

Typhoid fever in Tongatapu (Tonga)

Introduction

This paper describes the different strategies used in Tonga during the last 30 years to combat typhoid fever. The effectiveness of these strategies is assessed in terms of their ability to prevent and perhaps control a typhoid outbreak on Tongatapu, the main island group in Tonga.

The strategies used are grouped into time-periods, in years, to simplify the process of assessing their effectiveness. When these strategies were first implemented, there were high expectations for successful outcomes, especially since they were carried out using principles of good public health practice. Unfortunately, as the results show, the control and prevention of typhoid fever in any developing country, such as Tonga, is a challenging task.

(The opinions presented in this paper are the author's own, and should not be considered to represent the views of the Ministry of Health.)

The country

Tonga consists of 150 islands divided into three major island groups: Tongatapu, Vava'u and Ha'apai. There are also two minor groups, the Niua and 'Eua. The climate is typically tropical with rain all year round. In 2002, the population was just over 100,000, with 69% living on Tongatapu, 16% on Vava'u, 8% on Ha'apai, 5% on 'Eua and 2% on the Niua. There is a high literacy rate. Travelling between the island groups is easy, with all of them having airstrips and good wharves for small to medium-sized inter-island boats.

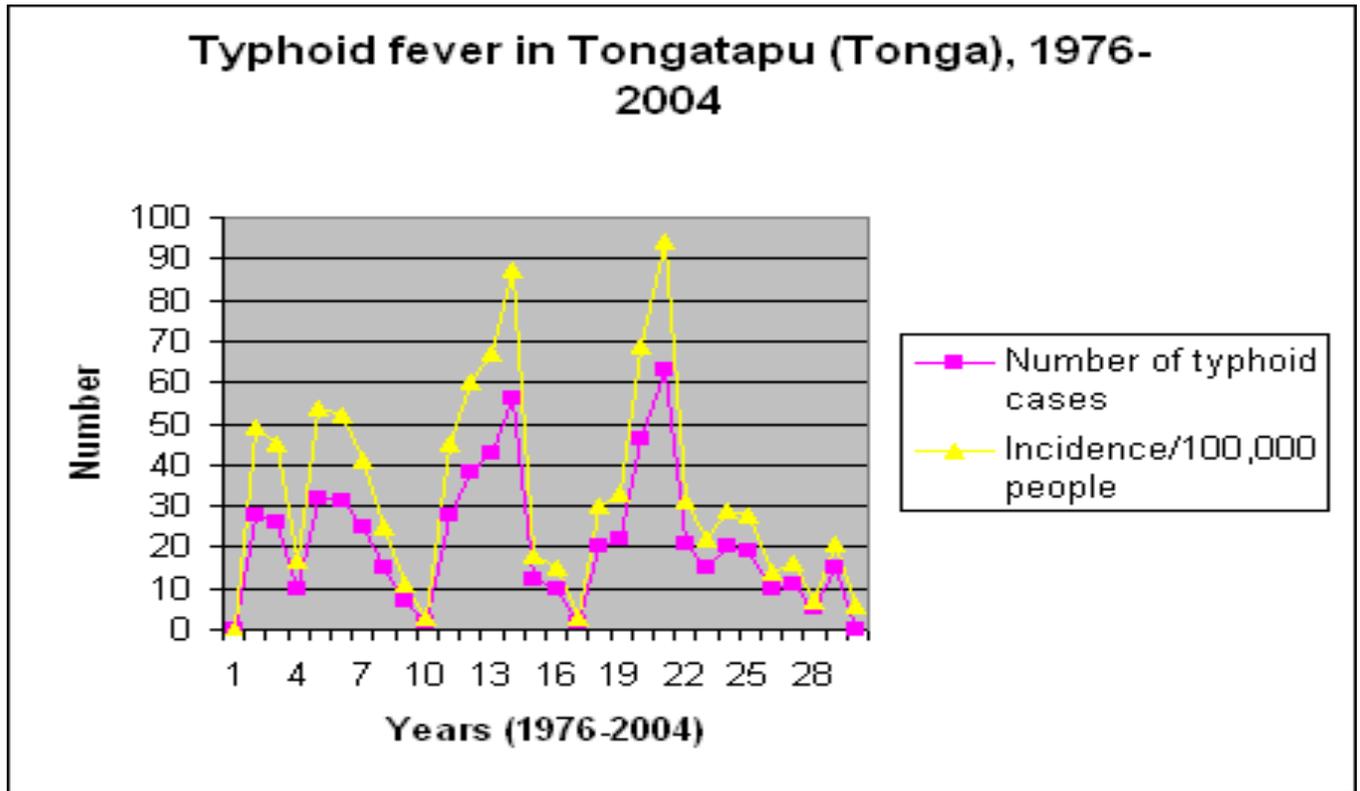
Significant history of typhoid fever in Tonga

The four leading causes of mortality in Tonga from the 1930s to 1940s were typhoid, tuberculosis, tetanus and whooping cough (Ministry of Health reports). With improvements in people's general living standards and the introduction of vaccination in the 1950s and 1960s, the incidence of tuberculosis, tetanus and whooping cough decreased significantly.

Typhoid fever, on the other hand, became an endemic disease with an average annual incidence of 32.4/100,000 from 1977 to 1989. There were also somewhat regular cycles of outbreaks, every 7 to 8 years (Dr Kopecky, 1991; Dr Markvart, 1990). The last major outbreak was in 1994–95 when there were more cases than in the previous major outbreak in 1986–88. Obviously, the public health activities carried out after the 1986–88 outbreak were not effective enough to prevent the more extensive one in 1994–95. The graph below shows the incidence of typhoid fever on Tongatapu between 1976 and 2004. The annual incidence of typhoid fever from 1976 to 2004 was based on laboratory-confirmed cases at Vaiola Hospital, by positive culture for *Salmonella typhi* of either stool, blood or, in rare cases, urine specimens. Vaiola Hospital is the main referral hospital for the whole country and it is located on Tongatapu.

Typhoid control strategies used pre-1970

Prior to the 1970s, the main factors that had indirect positive effects on the control and prevention of typhoid fever in Tonga were improvements in general living standards and hygiene practices amongst the people.



1970–78 period

Many activities were carried out during this period, apparently ‘kick-started’ by the opening of the new Vaiola Hospital in 1971. Together with this new infrastructure development, the administration of the public health division was improved and laboratory services were developed.

Programmes to provide a reticulated water supply to rural areas were also completed during this period and new legislation banning private wells was passed. However, there was concern at the removal of a readily available source of water for washing and cleaning.

Another factor believed to have led to an improvement in living standards during this period was the short-term employment opportunities offered by the New Zealand government. There is no doubt that this led to significant improvements in housing standards, sanitation and hygiene for Tongans.

1978–1988 period

At-risk groups were vaccinated against typhoid during outbreaks in 1981, 1986, 1987 and 1988. In the late 1980s, several WHO consultants visited Tonga to investigate the typhoid outbreaks. One of the most fascinating conclusions they drew was the epidemiological confirmation that “typhoid transmission in Tonga was due to fecal contamination of food by unhygienic handling by typhoid carriers, and contaminated water was not the primary cause of transmission”.

1988–1995 period

A typhoid taskforce was established in 1989 to prepare and implement a comprehensive strategic plan for control of typhoid fever. The main objective, again, was to prevent another outbreak.

The activities implemented included refresher training for public health staff on surveillance for and control of typhoid and strengthened programmes to improve sanitation and hygiene.

This included attempts to destroy pit-latrines, chlorinate all water supplies and provide education on hygienic food practices. 'Healthy carriers' of typhoid were also identified and counselled in the hope that they would avoid any part in food preparation.

At the same time, the involvement of health centres in sanitation and hygiene health promotion activities was strengthened and, finally, people involved in food processing industries were routinely tested to ensure that they were not typhoid carriers.

Initial outcome of the strategies

In spite of these strategies, there were still problems with the various programmes. This was most evident when the biggest outbreak of typhoid fever in the last decade struck in 1994–95.

After discussions with stakeholders, the following factors were identified as the main contributors to the lack of a positive outcome despite the implementation of the various strategies:

- lack of resources, especially for the outlying islands;
- frequent staff turnover;
- management issues;
- unclearly defined strategies that were vague in regard to responsibilities and time frames;
- difficulties in identifying and following up typhoid carriers;
- unreliable water supply for toilets;
- still some homes with pit-latrines, or even no toilets;
- insufficiently hygienic kitchen facilities for cooking; and
- high cost of toilet paper.

In 1996, after the 1994–95 epidemic, people were becoming discouraged and tired of trying to prevent and control a disease that appeared to have no respect for the hard work being done by the Ministry of Health and the public. In fact, laboratory staff were overwhelmed with stool specimens and public health staff were fed up with chasing typhoid carriers. At this time, it became obvious that something had to be done about typhoid carriers.

1999 strategy

In 1997, following a literature search that produced evidence showing that oral ciprofloxacin was more effective for treating chronic typhoid carriers than IV ampicillin, oral bactrim or oral chloramphenicol, agreement was reached with the public health division to try out this new strategy in Tonga. After further negotiations with stakeholders, the strategy was approved by the Ministry of Health for implementation in 1999.

The initial outcome of this new strategy was a sudden dramatic drop in the incidence of typhoid fever in 2000, 2001 and 2002. Unfortunately, in 2003 it rose unexpectedly, but it fell again in 2004 and 2005 following concerted efforts by public health staff to prevent any further spread of these somewhat sporadic outbreaks.

Conclusion

This review of the effectiveness of the various strategies used in Tonga so far suggests the following general conclusions:

- There is no one 'magic bullet' for the prevention and control of typhoid fever.
- Different strategies must work hand in hand to produce a sustainable positive outcome.

- The typhoid taskforce must constantly review and update its guidelines on surveillance for and control of typhoid to ensure that stakeholders are kept informed of developments in this important programme.
- Good leadership is required to ensure that the team is focused on the tasks at hand. At the same time, team members must be supported where necessary, especially in building their capacities to be more effective team members.
- Various international agencies are willing to support any programme to help prevent and control typhoid fever in the Pacific Islands.
- The typhoid taskforce must look at other key health determinants that depend on factors such as housing, income, unemployment and so forth to provide a clearer view of the type of constraints it will always face in fighting typhoid in the future. This will help prevent them becoming discouraged by frequent temporary failures in striving for constant success in a land that has only limited resources.

Last, but not least, we should remember that typhoid control and prevention strategies adopted by Pacific Island countries present challenges and opportunities that will make us better health care workers in our region.

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