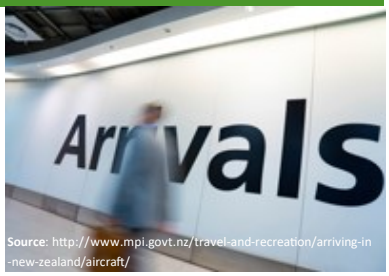
Border Health in New Zealand

HIGHLIGHTS:

- **Zika declared a 'Public Health Emergency of International Concern' in 2016.**
- **99 cases of Zika were imported into New Zealand in 2016 and there was one locally acquired sexually transmitted case.**
- **In 2016 New Zealand recorded its highest total for all reported cases of mosquito-borne diseases since 2001.**
- **Dengue Fever was the most commonly diagnosed mosquito-borne disease in 2016.**
- **From 2015-16 the Asian and Pacific regions were the most frequently visited regions among mosquito-borne disease cases.**
- **There were age, gender, ethnic and regional differences in who acquired these exotic diseases.**



Source: http://www.mpi.govt.nz/travel-and-recreation/arriving-in-new-zealand/aircraft/


Source: https://safetravel.govt.nz/news/health-information

Exotic diseases are bad for border health

This indicator explores how New Zealand health is affected by exotic diseases which cross our international borders. Certain exotic diseases can pose a greater risk because:

- New Zealanders are not immune to them (e.g. disease is not locally acquired, no vaccine exists),
- they spread easily
- they can cause severe illness
- they are difficult to treat.

High-risk exotic diseases include:

- any disease classified as a 'Public Health Emergency of International Concern' by the World Health Organization (WHO) - these pose a high international threat;
- severe respiratory diseases which can cause serious lung infections (e.g. influenza like 'Bird Flu');
- and specific vector-borne diseases, particularly those spread by mosquitoes (e.g. Dengue Fever, Malaria) - these can cause fever, joint pain, bleeding problems, and can be fatal (WHO 2018).

The list of overseas diseases of priority concern to New Zealand needs regular review due to the fast changing infectious disease environment in the world (Mackenzie 2011).

Public Health Emergencies of International Concern 2016-17

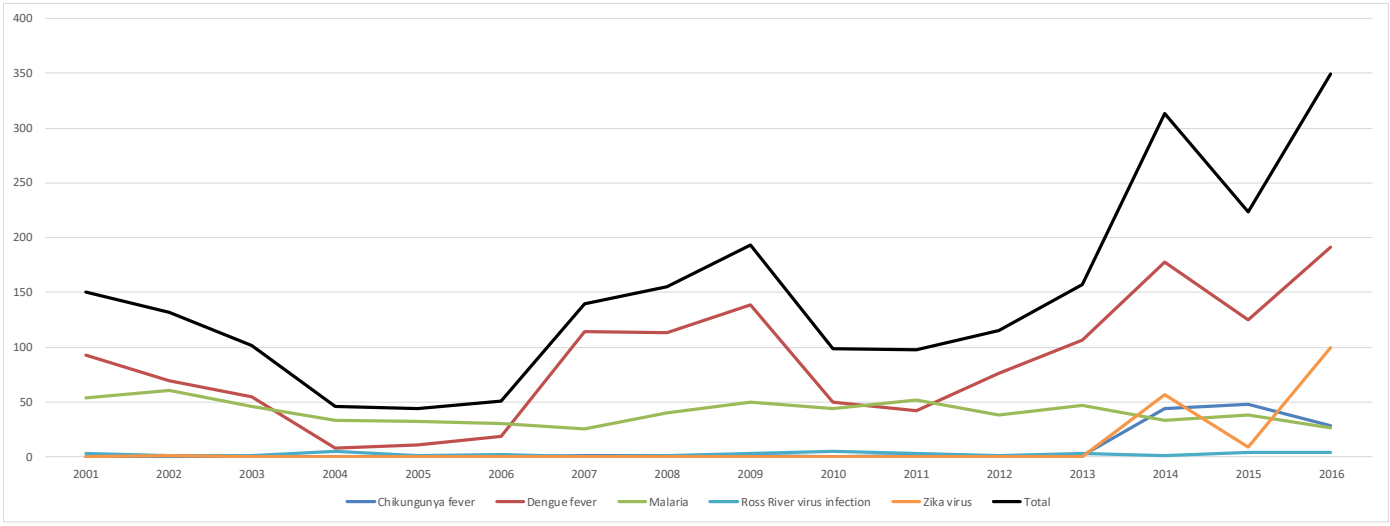
During 2016-17, there were two 'Public Health Emergencies of International Concern' (WHO, 2018). These were Zika infection and microcephaly and other neurological disorders (February— November 2016), and Polio (2014-present). No cases of Polio were reported in New Zealand. In 2016 there were 99 cases of imported Zika, mainly from the Pacific. There was one locally acquired sexually transmitted case (ESR 2016).

Border Health in New Zealand

Five mosquito-borne diseases detected in New Zealand in 2016

Five mosquito-borne diseases were reported in New Zealanders 2016 (ESR 2018). This included diseases caused by four mosquito-borne viruses (Chikungunya, Zika, Ross River virus and Dengue fever) and one mosquito-borne parasitic disease (Malaria).

Figure 1: Number of case notifications of priority border health diseases detected in New Zealand, 2001-16



Data Source: ESR 2018

Mosquito-borne diseases have increased in New Zealand, since 2001. This trend was driven by an increase in the number of Dengue cases, and the emergence of Zika and Chikungunya since 2014. In 2016, New Zealand recorded its highest total for all reported cases of mosquito-borne diseases since 2001.

Since 2001, annual Malaria cases have averaged 41, although recent years have seen fewer cases. Ross River Fever remained a rare disease, averaging two cases annually.

Trends in Mosquito-borne Diseases in the Pacific

For live and historical data see:
Pacific Public Health Surveillance Network
www.pphsn.net

Asymptomatic disease

As many as 80% of people infected with some mosquito-borne diseases may have no or mild symptoms (Duffy et al 2009). So the true burden of disease in New Zealand could be much greater than those who became symptomatic and were diagnosed.

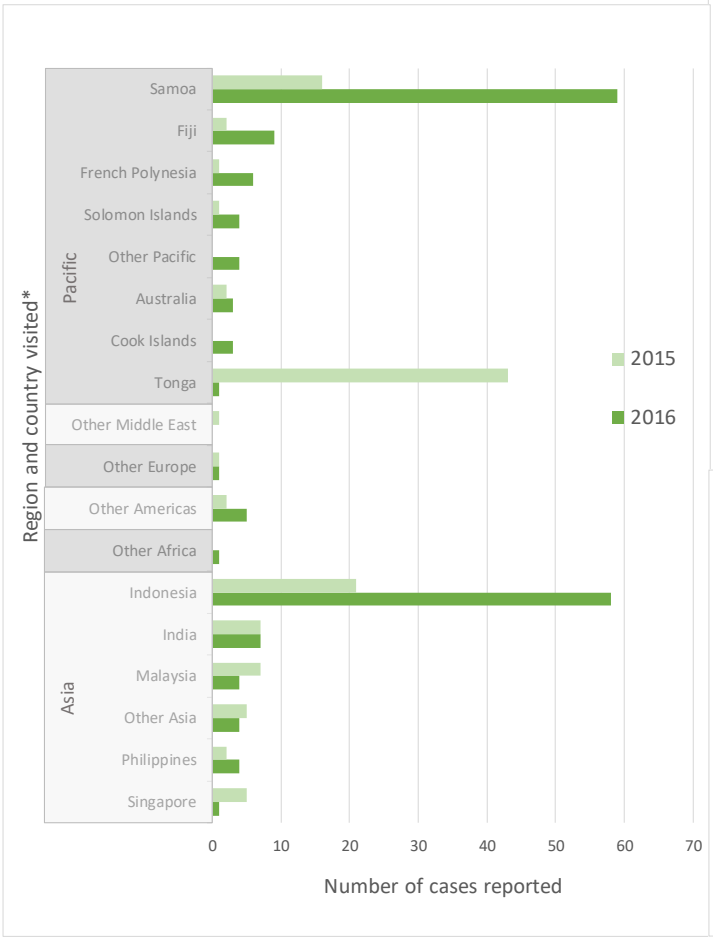
Border Health in New Zealand

Almost all mosquito-borne diseases were thought to have been acquired overseas

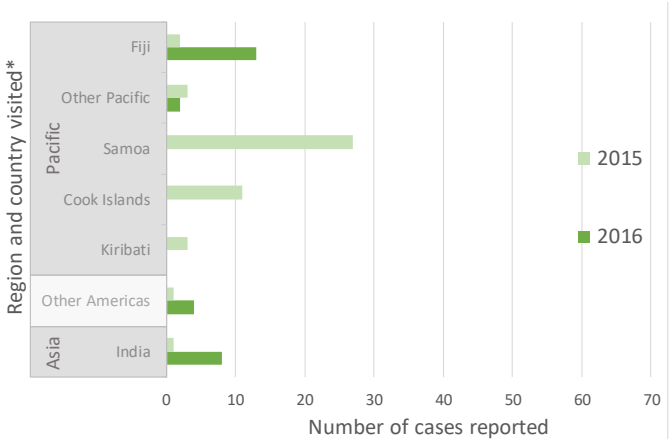
During the years 2015-16, nearly all people diagnosed with mosquito-borne diseases were thought to have acquired these diseases while travelling overseas (ESR 2018). The exception to this was one locally acquired case of Zika in 2016, although this was most likely sexually transmitted (ESR 2016). Figure 2 summarises the main destinations visited before diagnosis for Dengue Fever, Chikungunya and Zika in 2015 and 2016.

Figure 2: Countries reported to have been visited by New Zealand travellers prior to diagnosis, 2015-16 for mosquito-borne diseases

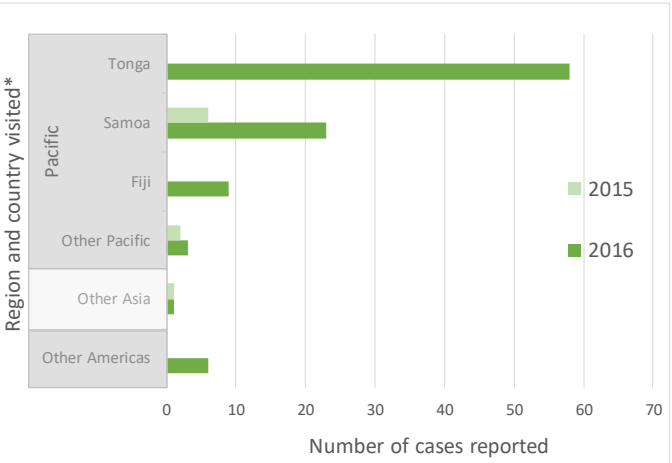
a) Dengue fever



b) Chikungunya virus



c) Zika virus

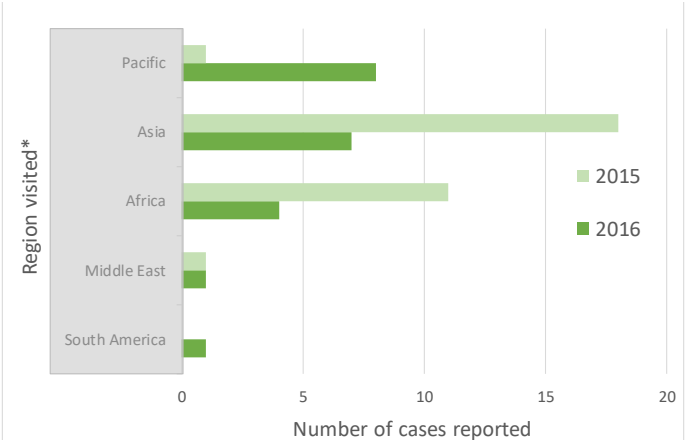


*Some cases visited more than one country. All countries potentially attributable to disease infection are included. Data source: ESR 2018.

In 2015-16, the vast majority of Chikungunya and Zika cases are likely to have become infected when travelling in the Pacific region (Figure 2.b-c), particularly Samoa, Tonga, and Fiji. Whereas, people diagnosed with Dengue Fever in 2015-16 had commonly visited countries in Asia as well as the Pacific (Figure 2.a).

Over the 2015-16 period, people diagnosed with Malaria in New Zealand had most commonly visited Asia and Africa. In 2016 the Pacific was also a commonly visited region (Figure 3). India was the most frequently visited country among Malaria cases over the 2015-16 period. Of the 64 overseas country visits among Malaria cases, 18 were to India.

Figure 3: Regions visited by before Malaria diagnosis, 2015-16



*Some cases visited more than one country. Data source: ESR 2018

Who is most affected by exotic diseases in New Zealand?

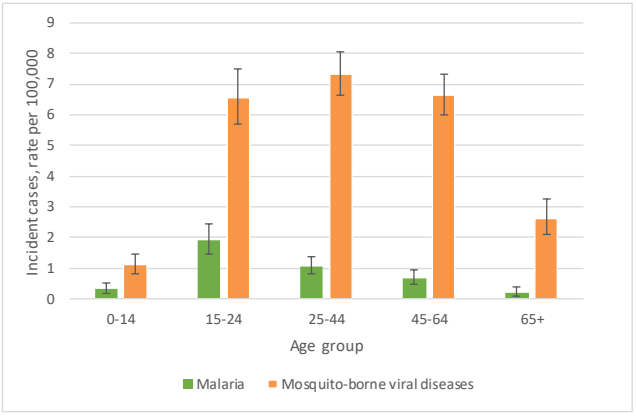
Gender differences

In 2015-16, New Zealand males and females were equally likely to be diagnosed with mosquito-borne viruses (ESR 2018). However, males were statistically significantly more likely to be diagnosed with Malaria (a parasitic disease) than females. There were twice as many cases of malaria in males compared to females (44 male cases vs. 20 female cases) (ESR 2018). This pattern is possibly due to gender differences in taking part in outdoor activities when visiting Asia, where Malaria is more prevalent (Lau et al 2014).

Age differences

Over the five year period 2012-16, children (<15) and older adults (65+) were less likely to be diagnosed with malaria compared to youth (15-24) and young adults (25-44). Over the same period, those aged 15-64 were six times more likely to be diagnosed with mosquito-borne disease than children (<14) and three times more likely to be diagnosed with mosquito-borne disease than older adults (aged 65+) (Figure 4).

Figure 4: Incident rate of malaria and mosquito-borne viral diseases 2012-16, by age



Data source: ESR 2018

Ethnic differences

Figure 5.a: Incidence rates of mosquito-borne viral diseases, 2015-16, by ethnicity

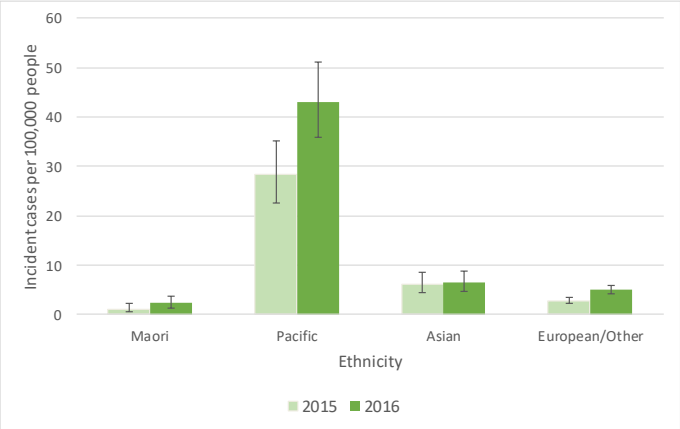
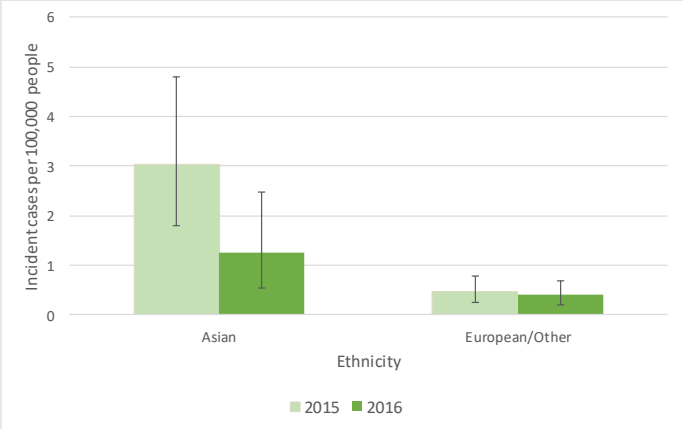


Figure 5.b: Incidence rates of Malaria diagnosis, 2015-16, by ethnicity



Ethnicity is prioritised, incidence rates are crude and 95% confidence intervals are shown (see metadata sheet). Some cases had unknown recorded ethnicity and could not be included: 11/186 and 9/323 arbovirus cases, and 1/38 and 2/26 Malaria cases, in 2015 and 2016, respectively. Malaria rates for Māori and Pacific were excluded from Figure 5.b due to small case numbers. Data Source: ESR 2018

Table 1: Number of cases of mosquito-borne diseases diagnosed, 2016, by ethnicity

Ethnicity	Chikungunya	Dengue Fever	Ross River virus	Zika	Malaria	Total
Māori	-	15	-	-	-	15
Pacific	-	55	-	66	-	121
Asian	11	17	-	-	8	36
Euro/other	10	99	-	25	12	146
Unknown	2	5	0	2	2	11
Total	23	191	0	93	22	329

Small or zero case counts are suppressed (-) and ethnicity is prioritised (see metadata sheet). Data Source: ESR 2018

In 2016 Pacific and European/Other ethnicities had statistically significant increases in rates of mosquito-borne disease compared to 2015. The rate of mosquito-borne disease in Pacific people was nine times that of European/Other ethnicities (Figure 5.a). In 2015, Asian people had a statistically significantly greater rate of malaria than European/Other ethnicities. However, in 2016 these rates were not significantly different (Figure 5.b).

Table 1 shows the total case numbers for mosquito-borne viruses were highest for European/Other and Pacific ethnic groups in 2016. Dengue fever was the most common virus diagnosed, except among Pacific people where Zika was the most common.

Socio-economic differences in rates of mosquito-borne diseases, 2015-16

From 2015 to 2016, there were statistically significant differences in the rates of mosquito-borne disease diagnoses in New Zealand by different levels of socio-economic deprivation (Atkinson et al 2014). More deprived areas had higher rates of mosquito-borne disease than less deprived areas. Incidence rates were 8.7 cases of mosquito-borne virus diagnosis per 100,000 people living in the most deprived areas (NZDep2013 quintile 5) and 5.8 cases per 100,000 in the least deprived areas (quintile 1). For Zika the difference in rates between deciles was even more pronounced. Incidence rates were 0.7 and 2.4 cases of Zika per 100,000 people living in quintiles 1 and 5, respectively.

Most exotic diseases were diagnosed in the Auckland DHB, 2015-16

During 2015 and 2016, people living in the Auckland DHB tended to be more likely to be diagnosed with a mosquito-borne virus than people living in other areas (Figure 6.a). 126 of 573 cases (22%) were in Auckland DHB. Although all DHBs observed an increase in rates of mosquito-borne viruses, the increase was only statistically significant in Bay of Plenty DHB, where the rate increased four-fold.

Figure 6.a: Age standardised incidence rates of mosquito-borne virus diagnosis, 2015-16, by DHB

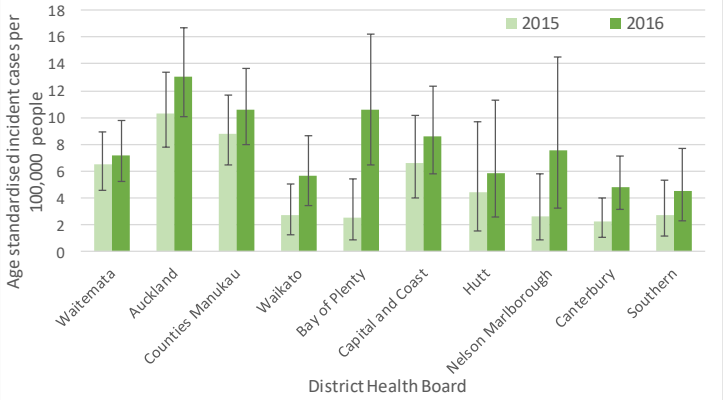
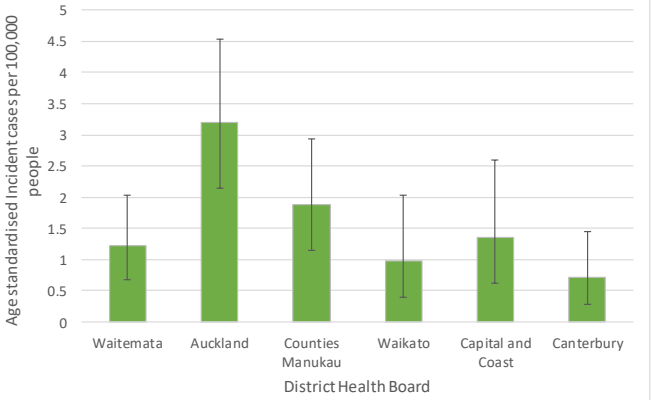


Figure 6.b: Age standardised incidence rates of Zika diagnosis, 2015-16, by DHB



Graphs present age standardised rates and 95% confidence intervals for counts >4 (see metadata sheet). Figure 6.b shows rates for two years aggregated data. Data Source: ESR, 2018

In 2015 and 2016, the Auckland DHB had the highest number of Zika cases diagnosed (32), followed by Counties Manukau (20), Waitemata (15), and Capital and Coast (9). Rates were significantly higher in Auckland when compared to Waitemata, Waikato and Canterbury (Figure 6.b). All other DHBs had low or zero case numbers.

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* WHO = World Health Organization; ESR = Institute of Environmental Science and Research Limited

This indicator's metadata sheet can be viewed on the EHINZ website for further information

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