Outbreak of Typhoid fever in Navosa, Fiji

Introduction:

Fiji has been experiencing typhoid endemicity with occasional outbreaks since last 3 years. It is estimated that typhoid rates in some parts of the country could be about 1-10 per thousand, thus amongst some of the highest rates like in India and China.

Small outbreaks of typhoid have happened in Fiji in the mid 1980’s however since then things had been under control. In the last few years typhoid outbreaks have been experienced in Northern division; on the second largest island-Vanualevu particularly in subdivisions; Savusavu, Wainunu in Bua, Macuata and on the island of Taveuni. Typhoid rates in these areas has come down however more recently outbreaks have been experienced in Rakiraki in the western division and Lami, Jittu Estate and sporadic cases Korovou in central division. There is few cases reported from Eastern division; mostly comprising of outer, smaller islands.

The latest outbreak of typhoid fever is in Navosa area in Western division, on the biggest island of Viti-Levu. Navosa is part of Nadroga province and has a population of approximately 5146 people, mostly indigenous Fijians, across 19 villages and 10 settlements, most of which are situated along the Sigatoka river. The affected area has rugged terrain and ridges thus making access to health services difficult for much of the population. This explains the delayed presentations in many cases. Health seeking behaviour itself is an issue. The Keiyasi Health centre serves this province. Medical teams from subdivisional, divisional and national level have been managing the situation in the area from last few weeks.

The overall development and provision of basic amenities like standard water supply and sanitary facilities are a challenge in this area. Much of the population use Sigatoka River as the main source of drinking water and ablution. There are huge limitations on sanitary facilities per house hold in many villages, including practice of hygiene and sanitation by the population. Immunisation has also been an issue in these areas. In the past there has been measles outbreak believed to have started in this medical area.

Epidemiology including chain of events:

The first confirmed typhoid case from this area was diagnosed on 14th November 2009, from Nabadalo settlement, near Nukuilau village. This case was picked through the divisional hospital based laboratory surveillance of typhoid, setup in 2009 and was managed with chloramphenicol. In March 2010 there were 4 more cases and the numbers rose steadily in April until May when the majority of the cases occurred. The Public health response was initiated by Medical officer from Keiyasi Health Centre however assistance was provided from higher level MOH and agencies on May 10th 2010,

Upon confirmation of outbreak it was decided to intervene using new guidelines-particularly using ciprofloxacin treatment for 5 days. In addition typhoid vaccine was introduced on the 1st of June 2010 and actual campaign started on the 4th of June2010. This was the first time Ciprofloxacin had been used the drug of choice for Typhoid Fever in Fiji.
Nurses have done tremendous job to immunise more than 95% of the Navosa population in a matter of weeks- the impact of which is shown in the decline aside from other contributions.

To date there have been total of 224 cases, only 27 of which have been confirmed cases from Navosa area and the rest have been suspected cases using the case definition. Most of the people affected have been children and younger adults- see graph on age distribution and both gender have been equally affected, although for some age groups males appear to be more affected. There have been a number of funerals (nine (9) from March to May 2010) in the area where some deaths are thought to be due to suspected typhoid. There have been possibly 2 or 3 deaths in suspected cases, of which one included a child with meningitis and hepatorenal syndrome, making it appear like leptospirosis.

The chain of event for this outbreak is such that in August 2009, illegal horse racing competition began at Nasatogo settlement, near Nukuilau. This weekly event is said to have attracted people from all over Navosa and as far as Nadi. During the event a wide range of food products, juice, ice and other drinks are sold every week. Despite declaring illegal in late April 2010 by health inspectors, it continued till 20th May 2010.

Many of the cases identified have at some stage consumed food sold at this weekly event and a number of them have admitted to preparing and selling food as well. On 9th April 2010 weekly rugby games started in Nukuilau, which appears to have contributed to the rapid spread, as food, juice and kava was sold and consumed at all events by people arriving from all over Navosa area.

From March to April 2010, some cases had been involved in food preparation on various occasions. Also in April there a huge gathering at Korolevu-the village with the highest number of cases where few deaths happened and also the evangelical team stopped over. The evangelism team that consisted of approximately 30 people, who toured Navosa in April, and one of the members became a suspected case later.

The horse racing was declared illegal following inspection by Health inspectors in April but continued until 20 May 2010 (week 20) when it was enforced. To support public health interventions Ministry of Health declared a Public Health Emergency in the area in order to exercise quarantine powers and so on in the area.

**Case definition**

The following case definitions were used to identify and count cases as the teams went about from village to village conducting investigation, case management and PH measures implementation including vaccinations;

A Suspected typhoid fever case was defined as someone with:

1. Fever of 3 days or longer
2. A fever case who lives in or has visited an area or village where there is an ongoing outbreak of typhoid fever.

A Confirmed typhoid fever was defined as:

Any suspected case with a blood or stool culture positive for S.Typhi.
By June 25th 2010 approximately 224 suspected and confirmed cases of typhoid fever have been identified using the case definitions stated. Most of the cases have been amongst the indigenous Fijians reflecting the population composition of the Navosa area.

Graph below shows both gender are affected by typhoid in Navosa however in some age groupings shown males had slightly more cases e.g.0-9, 20-29, 60+ etc. In general mostly children and the young adults are affected by typhoid in Navosa.

The epi-curve shows propagating nature of the typhoid, peaked in May – week 20 and since then it is on the decline following the PH interventions put in place.

Enhanced surveillance and line listing is still continuing. Fortunately the typhoid outbreak appears to be on the decline.

Subdivisional area level measures and stopping of horse race events perhaps decreased dissemination of the typhoid. If this is true as per epidemic curve than it is
likely that carriers or cases contaminated food or drinks that were sold/consumed at these events or similar gatherings. Nonetheless there are other observations suggesting breech of infection control practices and other just as likely hypothesis on modes of transmission warranting more detailed studies. Much of the rapid decline could be attributed to intensive detection and treatment with new guideline and vaccinations.

The map below shows the places where the greatest numbers of cases were seen.

It also shows the location of villages along and in proximity of the Sigatoka River and in terrain or ridge areas. In reality some of the locations are real challenges in terms of reach and access to health services. Cases at Keiyasi and Draiba village appear to be reported as high because they are nearby the health centre.

**Interventions:**
Public health Actions have ceased horse racing, declared illegal as it was operating without a permit- week 21. Public gatherings like sports have been restricted in the area.
Intensive health education, infection control, hand washing and soap provision is in place
Guidelines for the treatment of typhoid fever in Fiji has been developed with assistance of WHO and distributed to medical practitioners and outbreak teams including supplies of medications.
Ciprofloxacin is the mainstay of treatment for all suspected and confirmed cases in this outbreak.

Navosa has been declared as a Typhoid Emergency Area from 1st June to June 30th June, 2010, prohibiting any major public gatherings except funerals (From Week 21).

Mass vaccination of the population began for all those > 2years of age with Typhim Vi vaccine and the coverage stands at 96%.
Intense media awareness, health promotion has been continuing via television and radio messages including those in the Navosa dialect, highlighting the need for hand washing, good hygiene and sanitation. Education on excreta disposal is ongoing in Navosa with plans for more systematic addressing of water and sanitary facilities via other government sectors.

Compilation of data on village profile by the health teams that visited the sites will be used in rehabilitation projects for water and sanitation.

Enhanced surveillance for typhoid is still ongoing.

Plans are underway to conduct studies via Fiji School of Medicine to look at several aspects of the outbreak including impact of guidelines, vaccine efficacy and behaviour change aside from things mentioned above.

**Conclusion:**
There has been a decline in typhoid cases in Navosa, as per the Epi-curve following the implementation of various public health measures, however ongoing monitoring is continuing to ensure true reduction in illness and spread elsewhere.

The emergency decree for the area to prohibit public gathering and social activities has been lifted as of yesterday. Surveillance continues. The next phase is to advocate for community wide developments for safe water supply and human waste disposal. The proposal is based in community profile datasets obtained during the outbreak. The Typhoid Vaccination Campaign has rolled out into other affected areas in Fiji targeting 70,000 populations. This is for completion by August 2010.

A new Treatment Guideline for Typhoid Fever will be finalised soon.

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