High-risk pests caught at New Zealand's border

This factsheet presents information on exotic mosquitoes and other insects caught at our border (international airports and seaports) by New Zealand's mosquito surveillance programme.

Key facts

There were 14 interceptions containing mosquitoes of overseas origin in 2020.

20 types of high-risk mosquito species of public health concern were caught between 2011–2020. Culex quinquefasciatus, Aedes aegypti and Aedes vexans were the most common species.

34.3% of all interceptions of overseas origin originated from the Pacific region between 2011–2020. Australia was the most common country of origin.

36.7% of mosquito interceptions of overseas origin were discovered among 'other cargo' (eg, household goods, shipping containers—contents not specified) between 2011–2020.

Background information

Insects, especially mosquitoes, are experts at international hitchhiking: eg, 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 infectious diseases (eg, dengue fever, malaria).

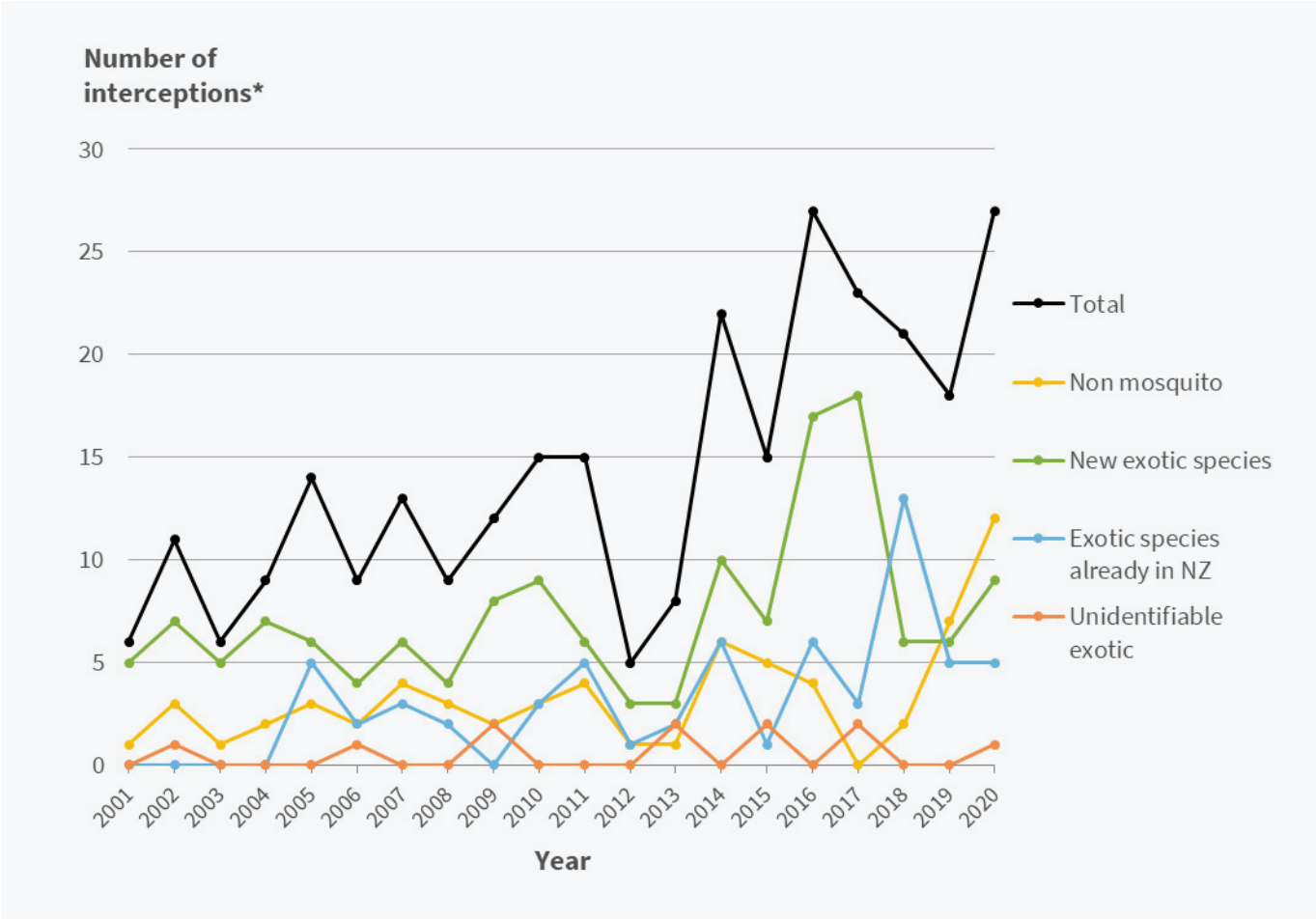
Various international activities help prevent pests crossing borders. For example, international aircraft are regularly sprayed with insecticide, and freight cargo are sealed until entering inspection zones. National mosquito surveillance takes place at New Zealand's border: international airports and seaports. 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 (eg, air, sea, cargo).

Suspected mosquito interceptions of overseas origin, 2001 – 2020

Mosquitoes of overseas origin include new exotic mosquito species entering New Zealand and exotic species established in New Zealand re-entering New Zealand from overseas.

Between 2011 and 2020, there were 128 interceptions of overseas origin. This compares to 73 interceptions the decade earlier (Figure 1).

Figure 1: Number of mosquito interceptions of overseas origin, 2001 – 2020



Note: An interception may include several insects which fall into different categories. Therefore, the sum of all categories is higher than the total number of interceptions.
Source: NZ BioSecure 2021a

An interception means at least one suspected mosquito was identified at the border at one place and time (eg, 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 other interceptions help flag potential routes for high-risk pest entry across our border.

In 2020, there were 14 interceptions containing mosquitoes of overseas origin, compared to an average of 13 interceptions per annum between 2011 and 2020. Of the 14 interceptions in 2020, five contained mosquitoes whose species is already established in New Zealand. Nine interceptions contained new exotic mosquitos.

About 70% of all interceptions of overseas origin took place in the Auckland region between 2011 and 2020. Christchurch was the next most frequent location (14%) and then Wellington (9%) (NZ BioSecure 2021a). Of imports by air in 2020, 92% were to Auckland Airport, 7% to Christchurch Airport, and 1% to Wellington Airport (Statistics NZ 2021).

43 types of exotic mosquito species were intercepted, 2011–2020

Forty-three types of exotic mosquitoes were caught at the New Zealand border between 2011 and 2020 (NZ BioSecure 2021a). Twenty were high-risk species, that is, on New Zealand's list of exotic mosquitoes of public health concern (NZ BioSecure 2021b). These included 20 interceptions of *Aedes aegypti* (the 'Yellow Fever mosquito'; a severe-risk species for many diseases eg, Chikungunya, Zika, dengue and yellow fevers) and seven interceptions of

Aedes vexans (the 'Floodwater mosquito'; capable of carrying West Nile virus). *Culex quinquefasciatus*, *Aedes aegypti* and *Aedes vexans* were the species most commonly intercepted. A table summarising all mosquito interceptions of overseas origin, between 2011 and 2020, can be viewed on the EHINZ website.

Interceptions of overseas origin were most frequently from countries in the Pacific region

Of all interceptions of overseas origin between 2011 and 2020, 34.3% originated from the Pacific region. Australia was the most common source country for interceptions (41), followed by Ecuador (14), USA and China (11 each) (Table 1).

Table 1: Number of mosquito and non-mosquito interceptions of overseas origin, by region and country, 2011–2020

Region of origin	Country of origin (Number of interceptions)	Percent of total interceptions	Travel mode
Pacific	Australia (41), Fiji (9), Tonga (4), Samoa (3), New Caledonia (1), Vanuatu (1) **Total: 59**	34.3	Sea: 71% Air: 27% Unknown: 2%
Asia	China (11), India (9), Japan (6), Malaysia (5), Singapore (5), Philippines (3), Hong Kong (2), Korea (2), Taiwan (2), Thailand (2), Bangladesh (1), Cambodia (1), Indonesia (1) **Total: 50**	29.1	Sea: 72% Air: 24% Unknown: 4%
Americas	Ecuador (14), USA (11), Chile (2), Colombia (2), Argentina (1), Mexico (1), Panama (1) **Total: 32**	18.6	Sea: 81% Air: 19%
Europe	Germany (3), Italy (2), UK (2), Belgium (1), Netherlands (1) **Total: 9**	5.2	Sea: 100%
Africa	South Africa (1) **Total: 1**	0.6	Sea: 100%
Unknown	**Total: 21**	12.2	Sea: 29% Air: 67% Unknown: 4%

Source: NZ BioSecure 2021a

These patterns may reflect the closer travel and trade relationships New Zealand has with Pacific and Asian countries, particularly Australia.

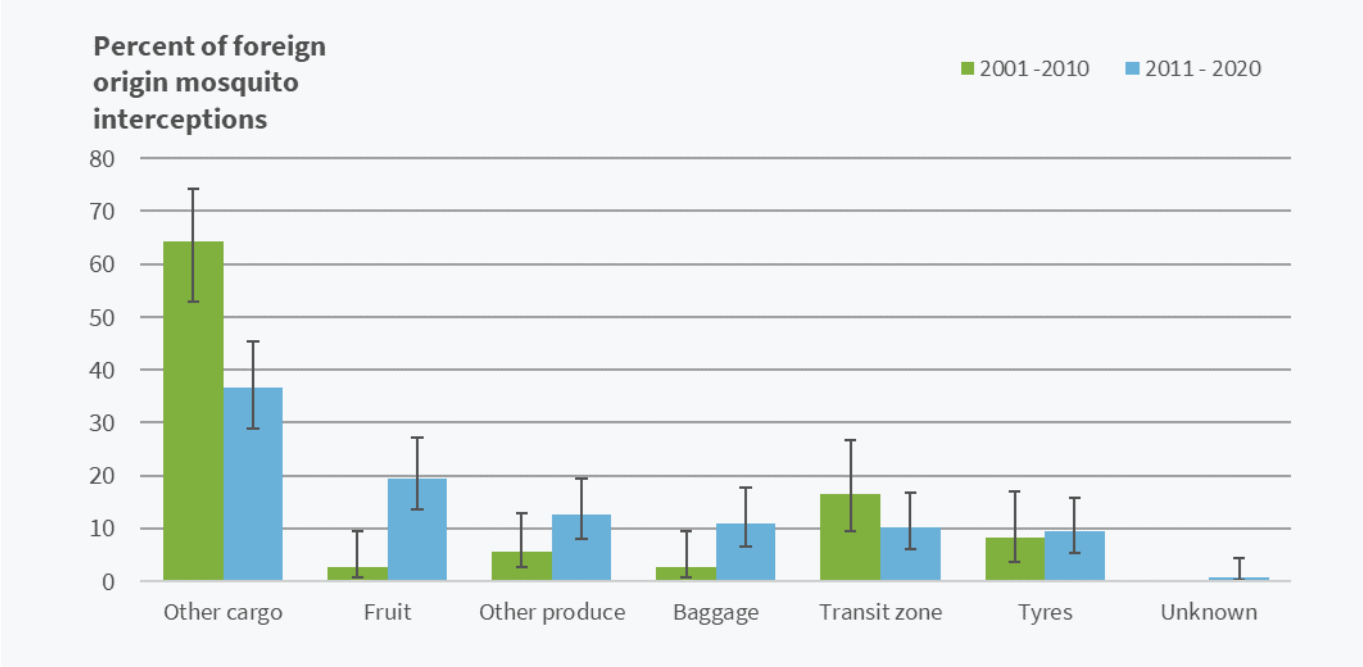
Of note, there has been an increase in interceptions from South America in recent decades when compared with historical records prior to this (Derraik 2004). The Americas were the third most common region for interceptions of overseas origin between 2011 and 2020 (Table 1).

High-risk pests most often travel by sea and in 'other cargo'

Between 2011 and 2020, 69.8% of mosquito and non-mosquito interceptions were suspected to have travelled by sea (NZ BioSecure 2021a). In 2020, over 99% of imported goods to New Zealand were transported by sea (Statistics NZ 2021).

Between 2011 and 2020, 36.7% of interceptions of suspected mosquitoes of overseas origin were transported alongside other cargo (eg, household goods, shipping containers—contents not specified). Fruit (eg, bananas, grapes) made up 19.5% of discovery locations at the New Zealand border, followed by 12.5% for other produce (eg, flowers, wood, oats, corn) (Figure 2). Compared to the previous decade, the percentage of mosquito interceptions of foreign origin found alongside other cargo decreased, and the percentage of interceptions found alongside fruit increased.

Figure 2: Mosquito interceptions of overseas origin, by location of discovery at the New Zealand border, 2011 –2020



Source: NZ BioSecure 2021a

Data for this indicator

All 95% confidence intervals have been presented as error bars on graphs. Unless otherwise stated, all differences mentioned in the text between two values are statistically significant at the 5% level or less.

Data comes from New Zealand BioSecure Entolomogy Laboratory (NZ BioSecure) online reporting of endemic New Zealand mosquitoes (NZ BioSecure 2021). For additional information, see the metadata link below.

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). 2021a. *Mosquito interceptions dataset*. Southern Monitoring Services Limited. (Personal communication, 2021).

New Zealand BioSecure Entomology Laboratory (NZ BioSecure). 2021b. *Exotic Mosquitoes*. Southern Monitoring Services Limited. URL: **www.smsl.co.nz** (accessed February 2021).

Statistics New Zealand (Statistics NZ). *Infoshare. Overseas cargo statistics: Total imports by New Zealand port (Annual-Jun)*. URL: **www.stats.govt.nz** (accessed February 2021).

Other related topics include:

Border health in New Zealand

Exotic mosquito species established in New Zealand

Overseas infectious diseases of priority concern

Author

The author of this factsheet is Allan Schori **ehinz@massey.ac.nz**

Citation

Environmental Health Intelligence. 2021. *High-Risk pests caught at New Zealand's border*. [Factsheet]. Wellington: Environmental Health Intelligence NZ, Massey University.

Further information

For descriptive information about the data **Metadata Sheet**

Visit our website

Subscribe to our newsletter