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## **An acute outbreak of diarrhea in the Ambunti District of East Sepik Province in 2010**

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### **Abstract**

In late December 2010 ten people from the village of Iniok, in the Ambunti District of East Sepik Province, died from acute watery diarrhea within the space of two weeks. This outbreak was reported in the local newspaper as cholera although that was never confirmed. With logistical support from the Frieda River Project operating in the area, a concerted effort from the project and district health authorities contained the outbreak in two weeks. This case study reflects on the containment of the outbreak, and discusses lessons learnt with future implications.

**Key words:** Diarrhea, outbreak, response, containment, cholera, disease monitoring, public health education, preventative strategies

### **Introduction**

The Frieda River Project is located on the border of East Sepik and Sandaun Provinces about 200km from the coast and about 70km from the Sepik River (Figure 1.0). Frieda River is a tributary of the Sepik River. The Project is a joint venture between Xstrata Frieda River Ltd and Highlands Pacific Ltd. The Frieda River Project is managed by Xstrata Copper (Frieda River Project 2010 Sustainability Report 2010).

The project site consists of three separate camps with no road links. The Project is operated by helicopter, including the logistics for an extensive drilling campaign. Other logistical support into the Project site is provided by Twin Otter airplanes and barges that navigate the Sepik River from Lae. The barges dock at Iniok village (10 minutes by chopper) where supplies and machinery are airlifted by helicopter into the project site. During the drilling program, the project employed more than 400 people (Frieda River Project 2010 Sustainability Report 2010).

The project is located in one of the most remote areas of Papua New Guinea (PNG). The communities affected by the project or will be affected by the project have been divided into three (3) zones. Zone one being six 'project villages' ( Paupe, Ok Isai, Wabia, Wamemin 1, Wamemin 2, and Amaromin (Frieda River Project 2011 Sustainability Report, 2011). Except for Paupe, all villages are in the Sandaun Province.



**Figure 1: Map showing location of Frieda River Project site.**

Source: Frieda River Project Sustainability Report 2011

### The outbreak at Iniok village

Towards the end December 2010 an adult male from Iniok village returning from Madang developed acute watery diarrhea, and after one day of being ill was taken to Hauna Health Centre for treatment as he was severely dehydrated. Hauna Health Centre is reachable by motorized canoe and is more than three hours away from Iniok village. At the health centre, he was treated by a volunteer nursing officer who recognized it as a possible case of cholera. The patient died at Hauna Health Centre the same day. Within two weeks of the index case a total of ten people died, all with acute onset of profuse watery diarrhea. The story of the outbreak quickly got the PNG media attention. Below is a newspaper article on the cholera outbreak reported in *The National* newspaper.

*The National*, Monday January 3 2011  
Duncan Willis

The cholera outbreak in East Sepik has spread to Ambunti district's Iniok village and neighboring villages from the Tunap sub-district. At least 10 people have been confirmed dead since last Friday with unconfirmed reports of more casualties. Ambunti-Dreikikir district administrator Solomon Hopkos confirmed this last Friday after being alerted by community affairs officers of Xstrata Copper company which is developing the Frieda River copper-gold project in the district. Its

helicopter flew health officials and necessary medical drugs from the Burui health centre to the affected communities.

'I have mobilised health officials from Maprik and Burui health centres and a medical team has already been sent to the villages by the company's helicopter,' Hopkos said.

He said he had tried to contact the provincial health office in Wewak but was unsuccessful since everyone was out for the Christmas and New Year holidays. 'I have sent them a fax and I am still awaiting their response.'

District health officer Dominica Wain, who is currently in the affected villagers to assess the situation, said: 'As of last Wednesday and Thursday, more people are being affected and the death toll is increasing.' Xstrata Copper company has been assisting the district with logistics while waiting for the government to intervene and assist them to help fight the outbreak. Since cholera is waterborne, contaminated waste in the river will prove fatal because there are many villages along the banks of the Sepik River and it could spread to villages downstream. Hopkos and the district medical team are currently assessing the situation with very little funding and is appealing to the government and Health Department to take action and move in as soon as possible.

'I have a VHF radio operating 12 hours a day that we are monitoring constantly with Iniok, but we are requesting provincial and national health support,' he said.

'Health officials from Ambunti, Burui and Maprik are on the ground and are currently dealing with the situation.'

### **Outbreak response and containment**

When the first death occurred at Iniok, Frieda River Project employees stationed there informed the site management and through the Community Affairs department established communication with the district health authorities to assemble and dispatch a government health team to Iniok. The Ambunti District Health Services assembled a Rapid Cholera Response Team, and with helicopter support from the Frieda River Project the team was dispatched to Iniok to start its initial investigation and control of the outbreak.

The Rapid Cholera Response Team consisted of a health extension officer who was the team leader, two community health workers and a nursing officer. The team leader and the two community health workers were part of the government team that responded to the cholera outbreak in Maprik so were experienced in recognizing cholera symptoms and administering preventative strategies. The project site doctor also worked with the government team and provided daily reports to the project management.

The outbreak was contained by implementing basic hygiene measures. Specifically, the following activities were carried out in the affected and high risk villages:

- Encouraging and emphasizing boiling of drinking water
- Washing of hands with soap before preparing meals and before eating. In addition families were instructed to have meals together with all members of the family present so as not to allow food to be stored away for other family members who were absent during the meal times
- Covering of food from flies, rats and cockroaches
- Instructing lactating mothers to wash themselves and their hands before breastfeeding their babies
- Very strict guidelines to villagers on how to bury dead victims of the outbreak and any contaminated materials. Villagers were instructed to select about five members who were to transport the dead victim to the burial site for burial. The victim was to be buried with his or her contaminated clothes. The handlers' clothes were to be washed in very hot water at the burial site and the handlers were instructed to have a full bath with soap and return to the village in clean clothes
- The affected villagers were also instructed not to stage a 'house krai' (mourning house) for dead victims of the outbreak. Dead victims were to be buried on the same day. And the cultural practice of touching, kissing or throwing oneself on the dead person's body was strictly prohibited.
- Shaking of hands in the village was prohibited
- Every villager including children were prophylactically treated with Co-trimoxazole (Septrin) (children, lactating and pregnant women) and Doxycilline (all other adults) once only according to their weight in the villages of Iniok, Paupe, Ok Esai and Wabia. Infants under one year were not given these medications
- Treatment of cases with intravenous rehydration.

These very basic measures effectively stopped the outbreak. The Frieda River Project also assisted with other necessary logistic support throughout the Government response. Following the Project's outbreak guidelines, and with the recommendation of the project medical team, in-coming employees out on break in the villages were prevented from returning to work until the outbreak was contained and clearance given. This delay had a negative impact on the

project's drilling program schedule, but it was an important public health decision that prevented the possible introduction of the disease into the Project's camps. When the crew change did occur, all incoming employees were screened for symptoms of diarrheal illness and given Doxycilline (100mg 12 hourly for 2 weeks) whether they had symptoms or not. No one needed to be quarantined or sent back home.

### **Ongoing preventative activities and diarrheal illness surveillance**

Cholera awareness and prevention of diarrheal illness in the Project camps is an integral part of induction procedures and weekly health talks. The Project also has a community health program and cholera prevention is an important component of health education in the villages. Community clinics are conducted once every month in the villages by the project medical team.

There is also a daily VHF radio schedule that is managed by the community affairs team through which the medical team receives reports and updates of disease trends in the villages. Diarrheal illness in the Project camps is a notifiable illness and all notification is made to the site medical doctor who notifies the operations manager daily.

One month after the outbreak the project medical team conducted a survey testing samples from pit latrines in Iniok village. Samples for testing were randomly obtained and tested for cholera using a field rapid testing method. The names of all the households in Iniok were put in a basket, shaken and ten names were randomly selected. The test samples tested were from ten sites selected and were all negative for cholera.

### **Discussion**

It is not known if the diarrheal illness outbreak was cholera. The symptoms are highly suggestive of cholera but site testing on stool samples from pit latrines in the affected village of Iniok was negative for cholera. There are many reasons for the negative result but this paper will not enter into this discussion. Because of the high specificity and sensitivity of the rapid diagnostic kits Iniok was cleared of cholera and employees were allowed to return to work.

The outbreak at Iniok was contained using basic hygiene messages. The quick response to the outbreak site was made possible with logistic support from the Project and is a good example of a private-public partnership to contain disease outbreaks.

The main impact of the disease outbreak on the project schedule was a three weeks delay in crew change, which subsequently had a negative impact on the drilling program schedule. But it was an important public health decision that the Frieda River Project site management made to prevent possible disease introduction and outbreak in the site camps.

Operating exploration projects in remote locations in PNG presents unique challenges, one of which is the high risk of infectious diseases. Most companies also recruit unskilled labour from neighbouring villages and a disease outbreak in the community has a high possibility of being introduced into project site camps. It is vital therefore to consider these factors and have a public health program to monitor disease trends in the community as well as preventing disease outbreaks in the camps.

Monitoring disease trends in communities in the vicinity of a project site in PNG is a vital responsibility of the project medical team. Early signs of disease outbreaks can be detected by active disease monitoring and putting in place procedures for disease reporting. These reports can be used by the project management for timely decision making, planning and allocating resources where needed.

Further, having standard operating procedures for responding to disease outbreaks allows a co-ordinated approach in containing any outbreak. The Frieda River Project response to the Inlok outbreak was done using the site emergency response procedure which allowed proper logistical support for district health authorities as well as qualified health personnel to travel to the affected village and contain the outbreak.

Building good relationships with various stakeholders early in an exploration project is also an important aspect of any project in PNG. The community affairs department of the Frieda River Project had built a good working relationship with Ambunti District government which facilitated easier communication and response from the government.

### **Conclusions**

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

- Infectious disease outbreaks are a threat to exploration project sites and remote locations in PNG and this risk can be managed with risk assessment planning.
- Having an emergency response or epidemic response plan at project sites allows a well co-ordinated response to an outbreak.
- Building relationships with the community and the government is an important aspect to monitor disease trends and in responding to disease outbreaks.
- Ongoing public health education in project camps but more importantly in project affected villages prevents introduction of diseases from the villages into the project site.
- Disease monitoring in the community near a project site will provide early warning signs of potential disease outbreak.

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Ambunti District Health Authorities, Communities of Iniok, Paupe, Wabia and Ok Esai.

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### Author

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