

WHO

WESTERN PACIFIC REGIONAL OFFICE

**Report on
Health Infrastructure Damage
Caused by Typhoon Damrey
in North Viet Nam October 27th 2005**



Emergency and Humanitarian Action Programme

October 2005

TABLE OF CONTENTS

<u>GLOSSARY OF TERMS</u>	1
<u>1 SUMMARY</u>	2
<u>2 BACKGROUND TO THE SURVEY</u>	4
<u>3 SURVEY METHOD</u>	4
<u>4 RESULTS OF THE SURVEY</u>	5
<u>4.1 Overview of the impact of the typhoon/floods</u>	5
<u>4.1.1 Damage to provincial health facilities (PHF)</u>	5
<u>4.1.2 Damage to District Health Centres (DHC)</u>	5
<u>4.1.3 Damage to Commune Health Stations (CHS)</u>	6
<u>4.2 Immediate health consequences of the typhoon in the affected population</u>	6
<u>4.3 Estimated costs for repair</u>	7
<u>4.3.1 Provincial health facilities</u>	7
<u>4.3.2 District Health Centres</u>	7
<u>4.3.3 Commune Health Stations</u>	8
<u>4.3.4 Summary of repair and replacement costs by Province</u>	9
<u>5 MAIN FINDINGS OF THE SURVEY</u>	9
<u>6 RECOMMENDATIONS</u>	10
<u>7 ANNEXES PHOTOGRAPHS OF THE DAMAGES</u>	10

Glossary of Terms

WHO	World Health Organisation
HSPH	Hanoi School of Public Health, Hanoi-Vietnam
MOH	Ministry of Health
ARI	Acute respiratory infections
CHS	Commune Health Station
DHC	District Health Center

This report was prepared by:

Dr. Ha Van Nhu, MD., MSc.

Hanoi School of Public Health, Hanoi-Vietnam

and

Le Van Tuan, MD., MPH.

WHO programme officer, WHO representative office in Vietnam

*This document does not constitute a formal publication
of the World Health Organisation.*

1 Summary

Three provinces of Viet Nam that were most affected by the typhoon Damrey from 26 to 27 October 2005 are Nam Dinh, Thanh Hoa and Quang Ninh. The World Health Organisation collaborated with the Hanoi School of Public Health in Hanoi, Vietnam to undertake a survey of the Health sector infrastructure damages caused by the Typhoon.

The principle findings are:

1. Very effective preparations for the typhoon were reported. The relief operations in response to the typhoon were timely, well organised and managed by the health sector in collaboration with local authorities and other sectors.
2. The floods resulted in significant damage health sector infrastructure, although losses of medicines and medical equipment were not observed.
3. Although no health facilities were completely destroyed but some of the visited District Health Centers (DHC) and many Commune Health Stations (CHS) were damaged by the Typhoon to different degrees.
4. There are insufficient resources available to repair and rehabilitate health facilities. Facilities that were built long ago have faced previous typhoons and have been slowly degraded over time (Typhoon number 6).
5. Many commune health stations are located in areas that are repeatedly exposed to typhoon/flood, particularly those in coastal areas.
6. There is a lack of official guidelines and standard tools for assessing damage to infrastructure in Viet Nam.
7. Rapid assessment and reporting system for disaster consequences within the health sector seems to be insufficient.
8. The environment was polluted after the flood, however, it was well controlled by civil the health and military health sectors.
9. There is no epidemic outbreak in the provinces affected by the Typhoon Damrey, however, there is a mild increase of some common disease like acute diarrhoea, ARI, conjunctivitis. No cholera case was reported. Severe injury was not recorded. At present, all visited health facilities were functioning normally and were meeting the health needs of the affected population.
10. Hygiene education for local people are conducted through the written messages and communal, district radio station

The principle recommendations are:

1. Guidelines on health sector infrastructure damage assessment and health needs assessment for the health sector need to be developed and/or applied.
2. Training on rapid assessment for provincial, district and commune health staff is needed.
3. Recording and reporting system after disasters should be promptly set up, integrated in the routine report system within the health sector. This system should be available and reactivated right after a disaster is declared.
4. For sustained working, long term planing for rebuild the damaged health facilities should be developed. Health facilities located in areas with

high risk flood needs to be rebuilt with relevant designs (solid houses).
(they should be elevated above ground)

5. For early warning and to prevent outbreak potentially occur, the communicable diseases surveillance system should focus tightly on monitoring the vector-borne, water-borne diseases such as dengue fever, malaria, acute diarrhea and ARI.
6. The impact of Damrey typhoon on health status among affected people should be conducted follow this assessment.
7. The nutrition status among the affected population should be monitored with at least in 2 - 3 months period.
8. EIC material on environment and personal hygiene should be developed and distributed to the local people in the affected areas.

2 Background to the survey

Typhoon Damrey (named in Viet Nam as Storm No. 7) was the most powerful storm to make landfall in Viet Nam in the last 10 years, with wind force near to the storm center at Beaufort scale 12 (118 to 133 km per hour) with gusts above Beaufort Scale 12. It affected coastal provinces of North Viet Nam from Quang Ninh to Quang Nam and Da Nang as it moved west and west-northwest from the South China Sea.

The typhoon was expected to be very dangerous, particularly as the sea dyke system, which serves to protect hundreds thousands of people, rice fields and aquaculture production areas along the coast of Viet Nam, were significantly weakened during storm No. 6 that hit Viet Nam on September 13th 2005. Three provinces: Nam Dinh, Thanh Hoa and Quang Ninh were most affected by the typhoon. Hundreds of metres of sea dykes in Nam Dinh and Thanh Hoa were ruptured. The broken sea dykes caused flooding in two districts in Nam Dinh (Hai Hau and Giao Thuy) and two districts in Thanh Hoa (Hau Loc and Nga Son). At the time of the assessment, the total damages were estimated at 3,509 billion VND (219.25 USD) (source: UNDP Viet Nam).

The purpose of this report is to document as accurately as possible the level of health sector damage in the three affected provinces of North Viet Nam to assist those planning to provide repairs and reconstruction aids. The findings of this assessment will also form the basis for the future study on morbidity and mortality after the floods.

3 Survey method

A rapid assessment approach was used for this survey. This included direct interview, observations and analysis of relevant documents, reports etc.

Interviews: Questionnaires developed by the team were used. Interviews were carried out from 5th October to 10th October 2003 which was 8 to 12 days after the Typhoon. Interviews were conducted with Provincial, District and Commune health authorities who were interviewed for up to two hours. The following health authorities were interviewed:

- Directors of the Provincial Health Service (PHS) or Vice-Directors of PHS
- Heads of Planning or Technical Departments of the PHS
- Heads of Commune health station

Collecting available data: the team collected as much data related to the Typhoon as possible. This included reports on damages caused by the Typhoon made by the Provincial committee for floods and storm control, the PHS, DHC and CHS. They also collected UNDP reports, MOH reports and reports from Central Committee for Floods and Storm Control.

Observations: direct observations were made by the team to all health facilities visited. During observations, pictures on damages were taken.

4 Results of the survey

4.1 Overview of the impact of the typhoon/floods

Overall, 65.1% of the population and 49.0% of the districts of the three provinces were exposed to the typhoon Damrey. The most affected province was Nam Dinh, where 79.3% of the population and 70% of districts were exposed.

Table 1: general information on the affected provinces

Province	Total population	Total number of districts	Total number of communes	Total deaths	Number of affected districts		Population affected	
					No	%	No	%
Nam Dinh	1,949,234	10	229	0	7	70	1,546,563	79.3
Thanh Hoa	3,700,000	27	633	1	14	51.9	2,337,475	63.7
Quang Ninh	1,064,000	14	184	1	4	28.6	488,726	45.9
Total	6,713,234	51	1064	2	25	49.0	4,372,764	65.1

4.1.1 Damage to provincial health facilities (PHF)

Table 2: number of provincial health facilities affected

Province	Total provincial health facilities (PHF)	PHF destroyed	PHF damaged	DHF inaccessible/undamaged
Nam Dinh	17	0	5	0
Thanh Hoa	15	0	3	0
Quang Ninh	8	0	5	0
Total	40	0	13	0
%	100	0	32.5	0

Table 2 shows that 32.5% of PHF was damaged. There was no PHF which was destroyed. Unroofing and collapsed surrounding fences were the most common damages. Even though the typhoon itself lasted one day and floods caused by the typhoon (in a limited number of communes) lasted from 1 to three days, all DHFs were accessible and functioned normally at all times.

4.1.2 Damage to District Health Centres (DHC)

Table 3 shows that 25 of 51 (49.0%) of DHC were damaged, but none was destroyed and none was inaccessible during the typhoon/flood. In all cases it was roofs, surrounding construction walls and ceilings which were damaged rather than the main part of the buildings.

Table 3: number of DHC affected

Province	Total DHC	DHC destroyed	DHC damaged	DHC inaccessible/undamaged
Nam Dinh	10	0	7	0
Thanh Hoa	27	0	14	0
Quang Ninh	14	0	4	0
Total	51	0	25	0
%	100	0	49.0	0

4.1.3 Damage to Commune Health Stations (CHS)

Table 4 shows the number of commune health stations (CHS) damaged in the three affected provinces. Nam Dinh was the most affected province in terms of numbers of CHS damaged, where 24.9% (51/229) of the CHS in the province were damaged. Hai Hau district, Nam Dinh province had a largest number of CHS damaged: 17/35 (48.6%).

Table 4: number of CHS affected

Province	Total CHS	CHS destroyed	CHS damaged*	CHS inaccessible but undamaged
Nam Dinh	229	0	51 (24.9%)	0
Thanh Hoa	633	0	149 (23.5%)	0
Quang Ninh	184	0	0	0
Total	1064	0	200	0
%	100	0	18.8	0

Some CHSs with minor damages were not reported because these CHSs were fixed by health staff with assistance of local people. In some CHS one or two rooms or parking areas which were built a long time ago and weakened by previous typhoon were destroyed but no CHS experienced loss of function.

4.2 Immediate health consequences of the typhoon in the affected population

Table 5: immediate health needs and anticipated health needs of local people by DHC

Province	Needs as identified by the damaged DHC				
	Diarrhoeal diseases	Acute respiratory infection (ARI)	Dengue* fever	Malaria	Conjunctivitis
Nam Dinh					
Hai Hau dist. (28/9-3/10, data from 17 CHS)	56	0	0	0	258
Hai Hau DHC (28/9-3/10)	37	157	0	0	66
Nghia Hung (28/9-6/10, data from 18 CHS)	50	35	0	0	45
Giao Thuy DHC	14	73	0	0	0
Thanh Hoa					
Hau Loc and Hoang Hoa (28/9-05/10, data from 15 CHS)	288	na	0	0	240
Tinh Gia & Hoang Hoa DHC (5/10/05)	na	na	86*	na	na
Quang Ninh	NA	NA	NA	NA	NA
Total	445	265	86	0	609

Source: data reported by PHS, DHC and CHS

NA: not applicable

*Data from six CHSs in two districts (Tinh Gia and Hoang Hoa)

Health authorities in the visited provinces, districts and communes were asked to describe the immediate health needs and health needs that might be anticipated over the coming months at commune and district level. At the time of the visit there was no outbreaks of diseases of epidemic potential (DEP) or diseases or public health significance (DPHS) reported by any province.

Most of the respondents reported that there was a slight increase of some common diseases, but they felt the situation was under control. The data shows that not all the affected DHC were experiencing increased demands for their services and also that the needs vary from area to area. Diarrhoeal diseases (not cholera), conjunctivitis and ARI were the most common diseases reported by health authorities. Diarrhoeal diseases are identified as the commonest threat because of contaminated water and changes of food during and after the typhoon. The second commonest is ARI. Cases of malaria have not been recorded and malaria was not expected to become a problem in the three provinces.

An increase of Dengue fever was reported by Thanh Hoa PHS. Six communes in Tinh Gia district and one commune in Hoang Hoa district with 86 cases. However, this diagnosis was based on clinical signs only and this should be confirmed by laboratory. It is important to note that dengue fever cases were reported before the typhoon in these two districts.

However, routine drug supplies were delivered before the floods and authorities believed that this should be sufficient to meet anticipated needs. Additional units would not be needed unless there are serious outbreaks of disease. Some districts like Hau Loc and Nga Son requested more chemicals to treat environment to protect people from communicable diseases.

4.3 *Estimated costs for repair*

Health authorities were asked to provide information from their own reports on the costs of repairing damaged buildings and replacing equipment. Each province has its own method for estimating these costs, due to lack of standard guidelines from central government. It is important to note that this estimation may not accurate as it seems that some damages were overestimated.

4.3.1 Provincial health facilities

Table 6: Cost to repair provincial health facilities (in USD)

Province	Repair	Furnishings	Medical supplies	Other supplies	Cost to re-locate
Nam Dinh	47,658	0	0		0
Thanh Hoa	10,063	0	0	0	0
Quang Ninh	66,456	0	0	0	0
Total	124,177	0	0	0	0

The Table 6 presents the total estimated cost for repair PHF in the three provinces is USD 124,177. Quang Ninh's estimation is the highest one due to landslide at the provincial health service.

4.3.2 District Health Centres

Table 7: Estimated cost to repair district health facilities (in USD)

Province	Repair	Furnishings	Medical supplies	Other supplies	Cost to relocate
Nam Dinh	56,456		0		0
Thanh Hoa	293,239	0	0	0	0
Quang Ninh	NA	NA	NA	NA	NA
Total	349,695	-	-	-	-

The Table 7 shows the total estimated cost to repair DHC is USD 349,695. Thanh Hoa province reported the need up to USD 293,239. According to Quang Ninh provincial health service, some minor damages were reported by DHC, however, a DHC has budgets to undertake repairs without needing to request assistance from the provincial health service. The main expenses are the cost to repair, while costs to replace furniture and medical supplies were not recorded. So the main costs to the MOH are to repair collapsed walls, leaking roofs and degraded rooms.

There was no need to replace medical equipment and medicine reported by all district and provinces visited. This reflects that the health sector has adequately prepared for the typhoon and this has led to all medical equipment and medicine protected.

4.3.3 Commune Health Stations

Table 8: Cost to repair commune health stations

Province	Repair	Furnishing	Medical	Other	Relocation
Nam Dinh	31,394	0	0	0	0
Thanh Hoa	189,430	0	0	0	0
Quang Ninh	NA	NA	NA	NA	0
Total	220,824				

NA: Not applicable

Table 8 shows costs to repair CHS. The biggest item is the cost to repair the buildings. Thanh Hoa is a province with the cost repairing up to USD 189,430 for 149 CHS damaged for repairing the roof and the wall of CHS. Estimated cost for furnishings and medical supplies were not reported by all provinces, districts and communes.

No province reported that additional medical supplies and medicine were needed. However, chloramine and chemicals for treatment of the environment were needed for some districts and communes in Nam Dinh and particularly in Thanh Hoa where there is an increase of Dengue fever. No provincial health authority identified other needs for the period after the typhoon/flood. This suggests that activities for typhoon/flood relief were prepared carefully in terms of health and the time of typhoon and flood was not long (the typhoon lasted in half to one day and the flood followed and lasted in two to 5 days. In addition, district and commune health staff reacted quickly to the consequences of the flood by undertaking sanitation work, sterilising well waters and instructing people in how to prevent and treat common diseases.

4.3.4 Summary of repair and replacement costs by Province

Table 9. Summary of estimated cost for repair infrastructure by type of health facility and province

Province	Provincial health facilities (PHF)	District health center (DHC)	Commune health station (CHS)	Total
Nam Dinh	47,658	56,456	31,394	135,508
Thanh Hoa	10,063	293,239	189,430	492,732
Quang Ninh	66,456	-	-	66,456
Total	124,177	349,695	220,824	694,696

Table 10: Estimated cost for repair of DHC by province

Province	District	Cost for repairs (USD)
Nam Dinh	Hai Hau	42,405
	Giao Thuy	7,089
	Nghia Hung	3,165
	Truc Ninh	3,797
	<i>Subtotal</i>	56,456
Thanh Hoa	Hau Loc	172,911
	Nga Son	43,303
	Hoang Hoa	12,532
	Quang Xuong	4,430
	Tinh Gia	13,544
	Thach Thanh	11,329
	Ha Trung	5,380
	Bim Son town	1,266
	Thanh Hoa City	3,165
	Trieu son	6,772
	Vinh Loc	3,165
	Nong Cong	10,759
	Yen Dinh	886
	Lang Chanh	3,797
	<i>Subtotal</i>	293,239
<i>Total</i>		349,695

5 Main Findings of the Survey

5.1 In general, the response to the typhoon Damrey was assessed as very good. Thanks to good preparation and timely interventions, there were few people lost in the three visited provinces, and no or little damage to medical equipment and medicine. Additional pharmaceuticals and medical supplies had been delivered in advance of the typhoon and flood season and there were few requests to meet unexpected needs.

5.2 Local staff was actively involved in health promotion and environmental health activities during the flood period. The planned activities for typhoon/flood for commune health stations include: providing a flood preventive drug unit; chloramines for sterilizing water and protecting medical equipment and furnishings. The flood preventive drug unit are often supplied by Ministry of Health as well as the preventive medicine centres for DHC and CHS before the flood season. Chloramine is one of the most important items of the drug unit.

5.3 Provincial authorities reacted quickly: all provinces have systems in place to collect information and respond to requests. However these systems are not standardised nor evaluated by the MOH.

5.4 From this survey, it is apparent that main costs to the health sector after this typhoon and flood in North Viet Nam are for repairs and reconstruction, rather than for more medicines and equipment. This information is relevant to donors who tend to react instinctively by supplying medicines and equipment. Lack of funds for repairs and repeated typhoon leads to severe degrading of buildings over time.

5.5 Funds from government for repairs tend to be focussed on DHC. Very little is given for CHS which are generally just cleaned out and reopened for services.

5.6 Local staff is not trained in making damage analysis and needs assessments after floods. There are no guidelines from the MOH and no standard timetables or formats for staff to submit information. Each province has developed its own system, making compilation and comparison of data difficult.

5.7 Though there was a slight increase in number of people with diarrhoeal disease, ARI and conjunctivitis after the typhoon but no outbreaks of DEP or DPHS were reported. It is noted that there is an increase dengue fever cases reported by Thanh Hoa Province but this has been based on clinical symptom only. Most local authorities and people are greatly concerned with the risk of outbreak of disease due to environmental issues.

6 Recommendations

Based on the findings of the survey, the following recommendations can be made:

- Commune health stations in typhoon and flood-affected areas which cannot be relocated should be constructed on two levels or at least raised the foundation. The second level can be used to store equipment during the flooding season and also provide emergency services.
- Government and donors should pay more attention to the long term infrastructure needs following typhoon.
- There is a need for a handbook for provincial district and commune level managers, modelled on the WHO staff handbook.
- Government training programmes should provide knowledge and skills in damage analysis and needs assessment.
- There is a need for standardised guidelines for assessing damage and standardised reporting formats for use during floods.
- Continuing need assessment is needed to identify health need of the affected areas. Especially the need for medicine and chemicals for treatment of the environment.

7 Annexes Photographs of the damages.

Unroofed, Collapsed & damaged health facilities





