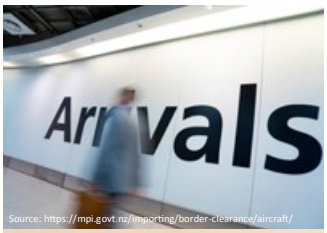
High-risk Pests Caught at New Zealand's Border

HIGHLIGHTS:

- **On average, there were nine border interceptions each year of exotic mosquitoes originating from overseas, 2006-15. Most (>80%) interceptions occurred in Auckland.**
- **Fifteen types of high-risk mosquito species of public health concern were caught, 2006-15. *Aedes aegypti*, *Aedes albopictus* and *Culex quinquefasciatus* were the most commonly intercepted species. They are capable of spreading serious diseases.**
- **Most (73%) intercepted suspected mosquitoes originated from the Asia-Pacific region. Australia was by far the biggest source by country.**
- **Most suspected mosquitoes came by sea and among general cargo.**



Source: https://mpi.govt.nz/importing/border-clearance/aircraft/


Source: https://www.safetravel.govt.nz/news/zika-virus

Foreign pests, particularly mosquitoes, are bad for our health

Insects, especially mosquitoes, are experts at international hitch-hiking: e.g. hiding in aircraft holds, laying larvae in puddles on ships. Exotic mosquitoes are highly unwanted in New Zealand due to their ability to spread serious mosquito-borne diseases (e.g. Dengue Fever, Malaria).

Various international activities help prevent pests crossing borders. For example, international aircraft are regularly sprayed with insecticide, and freight cargo are sealed until entering inspection zones. National mosquito surveillance takes place at New Zealand's border: international airports and sea-ports. This helps capture exotic mosquitoes to prevent them from establishing. It also tells us which exotic mosquitoes are arriving at our borders, where they are coming from, and how they are travelling (e.g. air, sea, cargo).

Suspected mosquito interceptions of foreign origin, 2006-2015.

A total of 149 interceptions of suspected mosquitoes of likely foreign origin were captured at the New Zealand border between 2006 and 2015 (Figure 1) (NZ BioSecure 2016a).

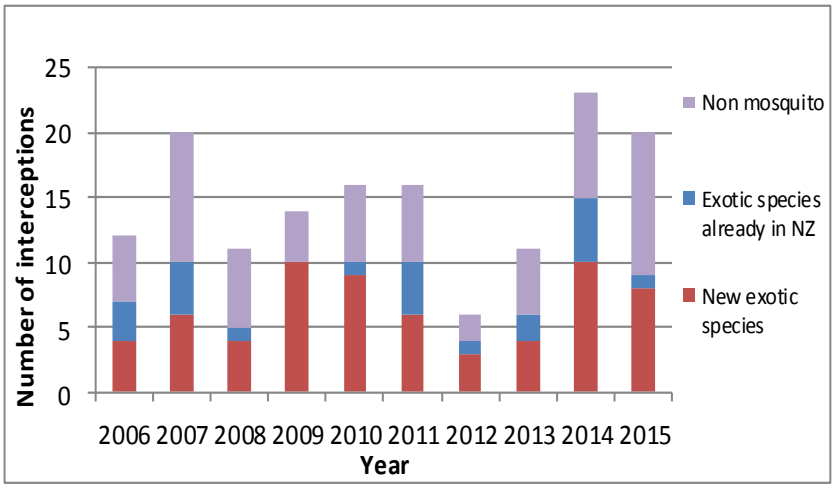


Figure 1: Number of suspected mosquito interceptions at the New Zealand border, of probable overseas origin, 2006-15

Data Source: NZ BioSecure, 2016a

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An interception means at least one suspected mosquito was identified at the border at one place and time (e.g. in a shipment of bananas). Each year, some interceptions turn out to be insects of other types (non-mosquitoes) or exotic mosquito species already established in New Zealand (Figure 1). These interceptions help flag potential routes for high–risk pest entry across our border.

Between 2006 and 2015, there were **86 interceptions of exotic mosquitoes** which were thought to have travelled from overseas to New Zealand (i.e. not local mosquitoes inadvertently caught) (Figure 1). Over one quarter of these intercepts (24/86) took place in 2014 and 2015. It is difficult to tell if year-to-year variation in interception numbers are statistically different due to small annual numbers and gradual improvements in the border surveillance programme over time. On average, there were nine border interceptions of exotic mosquitoes originating from overseas each year, between 2006 and 2015.

Over 80% (120/149) of all interceptions of suspected mosquitoes of foreign origin took place in the **Auckland** region between 2006 and 2015. Christchurch was the next most frequent location (15) and then Wellington (8).

30 types of exotic mosquito species were intercepted, 2006-15

30 types of exotic mosquitoes were caught at the New Zealand border, 2006-15 (NZ BioSecure 2016a). Fifteen were high-risk species, i.e. on New Zealand's list of exotic mosquitoes of public health concern (NZ BioSecure 2016b). These included twelve interceptions of *Aedes aegypti* (the 'Yellow Fever mosquito'; a severe-risk species for many diseases e.g. Chikungunya, Zika, Dengue and Yellow Fevers), ten interceptions of *Aedes albopictus* (the 'Asian Tiger mosquito'; a severe-risk species for many diseases e.g. Chikungunya, Ross River Fever and West Nile Virus), and two interceptions of *Anopheles* species (with Malaria carrying potential). ***Aedes aegypti***, ***Aedes albopictus*** and ***Culex quinquefasciatus*** were the species most commonly intercepted. A table summarising all foreign suspected mosquito interceptions, between 2006 and 2015, can be viewed on the EHINZ website.

Yellow Fever mosquito (left) and its larvae (right). Source: Wikipedia

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Most interceptions of foreign suspected mosquitoes were from countries in the Asia-Pacific region

Nearly three-quarters (73%) of exotic mosquito and non-mosquito interceptions of foreign origin were thought to have come from the Asia-Pacific region (Table 1) (NZ BioSecure 2016a). The proportion was the same for mosquito interceptions alone (65/86). By country, Australia was by far the main source (39 interceptions: 27 exotic mosquito and 12 non-mosquito). The next most frequent was Ecuador (10), then Fiji, China and Japan (6 each).

Table 1: Number of suspected mosquito interceptions at the New Zealand border of probable overseas origin, 2006-2015

Region of Origin	Country of Origin (Number of Exotic Mosquito and Exotic Non-Mosquito Interceptions)	Percentage of Total Interceptions	Mode Of Travel
Asia	Japan (6), China (6), Singapore (4), Philippines (3), Thailand (3), India (2), Bangladesh (1), Cambodia (1), Hong Kong (1), Malaysia (1), South Korea (1), Taiwan (1), Vietnam (1) **Total = 31**	25.4 %	29% Air, 71% Sea
Europe	UK (2), Germany (1), Netherlands (1) **Total = 4**	3.3 %	100% Sea
Pacific	Australia (39), Fiji (6), Vanuatu (3), New Caledonia (2), Samoa (2), Cook Islands (2), American Samoa (1), Niue (1), Papua New Guinea (1), Tahiti (1) **Total = 58**	47.5 %	26% Air, 74% Sea
The Americas	Ecuador (10), USA (4), Chile (2), Panama (1) **Total = 17**	13.1 %	100% Sea
Other	Unknown (13) **Total = 13**	10.7 %	38% Air, 62% Sea

Data Source: NZ BioSecure, 2016a*

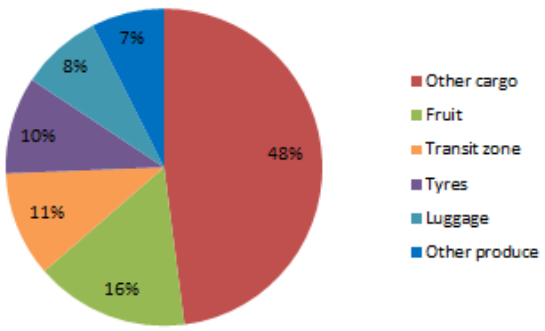
These patterns may reflect the closer travel and trade relationships New Zealand has with Asia-Pacific countries, particularly Australia. Of note, there has been an increase in interceptions from South America in the last decade when compared with historical records prior to this (Derraik 2004). This may be related to increasing globalisation of travel and trade.

High-risk pests most often travel by sea and general cargo

The majority of high-risk pests were suspected to have travelled by sea, 2006-15 (Table 1) (NZ BioSecure 2016a). Over 99% of imported goods to New Zealand are transported by sea (Statistics NZ 2016).

Figure 2 shows the largest proportion of interceptions of suspected mosquitoes of overseas origin were among 'other cargo' (e.g. household goods, shipping containers—contents not specified). Fruit (e.g. bananas, mandarins) were the next most common type of identified cargo where interceptions occurred.

Figure 2: Pie chart of suspected mosquito interceptions of probable overseas origin, by location of discovery at the New Zealand border, 2006-15



For more information, a table of annual intercept counts and locations is presented on the EHINZ webpage for this indicator. Data Source: NZ BioSecure, 2016a

*See metadata sheet for further details

References

Derraik JGB. 2004. Exotic mosquitoes in New Zealand: a review of species intercepted, their pathways and ports of entry. *Aust N Z J Public Health* 28(5): 433 – 44.

New Zealand BioSecure Entomology Laboratory (NZ BioSecure). 2016a. *Mosquito interceptions dataset.* Southern Monitoring Services Limited. (Senior Entomologist J Kasper, personal communication, 2016).

New Zealand BioSecure Entomology Laboratory (NZ BioSecure). 2016b. *Exotic Mosquitoes.* Southern Monitoring Services Limited. URL: www.smsl.co.nz (accessed June 2016).

Statistics New Zealand (Statistics NZ). *Infoshare. Overseas cargo statistics: Total imports by New Zealand port (Annual-Jun)*. URL: www.stats.govt.nz (accessed June 2016).

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