

## Syndromic disease surveillance on Guam following a natural disaster

Early in December 2002, weather officials predicted that a typhoon then forming near Pohnpei might pass near Guam. As late as 7 December the typhoon, since named Pongsona, was predicted to pass north of Guam. On 8 December, however, the typhoon passed directly over the island with wind gusts estimated to be in excess of 180 miles per hour (290 km per hour). Many long-time island residents believe that the storm was the worst to ever hit Guam. The widespread severe damage experienced despite efforts following previous storms to make utilities and buildings typhoon-proof lent credence to these claims. In addition to the complete destruction of 1751 private homes and significant damage to 2048 other residences, many concrete power poles were felled and reinforced concrete structures such as the island's only civilian hospital sustained major damage. It is remarkable that only two deaths were attributed to the storm: one person apparently died of a heart attack after being struck by an imploding window and another person died of carbon monoxide poisoning from inadequate ventilation of a gas powered home generator. The lack of more serious injuries can probably be credited to the government policy of encouraging residents who felt insecure in their residences to seek safety in school buildings designated as shelters well in advance of arrival of the storm.

As if the destruction of homes, automobiles, crops, etc., was not enough, to add to the island's misery fuel storage tanks at Guam's port caught fire, apparently from lightning strikes, resulting in gasoline rationing and long lines at service stations for several weeks.

With the storm's departure island residents emerged to discover that power and water supplies to virtually all areas of the island had been disrupted. Although these utilities would gradually be restored over the next several months, health authorities were concerned that the island would be susceptible to disease epidemics due to the difficulty in maintaining hygienic standards under such conditions.

Syndromic disease surveillance (collection of data on certain disease symptom complexes in addition to reports of specific "reportable" diseases) has been carried out on Guam since 1974 when it was first observed that cases of cholera, never previously reported in Micronesia, were occurring locally (Haddock 1987). This surveillance is conducted by reviewing the patient log of the Guam Memorial Hospital Emergency Department (GMH-ED) and recording the number of patients seen for six diagnostic categories; diarrhoea, gastroenteritis/enteritis, acute respiratory disease, asthma/COPD, influenza/flu syndrome and conjunctivitis. In addition, the total number of patients seen and the number of patients admitted to hospital are recorded. Since there is only one civilian hospital on Guam, it is felt that this provides a representative view for the island as a whole.

Syndromic surveillance by week for the year 2002 did not reveal a substantial increase in any of the disease syndromes recorded immediately following typhoon Pongsona (Fig. 1). This may be due to the experience of islanders in dealing with similar circumstances in the past, frequent media advisories on steps to take to avoid spreading illnesses, the common use of bottled water for drinking and the provision of potable water in tankers placed at strategic locations around the island. Beginning on the 36<sup>th</sup> week, before the storm, an increase in acute respiratory disease (URI, bronchitis, pneumonia, etc.) was observed, which lasted for about 10 weeks (September to November). This increase was probably due to circulation in the community of a common cold virus rather than a flu virus, although we are not aware of any specimens being collected for influenza surveillance.

Daily surveillance for enteric disease (diarrhoea, gastroenteritis, etc.) during the month of December (Fig. 2) showed an increase two days after the storm and may have been due to consumption of food that had not been adequately refrigerated following the island-wide loss of electrical power during the storm. Fortunately no common-source outbreaks were detected at this time. Daily data for acute respiratory disease during the same period (Fig. 3) never exceeded a threshold of the annual day-of-week mean plus 2 standard deviations.

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In addition to disease surveillance, special injury surveillance was conducted using GMH-ED data beginning 1 December 2002 (Fig. 4). These data show lacerations to be the most commonly treated injury and clearly illustrate that the greatest need for augmentation of medical services occurs within the 24 hours immediately following the storm. It is clear that island communities must prepare for such events using local resources and should not depend on assistance arriving from neighbour islands or donor countries in a timely manner.

**Reported by:**

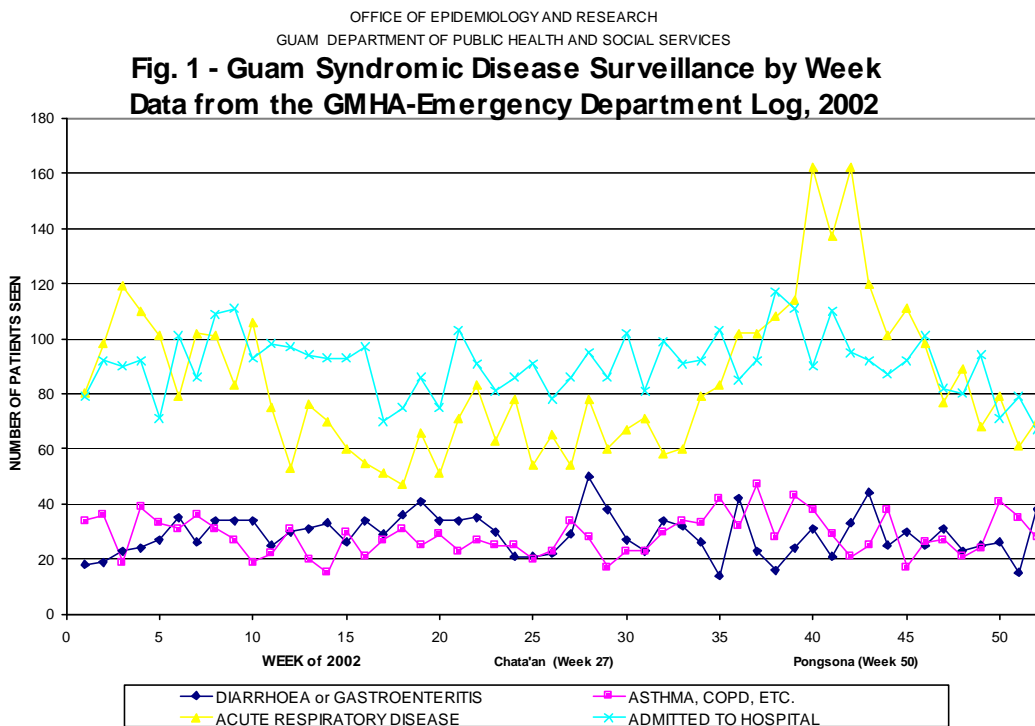
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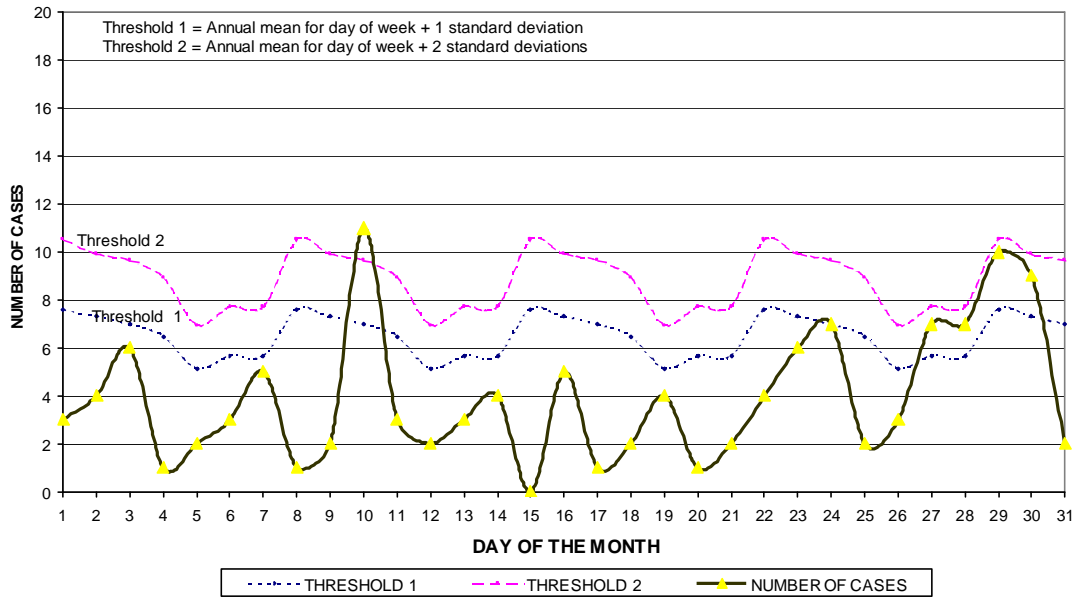
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**References:**

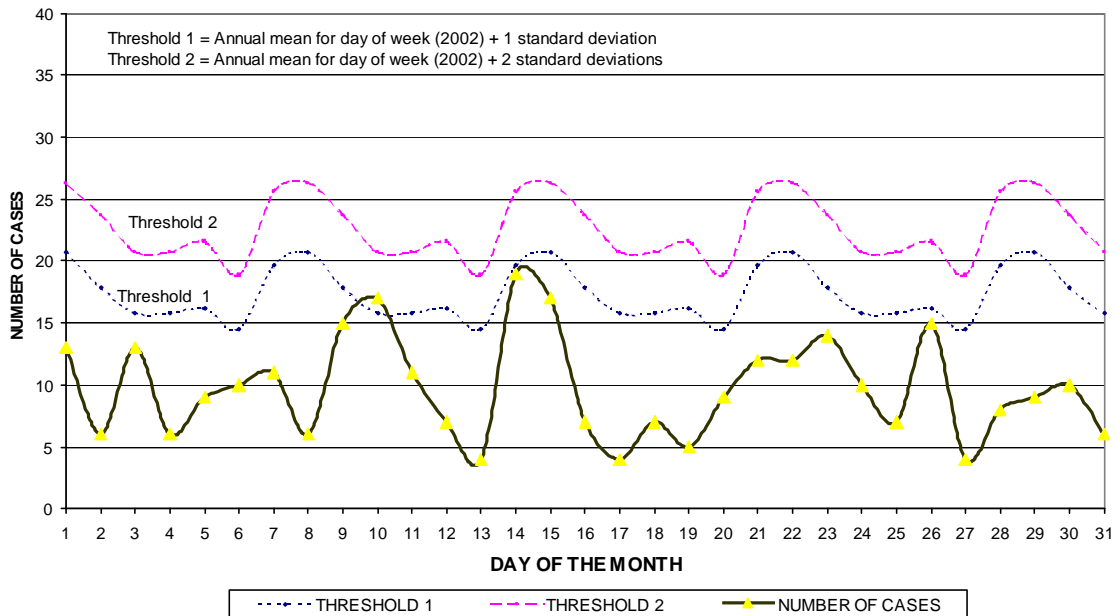
Haddock, R.L. Cholera in a Pacific Island. J Diarrhoeal Dis Res 1987 Sep 5(3):181–183.



**Fig. 2 - SYNDROMIC SURVEILLANCE FOR ENTERIC DISEASE,  
GUAM MEMORIAL HOSPITAL EMERGENCY DEPARTMENT, DECEMBER, 2002**



**Fig. 3 - SYNDROMIC SURVEILLANCE FOR ACUTE RESPIRATORY DISEASE,  
GUAM MEMORIAL HOSPITAL EMERGENCY DEPARTMENT, DECEMBER, 2002**



**Fig. 4 - INJURY SURVEILLANCE, GMHA EMERGENCY DEPARTMENT, (INCLUDING INJURIES TREATED AT DMAT UNITS), DECEMBER, 2002**

