Chapter 6: Union of Myanmar
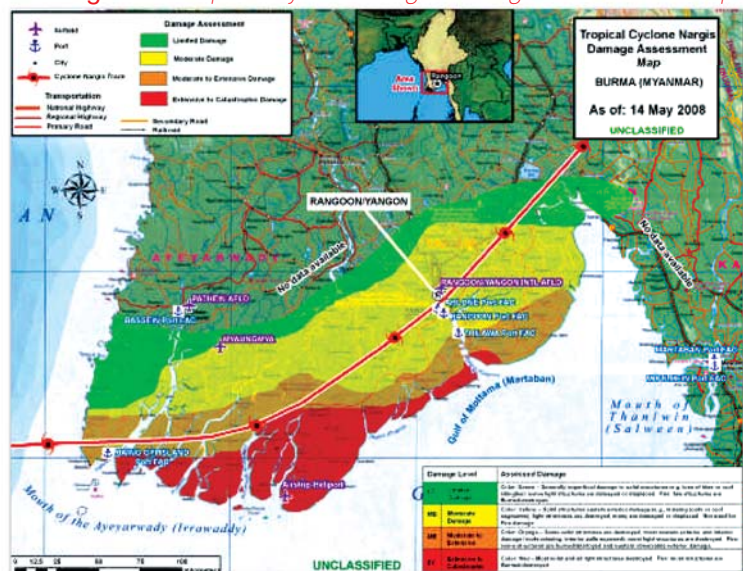
Good Practice on Early Warning and Response System of Emerging Infectious Diseases and Disaster Management

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Early Warning and Response System (EWARS): A system (a series of process) for getting early information through data collection and analysis as well as dissemination of information and taking rapid action for disease outbreak and emergency situation or emergencies.

Experience on Early Warning in Nargis Disaster

Figure 1: *Tropical Cyclone Nargis Damage Assessment Map*

1. Scenarios

Scenario (1)

We were warned about the cyclone Nargis on TV several days before it happened, but did not really know how seriously to take those warnings, as we were not sure whether the cyclone would hit Yangon or not. Hence, the delta area was not in our minds.

Having never experienced a cyclone, I did not take it too seriously, and thought we might be protected by being in Yangon, a big city, inside our brick buildings. As a result, I did not actually stock up on food or candles and other necessities.

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In the middle of a night, I was woken up by the sound of windows, banging loudly all over the house. The electricity was disconnected and it was pitch dark. Luckily, I had a torch. I lived in an old house and the windows could not shut completely. I could not find any tape to tie the windows, and thus, I tied them with gift-wrapping strings. Rainwater was dripping in many places inside the house, and I kept moving buckets around to collect the water. However, I soon realized that it was a losing battle; I simply did not have enough buckets, and the dripping intensified. I moved what furniture I could to a dry spot and covered them with plastic sheets.

Scenario (2)

There was no telephone or mobile connection, no way to reach out to anybody. I decided to focus on getting food for ourselves and for my staff who could not get home to their families since no buses were running. We made our way to the local market about three kilometers away. It was, of course, closed but we did manage to pick up some eggs, rice and a few tomatoes eventually from a makeshift market that had sprung up at the site. It was strange to see that even the roads used to be busiest had no cars on that day. The landscape of Yangon had completely changed, and I did not even recognize the roads that I used to take to work. Everyone was walking like us, climbing over branches of fallen trees and helping each other -- it created a feeling of solidarity.

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Scenario (3)

The villages tended to be rows of houses along the river, with each house appearing to had direct access to the river. Everyone we met in the villages had a story of suffering to tell. They spoke about how dark it was that night, so dark that they could not see anything, only heard the sounds of water, battered constantly by rain and wind. One villager told us that the worse part of the experience was not being able to help each other. Everyone was on their own. We saw one brick health center had been completely flattened. A flag, made from a curtain in the health center, had been placed in honor of the midwife who had died during the cyclone. In the same village, the three pillars of the village community who held the moral edifice of the village -- the health worker, school headteacher and the monk -- had passed away, leaving villagers feeling orphaned.

In another village, a woman told us that she had lost 20 members of her family. She was alone and felt completely drained of strength. She did not need to say anything more as the lugubrious look in her eyes was telling her story. That look stayed with me, reminding me constantly of my mission.

Scenario (4)

We heard so many stories of personal tragedies. One health worker described how she lost her young son who was on the same tree as her. For six hours, both of them clung together to the tree, waiting for the water to recede. Her son just did not have the strength to hold on longer and she could not help him. As she watched helplessly her son fell into the water and disappeared before her eyes.

We got a clearer picture after detailed discussion with people from the field, and comparison with detailed data on morbidity and mortality in the field for the past several years, including dengue situation. Based on those data and the literature, we decided the needs, and informed others, "This is the situation in the affected areas, this is my prediction".
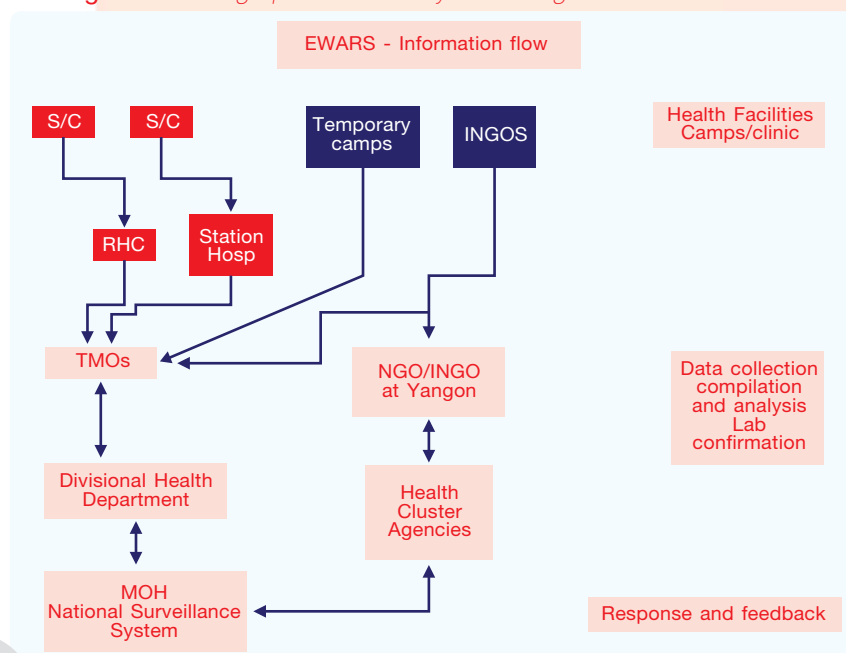
2. Setting up EWARS in Cyclone Nargis

Disease surveillance and early warning systems put in place by MOH and WHO in the disaster affected areas took part in prevention of disease outbreaks and assisted in proper case management. Activities of NGO were mapped and listed, and a new disease surveillance format was used to observe the morbidity trend more accurately.

Early warning and response has been an integral part of existing public health surveillance and response system which allows early detection of any abnormal or unusual occurrence or event so that the event is verified and confirmed, and if applicable, control measures are implemented in timely manner.

Following Nargis, routine surveillance system was also disrupted and health partners started EWARS with reporting of cases from health facilities and clinics run by them.

The surveillance/early warning and response system focused on priority epidemic-prone communicable diseases most likely to occur in the disaster affected population. Standard case definitions and reporting forms for detection of acute watery diarrhea, acute bloody diarrhea, measles, acute respiratory infection, malaria, jaundice syndrome, meningitis, tetanus, unexplained fevers, and unexplained cluster of events were shared with all partners.

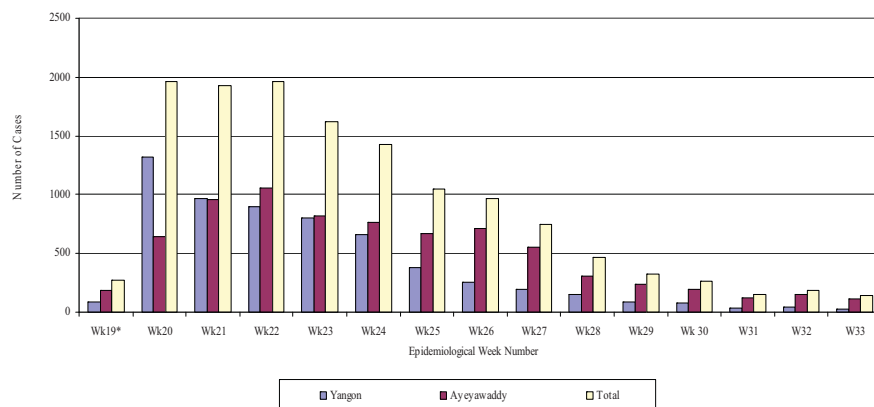**Figure 2:** *Setting up EWARS in Cyclone Nargis*

Figure 3: *Weekly Diarrhea Cases in Nargis-hit Yargon and Ayeyarwaddy Division*

UN agencies, INGO and NGO partners were concerned with some outbreaks of acute diarrhea in affected areas, but with timely intervention, the incidence rate went down and most of epidemic prone diseases were controlled.

Following standard guidelines were used to set up Early Warning and Response System:
- Focused on the communicable disease of public health significance (severe diarrhea, measles, tetanus, DHF, etc.)
- Daily reporting system
- Daily monitoring of disease morbidity and mortality
- Immediate feedback mechanism
- Monitoring of response and outcome

3. Good Practice on EWARS

Early Warning and Response System (EWARS) is the operating procedures for those organizations involved in the Early Warning and Rapid Response (EWRR) activities for epidemic surveillance.

The system is based at the Ministry of Health, Department of Health, Central Epidemiology Unit, and aims to receive data from all health sector organizations.

The system is highly sensitive to all potential epidemics. The essential components of the EWARS are efficient and immediate communication tools, the ability to trigger immediate response capacities for signal verification, and the capacity to perform laboratory confirmation, and rapid investigation and management of outbreaks.

The sensitivity of the system is ensured through:

- Early notification of any unusual health event and epidemic-prone diseases.
- Establishment of an informal system (OUTBREAK ZERO REPORTING) for rumor verification.
- Use of an EWARS computer programme application to detect and quantify outbreak of any diseases/syndromes under surveillance both at the community level and at the level of individual health facilities.

The EWARS has two components:

- An informal ("rumor verification") component involving active daily surveillance of all EWARS team to ask about suspected outbreaks.
- A formal component which will gather data from all health facilities providing health care of populations for daily and weekly analysis by the EWARS computer application.

4. Objectives of the EWARS

(1) To ensure timely detection, response and control of outbreaks by early recording of time and place of cases and deaths at local level States and Divisions, Districts,Townships and Villages.

(2) To ensure timely detection of clusters of unknown health events.

(3) To ensure timely detection and investigation of unexplained deaths.

(4) To provide analysis showing weekly trend of health events under surveillance, death and Case Fatality Ratio and Proportional Morbidity.

(5) To trigger an immediate and adequate response to an outbreak after signal detection and verification.

(6) To estimate workload due to communicable diseases at the health facilities level, allowing rationalization of resource allocation within relief operations.

5. Signal Verification, Outbreak Investigation and Action Triggers

The EWARS application's analysis provides a weekly list of alerts according to case definitions and these alerts trigger a sequence of actions:

5.1 Action at Village Level (Community based Surveillance)

The village local authority immediately communicates to the TMO for detection of an outbreak indicating the place, the time and the number of people concerned, if any death and severity of the cases detected.

5.2 Action at Township Level

The Rapid Response Team supported by State/Division and Central (MOH and NGOs) based at township level is deployed in the field to get all necessary information from the local authority and from the field. They verify at township/village level about the existence of a cluster of unusual health events, and communicate immediately to the DMO/TMO about the findings.

They also conduct active case finding to identify other similar cases, and transfer detected cases to hospital of higher level according to the severity of cases. Moreover, a line listing is filled up for detected suspected cases.

The laboratory staff are mobilized to collect the requested specimen and transfer to reference laboratory. A daily situation report is completed by the team every day and sent to higher levels.

The township team enhances surveillance for using case definition team in the enhanced surveillance to define flexible case definition in community, contact tracing and active case finding, subsequent rumor verification and case management (case based management and control training).

5.3 Action at National Level

WHO, in collaboration with MOH/CEU and Health Cluster Surveillance Partners, takes responsibility for laboratory confirmation, supporting field investigations when required, reporting to higher levels and providing feedbacks (Response Activity), and evaluating of the EWARS and field management.

Figure 4: *Weekly Reporting Form*

WEEKLY MORBIDITY/MORTALITY SURVEILLANCE FORM				
Name and type of location (Temporary Shelter/School/Monastry/Relief camp etc)			Population at the location	
Township: …………………………………				
State/division		Week Number _____		
Reporting Data ……………				
Main cause of illness/death	Cases		Deaths	
	Under 5	5 years +	Under 5	5 years +
Acute Diarrhoea				
Suspected Cholera (Acute watery Diarrhoea)				
Bloody diarrhoea				
Acute Jaundice				
ARI/ Pneumonia				
Suspected measles				
Suspected Meningitis				
Malaria confirmed by RT				
Suspected Dengue				
Suspected Dengue Haemorrhagic Fever				
Trauma cases				
Suspected Tetanus				
Snake bites				
STI				
Unexplained cluster of health events				
Others consultations				

ID Reporting unit/agency ....

Figure 5: *EWARS Report (Week No. 30/2008)*

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Weekly Morbidity and Mortality Report
Country
Week 2008-30 (2008-07-20 : 2008-07-26)

Myanmar Affected Area (Country) Week 2008-30

	Case	Death	CFR%	PropMorbidity%
Acute Diarrhea	636	0	-	1.8
Severe acute watery diarrhea (Suspected Cholera)	2	0	-	0
Bloody Diarrhea	143	0	-	0.4
Acute Jaundice Syndrome	27	0	-	0.1
Acute respiratory infection	1955	0	-	5.6
Suspected Measles	6	0	-	0
Suspected Meningitis	0	0	-	0
Malaria confirmed by RT	73	0	-	0.2
Suspected Dengue Fever	77	0	-	0.2
Dengue Hemorrhagic Fever	66	0	-	0.2
Trauma/Injuries	954	0	-	2.7
Suspected Tetanus	2	0	-	0
Snake bite	1	0	-	0
Sexual Transmitted Infections	45	0	-	0.1
Cluster of disease of unknown origins	0	0	-	0
Other consultations	30762	0	-	88.5

Myanmar Affected Area (Country) Week 2008-30

	Case < 5 years	Case > 5 years	Death < 5 years	Death > 5 years
Acute Diarrhea	328	308	0	0
Severe acute watery diarrhea (Suspected Cholera)	2	0	0	0
Bloody Diarrhea	32	111	0	0
Acute Jaundice Syndrome	3	24	0	0
Acute respiratory infection	810	1145	0	0
Suspected Measles	3	3	0	0
Suspected Meningitis	0	0	0	0
Malaria confirmed by RT	8	65	0	0
Suspected Dengue Fever	21	56	0	0
Dengue Hemorrhagic Fever	18	48	0	0
Trauma/Injuries	57	897	0	0
Suspected Tetanus	0	2	0	0
Snake bite	0	1	0	0
Sexual Transmitted Infections	0	45	0	0
Cluster of disease of unknown origins	0	0	0	0
Other consultations	3309	27453	0	0

6. After Cyclone Nargis

This was the fourth week of putting both MOH and NGOs data into the EWARS. Therefore, analysis had been possible on single data source. Number of cases of acute jaundice, dengue, Dengue Hemorrhagic Fever (DHF) were increased than that of last week. Overall cases of measles was decreased, although two cases, one each in Ngapudaw and Maubin Townships, were reported recently. Three out of six cases of measles reported in this week were in age group older than five years of age. Most of the cases of dengue and DHF were reported from hospital in Pathein Township, a Divisional referral hospital. Bogale and Pyapon Townships remained as areas where dengue and DHF had been prevalent for over last four weeks.

Geographically, most of the priority diseases under surveillance were in the southern and southwestern part of the delta, very adjacent to ocean. This was for the first time 2 adult cases of tetanus were reported from Labutta Township. Reducing chances of overlapped reporting from various sources and obtaining population data of the area were two tasks that this EWARS needed to pay attention to. Further investigation on sources of tetanus should be undertaken so that it could limit the outbreaks and virtually put it to a siege. Referral facilities like Pathein Township where most of the diseases were reported to EWARS should be strengthened to get details of information on the cases of suspected diseases. For the coming months, it was important that EWARS took a vigilant eye on diseases of delta and helped to reduce burden of disease morbidity and mortality.

Acute Jaundice Syndrome				
Week	**Place**	**Cases**	**Compare**	**Generated**
2008-30	Ayeyarwady Division	20	13	2008-07-29
Suspected Measles				
Week	**Place**	**Cases**	**Compare**	**Generated**
2008-30	Ayeyarwady Division	5	5	2008-07-29
Suspected Dengue Fever				
Week	**Place**	**Cases**	**Compare**	**Generated**
2008-30	Ayeyarwady Division	75	48-67	2008-07-29
Dengue Hemorrhagic Fever				
Week	**Place**	**Cases**	**Compare**	**Generated**
2008-30	Ayeyarwady Division	81	81	2008-07-29
2008-30	Yangon Division	5	5	2008-07-29
Suspected Tetanus				
Week	**Place**	**Cases**	**Compare**	**Generated**
2008-30	Ayeyarwady Division	2	2	2008-07-29

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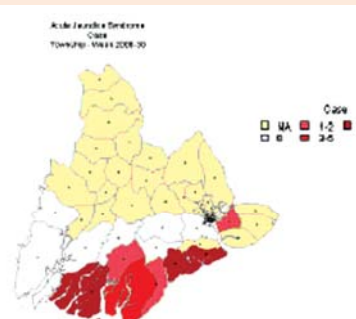Emerging Infectious Diseases: Experiences from the
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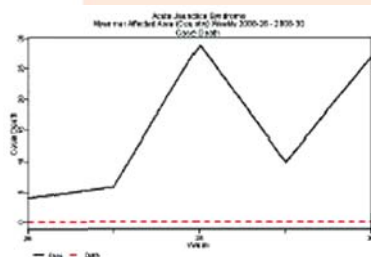
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6.1 Acute Jaundice Syndrome

Overall cases of jaundice had doubled from 10 in last week to 20 cases in this week, although no new cases were reported from the previous outbreaks spot in Myaungmya Township. It was quite likely that due to taking of preventive measures, it had become possible to control the jaundice outbreaks in Myaungmya.

However, numbers of cases of jaundice in Labutta and Bogale Township had increased. Geographically, these cases were more common to most southern part of delta adjacent to the ocean.

Indicator	2006 26	2006 27	2006 28	2006 29	2006 30
Case	4	6	29	10	27
Case Age under 5	0	0	2	1	3
Case Age under 5 years +	4	6	27	9	24
Death	0	0	0	0	0
Death Age under 5	0	0	0	0	0
Death Age under 5 years +	0	0	0	0	0
CFR %	-	-	-	-	-
Prop Morbidity %	0	0	0.1	0	0.1

6.2 Dengue Hemorrhagic Fever

Overall number of cases of DHF reported for this week was 66. This was on alert for this week and had increased from 43 in previous week to 66 in this week. Of the total 66 cases, 61 cases were from Ayeyarwady Division and 5 cases from Yangon Division. 48 out 66 cases were in the age group above five years. It was quite possible that increased mobility might have some links to increased number of DHF incidence.

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6.3 Tetanus

This week tetanus was on EWARS alert. Two cases of tetanus from MOH sources were reported from Labutta who were over five years of age.

7. The Integrated EWARS

Data from MOH contributed to major share of EWARS that allowed a much more comprehensive view of health status in the Nargis affected areas. On the other hand, NGO's data were collected from many remote corners of the affected areas.

Combined data from both sources provided this system an unique opportunity to further develop a system which could give a clearer picture of alarming diseases. The system had also allowed developing an opportunity to accountability. Reporting from Myaungmya Township was an example which led us develop further. This system along with laboratory facility is a role model for the country.

8. References

(1) Strategic Framework for the ASEAN + 3 Emerging Infectious Diseases Program Phase Two (2006-2009)(Draft Report).
(2) FOCUS (Nargis Report), WHO.
(3) EWARS Report, Week No.(30/2008), Health Cluster Myanmar.
(4) Annual Report (2008) Central Epidemiology Unit, Department of Health, Ministry of Health, Myanmar.

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