6. Environmental Decontamination

The need to perform environmental decontamination for chemicals depends on the chemical involved. Persistent chemicals can remain in the environment for long periods and must be actively removed through decontamination. Other chemicals are more volatile and will evaporate without intervention, thus eliminating the need for decontamination.

CHAPTER 11:MINIMUM INITIAL SERVICE PACKAGE FOR SEXUAL &REPRODUCTIVE HEALTH IN DISASTER

SRH Coordinator for Disaster at State: Joint Director (RH)

SRH Coordinator of District: ADMO(FW) of concerned district

1. SRH needs continue and as a matter of fact often increase during disasters
2. Risk of sexual violence may increase during social instability
3. STI/HIV transmission may increase in areas of high population density
4. Lack of FP increases risk associated with unwanted pregnancy
5. Malnutrition and epidemics increase risks of pregnancy complications
6. child birth occurs on the way during population movements
7. Lack of access to comprehensive emergency obstetric care increases risk of maternal deaths

11.1:Prevention and management of the consequences of sexual violence:

Prevention

a. Careful site planning of displacement camps, in consultation with persons of concern, especially women.
b. Ensuring female staff members are included in registration, security, food distribution, other sections, etc.
c. Setting up latrines, hygiene and water points to be accessible and safe and have proper lighting.
d. Ensuring house-hold fuel collection methods are safe.
e. Ensuring that displaced women have individual registration cards, food ration cards etc.
f. Identifying persons/groups with special needs who could be at a higher risk for sexual violence such as female headed households, unaccompanied and separated children, women at risk, single women, persons living with disabilities, elderly etc. and determining their special protection and assistance needs.
g. Ensuring confidentiality and impartiality in access to services (non-judgmental).

Response

a. Identifying lead agency and partners to set up Standard Operating Procedures (SOPs) or protocols with partners and agencies for identification, response and referral of sexual violence survivors for the necessary assistance .

b. Ensuring that survivors of sexual violence have access to health services.
c. Coordinating mechanisms for appropriate psychosocial support.
d. Ensuring 24/7 access to services, private consultation spaces, and conditions and reporting mechanisms obliging staff to maintain confidentiality.
e. Ensuring physical safety of survivors.
f. Appointing staff trained on Sexual Violence prevention and response mechanisms.

Responsible persons---- ADMO (FW) and MOI/C CHC

Reducing maternal and newborn mortality and morbidity:

a. Distributing clean delivery Kits.
b. Making sure that midwifery Kits are available at health centres.
c. Appointing skilled staff.
d. Providing for safe abortion care facilities.
e. Including the needs of adolescent population.
f. Making provision for FP services.
g. Establishing a functioning obstetric emergency referral system.

Responsible person----- ADMO(FW) / M.O I/C CHC

Reducing transmission of HIV and other STIs:

a. Ensuring condoms are available and accessible.
b. Ensuring staff will comply with standard precautions and have easy access to protocols.
c. Ensuring blood transfusion is rational and safe (protocols, rapid HIV and other screening tests).
d. Appointing health workers who can effectively apply standard precautions.

Responsible persons--- ADMO(PH)/ DPM (DAPCU) in DAPCU districts

Plan for provision of comprehensive SRH services:

a. Collecting SRH data (segregated by age and sex): SRH mortality, HIV/STI prevalence, contraceptive prevalence, etc.
b. Identifying appropriate sites for future delivery of comprehensive SRH services.
c. Identifying training needs on technical, cultural, ethical religious and legal aspects of SRH and gender awareness.
d. Putting in place a logistics management information system for equipment/supplies for comprehensive SRH services

Responsible persons--- ADMO (PH)/DSMO

Annexure -1

District wise list of Control Rooms with Telephone Numbers:

1. **Functioning of control room**
   Period:- 1st June to 31st October (State / District)

Sl No	District	District Control Room Number	E.Mail ID
	State HQ	0674- 2390466/2391230	dirhealtho@gmail.com
1	Angul	06764-232291 / 232507	dsuangul@gmail.com
2	Balasore	06782-262184	dsubalasore@gmail.com
3	Baragarh	06646-233084	dsubaragarh@gmail.com
4	Bhadrak	06784-251706	dsubhadrak@gmail.com
5	Bolangir	06652-232638	dsubolangir@gmail.com
6	Boudh	06841-222225	dsuboudh@gmail.com
7	Cuttack	0671-2307283	dsucuttack@gmail.com
8	Deogarh	06641-226428	dsudeogarh@gmail.com
9	Dhenkanal	06622-226818	dsudhenkanal@gmail.com
10	Gajapati	06815-222205 / 223834	dsugajapati@gmail.com
11	Ganjam	0680-2224798	idspdsuganjam@gmail.com
12	Jagatsinghpur	06724-221011	dsujagatsinghpur@gmail.com
13	Jajpur	06728-222597	dsujajpur@gmail.com
14	Jharsuguda	06645-273105	dsujharsuguda@gmail.com
15	Kalahandi	06670-230022	dsukalahandi@gmail.com
16	Kandhamal	06842-253229	dsukandhamal@gmail.com
17	Kendrapara	06727-233301	dsukendrapara@gmail.com
18	Keonjhar	06766-255426	idspdsukeonjhar@gmail.com
19	Khurda	06755-223178	dsukhorda@gmail.com
20	Koraput	06852-25061 / 251381	dsukoraput@gmail.com
21	Malkanagiri	06861-230277 / 230331	dsumalkanagiri@gmail.com
22	Mayurbhanj	06792-252671 / 252702	dsumayurbhanja@gmail.com
23	Nawarangapur	06858-222459/222057	dsunawarangpur@gmail.com
24	Nayagarh	06753-253392	dsunayagarh@gmail.com
25	Nuapada	06678-223346 / 223745	dsunuapada@gmail.com
26	Puri	06752-22175	dsupuri@gmail.com
27	Rayagada	06856-235606 / 236212	dsurayagada@gmail.com
28	Sambalpur	0663-2520035/2533536	dsusambalpur@gmail.com
29	Sonepur	06654-221299	dsusonepur@gmail.com
30	Sundergarh	06622-272889	dsusundergarh@gmail.com

Annexure -2

District wise list of Flood Prone Gram Panchyats

District	Name of the block	No. of the flood prone (GPs)	Total flood prone GPs
1. Anugul	Angul	1	31
	Athamallik	14	
	Pallahara	3	
	Chhendipada	2	
	Talcher	4	
	Kaniha	7	
2. Balasore	Sadar	18	98
	Basta	7	
	Bhogarai	9	
	Remuna	11	
	Jaleswar	20	
	Nilagiri	7	
	Baliapal	16	
	Soro	5	
3. Baragarh	Ambabhana	3	18
	Bheden	4	
	Attabira	1	
	Padmapur	3	
	Gaisilat	2	
	Paikmal	3	
	Jharbandh	2	
4. Bhadrak	Basudevpur	8	65
	Bhandaripokari	9	
	Barapada	6	
	Chandabali	8	
	Dhamanagar	23	
	Tihidi	11	
5. Bolangir	Gudvella	7	14
	Saintala	1	
	Titlagarh	2	
	Deogaon	4	
6. Boudh	Kantamal	25	34
	Boudh	5	
	Harbhanga	4	
7. Cuttack	Athagarh	6	126
	Subarnapur	18	
	Tigiria	5	
	Baramba	9	
	Kanpur	20	
	Dompada	20	
	Kantapada	8	
	Baranga	7	
	Sadar	6	
	Tangi	2	
	Salepur	9	
	Mahanga	6	

	Nischintokoili	10	
8. Deogarh	Barkote	3	17
	Tileibani	7	
	Reamal	4	
	Deogarh Town	Ward No. 5 / 6 & 10	
9. Dhenkanal	Gandia	4	25
	Sadar	1	
	Odapada	4	
	Kamkhyanagar	8	
	Parjanga	3	
	Bhuban	5	
10. Gajapati	Kasinagar	4	4
11. Ganjam	Digapahandi	7	112
	Sanakhemundi	12	
	Hinjulicut	4	
	Patrapur	7	
	Chikiti	6	
	Rangeillunda	5	
	Sergarh	5	
	Purusottampur	6	
	Polasara	6	
	Chatrapur	5	
	K.S Nagar	3	
	Ganjam	5	
	J.N Prasad	5	
	Bhanjanagar	8	
	Bellagunta	5	
	Aska	8	
	Sorada	6	
	Dharakote	9	
12.Jagatsinghpur	Biridi	7	83
	Ballikuda	6	
	Jagatsinghpur	8	
	Tritol	11	
	Naugaon	9	
	Kujanga	8	
	Erasama	20	
	Raghunathpur	14	
Jajpur	Barachana	14	120
	Bari	29	
	Binjharpur	11	
	Korei	13	
	Dharmasala	9	
	Dasarathpur	11	
	Jajpur	20	
	Rasulpur	8	
	Danagadi	4	
	Sukinda	1	
Jharsuguda	Lakhanpur	4	4
Kalahandi	Jaipatna		43
	Kalampur		
	Koksara		

	Karlamunda		
	Kesinga		
Kandhamal			
Kendrapara	Rajakanika	29	117
	Rajnagar	7	
	Aul	15	
	Pattamundai	13	
	Mahakalpara	12	
	Marsaghai	19	
	Patkura	18	
	Indupur	3	
	Derabishi	2	
Keonjhar	Hatadihi	9	14
	Anandapur	4	
	Ghasipura	1	
Khurda	Balipatna	5	27
	Khurda	4	
	Balianta	10	
	Tangi	1	
	Begunia	1	
	Jatni	2	
	Bhubaneswar	4	
Koraput	Kotpad	5	5
Malkangiri	Mathili	9	44
	Korkunda	5	
	K. Gumma	13	
	Podia	12	
	Kalimela	5	
Mayurbhanj	Kaptipada	4	25
	G.B Nagar	5	
	Betnoti	3	
	Badasahi	5	
	Rasgovindpur	5	
	Morada	1	
	Baripada Municipality	Ward No. 5, 9 & 14	
Nawarangpur			
Nayagarh	Bhapur	6	25
	Khandapara	4	
	Gania	5	
	Nayagarh	10	
Nuapada	Khariar Road	10	26
	Komna	4	
	Khariar	2	
	Sinapali	5	
	Boden	5	
Puri	Satyabadi	16	128
	Astaranga	8	
	Kakatpur	13	
	Puri Sadar	11	
	Nimapada	18	
	Krushnaprasad	7	
	Delanga	13	

	Gop	7	
	Kanas	22	
	Pipili	5	
	Brahmagiri	8	
Rayagada	Rayagada	17	94
	Gunupur	11	
	Gudari	8	
	Chandrapur	6	
	Ramanguda	13	
	Bissamcuttack	7	
	Muniguda	12	
	Padmapur	8	
	K. Singpur	12	
Sambalpur	Dhankauda	4	47
	Maneswar	7	
	Jujumura	2	
	Rengali	3	
	Kuchinda	2	
	Rairakhol	4	
	Bamra	1	
	Naktideul	8	
	Jamankira	4	
	Sambalpur Municipality	13 wards	
Subarnapur	Tarva	14	39
	Binika	6	
	Naikenpali	5	
	Birmaharajpur	7	
	Ullunda	7	
Sundargarh	Sadar Block Sundargarh	4 GP 3 Wards of Municipality	76
	Tangerpali	6	
	Subdega	3	
	Balisankara	5	
	Laphripara	6	
	Kutra	3	
	Kuarmunda	5	
	Nuagaon	8	
	Bisra	5	
	Lathikata	7	
	Bonai	7	
	Lahunipara	4	
	Gurundia	8	
	Koida	5	
	Bargoan	3	
	Rajgangpur	4	

Annexure – 3

District wise List of Medical Relief Centers in the State

Medical Relief Centers are opened at existing Sub Centre or any health institutions, other Govt. premises like AWC, Schools, Panchayats office as per the situation and manned mostly by paramedics and Medical Officers in mobile teams visits the MRC in rotation. Wherever workload is more Medical Officers are also deployed. As the water recedes staff from MRCs visited the affected villages to provide relief**.**

Name of the district	Name of the block	No. of MRC planned	Total
Anugul	Angul	3	16
	Athamallik	5	
	Pallahara	2	
	Chhendipada	3	
	Talcher	1	
	Kaniha	2	
Balasore	Sadar	4	40
	Basta	7	
	Bhogarai	7	
	Remuna	4	
	Jaleswar	8	
	Nilagiri	4	
	Baliapal	4	
	Soro	2	
Baragarh	Ambabhana	6	27
	Bheden	4	
	Attabira	2	
	Padmapur	5	
	Gaisilat	3	
	Paikmal	3	
	Jharbandh	4	
Bhadrak	Basudevpur	2	19
	Bhandaripokari	3	
	Barapada	1	
	Chandabali	5	
	Dhamanagar	4	
	Tihidi	4	
Bolangir	Gudvella	12	21
	Saintala	5	
	Titlagarh	2	
	Deogaon	3	
Boudh	Kantamal	9	20
	Boudh	5	
	Harbhanga	6	
Cuttack	Berhampur	5	56
	Subarnapur	3	
	Bindhanima	3	
	Maniabandha	4	
	Kanpur	3	
	Dompada	4	
	Niali	4	
	Adaspur	4	

	Mahidharpada	4	
	Bentkar	4	
	Tangi	3	
	Salepur	4	
	Mahanga	5	
	Nischintokoili	6	
Deogarh	Barkote	3	15
	Tileibani	7	
	Reamal	4	
	Deogarh Town	1	
Dhenkanal	Gandia	5	30
	Sadar	5	
	Odapada	5	
	Kamkhyanagar	5	
	Parjanga	5	
	Bhuban	5	
Gajapati	Kasinagar	4	4
Ganjam	Digapahandi	5	109
	Sanakhemundi	5	
	Hinjulicut	15	
	Patrapur	5	
	Chikiti	4	
	Rangeillunda	4	
	Sergarh	3	
	Purusottampur	6	
	Polasara	4	
	Chatrapur	4	
	K.S Nagar	4	
	Ganjam	10	
	J.N Prasad	5	
	Bhanjanagar	7	
	Bellagunta	8	
	Aska	6	
	Sorada	10	
	Dharakote	5	
Jagatsinghpur	Biridi	5	38
	Ballikuda	5	
	Jagatsinghpur	3	
	Tritol	5	
	Naugaon	5	
	Kujanga	5	
	Erasama	5	
	Raghunathpur	5	
Jajpur	Barachana	5	93
	Bari	15	
	Binjharpur	11	
	Korei	11	
	Dharmasala	8	
	Dasarathpur	6	
	Jajpur	17	
	Rasulpur	11	
	Danagadi	5	

	Sukinda	4	
Jharsuguda	Lakhanpur	3	3
Kalahandi	Th Rampur	3	18
	Lanjigarh	4	
	Koksara	2	
	Dharmagarh	2	
	Kalampur	7	
	Junagarh	6	
	Bhawanipatna	5	
Kandhamal			
Kendrapara	Rajakanika	3	38
	Rajnagar	4	
	Aul	6	
	Pattamundai	4	
	Mahakalpara	4	
	Marsaghai	10	
	Patkura	5	
	Indupur	1	
	Derabishi	1	
Keonjhar	Hatadihi	9	14
	Anandapur	4	
	Ghasipura	1	
Khurda	Balipatna	3	23
	Khurda	3	
	Balianta	6	
	Tangi	3	
	Begunia	3	
	Jatni	3	
	Bhubaneswar	2	
Koraput	Kotpad	5	15
Malkangiri	Mathili	4	
	Korkunda	2	
	K. Gumma	1	
	Podia	2	
	Kalimela	1	
Mayurbhanj	Kaptipada	1	9
	G.B Nagar	1	
	Betnoti	1	
	Badasahi	1	
	Rasgovindpur	2	
	Morada	1	
	Baripada Municipality	2	
Nawarangpur		2	11
Nayagarh	Bhapur	9	24
	Khandapara	4	
	Gania	6	
	Nayagarh	5	
Nuapada	Khariar Road	13	49
	Komna	11	
	Khariar	7	
	Sinapali	11	
	Boden	7	

Puri	Satyabadi	5	
	Astaranga	5	
	Kakatpur	10	
	Puri Sadar	6	
	Nimapada	9	81
	Krushnaprasad	4	
	Delanga	5	
	Gop	8	
	Kanas	23	
	Pipili	2	
	Brahmagiri	6	
Rayagada	Rayagada	17	94
	Gunupur	11	
	Gudari	8	
	Chandrapur	6	
	Ramanguda	13	
	Bissamcuttack	7	
	Muniguda	12	
	Padmapur	8	
	K. Singpur	12	
Sambalpur	Dhankauda	2	27
	Maneswar	2	
	Jujumura	2	
	Rengali	2	
	Kuchinda	1	
	Rairakhol	1	
	Bamra	1	
	Naktideul	2	
	Jamankira	2	
	Sambalpur Municipality	12	
Subarnapur	Tarva	7	30
	Binika	12	
	Naikenpali	3	
	Birmaharajpur	6	
	Ullunda	2	
Sundargarh	Sadar Block Sundargarh	5	64
	Tangerpali	5	
	Subdega	3	
	Balisankara	5	
	Laphripara	3	
	Kutra	1	
	Kuarmunda	5	
	Nuagaon	4	
	Bisra	2	
	Lathikata	6	
	Bonai	5	
	Lahunipara	2	
	Gurundia	6	
	Koida	3	
	Bargoan	5	
	Rajgangpur	4	

Annexure-4

District/Block wise list of Mobile Teams

Name of the district	District Level	Block Level
Anugul	4	6
Balasore	2	12
Baragarh	1	7
Bhadrak	1	8
Bolangir	1	4
Boudh	1	3
Cuttack	1	14
Deogarh	1	4
Dhenkanal	1	8
Gajapati	1	1
Ganjam	4	22
Jagatsinghpur	1	8
Jajpur	1	11
Jharsuguda	1	1
Kalahandi	1	5
Kandhamal	1	14
Kendrapara	2	11
Keonjhar	1	3
Khurda	1	10
Koraput	1	1
Malkangiri	1	8
Malkangiri	1	6
Mayurbhanj	1	7
Nawarangpur	1	11
Nayagarh	1	8
Nuapada	1	4
Puri	1	15
Rayagada	1	10
Sambalpur	1	10
Subarnapur	1	7
Sundargarh	4	24

Annexure-5

District wise list of Ambulances & Motor Boats

Particularly in coastal areas where villages are completely cut off medical relief is provided through motor boats / country boats regularly. In some instances patients are also transferred to health institutions for appropriate medical care.

The district health authorities place their requisition to the district administration for providing motor boats/country boats for the medical relief operation.

Name of the district	Name of the block	No. of Ambulance	No. of Motor boats required
Anugul	Angul	1	2
	Athamallik	1	3
	Pallahara	1	
	Chhendipada	1	
	Talcher	1	
	Kaniha	1	
Balasore	Sadar	1	1
	Basta	1	1
	Bhogarai	1	1
	Remuna	1	1
	Jaleswar	1	1
	Nilagiri	1	
	Baliapal	1	1
	Soro	1	
Baragarh	Ambabhana		
	Bheden	1	
	Attabira	2	
	Padmapur	2	
	Gaisilat		
	Paikmal		
	Jharbandh	1	
Bhadrak	Basudevpur	8	27
	Bhandaripokari		
	Barapada		
	Chandabali		
	Dhamanagar		
	Tihidi		
Bolangir	Gudvella	4	1
	Saintala	3	
	Titlagarh	3	
	Deogaon	3	
Boudh	Kantamal	1	
	Boudh	1	
	Harbhanga	1	
Cuttack	Berhampur	14	16
	Subarnapur		
	Bindhanima		
	Maniabandha		
	Kanpur		
	Dompada		
	Niali		
	Adaspur		
	Mahidharpada		
	Bentkar		
	Tangi		
	Salepur		

	Mahanga		
	Nischintokoili		
Deogarh	Barkote	1	
	Tileibani	1	
	Reamal	1	
	Deogarh Town	1	
Dhenkanal	Gandia	1	
	Sadar	1	
	Odapada	1	
	Kamkhyanagar	1	
	Parjanga	1	
	Bhuban	1	1
Gajapati	Kasinagar	1	
Ganjam	Digapahandi	2	
	Sanakhemundi	2	
	Hinjulicut	1	
	Patrapur	1	
	Chikiti	1	
	Rangeillunda	3	
	Sergarh	1	
	Purusottampur	1	
	Polasara	1	
	Chatrapur	3	
	K.S Nagar	1	
	Ganjam	1	
	J.N Prasad	1	
	Bhanjanagar	3	
	Bellagunta	2	
	Aska	2	
	Sorada	2	
	Dharakote	1	
Jagatsinghpur	Biridi	1	1
	Ballikuda	1	2
	Jagatsinghpur	1	2
	Tritol	1	1
	Naugaon	1	1
	Kujanga	1	1
	Erasama	1	2
	Raghunathpur	1	1
Jajpur	Barachana	2	4
	Bari	2	2
	Binjharpur	1	1
	Korei	2	3
	Dharmasala	1	
	Dasarathpur	2	2
	Jajpur	2	3
	Rasulpur	1	1
	Danagadi	1	
	Sukinda	1	1
Jharsuguda	Lakhanpur	2	
Kalahandi	Jaipatna	29	2
	Kalampur		
	Koksara		
	Karlamunda		
	Kesinga		
Kandhamal		17	
Kendrapara	Rajakanika	1	2

	Rajnagar		
	Aul	1	
	Pattamundai	1	
	Mahakalpara	1	
	Marsaghai	1	
	Patkura		
	Indupur		
	Derabishi	1	
Keonjhar	Hatadihi	15	
	Anandapur		
	Ghasipura		
Khurda	Balipatna	1	3
	Khurda		2
	Balianta		3
	Tangi	1	
	Begunia		2
	Jatni	1	2
	Bhubaneswar		1
Koraput	Kotpad	2	1
Malkangiri	Mathili	4	
	Korkunda	11	
	K. Gumma	8	2
	Podia	4	
	Kalimela	6	
Mayurbhanj	Kaptipada		1
	G.B Nagar	5	1
	Betnoti	4	2
	Badasahi	5	1
	Rasgovindpur	3	2
	Morada	4	1
	Baripada Municipality		
Nawarangpur			
Nayagarh	Bhapur	5	1
	Khandapara		
	Gania		
	Nayagarh		
Nuapada	Khariar Road	1	
	Komna	1	
	Khariar	1	
	Sinapali	1	
	Boden	1	
Puri	Satyabadi	11	2
	Astaranga		4
	Kakatpur		3
	Puri Sadar		3
	Nimapada		4
	Krushnaprasad		1
	Delanga		5
	Gop		3
	Kanas		5
	Pipili		2
	Brahmagiri		2
Rayagada	Rayagada	24	
	Gunupur		
	Gudari		
	Chandrapur		
	Ramanguda		

	Bissamcuttack		
	Muniguda		
	Padmapur		
	K. Singpur		
Sambalpur	Dhankauda	19	1
	Maneswar		
	Jujumura		
	Rengali		
	Kuchinda		
	Rairakhol		
	Bamra		
	Naktideul		
	Jamankira		
	Sambalpur Municipality		
Subarnapur	Tarva	3	
	Binika	3	
	Naikenpali	3	
	Birmaharajpur	3	
	Ullunda	3	
Sundargarh	Sadar (Sundargarh)	21	
	Tangerpali		
	Subdega		
	Balisankara		
	Laphripara		
	Kutra		
	Kuarmunda		
	Nuagaon		
	Bisra		
	Lathikata		
	Bonai		
	Lahunipara		
	Gurundia		
	Koida		
	Bargoan		
	Rajgangpur		

Annexure-6

District wise list of Dug wells & Tube Wells

Name of the district	Name of the block	No. of Dug Well	No. of Tube Well
Anugul	Angul	50	18
	Athamallik	1708	329
	Pallahara	98	49
	Chhendipada	65	5
	Talcher	263	70
	Kaniha	527	98
Balasore	Sadar	146	3466
	Basta	335	4879
	Bhogarai		
	Remuna	258	3649
	Jaleswar	821	3259
	Nilagiri	1027	931
	Baliapal	35	952
	Soro	65	9210
Baragarh	Ambabhana	20	45
	Bheden	22	46
	Attabira	18	42
	Padmapur	36	65
	Gaisilat	29	51
	Paikmal	36	58
	Jharbandh	33	61
Bhadrak	Basudevpur	12173	498
	Bhandaripokari		
	Barapada		
	Chandabali		
	Dhamanagar		
	Tihidi		
Bolangir	Gudvella	39	47
	Saintala	24	38
	Titlagarh	7	11
	Deogaon	9	14
Boudh	Kantamal	728	4391
	Boudh		
	Harbhanga		
Cuttack	Berhampur	13202	7043
	Subarnapur		
	Bindhanima		
	Maniabandha		
	Kanpur		
	Dompada		
	Niali		
	Adaspur		
	Mahidharpada		
	Bentkar		
	Tangi		
	Salepur		
	Mahanga		
	Nischintokoili		
Deogarh	Barkote	3777	6611
	Tileibani		
	Reamal		
	Deogarh Town		

Dhenkanal	Gandia	280	68
	Sadar	42	6
	Odapada	88	15
	Kamkhyanagar	148	42
	Parjanga	104	35
	Bhuban	160	32
Gajapati	Kasinagar	75	
Ganjam	Digapahandi	37	740
	Sanakhemundi	36	719
	Hinjulicut	22	687
	Patrapur	125	708
	Chikiti	18	678
	Rangeillunda	10	757
	Sergarh	14	667
	Purusottampur	10	743
	Polasara	9	726
	Chatrapur	2	215
	K.S Nagar	4	532
	Ganjam	1	405
	J.N Prasad	21	1156
	Bhanjanagar	17	1071
	Bellagunta	2	663
	Aska	4	911
	Sorada	60	907
	Dharakote	20	724
Jagatsinghpur	Biridi	175	377
	Ballikuda	210	62
	Jagatsinghpur	139	295
	Tritol	611	38
	Naugaon	51	15
	Kujanga	888	591
	Erasama	1410	3840
	Raghunathpur	1269	155
Jajpur	Barachana	5031	924
	Bari	7081	1550
Jajpur	Binjharpur	2166	438
	Korei	115	1507
	Dharmasala	8615	1348
	Dasarathpur	8560	5470
	Jajpur	3352	7431
	Rasulpur	5004	6015
	Danagadi	3923	1177
	Sukinda	98	17
Jharsuguda	Lakhanpur	114	226
Kalahandi		15039	3531
Kandhamal		No flood affected area	
Kendrapara	Rajakanika	128	
	Rajnagar	18	
	Aul	165	
	Pattamundai	563	
	Mahakalpara	133	
	Marsaghai	597	
	Patkura	173	
	Indupur	40	
	Derabishi	103	
Keonjhar		21192	25840
Khurda	Balipatna	665	

	Khurda	442	
	Balianta	638	
	Tangi	355	
	Begunia	668	
	Jatni	407	
	Bhubaneswar	1420	
Koraput	Kotpad		
Malkangiri	Mathili	19	67
	Korkunda	148	114
	K. Gumma	6	22
	Podia	2	71
	Kalimela	740	940
Mayurbhanj	Kaptipada	1487	1646
	G.B Nagar	1492	664
	Betnoti	3118	1553
	Badasahi	3019	2016
	Rasgovindpur	2994	1440
Mayurbhanj	Morada	4573	555
	Baripada Municipality		
Nawarangpur		11173	11029
Nayagarh	Bhapur	1	
	Khandapara	2	
	Gania	1	1
	Nayagarh	1	
Nuapada	Khariar Road	85	94
	Komna	36	15
	Khariar	28	21
	Sinapali	30	15
	Boden	18	12
Puri	Satyabadi	368	
	Astaranga	142	
	Kakatpur	402	
	Puri Sadar	791	
	Nimapada	427	
	Krushnaprasad	70	
	Delanga	1123	
	Gop	575	
	Kanas	1072	
	Pipili	225	
	Brahmagiri	23	
Rayagada		4325	8528
	Sambalpur Municipality	13090	5885
Subarnapur	Tarva	265	262
	Binika	869	189
	Naikenpali	208	
	Birmaharajpur	1428	
	Ullunda	143	319
Sundargarh	Sadar Block Sundargarh	26399	14354

DIRECTORATE OF HEALTH SERVICES ORISSA

Letter No 342 / Dated 25/05/13

To

All Chief District Medical Officers,
Health Officers of all Municipal Corporation/ Municipalities

Sub: - Action plan for preparedness for Medical Relief Operations during Flood/cyclone 2013.

Sir/Madam,

You are aware that each year we expect flood of varying severity between the months of June to October. Routinely we undertake preparedness activity from the month of May. Ditrict need to map the areas (block wise) that may be affected (marooned & partially marooned), sites for opening of MRC and deployment of staff, so it is requested that while preparing the action plan give special attention to the sites for opening of MRCs, deployment of personnel to the MRCs, formation of mobile medical teams, plan for mobilization of personnel from non affected areas within the district and pre positioning of supplies, ambulances etc. block wise in such a manner that the preparedness activity gets institutionalized and response initiated within a short notice. Brief guideline on development of action plan is enclosed herewith for your reference. The detail guideline on management of Acute Diarrhoeal Disorder (ADD) has already been sent vide this Directorate Letter No. 320/SSU Dt. 22-05-13. The action plan may be sent positively to State Surveillance Unit, IDSP for compilation & onward transmission by 4th June 2013. The guidelines on development of action plan to combat flood / cyclone-2013 are enclosed herewith for guidance.

Yours faithfully,

25.5.13

For **Director of Public Health, Odisha**

Memo No 343 / Dated 25/05/13

Copy along with the enclosures is forwarded to Mission Director, NRHM, Odisha for favour of information and requested to issue necessary guidelines & instruction to the district authorities for utilization of Untied/ RKS or any other available fund for utilization for medical relief activities during flood/cyclone, if any.

25.5.13
for DPH (O)

Memo No 344 / Dated 25/05/13

Copy along with the enclosures is forwarded to Principal Secretary to Govt. Revenue & Disaster Management Department/ SRC-cum-MD, OSDMA, Rajiv Bhawan for favor of information.

25.5.13

for **Director of Public Health, Odisha**

Memo No 345 / Dated 25/05/13

Copy along with the enclosures is forwarded to Director, SIH & FW, Odisha for information and requested to keep in readiness health education material for print, electronic media & out door display so that the same can be utilized within a short notice.

25.5.13

for **Director of Public Health, Odisha**

Memo No 346 / Dated 25/05/13

Copy along with the enclosures is forwarded to Joint Director, SDMU, Odisha for information and requested to monitor the drug position & take necessary measures to procure the essential drugs, logistics & disinfectants to meet the shortfall if any.

25.5.13

for **Director of Public Health, Odisha**

Memo No 347 / Dated 25/05/13

Copies along with the enclosures are forwarded to Commissioner-cum-Secretary to Govt. of Orissa, Health & Family Welfare Department for favour of information.

25.5.13

for **Director of Public Health, Odisha**

State Surveillance Unit, IDSP
Directorate of Health Services, Odisha, Heads of the Deptt. Building, Bhubaneswar - 751001
Telephone No. : 0674-2390466, E-Mail ID : dirhealthbbsr@gmail.com

Annexure-7

Guidelines on Development of Action Plan to combat Flood / Cyclone - 2013

Odisha is perennially affected by natural hazards like Flood/Cyclone etc. which leads to diseases, disability and deaths in the community .To reduce the risks of disaster related departments should undertake preparedness activities at all levels in advance. This can mitigate the suffering of the people, loss of life, property & livelihood.

During flood / cyclone and its aftermath, water borne diseases commonly occurred in the community. To address such disasters, health functionnaries located at state, district, block & villages need to make the following arrangements in adnavce.

1. **Functioning of Control Rooms:-**
   - From 15st June, the control Room will be operational 24X7 at the State, District & Block Head Quarter level.
   - During normal time control room should monitor the preparedness activities during pre-disaster, disaster & post diosaster, dissemination of early warning on flood situation received from Revenue Authorities.
   - Ensuring initiation of implementation of public health measures, monitoring trend of diseases and cope with any situation arising out of disaster.
   - The line list of district RRT & block RRT with mobile No. of key nodal persons in the cut of areas should be available at district level.
2. **Identification of Flood / Cyclone Prone areas (Hazard Mapping) & Formation of Zones:-**
   - The district authorities should identify flood / cyclone prone areas of the district (Block, G.P & Village wise with population) and the list of the affected health institutions based on the last flood / cyclone.
   - While hazard mapping, the areas completely submerged / marooned during the last flood / cyclone should be mentioned.
   - The districts may be divided into suitable zones keeping in view the operational aspects & each zone is to be assigned to an officer of the rank of ADMO/SDMO for supervision and monitoring and to ensure inter – departmental coordination for smooth implementation of activities.
   - Coordination with revenue division needs to be done for identification of marooned/partially marooned areas, shelter homes, high land & low land areas.
3. **Casualty Services & Contingency Plan for Medical Relief Centre:-**
   - During disasters arrangements should be made to provide casualty services 24X7 at all health institutions.
   - Contingency plan to open medical relief centers (MRC) at strategic places to be planned in advance. Those centers should be located at strategic places, so that they

can render services to disadvantaged population where existing infrastructures are likely to be ineffective.

- State experiences disasters/ flood/cyclone/epidemic each year, the contingency planning should be made in such a way that we need not do the same plan each year & people should be made aware about the plan.
- Mobile Medical team should render the services regularly to displaced persons at their place of shelter and in marooned villages.
- Steps may be taken to make the people aware about the availability of services of 108 ambulances in the districts where ever it is available.

4. Contingency Plan for Mobile Health Team & Deployment of staff:-

- Mobile health teams consisting of one M.O & one Paramedic are to be mobilized from DHH, SDH and non affected blocks within the districts. The teams should be kept in readiness for deployment in the flood / cyclone affected areas.
- At State HQ contingency plan is in force for deployment of medical teams from medical colleges and other non flood / cyclone prone districts within a short notice. Keeping in mind the manpower required during the previous flood, the districts may intimate about the requirement of personnel from outside the district, in case of high flood.

5. Supply of Drugs, logistics & Disinfectants:-

Taking into account the available stock & store position and utilization of drugs during the last flood / cyclone, the anticipated requirements of stock & store can be estimated. Accordingly the District Authorities should take necessary steps to procure medicine & disinfectants etc. from SDMU and ensure that adequate life saving drugs / disinfectants are available with all the health institutions and paramedical workers under their control. Ensure that stock & store are pre positioned sufficiently ahead in the areas likely to be marooned.

- Ensure availability of a minimum of five injection ASV vails (Anti Snake Venom) at PHC (N) and 10 injection ASV vials at Block PHC / CHC. The patient may be administered Inj. ASV as per the need without any ceiling.
- Make available ORS sachets at SC, PHC (N) and Block PHC/CHC of the district. A minimum of 100 sachets with Health Worker at Sub Centre level, 400 sachets at PHC (N) and 1500 sachets at Block PHC/CHC level. ASHAs to be provided with ORS sachets wherever stock is exhausted a minimum of 25 packets may be provided and stocks need to be replenished.
- Halazone tablets may be stored, 1000 tabs at each SC, 3000 tabs at PHC (N) and 5000 tabs at Block PHC/CHC level.
- In each PHC (N) at least 1 bag (25 kg) and at Block PHC/CHC, 3 bags of bleaching powder need to be stored to disinfect the source of drinking water.
- In case of health institutions likely to be affected and the areas likely to be cutoff, bleaching powder as per requirement need to be stocked at identified/alternate sites.
- Stock & store need to be replenished at all levels as & when required.

6. Ambulance Services:-

- All the Ambulances of different health institutions of the districts should be kept in readiness.
- Simultaneously, other vehicles have got to be repaired & kept in road worthiness as far as practicable so that they can be pressed in to service during emergency situation.
- In case of non availability of institutional ambulances, the ambulances may be hired using Untied/ RKS fund of NRHM.
- Where ever 108 ambulance services are available it must be utilised for referral of cases.

7. Disinfection of Drinking Water Sources:-

- Ensuring safe drinking water is of paramount importance to prevent out break of water borne diseases.
- Disinfection of all drinking water sources by bleaching powder must be undertaken routinely and frequently.
- Water quality analysis of different sources and distribution points is another important activity to be pursued, with the help of other departments like RD & RWSS etc.
- Tube wells/dyfunct tube wells can be made functional and disinfected.
- Adequate measures may be taken to distribute Halazone tabs and make people conversant about its use.
- Disinfectant (Bleaching power bag) should also be stored in cutoff areas in advance that are likely to be completely or partially marooned in flood.

8. Disease Surveillance (IDSP):-

- **During emergency weekly surveillance system should adopt it self to a daily mode.**
- Please ensure daily flow of information from different health institutions of the districts.
- The epidemiological situation of communicable diseases, flood/cyclone should be analysed daily at Block, District and State level to take immediate effective containment measures.
- Compliance reports of news items (morbidity & mortality) published in the daily news papers should be immediately sent to State HQ through fax / e. mail, after undertaking proper investigation.

9. Health Education:-

- District Mass Media organization (electronic, print, outdoor display), health service providers like M.O., AYUSHs, PHEIOs, MPHS (M & F), MPHW (M & F) should propagate the messages relating to personal hygiene, hand washing, safe drinking water, use of ORS, Halazone & Bleaching Power, Food Hygiene & Environmental sanitation to AWWs/ASHAs/SHGs/Villagers.

- The IEC campaign can be made successful & effective with the active participation of local NGOs, CBOs, FBOs & elected panchayat members and private sector units.

10. Additional Safety Measures:-

- In case of requirement of motor boats by the district for Medical Relief Operations, CDMOs to place requisition for motorboats from respective revenue authorities in advance.
- The life jackets supplied to the districts earlier should be utilized by Health personnel while rendering services in the flood / cyclone affected areas.

11. Inter Sectoral Coordination:-

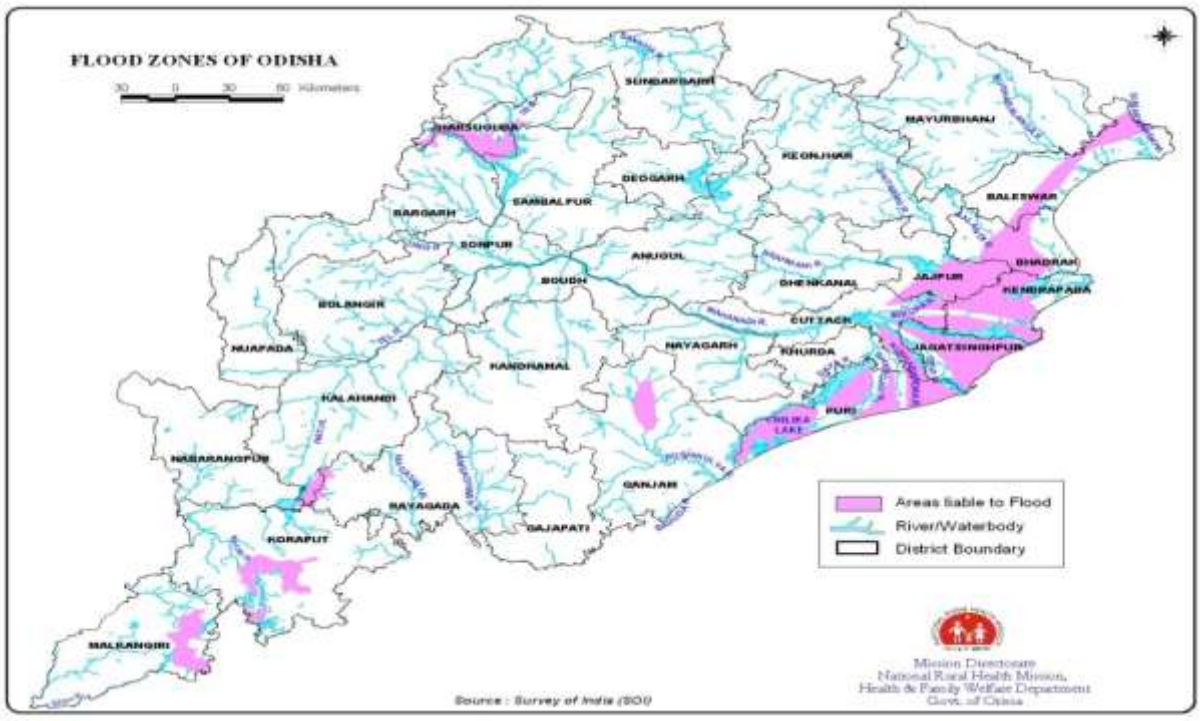
- District natural calamity committee meeting to be conducted in the districts in the month of May to ascertain the requirement of boats, life jackets and other local requirementsif any.
- Please keep liaison with District Magistrate – cum – Collector, officials of related line departments & NGOs for smooth management of medical relief operation.

12. Daily Reporting:-

- The days report in the prescribed format need to be sent to State HQ through E.Mail & Fax by 3 P.M of the next day.

NB: Enclosed:

- Annexure I – format for enumeration of flood prone areas, opening of MRC etc.
- Annexure – II for Daily reporting format.
- Annexure-III Name & mobile No. of districts & blocks RRTs, Key nodal persons of cut off areas.



Annexure - I A

FLOOD PRONE AREAS (Attach map of flood prone areas of the district).

Sl No	Name of Block	No of flood proneGP	No of villages likely to be affected		Total population likely to be affected	No of institution likely to be affedted		
			Marooned	Partially Marooned		CHC/ BPHC	PHC-N	SC

Contigency Plan for Opening MRC

Sl. No	Name of Block	Mention name of places for functioning of MRC					Total
		1	2	3	4	5	

Plan for Formation of Mobile Team

No of Team

From with in district	
From outside district	
Total Nos	

Annexure - I B

Requirement of Estimated/Anticipated stock

Sl. no	Item	Quantity
1	ORS sachets	
2	Halazone Tab.	
3	Bleaching pkts	
4	Metronidazole	
5	Tetracycline Cap	
6	Norflox tab	
7	Ciproflox tab	
8	IV Fluid	
9	ASV Vials	
10	Doxycycline cap	
11	Gentian violet	
12	Paracetamol syrup	
13	Antidiarrhoeal syrup	
14	Anti allergic syrup	

No of wells in Flood Prone Areas (Block wise)

Sl No	Name of Block	No of Dug well	No of Tubewell

No of Ambulance & other road worthy vehicle

Sl NO	Name of Block	Station	Nos

No of motor boats required with the their station

Sl No	Name of Block	Place of Station	Nos

Annexure-II

Daily Information Sheet on Flood 2013

District : _____ Date : _____ Reporting Date : _____

1. Details of the Areas Affected

Name of the affected Block										Total
No of GPs affected										
No of Villages affected										
Total Population affected										
No. of Marooned Villages										
No. of Marooned Villages covered till date										

2. Stock & Store Position

Name of the Items	Quantity last receipt from SDMU with Date	Quantity at the District Warehouse on the Day	Qty issued to Perripherial institutions on the Day	Balance in the District Warehouse	Immediate Addl. Requirement
Bleaching Powder					
Phenyle					
ORS					
Halazone Tabs					
IV Fluids					
Anti Snake Venom					
Anti Rabies Vaccine					

3. Disinfection of Water Sources

Name of the Block	Total No. Wells in the block	Wells Disinfected		
		1st Round	2nd Round	3rd Round

4. Manpower Deployed

No of Medical Teams Deployed on the day	
From Within District	
From Other District	
No. of Medical Relief Centres Opened	

5. Containment Measures Taken

Name of the Block	Minor Ailment Treated	ORS distributed	Halazone distributed

Signature of the Reporting Officer

6. Daily Report on Disease Condition

Name of the District :_____ Dated_____

Name of the Block	Acute Diarrhoea including GE				Bloody Dysentry				Viral Hepatitis				Malaria				A.R.I			
	Cases		Deaths		Cases		Deaths		Cases		Deaths		Cases		Deaths		Cases		Deaths	
	< 5	>= 5	< 5	>= 5	< 5	>= 5	< 5	>= 5	< 5	>= 5	< 5	>= 5	< 5	>= 5	< 5	>= 5	< 5	>= 5	< 5	>= 5
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Name of the Block	Snake Bites				Skin Diseases				Measles			
	Cases		Deaths		Cases		Deaths		Cases		Deaths	
	< 5	>= 5	< 5	>= 5	< 5	>= 5	< 5	>= 5	< 5	>= 5	< 5	>= 5
Total	0	0	0	0	0	0	0	0	0	0	0	0

7. Outbreaks if any, gives detail with Meaures taken

N.B: - The days report in the prescribed format need to be sent by 3.00 P.M

Signature of the Reporting Officer

Annexure-8

Guidelines on Containment of Outbreaks of Acute Diarrhoeal Diseases

1. Introduction

Waterborne diseases like Diarrhoea, Dysentry, Jaundice, Typhoid are important public health diseases that cause outbreaks which lead to cases &deaths in the community in a short span of time. Out of all causes of Acute Diarrhoeal Diseases, Cholera accounts for 5-10% among other organisms.

Globally 1.8million people die every year & the total DALYS lost is about 4.1%. WHO estimates that 4.9 children die per 1000 per year in the first five years of life. WHO, estimated that about 3.2 episodes of diarrhoea occurred per child (<5yr) per year. During 2010, 11% of diarrhoeal death is contributing to the global cause of death among children under five.(Lancet 2012)

In India, diarrhoeal diseases are a major health problem among children under the age of five years. During 2005, 1.07 million cases & 2040 deaths due to diarrhoeal diseases were reported among under five year old children. National Diarrhoeal Disease Control Programme implemented in 1978 could avert cases & deaths due to diarrhoea in the country. Oral Rehydration Therapy programme implemented in 1985-86 further caused a decline in deaths due to acute diarrhoeal diseases. Further this was integrated in 1992-93 with Child Survival and Safe motherhood (CSSM) for popularizing use of ORS/Home available fluid among mothers to reduce deaths among children under five years of age. However during 2010, it is reported that 13% of diarrhoeal deaths is contributing to the all cause of death among children under five (Lancet 2012).

IDSP database India, revealed that about 30-40 outbreaks are reported from different states each week to IDSP, NCDC, New Delhi.

Table 1: **Year wise distribution of reported ADD outbreaks, IDSP, NCDC, New Delhi**

Year	Total outbreaks	No Of ADD Outbreak
2008	553	230
2009	799	353
2010	990	414
2011	1675	540
2012	1584	475
2013	899 (upto June)	278

In Odisha, 2012 IDSP surveillance data base analysis revealed that out of 100 patients that seek treatment at OPD for various ailments, five persons seek treatment for Acute Diarrhoeal Diseases each week at 1745 health facilities in the state.(DHH/SDH/ CHC/PHC(N/Area hospitals).

In 2012,ADD outbreak database analysis revealed that out of 257 outbreaks,148 were ADD outbreaks with 59 deaths. Majority of the outbreaks were reported from Southern &Northern revenue division districts. Of which 88% of the outbreaks are attributable to unsafe water, lack of environmental sanitation, poor personnel hygiene,poor connectivity, delayed referral, low community awareness &weak intersectoral Convergence.

ADD outbreaks can be prevented or else cases & deaths due to diarrhoea can be reduced by thorough preparedness at district & sub district level such as preventive disinfection, preventive maintenance of drinking water sources, community awareness, early case management, timely referral & environmental sanitation.

In the event of an Acute Diarrhoeal Outbreak, the response has to be anchored around a well thought out micro-plan for preventing further spread and contain the outbreak.

2. Objective

1. To estimate the magnitude of the problem
2. To find out the source of infection and cut off further transmission
3. To institute Preventive& Control Measures in the affected area.
4. To advocate for further follow up action to prevent further outbreaks.

The following action points are to be implemented at District & sub district level

3. Disease Surveillance

3.1. Evidence Based Surveillance

- Develop a spot-map by plotting cases to find out the geographic extent of spread and clustering of the cases.
- Enumerate the affected villages and estimate the population at risk
- Identify the sources of drinking water and nearby health facilities
- Conduct House to house survey for identification of cases by adaptingor deriving the standard case definition as per WHO guidelines.

3.2. Case Definition

- In the case of a probable cholera outbreak all the subsequent cases meeting the clinical case definition:- "Acute Watery Diarrhoea with or without vomiting in a patient aged 5 years or more should be treated as "Suspected Cholera Case". However Laboratory confirmation is essential to declare the Outbreak as Cholera Outbreak.

  Confirmed Case: Isolation of *Vibrio* Cholera 01 or 0139 from stool of a patient with diarrhoea

3.3. Role of field Functionaries during an ADD Outbreak

- Health workers(M/F) should be deployed in affected village to undertake active surveillance to detect cases early, refer to the nearby health facility if necessary, provide health education on safe drinking water, personnel hygiene, Hand washing, cleanliness & Sanitation, use of halazone tab, discourage open defecation and drinking of water from river/chua/nala/pond etc,ensure Night surveillance in the villages to refer the cases timely to the DTC/HF, and conduct disinfection of water sources etc.
- Health supervisor(M/F) to be deployed accordingly for field supervision during outbreak. Preferably one supervisor should supervise 3-5 health workers.

3.4. When to refer a Case of Diarrhoea ?

- In village/ward, the surveillance workers should search actively for cases with the following criteria which necessitates the patients to get admitted to the nearby health facility at the earliest-

- **Increased number of watery stools**
- **Neither eating nor drinking properly**
- **Marked thirst and repeated vomiting**
- **Sunken eyes and dry mouth and tongue**
- **Decreased urine output**
- **Lethargic/disoriented or unconscious**
- **Convulsions**
- **When skin pinch goes back very slowly**
- **Blood in stool**
- **When the Fever does not subside**

Patient with above signs must be transported immediately to the nearby health facility following standard infection control practices during transportation.

- Adjacent unaffected villages need to be kept under surveillance through health workers, ASHAs and AWWs. Health education activities and disinfection of water sources may be carried out in those villages to prevent spread of outbreak.
- Sector PHC(N) Medical Officer/ Block MO/ MO deployed from other areas must manage the cases at Diarrhoea treatment centers/ Medical Relief Centers and simultaneously supervise the containment measures in the affected area.
- Ensure Sensitization the health workers/ supervisors and supervisory medical officers (identified for surveillance supervisory duty) on :
    - Case definition
    - Importance of initiation of Oral Rehydration Therapy/ Home available fluid immediately on case detection.
    - Basic communication on hand wash, safe drinking water (boiled water/ chlorinated water/ disinfected Tube well water), personnel hygiene, environmental sanitation and consuming properly cooked foods.
    - Techniques of chlorination of drinking water sources & other sources of use
    - Modalities of administering chemoprophylaxis to close contacts of the cases.
    - Expeditious patients referral to the nearest identified health facility.
    - Plan the mobilization of the surveillance team, identification of referral facility/ drug treatment centre for management of cases.
    - Vehicles may be kept in readiness at strategic places for referral of cases from remote and inaccessible areas to the nearest health facilities.
    - Sensitizationof SHG members/volunteers/ASHAs/AWWs/PRI members/CBOs/NGOs/VLWs/Teachers etc in the village to propagate the health education messages, oral rehydration therapy and help in referral of cases.

3.5. Case Management

- Guiding principles of treatment
    - Assess the patient for hydration
    - Rehydrate and monitor the patient.
    - Maintain hydration: Replace continuing fluid losses until patient recovers
    - Treat with appropriate anti diarrhoeal drugs
    - Feed the patient orally

(Guidelines for treatment Centre at *Annexure - 1*)

- The hospitals should have adequate number of doctors and nurses to perform duty on 24X7 basis.
- The hospital wards and corridors should frequently be cleaned with disinfectants.
- The doctors, nurses and paramedics should use alcoholic hand rubs/soap & water / 0.05 chlorine water and use gloves.
- If required temporary Diarrhoea Treatment Centers (DTC)/Medical Relief Centers(MRC) would be created in schools/ community halls/ Panchyat office/AWW centersetc with beds placed at least one meter apart. It should have provision for hand washing, safe drinking water, toilet, etc.
- Requisite staff must be assigned along with logistic resources.
- The relatives of the patients should be advised toavoid washing the clothes in drinking water sources or sources like nala/chua/river/stream. Also, avoid washing/bathingof cases dying due to Cholera close to a drinking water source.

3.6. Chemoprophylaxis

- Chemoprophylaxis should be given only to members of a household who share/ shared food and shelter with cholera patients.
- Mass chemoprophylaxis is not recommended as it does not prevent the spread of cholera and rather diverts attention and resources from other effective control measures.
- Selective chemoprophylaxis should be given to all close contacts of the case as soon as possible after the case is detected. The effect of the drug persists only for a day or two after which re-infection can occur.
- The drug of choice for chemoprophylaxis is Doxycycline for adults given in a single dose of 300mg. Tetracycline 500mg two times a day for three days is also recommended.

Table 1: Assessment of dehydration

Signs	Mild Dehydration	Severe Dehydration
Patient's appearance	Thirsty, alert	Drowsy, Limp cold, Sweaty may be comatose.
Radial Pulse	Normal rate and volume	Rapid, Feeble, sometime impalpable
Blood Pressure	Normal	Less than 80 mm Hg, may be unrecordable
Skin elasticity	Pinch retracts immediately	Pinch retracts slowly (taking more than 2 Seconds)
Tongue	Moist	Very dry
Anterior Front nalle	Normal	Very sunken
Urine flow	Normal	Little or none
% body weight loss	4-5%	10 % or more

3.7. Command and Control

- A control room, to function on 24 x 7 basisat District / Block HQ for close monitoring& supervision of the containment measures being implemented in the field.

- DSMO/ADMO (PH) to give feedback to the higher and lower levels for effective management of an outbreak

4. Disinfection of Water Sources

- Ensure sustained chlorination of water sources in the affected villages/wards
- Discourage use of water from Nala/Chua/stream/river/Pond for drinking purposes
- Encourage use of Halazone Tab to make the water safe for drinking purposes.

5. Logistics

- Ensure adequate stock of ORS, Bleaching powder/ Halazone Tablets; antidiarrhoeals, IV Fluids (Ringer Lactate / Normal Saline) and Personal Protective Equipments.
- Ensure preposition of supplies as per norms at each level of field functionaries like ASHA/AWW/HW and at each health facilities to prevent stock outs.
- The required stock & store to be received from SDMU, Bhubaneswar/district warehouse. The daily inventory status to be maintained by the pharmacist I/C.

6. **IEC/BCC activities**

6.1. Communicate risk to the community

- Disseminate public health messages through local channels, miking, distribution of FAQs/ leaflets/posters etc.
- Use of local electronic &print media to upscale community awareness.
- Resort to IPC to propagate health messages on hand wash, drink safe water (boiled/ chlorinated water/ disinfected tube well water), personnel hygiene, environmental sanitation, use of ORS/home available fluid, use of Halazone, consuming properly cooked foods, disinfection of dugwells/tubewell/well.

6.2. Communicate to the community that:

- With early diagnosis ,proper case management and timely referral death due to cholera can be avoided
- Take more quantity of fluids (ORS/home available fluid) as soon as diarrhoea occurs.
- Demonstrate ORS Preparation to ASHAs/AWWs/SHGs/PRI Members/CBOs/Teachers/VLWS/NGOs etc to popularize use of ORS among community.

6.3. The specific messages should focus on:

- Washing hands.
  - Before and after use of toilet
  - Before preparing food
  - Before eating feeding the children
- Boil water for drinking or chlorinate water as advised
- Use of Tubewell water(disinfected)

  (Rendering Drinking water safe at annexed at *Annexure - II*)
- Store water safely
- Use Toilets/ latrines and safe disposal of human excreta.

- Use of properly cooked food (void uncooked food) and practice reheat of stored food before eating
- Cleanliness & Sanitation of Premises

(Health Education messages in English & Oriya placed at *Annexure –III)*

7. Monitoring &Supervision

- Daily supervision& hand holding support may be given to theSurveillance workers involved in preventive and control measures in the field

8. Laboratory Surveillance

- Water & rectal swab samples to be collected and sent to the designated state referral laboratory as per Standard Operative Procedure.(Annexure – V)

9. **Reporting (Daily report is to be transmitted to the State Surveillance Unit regarding outbreak status along with interim / final outbreak report within the stipulated time**

Timeline reporting should include:

- Early warning signal Report/Outbreak alert within 48 hours
- Daily situational report with line list of cases & deaths, lab sample collected
- INTERIM outbreak investigation report with Time,Place& person analysis within seven days
- Final Outbreak Report after the Outbreak is declared to be over
- Cross notification to neighboring areas
- Augment reporting from the private sector (even the unorganized)

Line listing of Acute Diarrhoeal cases at PHC/ CHC and treatmentcentre, block reporting format and district reporting format are annexed at ***Annexure- IV (Form – I,II&III)***

10. Ineffective control measures

Efforts to control cholera through mass chemoprophylaxis, vaccination and travel & trade restrictions are ineffective in controlling cholera.

11. LEVEL/TRIGGER EVENTS /DESIGNATED PERSONS/ACTION POINTS&SOURCE OF FUNDS

Level	Disease / Syndrome	Trigger Events	Designated Person	Action Points	Source of Funds / Logisitics
Village/ Ward/Sub-centre	Acute Watery Diarrhoea Def^{n}: Passage of three or more loose or watery stools in the past 24 hours with or without dehydration OR Passage of single or voluminous watery stool.	• A single case of severe dehydration/ death in a patient >5 years of age with diarrhoea. • More than 10 houses having at least one case of diarrhoea irrespective of age per village or an urban ward.	• ASHAs • USHAs • AWWs • Health Workers (M/F)	1. Conduct house to house survey in the village/ ward for new cases as per adopted case definition. 2. Maintain as per standard case definition the line list of cases & deaths 3. Treat cases with ORS/appropriate anti-diarrhoeals if required. 4. Refer to DTC /PHC/CHC/SDH/DHH/AH/MCH, if dehydration persists/loose motion continues/ case doesn't pass urine for ≥ 5 hrs. / any other danger signs seen 5. Distribution of ORS/ Halazone for domestic use. 6. Conduct preventive disinfection of drinking water sources (tube well/ well). 7. Inform the RWSS deptt. for repair of defunct tube wells if any with the help of SEM(Self Employed Mechanic). 8. Ensure proper sanitation in the village in respect of general environmental sanitation, drainage, waste disposal. 9. Health Education for hand washing,	For immediate referral, small purchases/ repair of tube well/ cleaning operation/ and health education activities, the required funds can be met from GKS/ Sub centre untied fund.

				drinking boiled/ chlorinated/ tube well water, personnel hygiene ,care of other patients/contacts at home, preparation & use of ORS/Home available fluids. 10. Group meeting can be undertaken at village/ward level to propagate messages on health education. i. Not to defecate or wash soiled clothes near water sources. ii. Discourage use of water from other sources for drinking purposes (Nala/ Chua/ river/ Stream) 11. Inform to MO /PHC/CHC/Sector MO regarding cases & deaths 12. Co-ordination with SHG, PRI, CBOs, Teachers, local NGOs, GKS, representatives of the community.	
Block / Sector	Acute Watery Diarrhoea Def^{n}: Passage of three or more loose or watery stools in the past 24 hours with or	• A single case of severe dehydration/ Death in a patient >5 years of age with diarrhoea. • More than 10 houses having at least one case of diarrhoea irrespective	• Medical Officer / Block RRT (MO, Supervisor (M/F) / LT and PHEIO) • Sector MO/ Ayush MO • MHU • BPO / BADA / VS clerk	1. Verify the existence of outbreak from ANM, ASHA, AWW,key informants and Health worker(M/F) 2. Confirmation of the outbreak by conducting interview of cases and other stake holders etc. 3. Active search for cases by Block RRT adopting proper case definition/ clinical	Provision has been made for • mobility support, • opening of medical relief centers, • For immediate referral, • TA/DA for Block

	without dehydration OR Passage of single or voluminous watery stool.	of age per village or an urban ward. • Unusually higher rising trend of diarrhoeal disease in the past week. • Increased hospital admission if several cases. • Clustering of cases in time and place. • Information by key informants about clustering of cases.		diagnosis. 4. Descriptive analysis with regard to time,place& person. 5. Assess the magnitude of the problem and estimate the population at risk 6. Find the source of infection and cut off transmission. 7. Arrange for management of cases in the village/temporary diarrhoeal treatment centre/Health institution as per the situation. Selective chemo prophylaxis to close family and social contacts only. 8. Maintain the line listing of cases & deaths. 9. Sensitization of health workers/others up to (ASHA/AWW/SHG/PRI members/ CBOs/NGOs) to manage the case and their role towards the patients. 10. Collection of stool samples/ water samples for Lab diagnosis. 11. Adopt infection control practices at DTC/ MRC/Health Facility. 12. Ensure safe drinking water /Chlorination of drinking water resources (well/ tube well).	RRT/Others during outbreak • Local purchase of essential medicines and disinfectants • Health education activities • Welfare activities • Other contingencies for administrative expenses. For mitigation of natural calamities like Flood, Cyclone and epidemics under mission flexi pool, NRHM. However initially local RKS fund may be utilized for the purpose to save delay.

				13. Ensure IEC activities. Propagate health education messages on hand wash, safe drinking water, Personnel hygiene & Cleanliness, environmental sanitation use of ORS &Halazone and consume properly cooked foods. Soap may be distributed for hand washing. 14. Assess drug & logistics position, Inform district health functionaries to ensure availability of buffer stock of drugs, logistics and disinfectants. 15. Mobilization of surveillance team(Block RRT) from within the block to the affected area 16. Dedicated Vehicles(Ambulance/MHU) for referral of patients to diarrhoeal treatment centre/ HF. 17. Vehicles with paramedics and drugs may be placed at strategic places to transfer the patients round the clock. **18. Ensure Night surveillance in the villages to refer the cases timely to the DTC/HF.** 19. Undertake active surveillance, health education and disinfection of drinking	

				water sources in surrounding villages. 20. Arrangements for supervision and monitoring the field activity. 21. Functioning of control room 24x7 with contact no. and contact person : to monitor surveillance teams, mobility of MHU, referral vehicles, stock position and complete information on morbidity and mortality. 22. Submission of daily situation report in the prescribed format. BPO/BADA/VS clerk to help the MPHS (M) to consolidate the report and comply. 23. Cross notification to the bordering blocks. 24. Sensitization of GKS/ SHG members/ Volunteers/ community representatives to propagate the health education messages like hand wash, safe drinking water , oral rehydration therapy and help in referral cases. Identification of key informants as & when required. 25. Procurements of drugs, logistics, disinfectants and consumables as and when required if the same is not	

				available at district ware houses. 26. Incentives to persons accompanying the cases to DTC. 27. All vehicles of the department should be pressed into service or else if required vehicles may be hired locally. 28. Co-ordination with other line departments like revenue, W&CD,S&ME, Forest, RWSS, RD, H&UD,ST &SC. Panchayati raj for identification of GP level Nodal officer, oversee active surveillance and referral of cases when required, ensure disinfection and health education activity etc	
District	Acute Watery Diarrhoea Def^{n}: Passage of three or more loose or watery stools in the past 24 hours with or without dehydration	• Information on Trigger events/ Early Warning Signal report from block • Sudden unusual increase in cases/ information of death • Increase incidence of hospital admissions. • Clustering of cases in time and space.	• District Surveillance Officer (ADMO – PH/DSMO) • District RRT (DSO, other programme officers, Epidemiologists/Clinician, lab personnel & IEC personnel)	• Verification of the existence of outbreak. • Outbreak investigation by district RRT. • Facilitate laboratory confirmation. • Identify Nodal officer for the block or zone. • Mobilization of staffs/ teams/ vehicles from within the districts or request state for additional support as & when required • Ensure pre-positioning of drugs, logistics, disinfectants and consumables. • Co-ordination with RWSS Dept. to	Provision has been made for • Mobility support • Opening of medical relief centers/DTC • For immediate referral of cases • TA/DA to / DSMO/ADMO (PH)/Dist RRT/Others during

	OR Passage of single or voluminous watery stool.	• Information from local vernacular dailies. • Information from community representatives and other key informants.		chlorinate drinking water sources (tube well/ pipe water supply system and conduct preventive disinfection wherever required. • Make the defunct tubewell functional and conduct preventive disinfection wherever required. In emergency situation safe drinking water may be provided through water tankers at villages/ward and health institutions etc. • Monitoring of response activities like active surveillance, case management, disinfection and health education etc on daily basis. • Ensure the functioning of diarrhoeal treatment centers with trained manpower following standard treatment guideline and infection control practices. • Functioning of control room 24x7 with telephone no. and contact person. • District information bureau need be activated to undertake extensive health education activities on safe drinking water, hand wash, disinfection and environmental sanitation, use of ORS &halazone through IPC, miking, print	outbreak. • Local purchase of essential medicines and disinfectants • Health education activities • Welfare activities • Other contingencies for administrative expenses. For mitigation of natural calamities like Flood, Cyclone and epidemics under mission flexi pool, NRHM. So funds may be provided to blocks and district public health authority to facilitate smooth functioning.

				media and electronic media etc. • Strengthen surveillance to collect daily information on cases and deaths from the affected area as well as surrounding unaffected villages/wards and blocks. • Geographic mapping of cases & deaths to monitor the spread of the disease. • Monitor the trend of the disease to assess the burden of disease and impact of containment measures in the affected area • Reporting of daily epidemic situations to the higher levels and giving feedback to the lower levels • Cross notification to bordering districts. • Procurement of drugs, logistics, disinfectants, from Central ware house and ensure the availability of the same to all the lower levels in the district to avoid stock out • Provide vehicle (Ambulance/MHUs) for referral of cases and surveillance team (District RRT/Block RRT). • Sensitization and training to health workers for cases management and IEC/BCC activities	

				• Ensure that the staff and person accompanying the patients that they get their DA/incentives • Ensure that wherever required the patients are provided with saris, dhotis and soap etc. • Co-ordination meeting under district magistrate and Collector involving other line departments like Revenue, RD,RWSS,PHED, Municipalities and local bodies, W&CD, S&ME, ST&SC,PRI Forest, I&PR to facilitate response activities by improving communication, ensuring safe drinking water, providing health education and monitoring supervision of the response activities. • Ensure solid waste management (Collection, segregation and transport) at all levels (village/ward) to prevent contamination of food and water	

GUIDELINE FOR DIARRHOEA TREATMENT CENTRE

In the case of a confirmed cholera outbreak, all subsequent cases meeting the clinical case definition (Acute watery diarrhoea, with or without vomiting in a patient aged 5 years or more) should be treated as cholera cases.

The following protocol should be strictly followed in all sites (PHCs, SC, or other temporary facilities) managing cases.

Treatment: (The attached treatment protocol must be posted in all sites)

1. Every new case should be recorded in the line list with: Name and Full address, Village, Sex, Age, date of onset of symptoms, Treatment (ORS / Antibiotic / IV Fluids), and Outcome (Cured/ Died/LAMA/Referred).
2. ORS should be given immediately to all cases. Nearly 80 to 90% of the patients can usually recover if treated with oral rehydration solution without intravenous therapy and antibiotics.
    - Give 100ml/ kg body weight of ORS solution in the first 3-6 hours to correct dehydration.
    - If the patient is thirsty and wants to drink more, allow to drink.
    - If the patient vomits after giving ORS solution, wait for few minutes and the again give ORS solution
    - After rehydration has been achieved, continue giving ORS solution for replacement of ongoing losses.
3. The condition of each patient should be regularly monitored for signs of dehydration. If the patients condition detoriates, or else develops the danger signs of diarrhoea mentioned before then the case is to be immediately referred and treated at the nearby haeath facility.
4. Antibiotics/ antidiarrhoeals should be given to all patients as per need of case.

Antibiotics of Choice

Antibiotics of Choice	**Alternatively**
Doxycycline • Adults : 300mg once Or **Tetracycline** • Children: 12.5mg/kg (4 times a day X 3 days) • Adults: 500mg (4 times a day X 3 days) **Trimethoprim/ Sulfamethoxazole** • Children : TMP 5 mg/kg & SMX 25mg/ kg twice a day for 3 days • Adult : TMP 5 mg/kg and SMX 25mg/ kg twice a day for 3 days	**Azithromycin** Children: 20 mg/kg, once Pregnant Women: 1g/once

*__Based on WHO guidelines and Antibiogram 2007__

During 2010, the antibiogram revealed that *V. Cholerae* are mostly

- **Sensitive to**:-

  Azithromycin / Doxycline / Tetracycline / Ciprofloxacin / Norfloxacin / Ofloxacin / Chloramphenicol / Gentamycin

- **Resistant to**:-

  Streptomycin / Erythromycin / Co-trimoxazole/ Ampicillin / Nalidixic acid / Furazolidone

5. Patients who are severely dehydrated must receive IV fluids. The preferred solution is Ringer's Lactate; alternatively, Normal Saline could be used.

   (Plain glucose solutions are ineffective and should not be used)

Quantity	Infants (< 1 yr)	Older Children / Adults
30ml/ kg body wt. 30ml/ kg body wt.	First 1 hour Next 5 hours	First 30 min Next hours
100ml/ kg body wt.	6 hours	3 hours
Reassess clinical condition very 1-2 hours; if hydration is not improving, refer the patient	Assess for signs of overload as patient recovers – evidence of swelling, shortness of breath or puffiness of eye lids etc; stop the IV fluid	If a patient can drink, start ORS solution along with IV infusion. When signs of severe dehydration disappear, continue with ORS. If condition does not improve then refer.

Patient Escort

1. No more than one person should stay with each patient in the facility to prevent overcrowding. No other unauthorized persons should be allowed inside the diarrhea treatment facility/center.

2. Chemoprophylaxis (Doxycycline 300g/once) could be given to patient escorts and close contacts.

3. No mass chemoprophylaxis should be given.

4. Provision should be made outside the treatment facility for other persons accompanying the patient. GKS/Untied funds / RogiKalyanSamiti funds may be utilized for this purpose.

Prevention / Hygiene

Additional measures are needed to ensure hygienic conditions in the Diarrhoea Treatment Centre/Medical relief Centersto prevent the spread of infection.

1. Suspected Cholera patients should be isolated from all other patients.
2. Safe water supply of 40-50 lits. per patient must be ensured.
3. All medical staff working with patients should be supplied with aprons and gloves.
4. Ring, bangles and other personal items should not be worn while on duty.
5. All Support staff/ Volunteers helping with cleaning should be supplied with gloves, aprons, goggles and gum boots.
6. Adequate water/ places for washing of hands with soap and 0.05% chlorine solution must be ensured –at the entry points of every cholera ward.
7. At least 1 meter (3 feet) should be ensured between each patient bed. Additional space may be made outside the health facility in vacant buildings or temporary tents.
8. All patient excreta/ vomitus collected in buckets should be treated with chlorine solution and disposed in pit latrine or hole dug for this purpose – well away from any drinking water source. Waste must not be put into rivers or canals.
9. All surfaces in contact with patients as well as their clothing should be treated with 0.05% chlorine solution in designated area away from water suppliers.
10. Dead bodies should be washed with 0.5% chlorine solution and the mouth and anus closed with chlorine soaked cotton swabs.

Chlorine Solutions	**How to Prepare**	**Where to use**
For 0.5% Chlorine Solution	Bleaching Power (30%): Add 16gm or 1 tablespoon to one lt. of water Calcium hypochlorite (70%): Add 7gm. Or ½ tablespoon to one lt. of water	To disinfect: Excreta / vomitus, dead bodies
For 0.05% Chlorine Solution	Bleaching Power (30%): Add 16gm or 1 tablespoon to 10litres of water Calcium hypochlorite (70%): Add 7gm. Or ½ tablespoon to 10 litres of water	To disinfect: Washing hands/ gloves floors, clothing / bedding/ equipment

ANNEXURE– II

RENDERING DRINKING WATER SAFE

- *Boiling for 1 minute will kill or inactivate V. Cholera and other common organisms that cause diarrhoea. Boiling is , however, expensive and not practical especially in areas where outbreaks of Cholera and other diarrhoeal diseases are most likely to occur because of fuel shortage*
- *When surface water/ hand pump water is contaminated, this source should be closed for drinking water purposes. This information should be prominently displayed indicating that the source of water in not fit for use. In Delhi, shallow hand pumps are painted red. Alternate water source should be provided, indicating water tankers during the course of an outbreak.*
- *Where it is feasible chlorination of the water source, such as a draw well should be immediately organized.*
- *In urban areas as well as semi urban or rural areas where piped water exists immediate co-ordination with the agency responsible for water supply should be organized to ensure chlorination of water source and repair of water pipes, if indicated*
- *Chlorine releasing tablets may be used for domestic purposes in the area of an outbreak*
- *Community should be encouraged to use narrow mouthed containers for water storage to reduce secondary transmission in the family.*

CHLORINATION OF DRINKING WATER

PREPARATION OF STOCK SOLUTION

(1% solution in 1 litre of water)

Add to one litre of water any of the following.

- Calcium hypochlorite (70%) 15gram

OR

- Bleaching powder or Chlorinated lime (30%) 33 gram

OR

- Sodium hypochlorite (5%) 250 ml

OR

- Sodium hypochlorite (10%) 110ml

The stock solution should be used within one month. It should be kept in a closed container in a cool place away from light.

(Add stock solution to water)

- 0.6ml or 3 drops 1litre of water
- 6ml 10 litres of water
- 60ml 100 litres of water

Allow water to stand for 30 minutes before using. The residual chlorine level should be 0.2 to 0.5mg/litre.

DOMESTIC CHLORINATION OF DRINKING WATER

- Crush commercially available chlorine – releasing tablet
- Put in the water container with 20litres of water
- Allow to stand for 30 minutes
- Use water with 24 hours
- 4mg of Halazone tablet to be added in one liter of water.

Containers with a narrow mount are recommended for the storage of drinking water.

RECOMMENDED MINIMUM CHLORINE LEVELS IN WATER DISTRIBUTING SYSTEMS

- 0.5mg/litre:– at all sampling points in a piped water system
- 1.0 mg/ litre:– at stand post
- 2.0mg/ litre:– in tanker trucks at filling

DISINFECTION OF WELLS BY CHLORINATION

- The most effective method of disinfecting wells is chlorination by fortnightly and on regular basis during disaster like flood or outbreak period.
- Measures the depth of the water column by lowering a stone tied to a dry rope in the well. The length of rope in meters which gets wet will give the depth of the well. Measure the diameter of well in meters. The volume of water in the well calculated by using the formula given below:

  Volume in litres = $\frac{3.14 \times d^2 \times h}{4}$ X 1000

  D = diameter of well and h = depth of water in meters
- Approximately 2.5 gms of pure quality bleaching powder is required to disinfect 1000 liters of water. (One matchbox full contains about 10gms of bleaching powder)
- The required quantity of bleaching powder is placed in a bucket with not more than 100gms in one bucket. If the volume of the water is more, use two or more buckets. Make a paste by adding one litre of water in it. More water is added till the bucket is nearly 3/4thfull. Then, stir the contents with a rod or wooden stick and allow 5-10 minutes for sedimentation of lime. The supernatant solution containing chlorine is transferred to another bucket and discarding the sediment. This sediment should not be poured into the well as it will increase the hardness of the well water.
- The bucket containing the chlorine solution is lowered some distance below the water surface and the well water is agitated by moving the bucket violently both vertically and laterally. This should be done several time so that the chlorine solution mixes intimately with the water inside the well.
- A contact period of one hour is allowed before the water is drawn for use. Therefore, it is better to chlorinate the well one hour before the villagers come to draw the water or after they have drawn it so that chlorine remains in contact with the water for required time.
- Bleaching powder should be stored in a cool, dark and dry place in a closed anti-corrosive container as it is an unstable substance, on exposure to air, light and moisture, it rapidly loses it chlorine content.

ANNEXURE - III

KEY MESSAGES FOR HEALTH EDUCATION

"Boil Your Water, Cook Your Food -Wash Your Hands"

1. PERSONAL HYGIENE

- Wash your hands with soap, ash or lime :
  - before cooking and eating
  - before feeding your children
  - after use of latrine or cleaning your children after they have used the latrine.
  - After taking care of ill patients
- Wash all parts of your hands: front, back, between the fingers thoroughly.
- Use of latrine for defecation should be practiced regularly.
- Keep the latrine clean.

2. FOOD

- Raw food should be properly cooked.
- Eat cooked foods immediately.
- Store cooked food carefully in refrigerator.
- Reheat cooked food thoroughly, if used.
- Don't mingle raw food with cooked food.
- Eat fruit and vegetable after peeling of yourself.
- Keep all kitchen surfaces clean.
- Cleanyour chopping board with soap and water.
- Wash your utensils and dishes with soap and water.
- All the vegetables and/ or fruits should be properly washed before peeling or cooking.

"Cook it – Peel it– Wash it"

3. SAFE DRINKING - WATER

- Even if it looks clear, water can contain germs.
- Boil or add drops of chlorine to the water before drinking.
- Keep drinking water in a clean, covered pot or bucket or other container with a small opening and a cover, which should be used within 24 hours of collection.
- Pour the water from the container – do not dip a cup into the container.
- If dipping into the water container cannot be avoided, use a cup or other utensil with a handle.

4. WELLS

- Do not defecate or urinate in or near a source of drinking water.
- Do not wash your clothes, or pots and utensils in the source of drinking-water (Streams, river,nala/pond/ chuas)

- Unused open wells must be covered to avoid contamination.
- One dedicated bucket to be used to collect water should be hung up when not in use – they must not be left on a dirty surface.
- The area surrounding a well or a hand pump must be kept as dry and clean as possible.
- Get rid of refuse and stagnant water around a water source.

5. FOR PEOPLE WITH DIARRHOEA

- The majorthreat is dehydration
- Quick action to be initiated without being panic.
- DrinkOral Rehydration Solutionprepared with boiled or chlorinated water.
- Go immediately to the health centre and ensure drinking ORS continuously on the way if the patient is conscious and alert

6. TAKING CARE OF PATIENTS

- Wash your hands after taking care of patients either by touching them, their stools/ vomit or clothes.
- Avoid contaminating a water bodies by washing patient's clothes in it.
- Stools and vomitusof a cholera patient can be disinfected withbleaching powder solution/hypochlorite solution).
- Disinfect the patient's clothing and bedding with a solution of chlorine (0.05%) or by stirring them in boiling water or by drying them thoroughly in the sun before and after normal washing.

ANNEXURE – IV

Form - 1

LINE LIST OF ACUTE DIARRHOEAL CASES / DEATHS

Block Name: Reporting Date:_____

Reporting site: Hospital / CHC / PHC / SC / CAMP / Treatment Center : _____

Sr. No	Name	Father's / Husband's Name	Gram Panchayat	Village	Block of residence	District of residence	Age (Yrs)	Sex (M/F)	Date of onset of diarrhoea	Outcome (Recovered / Referred / Died)	Treatment given (mark with tick □as appropriate)		
											ORS	IV Fluid	Antibiotics

Form-2

Daily Block Reporting Form

Reporting Date:_____ Reporting Block:_____

Block Name	Number of Gram Panchayats			Number of Villages			On the Day						Progressive					
							Cases			Deaths			Cases			Deaths		
	Already affected	Affected Today	Total affected	Already affected	Affected Today	Total affected	<5 Yrs	≥ 5 Yrs.	Total	<5 Yrs	≥ 5 Yrs.	Total	<5 Yrs	≥ 5 Yrs.	Total	<5 Yrs	≥ 5 Yrs.	Total

Information of reporting block

Information of cases belonging to other blocks

Ensure there is no duplication while compiling this report

This report & Acute Diarrhoea case line list is to be compiled at block & sent to district by 5.00 P.M everyday

Signature

Form-3

Daily District Reporting Form

Reporting Date:_____ Reporting District:_____

Block Name	Number of Gram Panchayats			Number of Villages			On the Day						Progressive					
							Cases			Deaths			Cases			Deaths		
	Already affected	Affected Today	Total affected	Already affected	Affected Today	Total affected	<5 Yrs	≥ 5 Yrs.	Total	<5 Yrs	≥ 5 Yrs.	Total	<5 Yrs	≥ 5 Yrs.	Total	<5 Yrs	≥ 5 Yrs.	Total

Information of blocks belonging to other districts

Ensure there is no duplication while compiling this report

This report & will be compiled everyday and will reach the State HQ by 12 noon of the next day. State will compile the data and present it to Higher Authority by 3.00 P.M of the next day.

Signature

Date / Village wise No. of Cases / Deaths due to Acute Diarrhoeal Disease Outbreak in the month_____

Name of the block:_____ Name of the District:_____

SL. No	Name of the Village	G.P / SCs	Date																													
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31

N.B:- C/D C:- Cases
D:- Deaths

Annexure-9

MANAGEMENT OF CHOLERA CASES& LABORATORY DIAGNOSIS

What is CHOLERA ?

Cholera is an acute diarrhoeal infection caused by ingestion of thebacterium *Vibrio cholerae*.

How it is transmitted?

Transmission occurs through direct faecal oral contamination or through ingestion of contaminated water or food.

Notification of cholera cases

1. Cholera is endemic in India and several outbreaks of the disease have been reported. Because cholera has the potential of rapid spread leading to an acute public health problem, special attention is required to be given to the surveillance and prompt follow up action on reported cases of cholera.

2. A suspect case of cholera must be notified immediately by messenger, telephone or fax to the local health office. Weekly notification of confirmed cholera cases is required to be made by the state health authorities to the Directorate General of Health Services:

3. If appropriate measures are taken, cholera remains restricted to a limited habitation. Therefore, reporting of taluka and district help in identifying the affected area.

4. The first suspect case of cholera in the area must be notified immediately to the local health officer. Laboratory confirmation should be obtained at the earliest opportunity and the results intimated to local health office as soon as these become available.

Clinical Case Description

A patient with acute watery diarrhoea and severe dehydration (lethargy, altered consciousness and decreased urine output) with or without vomiting.

It is characterized by a sudden onset of acute watery diarrhoea that can lead to severe dehydration which results in death and kidney failure.

Incubation Period

The incubation period is from two hours to five days About 75% of people infected with cholera do not develop any symptoms. However, the cholera vibrios persist in their faeces for 7 to 14 days and are shed back into the environment, potentially infecting other individuals. Cholera is an extremely virulent disease that affects both children and adults. Unlike other diarrhoeal diseases, it can kill healthy adults within

hours. Individuals with lower immunity, such as malnourished children or people living with HIV, are at greater risk of death if infected by cholera.

Case classification

Probable:

- *In an area where the disease is not known to be present:* Severe dehydration or death from acute watery diarrhoea in a patient aged 5 years or more
- *In an area where Cholera is endemic:* Acute watery diarrhoea, with or without vomiting in a patient aged 5 years or more.
- *In an area where there is a Cholera epidemic:* Acute watery diarrhoea, with or without vomiting, in any patient.

Confirmed:A probable case that is laboratory confirmed

Laboratory criteria for diagnosis:Isolation of *Vibrio cholerae* 01 or 0139 from the stools samples of any patient with diarrhoea.

Key issues

1. Treatment of cholera does not depend on the results of laboratory examination. However, laboratory examination of specimens from the first few suspected cases is important to confirm the diagnosis and to determine the characteristics of the organism.
2. A sufficient number of stool specimens should be examined to identify the causative organism. Once the presence of cholera is confirmed, *it is not necessary to examine specimens from all cases or contacts*. In fact, this should be discouraged since it unnecessarily burdens the laboratory and is not required for effective treatment.
3. Specimens should be collected before the patient has received any antibiotics.
4. Full particulars of the patient(s) from whom samples have been collected must be sent along with the samples as many factors can influence the results of the laboratory tests. The information that should accompany each stool sample is given below:
    - Name, age, sex
    - Name of mother or father
    - Address
    - Date of onset of symptoms
    - Provisional diagnosis
    - Clinical outcome (recovered, under treatment, dead, not known)
    - Antibiotic received prior to collection of sample - Y/N/not known
    - Date of sample collection

COLLECTION, TRANSPORT &STORAGE OF SPECIMENS

The appropriate selection, collection, rapid transport of specimens is very important for etiological diagnosis and case management in the community. It is the responsibility of district health authorities to provide complete and accurate specimen management information to the health care workers who have the primary responsibility of collecting the specimens. The information provided to include safety, selection, collection, storage, labeling, transportation and acceptability.

Bio-Safety Measures

Biosafety measures needs to be adopted for personnel safety of the healthcare worker collecting the sample.

1. During specimen collection wear personal protective equipment such as gloves, aprons, mask and / or goggles.
2. Use leak-proof specimen containers (CBT Media) and transport them in vaccine carrier/ leak proof plastic bag carrier at ambient temperature along with a lab requisition form,
3. Make sure screw-cap lids (CBT Media) are secured with adhesives & fastened evenly and securely. Do not transport leaking containers to the laboratory because test results will be compromised and it is a hazard to couriers and laboratory personnel.
4. To protect the safety of others, take care not to contaminate the outside of the specimen container or the laboratory requisition form.

General specimen selection and collection guidelines:

- Wash hands before and after the collection.
- Aseptic techniques must be employed during sample collection and to prevent the sample from being contaminated during collection.
- Collect stool specimens before the administration of antimicrobial agents.
- Collect the specimen from fresh stool sample & not from the bed pans etc.
- Make certain that the specimen is representative of the disease.
- Collect adequate volume in the swab stick, as insufficient material may yield false negative results.
- Collect the specimen in an appropriate screw capped, external threaded, unbreakable, leak-proof container provided to you.
- Ensure that the outside of the specimen container is clean and uncontaminated.
- Close the container tightly so that its contents do not leak during transportation.
- Label the container appropriately and complete the lab requisition form.
- Arrange for immediate transportation of the specimen to the state referral laboratory

Storage & transportation of specimens

In general samples should be kept at 2-8°C during storage and transport. The quality of sample can deteriorate during storage or transportation which affects the diagnostic results. Hence, special care should be taken during transport of samples to the laboratory to protect them from heating or drying.

- All specimens must be promptly transported to the laboratory, preferably within 2 hours. In case of delay the samples should be kept in vaccine carrier.
- Specimens for bacterial culture should not be stored for more than 24 hours before transport to the laboratory.

- Specimen containers relating to single case investigation should be placed in a plastic bag with an absorbent material surrounding the specimen so that even if the whole specimen leaks out, it will be absorbed**.**
- The lab report form should be sealed within a separate plastic bag and wrapped round the specimen or attached firmly to box of specimens.

Specimen acceptability or rejection criteria

At times, specimens arriving in the laboratory may have been improperly selected, collected or transported. Processing and reporting such specimens may provide misleading information that can lead to misdiagnosis and inappropriate therapy. Consequently, the laboratory must adhere to a strict policy of specimen acceptance and rejection. The following are some examples under which samples could be rejected in the laboratory:

- No label
- Improper or leaking container
- Prolonged transport
- Insufficient quantity
- Specimen collected in an inappropriate container
- Contamination suspected
- In appropriate transport or storage

In all the above cases, immediately contact the submitting health care worker. For specimens collected by non-invasive means, have a new specimen submitted, but for invasive specimens or for other samples which cannot be collected again, process the specimen only after consulting the person who obtained the specimen. Note the problem on the form and report.

Labelling and identification of specimens

Proper identification of every patient sample is as important as the quality of the sample. Each patient should be given a unique identification number. This unique identification number and the patient name should be present on all specimens, epidemiological data forms, and the laboratory transmittal forms and used as a common reference. The sample should be labelled using pre-printed labels / glass-marking pencil / permanent markers / adhesive tape, etc. Labels should be firmly

affixed to the specimen container. It should contain the following:

- Patient's name
- Identification number
- Specimen type
- Date & time of collection

Glass slides for microscopy must be labelled individually, using glass marking pencil. This should not interfere with the staining process. Each slide should bear:

- Patient's name

- Identification number
- Date of collection

Faecal specimen

Faecal specimens may be collected in the early stages of a disease, when pathogens are likely to be present in the stool in high numbers i.e. soon after onset of diarrhoea (for viruses <48 hours and for bacteria <4 days), and preferably before the initiation of antibiotic therapy.

- Stool specimens should be collected in a wide-mouthed sterile container with a leak-proof screw-capped lid.
- The collected stool should be processed as soon as possible upon receipt in the laboratory.
- In case of delayed transport (> 2 hours), collect a small amount of stool on a swab and inoculate Cary-Blair transport medium.
- Stool is the preferred specimen for culture in a case of diarrhoea.
- Rectal swab may be collected for acutely ill patients, newborns or when stool specimen is not available. It is advisable to collect two swabs from each patient, one for microscopy and other for bacterial/viral studies.

Materials required

- Sterile wide mouth, external threaded, unbreakable, leak proof container
- Spatula for transferring the specimen to the container

Inoculation of rectal swab into Cary Blair's medium

- Transport medium (e.g. Cary Blair's medium)

Collection of rectal swab

- Moisten 2 swabs in an appropriate transport medium (e.g. Cary-Blair).
- Insert swab 2-3 cm into rectum and gently rotate.
- Gently rotate up to 90 degrees, so that faeces covers the swab.
- Withdraw the swab.
- After collection of both swabs (one at a time), place both swabs into the same tube deep enough so that medium covers the cotton tips.Break off top portion of sticks and replace the cap

- Label the specimen and place it in a plastic bag with the appropriate request slip.

STOOL SPECIMENCOLLECTION

- Freshly passed stool samples avoid specimens from a bed pan
  Use sterile or clean container
- do not clean with disinfectant
  During an outbreak - collect from 5-10 patients

Stool samples for bacteria

Timing

- during active phase

Sample amount and size

- fresh sample and two swabs from patients,controls and carriers (if indicated)

Method

- Cary-Blair medium
- For Ag detection/PCR – no transport medium

Storage

- refrigerate at 4^{o}C if testing within 48 hours, -70^{o}C if longer; store at -15^{o}C for Ag detection and PCR

Transport

- 4^{o}C (do not freeze); dry ice for Ag, PCR detection

Water Sample Collection for bacteriological Examination

Preparation

Chlorinated water - add sodium thiosulphate (0.5ml of 10% solution or a small crystal)

Tap/ pump

- remove attachments
- wipe, clean and flame outlet
- allow to flow (at least one minute)

Water course or reservoir - collect from a depth of at least 20 cm

Dug well - do not allow the bottle to touch the sides of the well

Collection

At least 200 ml of water sample from the source

In sterile glass bottles OR autoclavable plastic bottles

- tight screw capped lid
- securely fitting stoppers/caps an overhanging rim

Case Investigation form

Date :.....

(To be filled in by the clinician/ epidemiologist)

Patient' s Name: Patient' s I.D No.:

Father's/ Husband's Name: Age/ Sex:

Address:

Date of onset of illness:

Date of hospitalization/ reporting to the district level:

Occupation:

Clinical signs & symptoms (with duration):

Treatment history:

Results of previous investigations (if any):

Any other relevant information:

Specimen details:

Nature of specimen (s)	Date of collection	Investigation required

Details of sender:

Signature:

Name of sender: Address of sender:

Fax: E-mail:

(NOTE: Please complete all the columns. Always send the sample under cold chain unless specified otherwise)

LIST OF LABORATORIES CONDUCTING LABORATORY CONFIRMATION OF OUTBREAK PRONE DISEASES

SL. NO.	NAME	ADDRESS	PHONE & FAX
1	S.C.B. Medical College, Cuttack	Division of Microbiology	0671 -242 8222 scbmcctc@gmail.com directordcms.c.b@gmail.com
2	V.S.S. Medical College, Burla, Sambalpur	Division of Microbiology	0663-2430768 vssmcburlaorissa@gmail.com skghosh.dr@gmail.com
3	M.K.C.G. Medical College, Berhampur, Ganjam	Division of Microbiology	Tel : 0680 – 2292746, Fax : 0680 – 2292809 , mkcgmc.bam@gmail.com
4	Capital Hospital, Bhubaneswar	Department of Regional Diagnostic Center (Pathology & Microbiology)	Tel:0674-2391983, Email: director.chb@gmail.com
5	Regional Medical Research Center (RMRC), Bhubaneswar	Division of Microbiology & virology,	Telephone Number: 91-674-301322(O), Fax: 91-674-301351 skk@icmr.org.in
6	National Centre for Disease Control, 22, Shamnath Marg New Delhi	Division of Microbiology & Zoonosis	Tel/fax 011-23912836 Idsp-lab@nic.in / idsp-npo@nic.in
7	NIV, Pune	National Institute of Virology, Pune, 20/ A, Dr. Ambedkar Road, Pune 411001,	**Tel. No.** : 91-020-26127301 / 91-020-26006290, **Fax No.** : 91-020-26122669/ 91-020-26126399

Annexure-10

Heat Wave Disaster Management

Origin – Natural (Meteorological)

Definition:-

Heat wave can be defined as a condition of atmospheric temperature that leads to physiological stress, which sometimes can claim human life.

Quantitatively heat wave can be defined as follows :

- The normal temperature is < 40° C. Any increase from the above normal temperature is called heat wave.
    - + (5 or 6)° C – Moderate heat wave
    - 7° C. or more – Severe heat wave
- The normal temperature is > 40° C. Any increase from the above normal temperature is called heat wave.
    - + (5 or 6) ° C – Moderate heat wave
    - 7° C or more – Severe heat wave
- If the maximum temperature of any place continues to be 45° C. Consecutively for two days, it is called a heat wave condition.

(Source: OSDMA web site)

Public health Problems due to Heat Wave Condition: -

Heat Disorders

A case with history of exposure to working in a hot environment with high to very high body temperature associated with any of the following – vomiting, headache, dizziness, fainting and altered or lower consciousness.

1. **Heat Cramps** - Muscle pains / Spasm associated with strenuous activity in a hot and humid environment.
2. **Heat Exhaustion** – Heavy sweating / weakness / tiredness / dizziness / headache / vomiting / muscle cramps / fainting /Moist and Cool Skin and rapid weak pulse.
3. **Heat Stroke** – Extremely high body temperature (above 103°F / 39.4°C orally or 105.8 ° F/ 41°C rectally). Absence of sweating, red hot & dry skin. Rapid and

strong pulse, throbbing headache, dizziness, nausea, confusion seizures, comma, unconsciousness.

Guidelines for Preventive Activities for Heat Wave Condition: -

i. **Review Meeting** – Meeting of nodal officers at State / District & Block level to review the preparedness activities.
ii. **Pre positionof Supplies** – Provision for adequate supply of ORS, IV Fluids, Life Saving Medicines at all health institutions and MPHW (F) & (M), ASHA& Anganwadi workers as per the suitability. Ensure that the essential drugs reaches the destination sufficiently ahead.
iii. **Training** – All categories of health personnel should be sensitized on heat stress disorders, its prevention and management.
iv. **Infrastructure and Logistic** –
    a. At all health institutions ear marked beds should be kept in readiness at a cool well-ventilated space.
    b. In the DHH, SDH & CHC / PHC wherever A.C & Coolers are available to be utilized.
    c. Provision of Ice & Ice cold water at DHH / SDH / Block CHC & PHC as per requirement & availability.
    d. Cold water should be stored in earthen pots in each health institutions.
    e. ORS Booth should be opened at all health institutions.
    f. All Ambulances & other PHC vehicle to be kept in roadworthiness for referral of patients.
v. **Monitoring –**
    a. Control Room operational at State HQ / District HQ / Block HQ from 1st March to 15th June.
    b. Daily reporting of cases and deaths through the prescribed format. (Reporting format enclosed).Even a Nil report is required to be sent. The days report should be collected daily from all health institution, compiled & transmit it to the state health control room by Fax or E-mail by 12 noon of next day.
    c. State Control Room reports daily to Revenue Control Room.
    d. Death Inquiry: report regarding death of a person due to sun stroke either at work place or any other area when received should be jointly inquired by local Revenue Officer and local Medical Officer of a PHC, CHC, SDH & DHH (to be nominated by SDMO & CDMO in case of SDH & DHH). The report to that effect should be sent to District Magistrate

&Collector & the copy of the report need be sent immediately to State Health Control Room over Fax or E.mail.

vi. **IEC –**

An intensive IEC campaign to be launched to keep people inform about Do's & Don't s as regards exposure to heat wave, fluid in take, regulation of work, clothing, protective device & work environment during the heat wave period.

a. Health Worker (M & F), Supervisors (M & F), BEE, Medical Officer should resort to Inter personal communication to propagate the messages as this is the most effective media with maximum reach. During field visit group discussions can be initiated & emphasis should be given on preventive aspect.
b. Leaf lets to be distributed & Poster displayed at strategic places.
c. IEC campaign through print & electronic media to be conducted through SIHFW.

vii. **Inter Sectoral Coordination: –**

Coordination between Revenue, Local Self Govt. Bodies, W & CD Deptt., RWSS, Education& Health is of utmost importance to focus the attention, mobilize resources, manage the heat wave condition & minimize the suffering of the community. The Officials at their respective places are expected to have close liaison with different department.

viii. **Fund**

Each year NRHM, Odisha provides funds for infrastructure strengthening as well as community level activity to be undertaken by GKS & IEC. MD, NRHM is being requested for the same to enable district authority to undertake preparedness activity on time.

ix. **Activities undertaken by other Departments**–

- Sinking of Hand Pumps. Drilling of Wells, Repair of Tube wells
- Opening of Jala Chatras & Mobile Water Tankers to render service in water scarce areas.
- Press note advertising against engagement of labour at worksite between 11.30 A.M to 3.30 P.M to avoid exposure.
- Bus Owners are requested to avoid overcrowding, restrict plying during the hours of intense heat. Provision of Drinking water, posters to be displayed.
- Timing of School may be changed and duration reduced.
- Doordarshan & A.I.R may be requested to conduct Phone in, TV & Radio talks.

Form for Daily Reporting of Heat Stress Disorders

Health Facility: Sub-centre : CHC/PHC : SDH : _____ DHH: _____Block : District : _____

IDSP Reporting Week No. Date _____

Maximum recorded Room/ External temperature: **^{0}C/ ^{0}F**

	DAILY							**PROGRESSIVE**					
Place of Identification / Care	Number of Cases			Number of Deaths				Number of Cases			Number of Deaths		
	<5 Yrs	>=5Yrs	Total	<5 Yrs	>5=Yrs	Total		<5 Yrs	>5=Yrs	Total	<5 Yrs	>=5Yrs.	Total
Institutional													
Non-institutional													
Total													

Details of Death:

Sl No	Name of the person	Address	Age	Sex (M/F)	Place of death	Date of death	Time of death	* Maximum Temperature recorded (^{0}C/^{0}F)		Date & time of post mortem (if conducted	Date and time of joint enquiry conducted with a revenue authority	Cause of death	Remarks	
								Rect -al	Oral				Related to post-mortem	Related to joint enquiry

* Ideally rectal temperature should be recorded. If it is not possible to record rectal temperature, oral temperature can be recorded.

Signature with Date:

Name and Designation of the reporter:

N.B. :

- *The days report should reach at State Health Control Room on or before 12 noon the next day.*
- *To be used for the collection of data relating to heat disorders at Sub-centers, PHC(N), BPHC, CHC, Area Hospitals, SDH & DHH.*

Annexure-11

Format for Early Warning Signal / Alert for outbreaks

(should be sent within 48 hrs. of an outbreak)

1. State: District: Date of reporting: Week No.

2. Is there any unusual increase in Cases/Deaths or unusual event in any area? Yes/No

3. If yes, provide the following information:

I.	Name of the Disease/ Syndrome (Provisional/Confirmed)	
II.	Name of the affected area (Block, PHC, Sub-center, Village, Ward/Town)	
III.	No of cases	
IV.	No of deaths	
V.	No. of cases referred	
VI.	Date of start of the outbreak	
VII.	Total population of affected area (Village/Ward)	
VIII.	Salient epidemiological observations	
IX.	Lab results (type of sample, number of samples collected and tested,What tests, where, results)	
X.	Control measures undertaken	
XI.	Investigation of outbreak by District/Blocks RRT or not)	
XII.	Present status	
XIII.	Any other information	

ADMO (PH)/DSMO
Mobile No:-

Annexure-12

OUTBREAK INVESTIGATION FORMAT (Final Report)

(Must be sent after the outbreak is contained)

1. General Information

- Disease - Suspected/ Lab Confirmed
- District -
- Town/CHC -
- Sub-Centre -
- Village -
- Population -
- Holdings -

2. Background Information

- Person reporting the outbreak -
- Date of reporting -
- Date of investigations started -
- Person(s) investigating the outbreak -

3. Details of investigation

- Describe how the cases were found (may include):

- House-to-house searches in the affected area:

- Visiting blocks/village adjacent to the affected households:

- Conduct Environmental survey
    - No. of wells in village/ward
    - No. of tube wells in village/ward
    - No. of pipe water supply points
    - Probable source of infection

- Conducting interviews with other stakeholders (treating physicians, AWW, ASHA, teachers, PRI members, NGOs etc.)

- Conducting record reviews at local hospital(OPD & IPD):
- Reviewing Current guidelines and SOP:

- Requesting health workers to report similar cases in their areas, etc:

4. Descriptive epidemiology by time, place and person

a. Cases by time, place and person (attach summary tables and relevant graphs and maps)-

	No. of Cases		
Age Group	M	F	Total
Total			

Insert Graph

b. Spot map of the affected area

Spot map

c. Epidemic curve by date of onset (Hrs/ Day/ Week/ Month/ Year)

Epicurve

5. Laboratory investigation:

Nature of Samples collected	Blood/Serum	Rectal swab	Skin smear	Other tissue	Water Samples
Total no. of samples collected					

6. Test Result of samples tested at State Referral Lab

7. Description of control measures taken

a. Case Management and Referral

Total cases	Total death	No. of Cases referred	Name of the referral Health Intuitions

b. IEC/BCC activity

- No. of Sensitization meeting conducted-
- No. of participants-
- Category of meeting- Urban/ NAC/ Block/Sector/SC/ Village-
- No. of leaflet or posters etc. distributed-

8. Description of Measures taken during follow-up visits-

- No. of MAT (Minor Ailment Treatment) given
- Advt. through electronic media/print media
- MRC/ DTC opened or not
- Daily surveillance by HW/ASHA conducted or not
- Preventive disinfection of drinking water source done or not
- No. of wells/ tube wells disinfected with date

9. Brief Description of Problem encountered-

10. Factors, which, in your opinion, contributed to the outbreak

- Source of infection
- Steps undertaken by RRT to identify source of infection

11. Conclusions and Recommendation

Signatureof DSMO Signature of ADMO (PH)

Signature of Epidemiologist

Annexure-13

Format for ADD Death Investigation

1. Name of the district: Date & Time of investigation:
2. Name of the CHC/Block: Sub center: village:
3. Details about the Death:
   a. Name : Age: mo/ yrs Sex: M/F
   b. Address: S/O, D/O W/O,G/O_____
   c. Religion:
   d. Occupation: Govt. /Non Govt./Labour/others (Specify)
   e. Resident (Living more than 6 months in that area)/ Visitor
   f. Date of onset of first symptoms: _____.
      (Pain abdomen, Vomiting, fever, loose motion, visible blood in stool, mucous in stool):_____
   g. Signs of dehydration. Tick the correct response(sunken eyes, scanty urination & any others)
   h. Date and time of first contact with the Health provider (ASHA/AWW/HW/MO/Others):
   i. Date and time of admission to Hospital i.e. first referral unit (PHC/CHC/SDH/DHH/Others) if any:
   j. Treatment given in the hospital 1st Referral unit: ORS/IV fluid/type of Anti-diarroheals/ Oxygen. (Ticks mark the correct response)
   k. Date & time of admission into secondary/tertiary care unit(Medical College& Hospital/other private hospital) if any :
   l. Type of treatment received at Secondary/tertiary care hospital: IV fluids, anti-diarroheals/Dialysis/others if any(tick mark the correct response)
   m. Date & time of Death:
   n. Place of Death: Home/ Hospital
   o. Travel history (in the past ten to twelve days):
   p. Any history of contact with ADD cases (Household members/others)
   q. Major signs and symptoms (Tick mark correct response) :

Signs & Symptoms	Signs & Symptoms	Signs& Symptoms	Signs & Symptoms
Acute watery Diarrohea (Passage of 3 or more loose or watery stool in the past 24 hours in a case aged 5 Yrs. or more) Sev. Diarrohhea Watery stool >three times in 24 hrs.	Sunken Eyes	Oliguria / Anuria	Altered Sensorium
Anaemia	Pain abdomen	Visible blood in stool	Convulsion
Fever	Vomiting	Mucus in stool	Coma

r. History of intake of food item in last 24 hours :
s. Source of drinking water (dug Well/Tube Well/ PWS/ spring/ River/ Lake/ Canal/ Ponds) _____.
t. Type of house – Kacha/Pucca/mixed dwelling
u. Use of sanitary latrine: Y/N
v. Other co existing diseases if any: Measles/Malaria/Dengue/TB/Diabetes/Hypertension/Jaundice/Heart disease/AIDS/Renal Failure/Severe anemia/Malnutrition.
w. Cause of referral to CHC/SDH/Medical College/Private hospital:_____

4. Provisional diagnosis :_____
5. Laboratory investigation conducted :

Sl. No	Lab investigations if done	Result	Date of Investigation(if Available)
1.	Blood slide for malaria/RDT		
2.	Hb%		
3.	S. Creatinine		
4.	S. Urea		
5.	Stool culture & sensitivity done locally		
6.	Stool RE & ME		
7.	Rectal swab		
8.	Fasting Blood sugar		
9	Serum electrolyte estimation		

6. Treatment Given :

7. Final diagnosis : Death due to Food Poisoning/Acute Diarrhoeal Disease /Any others Specify
8. Preventative measures taken
   a. Total nos. of Household members :
   b. Contact dose given to all members : Y/N
   c. Group meeting conducted in village : Y/N
   d. Disinfection measures under taken : Y/N
   e. Active surveillance conducted : Y/N
   f. No of dug wells disinfected with bleaching powder
   g. No of Tube wells disinfected by RWSS.
9. Public health follow-up preventive/control actions taken by State/District/local health authorities in affected area:
   IEC/BCC activities conducted at Village/SC/CHC level:

   No of Medical/Paramedical medical workers/ GKS/SHG/NGOs/CBOs sensitized (please mention the category of staff/ date/venu & Time/ documentation done if any):

   Disinfection measures undertaken:

   No of Group meetings conducted:

10. Remarks of the investigating officers:

The death investigation report may be submitted within three days of investigation to the state HQs

Signature of investigated Officer Signature of ADMO (PH)

Annexure-14

SCAN & SITUATION UPDATE REPORT ON DATE_____
State Surveillance Unit, IDSP

Sl No	Name of the district/Urban areas	Description of reported rumour/ Media scan	Place of occurrence	Source of information on Print/Electronic media	Person contacted at district/block level	Feedback received over telephone today from district/block	Epidemiological Work plan for district & block	Action taken by District / Block

Status of Diarrhoea outbreaks from January to December 20_____

Total No. of outbreaks investigated by RRT	Total No. of ADD cases	Total No. of ADD Deaths	Affected districts (Cases/Deaths)

Status of Dengue from January to December 20_____

Total blood sample tested at sentinel site (MCH, CH)	Total sample found positive	Affected districts (Cases/Deaths)	Death

SSO, State Health Control Room, 0674-2390466

Annexure-15

LIST OF LICENSED BLOOD BANKS FUNCTIONING IN THE STATE

Sl.no	Name of the District	Name of the Blood Bank
1	Angul	Orissa Red Cross Blood Bank,DHH, Angul
2	Angul	Orissa Red Cross Blood Bank, SDH,Talcher, Angul
3	Angul	Blood Bank, Nalco Hosp, Angul
4	Angul	Blood Bank, Neheru Shatabdi Hosp,Talcher,Angul
5	Angul	Orissa Red Cross Blood Bank, SDH,Athamallick, Angul
6	Balasore	Orissa Red Cross Blood Bank,DHH, Balasore
7	Balasore	Orissa Red Cross Blood Bank,SDH, Nilagiri , Balasore
8	Balasore	M/sJyoti Hopital Blood Bank,Balasore
9	Baragarh	Orissa Red Cross Blood Bank,DHH, Baragarh
10	Baragarh	Orissa Red Cross Blood Bank,SDH, Padmapur, Baragarh
11	Baragarh	M/s . Catholic Mission Hospital, Baragarh
12	Bhadrak	Orissa Red Cross Blood Bank,DHH, Bhadrak
13	Bolangir	Orissa Red Cross Blood Bank,DHH, Bolangir
14	Bolangir	Orissa Red Cross Blood Bank,SDH, Patnagarh, Bolangir
15	Bolangir	Orissa Red Cross Blood Bank, SDH, Titlagarh
16	Bolangir	Orissa Red Cross Blood Bank, CHC, Kantabanji
17	Boudh	Orissa Red Cross Blood Bank, DHH, Boudh
18	Cuttack	Central Red Cross Blood Bank,Infront SCB Medical College , Cuttack
19	Cuttack	Orissa Red Cross Blood Bank,SCB Medical College , Cuttack
20	Cuttack	Orissa Red Cross Blood Bank, SDH, Athagarh, Cuttack
21	Deogarh	Orissa Red Cross Blood Bank,DHH, Deogarh
22	Dhenkanal	Orissa Red Cross Blood Bank,DHH, Dhenkanal
23	Gajapati	Orissa Red Cross Blood Bank,DHH, Paralakhemundi,Gajapati
24	Ganjam	Orissa Red Cross Blood Bank, MKCG Medical College, Berhampur
25	Ganjam	Orissa Red Cross Blood Bank, SDH, Bhanjanagar,Ganjam
26	Ganjam	Orissa Red Cross Blood Bank, SDH, Chatrapur,Ganjam
27	Jagatsinghpur	Orissa Red Cross Blood Bank,DHH, Jagatsinghpur
28	Jagatsinghpur	Orissa Red Cross Blood Bank, Paradeep Port Trust Hosp. BloodBank,Jagatsinghpur
29	Jajpur	Orissa Red Cross Blood Bank, DHH, Jajpur
30	Jajpur	Orissa Red Cross Blood Bank, AH, Jajpur Road
31	Jharsuguda	Orissa Red Cross Blood Bank,DHH, Jharsuguda
32	Jharsuguda	Blood Bank., Tata Refractories Ltd,Belpahada, Jharsuguda
33	Jharsuguda	CENTRAL HOSP. (MCL), Brajaraj nagar,
34	Kalahandi	Orissa Red Cross Blood Bank,DHH, Bhawanipatna, Kalahandi
35	Kalahandi	Orissa Red Cross Blood Bank, SDH, Dharmagarh,Kalahandi
36	Kandhamal	Orissa Red Cross Blood Bank,SDH, Baliguda,Kandhamala
37	Kendrapara	Orissa Red Cross Blood Bank,DHH, Kendrapara
38	Keonjhar	Orissa Red Cross Blood Bank,DHH, Keonjhar
39	Keonjhar	Orissa Red Cross Blood Bank, SDH, Anandapur, Keonjhar
40	Keonjhar	Orissa Red Cross Blood Bank, SDH, Champua, Keonjhar

41	Keonjhar	Blood Bank,Tisco Hosp, Joda, Keonjhar
42	Keonjhar	Blood Bank,Central Hosp,Joda, Keonjhar
43	Khurda	Orissa Red Cross Blood Bank, Capital Hospital, Bhubaneswar
44	Khurda	Orissa Red Cross Blood Bank, Munciplality Hospital, Bhubaneswar
45	Khurda	Orissa Red Cross Blood Bank,DHH, Khurda
46	Khurda	Blood Bank , Kalinga Hosp.Bhubaneswar
47	Khurda	M/s. Apollo Hospital, Bhubaneswar
48	Khurda	M/s Hi-Tech Medical College & Hospital Blood Bank, Bhubaneswar
49	Khurda	M/s Sum Medical College & Hospital Blood Bank, Bhubaneswar
50	Khurda	M/s. Kalinga Institute of Medical Sciences (KIMS), Bhubaneswar
51	Koraput	Orissa Red Cross Blood Bank, DHH, Koraput
52	Koraput	Orissa Red Cross Blood Bank,SDH, Jaypore, Koraput
53	Koraput	Blood Bank, Nalco, Damanjodi
54	Koraput	Blood Bank, HAL,Sunabeda, Koraput
55	Koraput	Blood Bank , M/s Asha Kiran Hops, Lamtaput , Koraput
56	Malkangiri	Orissa Red Cross Blood Bank, DHH, Malkangiri
57	Mayurbhanj	Orissa Red Cross Blood Bank, DHH, Baripada, Mayurbhanj
58	Mayurbhanj	Orissa Red Cross Blood Bank, SDH, Udala, Mayurbhanj
59	Mayurbhanj	Orissa Red Cross Blood Bank,SDH, Karanjia, Mayurbhanj
60	Mayurbhanj	Orissa Red Cross Blood Bank, SDH, Rairangpur, Mayurbhanj
61	Nawarangpur	Orissa Red Cross Blood Bank, DHH, Nawrangpur
62	Nawarangpur	Blood Bank, Christian Hosp, Nawarangpur
63	Nayagarh	Orissa Red Cross Blood Bank,DHH, Nayagarh
64	Nuapara	Orissa Red Cross Blood Bank,DHH, Nuapara
65	Nuapara	Blood Bank,Evagelical Hospital, Khariar, Nuapara
66	Phulbani	Orissa Red Cross Blood Bank, DHH, Phulbani
67	Puri	Orissa Red Cross Blood Bank,DHH, Puri (Acharya Harihar)
68	Rayagada	Orissa Red Cross Blood Bank,DHH, Rayagara
69	Rayagada	Orissa Red Cross Blood Bank,SDH, Gunupur,Rayagada
70	Rayagada	Blood Bank, Christian Hosp,BissamCuttack
71	Sambalpur	Orissa Red Cross Blood Bank,VSS Medical College, Burla ,Sambalpur
72	Sambalpur	Orissa Red Cross Blood Bank,DHH, Sambalpur
73	Sambalpur	Orissa Red Cross Blood Bank, SDH,Kuchinda, Sambalpur
74	Sambalpur	Blood Bank, J.M.J. Hops., Barapali, Sambalpur
75	Sambalpur	Orissa Red Cross Blood Bank, SDH,Rairakhol, Sambalpur
76	Sonepur	Orissa Red Cross Blood Bank,DHH, Sonepur
77	Sundergarh	Orissa Red Cross Blood Bank,DHH, Sundergarh
78	Sundergarh	Orissa Red Cross Blood Bank,SDH, Bonai,Sunderagarh
79	Sundergarh	Orissa Red Cross Blood Bank,Govt Hos.Campus RGH,Rourkella , Sundergarh
80	Sundergarh	Blood Bank,IGH,Rourkella , Sundergarh
81	Sundergarh	M/s Vesaj Patel Hosp & Research Center , Rourkela
82	Sundergarh	M/s. Community Welfare Society Hospital, Jagda, Rourkela, Sundargarh
83	Sundergarh	M/s Hi-Tech Medical College & Hospital Blood Bank, Rourkela, Sundargarh

Annexure-15

LIST OF APPROVED BLOOD STORAGE CENTRES

Sl No.	Name of the District	Blood Storage Centres	Mother Blood Bank
1	Balasore	CHC, Jaleswar	RCBB, DHH, Balasore
2	Balasore	CHC, Soro	RCBB, DHH, Balasore
3	Balasore	CHC, Basta	RCBB, DHH, Balasore
4	Angul	UGPHC, Khamar	RCBB, DHH, Angul
5	Angul	SDH, Pallahara	RCBB, DHH, Angul
6	Dhenkanal	SDH,Hindol	RCBB, DHH, Dhenkanal
7	Dhenkanal	SDH,Kamakhyanagar	RCBB, DHH, Dhenkanal
8	Dhenkanal	CHC,Bhuban	RCBB,DHH,Dhenkanal
9	Kalahandi	CHC, Junagarh	RCBB, DHH, Kalahandi
10	Sonepur	UGPHC, Birmaharajpur	RCBB, DHH, Sonepur
11	Nuapada	UGPHC, Khariar	RCBB, DHH,Nuapada
12	Nayagarh	CHC,Dasapalla	RCBB,DHH,Nayagarh
13	Rayagada	CHC,Muniguda	RCBB,DHH,Rayagada
14	Bargarh	CHC,Sohela	RCBB,DHH,Bargarh
15	Keonjhar	UGPHC, Ghatagaon	RCBB,DHH,Keonjhar
16	Bhadrak	CHC, Basudevpur	RCBB, DHH, Bhadrak
17	Bhadrak	CHC,Dhamnagar	RCBB, DHH, Bhadrak
18	Nabarangpur	AH,Umerkote	RCBB, DHH, Nabarangpur
19	Jharsuguda	CHC, Lakhanpur	RCBB, DHH, Jharsuguda
20	Sundergarh	CHC, Rajgangpur	RCBB, DHH, Sundergarh
21	Sundergarh	CHC, Bargaon	RCBB, DHH, Sundergarh
22	Sundergarh	CHC, Sargipalli	RCBB, DHH, Sundergarh
23	Sundergarh	UGPHC, Subdega	RCBB, DHH, Sundergarh
24	Kendrapada	UGPHC, Patkura	RCBB, DHH, Kendrapada
25	Kendrapada	UGPHC, Patamundai	RCBB, DHH, Kendrapada
26	Puri	AH,Sakhigopal	RCBB, DHH, Puri
27	Puri	AH,Nimapada	RCBB, DHH, Puri
28	Kandhamal	CHC, G.Udaygiri	RCBB, DHH, Kandhamal

Annexure-16

FRUs List (94)

SL. NO.	DISTRICT	BLOCK	INSTITUTION NAME	CATEGORY	Nos.
1	ANUGUL	ANUGUL	Dist. HQ Hospital	DHH	4
2	ANUGUL	ATHAMALLIK	SDH, Athamallik	SDH	
3	ANUGUL	PALLALAHARA	SDH, Pallahara	SDH	
4	ANUGUL	TALCHER	SDH, Talcher	SDH	
5	BALASORE	BALASORE	D.H.H. Balasore	DHH	5
6	BALASORE	BASTA	CHC Basta	CHC	
7	BALASORE	JALESWAR NAC	CHC G. K. Bhatta	CHC	
8	BALASORE	NILAGIRI	SDH Nilgiri	SDH	
9	BALASORE	SORO	CHC Soro	CHC	
10	BARAGARH	BARAGARH MTY	DHH Bargarh	DHH	3
11	BARAGARH	PADMAPUR	SDH Padampur	SDH	
12	BARAGARH	SOHELLA	CHC Sohela	CHC	
13	BHADRAK	BASUDEVPUR	CHC, Basudevpur	CHC	3
14	BHADRAK	BHADRAK	DHH, Bhadrak	DHH	
15	BHADRAK	BONTH	CHC, Agarpada	CHC	
16	BOLANGIR	BOLANGIR	DHH Bolangir	DHH	4
17	BOLANGIR	PATNAGARH	SDH Patnagarh	SDH	
18	BOLANGIR	TITILAGARH	SDH Titilagarh	SDH	
19	BOLANGIR	TUREIKELA	CHC Kantabanji	CHC	
20	BOUDH	BOUDH NAC	DHH Boudh	DHH	1
21	CUTTACK	ATHAGARH	SDH, Athagarh	SDH	5
22	CUTTACK	BANKI	SDH, Banki	SDH	
23	CUTTACK	CUTTACK(SADAR)	DHH, City Hospital, Cuttack	DHH	
24	CUTTACK	KANTAPADA	CHC, Adaspur	CHC	
25	CUTTACK	MAHANGA	CHC, Mahanga	CHC	
26	DEOGARH	TILEIBANI	Deogarh DHH	DHH	1
27	DHENKANAL	DHENKANAL MTY	DHH, Dhenkanal	DHH	3
28	DHENKANAL	HINDOL	SDH, Hindola	SDH	
29	DHENKANAL	KAMAKHYANAGAR	SDH, Kamakhya Nagar	SDH	

30	GAJAPATI	PARALAKHEMUNDI	DHH, Paralakhemundi	DHH	1
31	GANJAM	ASKA	CHC ASKA	CHC	7
32	GANJAM	BEGUNIAPADA (KODALA)	KODALA	CHC	
33	GANJAM	BHANJANAGAR	BHANJANAGAR	SDH	
34	GANJAM	CHATRAPUR	CHHATRAPUR	SDH	
35	GANJAM	KHALIKOTE	KHALIKOTE	CHC	
36	GANJAM	POLOSARA	POLOSARA	CHC	
37	GANJAM	RANGEILUNDA	DHH - BERHAMPUR	DHH	
38	JAGATSINGHPUR	BALIKUDA	CHC, Balikuda	CHC	3
39	JAGATSINGHPUR	ERSAMA	CHC, Ersama	CHC	
40	JAGATSINGHPUR	JAGATSINGHPUR	DHH, Jagatsinghpur	DHH	
41	JAJPUR	BARACHANA	CHC Barchana	CHC	4
42	JAJPUR	DANAGADI	CHC Jajpur Road	CHC	
43	JAJPUR	DANAGADI	CHC Danagadi	CHC	
44	JAJPUR	JAJAPUR	DHH JAJPUR	DHH	
45	JHARSUGUDA	JHARSUGUDA	JHARSUGUDA	DHH	1
46	KALAHANDI	BHAWANIPATNA	DHH, Bhawanipatna	DHH	3
47	KALAHANDI	DHARMAGAD	SDH, Dharamgarh	SDH	
48	KALAHANDI	KESINGA	CHC Kesinga	CHC	
49	KANDHAMAL	BALIGUDA	BALIGUDA SDH	SDH	2
50	KANDHAMAL	PHULBANI	PHULBANI DHH	DHH	
51	KENDRAPARA	GARADPUR	CHC Patkura	CHC	3
52	KENDRAPARA	KENDRAPARA	DHH, Kendrapara	DHH	
53	KENDRAPARA	PATTAMUNDAI	UGPHC Pattamundai	CHC	
54	KEONJHAR	ANANDAPUR	SDH, Anandapur	SDH	4
55	KEONJHAR	CHAMPUA	SDH, Champua	SDH	
56	KEONJHAR	GHATAGAON	UGPHC, Ghatagaon	CHC	
57	KEONJHAR	KEONJHAR	DHH, Keonjhar	DHH	
58	KHURDA	BANAPUR	CHC Banapur	CHC	5
59	KHURDA	BHUBANESWAR MTY	Capital Hospital	DHH	
60	KHURDA	JATANI	CHC, Jatani	CHC	
61	KHURDA	KHURDA	Khurda DHH	DHH	
62	KHURDA	TANGI	CHC, Tangi	CHC	
63	KORAPUT	JEYPUR	SDH Jeypur	SDH	3
64	KORAPUT	KORAPUT	DHH Koraput	DHH	

65	KORAPUT	LAXMIPUR	CHC Laxmipur	CHC	
66	MALKANGIRI	KALIMELA	CHC Kalimela	CHC	2
67	MALKANGIRI	MALKANGIRI	DHH Malkangiri	DHH	
68	MAYURBHANJ	JASHIPUR	CHC Jasipur	CHC	5
69	MAYURBHANJ	KARANJIA	SDH Karanjia	SDH	
70	MAYURBHANJ	RAIRANGPUR	SDH Rairangpur	SDH	
71	MAYURBHANJ	SAMAKHUNTA	DHH Baripada	DHH	
72	MAYURBHANJ	UDALA	SDH Udala	SDH	
73	NABARANGAPUR	NABARANGAPUR	DHH, Nabarangpur	DHH	3
74	NABARANGAPUR	PAPADAHANDI	CHC PAPADAHANDI	CHC	
75	NABARANGAPUR	UMERKOTE	CHC DNK UMERKOTE	CHC	
76	NAYAGARH	DASAPALA	CHC-Dasapalla	CHC	2
77	NAYAGARH	NAYAGARH	DHH, Nayagarh	DHH	
78	NUAPADA	KHARIAR	UGPHC , Khariar	CHC	2
79	NUAPADA	NUAPADA NAC	DHH, NUAPADA	DHH	
80	PURI	NIMAPADA	CHC Nimapada	CHC	4
81	PURI	NIMAPADA	CHC Charichhak	CHC	
82	PURI	PURI SADAR	DHH,Puri	DHH	
83	PURI	SATYABADI	CHC Sakhigopal	CHC	
84	RAYAGADA	GUNUPUR	Gunupur SDH	SDH	2
85	RAYAGADA	RAYAGADA	Rayagada DHH	DHH	
86	SAMBALPUR	KUCHINDA	SDH Kuchinda	SDH	3
87	SAMBALPUR	RAIRAKHOL	SDH Rairakhol	SDH	
88	SAMBALPUR	SAMBALPUR	Sambalpur	DHH	
89	SUBARNAPUR	DUNGURIPALI	CHC Dunguripali	CHC	2
90	SUBARNAPUR	SONEPUR	DHH-Subarnapur	DHH	
91	SUNDARGARH	BONAIGARH	Boneigarh SDH	SDH	4
92	SUNDARGARH	RAJGANGPUR	Rajgangpur CHC	CHC	
93	SUNDARGARH	SUNDARGARH	Sundargarh DHH	DHH	
94	SUNDARGARH	SUNDARGARH	RGH, Rourkela	DHH	

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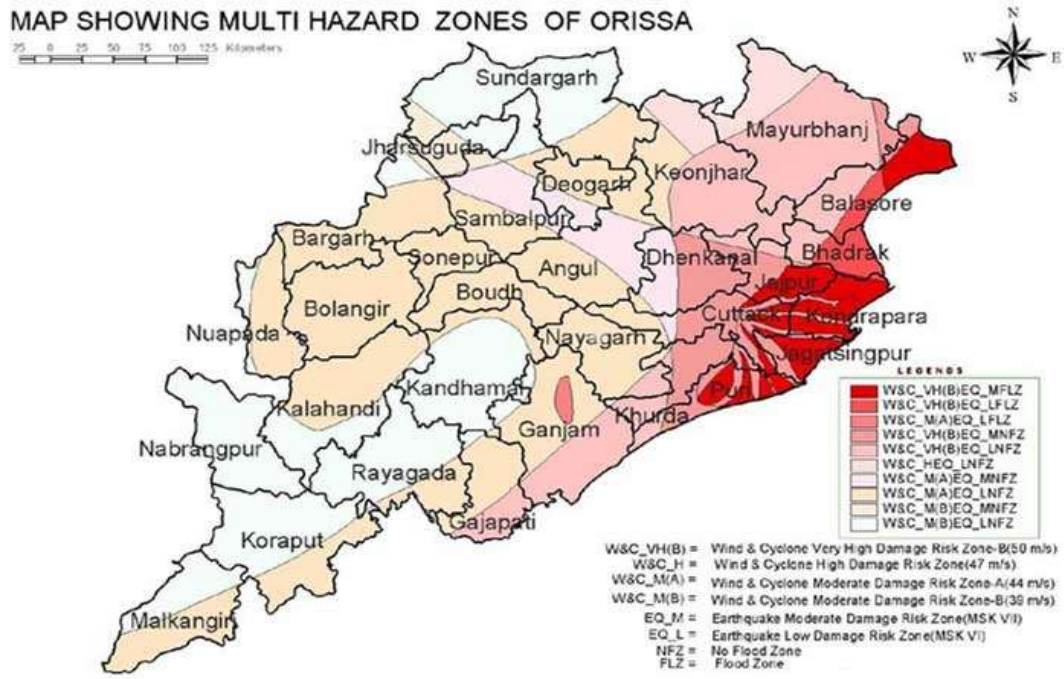
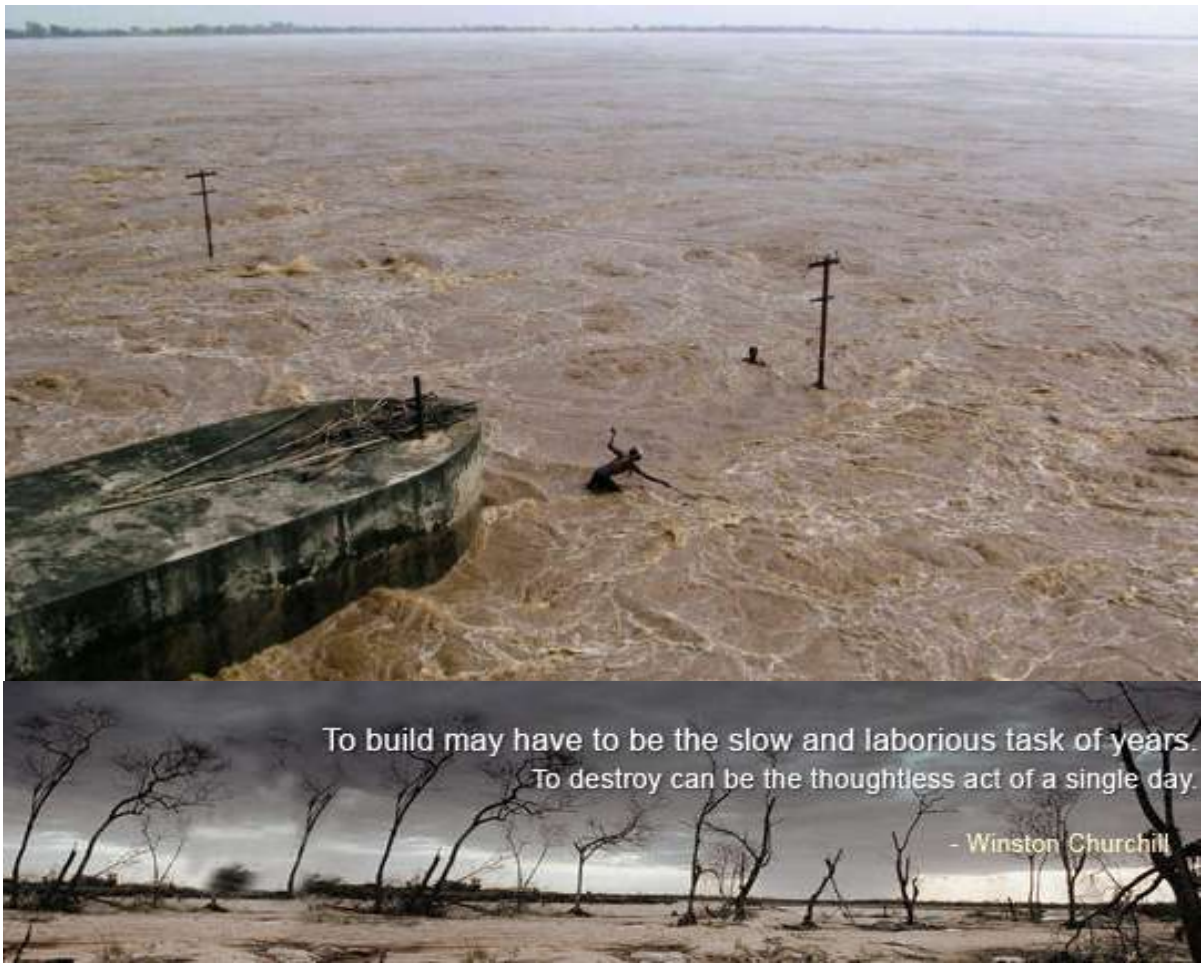

MAP SHOWING MULTI HAZARD ZONES OF ORISSA
Sundargarh
Jharsuguda
Deogarh
Keonjhar
Mayurbhanj
Balasore
Sambalpur
Bargarh
Sonepur
Angul
Dhenkanal
Bhadrak
Boudh
Bolangir
Nuapada
Nayagarh
Kandhamal
Kalahandi
Ganjam
Khurda
Nabrangpur
Rayagada
Gajapati
Koraput
Malkangiri
LEGENDS
W&C_VH(B)EQ_MFLZ
W&C_VH(B)EQ_LFLZ
W&C_M(A)EQ_LFLZ
W&C_VH(B)EQ_MNFZ
W&C_VH(B)EQ_LNFZ
W&C_HEQ_LNFZ
W&C_M(A)EQ_MNFZ
W&C_M(A)EQ_LNFZ
W&C_M(B)EQ_MNFZ
W&C_M(B)EQ_LNFZ
W&C_VH(B) = Wind & Cyclone Very High Damage Risk Zone-B(50 m/s)
W&C_H = Wind & Cyclone High Damage Risk Zone(47 m/s)
W&C_M(A) = Wind & Cyclone Moderate Damage Risk Zone-A(44 m/s)
W&C_M(B) = Wind & Cyclone Moderate Damage Risk Zone-B(39 m/s)
EQ_M = Earthquake Moderate Damage Risk Zone(MSK VII)
EQ_L = Earthquake Low Damage Risk Zone(MSK VI)
NFZ = No Flood Zone
FLZ = Flood Zone


To build may have to be the slow and laborious task of years.
To destroy can be the thoughtless act of a single day.
- Winston Churchill