

Notifiable Diseases Under Philippine Integrated Disease Surveillance and Response (PIDSr) Among Patients Seen at the Eastern Visayas Regional Medical Center (EVRMC) Before and After Super Typhoon Yolanda

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Introduction: Typhoon Haiyan, or Typhoon “Yolanda” in the Philippines, caused catastrophic damage last November 8, 2013 in the islands of Leyte. As of April 17, 2014, NDRRMC confirmed 6,300 fatalities across the country and around 5,877 were from Eastern Visayas. The actual death toll remained unclear although it is being claimed to be about 10,000 in Tacloban City alone.

Objective: This study aimed to determine the transmission of notifiable diseases under PIDSr as to increase in morbidity, deaths and case fatality rates among patients consulted and /or admitted at EVRMC before and after ST Yolanda.

Materials and Methods: This is a descriptive study which included all patients who sought consultation and/or admission in EVRMC with clinical diagnosis of any notifiable disease under the PIDSr reference list.

Results: A cumulative total of 8,299 patients with notifiable diseases sought consultation and /or admission between November 2012 - October 2013 and November 2013 - October 2014. Of which , 3,873 or 46.67% were cases before Super Typhoon Yolanda while 4,426 or 53.33% were cases a year after. Patients below 14 years old were mostly affected after the disaster. There were few patients, 70 years old and above who sought consultation and / or admission. As to occurrence between sexes, there were more females affected than males after the disaster which comprised of 51.4% of the total. As to geographic distribution, there were more cases coming from the 1st district of Leyte including Tacloban City comprising 61.58% compared to its occurrence prior to the disaster. As to the number of cases under Category 1, an increased cases of measles from 2 cases to 356 or an increase of 99.44 % after the disaster . Notifiable diseases under Category II comprised 91.53% of the total post disaster with an increase of 12.5% from the total cases the previous year. Acute watery diarrhea had the highest number of patients affected then, was followed by Dengue fever, 27.43% and Acute bloody diarrhea, 2.35%. Chikungunya increased from 10 cases the previous year to 33 . As to deaths , there was no increase under Category I but, under Category II, an increase of 26.1% after the typhoon was observed. Among these, were Acute watery diarrhea, Dengue fever, Influenza like illness and Measles after disaster.

Conclusion: During calamities, everything is affected, from infrastructure, agriculture and most of all the people. Transmission of different infectious diseases occur because of displacement of the population, lack of safe water supply and sanitation facilities and, lack of available health care services.

Key words: Transmission, notifiable diseases, Super-typhoon

INTRODUCTION

Typhoon Haiyan, called Typhoon “Yolanda” in the Philippines, caused catastrophic damage throughout much of the islands of Leyte, where cities and towns were largely destroyed. As of April 17, 2014, the National Disaster Risk Reduction and Management (NDRRMC) confirmed 6,300 fatalities across the region and around 5,877 of those took place in Eastern Visayas. The actual death toll remained unclear, although at least 10,000 victims were from Tacloban City, Leyte alone, as others claimed.¹ Health services in affected areas were completely hampered. Health priorities included injury management, prevention of the spread of communicable diseases, maternal and child health services and, mental health and psychosocial support.

The aftermath of the Philippine typhoon threatened the country with possible outbreaks of debilitating and potentially fatal diseases, including those which others thought to be nearly eradicated, because of poor sanitation, shortage of potable water supply and inability of emergency health teams to respond quickly within the week after the storm. Illnesses like cholera, hepatitis, malaria, dengue fever, typhoid fever, bacterial dysentery and others that thrive in tropical field environments, where sewage and water supply intermingle, could form what doctors fear as the disaster’s second wave. They predicted that Leptospirosis, a parasitic disease endemic in the country, would surge.⁵

This study aimed to determine the transmission of PIDSR notifiable diseases among patients consulted and/ or admitted in Eastern Visayas Regional Medical Center before and after Super-typhoon Yolanda as to increase in morbidity, deaths and case fatality rates.

METHODS

All patients who sought consultations and/ or admitted due to any PIDSR notifiable disease were included in this descriptive study. A review of surveillance records of notifiable disease included 1 year before and after Super

Typhoon Yolanda (Nov 2012- Oct 2013 and Nov 2013- Oct 2014) was done. The data collected, were kept with strict confidentiality and were used only for this research.

RESULTS

A cumulative total of 8,299 patients with notifiable diseases sought consultation and / or admitted from November, 2012 to October 2013 (one year before Super Typhon Yolanda) and November 2013 to October 2014, a year after. Of which, 3,873 (46.67%) cases were recorded before the disaster while 4,426 (53.33%), a year after.

Table 1. Demographic profile of patients with notifiable diseases who sought consultation and /or admitted in EVRMC between November 2012-October 2014.

	Notifiable Disease Cases			
	Patients one year before before ST Yolanda		1 year after Super Typhoon Yolanda	
	No.	%	No.	%
Age in years				
0-4	1,595	41.18	1,610	36.38
5-9	1,020	26.34	1,423	32.15
10-14	302	7.8	500	11.3
15-19	415	10.71	315	7.12
20-24	218	5.63	137	3.1
25-29	99	2.56	107	2.42
30-34	47	1.21	49	1.11
35-39	29	0.75	99	2.23
40-44	23	0.59	50	1.13
45-49	14	0.36	51	1.15
50-54	14	0.36	20	0.45
55-59	20	0.52	23	0.52
60-64	26	0.67	20	0.45
65-69	31	0.8	15	0.34
70 and above	20	0.52	10	0.22
TOTAL	3,873	100.0	4,426	100.00
SEX				
Female	1,709	44.13	2,275	51.4
Male	2,164	55.87	2,151	48.6
TOTAL	3,873	100.0	4,426	100.0

Table 1 shows that patients below 14 years old were mostly affected after the disaster but among patients 70 years old and above, only few sought consultation. It also shows the occurrence of notifiable diseases between sexes. There were more females affected compared to males after the disaster. Females comprised of 51.4% of the total.

Table 2. a and b. Distribution of notifiable disease cases before and after super typhoon Yolanda.

a. PIDSR notifiable disease cases

PIDSR notifiable disease cases	No.	%	% Increase in cases From previous data
One year before ST Yolanda	3,873	46.67	
One year after ST Yolanda	4,426	53.3	
Total	8,299	100.00	12.5%

b. Increase in cases by category

Category	One year before ST Yolanda		2 One year after ST Yolanda		% increase in cases From previous year
	No.	%	No.	%	
Category 1	43	1.1	375	8.47	88.5%
Category 2	3,830	98.89	4,051	91.53	5.46%
Total	3,873	100.0	4,426	100.0	12.5%

Table 2a shows the distribution of cases before and after ST Yolanda as to morbidity. A comparison in the number of cases shows an increase of 12.5 % from the previous year.

Table 2-b shows that Category 1 comprised of 1.11% before the ST Yolanda, but increased to 8.47% after the disaster while Category II cases showed no increase in cases from the previous year. There was a cumulative increase of 12.5% all cases.

From Category 1, measles had 356 cases after ST Yolanda from 2 at baseline. The infection rate for measles rose to 95.0% from 4.7% the previous year with a percent increase of 99.44%. An 88.5% increase in total cases post ST Yolanda was observed. (Table –c)

Under Category II, Dengue had the highest number of cases from baseline which then increased to 27.43% of the total after the typhoon, followed with acute watery diarrhea from 16.76% to 34.26%. Chikungunya cases increased from 10 the previous year to 33 cases after the typhoon while acute bloody diarrhea rose to 2.35% from 1.78% the previous year.

As to percent increase per cases, 99.44% increase of cases in Dengue was observed followed by acute watery diarrhea (53.75%), acute bloody diarrhea (28.4%), Dengue (20.0%) and Chikungunya (69.7%) after the typhoon. The total cases increased by 5.46% from the previous year.

Table 3 shows the data on the deaths and case fatality rate among the notifiable disease cases before and after ST Yolanda.

From Category I, out of 16 deaths, Neonatal Tetanus caused the highest number of deaths before the disaster (43.75 %) followed by meningococemia, 31.25% and rabies, 18,75 %, respectively.

From Category II, out of 17 deaths among the notifiable disease cases, Non- neonatal tetanus was the highest

Table 3. Deaths and case fatality rate.

a-Deaths from all Notifiable disease cases

Deaths from Notifiable cases	No.	%	% increase from the previous year
One year before ST Typhoon	33	54.1	
One year after ST Typhoon	28	46.0	
Total =	61	100.0	Zero increase in deaths from all cases

a.1 increase in deaths from a particular disease presented by category

Notifiable Diseases	1 year before Super typhoon Yolanda (2013)		1 year after Super Typhoon Yolanda (2014)		Increase in deaths from previous year
	No	%	No	%	
Category I					
1. Acute Flaccid Paralysis	1	6.25	0	0	-
2. Meningococemia	5	31.25	1	20.0	-
3. Measles	0	0	1	20.0	-
4. Neonatal Tetanus	7	43.75	1	20.0	-
5. Rabies	3	18.75	2	40.0	-
Total	16	100.0	5	100.0	0 % increase
Category II					
1. Acute Viral Hepatitis (A&B)	3	17.65	1	4.35	-
2. Acute Watery Diarrhea	1	5.88	9	39.1	88.88%
3. Bacterial Meningitis	4	23.53	2	8.7	-
4. Dengue Fever	0	0	1	4.35	100.0%
5. Influenza-like illness	0	0	6	26.1	100.0%
6. Non Neonatal Tetanus	6	35.3	2	8.7	-
7. Typhoid Fever	3	17.65	2	8.7	-
Total	17	100.0	23	100.0	26.1 % increase
Total Deaths	33		28		

cause of death (35.3%), followed by Bacterial meningitis (23.53%). Both Acute viral hepatitis and typhoid fever had 17.65% from the total deaths before ST Yolanda.

After the Super typhoon, there were 23 deaths from notifiable diseases. Acute watery diarrhea had the highest number of deaths (39.1%), followed by deaths from Influenza – like –illness (26.1%), then Bacterial meningitis, Typhoid fever and Non-neonatal tetanus at 8.7% each with an increased deaths from all the notifiable disease cases of 26.1% from the previous year.

Table 3-b shows the case fatality rate under Category I. Rabies had the highest case fatality rate, followed by Neonatal tetanus and Meningococemia, respectively one year before ST Yolanda. Under Category II, data show a high case fatality rate from Bacterial meningitis followed by Acute viral hepatitis (A & B) and Non neonatal tetanus at 25.0% each and Typhoid (21.0%).

The data also show a slight increase in Case fatality rates from Measles (Category I), and from Dengue fever and Influenza-like infections (Category II).

DISCUSSION

After Super Typhoon Yolanda hit some places in Eastern Visayas, the risk of communicable disease transmission increased due to the lack of potable water supply; poor environmental sanitation like lack of functioning latrines and exposure to dead bodies and, poor nutritional status of the population.

Most patients who sought consultation and/or admission in Eastern Visayas Regional Medical Center after ST Yolanda were below 14 years of age who were the vulnerable group. More females sought consultation and/

Table 3-b. Case fatality rate from cases

Notifiable Diseases	Case Fatality Rates from cases		Interpretation
	One year before ST Yolanda	One year after ST Yolanda	
Category I			
1. Acute Flaccid Paralysis	7.1	0	Slight increase
2. Meningococemia	55.6	50.0	
3. Measles	0	0.28	
4. Neonatal tetanus	87.5	0	
5. Rabies	100.0	100.0	
Category II			
1. Acute Viral Hepatitis (A&B)	25.0	11.1	Slight increase Slight increase
2. Acute watery Diarrhea	1.6	0.65	
3. Baterial Meningitis	50.0	50.0	
4. Dengue Fever	0	0.09	
5. Influenza like illness	0	0.46	
6. Non neonatal Tetanus	25.0	12.5	
7. Typhoid	21.0	3.0	

or admission than males after the typhoon. There was an increased number of patients from the 1st District of Leyte including Tacloban City and Samar because these were the most devastated areas.

Notifiable diseases listed in the hospital surveillance data after ST Yolanda showed an increase of measles by 99.44% from the previous year which could be due to overcrowding in temporary shelters.

In a similar case following Mt. Pinatubo eruption in 1991, report showed similar measles outbreak occurring in more than 18,000 cases. Likewise, measles outbreak also occurred after a tsunami in Aceh where 35 cases were observed.¹⁵

The result of the study also shows that mosquito borne diseases like Chikungunya and Dengue fever were increased after ST Yolanda in which case pooling of water from heavy rainfall, provided perfect breeding sites for mosquitoes.

In 1996, a flood disaster occurred in North Queensland where a similar outbreak of Dengue fever was reported, and an increase in diarrheal cases due to poor access to water.

In this study, diarrheal diseases (acute watery diarrhea and acute bloody diarrhea) also increased. A similar report

in 2004 showed that more than 17,000 cases of *Vibrio cholerae* and Enteropathogenic *E. coli* were isolated after a Bangladesh disaster while in Indonesia, flooding was the significant risk factor for diarrheal cases. *Salmonella enterica* was isolated in 1992-1993.¹⁵

Deaths from diarrheal diseases were increased too, which could be due to lack of safe water supply after the ST typhoon. Influenza-like infections and dengue were high due to lack of shelter or because transmission could be due to congested bunkhouses after the disaster.

As to case fatality rates, this study shows slight increase from measles under Category I. Similarly, in Myanmar after Cyclone Nargis, there was an increase in case fatality rate for measles due to disease complication. Children affected were mostly malnourished. A slight increase in case fatality rates was also observed under Category II which included Dengue and Influenza-like infection.

There was a similar report from Guatemala, Nicaragua and Belize after Hurricane Mitch in 1998. The increase in mosquito-borne diseases was due to lack of preventive measures as well as alterations in mosquito breeding places after the disaster.

CONCLUSION

During calamities everything is affected: from infrastructure, agriculture and most of all, the people. Development and transmission of different diseases occur due to displacement of the population, lack of safe water supply and sanitation facilities and lack of available health care services.

Super Typhoon Yolanda has affected much in both the economic as well as the health status of the people in Region VIII.

In a review of records from the surveillance in this medical center, the proponents studied transmission of PIDSR notifiable diseases. It reviewed data of cases 1 year before and after ST Yolanda, and studied the cumulative total in the number of disease occurrence. A total of 4,426 patients sought consultation and/or admission in Eastern Visayas Regional Medical Center, after Yolanda with an increase of 12.5% from the previous year. Patients below 14 years old were mostly affected with predominance among females (51.4%) compared to males. Young children and females were the vulnerable groups because women were left at home to take care of the children, the sick and the household, thus increasing the chances of exposure to the sick.

As to geographic distribution, those affected were patients from the 1st district of Leyte including Tacloban City then followed by Samar areas severely hit by ST Yolanda.

The occurrence of PIDSR notifiable disease shows an increase in cases from 46.67% to 53.3% or an increase of 12.5% from the previous year as expected after a disaster. Category I comprised of 8.47% of the total, post ST Yolanda, with measles rising up from 4.7% to 95% the previous year. There were increased cases under Category II from acute watery diarrhea, chikungunya, acute bloody diarrhea and dengue fever.

Deaths before and after ST Yolanda were compared. Among the Category I diseases, there was no increase in death rate. However, for Category II, an increase of 26.1% after the typhoon was noted. These included cases from

Acute watery diarrhea, dengue fever and Influenza-like illness.

For the case fatality rate, there was no increase among the cases under Category I. However, under Category II, acute watery diarrhea, dengue fever and Influenza-like illness were slightly increased a year after the disaster. It was probably due to the fact that in a disaster, an increase in the number of cases, deaths and case fatality rates from a particular disease could be a result of poor water supply and environmental sanitation, pollution from congested evacuation centers and, poor health services to cause increased transmission of diseases. Health workers in the areas also suffered the same consequences during the disaster.

Therefore, this study provides baseline data on notifiable infectious diseases common after a Super Typhoon and acts as a guide, as to what resource allotment is to be prioritized. It also shows us that despite the increase in notifiable disease cases from the previous year among the patients who consulted and/or admitted in the Medical Center, there was no significant increase in deaths from all cases.

This indicated efficiency in managing cases by healthcare providers and, the good quality of healthcare services provided by the Hospital to address the need during and immediately after the Super typhoon disaster. EVRMC, the end referral hospital for Region 8 was considered the last hospital standing when most of the health facilities were damaged.

RECOMMENDATION

This study recommends to the Department of Health Region VIII to increase risk awareness, increase logistics like manpower, supplies and medicines to cope up with increased demand in health services and medicines particularly for Acute watery diarrhea, acute bloody diarrhea, measles, chikungunya and dengue.

For the government, evacuation center facilities should be improved to avoid congestion that exposes people to

increased transmission of diseases, so that outbreak of infectious diseases is prevented. Provision of safe water supply and the immediate implementation of environmental sanitation are equally important during and after disaster.

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