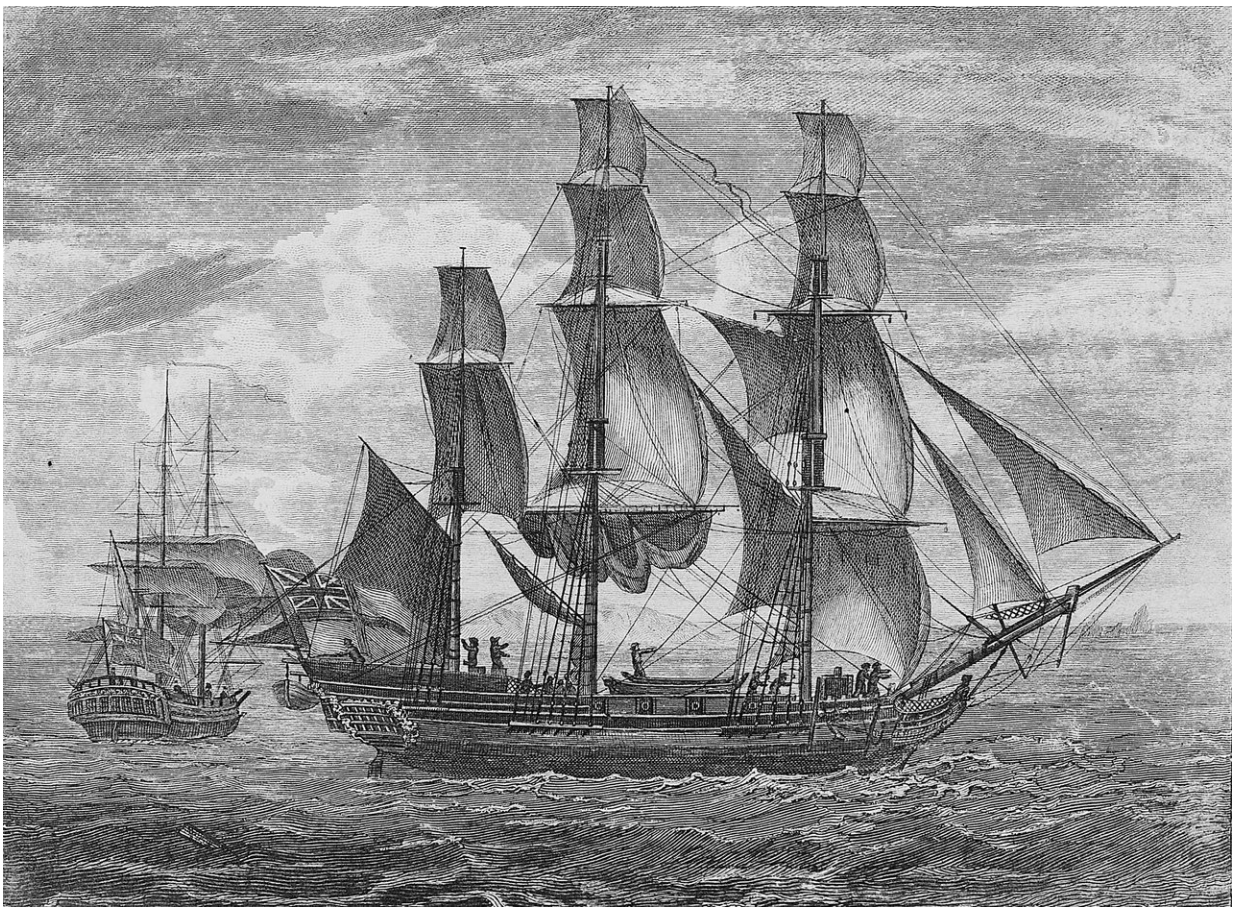
250 years after Captain Cook's arrival, we still can't be sure how many Māori lived in Aotearoa at the time

January 3 2019, by Simon Chapple



Captain James Cook sailed the Endeavour off New Zealand’s east coast in 1769. Credit: Wikimedia Commons, CC BY-ND

Two hundred and fifty years ago this year, James Cook's ship the *Endeavour* arrived off the eastern coast of New Zealand. The following circumnavigation marked the beginning of ongoing European contact with the indigenous population, and eventually mass British immigration from 1840.

One important question historians are trying to answer is how many Māori lived in Aotearoa at the time of Cook's arrival. This question goes to the heart of the negative impacts of European contact on the size and health of the 19th-century Māori population, which subsequently bottomed out in the 1890s at just over 40,000 people.

The conventional wisdom is that there were about 100,000 Māori alive in 1769, living on 268,000 square kilometres of temperate Aotearoa. This is a much lower population density (0.37 people per square kilometre) than densities achieved on tropical and much smaller Pacific Islands.

Examples of order-of-magnitude higher density Pacific populations in the contact-era include:

- Hawai'i where 200,000 to 800,000 people lived on 28,000 square kilometres (7 to 29 people per square kilometre)
- Tahiti where 66,000 or more people lived on 1000 square kilometres (66 people per square kilometre), and
- Rapa Iti where 3000 people lived on 38 square kilometres (79 people per square kilometre).

In conjunction with later 19th-century census figures, the conventional wisdom implies that European contact and colonisation following Cook's arrival was much less devastating for the indigenous population of Aotearoa than for many other Pacific islands.

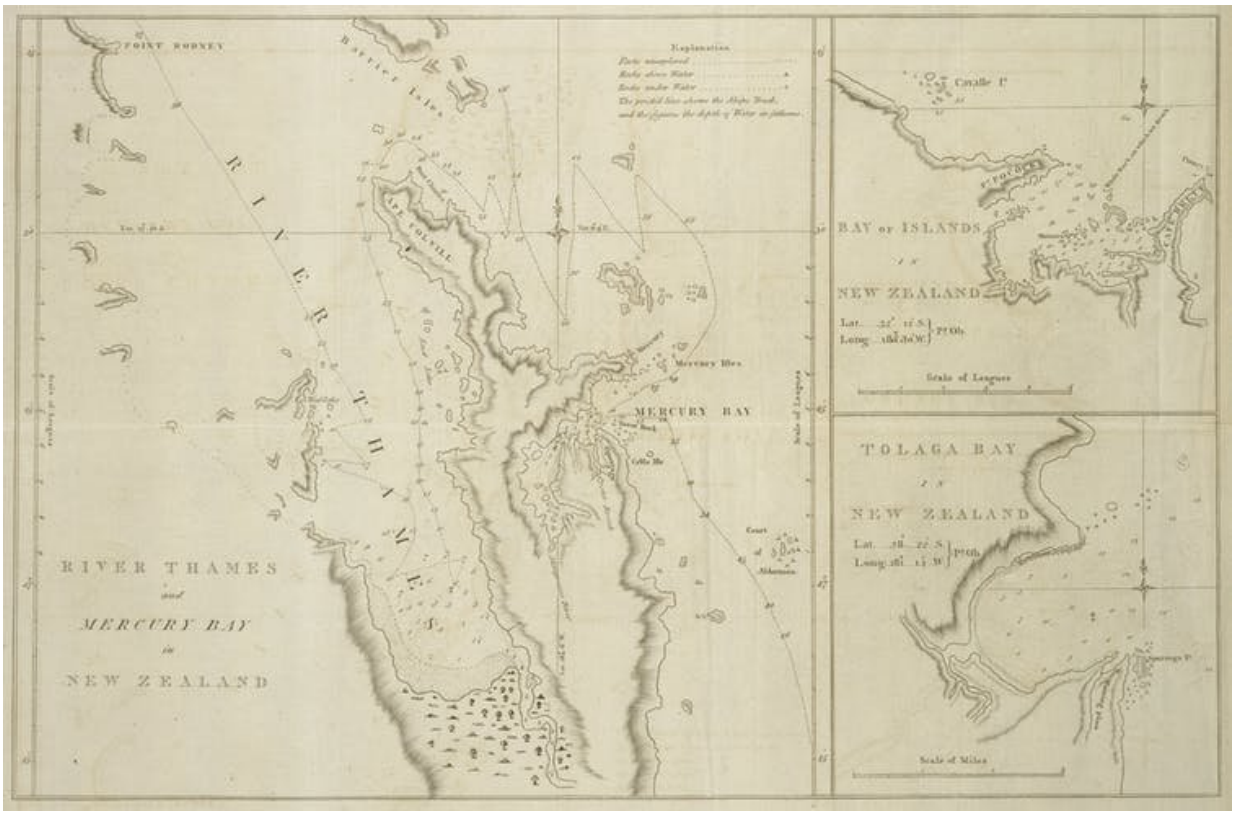
Three approaches have been used to support the estimate of 100,000 Māori. Unfortunately, none bears any serious weight.

The Cook population estimate

The 100,000-strong estimate of the contact-era Māori population is often attributed to Cook. However, it never received his seal of approval, and it was not made in 1769.

It was published in a 1778 book written by Johann Forster, the naturalist on Cook's second expedition of 1772-1775. Forster's estimate is a guess, innocent of method. He suggests 100,000 Māori as a round figure at the lower end of likelihood. His direct observation of Māori was brief, in the lightly populated South Island, far from major northern Māori population centres.

Later visitors had greater direct knowledge of the populous coastal northern parts of New Zealand. They also made population estimates. Some were guesses like Forster's. Others were based on a rough method. Their estimates range from 130,000 (by early British trader Joel Polack) to over 500,000 Māori (by French explorer Dumont D'Urville), both referring to the 1820s. The wide range further emphasises the lack of information in Forster's guess.



A map of the east coast on New Zealand's North Island, drawn by Captain James Cook. Credit: Wikimedia Commons, CC BY-ND

Working backwards from the 1858 census

A second method takes the figure from the first New Zealand-wide Māori population census of 1858, of about 60,000 people. It works this number backwards over 89 years to 1769, making assumptions about the rate of annual population decline between 1769 and 1858.

There is a good quantitative estimate for the rate of decline back from 1858 to 1844, taken from a Waikato longitudinal census. But there is nothing solid for the period before 1844.

To overcome the absence of numbers, an apparently better documented and very low average annual rate of decline of the Moriori people of the Chatham Islands of 0.4% between 1791 and 1835 has been applied to New Zealand. However, the estimated rate is calculated from wrong numbers for both the 1791 and 1835 Moriori populations. In fact, there is no contemporary 1791 estimate of the Moriori population from which to calculate a meaningful rate of quantitative decline to 1835.

The qualitative conclusion of low population decline is based on two propositions. The first is that prior to the 1850s, imported European diseases were localised to a few coastal areas. The second is that the impact of warfare on populations over the first half of the 19th century was minimal. What is the evidence for these propositions? The answer is not much in either case.

Historical evidence suggests that there were indeed widespread epidemics in New Zealand prior to the 1850s. For example, there is evidence of a great epidemic around 1808, possibly some form of enteric fever or influenza, which killed many people across the North Island and the top of the South Island. Other high-mortality diseases known to be present in New Zealand pre-1840 and readily transmittable internally include syphilis and tuberculosis.

The estimates of how many Māori died directly and indirectly on account of warfare over the 1769 to 1840 period lack a coherent method. They are weak on definitions of what they count. They cover varying or indeterminate periods. Where they can be made roughly comparable, the numbers arrived at are wildly different, with estimates of deaths ranging from 300 to 2000 people on average annually. In other words, the impact of warfare on population decline could have been quite small or quite large. We simply don't know.

Overall, Hawaiian archaeologist Patrick Kirch's conclusion on the

validity of this method for estimating other contact-era Pacific populations is also applicable to New Zealand. It is a largely circular exercise in assuming what needs to be proven.

Predicting population from settlement

The third method used to estimate 100,000 Māori predicts the population forward from first arrival in New Zealand. Prediction requires a minimum of three parameters. These are the arrival date of Māori in New Zealand, the size of the founding population and the prehistoric population growth rate to 1769.

The current consensus is that voyagers from Eastern Polynesia arrived in New Zealand between 1230 and 1280 AD and then became known as Māori. However, even a 50-year difference in arrival dates can make large differences to an end population prediction.

Geneticists have estimated the plausible size of the Māori female founding population as between 50 to 230 women. The high population estimate which would result from using these numbers is therefore nearly five times the size of the low estimate. Such a broad range is meaningless.

Waka paddles, as described in Joseph Banks' journal in 1769. From New

Zealand drawings made in the countries visited by Captain Cook in his First Voyage. Credit: Wikimedia Commons, CC BY-ND

The third big unknown of the prediction method is the growth rate. Minimalists have employed low rates, based on prehistoric Eurasian populations, where humans had lived for tens of thousands of years. This perspective of low Māori prehistoric growth rates is problematic. Humans did not live in New Zealand prior to Māori. The population density faced by newly arriving people was zero.

Also, New Zealand's flora and fauna had evolved without people. Once people arrived, they would have found more niches of exploitable nutrients than in regions where plants and animals had long co-evolved with people as apex predators. Such circumstances allowed for a potentially rapid Māori population expansion.

Indeed, historically recorded population growth rates for Pacific islands with small founding populations could be exceptionally high. For example, on tiny, resource-constrained Pitcairn Island, population growth averaged an astounding 3% annually over 66 years between 1790 and 1856.

Arguments for rapid prehistoric population growth run up against other problems. Skeletal evidence seems to show that prehistoric Māori female fertility rates were too low; and mortality, indicated by a low average adult age at death, was too high to generate rapid population growth.

This low-fertility finding has always been puzzling, given high Māori fertility rates in the latter 19th century. Equally, archaeological findings of a low average adult age at death have been difficult to reconcile with numbers of elderly Māori observed in accounts of early explorers.

However, recent literature on using skeletal remains to estimate either female fertility or adult age at death is sceptical that this evidence can determine either variable in a manner approaching acceptable reliability. So high growth paths cannot be ruled out.

Because of resulting uncertainties in the three key parameters and the 500-year-plus forecast horizon, the plausible population range around 100,000 Māori in 1769 is so broad as to make any prediction estimate meaningless. Virtually any contact-era population can be illustrated by someone with a modicum of numerical nous.

Density analogies

In the 2017 New Zealand Journal of History, New Zealand archaeologist Atholl Anderson argues that medieval population density on the large (about 103,000 square kilometres, slightly smaller than the North Island), isolated and sub-arctic island of Iceland is a much better analogy for likely contact-era Māori density than those of smaller tropical Pacific islands.

He uses Icelandic population density from the year 1800, over 900 years into the settlement sequence. If Icelandic population numbers closest to 500 years into the settlement sequence were used, they would provide a more direct temporal analogy for 500 years of Māori settlement in 1769.

Iceland was settled circa 870 AD. The best estimates of the pre-industrial Icelandic population closest to 500 years post-settlement are from 1311. They are based on farm numbers counted for tax purposes. This method gives 72,000 to 95,000 Icelanders. So, in its medieval period, sub-arctic Iceland achieved population densities of 0.70 to 0.92 people per square km. Applying these densities to contact-era temperate New Zealand gives a Māori population of between 190,000 to 250,000 people when Cook arrived.

In terms of a New Zealand-related density analogy, there is good 1835 population data from the temperate Chatham Islands (about 970 square kilometres in area), giving a Moriori population density exceeding two people per square kilometre. It was measured after decades of likely population decline from contact with European sealers and whalers, as well as after at least one serious epidemic. Applying this density figure to the North Island alone, which the Chatham Islands climatically best resembles, gives 230,000 people when Cook arrived.

Using analogies from Iceland and the Chatham Islands suggests that post-Cook European contact may have been more devastating for Māori than conventional wisdom acknowledges. There may have been 200,000 or more Māori in 1769, falling to about 40,000 in the 1890s. Additionally, a figure of 200,000 or more Māori implies that much post-contact population decline occurred prior to mass British immigration.

As elsewhere in the Americas and the Pacific, perhaps European germs, not mass immigration, were the primary driver of indigenous population decline. But 250 years on from Cook, more work and different methods are needed to answer this question.

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