Information topic	Details
Indicator name	**Mosquito-borne disease in New Zealand**
Domain and topic	Mosquito-borne diseases
Indicator definition and units	Priority* notifiable respiratory and vector-borne diseases imported into New Zealand. Reported by district (areas formerly known as District Health Boards), ethnicity, age, socioeconomic status (SES), sex and origins of the disease. *Disease priorities should be identified by annual risk assessment (*Johnson 2016*).
Data source	- Notifiable and other diseases in New Zealand: Annual Summary. Institute of Environmental Science and Research (ESR) - As required: more detailed unit record Episurv data requested from ESR for specific diseases identified in the risk assessment
Numerator	EpiSurv notifications reported by ESR for each year, in accordance with their case status annual reporting inclusion criteria (i.e. all cases, excluding those classified 'not a case') (ESR 2021).
Denominator	Statistics New Zealand mid-year population estimates for corresponding year and subsection of numerator data. For the NZDep2018 analysis, the 2018 denominator population by NZDep2018 deciles, age group and sex has been used.
Methodology	- Individual mosquito-borne diseases were reported by number of notifications. Analysis of rates reported on total mosquito-borne diseases. - Crude rates were used for analysis due to low counts in recent years, making age-standardised rates unfeasible. - Statistically significant differences noted (i.e. no overlapping 95% confidence intervals, or hypothesis test $p<0.05$). - Total counts <5 are excluded from analysis to reduce random error and protect case confidentiality. - Data from individual years was used where possible; however, aggregations of data across years were used for comparative analysis between specific subgroups due to small numbers in recent years.

Time period and time scale	- Annual; from 2001 onwards
	- Time trends:
	  o Trends from 2001 onwards for total counts of individual diseases
	  o Trends from 2017 onwards for individual years by ethnicity, sex, and NZDep2018.
	  o Trends over five years accumulated for age and district, from 2017–21.

Spatial coverage	National District
Measures of frequency	Annual number of disease notifications by: - origin of disease, - age group, - sex - ethnicity, - District - NZDep
Limitations of indicator	Annual notification counts may be small making statistical trend analysis unfeasible.
Limitations of data source	- Case under-detection is likely for exotic diseases. New Zealand can only identify diseases which are currently notifiable*, which health practitioners know to look for, and for which we have current national diagnostic capacity. - Some diseases, including mosquito-borne diseases, can have a high proportion of asymptomatic or mild associated infection (Duffy et al 2009). *Zika only became officially notifiable in New Zealand in March 2014 (ESR 2019)
Related indicators	- Overseas infectious diseases of priority concern to New Zealand - Human-disease competent vectors/pests introduced to New Zealand - High-risk human-disease competent vectors/pests present at the New Zealand border
For more information	ESR. Annual Surveillance Summary: Notifiable diseases annual surveillance summary 2021 (esr.cri.nz) (accessed May 2024)
References	- Atkinson J, Salmond C, & Crampton P. 2020. *NZDep2018 index of deprivation*. Wellington: Department of Public Health, University of Otago. - Duffy MR, Chen TH, Hancock WT, et al. 2009. Zika virus outbreak on Yap Island, Federated States of Micronesia. *The New England Journal of Medicine* 360: 2536 – 43. - ESR. 2021. *Notifiable diseases annual surveillance summary 2021.* Porirua: Institute of Environmental Science and Research Limited. - Johnson S. 2016. *Development Report: Border Health Indicators*. Wellington: Environmental Health Intelligence New Zealand.