

# High-risk insects caught at the border

This report presents data from 2001–23 on exotic mosquitoes and other insects caught at our border (international airports and seaports) by Aotearoa New Zealand’s mosquito surveillance programme.

## Key facts

- Interceptions potentially originating from China, Australia, Singapore and India accounted for over half of all interceptions from 2019–23.
- There were 10 interceptions of international origin in 2023, compared to an average of 21 per year between 2014–21.
- Most interceptions from 2019–23 were in Auckland and Christchurch. Before 2019, Auckland had the overwhelming majority of interceptions.
- Between 2019–23, intercepted high-risk insects were mainly found in household goods and vehicle and machinery parts.

## Exotic mosquitoes and other insect arrivals from overseas pose a threat to New Zealand’s health

Exotic mosquitoes are considered high-risk insects in New Zealand due to their ability to spread serious infectious diseases such as Dengue Fever and Malaria. Insects can travel internationally through multiple pathways, including aircraft holds and laying larvae in stagnant water on ships.

Common practices used internationally for preventing the spread of insects include aircraft being sprayed with insecticide, and freight cargo being sealed until entering inspection zones. National mosquito surveillance takes place at New Zealand’s international airports and seaports. This prevents exotic mosquitoes and other high-risk insects from establishing in New Zealand and tells us which species are arriving, where they are from, and how they travel.

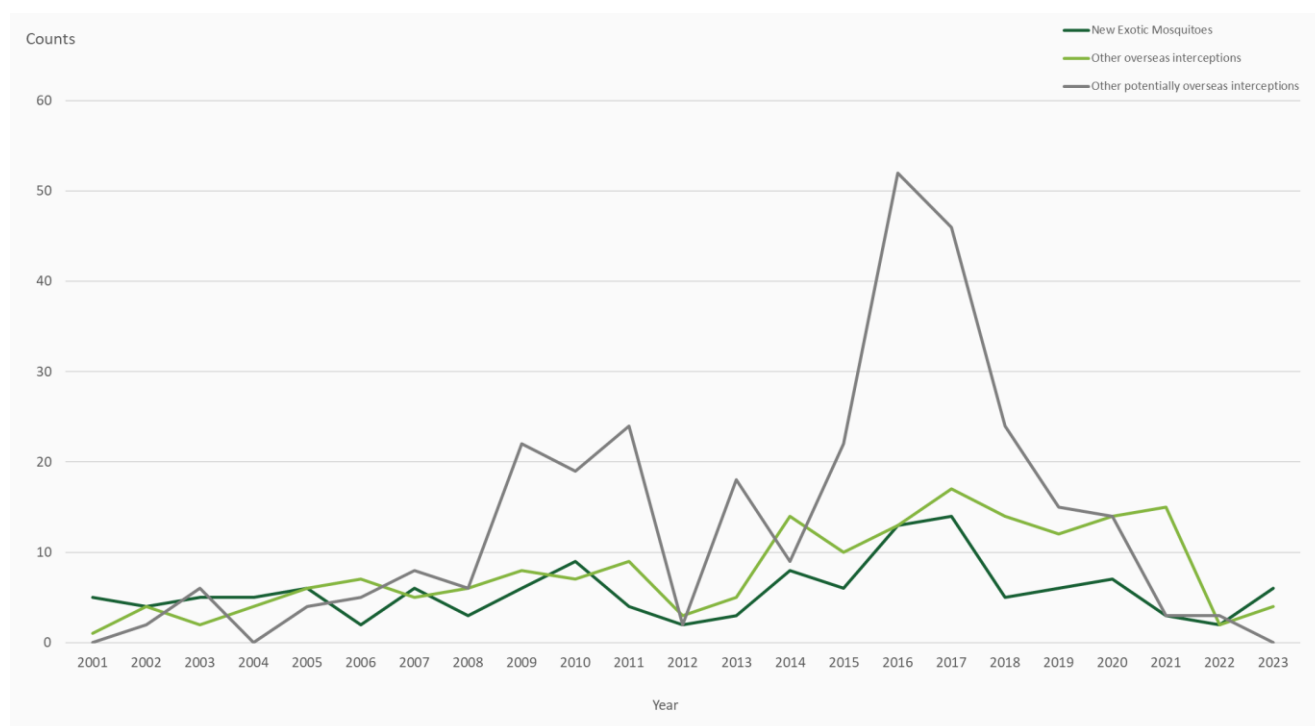
In 2023, over 98% of international travellers arrived in New Zealand by air, while 99% of all imported goods, based on mass, arrived by sea. COVID-19 restrictions caused a massive decrease in incoming travellers in 2020 and 2021, but the mass of incoming cargo remained relatively steady (Statistics NZ 2024a, 2024b).

## Interceptions of international insects remained lower than the long-run average

There were six interceptions of new exotic mosquitoes in 2023, and four interceptions of other overseas insects. In 2022, two exotic mosquitoes were intercepted along with five other insects of overseas, or potentially overseas, origin. From 2014–21, there were an average of 21 interceptions of definite overseas

origin (green lines in Figure 1) and 23 interceptions of potential overseas origin annually (grey line in Figure 1). The average annual interceptions were much lower prior to 2014, at 10 of definite overseas origin and 9 of potential overseas origin.

**Figure 1: High-risk insect interception counts, 2001–23**



Note 1: One interception may include several insects which fall into different categories. Therefore, the sum of all categories may be higher than the total number of interceptions for that year.

Note 2: 'Other overseas interceptions' is a combination of exotic mosquitoes already in New Zealand, New Zealand native mosquitoes which also exist overseas and non-mosquitoes which have an overseas origin.

Note 3: 'Other potentially overseas interceptions' includes all the categories listed in Note 2 but cannot be confirmed to be from overseas. It is possible that some of these were local insects that were trapped during routine surveillance.

Note 4: Two notifications in 2022 and one notification in 2021 were excluded due to being eDNA samples from water samples in areas unrelated to major ports. These notifications are discussed further at the end of this factsheet.

Source: NZBioSecure 2024

When an interception is made, the species and likely origin are recorded. Any interception where the origin is unknown is considered potentially international. Species are classified as:

- Non-mosquitoes: Any insect that is not a mosquito, such as crane flies.
- Exotic mosquitoes already in New Zealand: An international mosquito species that is established in New Zealand, such as *C. quinquefasciatus* or *A. notoscriptus*.
- Unidentifiable exotic: The specimen has been lost or damaged beyond recognition.
- New exotic species<sup>1</sup>: Mosquito species that are not established in New Zealand.

While new exotic species are a direct threat to New Zealanders' health, the categories described as "Other" in Table 1 can assist in identifying routes that high-risk insects could use to cross our borders.

<sup>1</sup> New exotic species are the only category where the species definitively originated outside New Zealand. With all other interceptions, there is a chance the specimen originated in New Zealand and was trapped unintentionally.

## China is the most common origin of potentially foreign interceptions

From 2019–2023 there were 103 interceptions of potentially international origin. China was the most common origin listed, with 24 interceptions, followed by Australia (14 interceptions), Singapore (12 interceptions) and India (9 interceptions). Table 1 presents all the potential international origins recorded for these interceptions. Australia has been a consistently common potential origin of interceptions since 2001. China and India have also started to feature more regularly in the last five years.

**Table 1: High-risk insect interceptions of potential international origin, by region and country, 2001–23**

Region	Country	New exotic mosquito interceptions	Other overseas interceptions	Other potentially overseas interceptions	Total high-risk interceptions
Africa	South Africa	1	0	0	1
Americas	Colombia	0	0	1	1
	Ecuador	0	2	2	4
	Mexico	0	0	1	1
	United States of America	2	0	1	3
Asia	Bangladesh	0	0	1	1
	China	5	14	6	24
	India	3	6	0	9
	Indonesia	1	1	0	2
	Japan	0	1	1	2
	Malaysia	3	1	1	4
	Pakistan	0	1	0	1
	Singapore	4	6	2	12
	Thailand	0	1	0	1
	United Arab Emirates	0	1	0	1
Europe	Belgium	1	0	0	1
	France	0	1	0	1
	Italy	1	2	1	3
	United Kingdom	0	0	1	1
Pacific	Australia	1	10	3	14
	Cook Islands	0	0	1	1
	Fiji	1	1	0	2
	Samoa	0	1	0	1
	Solomon Islands	1	0	0	1
	Tonga	0	1	0	1

Note 1: An interception can have several insects which fall into different categories. An interception may also be listed as having more than one potential origin. This means the sum of interceptions across categories or countries may be greater than the total interceptions.

Note 2: Potential foreign origin notifications without a listed country are not included (19 notifications for 2019–23).

Note 3: 'Other overseas interceptions' is a combination of exotic mosquitoes already in New Zealand, New Zealand native mosquitoes which also exist overseas and non-mosquitoes which have an overseas origin.

Note 3: 'Other potentially overseas interceptions' includes all the categories listed in Note 3 but cannot be confirmed to be from overseas. It is possible that some of these were local insects that were trapped during routine surveillance.

Source: NZBioSecure 2024

The rest of this report relates to interceptions which have a high likelihood of being of overseas origin. This includes *New Exotic Mosquitoes* and *Other Overseas Interceptions*. *Other Potentially Overseas Interceptions* will not be discussed due to the uncertainty of their origin.

## Most interceptions happen in the Auckland region

More than two-thirds of all international interceptions occurred in areas overseen by Auckland Regional Public Health Service (ARPHS). This is consistent with the high proportion of international travellers and cargo that arrive via Auckland Airport and Auckland Seaport. Interceptions occurring in the areas overseen by Te Mana Ora (Canterbury, South Canterbury and West Coast) were higher than usual between 2019 and 2021 (Table 2). No cause for this difference is known. Given the small counts involved, it may simply reflect year-on-year fluctuation due to random variation.

**Table 2: International high-risk insect interceptions, by Public Health Unit, 2001–23**

Year	ARPHS	Te Mana Ora	Regional Public Health	Toi Te Ora	Nelson-Marlborough	MidCentral	Southern	Tairāwhiti	Taranaki	Waikato
2001	4	1	0	1	0	0	0	0	0	0
2002	6	1	0	0	0	1	0	0	0	0
2003	5	1	0	0	0	0	0	0	0	0
2004	4	2	1	0	1	0	0	0	0	0
2005	9	2	0	0	0	0	1	0	0	0
2006	7	0	1	0	0	0	1	0	0	0
2007	6	5	0	0	0	0	0	0	0	0
2008	8	0	0	0	0	0	0	0	0	0
2009	11	0	0	0	1	0	0	0	0	0
2010	10	0	3	0	0	0	0	0	0	0
2011	10	1	0	1	0	0	0	0	0	0
2012	1	1	1	1	1	0	0	0	0	0
2013	3	3	1	0	0	0	0	0	0	0
2014	19	1	1	0	0	0	0	0	0	0
2015	13	2	0	0	0	0	0	0	0	0
2016	20	1	3	0	0	0	0	0	0	0
2017	23	1	2	2	0	1	0	0	0	0
2018	16	1	2	0	0	0	0	0	0	0
2019	8	7	1	0	0	1	0	0	0	0
2020	6	8	2	2	0	0	1	0	1	0
2021	3	9	0	1	1	1	0	1	0	1
2022	1	0	0	2	1	0	0	0	0	0
2023	6	1	1	0	0	1	0	1	0	0
<b>Total</b>	<b>199</b>	<b>48</b>	<b>19</b>	<b>10</b>	<b>5</b>	<b>5</b>	<b>3</b>	<b>2</b>	<b>1</b>	<b>1</b>

Note: ARPHS is the Auckland Regional Public Health Service, which covers Auckland. Te Mana Ora covers Canterbury, South Canterbury and West Coast. Regional Public Health covers the greater Wellington region. Toi Te Ora covers Bay of Plenty, Rotorua and Taupō. Plenty, Rotorua and Taupō.

Source: NZBioSecure 2024

## The majority of recent intercepted insects have been found dead in various types of cargo

Of the 68 high-risk interceptions recorded from 2019–23, 45 were found in various types of cargo, including 9 which involved living specimens (Table 3). Live specimens are a greater concern, as it suggests the insect survived procedures intended to prevent an incursion.

**Table 3: High-risk insect interceptions of international origin, by location and living status, 2019–23**

Location found	Alive	Dead	Unrecorded	Total
Cargo	9	34	2	45
Non-fruit organic juice	1	8	0	9
Fruit	1	6	0	7
Surveillance traps	3	0	0	3
Tyres	2	0	0	2
Baggage or luggage	1	1	0	2
Total	17	49	2	68

Source: NZBioSecure 2024

Table 4 shows the different types of cargo in which the insects were found. The most common types were household items, followed by vehicles, machinery and its parts (17 and 16 interceptions, respectively).

**Table 4: Types of cargo containing high-risk insects of international origin, 2019–23**

Type of cargo	Interceptions
Household items	17
Vehicles, machinery and its parts	16
Building equipment/materials	2
Empty shipping containers	2
All other cargo types:	
Barrels of insecticide	1
Camping equipment	1
Cardboard/paper	1
Inorganic risk materials	1
Packaging	1
Water container	1
Miscellaneous goods	1

Source: NZBioSecure 2024

## Data for this indicator

This indicator is an analysis of the most recent data available from the New Zealand BioSecure Entomology Laboratory (NZBioSecure), provided to EHINZ by NZBioSecure in September 2024.

For additional information, see the [Metadata](#) sheet.

## References

Statistics New Zealand (Statistics NZ). 2024a. *Infoshare. Overseas Cargo Statistics: Total imports by New Zealand port. (Annual-Jun)*. URL: [www.stats.govt.nz](http://www.stats.govt.nz) (accessed 27 September 2024).

Statistics New Zealand (Statistics NZ). 2024b. *Infoshare. International Travel and Migration: Total passenger movements by NZ port and selected overseas ports. (Annual-Jun)*. URL: [www.stats.govt.nz](http://www.stats.govt.nz) (accessed 27 September 2024).

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