**Waikato Population Model and Projections at TA Level**

**Frequently Asked Questions**

Michael Cameron, January 2021

**Q: Has the methodology changed from the previous projections (based on 2013 Census)?**

UoW/NIDEA have used a modified population model, based on feedback from the peer review undertaken following the 2013 Census Waikato projection work, recent UoW/NIDEA demographic research, and discussions with Stats NZ.

Key changes and assumptions include:

* Move to a ‘gravity model’ to simulate internal/domestic migration. The consequence of having directional migration embedded in the model is that the TA projections are no longer independent, and any change we make to any TA projection will affect every other TA.
* International migration is now modelled separately from internal migration, with both emigration and immigration modelled separately.
* Assumptions for HIGH/LOW international migration are based on a range of +/- 10% of the long run trend for both emigration and immigration.
* Assumptions for HIGH/LOW for fertility and mortality are as per previous projections, see page 6 [www.creatingfutures.org.nz/assets/CF-Uploads/Case-Studies/Waikato\_Projections/Data\_and-Reports/NIDEATA-Report-2016final.pdf](https://aus01.safelinks.protection.outlook.com/?url=https%3A%2F%2Fus-west-2.protection.sophos.com%2F%3Fd%3Dcreatingfutures.org.nz%26u%3DaHR0cDovL3d3dy5jcmVhdGluZ2Z1dHVyZXMub3JnLm56L2Fzc2V0cy9DRi1VcGxvYWRzL0Nhc2UtU3R1ZGllcy9XYWlrYXRvX1Byb2plY3Rpb25zL0RhdGFfYW5kLVJlcG9ydHMvTklERUFUQS1SZXBvcnQtMjAxNmZpbmFsLnBkZg%3D%3D%26i%3DNWQzOGY1MTY1OWJjMWExNjMwMTIxY2Iz%26t%3DbXNkNXZENDZLd0syTWF0bkxOei9hWUplaFJGbElRYmZxeDdQK01McldBST0%3D%26h%3Dc5c4e3f7453e4014b91bed20a65ffd02&data=04%7C01%7CBeat.Huser%40waikatoregion.govt.nz%7C1d07e5f4aeed484f482208d8be6dc635%7Ce36ab77fcb694ec4bf31a94b8dacc5ca%7C0%7C0%7C637468725985122796%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%3D%7C1000&sdata=0b%2BuRn%2FUZHjXMiMmymnLwpozkNhqIPd5ZQi9QRZVhU0%3D&reserved=0).

**Q: Why are the key assumptions and their relative importance?**

Population changes are based on three factors: net migration, fertility, and mortality. Net migration is the main factor influencing future population numbers but is also the most volatile and unpredictable component of population change. Births and deaths are estimated using age-specific fertility rates applied to the female population of reproductive age, and age-sex-specific survivorship rates applied to the population by age and sex. Emigration and immigration are each modelled separately at the national level using error correction models that approach the long-run trend for emigration and immigration (defined as the annual average over the period from 1990-2020. Internal migration (between/within districts) is modelled using a ‘gravity model’ that models all inter-TA migration flows by age and sex, where the flows depend on the size of the populations of the origin and destination, and the distance between them.

While fertility and mortality are known to be the drivers of population change in the long term, the changes in these assumptions only make an appreciable difference in the projections towards the end of the projection series, and the differences resulting from these changes are not in the thousands of people – the effects are much smaller than that.

**Q: What base population was used?**

The base populations used was the final subnational Estimated Usually Resident Population as at 30 June 2018, after the results of the Census and the Census Post-Enumeration Survey. This latest data was released on 23 September 2020 and is the starting point for the updated projections.

**Q: How different are these 2018 Census-based projections from the previous projections (based on the 2013 Census)?**

I will add table, brief comment? Further comparisons of the updated projections and 2018 baseline data with StatsNZ and Waikato data are summarised in a separate document (needs updating): <http://www.creatingfutures.org.nz/assets/Projections-Comparisons-finalOct2020.pdf>

The projections are similar for the high-population TAs in the central and northern Waikato, but higher for the more rural and peripheral TAs. That is for two main reasons: (1) those TAs grew faster than projected previously, and so their future growth is projected higher; and (2) the internal migration projected by the gravity model allows for spill-over growth from the fast-growing TAs, and this affects all of the Waikato TAs.

**Q: How has Covid-19 influenced the projections?**

COVID-19 has reduced international migration flows (both immigration and emigration), and this is picked up in the models through a projected reduction in those flows. Effectively, it has accelerated a reduction in net international migration towards the long-term trend.

**Q: How confident are you in these projections?**

We are confident that the methodology that has been applied is state-of-the-art in population projections. This is evidenced by peer-reviewed publication of the methodology and results of past population projections and considering feedback from the peer review of the previous Waikato projections. Note that the medium (and associated low/high) projection scenario developed here are one potential future scenario. There is a degree of uncertainty around that medium projection. Moreover, the extent of the uncertainty around the medium projection gets larger the further into the future you consider.