



**CaDDANZ**

Capturing the Diversity Dividend  
of Aotearoa/New Zealand

# Sub-national ethnic population projections for small ethnic groups

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# CADDANZ



- In the CADDANZ project, we are not only concerned with looking at New Zealand's past and current experience of diversity, but we are also looking ahead to the future
- In terms of future focus, we are doing this quantitatively through two methods:
  - Subnational ethnic population projections
  - Spatial microsimulation modelling
- Today I want to briefly outline our work on the first of these two methods

# The cohort component projection model



The population usually resident in area  $i$  at the **end** of year  $t$

$$\begin{aligned} &= \text{The population usually resident in area } i \text{ at the } \mathbf{beginning} \text{ of year } t \\ &+ \mathbf{births to mothers} \text{ residing in area } i \text{ during year } t \\ &- \mathbf{deaths of residents} \text{ of area } i \text{ during year } t \\ &+ \mathbf{inward migration from other regions} \text{ into region } i \text{ during year } t \\ &+ \mathbf{inward migration from overseas} \text{ into region } i \text{ during year } t \\ &- \mathbf{outward migration of residents} \text{ from area } i \text{ to other regions} \\ &\quad \text{during year } t \\ &- \mathbf{outward migration of residents} \text{ from area } i \text{ to overseas} \text{ during} \\ &\quad \text{year } t \end{aligned}$$

*Note:* All migration is conventionally combined into one **net** migration **number** (by region, age and sex)

# Ethnic projections in New Zealand



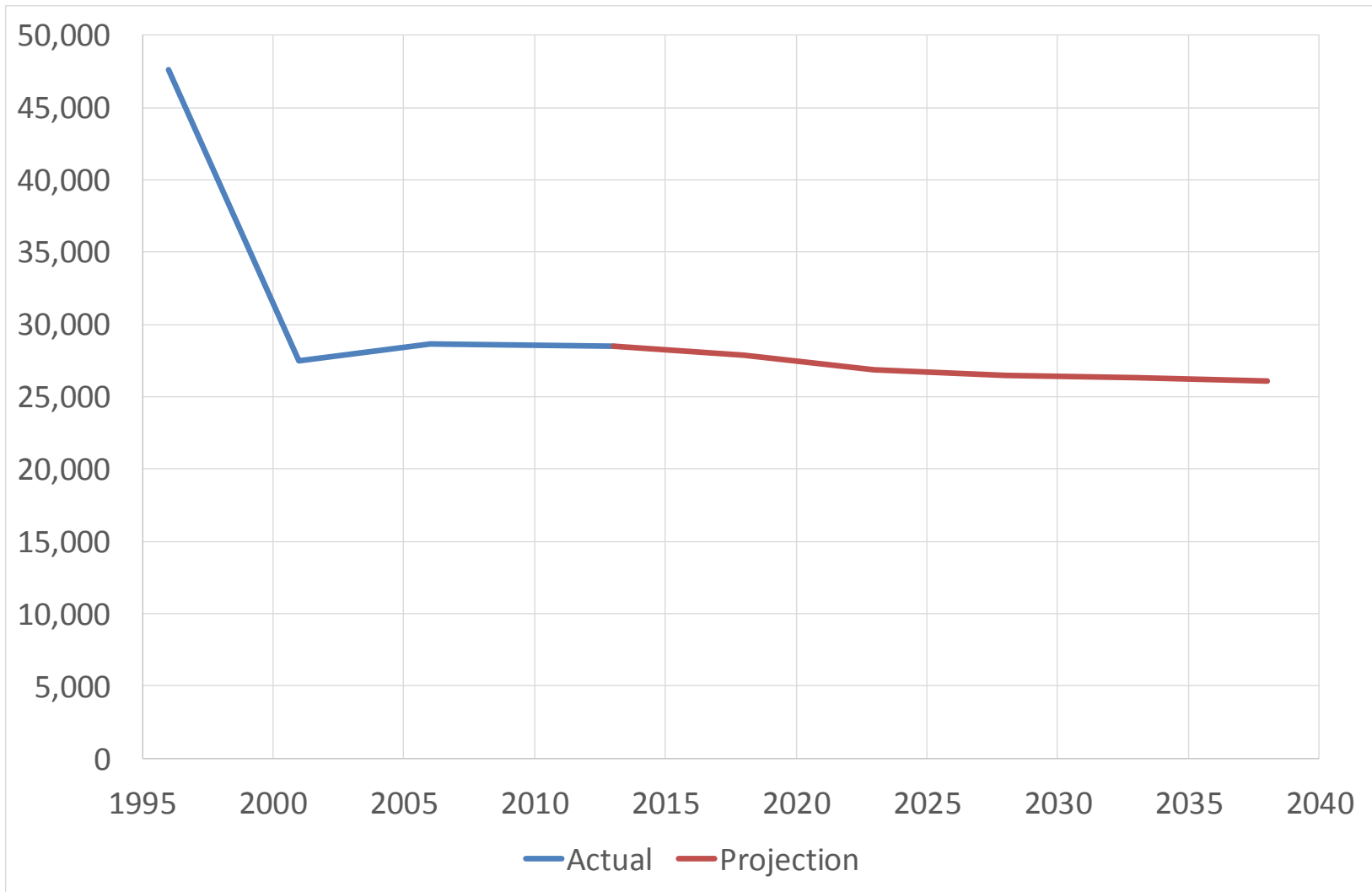
- The official ethnic population projections for New Zealand have been updated in 2017
- These official projections are based on a Bayesian stochastic cohort component methodology
- They include projections for the ‘Level 1’ ethnic groups (New Zealand European or Other, Maori, Pacific, Asian, and Middle Eastern/Latin American/African), as well as for the first time a limited number of the larger ‘Level 2’ ethnicities (Chinese, Indian, Samoan)

# Methods

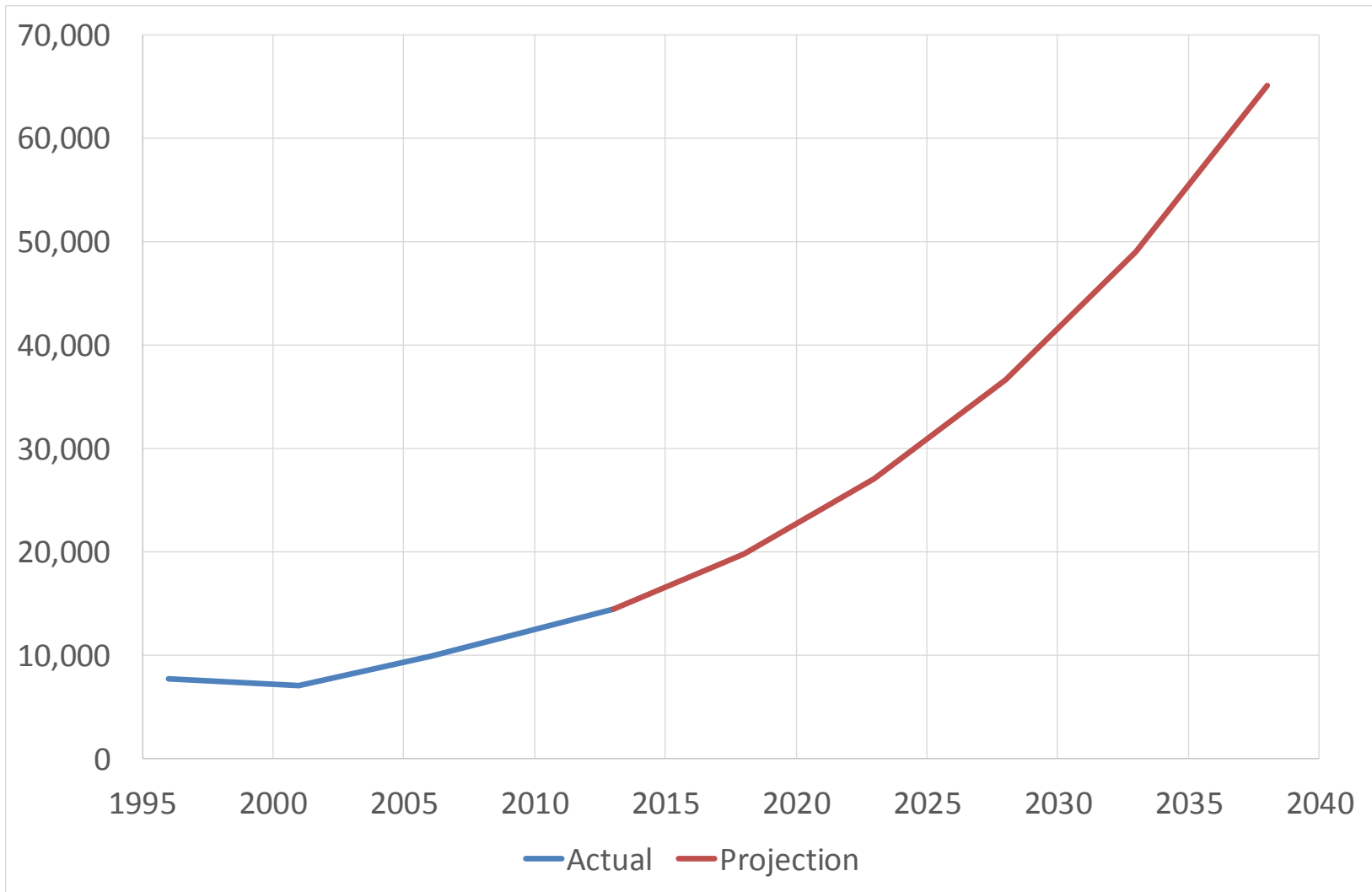


- In this paper, we adopt a modified Hamilton-Perry projection method to the projection of small ethnic groups (37 “Level 3 ethnicities” at the national level; and all Level 3 ethnic groups larger than 500 people at the regional level), with a projection horizon of 25 years
- The Hamilton-Perry method is deceptively simple
  - Using two Census datasets five years apart, a cohort change ratio is calculated for each five-year age-sex cohort
  - Each five-year age-sex cohort can then be projected forward based on these ratios
  - The exception is the age cohort 0-4 years, which is instead projected based on the child-woman ratio (using the number of women aged 20-44 years)

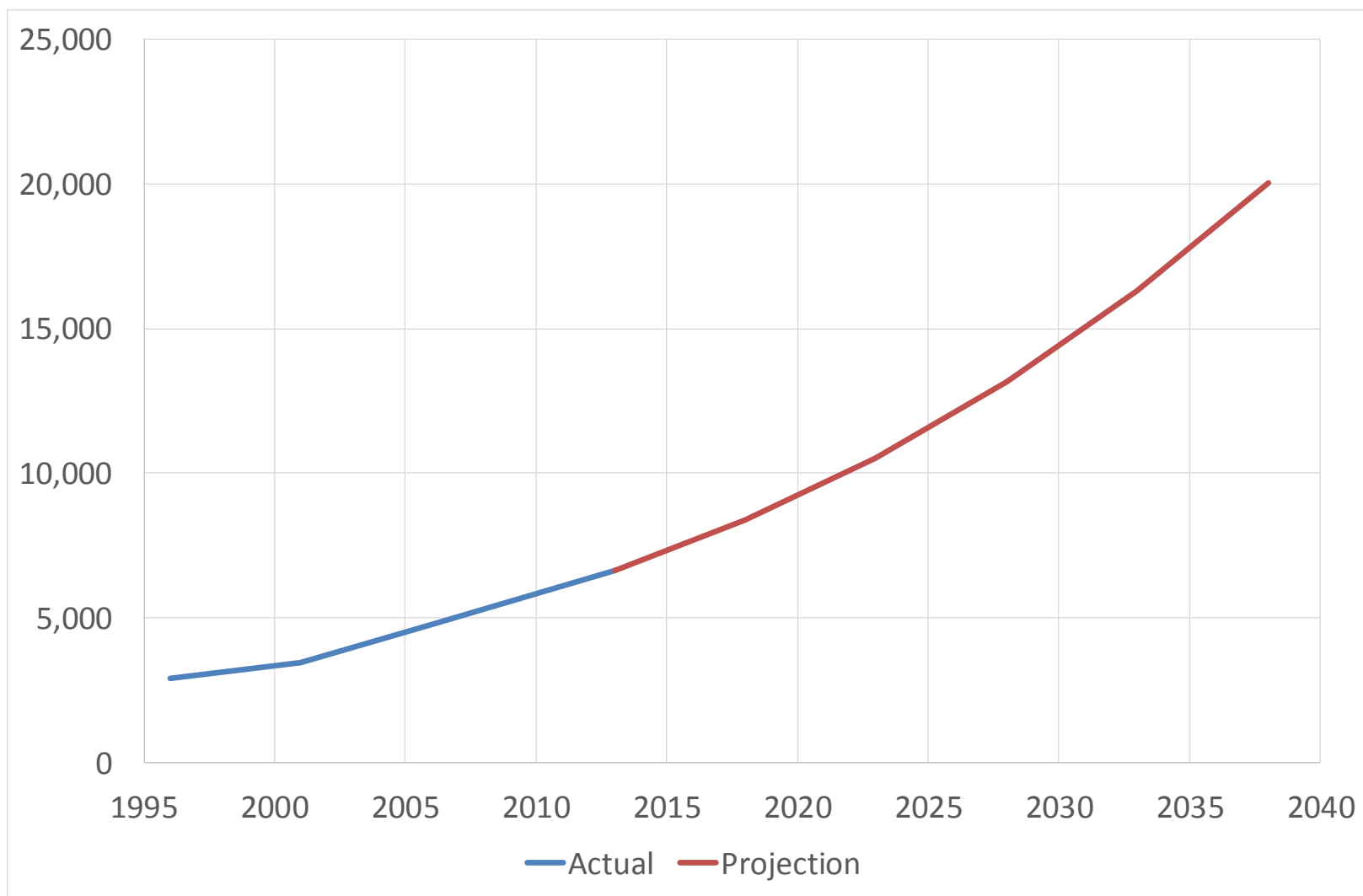
# Results – 2013-base projections: Dutch population (national)



# Results – 2013-base projections: Fijian population (national)

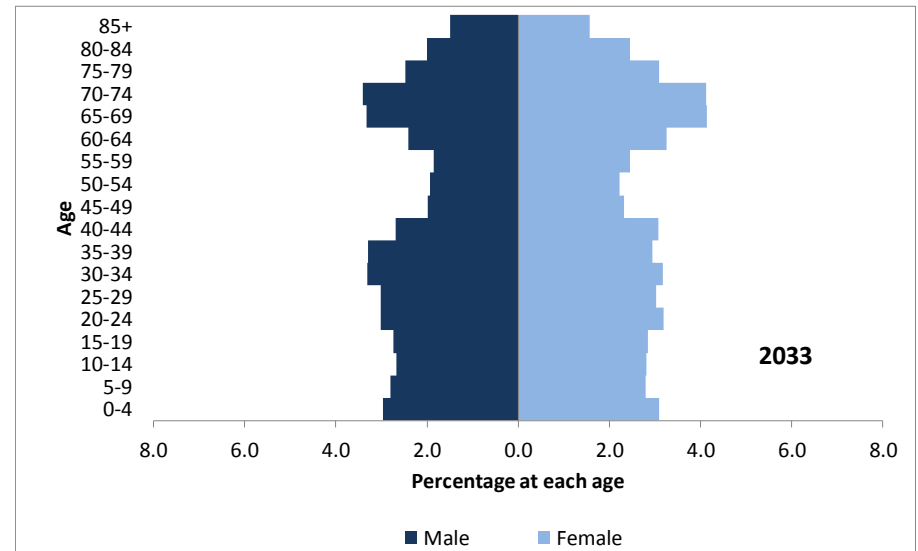
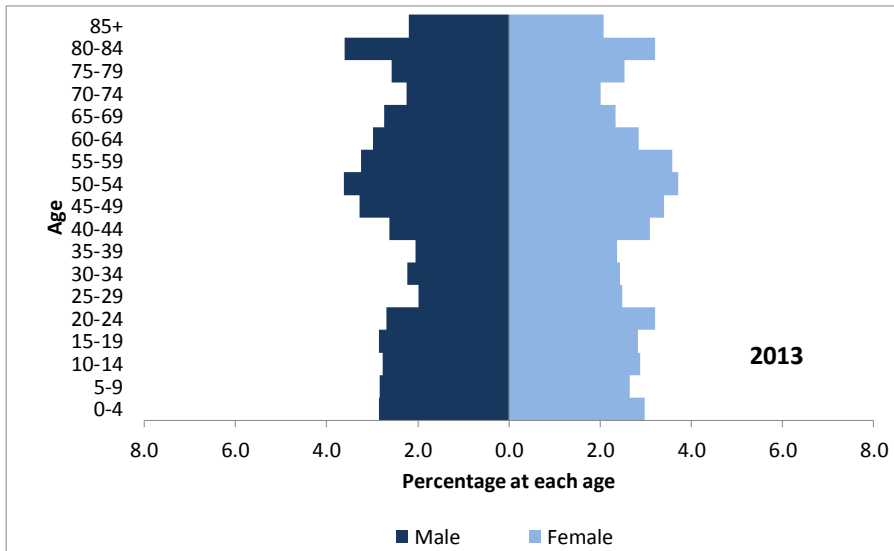


# Results – 2013-base projections: Vietnamese population (national)

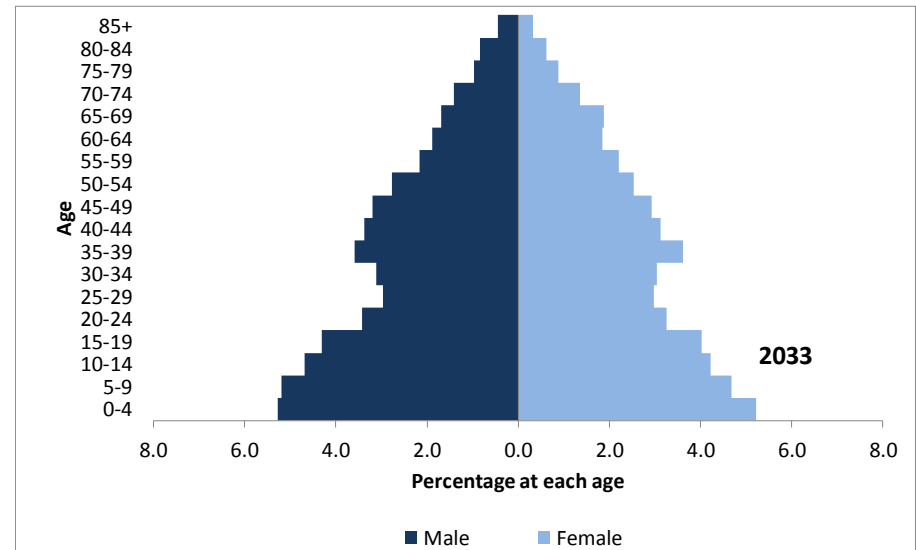
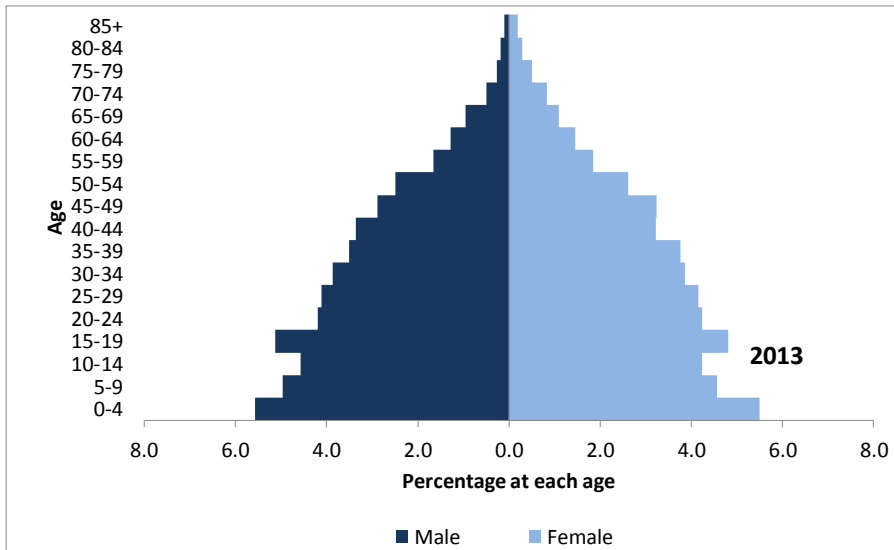




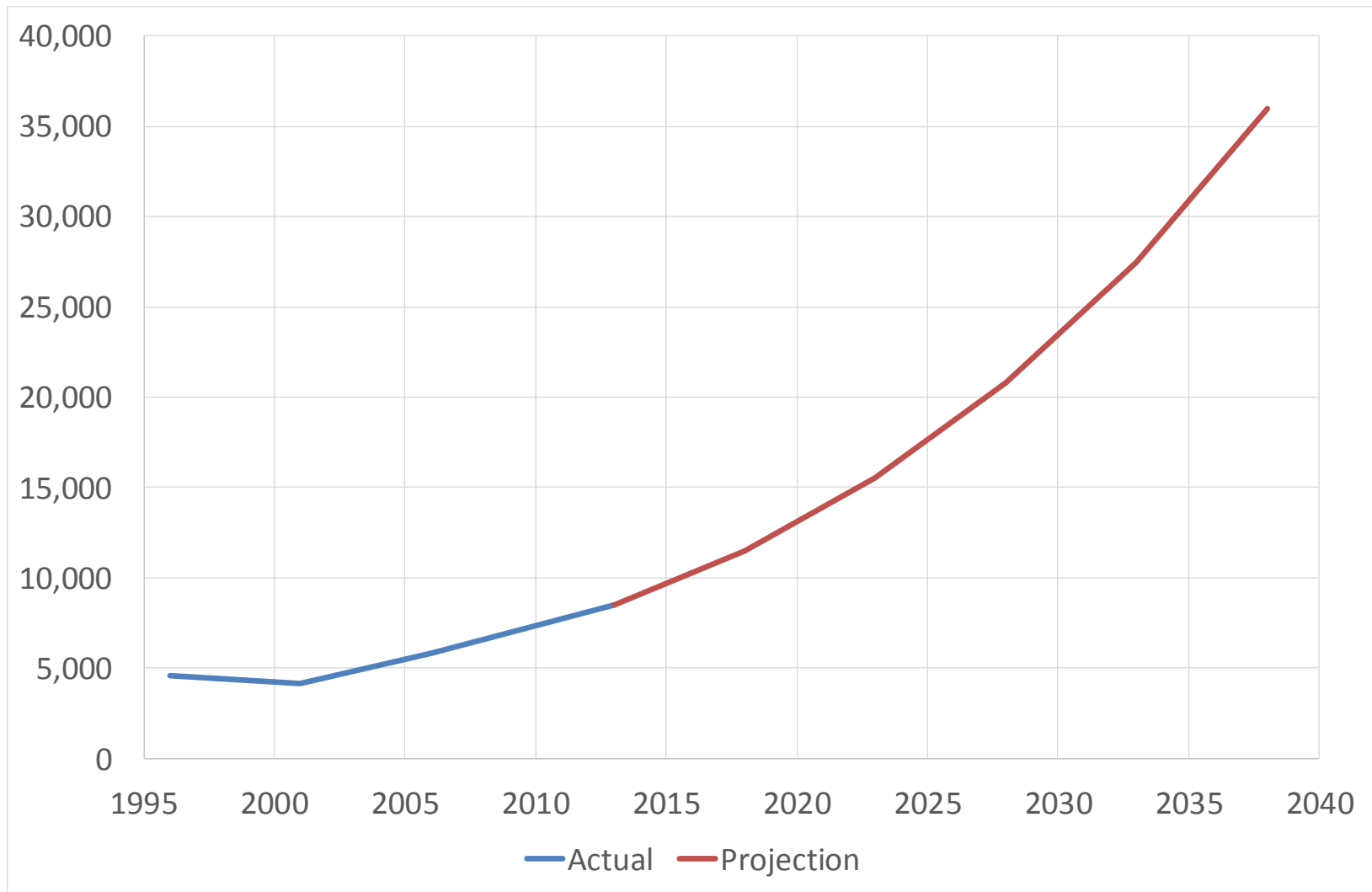
# Results – 2013-base projections: Dutch population (national)



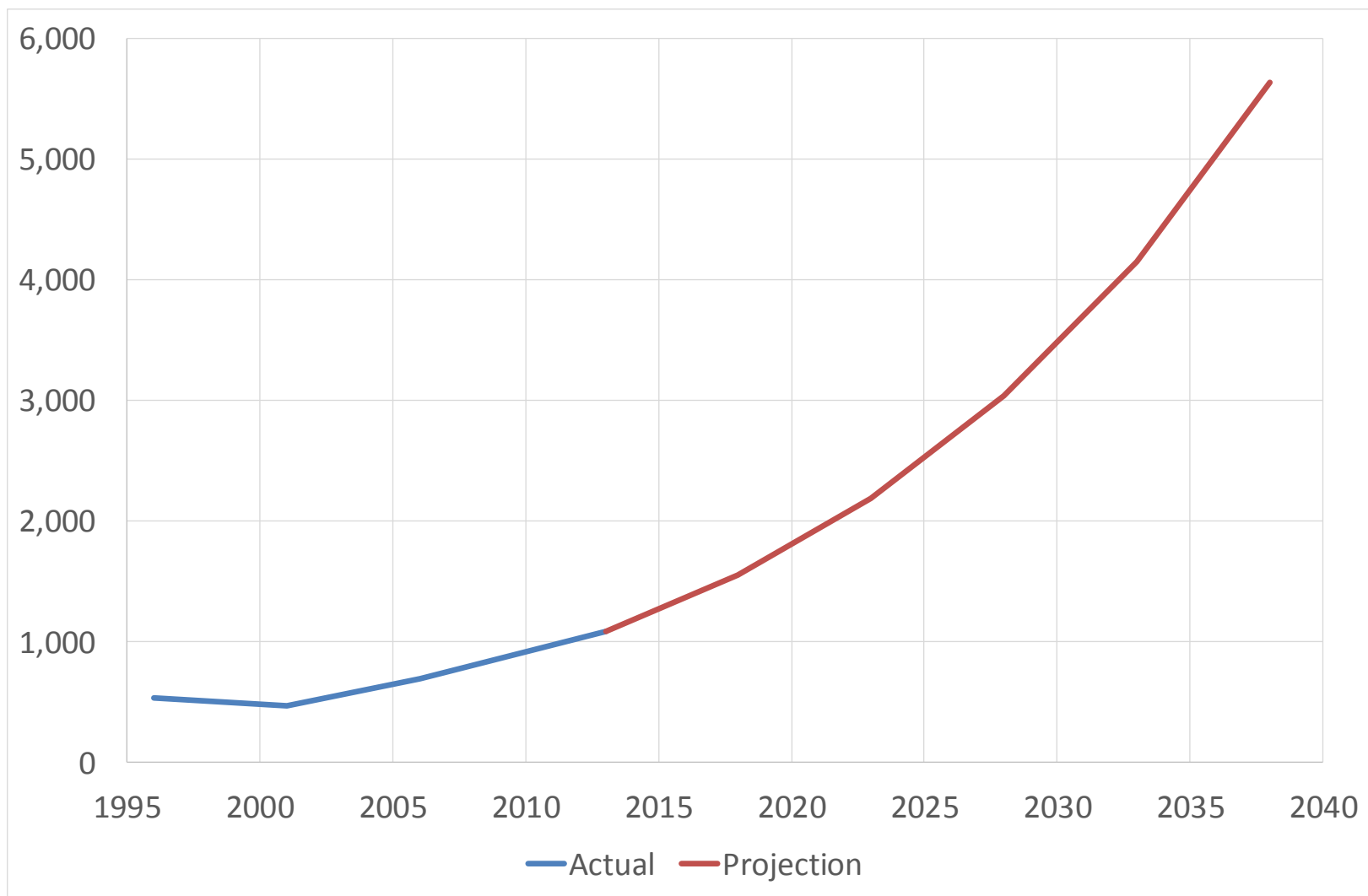
# Results – 2013-base projections: Fijian population (national)



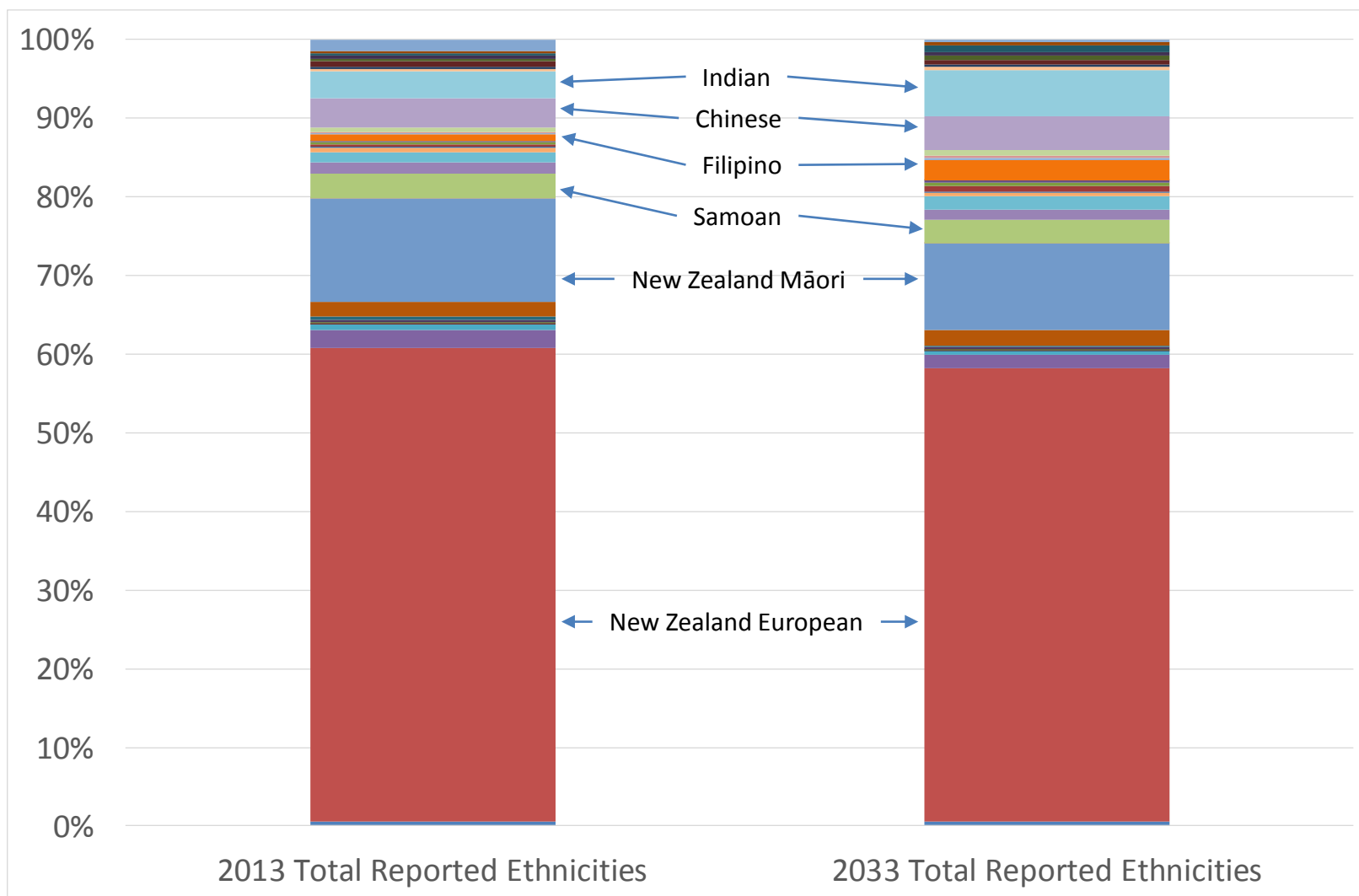
# Results – 2013-base projections: Fijian population (Auckland)



# Results – 2013-base projections: Fijian population (Waikato)



# Results – Diversity of ethnicity at the national level



# Where to from here?



- These are still preliminary results from these models. We will be doing much further work to refine the models
- In particular, we'll look at whether accuracy/plausibility is improved by using cohort-change rates averaged over several inter-Censal periods, or truncating some of the very high rates that we observed for some cohorts (especially at the regional level)
- We also need to further consider the implications of the seven-year Census period (2006-13) for the projections model



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