

A short report on the acute diarrhoea outbreak that affected the Ambunti District of East Sepik Province in 2010

RODNEY ITAKI¹

Division of Pathology, School of Medicine and Health Sciences, University of Papua New Guinea, Port Moresby

SUMMARY

In December 2010 there was a diarrhoea outbreak in Ambunti District, East Sepik Province that was presumed to be cholera. This short report describes the outbreak and outlines the preventive strategies that were implemented to contain the outbreak. Lessons learnt are also discussed.

Introduction

The outbreak of cholera in Papua New Guinea (PNG) began in the Morobe Province in July 2009 (1) and later spread to the rest of the country. Papua New Guinea has been recognized as a high-risk area for cholera outbreaks and transmission (2) and the prevailing social and environmental conditions allowed the outbreak to spread to the rest of the country.

The first case of cholera in the East Sepik Province (ESP) of PNG was reported on 3 November 2009 (2), 3 months after the outbreak in Morobe Province. Eventually a total of 879 cases were reported in the Province with 28 deaths (2). The Frieda River Project is located at the border of Ambunti District, ESP and Telefomin District in the Sandaun Province (3). The geography of the project area is a mixture of rugged mountains in the Telefomin District, which abruptly end with the Sepik plains extending into Ambunti District. There are seven villages currently recognized in the exploration licence area but demographic studies are ongoing and this figure may change in the future (4).

Villages in the Frieda River area are accessible either by air or via motorized canoe following the Sepik River and its tributaries. As a result, health care is difficult to deliver by health authorities from either Telefomin or

Ambunti. There are no functioning aid posts in the villages and villagers access health care at the Hauna Health Centre that is operated by the Catholic Church. Immunization status of children under five years of age is below 50% (personal immunization survey, unpublished data) with diarrhoea and malaria being the most common causes of death in children under five years of age (personal survey, unpublished data). Drinking water is obtained from mountain streams, rain water and from the Frieda River. Pit latrines are used in all the villages, but it is a common practice among villagers living along the Frieda and Sepik Rivers to defecate into the rivers. Therefore risk factors for cholera transmission (5) are prevalent in this area.

This report documents an outbreak of diarrhoea in the Frieda River area, which was presumed to be cholera. The outbreak containment strategies used to contain the outbreak are highlighted and lessons learnt for the future are discussed.

Outbreak at Iniok

In December 2010 (exact date unknown) an adult male returning to Iniok village from Madang developed acute watery diarrhoea and was taken to Hauna Health Centre for treatment. The health worker at Hauna Health Centre diagnosed him with cholera based on the signs and symptoms and commenced

1 Division of Pathology, School of Medicine and Health Sciences, University of Papua New Guinea, PO Box 5623, Boroko, National Capital District, Papua New Guinea
itaki7@gmail.com

intravenous rehydration but the patient died the same day. The diagnosis of cholera was based on the index case history of having returned from Madang where a cholera outbreak was being contained at the time. The index case developed symptoms one week after returning. The index case had one and a half days of profuse watery diarrhoea and dehydration. There was no vomiting or fever. A case of cholera was defined as having profuse watery diarrhoea with severe dehydration over 2 days with a history of contact with the index case or contacts of the index. Contact was defined loosely as living in the same village. By the use of this clinical and epidemiological definition of cholera, 16 more people were diagnosed with cholera, with 10 people dying. This is a case fatality rate of 62.5%. The 6 people who survived received intravenous rehydration (personal communication, Hauna Health Centre health worker).

Outbreak response and containment

Initial response

The Ambunti District health officials were alerted by Hauna Health Centre staff and quickly mobilized a Rapid Cholera Response Team (RCRT) to Hauna to contain the outbreak. The Frieda River Project provided logistic support for the movement of the RCRT. The RCRT comprised a health extension officer, who was also the team leader, two community health care workers and a nursing officer. The health extension officer and the two community health care workers were part of a government RCRT that had responded to a cholera outbreak in Maprik earlier in 2010 so were experienced in recognizing cholera symptoms and administering cholera treatment and preventive strategies. I was the company doctor at the Frieda River Project and worked with the RCRT to contain the outbreak.

Outbreak containment

The outbreak was contained by implementing basic hygiene measures and messages to the affected villages of Iniok, Paupe, Ok Isai, Wabia, Wamemin 1, Wamemin 2 and Amaromin. All villages are in the Telefomin District, except Iniok and Paupe villages, which belong to Ambunti District.

Specifically the following strategies were

implemented:

- Encouraging and emphasizing the importance of boiling drinking water.
- Washing of hands with soap before meal preparation and eating. In addition families were instructed to have meals with all members of the family present and not to store cooked food for absent family members. Soap was not given to every household due to logistic and financial constraints.
- Cooked food to be covered from flies, rats and cockroaches.
- Lactating mothers were given clear instructions to have a full bath before breastfeeding their babies.
- Very strict and clear guidelines were given to villagers on how to bury dead victims of the outbreak. Villagers were educated to select about five members who were to transport the corpses to the burial site. The victim was to be buried with his or her contaminated clothes. The handlers' clothes were to be washed in very hot water after the burial at the burial site and handlers were educated on how to have a full bath with soap and return to the village in clean clothes.
- The affected villages were also instructed not to stage a 'haus krai' (mourning house) for dead victims of the outbreak. Dead victims were to be buried on the same day. The cultural practice of touching, kissing and throwing oneself on the dead person's body was strictly prohibited. This instruction was well received by the villagers because of fear of the outbreak.
- Shaking of hands in greetings was also prohibited.
- Adult villagers with diarrhoea with dehydration were treated with intravenous normal saline. There were no cases in children.
- Oral rehydration powder packets were distributed to every household in the affected villages.

These very basic measures effectively contained the outbreak in two weeks.

Ongoing preventive activities and diarrhoeal illness surveillance

Villagers were educated on signs and symptoms of cholera and were instructed to report to the company doctor or the district health authorities using the village VHF (very high frequency) radio if any child or adult developed acute diarrhoea.

Discussion and Conclusion

It is not known if the diarrhoeal outbreak illness was cholera as no stool sample was sent to a laboratory for testing. Logistic constraints prevented laboratory diagnosis of the cause of the outbreak from stool samples. The presumptive diagnosis of cholera was based on signs and symptoms and other associated risk factors. Two factors emerged among the cases: 1) living or having travelled to a village where there was a history of someone with acute watery diarrhoea; and 2) having contact with a person who died from acute watery diarrhoea in an affected village. Contact was defined loosely as living in the same village or household of a case. The outbreak at Inlok village was contained by implementing basic hygiene strategies. The quick response was possible through logistic support from the Frieda River Project and is an example of a private-public partnership to contain a disease outbreak in a remote part of PNG.

Lessons learnt from this case study can be summarized as follows:

- Infectious disease outbreaks remain a major threat in rural PNG.
- Developing strong private-public partnerships is essential to contain outbreaks where district health authorities face logistical constraints, particularly in rural areas where exploration activity is ongoing.
- Having a VHF radio in villages is an important tool for disease surveillance.
- Sustained village health and hygiene education is vital for reducing the burden of diarrhoeal illness in rural PNG.
- Disease monitoring in rural communities by educating villagers on the recognition of disease symptoms can provide early warning signs of a disease outbreak.
- Access to clean drinking water remains a challenge in rural PNG.

ACKNOWLEDGEMENTS

I acknowledge the management of Xstrata Frieda River Ltd for their consent to publish the information contained in this report. I also thank the Ambunti District health authorities for their assistance.

REFERENCES

- 1 **Rosewell A, Dagina R, Murhekar M, Ropa B, Posanai E, Dutta SR, Jennison A, Smith H, Mola G, Zwi A, MacIntyre CR.** *Vibrio cholerae* O1 in 2 coastal villages, Papua New Guinea, 2011. *Emerg Infect Dis* 2011;17:154-156.
- 2 **Horwood PF, Collins D, Jonduo MH, Rosewell A, Dutta SR, Dagina R, Ropa B, Siba PM, Greenhill AR.** Clonal origins of *Vibrio cholerae* O1 El Tor strains, Papua New Guinea, 2009-2011. *Emerg Infect Dis* 2011;17:2063-2065.
- 3 **Xstrata Frieda River Limited.** Frieda River Project Sustainability Report 2010. Port Moresby: Xstrata Frieda River Limited, 2010:4-10.
- 4 **Xstrata Frieda River Limited.** Frieda River Project Sustainability Report 2011. Port Moresby: Xstrata Frieda River Limited, 2011:8-44.
- 5 **Rosewell A, Addy B, Komnapi L, Makanda F, Ropa B, Posanai E, Dutta S, Mola G, Man WYN, Zwi A, MacIntyre CR.** Cholera risk factors, Papua New Guinea, 2010. *BMC Infect Dis* 2012;12:287.