



Population change in Aotearoa: People, places and well-being

New Zealand's Population Conference 2019

20 and 21 June 2018, Te Papa Tongarewa, Wellington

Organised by the Population Association of New Zealand
Te Roopu Whaka Waihangā Iwi O Aotearoa

Sponsored by:



Population Association of New Zealand
Te Roopu Whaka Waihangā Iwi O Aotearoa



National Institute of
Demographic and Economic Analysis
Te Rūnanga Tātari Tātauranga

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DAY ONE: Thursday, 20 June 2019

8.00 am – 8.45 am	Coffee, Tea and Registration, Venue: Oceania 2				
8.45 am – 9.30 am	Venue: Oceania 1	Mihi whakatau Conference opening by Liz MacPherson Government Statistician Welcome by Rosemary Goodyear President, Population Association of New Zealand			
9.30 am – 10.15 am		James Renwick (Professor and Head of School of Geography, Environment and Earth Sciences, Victoria University of Wellington) Keynote 1: 'Climate change and implications for human populations' Chair: Rosemary Goodyear			
10.15 am – 11.00 am		Haydn Read (Managing Director – Infrastructuralist, The Consortia) Keynote 2: 'For many, population 'equals' demand....' Chair: Rosemary Goodyear			
11.00 am – 11.30 am	Morning tea, Venue: Oceania 2				
11.30 am – 12.30 pm	Concurrent Sessions				
1a. Gender identity, Sex and Sexual Orientation Venue: Rangimarie 1 Chair: Tahu Kukutai Jack Byrne, Jaime Veale and Kyle Tan Counting the population of transgender people in Aotearoa: Using evidence from a large transgender health survey to inform population measurement Micah Davison and Rosemary Goodyear Sex, gender and sexual orientation in Stats NZ household surveys	1b. Ageing Venue: Oceania 1 Chair: Michael Berry Jeroen Spijker, Daniel Devolder and Pilar Zueras The changing balance between formal and informal old-age care in Spain. Results from a mixed micro simulation-agent-based model Heather McLeod and June Atkinson The price of a successful health system? Changing trajectories at the end of life Olivia Healey and Daniel Exeter Creating a census based measure of socioeconomic	1c. Health Venue: Rangimarie 2 Chair: Rosemary Goodyear Samuel Murray Disability data on wellbeing and socioeconomic outcomes; what we currently know and the future challenges Bo Ning, Ivan Yeo and Kelly Feng Wellington Chinese Psychological Health Survey 2018: An analytical report Zhi-ling (Jim) Zhang and Sylvia Yan Population characteristics and hospitalisations in New Zealand 2014 to 2018	1d. Diversity I Venue: Mahuki Chair: Tze Ming Mok Kylie Reiri and Emily Mason Who needs support and who receives it: system view of our population and their needs Shriya Bhagwat-Chitale and Camille Nakhid Asian MSM health outcomes and HIV testing in Aotearoa New Zealand Lars Brabyn and Natalie Jackson Visualising and working with population diversity	1e. Demographic Methods Venue: Rangimarie 3 Chair: Shefali Pawar Natalie Jackson Applied Demography and its awesome ability to throw light on pressing issues Glenn Capuano ID's work with the Australian and New Zealand Censuses – a Trans-Tasman experience Peta Darby Coverage and quality of administrative data sources in Australia	

	position for the 65+ population in New Zealand			
12.30 pm – 1.15 pm		Lunch, Venue: Oceania 2		
1.15 pm – 3.00 pm		Concurrent Sessions		
<p>2a. Diversity II Venue: Rangimarie 1 Chair: Renae Dixon</p> <p>Francis Collins Migration, diversity management and social stratification in Aotearoa</p> <p>Michael Cameron Dimensions of past and future ethnic diversity in New Zealand and its regions</p> <p>Arama Rata and Faisal Al-Asaad Whanaungatanga as an alternative to state managed multiculturalism</p> <p>Jessica Terruhn and Trudie Cain Diversity as a selling point in urban development projects in Auckland</p> <p>Robin Peace and Geoff Stone Understanding institutional capacity to respond to diversity</p>	<p>2b. Housing I Venue: Oceania 1 Chair: Joel Watkins</p> <p>Fiona Cram, Mariana Churchward, Elsie Ho, Bev James, Robin Kearns, Laura Bates and Tara Coleman Life when Renting in Aotearoa New Zealand: Enabling older people's independence in the tenure revolution</p>	<p>2c. Wellbeing Venue: Rangimarie 2 Chair: Tahu Kukutai</p> <p>Harini Dissanayake, Holly Trowland and Paul Bracewell A dynamic assessment of New Zealand education and skill growth</p> <p>Pascarn Dickinson Does local population context matter for our wellbeing?</p> <p>Simon Brown and Steven Johnston Multi-dimensional wellbeing in the New Zealand Population</p> <p>Dave Grimmond What does the 2018 Quality of Life Survey tell us about us?</p>	<p>2d. Fertility Venue: Mahuki Chair: Kim Dunstan</p> <p>Phil Morrison Fertility decline, the child deficit and the changing value of children in Asia</p> <p>Nick Parr Replacement with a Total Fertility Rate Below 2.1: Fertility Level and Long Run Population Growth Prospects in 22 Countries with Net Immigration</p> <p>Bryndl Hohmann-Marriot Fertility and Contraceptive Use in NZ</p> <p>Rebekah Hennessey and Lisa Sands Parenting and fertility: Trends over time based on registration data</p>	<p>2e. Geospatial Venue: Rangimarie 3 Chair: Shefali Pawar</p> <p>Reender Buikema Cartographic techniques for utilising the geography of statistical data</p> <p>Karl Majorhazi Spatial techniques for disaggregating published statistics</p> <p>Shaun Copley Commuting Distance for Australia</p> <p>Daniel Barnett and Andrew Sporle Interactive Web Tools to Examine the Sensitivity of Age-Adjusted Rates and Electoral Allocation to Census Undercount</p>
3.00 pm – 3.30 pm		Afternoon tea, Venue: Oceania 2		
3.30 pm – 5.00 pm		Concurrent Sessions		
<p>3a. Migration Venue: Rangimarie 1 Chair: Joel Watkins</p> <p>Martin Skeggs Measuring International Migration – continual improvements in the Australian context</p> <p>Kim Dunstan Measuring New Zealand's external migration: From precisely wrong to</p>	<p>3b. Diversity III Venue: Oceania 1 Chair: Shefali Pawar</p> <p>Mai Chen Impact of super-diversity on NZ's Health and safety and legal system</p> <p>Tze Ming Mok What kind of Whitening? Predictors of ethnic group change for Mixed people in the United Kingdom</p>	<p>3c. Regional NZ and Ageing Venue: Rangimarie 2 Chair: Michael Berry</p> <p>Nick Chester Hamilton's Age Friendly Plan 2018-2022</p> <p>Robert Didham Population ageing and diversity</p> <p>Andrew Sporle, Daniel Barnett Making population statistics usable by</p>	<p>3d. Housing II Venue: Mahuki Chair: Rosemary Goodyear</p> <p>Emma Campbell, Holly Trowland and Paul Bracewell A Small Area Assessment of New Zealand Housing</p> <p>Alan Bentley Home ownership in New Zealand: Trends over time and generations</p>	<p>3e. Gender and Homelessness Venue: Rangimarie 3 Chair: Polly Atatoa Carr</p> <p>Taylor Winter Using overseas surveys to produce reliable small population statistics in Aotearoa</p> <p>Brodie Fraser "That's what keeps me healthy and safe these days": LGBTQ+</p>

<p>approximately correct</p> <p>Denise Carlton Crossing the ditch – New Zealanders in Australia</p>	<p>Conal Smith, Atawhai Tibble and Luisa Beltran-Castillon Nga Tamariki o Te Kupenga – Diversity of Maori students</p>	<p>non-statisticians – a novel tool for reducing the skill barriers to using population statistics</p>	<p>Yukiko Kuboshima Constructing the design framework for housing that improves the quality of life of the high-needs elderly</p> <p>Toni Kennerley and Tom Simonson Local Government Social Housing in New Zealand</p>	<p>homelessness and the realisation of boundaries</p> <p>Jenny Ombler The Housing First research programme</p> <p>John Pritchard and Olivia Miller 'If you don't have a home you don't know who you are' – the role of Hutt City Council and partners in preventing homelessness</p>
<p>5.15 pm – 6.00 pm</p>	<p>Plenary Panel and Discussion: 'Understanding New Zealand's Diverse Population in the 21st Century: Opportunities and Challenges'</p> <p>Francis Collins Director, National Institute of Demographic and Economic Analysis (NIDEA)</p> <p>Natalie Jackson Director, Natalie Jackson Demographics Ltd.</p> <p>Tze Ming Mok Writer and Te Pūnaha Matatini Associate Investigator</p> <p>Chair: Rosemary Goodyear Venue: Oceania 1</p>			
<p>6.00 pm – 6.30 pm</p>	<p>PANZ Annual General Meeting, Venue: Oceania 1</p>			
<p>6.00 pm – 7.00 pm</p>	<p>Pre-Dinner Drinks, Venue: Te Marae</p>			
<p>7.00 pm onwards</p>	<p>Conference Dinner, Venue: Te Marae</p> <p>After Dinner Speaker: Keith Ng, NZ Herald Data Journalist</p>			

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DAY TWO: Friday, 21 June 2019

8.00 am – 8.45 am	Coffee, Tea and Registration Venue: Oceania 2				
8.45 am – 9.00 am	<p>PANZ Presidential Speech - Rosemary Goodyear, PANZ President</p> <p>Presentation of Newell Prize</p> <p>Data Stewardship - Liz McPherson, CGDS/GS</p> <p>Presentation of Stats NZ Jacoby Prize</p>				
9.30 am – 10.15 pm	<p>Ruth De Souza (Academic Convenor of The Data, Systems and Society Research Network (DSSRN) and Honorary Senior Research Fellow at the University of Melbourne)</p> <p>Keynote 3: 'Webs and mosaics: What do digital worlds mean for ethnic populations in health?'</p> <p>Chair: Tahu Kukutai</p>				
10.15 am – 11.00 am	<p>Maggie Walter (Pro Vice-Chancellor Aboriginal Research and Leadership, University of Tasmania)</p> <p><i>Sponsored by NIDEA</i></p> <p>Keynote 4: 'Reinventing how indigenous data are done in the age of big data and open data'</p> <p>Chair: Tahu Kukutai</p>				
11.00 am – 11.30 am	Morning tea , Oceania 2				
11.30 am – 1.00 pm	Concurrent Sessions				
<p>4a. Migration and Geospatial Venue: Rangimarie 1 Chair: Rosemary Goodyear</p> <p>Bridget Snodgrass and Kirsten Nissen People move out of Auckland, where do they go? Estimating internal migration using linked administrative data</p> <p>Sally Clement Where does the city stop and the</p>	<p>4b. Homelessness Venue: Oceania 1 Chair: Moana Rarere</p> <p>Maddie White Service usage by a New Zealand Housing First cohort prior to being housed</p> <p>Claire Aspinall Unpacking the terminology "Complex Unmet Need"</p> <p>Carole McMinn A Housing First Response to Homelessness in</p>	<p>4c. Inequality and Wellbeing Venue: Rangimarie 2 Chair: Michael Berry</p> <p>Adam Ward, Jenny Stevenson and Paul Bracewell Constructing a Summary Measure of Income Mobility from Transition Matrices</p> <p>Tamsyn Hilder, Paul Bracewell and Jordan Wilson Quantifying the Association between the</p>	<p>4d. Administrative Data Venue: Mahuki Chair: Shefali Pawar</p> <p>Sini Miller, Christine Bycroft and Robert Didham Using the parent-child link in the IDI to derive 'number of children born'</p> <p>Ross Watmuff Using admin data to improve occupancy determination and imputation in the Australian Census</p>	<p>4e. Maori Venue: Rangimarie 3 Chair: Tahu Kukutai</p> <p>Kate Prickett, Tahu Kukutai, Polly Atatoa Carr and Arama Rata Family structure and stability and child development during early childhood among tamariki Māori</p> <p>Rajas Kulkarni Creating an iwi specific Index of Multiple Deprivation of</p>	

<p>bush begin?</p> <p>James Raymer Evaluating the availability and consistency of annual migration flow data amongst ASEAN countries, 2000-2015</p> <p>Edward Griffin Migration Data Explorer: information at your fingertips</p>	<p>Hamilton</p> <p>Polly Atatoa Carr Who was housed first? Early demographic analysis of the Housing First Population in The Peoples Project, Hamilton</p>	<p>Sentiment of Regions and Socio-economic Status</p> <p>Duncan McCann and Stephen Youngblood Understanding the wellbeing of New Zealand's children</p> <p>Wesley Bachur The Southern Way: a journey beyond "delivering health services for former refugees"</p>	<p>Laura Cleary The Health Service Utilisation population: deriving population estimates using health data</p> <p>Susmita Das and Kirsten Nissen Investigating the potential for administrative data to provide birthplace and year and month of arrival/years since arrival in New Zealand information</p>	<p>Ngai Tahu iwi to measure against health and other outcomes</p> <p>Tahu Kukutai and Arama Rata Attitudes towards Māori culture and multiculturalism in the NZ General Social Survey</p> <p>Isaac Morunga, Daniel Barnett and Andrew Sporle Accuracy of previously published Maori population projections</p>
<p>1.00 pm – 1.45 pm</p>	<p>Lunch, Venue: Oceania 2</p>			
<p>1.45 pm – 2.30 pm</p>	<p>Ian Cope 'Where next for population and dwelling censuses' Chair: Rosemary Goodyear Venue: Oceania 1</p>			
<p>2.30 pm – 4.00 pm</p>	<p>Stats NZ Census Session</p> <p>Kathy Connolly, Stats NZ Overview</p> <p>Stephanie Prosser, Stats NZ 'How the new 2018 collection model worked in practice'</p> <p>Christine Bycroft, Stats NZ 'Methods developed for using administrative data to count those missed by census collection'</p> <p>Digby Carter, Stats NZ 'Quality information for census variables: where information for census variables comes from, and associated quality measures'</p> <p>Chair: Michael Berry Venue: Oceania 1</p>			
<p>4.00 pm – 4.15 pm</p>	<p>Wrap up and conference conclusion</p>			

ABSTRACTS

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KEYNOTES AND SPECIAL SESSIONS

KEYNOTE 1

James Renwick

Professor and Head of School of Geography, Environment & Earth Sciences, Victoria University of Wellington

Climate change and implications for human populations

Climate change is redrawing coastlines and changing the weather worldwide. As the globe warms, we are being exposed to increased hazards associated with coastal inundation, flooding, droughts, heat waves and forest fires. Our collective ability to feed ourselves and to ensure access to fresh water is likely to be significantly degraded in future, at a time when global population continues to grow. This presentation will outline the science and will discuss implications for food security, migration, and social disruption. It will also cover what is required to avoid the most damaging impacts.

KEYNOTE 2

Hadyn Read

Managing Director – Infrastructuralist, The Consortia

For many, population 'equals' demand....

Infrastructure stewards globally are struggling with the growth of our cities, and the negative growth in our rural areas. In New Zealand, we are not immune to these challenges. In recent years, our own cities have challenged the current thinking - the way we run them and what they ought to look like in the future. Those who have responsibilities that extend across public infrastructure consider core 'decision elements' for infrastructure investments. Demand is one of these. Demand in this guise, is population demand. This presentation will look under the hood at applied population statistics and the implications of coupling these with a practitioner's ontology – that is, someone whose worldview has the responsibility for city infrastructure front and centre, and the implications of that insight.

KEYNOTE 3

Ruth De Souza

Academic Convenor, Data, Systems and Society Research Network (DSSRN)
Honorary Senior Research Fellow, The University of Melbourne

Webs and mosaics: What do digital worlds mean for ethnic populations in health?

In settler-colonial nation-states such as Australia and New Zealand, differential health trajectories for different populations are well-documented. Racialised populations — including indigenous, migrant, and refugee and asylum seeker populations — experience both a higher burden of disease compared to Pākehā/settlers and differential access to health care. However, there is growing evidence that big data and digital health technologies can provide novel insights and solutions into the complex issues that structure the social determinants of health.

This presentation explores the emancipatory potential that these advances offer when people become more engaged in their own health care. However, caution is needed about possible consequences of these advances in the context of neoliberal securitisation: these technologies also allow unprecedented secondary data use, and the aggregation of data about particular populations contributes to surveillance cultures that routinely target racialised groups. The presentation explores some ways in which these unintended consequences can be ameliorated through algorithmic accountability and data segmentation from a rights-based perspective.

Maggie Walters

Pro Vice-Chancellor Aboriginal Research and Leadership, University of Tasmania

Reinventing how indigenous data are done in the age of big data and open data

The landscape of Indigenous population statistics in first world colonised nation states is characterised by two simultaneously occurring data revolutions. One is the emergence of the science and activism of Indigenous Data Sovereignty and its operating mechanism, Indigenous data governance which challenge the embedded practices of Indigenous population statistics by asserting the rights of Indigenous peoples within those data ecosystems. The other is the inception of high-powered technologies that underpin the concepts and realities of Big Data and Open Data initiatives which are presented as activating the resource promise of Indigenous population data. Both revolutions are now a pervasive feature of how Indigenous population data is conceived and utilised. Both revolutions hold the potential to deliver significant benefits to Indigenous populations. But as currently constructed within the population data space these data revolutions are incompatible and perhaps irreconcilable. This presentation explores what has become an internationally prominent conundrum; how the concepts and practice of Open Data and Big Data can co-exist with and align with Indigenous Data Sovereignty. The radical restructuring of the existing paradigm of population statistics is canvassed inclusive of an extensive reinvention of the conceptualisation, operationalisation and core principles of data practices associated with Indigenous population data.

KEYNOTE 4**Ian Cope**

Independent Consultant

'Where next for population and dwelling censuses'

Censuses have been carried out in different countries for centuries. Obviously, in that time they have evolved as society, information needs, and technology have changed. In his talk Ian will discuss the future of the census in an age of administrative and big Data, with reference to fundamental questions such as 'why do we carry out a census'; how and why have censuses changed over time. He was also bring in global experience and context to shed light on possible future developments.

SPECIAL SESSION

The NZ 2018 Census: collection challenges, and innovative use of administrative data

The 2018 Census strategy set out an ambitious modernisation programme across all components of census taking. This followed several censuses of minimal content change, and limited innovation. Some aspects of this modernisation have been successful, but major challenges were faced when implementing the new collection model. The lower than expected response to the census has meant that new methods of counting people based on administrative data have been developed to ensure a high quality 2018 Census dataset.

Improvements to adjust for missing census characteristics data were signalled in the 2018 Census strategy. These included the use of alternative sources (the previous 2013 Census and good quality administrative sources), and more extensive use of statistical imputation. These approaches have taken on greater significance than originally anticipated given the increased number of partial census responses and the contribution of 'admin enumerations' to the final census dataset. The 2018 Census session will consist of three presentations, and an extended Question time. The 2018 Census General Manager, Kathy Connolly, will provide a short introduction, and wrap up before we open the floor for questions.

The three presentations are:

'How the new 2018 collection model worked in practice'

Stephanie Prosser, Stats NZ

'Methods developed for using administrative data to count those missed by census collection'

Christine Bycroft, Stats NZ

'Quality information for census variables: where information for census variables comes from, and associated quality measures'

Digby Carter, Stats NZ

Counting the population of transgender people in Aotearoa: Using evidence from a large transgender health survey to inform population measurement

Jack Byrne, Jaime Veale and Kyle Tan, University of Waikato

There is growing awareness that people's gender does not always match their sex assigned at birth. Youth '12 found that 1.2% of their sample of high school students identified as transgender, and research in the United States estimated that 0.6% of adults there are transgender. Transgender communities are increasingly voicing the need to have themselves counted in population estimates and to have gender measured in a way that is inclusive of non-binary genders. Counting Ourselves is a national transgender health survey that was conducted in 2018. We worked with a community advisory group, researchers, health professionals, community organisations, and other interested organisations from across the country to develop a questionnaire about the health of transgender people and issues related to our health. We recruited participants through our networks of community organisations and health professionals, as well as a social media campaign. We had 1,170 responses to our anonymous survey, most of which were online. In this presentation, we will report the diverse range of gender terms that people are using in our communities, the demographics of our sample, as well as findings about how transgender people respond to questions based on Statistics New Zealand's 2015 standard for gender identity, which includes the term "gender diverse". This presentation will also include images and quotes from our communities, highlighting the importance they place on being visible and counted in statistical surveys. Based on our results and our knowledge of international best practice, we suggest ways that population-based surveys can measure gender in a way that is inclusive of transgender people and most accurately measure the transgender population. We also suggest ways that surveys can ask about gender in a way that is inclusive of transgender (especially non-binary) people and discuss privacy and ethical implications for use of this data.

Sex, gender and sexual orientation in Stats NZ household surveys

Micah Davison and Rosemary Goodyear, Stats NZ

Stats NZ is committed to ensuring New Zealanders are able to see themselves reflected in the data we collect. We recognise that the collection of information which adequately reflects the diversity of the population in Aotearoa with respect to sex, gender and sexual orientation has not been suitable for some people, and has not met existing information needs about sexual and gender minority groups in Aotearoa. We would like to talk about the progress made toward collecting information on these topics in our household surveys, with particular focus on the Household Economic Survey and the General Social survey. We will cover some of the progress made internationally in this area, and how by work at Stats NZ aligns with this. This is a particular area of focus for the United Nations and international human rights experts, in an effort to lift equality for LGBTQI+ peoples. We will cover some background about the drive for this work, engagement around developing the approach taken, and flow on implications. We will also talk about some of the practical considerations regarding survey mode, and efforts to maximise respondent privacy.'

The changing balance between formal and informal old-age care in Spain. Results from a mixed Microsimulation agent-based model

Jeroen Spijker, Daniel Devolder and Pilar Zueras, Centre d'Estudis Demogràfics, Spain

All developed countries have seen life expectancy improve at old ages, accelerating the process of population ageing associated with low fertility. In Spain this process has been especially fast, to the extent that in the last 30 years the number of people aged over 65 has doubled. This change in demographic structure is increasing the demand for health and social care for old-age persons, which today is still largely provided by family, typically by spouses and adult children. Concurrently, family structures are also rapidly changing due to reductions in fertility, the delay in family formation and rising divorce rates.

Moreover, an increasing proportion of women have entered the labour force. Together, these factors affect the availability of family, i.e. informal, care for people of old age. To study the supply and demand balance of informal care and quantify the needs for formal care when there is a deficit we have developed a mixed model that uses two different simulation techniques: microsimulation and agent-based-modelling (ABM). Based on current nuptiality, fertility and mortality levels, the model starts with a micro-simulation of the lifecycle of a cohort of individuals and their close relatives until death. The ABM then determines the amount of time available or needed, for caring for family members over their lifecycle, starting at age 50. Data on dependency risks, labour force participation and time available or required for care are estimated from Spanish surveys.

Surprisingly, results show that family care deficit was higher in older cohorts due to the higher mortality and thus greater impact of widowhood. However, for future generations we foresee that fertility decline and, paradoxically, the prolongation of couples' lifespan will augment the demand for formal care as there will be more couples with both members disabled but without children to take care of them.

The price of a successful health system? Changing trajectories at the end of life

Heather McLeod (Heather McLeod & Associates Ltd) **and June Atkinson** (University of Otago)

The success of the health system means people are living longer, but potentially also with longer and more complex trajectories at the end of life. Statistics NZ projects that the number of deaths each year will increase by 41% from FY2018 to FY2038 and by 85% to 2068. Not only will there be more deaths as the baby-boomers reach the end of their lives, but the deaths for all ethnicities are projected to occur at much older ages.

This research, commissioned by the Ministry of Health, uses linked data from the National Collections, aged residential care subsidies, interRAI and data directly from hospices and hospital palliative care to identify five trajectory groups. The utilisation of services is explored over the last ten years of life by trajectory group. The extraction from the linked data of those dying with dementia as opposed to from dementia shows that deaths with dementia are already the largest trajectory group in New Zealand, across all age bands.

There are new findings on the use of aged residential care at the end of life, the numbers with cancer who die of other causes, and the numbers of frail elderly with chronic conditions. The research shows the use of hospices at the end of life and an estimate was produced for the first time on the use of specialist palliative care (hospices and hospital palliative care). From a policy perspective, the results show the extent to which groups need to rely on aged residential care and primary care for palliative care at the end of life.

By combining patterns observed in the linked data with projections from Statistics NZ for the Ministry of Health, we explore the possible impact of older deaths and changing trajectories. A focus of the extension of this work in 2019 is to consider time spent in the community, and hence the support that might be

needed at home. We will demonstrate a novel way of animating the time in community information to inform the policy debate.

Creating a census based measure of socioeconomic position (SEP) for the ≥ 65 population in New Zealand

Olivia Healey and Daniel Exeter, University of Auckland

With low fertility rates and the ageing of post war baby boomers, the proportion of people living in advanced age is expected to increase. In many studies of health inequalities among the population aged 65 and over, researchers typically use traditional indicators of socioeconomic position such as education, occupation and income. While these may accurately reflect the working-age population (15-64), the applicability of these indicators is likely to decrease with age. In this study, we propose a conceptual framework for measuring the socioeconomic position of those aged 65 and over to distinguish between 'advantaged' and 'disadvantaged' groups in the older population. This study uses de-identified microdata from the 2013 New Zealand census accessed within the Integrated Data Infrastructure. Using 11 census variables representing four constructs of relevance (house value, housing income, tenure, assets and savings) we create a 'lifetime measure' of socioeconomic position, which divides the ≥ 65 population (excluding those in non-private dwellings) into low, medium and high socioeconomic position. We provide a demographic snapshot of the study population, before discussing the results of the measure itself and exploring the association between the measure, smoking and the New Zealand Index of Deprivation. To our knowledge, this is the first study in New Zealand to use whole population census data to create a measure of socioeconomic position, reflective of the changing circumstances of older people. This presentation concludes with a discussion on the potential uses for this tool in research, in addition to its strengths and limitations.

CONCURRENT SESSION 1c: Health

Day 1, Thursday 20 June 2019, 11.30 am – 1.00 pm

Disability data on wellbeing and socioeconomic outcomes; What we currently know and the future challenges

Samuel Murray, CCS Disability Action

We have a growing pool of data on wellbeing and socio-economic outcomes for disabled people. We now have data showing that disabled people have lower household income, lower qualifications, higher income inadequacy and poorer labour force outcomes than non-disabled people. Disabled people have lower mean hourly income from wages and salaries. Disabled people are more likely to report a lower level of life satisfaction and family wellbeing. Disabled people report lower trust in a wide range of institutions, including Parliament, the Police, the courts and the media. Disabled people are more likely to report experiencing violent crime and feeling unsafe.

We also have data showing that disabled children are more likely to live in one parent households and that their primary carers are more likely to be unemployed. Disabled people are also more likely to report that it is difficult to be themselves in New Zealand, especially younger disabled people. Disabled students receiving the Ongoing Resourcing Scheme are becoming disproportionately concentrated in lower decile schools. Disabled young people are more likely to use mental health services. Disabled young people are four times more likely to not be in education, employment or training.

Where we lack data is often around the diversity within the disability population and how this affects wellbeing and socio-economic outcomes. Some people may experience disability from birth or early childhood, while others may only experience a few years of disability towards the end of their lives. This is likely to affect outcomes as is age, sexuality, gender, and ethnicity as well as what types of impairments people have and how they are caused. The 2013 Disability Survey allowed us to explore some of the

diversity, but other Statistics New Zealand surveys are generally unable to because of the disability identification question set used.

Statistics New Zealand is now exclusively using the disability identification question sets of an United Nation's group called the Washington Group on Disability Statistics. The integration of the Washington Group's Short Set of Disability Questions into the General Social Survey and the Household Labour Force Survey has greatly improved the quantity of regularly collected disability data available. The limitations of the Short Set, in particular, but also of the Washington Group's other question sets is that they identify a low number of people as having a disability, compared with Statistics New Zealand's previous question sets. This tends to make further disaggregation of disability status by other characteristics unreliable.

The next challenge to overcome is to get data that allows us to understand the diversity of experience amongst disabled people as well as what the drivers and dynamics might be behind the inequities disabled people face. At the same time, we face limited funding for disability specific surveys, space and time constraints in non-disability specific surveys, and the complex dynamic, political and contested nature of disability itself as a category. Regardless of the barriers, this is a challenge we must overcome if we are serious about improving the wellbeing of all New Zealanders.

Wellington Chinese Psychological Health Survey 2018: An analytical report

Bo Ning, Ivan Yeo and Kelly Feng, Asian Family Services

There were a great deal of national research regarding the general psychological health conditions of the entire population living in New Zealand. There were also a good number of studies exploring one specific and professional aspect of psychological pathology, such as gambling addiction. However, as far as ethnicity is concerned, little research has been conducted regarding the psychological health conditions of the Chinese ethnic groups living in New Zealand.

The aim of this research is to find out the actual psychological health conditions of the Chinese ethnicity in the Wellington region, and moreover, shed light on the status quo of relevant psychological issues such as the life satisfaction and emotional distress level, as well as the determinant of life satisfaction of the Chinese Wellingtonians.

Samples were collected by interception interviews at various locations in Wellington, such as the harbour-side Sunday market near Oriental Bay, the Lower Hutt CBD, the Victoria University campus, the Massey university campus and the Chinese Methodist Church where the local Chinese normally cluster. ANOVA and regression analysis were used to explore the life satisfaction levels, the psychological well beings and the determinants.

Generally speaking, the Chinese living in Wellington suffered from dual sources of psychological pressure, i.e., the cultural adaptation pressure (such as linguistic barriers), and the environmental pressure (academic pressure, financial pressure, etc). We come up with a life satisfaction conceptual model, and have important findings regarding the determinants of the psychological wellbeing of the Chinese Wellingtonians as well. The findings are: age is positively associated with their life satisfaction level; emotional distress negatively affect their life satisfaction; the duration of settlement and the dwelling conditions are important predictors of life satisfaction. We also revealed that more than half of the Wellington-based Chinese have little knowledge about the public medical knowledge, and pay less attention to their mental wellbeing than their physical health.

This research is a trial study for a national psychological health survey to be implemented by Asian Family Services. This trial survey may serve as important reference for the clinic counselling services, and create the basis of comparison for the forthcoming psychological health research to be held in Auckland, Christchurch and other cities in New Zealand.

Population characteristics and hospitalisations in New Zealand 2014 to 2018

Zhi-ling (Jim) Zhang and Sylvia Yan, Ministry of Health

Background: Demographic changes have significant impact on health services. Health care needs are different in sub-population groups. This paper describes main population characteristics and the use of hospital care in New Zealand between 2014 and 2018.

Methods: The National Minimum Dataset for Hospital Inpatient Events (NMDS) and the National Non-Admitted Patient Collection (NNPAC) were used to identify Inpatient and emergency department (ED) hospital events. These two datasets were matched to identify inpatient events admitted from ED. Projected population was used as denominator to calculate age-specific and age-standardised rates of hospital events per 1,000 population. Causes of hospitalisation were classified by the International Statistical Classification of Diseases and Related Health Problems (ICD-10-AM). Overseas residents were excluded from the analyses.

Results: There are 5.8 million presentations to ED in the period. Among them 30% of the presentations are injury-related. Age-standardised rate (ASR) of the ED presentations was 245 per 1,000 population. Children and older people have higher age-specific rate than other age groups of the population. Maori and Pacific people also have significantly higher ASR than other ethnicities. There is significantly increasing trends in ASRs from people living in NZdep13 Q1 to Q5. Around 40% of ED events were subsequently admitted as inpatient events. The percentage was higher in older patients, but lower in Maori and the people living in deprived areas (Q4 and Q5).

During the period, there are around 6.2 million hospital inpatient events. The most common causes of the hospitalisations are: injury and poisoning (10%), diseases of digestive system (10%), maternity events (8%), respiratory diseases (7%), cardiovascular diseases (7%), cancer (6%) and musculoskeletal disorders (6%). Nevertheless, the common causes are slightly different between ethnical and NZdep groups. Age-standardised rate of hospital inpatient events was 260 per 1,000 population. Pacific and Maori people have the highest rates in the population. There is a significant gradient of the rates from NZdep Q1 to Q5. While young age groups have the highest age specific rates of infectious and parasitic, ear and respiratory diseases; the rates of many major causes of hospitalisation are increasing with age, and reaching the peak at old age groups, including cancer, injury and diseases of blood and immune mechanism, circulatory, digestive, eye and musculoskeletal system. Age specific rate was 574 per 1,000 population in patients aged 65+ compared with 208 per 1,000 in those under 65.

Conclusion: In terms of rates and the causes of hospitalisations, sub-groups of the population have different patterns of using hospital services. The high rates of hospitalisations in old age groups indicate high service demand in the future as population ageing. The findings in this work also show health inequity issues between ethnical and deprivation groups. The results from the cause analysis provide evidence for policy development for service improvement and reducing health inequities in the population.

CONCURRENT SESSION 1d: Diversity I

Day 1, Thursday 20 June 2019, 11.30 am – 1.00 pm

Who needs support and who receives it: A system view of our population and their needs

Kylie Reiri (Nicholson Consulting) and **Emily Mason** (FrankAdvice)

What can we say about how our government supports our population throughout their lives? Who needs support? Who receives it? And how can we do better when take an all of population view, with people's lived experiences at the centre of our approach.

Statistics NZ Integrated Data Infrastructure (IDI) is a taonga. We can use it to understand the lived experiences of our population in a very unique way.

Our presentation will start with an overview of the linked data that exists in New Zealand to spark some ideas of how this could be better used. We give an example of the spread of social sector spending in the New Zealand population by demographic breakdowns, including all government spending included in the IDI.

Asian MSM health outcomes and HIV testing in Aotearoa New Zealand

Shriya Bhagwat-Chitale (AUT / Auckland Council) and **Camille Nakhid** (AUT)

This pilot study explores Asian Men Who have Sex with Men (MSM)'s perception of risk behaviour and HIV testing in New Zealand using the Health Belief Model (HBM) framework. Though Asian MSM report high recall of HIV prevention messages and knowledge of HIV, their perception of HIV risk presents as a key barrier to HIV testing.

Participants do not perceive HIV testing as necessary when they mitigate HIV risk through modelling monogamous sexual relationships or avoid condomless sex with multiple partners. A perception that sexual partnering among the openly gay, non-Asian gay community as being riskier combined with low involvement in the openly gay community where targeted HIV testing is easily accessible, fear of stigma in the Asian community of homosexuality and HIV, and limited desire to access primary health care (GPs) until the first episode of illness all present as barriers to HIV testing.

Visualising and working with population diversity

Lars Brabyn (University of Waikato) and **Natalie Jackson** (Natalie Jackson Demographics Ltd.)

An online New Zealand Atlas of Population Change has been developed (see <http://socialatlas.waikato.ac.nz/>) to communicate the interaction and associated diversity resulting from three important components of population change – migration, natural change (births minus deaths), and population ageing. Prior to developing this site, an evaluation was undertaken of five prominent international online population mapping applications. This paper draws on the main findings of that evaluation, bringing together the principles of demography, cartography, and human-computer interaction, as well as consideration of open source and proprietary software. We also reflect on the practical development of the Atlas and our choice of static over dynamic mapping. Interactive online maps and graphics are a powerful medium for communicating population change and associated diversity, but care needs to be taken in the choice of data and their interpretation. The New Zealand Atlas of Population Change differs from the thematic mapping of raw data in that it is accompanied by supporting research. This is a different approach to mainstream online atlases and mapping applications that provide access to large datasets and allow the user to dynamically construct their own maps. We argue that many users do not know what questions to ask from an online database, therefore the provision of research-supported maps and graphs by experienced researchers has a place in online mapping. We

structure the remainder of our paper using examples from the Atlas, with a focus on assisting New Zealand to better prepare for, respond to, and celebrate, its increasingly diverse population.

CONCURRENT SESSION 1e: Demographic Methods

Day 1, Thursday 20 June 2019, 11.30 am – 1.00 pm

Applied Demography and its awesome ability to throw light on pressing issues

Natalie Jackson, Natalie Jackson Demographics Ltd.

The decline of demography as a taught subject across New Zealand (and Australian) universities is a travesty, occurring just at the moment it is most needed. Every day we hear of skill and housing shortages. Applied demography has much to offer. This paper illustrates (a) the ageing of New Zealand's occupations, with implications for both migration and HR/recruitment policy, and (b) the mobility and demographic drivers of change of local populations, with implications for housing demand—and supply. The paper will argue that timely attention to these demographic drivers would assist in (a) labour supply meeting labour demand, and (b) housing supply meeting local demand.

ID's work with the Australian and New Zealand Censuses – a Trans-Tasman experience

Glenn Capuano, .id (informed decisions)

.id have been working with the Census data on behalf of our local government clients in Australia for the past 20 years. We present information from the Census (up to 6 Census periods) on a consistent geographic basis, in a user friendly format for council staff and external users to make evidence-based decisions. The toolkit has been phenomenally successful in Australia, with over 270 clients, covering over 75% of the national population. In 2011, we moved into New Zealand and tried to repurpose the methodology which made us so successful in Australia. We have since worked with approximately 20 clients in New Zealand, for population profiling and forecasting. This presentation is about our experience with the similarities and differences between the Censuses across the Tasman and how we adjusted our work between the two countries.

- What worked in Australia but didn't work in New Zealand?
- What are some features of the Census in New Zealand which would be really useful to have on the Australian Census?
- How did the Christchurch Earthquake in 2011 affect the results, and how did we manage the adjustment to the new Census cycle?
- Confidentiality in the Census – how it affects the output and how the two countries do it differently.
- Changes in Australia for the 2016 Census – Removal of Additivity and changes to Journey to Work coding, and the issues they have caused.
- Response rate in New Zealand 2018 and how it is affecting our work.
- The 2021 submissions process - .id submitted suggestions for new topics for 2021 in Australia – how successful were we, and what's coming next? What are the plans for new topics in 2021?

Coverage and quality of administrative data sources in Australia

Peta Darby, Australian Bureau of Statistics

Administrative data show great promise in providing valuable information in a timely manner and are increasingly being used as an integrated data source for official statistics to create new insights for policy formulation and evaluation. There are a number of large administrative data sources in Australia that provide information about different parts of the population. This presentation will outline the coverage and quality of key integrated data sources for the Australian population, including data available for Aboriginal and Torres Strait Islander people. These data sources include administrative data obtained from government agencies such as the Australian Taxation Office, the Department of Health and the Department of Social Services.

This presentation will focus on comparisons of the administrative data with the Australian Census and ABS population estimates.

CONCURRENT SESSION 2a: Diversity II

Day 1, Thursday 20 June 2019, 1.15 pm – 3.00 pm

Migration, diversity management and social stratification in Aotearoa New Zealand

Francis Collins, National Institute of Demographic and Economic Analysis (NIDEA)

The notion of a “diversity dividend” hinges on a conception of socio-cultural difference as a generator of economic benefits. Unsurprisingly, then, in government and institutional responses the goal of extracting value from such diversity often centres on those groups deemed to have economic worth, high skilled migrants, corporate culture, and creative industries for example. In contrast, other expressions and embodiments of socio-cultural difference can often be ignored or denigrated as a problem in need of management.

In this paper, I centre my analysis on the socio-cultural differences manifest in “lower skilled” labour migration pathways to Aotearoa/New Zealand and the diversity responses evidenced in employer and government actions. Two patterns of diversity management emerge in this analysis: 1) that migrants from different backgrounds are stratified in terms of value and rights along the lines of occupation, nationality and gender; and 2) that migration and diversity are governed within a deficit rather than dividend model that essentialises migrant difference as a problem to be solved through paternalist employer and government responses. Through this analysis, the paper questions the seeming pervasiveness of the “diversity dividend” as a logic for governing difference in Aotearoa/New Zealand while also signalling the way that the objective of managing difference often leads to the intensification of social stratification.

Superdiverse Aotearoa: Dimensions of past and future ethnic diversity in New Zealand and its regions

Michael Cameron, University of Waikato

New Zealand is incredibly ethnically diverse, and some would argue that the ‘superdiversity’ label is a perfect fit. A diverse population comes with both opportunities and challenges. Is there a diversity dividend to be captured? Before such a question can be answered, we first need to consider what current and future diversity will look like. In this paper, I present data from the New Zealand Census of Population and Dwellings 1976 to 2013, to demonstrate the rapidly increasing ethnic diversity of New Zealand and its regions. I then explore the ‘cultural generation gap’ measure in 2013 as a signal of the future trajectory of ethnic diversity, before discussing national and subnational ethnic population projections and the implied future changes in diversity.

Whanaungatanga as an alternative to state managed multiculturalism

Arama Rata (NIDEA, University of Waikato) and **Faisal Al-Asaad** (University of Melbourne)

The concept of diversity has tended to attract critical scrutiny in scholarly writing in almost equal proportion to the symbolic currency it has acquired in administrative and governmental practice. Diversity discourse tends to conflate racialised groups as equivalent and interchangeable, and (in settler colonial contexts) reduce Indigenous sovereign peoples to ‘ethnic groups’. These tendencies, coupled with settler colonial structural binaries (Native/settler, White/non-White) exist to the detriment of Indigenous-migrant relations, and point to the need for new ways of engaging social difference. While there is a long history of research into relationships between Māori and Pākehā, scholarship on the relationship between Māori and settlers of colour is sparse.

In this research, through qualitative analysis of interview data, we explore how Māori relate to settlers of colour, against the paradigm of ‘diversity’ that dominates state interactions with both Māori and settlers of colour. Māori who participated in this research described relations with settlers of colour in terms that were

consistent with whanaungatanga (a Māori concept for good relations), as relations were characterised as family-like, based on shared (similar) experiences, and bound in (conditional) solidarity. We also explored whether and how Māori practiced whakawhanaungatanga (a Māori process of relationship building) with settlers of colour. We grouped the whakawhanaungatanga strategies into seven themes: knowing oneself, manaaki (respect), aroha (compassion), creating space for dialogue, airing take (grievances), perspective taking, and cultural practice. We conclude that the Indigenous concept whanaungatanga offers opportunities to engage social difference, while avoiding the pitfalls of diversity discourse, and may therefore be used to strengthen Māori-migrant relations.

Whose dividend? Diversity as a selling point in urban development projects in Auckland

Jessica Terruhn and Trudie Cain, Massey University

The rapid population growth Auckland has experienced over recent years has necessitated new policy initiatives to accommodate the growing need for housing. In order to minimise further urban sprawl, Auckland Council envisions that a substantial share of all new dwellings will be built within current urban boundaries. The Unitary Plan has identified a number of neighbourhoods as suitable locations to accommodate such growth. Often (but not always), these are socio-economically deprived neighbourhoods with large shares of social housing. This paper critically discusses the role diversity discourses play in such urban development projects in Auckland. Drawing on an analysis of documents pertaining to current urban development in the Auckland neighbourhoods of Avondale and Northcote, we argue that rationales for developments in these neighbourhoods centrally rely on narratives of neighbourhood regeneration and improvement. These narratives also explicitly state that attracting higher income earners to buy into these areas is desirable. Even though the projected demographic change amounts to state-led gentrification, it is framed as increased diversity which is said to benefit the socio-economically disadvantaged residents of the neighbourhoods. The paper argues that diversity is instrumentalised in a way that normalises gentrification and not only hides but perpetuates inequalities.

Understanding institutional capacity to respond to diversity

Robin Peace (Massey University) and **Geoff Stone** (Ripple Collective)

The 'diversity dividend' is well measured in econometric terms (see Poot, Mare et al.) but is not well understood in terms of service ecologies or institutional capacity building. A series of three CADDANZ projects have taken the form of 'institutional evaluations' in order to develop a clearer understanding of what organisations need to know about their own business in relation to increasing social (particularly ethnic) diversity. One of the end products of these three projects is a stronger understanding of the value of co-produced artefacts (maps, diagrams, plans) in developing a richer picture of where an organisation is in relation to its capacity to respond to diversity. Each of the organisations evinced at least one novel representation of 'what we look like now' that was helpful in ongoing strategic management. This paper explores the way these artefacts were constructed, what they revealed that had previously been unclear and what opportunities arose for different kinds of organisational action. The conclusion taken from this series of studies is that working closely with an organisation in a 'critical evaluative friend' role enables a stronger institutional response to diversity demands and expectations.

CONCURRENT SESSION 2b: Housing I

Day 1, Thursday 20 June 2019, 1.15 pm – 3.00 pm

Life when renting in Aotearoa New Zealand: Enabling older people's independence in the tenure revolution

Fiona Cram (Katoa Ltd), **Marianna Churchward** (Victoria University of Wellington), **Elsie Ho** (University of Auckland), **Bev James** (Public Policy & Research), **Robin Kearns**, **Laura Bates** and **Tara Coleman** (University of Auckland),

The success of the health system means people are living longer, but potentially also with longer and more complex trajectories at the end of life. Statistics NZ projects that the number of deaths each year will increase by 41% from FY2018 to FY2038 and by 85% to 2068. Not only will there be more deaths as the baby-boomers reach the end of their lives, but the deaths for all ethnicities are projected to occur at much older ages.

This research, commissioned by the Ministry of Health, uses linked data from the National Collections, aged residential care subsidies, interRAI and data directly from hospices and hospital palliative care to identify five trajectory groups. The utilisation of services is explored over the last ten years of life by trajectory group.

The extraction from the linked data of those dying with dementia as opposed to from dementia shows that deaths with dementia are already the largest trajectory group in New Zealand, across all age bands.

There are new findings on the use of aged residential care at the end of life, the numbers with cancer who die of other causes, and the numbers of frail elderly with chronic conditions. The research shows the use of hospices at the end of life and an estimate was produced for the first time on the use of specialist palliative care (hospices and hospital palliative care). From a policy perspective, the results show the extent to which groups need to rely on aged residential care and primary care for palliative care at the end of life.

By combining patterns observed in the linked data with projections from Statistics NZ for the Ministry of Health, we explore the possible impact of older deaths and changing trajectories. A focus of the extension of this work in 2019 is to consider time spent in the community, and hence the support that might be needed at home. We will demonstrate a novel way of animating the time in community information to inform the policy debate

CONCURRENT SESSION 2c: Wellbeing

Day 1, Thursday 20 June 2019, 1.15 pm – 3.00 pm

A dynamic assessment of New Zealand education and skill growth

Harini Dissanayake, Holly Trowland and Paul Bracewell, Dot Loves Data

Education is a core contributor to the success of a nation. Monitoring the development of education and skills in New Zealand extends our measures of success beyond just financial aspects. Importantly, education and skills are key components of community wellbeing, as outlined by the Social Investment Agency's work into a Wellbeing Index (Social Investment Agency, 2018). There is currently no method of exploring wellbeing at a community level within New Zealand, however, there is substantial interest in producing such a metric.

To create a measure of Education and Skills at a community level within New Zealand, a range of public and private data sources are identified and combined meaningfully using multivariate analysis to create a metric which updates monthly. The underlying elements that are used to develop the index also have intrinsic value.

The methodology for measuring each of these underlying elements is discussed and validated. Emphasis is placed on the use of dynamic data sources that are robust, transparent, frequently updated and accessible at a small area level. The final solution is a transparent measure of Education and Skill growth. Consequently, The Education and Skills Index, can be interpreted by multiple parties outside government and research agencies, allowing the end user to rank all area units in New Zealand by overall progress in education and skills.

Does local population context matter for our wellbeing?

Pascarn Dickinson, Victoria University of Wellington

One of the most important attributes of a population is its level of wellbeing, and closely associated with wellbeing are the communities that people live in. This paper considers the relationship between wellbeing and the wellbeing of communities. Typically this relationship is examined by considering the impacts that governance or income inequality have upon our wellbeing. However, only a handful of research addresses the relationship between wellbeing and the distribution of a population's wellbeing. Previous studies have established a robust negative relationship between the average level of subjective wellbeing in countries and the distribution of subjective wellbeing within them. The fact that our wellbeing falls as the wellbeing distribution widens to become more unequal suggests that we care about inequalities in the lives of others. In contrast to the international literature, I examine the relationship between wellbeing and wellbeing inequality within countries at the level of the region, city and ward.

I use the standard deviation of life satisfaction, the most widely used measure of wellbeing inequality, and draw on the New Zealand Quality of Life Survey, the New Zealand General Social Survey, and the World Values Survey for data.

I find a consistent negative relationship between the level of wellbeing and the inequality of wellbeing in sub-national groups. Unlike comparisons between countries, my sub-national explorations suggest that holding egalitarian values make people more sensitive to the inequality in wellbeing of those around them. There is a strong argument for care and attention to be given to wellbeing inequality in New Zealand's 'Wellbeing Budget': On empirical grounds alone, reducing local wellbeing inequality is likely to make us all much happier.

Multi-dimensional wellbeing in the New Zealand Population

Simon Brown and Steven Johnston, The Treasury

We present analysis that uses The Treasury's Living Standards Framework (LSF) to examine multi-dimensional wellbeing in the New Zealand population.

The LSF represents The Treasury's current thinking on how living standards can be defined and measured, broadening our focus beyond traditional economic indicators such as GDP. The LSF borrows from the OECD's "How's Life?" wellbeing measurement framework, adapted for New Zealand with an additional focus on cultural identity. There are 12 domains of current wellbeing and 4 capitals that represent the resources needed for future wellbeing.

Our analysis uses data from the 2014 and 2016 New Zealand General Social Survey (GSS). We mapped selected GSS questions to the LSF, and created indicators across 9 of the 12 domains of current wellbeing for each GSS respondent. This enables us to summarise and compare the multi-dimensional wellbeing of groups within the New Zealand population – showing the domains of wellbeing where a particular group is doing better or worse than the rest of the population. And we can look at how domains of wellbeing are related – how is low/high wellbeing on one domain associated with low/high wellbeing on other domains.

This analysis is available as the "Our people" section of the LSF Dashboard, published by The Treasury in December 2018.

Since the release of the dashboard, we have constructed a more comprehensive dataset by combining all five iterations of the GSS from 2008 to 2016, and combining it with the datasets available in Statistics NZ's Integrated Data Infrastructure (IDI). The link from GSS respondents to their data in the IDI opens up additional opportunities for analysis. We can look at the multi-dimensional wellbeing for a wider range of groups within the New Zealand population, such as groups defined by their engagement with specific Government services. We can also analyse the use of Government services by people with a particular wellbeing profile.

As an example of the wellbeing analysis possible with this data, we present some exploratory work on mental health wellbeing. The analysis questions were:

- Which other aspects of wellbeing are most closely associated with mental health?
- What is the multi-dimensional wellbeing of recent users of mental health services (e.g. mental health prescriptions) and selected other services?
- Which population groups with poor mental health wellbeing have a low take-up rate of mental health services?

Our presentation will provide an overview of the above developments, results from the LSF Dashboard and mental health paper, and potential next steps for The Treasury's wellbeing analysis.

What does the 2018 Quality of Life Survey tell us about us?

Dave Grimmond, Greater Wellington Regional Council

Principal component analysis is employed to investigate whether there are any commonalities in the way that respondents answered the 2018 Quality of Life Survey. In particular, we investigate the way that people who answered specific questions in a certain way responded to other questions in the survey. We are hoping to identify if there are any common characteristics about people who, say, report a low or high quality of life, or perhaps an improving or declining quality of life.

CONCURRENT SESSION 2d: Fertility

Day 1, Thursday 20 June 2019, 1.15 pm – 3.00 pm

Fertility decline, the child deficit and the changing value of children in Asia

Phil Morrison, Victoria University of Wellington

There is considerable concern over the social implications of rapid declines in the fertility rate experienced by countries in the Asian continent. However we know little about accompanying changes in the distribution of values associated with the family or how this varies from country to country. Of central interest in this chapter of a forthcoming book is the possibility of a growing tension between family preferences of parents and their ability to realise them in contemporary urban Asian settings (Morrison, 2019).

This paper draws on chapter 15 to explore the changing relationship between fertility decline, the difference between the actual and ideal number of children (the 'child deficit') and values associated with the family. Specifically, it asks whether the value accorded children in a population remains constant as the number of children born falls short of parents' ideal or whether values adjust to the new demographic reality. In an increasingly expensive urban world with considerable employment uncertainty most people would like to have more children than they actually do. If the reason for the child deficit is primarily economic we should see little or no decline in the value accorded the family and children as fertility rates fall and an increasing tension between family aspirations and reality.

Evidence for a growing discord between family values and lowered fertility is sought from the unit records from the World Value Surveys administered in several Asian countries at different stages in their fertility decline. The repeated cross-sectional samples allow the implications of varying speeds of fertility decline to be examined. Countries experiencing more rapid fertility decline are expected to exhibit a wider gap between their ideal and their actual number of children while sustaining family values derived from parents raised in less urbanised contexts. A central question is whether the length of time a country remains in a low fertility state is associated with a lower the child deficit (as parents revise their ideal number of children downward by generation) and whether these revisions are associated with a diminution in the strength of family values. The absence of a reconciliation between the values accorded the family and the ability to aspire to and realise desired family size speaks to an increasing tension between the demands of contemporary urban living and the base life style preferences of many parents throughout the Asian continent.

Replacement with a Total Fertility Rate below 2.1: Fertility level and long run population growth prospects in 22 Countries with net immigration

Nick Parr, Macquarie University

Over 2010-15 the TFR was below 2.1 in all the More Developed Countries, except Israel. 65% of these countries also had positive net immigration. For 22 countries, this paper calculates a 'With Migration Replacement TFR' which equates the size of the stationary population to which convergence would occur over time under constant mortality and net migration amount to current population size, and a 'Replacement Migration' which does so under constant fertility and mortality. The results show the With Migration Replacement TFR ranges widely from 0.60 for Singapore to 2.05 for Slovakia, and is below the current TFR in 14 of the 22 countries. Despite its smaller population, absolute 'Replacement Migration' is higher for Japan than for USA, due to its lower TFR. On a per 1000 population basis 'Replacement Migration' is highest for Korea and lowest for France. Synthetic measures for the long run population growth implications of the combined effects of age profiles of fertility, migration and mortality for long run population growth are proposed and illustrated. Simple, short-cut approximate estimators of Migration Replacement TFR and Replacement Migration are proposed, with a view to their helping to counter a popular misconception that a TFR of 2.1 is necessary to prevent long-run population decline. The results

demonstrate the importance of considering the implication of a particular level of national fertility jointly in conjunction with the prevailing migration and mortality levels, as opposed to in isolation.

Fertility and contraceptive use in NZ

Bryndl Hohmann-Marriot, University of Otago

Fertility and population dynamics are linked to contraception. The contraceptive context includes factors such as education, availability, affordability and perception, as well as how contraceptives fit within individual and community perspectives on pregnancy. The extent of these perspectives may not be fully captured by the standard planning paradigm, despite its wide use. Further, there are an increasing number of contraceptive options available. One of these is the use of reproductive health apps for contraception. We know little about this use, as it has not been measured by any survey, but is likely that use is growing. These new contraceptive options may play a role in how current contraception is perceived and used in New Zealand, and this presentation offers a first look at how they could fit into our fertility landscape. It will give the results of a pilot study to gauge awareness of this contraceptive method, as well as preliminary results of a study on how this method is being used. This information will be useful for those working in the areas of reproductive health, family and youth wellbeing, family planning, fertility and population dynamics, new technologies and big data.

Parenting and fertility: Trends over time based on registration data

Rebekah Hennessey and Lisa Sands, Stats NZ

People are celebrating life events later in their lives than previously. Parents are often older when they have their first children. As the age at first birth rises, we can expect to see changes in the timing and tempo of births, and eventual "family" size. Median age of mothers is a well-used measure when analysing changes in maternal age over time. However, further insights on how parenting and fertility has changed over time can be analysed using data sourced from birth registrations.

Age-specific analysis can provide information about births to mothers of different ages. However, little is known about fathers. What age-specific and median age data can we analyse from birth registrations about fathers? Other variables included in birth registrations provide insights into changing parenting and fertility trends. Mothers ethnicity and address are such variables. Do ethnic and regional differences affect what age mothers have their children?

Finally, what about the parent's relationships themselves? It is commonly known that fewer parents are married when their children are born compared with the past. But what further information about parental relationships can be obtained from registration data? How large are parents' age gaps, and how have these changed over time? This paper will investigate and discuss how parenting and fertility has changed over time using birth registration data.

CONCURRENT SESSION 2e: Geospatial

Day 1, Thursday 20 June 2019, 1.15 pm – 3.00 pm

Cartographic techniques for utilising the geography of statistical data

Reender Buikema, Stats NZ

The geography of statistical data can be utilised to tell stories that are otherwise hidden in statistical tables. Several tools and techniques exist that can be used to visualise data on maps. Visualising your data on a map can communicate new information, create insights, and even change attitudes and behaviours. Modern day mapping software are now within the reach of anyone with a computer and a little skill. However, first impressions can be potent, and simply placing data on a map may not be enough. Stepping outside the box and away from not only the default, single variable choropleth map but also the statistical geography that contains your data, can yield interesting insights and increase user engagement. This paper/presentation explains four examples of cartographic techniques that anyone can use to map and communicate statistical data to get the best impact. These are: bivariate choropleth mapping, multi-variate dot density mapping, gridded data, and story maps.

Bivariate choropleth maps are a variation on the traditional univariate choropleth map, displaying two variables on one map by utilising colour and transparency. Dot density maps are distribution maps that use a dot symbol and visual scatter to show the spatial pattern of features or phenomena. Gridded maps take statistical data that is traditionally viewed in small-area geographies like meshblocks and transforms them into a regular tessellation to more accurately display the data's geographic location. As all data has a story in it, utilising technology and techniques such as story mapping can greatly enhance the presentation of your statistical data by allowing a narrative to be presented alongside your data. All the examples presented utilise Stats NZ's publicly available data, or datasets provided by other institutions that utilise Stats NZ's public data.

Spatial techniques for disaggregating published statistics

Karl Majorhazi, Stats NZ

The northward drift of New Zealand's population is well known, but now we can now show you the rate at which this happens. Stats NZ have completed a project to track the centres of population since 1891 using the mean centre, or centre of gravity - the point at which the population is perfectly balanced. The population track shows the direction of the northward drift of the population and some significant events such as wars and earthquakes have had on population distribution. For this analysis, the preferred method of determining the centre of population is the mean centre (also called the centre of gravity). This is the balancing point of all people on a plane. It is preferred to the median centre because it accounts for the movement in the entire dataset whereas the median centre discounts small movements within in regions. The source of the historic population data up until 1986 has been the Yearbook collection. The population of counties and boroughs provides a consistent time-series of population data at the highest spatial resolution for that period. For 1991 and later, population by census area unit with geographically-weighted centroids provides an increased spatial resolution.

Will we see the effect of the growth of Wellington, Napier-Hastings, Nelson and Picton creating a lateral movement or deceleration of the northward drift? Will we be able to see the effects of wars, the gold rush, earthquakes and other natural disasters?

Commuting distance for Australia

Shaun Copley, Australian Bureau of Statistics

The Australian Bureau of Statistics has been working on a number of practical projects to add value to statistics with geospatial data. This presentation will take you through the journey of the ABS developing a new Census data item (commuting distance) using the integration of existing geospatial and statistical data. This project aimed to inform policy and research around the commuting behaviours of Australians and highlight differences across the country that might be used to inform the design and sustainability of towns and cities. The presentation will see the ABS Geospatial Solutions section introduce the concept of geo-statistics and reflect on their work to develop measurements of commuting distance using data from the 2016 Census of Population and Housing. This will include information on the methods, data sources and analysis, as well as the collaboration required to develop this new product. The presentation will showcase some of the outputs produced as part of this work including interactive maps which visualise journey to work patterns for Australian's. It will also touch on some similar future work which will look at linking geospatial data to the National Health Survey (NHS) and the National Early Childhood Education and Care Collection.

Interactive web tools to examine the sensitivity of age-adjusted rates and electoral allocation to Census undercount

Daniel Barnett and Andrew Sporle, University of Auckland

The New Zealand Census provides vital information and figures used in important calculations in governmental departments, business, iwi, and research. A low response rate in the census has the possibility of significantly affecting the reliability of these calculations and the resulting outcomes. Based on reports released by Stats NZ, the 2018 census experienced lower-than-expected response rates with estimates of approximately 90% overall, with lower response rates expected amongst certain populations such as those of Māori or Pasifika descent. Research into how low response rate affects some calculations will allow us to better understand the implications of the 2018 census.

We constructed two interactive web-based applications that allow users to explore the consequences of census undercount on two calculations: age-adjusted rates and electorate allocation. As data from the 2018 census is yet to be released, we use 2013 census data publicly available from Stats NZ and we provide three numerator datasets in the age-adjusted rates application: mortality, cancer incidence, and injuries requiring hospital attention. These are intended to act as proxies for issues that affect older, middle-aged and younger age groups more often. Both applications adjust the census data based on user-inputted response rates for individual 5-year age bands for Māori and Non-Māori males and females before proceeding with the remainder of the calculation in question with this adjusted data. Results from the original, unadjusted data are contrasted with those from the adjusted data so users can gauge the sensitivity of their chosen level of undercount on the calculations. Pairwise comparisons are used to demonstrate differences in well-being between ethnicities and sexes in the age-adjusted rates application. The number of Māori electorates depends on both the Māori usually resident population and the number of Māori choosing the Māori electoral roll. Our electorate allocation application provides the ability to adjust both the census undercount and the proportion of Māori on the Māori electoral roll for each electoral population (North Island, South Island and Chatham Islands). These applications are interactive and dynamic with results that automatically update as users adjust the response rates, which enables fast iteration and immediate feedback to users.

Preliminary exploration using these applications has shown combinations of undercount that add to an overall response rate of 90% produce results significantly differing from those calculated based on the unadjusted data. The difference between age-adjusted rates from unadjusted and adjusted data was found to be significant enough for the confidence intervals to not overlap. Electorate allocation changes were also possible from low response rate alone, but we found the calculation is more sensitive to the number of Māori who choose to be on the Māori electoral roll.

These tools give the ability to researchers to investigate the sensitivity of age-adjusted rates and electorate allocation to census undercount without requiring the programming knowledge involved in simulating these processes.

CONCURRENT SESSION 3a: Migration

Day 1, Thursday 20 June 2019, 3.30 pm – 5.00 pm

Measuring international migration – Continual improvements in the Australian context

Martin Skeggs, Australian Bureau of Statistics

In 2018 there were over 42 million movements across Australia's international border. However, less than 2 percent of all these movements were made by migrants who are subsequently either added to, or subtracted from, Australia's population.

In Australia, there is a legislative requirement to produce quarterly population estimates which (amongst many other uses) underpin the distribution of Goods and Services Tax revenue and the number of seats each state and territory is entitled to in the House of Representatives within the Parliament of Australia.

For more than a decade, overseas migration has contributed well over half of Australia's population growth, however historically this contribution has varied greatly. Additionally, over the years there have been various waves of migration to Australia with a shift from more permanent migrants to those who now migrate temporarily. Given this variability of overseas migration and its impact on population growth, adapting and improving the methods used in its measurement are critical to the quality of both Australia's migration and population estimates.

Like many other national statistical agencies, the Australian Bureau of Statistics (ABS) has been on a journey of continual improvement in the measurement of overseas migration. From the use of Census of Population and Housing information, sample surveys and administrative data, the methods and measurement of migration have improved over time.

Due in part to some distinctive attributes, such as having maritime borders only, with the vast majority of travel being by air, and a long history of an immigration department with administrative systems that are well established and robust, the ABS has been able to produce migration statistics that are among the best in the world.

With the use of Australia's data on migration as a back drop, this presentation will provide an overview of the methods used by the ABS over time and include a focus on the most recent improvements and the information now available at our fingertips.

StatsNZ Measuring New Zealand's external migration: From precisely wrong to approximately correct

Kim Dunstan, Stats NZ

Accurate measurement of the number and characteristics of travellers crossing the border are important because of how migration and related population and economic statistics are used. The surge in tourism and trans-nationalism makes differentiating 'travel' (short-term movements) from 'migration' (long-term movements) increasingly challenging, but no less important. A new outcomes-based measure – based on longitudinal travel histories from linking of individual arrivals and departures – gives a logical method of determining migration status based on a 12/16-month rule. In 2019 this replaced the intentions-based ('permanent and long-term' - PLT) measure – based on passenger card responses – which had been the mainstay of New Zealand migration statistics since the 1920s. The precision of the PLT measure belied its inherent, but unknown, uncertainty.

This major change in migration measurement is not without challenges. How long travellers stay in New Zealand, or New Zealand-residents stay abroad, is not immediately known. As a result, their 'outcomes' need to be modelled to maintain timely statistics. This uncertainty in initial migration estimates also impacts population estimates and other statistics. Of every 50 border crossings, no more than 1 is a migrant arriving or departing, so migration estimates are sensitive to mis-classification. Deriving an extended historical time

series of migration estimates is dependent on accurate linking of arrival and departures in the Integrated Data Infrastructure (IDI). The IDI is also a necessary data source to derive subnational migration estimates.

New migration statistics reinforce the magnitude of New Zealand's migration gains since 2013, but they also necessitate an upwards reassessment of historical flows, especially in the early 2000s. A longitudinal travel database does present new opportunities, such as insights into repeat migration and travellers, insights into our temporary migrant populations (eg students, seasonal workers, working holiday-makers), and as a key input into an administrative-based population frame.

Crossing the ditch – New Zealanders in Australia

Denise Carlton, Australian Bureau of Statistics

Australia and New Zealand enjoy a unique relationship, nurtured by a number of factors including close geographic proximity and shared histories. This relationship has led to arrangements that enable citizens of Australia and New Zealand to migrate freely between the two countries. In 2016-17, well over half a million people living in Australia had been born in New Zealand - close to half of them having arrived over 20 years ago. In addition, Australia's 2016 Census showed that over 480,000 people born in Australia had at least one parent born in New Zealand.

Over recent decades, New Zealanders coming into and out of Australia have also featured significantly in Australia's immigration and visitor landscape. In the year to June 2018, 30,200 New Zealand citizens arrived to live in Australia, while another 23,500 left after a period of residency in Australia. In 2018, there were also 1.4 million short term visitor arrivals of New Zealand residents to Australia.

The presentation will explore the trends in movements of New Zealanders into and out of Australia over recent decades, and the characteristics of people born in New Zealand who live in Australia. Where do they settle? Are they more likely to be men or women? Young or old? Are they working or studying? What are their living arrangements? How many decide to return to New Zealand, and how many become Australian citizens?

These questions will be answered using a number of key Australian datasets including the Census of Population Housing, official population estimates, overseas arrivals and departures data and the Census Temporary Entrants and Migrants Integrated Datasets.

CONCURRENT SESSION 3b: Diversity III

Day 1, Thursday 20 June 2019, 3.30 pm – 5.00 pm

Increasing importance of building social capital given the increasing super diversity of New Zealand

Mai Chen, Superdiversity Institute for Law, Policy and Business

New Zealand has now:

- over 200 ethnicities and 160 languages;
- Sikhism, Hinduism, Islam are now the fastest growing religions;
- and, the most discriminated against groups are Asians, Pacifica and Maori – in that order;
- there is a growth in ethnoburbs, especially in Auckland;
- minorities are becoming a majority – Maori, Asian and Pacifica now make up half of Auckland and by 2038 Statistics NZ projects that 51% of NZers will identify as Asian, Maori and Pacifica, in that order;
- Multicultural issues on a bicultural base given the large number of indigenous people in NZ also.

NZ's ranks second behind Iceland in the Global Peace index, but we cannot take our ranking for granted. How do we systemically analyse and implement actions to prevent a deterioration in race relations and the breakdown of communities and the growth of extremism and terrorism?

What kind of Whitening? Predictors of ethnic group change for Mixed people in the United Kingdom

Tze Ming Mok, PhD Candidate, London School of Economics

Why do people classified as Mixed/multiracial in the UK so often change their reported ethnic group, including in the Census? For the US multiracial movement, the act of choosing between different ethnic options has been framed as an aspirational act of agency (Root, 1994). Change in ethnic choices over time has also been framed more pejoratively as fluctuation or 'instability', implying an unsettled or insecure identity (Carter, Hayward, Blakely, & Shaw, 2009; Simpson, Jivraj, & Warren, 2014). How free are these choices, and are they independent from family circumstance, social hierarchy and racialization? There is little large-scale quantitative research into reasons for reported ethnic group change, and none in the UK context. What little there is, is often unable to control for a full range of structural predictors, nor for change in socioeconomic or household circumstances. This paper exploits repeated measures of ethnic group in large-scale, nationally representative longitudinal data in the Office for National Statistics' Longitudinal Study (ONS LS). The ONS LS is a 1% sample of the Census for England and Wales. I identify the predictors of change in ethnic group identification among those self-categorising themselves as 'Mixed' at one or more time points, including baseline cross-sectional socioeconomic circumstances, and change in those circumstances. This allows us to explore the extent to which change appears to be 'free' and independent of structural and contextual social factors (and thus would appear to be random kinds of change), or alternatively is associated with personal instability, or with changes in social status according to theories of racialized social hierarchies. Analysis finds that higher status at baseline is associated with more ethnic/racial stability, not with aspirational change. However, decline in individual socioeconomic status is associated with moving out of Mixed/multiracial categories and towards White categories. Findings suggest that Mixed identification may reflect socioeconomic and cultural security; while changes towards Whiteness associated with insecurity may be a way of seeking safety within identities seen as more socially powerful.

Nga Tamariki o Te Kupenga – Diversity of Māori students

Conal Smith, Atawhai Tibble and Luisa Beltran-Castillon, Kotata Insight

The Māori population of Aotearoa New Zealand is large, and it encompasses a diverse range of different social and cultural features. There is no single way of living as or being Māori. Despite this, the consideration of Māori needs and experiences in public policy is often viewed through the lens of Māori ethnicity, where the distinction between identifying as Māori or not becomes the primary focus. Binary analysis of this sort inevitably involves the loss of much potentially relevant information. Although there is some recognition of the importance of iwi and hapu in elements of the Crown- Māori relationship, by and large policy targeted at Maori disadvantage treats Maori as culturally and socially homogenous.

Te Kupenga – the Māori Social Survey – represents the most comprehensive study of the social and cultural outcomes of Maori ever undertaken in Aotearoa New Zealand. However, transforming the wealth of data on Māori cultural activities into a meaningful picture is challenging. Simply describing a large number of different forms of engagement with Māori culture does little to support Crown agencies attempting to engage operationally with a diverse Māori community.

Nga Tamariki o Te Kupenga builds on the work of Carla Houkamou and Chris Sibley to empirically identify a set of five dimensions of Māori cultural identity and connectedness, and then uses these to identify 6 clusters relating to different types of Māori identity. These Māori identity signatures break the Māori population down into groups with similar levels and types of connection to Māori identity and allow for more meaningful analysis of the interaction between Māori identity and other outcomes. As an example we look at how Māori cultural identity and connection interacts with school and student characteristics to affect education outcomes.

CONCURRENT SESSION 3c: Regional New Zealand and Ageing

Day 1, Thursday 20 June 2019, 3.30 pm – 5.00 pm

Hamilton's Age Friendly Plan 2018–2022

Nick Chester, Hamilton City Council

In May 2018, Hamilton became the first city in New Zealand to join the World Health Organisation Age Friendly Global Network of Cities and Communities. Hamilton joined 600 other cities around the world who have made a commitment to improved services and facilities for older people.

Although Hamilton has a comparatively young population compared to other New Zealand cities and towns, the impacts of an ageing population are still critical and require careful consideration and forward planning. The development of the Age Friendly Plan and joining the Global Network was the first step in this planning.

Hamilton's journey to joining the network was a truly collaborative one. The Age Friendly Plan was developed by a multi-disciple steering group and informed through ongoing dialogue with services providers and older people themselves. The project was supported by Hamilton City Council, but very much driven by the community.

The end result is a plan that begins to address the needs of older people in nine categories; Outdoor spaces and public buildings, Transport and Mobility, Respect and Social Inclusion, Civic Participation and Employment, Housing, Social Participation, Communication and Information, Community Support and Health Services, and Safety.

The plan has 48 actions for completion over four years. Most of these actions are led by community groups and agencies. The plan provides a starting base to making Hamilton a better place for older people to live and start to develop sustainable solutions to the concerns of older residents. Early progress on the plan has been strong, with many exciting projects underway. Ongoing monitoring and reporting on the Plan's progress continues with a community led group, who will report every six months to Hamilton City Council.

The Plan has been developed as a living document, and as new groups emerge or other projects are identified, these can easily be aligned with the overall intention of the plan and expand on the range of services that contribute to improving the lives of Hamilton's older residents.

Population ageing and diversity

Robert Didham, Stats NZ

The New Zealand population is diverse, and it is ageing. Moreover, the degree of diversity is increasing and extending throughout the population, with the older ages becoming more diverse on almost every measure. Not only are the cohorts moving into the older ages more diverse ethnically, linguistically and religiously, they are carrying with them an increasingly diverse set of skills along with the means to apply these skills. Moreover, people are living longer, and living longer healthy and active. This will provoke a paradigm shift in the engagement of older people within society and challenge the definition of "older". Implicit is a questioning of the wisdom of simplistically slicing and dicing populations along age lines, a habit that is a hang-over from several decades ago but still prevalent in some people's thinking.

Over the last 20 years, there has been a number of iterations of the New Zealand Positive Ageing Strategy developed by the Ministry of Social Development (MSD). In 2018, the Office of Seniors, administered by MSD, developed a new Strategy for an ageing population. One of the key themes explored during consultation was the increasing diversity of the older age groups. Parallel to this there has been explorations of diversification of diversity, including work lead by the Max Planck Institute, within the superdiversity paradigm associated with Steve Vertovec.

This paper will draw together several related strands from these pieces of work and examine some of the changes occurring within the older age groups and some of the future scenarios.

Making population statistics usable by non-statisticians – a novel tool for reducing the skill barriers to using population statistics

Andrew Sporle (McDonald Sporle Ltd) and **Daniel Barnett** (University of Auckland)

The collection and collation of high quality official population statistics involves considerable time, effort and expenditure. The utility of these data resources is often limited by technical barriers to accessing and analysing the available data. These barriers can be lack of affordable or suitable software or a shortage of skills required to undertake the required analysis. In response to this need, we have created a software tool that reduces the cost, security and skill restrictions affecting the use of population data. This population statistics analyser and visualiser is developed using the R software platform. It can work in an online or standalone environment to create and compare age-standardised rates (with confidence intervals) for population outcomes by user-defined selections of population and reference (standard) population, then present the results in a range of table, graph and map formats. Age standardisation of rates enables outcome comparisons between populations of different size and with differing age structures. However calculating these rates and their error parameters can be time consuming and tedious even for experienced statisticians. For non-statisticians, there are the barriers of data availability, data security and technical skill that prevent the application of existing outcome data outside of research environments. This simple to use tool produces tables and interactive graphs for age specific and age standardised rates. It also can compare and graph population outcomes over time and place, including absolute and relative rate differences with statistically robust confidence intervals using multiple methods. All results are exportable into other formats. This software works with both count data and microdata (unit record file), with the latter requiring some dataset specific modification. Additional outcome data, population denominators, reference population and maps can be added to the software, making it capable of working with population data for any region where the demographic information is available. The data behind the tools is not visible and the software can sit on the user's computer, meaning that control of the data can be maintained. Learning to use the tool takes a few minutes of instruction as all controls are pull down menus or mouse click functions. These tools provide flexible, low or no-cost solutions to the software and skill limitations that currently restrict the potential application of expensive population statistical resources.

CONCURRENT SESSION 3d: Housing II

Day 1, Thursday 20 June 2019, 3.30 pm – 5.00 pm

A small area assessment of New Zealand housing

Emma Campbell, Holly Trowland and Paul Bracewell, Dot Loves Data

New Zealand is in need of an alternative way of quantifying national progress that considers more than financial success. Social, cultural and environmental factors need to be accounted for as well. One way to do so is by measuring wellbeing. There is currently no method of doing this at a community level within New Zealand, however, there is substantial interest in producing such a metric, as evidenced by the Social Investment Agency's work into a Wellbeing Index (Social Investment Agency, 2018).

This study explores the housing domain of the SIA's wellbeing framework. Quantifying the relationship between housing and wellbeing is divided into four subdomains: affordability, home health, living density and safety. The methodology of measuring each of these elements is discussed and validated. Emphasis is placed on the use of dynamic data sources that are robust, transparent, frequently updated and accessible at a small area level. The final solution is a simplistic measure of housing quality. Consequently, the Housing Index, can be interpreted by multiple parties outside government and research agencies, allowing the end user to rank all area units in New Zealand by overall housing quality or individual subdomain.

The four housing subdomains: Safety, Living density, Home Health and Affordability are constructed independently using various data sources. Following the development of the four individual components, the methodology used to amalgamate them and create an index for the housing domain of wellbeing is detailed. Where necessary, the final measures developed are validated using additional data sources and the results from this process are outlined.

In general, rural districts in the South Island were found to have some of the best housing in the country. Conversely, the wider Auckland region was identified as having pockets of lower overall quality housing, primarily driven by overcrowding. The Housing Index has numerous applications, particularly for government parties and local councils. The ability to rank areas provides an opportunity for more informed allocation of resources to improve housing conditions across New Zealand.

Home ownership in New Zealand: Trends over time and generations

Alan Bentley, Stats NZ

Homeowners enjoy two important benefits: secure shelter for today and a sound investment for tomorrow. Diversity in rates of home ownership matter to individuals, to families, and for public policy. Using Household Economic Surveys 1988–2018, we explore ownership by synthetic age-cohorts. We find marked differences in rates of homeownership across generations. If you spent your twenties in New Zealand in the late-1980s or early–mid-1990s, it's more likely than not that the house you lived in was owned by you or your household. This century, the reverse has been true; the majority of people under the age of thirty are not homeowners. We explore patterns behind this trend.

Constructing the design framework for housing that improves the quality of life of the high-needs elderly

Yukiko Kuboshima, PhD candidate, Victoria University of Wellington

People are living longer than ever in New Zealand. By the age of 65, they have an average life expectancy of approximately 20 years. However, for the latter 10 years, most elderly people will require some level of assistance from others and hence the number of people with care needs is projected to increase rapidly. 'Ageing-in-place' is a national policy, meaning that elderly individuals are encouraged to stay in their own home as long as possible, without entering residential care facilities. As impairments increase and care needs also increase, the quality of life (QoL) of the elderly typically decreases. In order to encourage this growing population to age-in-place with a good QoL, the design of housing requires greater consideration.

A qualitative survey was conducted to investigate the QoL of the high-needs elderly and influential design elements. Using semi-structured interviews and full-day observation for 30 elderly people who required care and their caregivers, perceptions and experiences were collected in relation to their physical environment. These surveys found a wide variety of residents' QoL related to their physical environments. Six main themes contributing to resident QoL emerged: control in daily activities, meaningful leisure activities, meaningful relationships, maintenance of personal possessions, comfort, and quality of care.

Through further analysis of the relationships between design elements and QoL, a framework for the requirements in housing design that improves QoL was developed. Housing that improves QoL must accommodate a variety of needs that reflect diverse individual preferences, personal circumstances and types of impairments. There is a need for reconsideration of spaces to accommodate caregivers, to facilitate valuable relationships and to accommodate personal possessions. The careful design of micro space has great potential to improve residents' control and QoL, particularly for enabling activities as well as maintaining both privacy and connection.

The creation of this framework will enable architects and designers to better understand the consequences of their designs and develop housing models that can help the high-needs elderly maintain satisfying and independent living for as long as possible. Constructing the design framework for housing that improves the quality of life of the high-needs elderly

Local government social housing in New Zealand

Toni Kennerley (Planalytics) and **Tom Simonson** (Local Government New Zealand)

Recent research has indicated that local government (including district and city councils and unitary authorities) own roughly 12,880 social housing units across New Zealand, representing some 16% of New Zealand's total social housing stock. The majority of local government-owned social housing consists of one-bedroom flats, typically for elderly people, as long term rentals. Local government-owned social housing therefore plays a key role in meeting the housing needs of New Zealanders, particularly the growing demographic of people over the age of 65. The role of local government in the social housing sector is not, however, recognised at a central government level. Local government-owned social housing is included within the definition of 'private housing' (not 'public housing') in the Ministry of Housing and Urban Development's Public Housing Plan 2018-2028 for example. Further, local government is also not eligible for the income-related rent subsidy (IRRS) that is available to other housing providers such as Housing New Zealand and registered Community Housing Providers (CHPs). Local government is therefore in a phase of exploring and reassessing its role in the provision of social housing, with varying outcomes. Some councils have decided to retain their social housing stock, others have chosen to divest their housing stock to CHPs or Trusts, and some are developing additional social housing units. Additional external factors such as the new Healthy Homes Guarantee Act 2017 mean that many councils may once again review their role in providing housing within their communities. This presentation will outline the current context of local government social housing provision in New Zealand, along with the unique challenges faced by councils as they maintain their aging housing portfolios. It will also highlight a recent initiative by LGNZ to develop an on-line Social Housing Toolkit to guide councils as they balance the housing needs of their local communities with the opportunities and challenges presented by population growth, local body politics, and a hands-off approach by central government. Participants will leave the presentation with a better understanding of wider social housing issues in New Zealand, of local government-owned housing challenges in particular, and one solution by which to address them.

CONCURRENT SESSION 3e: Gender & Homelessness

Day 1, Thursday 20 June 2019, 3.30 pm – 5.00 pm

Using overseas surveys to produce reliable small population statistics in Aotearoa New Zealand

Taylor Winter, Victoria University of Wellington

Mental health issues and related maladaptive behaviours disproportionately affect minority populations. In particular, sexual minorities (SMs) are more likely than non-SMs to drink hazardously and experience mood disorders. However, gaining insight on SM populations has proven problematic in a small nation such as Aotearoa. Currently our best sample of SMs from national surveys is from the New Zealand Health Survey (NZHS), a sample of 626 SMs. Fortunately, Bayesian statistics allow us to draw from larger overseas surveys and set priors on small samples to gain more stable estimates of disparities between SM and non-SMs. In the present study we investigated how The United States National Survey on Drug Use and Health (NSDUH) could inform our analyses on SMs in the NZHS. The NSDUH has a lot of similarities to our own NZHS and samples over 50,000 people every year. Our first analysis supported that SMs are at higher risk of hazardous drinking. We then determined that psychological distress can explain the increased risk of hazardous drinking for SMs. Our study provided new insight to the health risks of SMs while also setting a precedent for the user of overseas data when investigating small populations in Aotearoa.

“That’s what keeps me healthy and safe these days”: LGBTIQ+ homelessness and the realisation of boundaries

Brodie Fraser, University of Otago

Little is known about the experiences of Lesbian, Gay, Bisexual, Transgender, Intersex, and Queer (LGBTIQ+) people who are, or have been, homeless in Aotearoa. In this paper I first present an analysis of the themes that emerge in the limited research literature relating to proximate causes of homelessness, systems failures in early life, and experiences during homelessness. In order to explore some specific impacts of these negative experiences, I then present some findings from semi-structured interviews with nine LGBTIQ+ people who have experienced homelessness. This paper focusses specifically on experiences of realising and implementing personal boundaries, the catalysts behind these periods of growth, the internal and external factors that have influenced them, and the impacts of implementing such boundaries. This group experience non-linear periods of growth and change. Turbulent childhood experiences, societal discrimination and prolonged periods of transience result in a demographic that does not conform to societal norms in relation to life cycles. Instead, they move through periods of personal growth at different stages of life, facing particular challenges and finding a range of ways to create more stable living situations, including housing and relationships, as well as other positive outcomes in their lives.

The Housing First research programme

Jenny Ombler, University of Otago

The MBIE-funded Housing First research programme is evaluating the implementation of Housing First in New Zealand. This paper gives an overview of our five streams of research, and gives a brief update on our current progress. Working with our community partners, The People's Project, our aim is to offer robust research to influence policy on homelessness interventions in New Zealand. The People's Project was the first organisation to implement the Housing First programme in New Zealand, with their Hamilton operation beginning in 2014. Homelessness in New Zealand has risen substantially over the past decade. One in one hundred New Zealanders were in severe housing deprivation in 2013. The public housing register has

recently risen to 10,000 people, showing significant need. For those who have been homeless for a long time, and/or who have complex needs, Housing First is aimed at providing permanent housing and wraparound support, without requiring treatment compliance. The programme is a rights-based model, based on a set of principles that aim to ensure the dignity and autonomy of the person served. Our research analyses data from the IDI and from The People's Project to better understand the histories and outcomes for clients; looks at the principles of Housing First in relation to Te Tiriti o Waitangi and Whānau Ora; considers the experience of homelessness for Takatūpui/LGBTIQ people; and looks at the implementation of Housing First into the New Zealand context. Housing First has a considerable evidence basis internationally. Our research aims to illustrate that Housing First, and its principles, should have a central role in New Zealand policy.

'If you don't have a home you don't know who you are' – the role of Hutt City Council and partners in preventing homelessness

John Pritchard and Olivia Miller, Hutt City Council

As in numerous areas of Aotearoa New Zealand, in recent years Lower Hutt has seen a considerable increase in the number of households becoming homeless. Along with poverty, the lack of affordable housing is the main structural reason for homelessness. Individual factors such as poor health, relationship breakdown, financial problems, or alcohol or drug issues, also contribute to a household's vulnerability to homelessness.

As well as instances of street homelessness, there have been significant increases in the use of emergency accommodation, including hotels in the city and region, transitional housing, and households living temporarily with whanau and friends. Households experiencing homelessness in the city also remain in insecure and unsafe situations for extended periods of time. Pressures in the housing system indicate that homelessness in the city is likely to continue and increase at least in the short-term. The housing system is struggling with supply; there is a growing public housing need and increasing competition for homes in the private rental sector which leaves lower income households and those with higher social needs with few options.

Between January and April 2018 Lower Hutt City Council conducted research into the extent of homelessness in the city – the effects on individuals and families – and the current response. Given the relatively poor data available, the research outlined the local situation to inform Council debate on its role in contributing to the response to the immediate problem as well as to the structural causes. In response to the research findings Council decided that it would lead the development of a homelessness strategy and action plan to improve the effectiveness of the local response. Both the research and the strategy work involved intensive engagement with households experiencing homelessness, organisations and individuals providing support and assistance to households, as well as councillors and the city's Youth Council, and partners in government, the health and education sectors.

A key consideration in the work, particularly as it moved from the research phase to the strategy and action plan, was the role of local government. Traditionally, and narrowly, homelessness is viewed as a central government responsibility. But the question is how should it be viewed in the context of local government's leadership role in its community, the wellbeing of the city's residents, and the broader impacts on communities and outcomes for the city?

The thrust of the strategic approach is to prevent homelessness and the key elements Council agreed to fund include increasing access to private rental housing, supporting households at risk of homelessness to retain their homes, and providing access to housing advice and advocacy.

CONCURRENT SESSION 4a: Migration & Geospatial

Day 2, Friday 21 June 2019, 11.30 am – 1.00 pm

People move out of Auckland, where do they go? Estimating internal migration using linked administrative data

Bridget Snodgrass and Kirsten Nissen, Stats NZ

In recent years Auckland has experienced the highest population change across regions of NZ due to higher than usual net migration gains. Both international and internal migration flows contribute to the overall net migration estimated for the region or for the 19 local board areas within Auckland. Stats NZ is developing an approach for determining both dimensions of internal migration for the territorial authorities and Auckland local board areas. In this presentation, we are showing results from developments using linked administrative data for determining the internal migration movements between areas, and the internal in- and out-migration estimated for the areas. Internal migration trends within Auckland, and from Auckland to other territorial authorities, are contrasted with the international migration trends for the areas.

The presentation includes a description of enhanced methods for determining internal migration movements since the first experimental release in May 2018. We use collated address notifications in the Stats NZ Integrated Data Infrastructure (IDI) to derive address histories for individuals. The regular updating of address changes at the most detailed geographic level has seen this as an opportunity to develop an approach for identifying internal migration movements between areas and over time. Traditionally, internal migration for the territorial authorities and Auckland local boards has been determined by a process relying on expert judgement for combining observed internal migration transitions by several independent sources. We will discuss the limitations of the linked administrative data source and the opportunity for incorporating the 2018 Census result on the one-year-ago address information. This will be concluded by an evaluation of the quality implications for the official annual subnational population estimates.

Where does the city stop and the bush begin?

Sally Clement, Australian Bureau of Statistics

Since the 1960s there has been significant growth of rural residential developments in Australia and it has become a topic of debate on how they are impacting on agricultural land, the cities providing services nearby and other issues.

There are many varied definitions of this type of settlement in academia and urban planning research and up until now they have not been recognised in the ABS' Australian Statistical Geography Standard (ASGS), which provides a framework for releasing geospatially integrated statistics.

As a result the Australian Bureau of Statistics has been doing research into how a new Rural Residential category might be included within the existing definition of "Rural" areas the Urban Centres and Localities (UCLs). This may help to address identification of this increasingly prevalent settlement type, and enable users to access data populations living in these areas. These changes are being planned so that they also maintain comparability with the original design principles published in 1965.

Evaluating the availability and consistency of annual migration flow data amongst ASEAN countries, 2000–2015

James Raymer, ANU School of Demography

This paper seeks to provide a better understanding of migration data and patterns amongst the ten countries constituting the Association of Southeast Asian Nations (ASEAN). The paper elucidates annual migration movements and pathways, which have remained largely unknown due to the lack of data to date. Our effort thus helps generate better understandings of social and demographic changes in the South-East Asian region, where international migration have been thriving and increasing rapidly in the two

recent decades. To do this, we start by reviewing all publicly available international migration data sources and examining the possibility of harmonizing these data. We then estimate annual bilateral migration flows amongst the ten ASEAN countries with a multiplicative component model, borrowing data from 35 countries and auxiliary information including population sizes, demographic and economic conditions, as well as bilateral relationships such as bilateral trade flows and remittance flows. Our results include an annotated database of reported ASEAN migration data and a set of estimates for annual country-to-country migration flows amongst the ten ASEAN countries from 2000 to 2015. We find that the reported data suffer from many issues, including missing data, inconsistent definition of migrants and severe under-coverage of specific types of migration (such as returned nationals). Further, no particular data source stands out as a consistent and reliable benchmark from which other reported data can be compared. Against that backdrop, our estimated migration flows represent an important first step to overcome the crucial issues of missing and incomplete data in South-East Asia.

Migration Data Explorer: Information at your fingertips

Edward Griffin, MBIE

MBIE's migration data explorer enables you to easily access migration data to address the overarching themes and enduring questions that relate to migration in New Zealand.

CONCURRENT SESSION 4b: Homelessness

Day 2, Friday 21 June 2019, 11.30 am – 1.00 pm

Service usage by a New Zealand Housing First cohort prior to being housed

Maddie White, Te Whare Wānanga o Otākou ki Te Whanganui a Tara – University of Otago

Background

The Ending Homelessness in New Zealand: Housing First research programme is evaluating outcomes for people housed in a Housing First programme run by The People's Project in Hamilton, New Zealand. This baseline results paper uses administrative data to look at the scope and duration of their interactions with government services.

Methods

We linked our de-identified cohort to the Integrated Data Infrastructure (IDI). This database contains administrative data on most services provided by the New Zealand Government to citizens. Linkage rates in all datasets were above 90%. This paper reports on the use of government services by the cohort before being housed. We focus on the domains of health, justice and income support.

Results

The cohort of 390 people had over 200,000 recorded interactions across a range of services in their lifetime. The most common services were health, justice and welfare. The homeless cohort had used the services at rates far in excess of the general population. Unfortunately these did not prevent them from becoming homeless.

Conclusion

These preliminary findings show the homeless population have important service delivery needs and a very high level of interaction with government services. This highlights the importance of analysing the contributing factors towards homelessness; for evaluation of interventions such as Housing First, and for

understanding the need for integrated systems of government policy and practice to prevent homelessness. This paper also provides the baseline for post-Housing First evaluations.

Unpacking the terminology “Complex Unmet Need”

Claire Aspinall, He Kainga Oranga Housing and Health Research Programme

New Zealand has an ongoing homelessness crisis, with 4,197 people being without shelter on the night of the 2013 census. Housing First is an intervention that is designed to meet the housing, health and social needs of people who are homeless. Housing First services prioritise groups of people who are often described in the literature and by agencies working with people who are homeless as having a “high level of unmet complex need”. But what does this actually mean in a New Zealand context? This paper presents the interim findings of a qualitative case study on the implementation of Housing First in New Zealand. Key informant interviews were used to gather data from participants implementing Housing First in Hamilton, Auckland and Wellington.

A Housing First response to homelessness in Hamilton

Carole McMinn, The People’s Project

This presentation will detail the development of The People's Project (TPP). In Hamilton, people experiencing homelessness are served by a number of community-based organisations, including TPP which was established in Hamilton in 2014 in response to the perception of an increasing number of rough sleepers in the central business district. Approximately 80 people were recorded by police and other local social agencies as rough sleeping on the streets of Hamilton. Urgency was placed on assisting this cohort, in part because Hamilton was to host the Cricket World Cup in February 2015. Census and other administrative data from 2013 reported that in total, at least 1313 people were considered severely housing deprived or homeless in Hamilton.

TPP was initiated as part of the Hamilton Central City Safety Plan 2014 and in conjunction with the introduction of the Hamilton Safety in Public Places Bylaw, 2014. The Hamilton Central City Safety Plan had two approaches; to set boundaries about what is acceptable and unacceptable behaviour in public spaces through the enforcement of the bylaw; and to provide help and support for people experiencing homelessness through support of the initiation of The People’s Project. The plan was established in consultation with police, health providers, non-government social services organisations including The Wise Group and the Hamilton Central Business Association.

Today, TPP is a collaboration between a large number of organisations: Hamilton City Council, New Zealand Police, Ministry of Social Development, Oranga Tamariki/Ministry of Children, social housing provider Housing New Zealand, the justice department's Department of Corrections, Waikato District Health Board, primary health care provider Midland's Pinnacle Health Network, Hamilton Central Business Association, Te Puni Kōwhiri, Waikato Tainui and, mental health and wellbeing non-government service provider, the Wise Group.

The People’s Project adopted a Pathways Housing First (PHF) approach in its response to assisting the homeless of Hamilton and was the first large-scale Housing First provider in New Zealand. The government funded Housing First responses in other New Zealand regions based on the success of this pilot programme. Since opening in 2014, more than 2000 people have registered for help with TPP. To date, over 1000 men, women and children have been supported into housing by TPP. A further 856 have been supported in other ways. A core 75 households are receiving ongoing support to sustain their tenancies, improve their wellbeing and return to social inclusion, at a level and pace determined by the client. Permanent Pathways Housing First clients typically have high and complex health, social and wellbeing support needs.

From the beginning, The People's Project has been committed to collecting the right data to support research that contributes to robust evidence and a framework for developing a model for ending homelessness in New Zealand. Developing this data collection and analysis capacity has been supported by partnerships between TPP and population study experts from both the University of Waikato and the University of Otago. TPP's data has provided evidence which has been the basis of significant positive local

systems change, and is shared widely with government policy makers, local community groups, researchers and Iwi. This presentation will introduce the TPP journey, and provide a background to the six concurrent research projects utilising TPP data as well as this evidence of policy translation.

Who was housed first? Early demographic analysis of the Housing First Population in The Peoples Project, Hamilton

Polly Atafoa Carr, National Institute of Demographic and Economic Analysis (NIDEA)

The People's Project (TPP) in Hamilton is a collaborative effort between 13 local organisations which takes a Housing First approach to homelessness (1). A Ministry of Business, Innovation and Employment-funded collaboration between the Universities of Waikato and Otago and TPP (2,3) has allowed the gathering of evidence regarding the Housing First approach to homelessness in Hamilton, the people served, and their engagement in services in the years leading up to registering for support. A better understanding of the sociodemographic characteristics, as well as the specific needs and experiences of this cohort, helps to consider how to most appropriately implement the principles of Housing First to meet the requirements of the local population and context.

Methods

For this analysis, TPP provided collated information from its case management system (Recordbase) where responses were provided to a basic questionnaire at the time of client registration. This unique dataset was collected from 695 individuals actively engaged in TPP) from July 2015-March 2017. Informed consent was obtained from each individual for the analysis of their data for research purposes. Questions asked at registration included those within the broad areas of: demographic information; housing situation and preferred housing arrangement; and wellbeing indicators.

Results

More than half (54.4%) of the TPP Housing First client population were aged between 25-44 years at the time of registration with the service, and one-fifth (19.8%) were under 25 years of age. The majority (73.7%) identified as Māori. This demographic information can be compared to the Hamilton City population from where the clients were drawn. There were over 1,000 dependent children among the registered client group and over half (55.4%) of these children were living with the TPP client at the time of registration (and were also therefore homeless).

Information was collected about where the TPP clients had slept prior to registration, with 'couch surfing', being 'on the streets' and living with family the most common prior housing situation. Triggers of prior homelessness included a family relationship breakdown (such as domestic violence), followed by a health issue (physical and mental health or addiction), or a tenancy issue (such as the cost of rent).

One of the common issues described for TPP clients was financial debt, with those in debt describing an average of \$10,000 owed (median \$4,690; range \$60-\$100,000). Debt to utilities companies, government agencies, and private organisations were common.

Conclusions and implications

This analysis of the early TPP database and its 695 clients describes the complex background, circumstances and housing arrangements prior to registering for a Housing First response. This picture of homelessness, determined from this unique database, differs somewhat from the most commonly depicted image of the homeless person being an older 'vagrant' man on the streets. In addition, the evidence of younger families experiencing homelessness, and issues of relationship and financial strains as important antecedents to homelessness are often hidden crises of critical importance for breaking intergenerational inequities and supporting future generations.

Constructing a summary measure of income mobility from transition matrices

Adam Ward, Jenny Stevenson and Paul Bracewell, Dot Loves Data

Inter-generational income mobility measures the degree of association between the incomes of adult children and their parents. Intra-generational income mobility measures the degree of association between the incomes of individuals at different points in time. By and large two forms of model have been developed to measure mobility; elasticity models and transition matrix models.

Elasticity models describe a broad range of regression type models which use least square methods to estimate parameters in equations of the form:

$$\ln Y_{i,t} = \alpha + \beta \ln Y_{i,t-1} + \gamma Z_i + \epsilon_i$$

Herein, $Y_{i,t}$ and $Y_{i,t-1}$ may denote either the incomes of a child-parent pair or the income of an individual at two different points in time, depending on whether one is investigating inter or intra-generational mobility. Whilst elasticity models provide a summary measure of mobility for the population under consideration, they are parametric in nature (i.e. they assume a log-linear relationship between $Y_{i,t}$ and $Y_{i,t-1}$ and may mask considerable differences in mobility levels between individuals in different parts of the income distribution. Alternatively, transition matrix models rank individuals or child-parent pairs into groups (usually quartiles, quintiles or deciles) at different epochs. Mobility is then expressed as the relative frequency of transition between such groups. Thus, whilst transition matrix models are non-parametric and may capture differences in mobility levels for individuals in different parts of the income distribution, they fail to provide an overall summary measure of mobility. In other words, given two transition matrices relating to two different populations it is often very difficult to know which represents a greater level of overall mobility.

Within this paper we construct a summary measure of income mobility that condenses the information within a transition matrix into a single real number contained in the interval $[0, 1)$ describing the overall level of mobility exhibited by the population under consideration. The measure, which is applicable to high dimensional matrices, is derived using elementary results from the theory of discrete time, finite state space Markov chains.

Constructing a summary measure of relative socio-economic mobility from transition matrices

Tamsyn Hilder, Paul Bracewell and Jordan Wilson, Dot Loves Data

The relationship between digital mainstream media and changes in socio-economic status within regions of New Zealand is explored. Socio-economic status is measured using the Dynamic Deprivation Index (Ward et. al., 2019), similar in concept to the NZ Dep studies, but designed to update monthly using a combination of public and proprietary data sources. New Zealand media articles have been collected by downloading content available via digital editions of major publications for the purposes of reporting on current events. Sentiment of current events is quantified using a text mining pipeline built with the Natural Language Toolkit in Python (Bird, et. al., 2019). Natural language processing is used to allocate this content to 74 regions of New Zealand. The sentiment within each region is standardized against a benchmark consisting of all digital mainstream media from 2013-2018. We examine socio-economic status and its relationship with both the sentiment within a region, and the number of times a particular region is mentioned. The Dynamic Deprivation Index is processed for each region by assigning the deprivation to each area unit across the country, as defined by Statistics New Zealand (2017). The deprivation is then aggregated to the 74 regions of New Zealand. The study demonstrates that digital mainstream media is more positive in regions with better socio-economic conditions.

Understanding the wellbeing of New Zealand's children

Duncan McCann and Stephen Youngblood, Oranga Tamariki

Understanding the multiple facets of wellbeing and the correlations between them is critical if we are to provide the best possible support for children and young people to reach their potential. More specifically, conceptualising and measuring wellbeing has the potential to change the way we think about and support New Zealand's children, offering a wide array of insights. Over the past few years considerable effort has gone into building the Children's Wellbeing Model for New Zealand to support this area.

The Children's Wellbeing Model captures data on all children and young people living in New Zealand and has been designed as a tool that the entire social sector can use and benefit from. Making use of the Statistics NZ Integrated Data Infrastructure, the model draws together data on service usage and other indications of potential need from across the social sector into one place to enable us to map the wellbeing of all children at a population level, and to help inform advice on different sub-populations. It can also model the potential impact of changes to policy settings on different population groups, and help ensure that investment decisions align to the government's strategic objectives.

The Southern Way: A journey beyond “delivering health services for former refugees”

Wesley Bachur, Southern District Health Board

Refugee resettlement efforts began in Dunedin in 2016 and within Invercargill in 2018. There are now currently more refugees settling within the Southern DHB catchment than anywhere else within New Zealand, while Dunedin is hosting more refugees than any other city. A refugee journey, however, is not one people willingly choose. Following arrival into a new host country, yet more pathways and decisions are made on behalf of new arrivals; each one impacting on integration while reflecting the values of the host community.

Often, refugee healthcare is delivered via a model that is constructed to address the needs of a population that is often recognised as being unique and vulnerable. With this approach, however, there is the significant risk of former refugees never fully integrating within the health system that is being used by the majority of the community in which they live. So, our story is of a journey that health services of the lower South Island are taking together with the former refugees who are settling in to our communities. The result is a rights-based model for access to health care which has challenged the thoughts and values of many services accustomed to providing traditional needs based approaches for vulnerable groups. The rights-based model has also been approached as a way of empowering and investing in a former refugee's right and ability to engage effectively with health agencies and the health system as a whole. In partnership with clinicians, and providers in general, the former refugee has more choices when it comes to who and how their care is delivered. There are, however, implicit expectations on proactive engagement by the former refugee.

In conjunction with having a culturally adept workforce, ensuring that there is clear and effective communication with former refugees has been critically important. Consequently, Southern DHB has focused on building a well-trained and highly responsive face-to-face interpreter service that is available to all health providers. Engaging with the existent relevant migrant community in sourcing interpreters has presented a number of benefits, some of which were entirely unanticipated, such as fostering the engagement and robustness of migrant communities. Yet, we have also been challenged by this approach, such as in ensuring that former refugees feel that their own privacy and confidentiality rights are being upheld.

Finally, we are in the beginning stages of recognising that many of the health service and consumer engagement challenges that agencies and former refugees are encountering are not unique to this population. Rather, they are perhaps amplified versions that are creating opportunities for us to address systemic issues that cut across our entire population. Thus, being able to witness and understand the former refugee experience of our health services is providing us with a unique view in which our entire community can benefit.

CONCURRENT SESSION 4d: Administrative Data

Day 2, Friday 21 June 2019, 11.30 am – 1.00 pm

Using the parent-child link in the IDI to derive 'number of children born'

Sini Miller, Christine Bycroft and Robert Didham, Stats NZ

Fertility is one of the main ways through which the size and composition of a population may change. The most widely known fertility measures, such as total fertility rate, are derived from birth registrations and resident population estimates. However, a more complete understanding of a country's fertility also needs to account for the pattern of births for each woman. In NZ this information has been obtained from the census question 'number of children born alive'. Stats NZ's Census Transformation programme is investigating the potential for administrative sources to provide census-type information. We will describe how we have derived 'number of children born alive' from the administrative data currently available in the Integrated Data Infrastructure (IDI). We use the Department of Internal Affairs' (DIA) birth registration data, which provides a history of children born in NZ. The data is event-based (the birth of a child), and information in the registration includes details of the child and both parents.

The IDI link between the child and the mother is the key to deriving the total number of children born to a woman. Due to the limited digitisation of historic birth records, it is only from 1990 onwards that we have high link rates between a child's birth registration and their mother's identity in the IDI. For older women some or all of their children are not able to be counted because the links cannot be made. For a younger cohort of woman born since around 1974, our results show a high degree of consistency with census results. When there are differences, the census count of children is almost always higher than the admin count. By definition, DIA does not include births occurring overseas. As might be expected, our results for the younger women show better consistency for those born in NZ than for overseas born women. Some differences can be attributed to different collection contexts such as non-response in the census and other survey errors.

For women born since 1974, the admin sources show good potential for deriving an ongoing series that would provide more frequent updates of the impact of family size on fertility. However it is likely that some periodic survey collection will continue to be needed to adjust for the small downward bias in the admin counts of children born. This work has wider importance as the parent-child link is fundamental in other contexts as well, for example to construct families, and to provide information about a child's parents in cohort analysis.

Using administrative data to improve occupancy determination and imputation in the Australian Census

Ross Watmuff, Australian Bureau of Statistics

One of the most important and well known inputs into Australia's official population estimates is the five-yearly Census of Population and Housing conducted by the Australian Bureau of Statistics (ABS). In every Census there is some level of non-response, and there are many ways that this can be handled. This presentation will outline results of two investigations conducted by the ABS Census Futures team to use administrative data to improve the way that non-response is addressed in the Australian Census.

A first step in handling non-response in the Australian Census is the determination of whether a non-responding dwelling was occupied on Census night. Historically, this determination has been made primarily on information collected in field operations. However, increasing numbers of people living in high density, secure buildings and an emphasis towards online self-response to the Census is making this process more challenging. This presentation will show how administrative data and machine learning can be used to model dwelling occupancy and improve the accuracy of occupancy determination.

Once an occupancy determination has been made, imputation is conducted for dwellings that were determined to have been occupied on Census night. The ABS has historically used a donor imputation approach to impute people into these occupied, non-responding dwellings. However, there is often limited

information available about the non-responding dwellings to inform the imputation method. This presentation will outline an approach to donor imputation that uses administrative data to improve the choice of donors and the quality of the imputed data.

This presentation will explore the impact of both of these innovations on data from the 2016 Australian Census.

The health service utilisation population: Deriving population estimates using health data

Laura Cleary, Ministry of Health

Introduction

Estimating the proportion of the population with a specific health outcome requires quantifying the population of people who have the outcome (the numerator), and the total population of New Zealand (the denominator). In the health sector, the numerator often comes from administrative health data, and the denominator from other sources such as StatsNZ's Census-derived population estimates. Often we want to disaggregate these estimates by sub-populations, for example by sex, DHB, or ethnicity. This causes problems when the datasets for the numerator and denominator do not have high levels of agreement in categorising individuals into these sub-populations. For example, we have found previously that an individual's ethnicity as recorded in the health system is often not the same as the ethnicity with which they self-identified in the Census. This leads to numerator denominator bias.

Health Service Utilisation Population

In order to reduce bias in estimates, the Ministry of Health is developing new methods for estimating denominator data. We combined a range of health data at NHI-level, to find individuals who accessed health services or were enrolled in a PHO in a specific period of time. This provides an estimate of the total population, based on the assumption that the majority of the NZ population will be enrolled in a PHO or access health services within a 12 month period.

The resulting population estimates are referred to as the Health Service Utilisation (HSU) population. The HSU population dataset contains a row for every individual, which health service they accessed, and their sex, age, ethnicity, DHB, and neighbourhood deprivation quintile (NZDep). Flags indicate people who died before and during of the period of interest, and overseas visitors. Sex, date of death, and date of birth are taken from the NHI register. DHB and NZDep are based on their address at the time they accessed the service. We are undertaking research to identify the most accurate way to classify point in time ethnicity.

This Health Service Utilisation (HSU) population can be used as the denominator when estimating health statistics. For the numerator, we identify which individuals in the HSU population have a specific health outcome. For example, to estimate the population who have cancer, we link the HSU population to the Cancer Registry, and divide the number of cancer cases by the total HSU. Using demographic information from the same source data in the numerator and denominator in this way counteracts bias. The HSU could also be useful for service provision calculations by showing the total burden on the health system.

Progress

The methods for estimating the HSU are in the process of being developed, they will be peer reviewed, quality checked, and refined. Initial estimates show high levels of agreement between the HSU population and StatsNZ population projections. However, differences exist in the estimates for sub-populations, for example Pacific populations by DHB. My presentation will explore these differences, and why we think they arise. I will also provide more results from the quality checking work, which is currently underway.

Investigating the potential for administrative data to provide birthplace and year and month of arrival/years since arrival in New Zealand information

Susmita Das and Kirsten Nissen, StatsNZ

This paper investigates the potential for obtaining census country of birth and years since arrival information for the overseas-born residents in New Zealand from administrative data currently available in Stats NZ's Integrated Data Infrastructure (IDI). Among other uses, central and local government agencies use data on country of birth in conjunction with information on years since arrival in New Zealand to develop, monitor and evaluate settlement programmes for immigrants, and to analyse the socioeconomic status of immigrants. We compared 2013 Census data on these two variables with similar information obtained from administrative data available in the IDI as at June 2018. Our assessments on the coverage rates and agreement rates with census responses suggest that for these variables the quality of information in the IDI is very good for recent immigrants. We think that the admin data has the potential to inform future demands for population statistics by these topics.

This paper also exemplifies how Stats NZ is moving towards greater use of admin sources to provide more accurate and frequent population statistics. We will be showing exploratory/ experimental examples of such applications in this presentation. For example, we can produce the IDI-ERP, the admin analogue of the estimated resident count of NZ by Birthplace (NZ born and Overseas-born). Another possibility is the component based (NZ-Born and Overseas-born/immigration-based) decomposition of the changes in the estimated resident population of NZ.

CONCURRENT SESSION 4e: Māori

Day 2, Friday 21 June 2019, 11.30 am – 1.00 pm

Family structure and stability and child development during early childhood among tamariki Māori

Kate Prickett (Victoria University of Wellington), **Tahu Kukutai**, **Polly Atafoa Carr** and **Arama Rata** National Institute of Demographic and Economic Analysis (NIDEA)

The second demographic transition is characterised by rising rates of cohabitation and increases in nonmarital and multipartner fertility. Moreover, growing economic inequality and increasingly unaffordable housing necessitate that families, generally, and low-SES families, in particular, rely on extended family or friends at times for a place to live. The confluence of these trends means children today are more likely to be exposed to transitions in household and family structure than prior decades. Yet, because these patterns are fluid and dynamic, measuring and identifying these trajectories of experiences over time is challenging. In this study, we combine innovative methodological techniques (social sequence analysis with multivariate analyses) and contemporary, longitudinal data from an ethnically-diverse birth cohort (Growing Up in New Zealand; $n \sim 7,000$), to identify patterns of family structure and stability experience over early childhood in Aotearoa New Zealand (Aim 1). We examine these experiences over early childhood for two important reasons. First, the addition of a baby calls for economic and social (re)organisation within families and creates new stressors on relationships, making this period particularly volatile. Second, early childhood represents a sensitive period for child development where lifelong trajectories are set and intervention can have outsized impact. Using the trajectories developed in Aim 1, our second Aim uses multinomial logistic regression analysis to explore socioeconomic predictors of trajectory risk. The findings from this study highlight the role family trajectories may be playing in the intergenerational transmission of inequality, and point to potentially sensitive periods during early childhood for policy intervention and support.

Accuracy of previously published Māori national and subnational population projections, and estimates, compared with the census counts

Isaac Morunga, **Daniel Barnett** and **Andrew Sporle**, University of Auckland

Population statistics such as projections, estimates, and census counts are fundamental in the development of any modern nation. Accurate population statistics for indigenous Māori, the largest sub-population group in Aotearoa New Zealand, are essential due to their importance in informing policies across various

geographic levels, abiding by the Crown's obligations to Te Tiriti o Waitangi, and usage in research about the Māori population. The implications of census inaccuracy and undercount of the 2018 Census has been a major concern amongst academics, politicians, and the public. The continued unavailability of counts from the 2018 Census has led to the usage of population projections based on the 2013 Census for calculations such as DHB funding by the Ministry of Health. In this case, inaccurate projections may result in underfunding for communities in-need; other concerns include Māori electorate loss or inadequate funding for schools. In areas of Government policy which include poverty alleviation, health and well-being and educational attainment, just to name a few, Māori are already disproportionately affected; therefore, access to accurate and precise data is required.

We looked at the accuracy of population statistics for Māori by making comparisons at the total, national and subnational level between population projections, estimates, and previously published census counts. Relative and forecast error is used to measure inaccuracy for these comparisons and were calculated using a statistical tool that also visualises the discrepancies between population statistic measures using interactive pivot charts. Our research showed that the longevity of population projections differed significantly and was heavily dependent on the populations we were making comparisons between:

- The range for our 1996-base National population projections of forecast and relative error was between 1.5% to 2.1%, and 13.6% to 17.4%, respectively. The median forecast and relative errors were 2.1% and 13.9%, respectively.
- The range for our 2001-base National population projections of forecast and relative error was between -0.2% to 0.9%, and 11.4% to 15.4%, respectively. The median forecast and relative errors were 0.35% and 13.4%, respectively.
- The range for our 1996-base Subnational population projections of forecast and relative error for the period, 1996-2001, was between 0.2% to 13.9%, and 0.8% to 25.6%, respectively. The median forecast and relative errors were 2.8% and 14.7%, respectively.
- The range for our 1996-base Subnational population projections of forecast error and relative error for the period, 1996-2006, was between -0.3% to 11.7%, and 6.8% to 21.7%, respectively. The median forecast and relative errors were 4.75% and 14.9%, respectively.
- Finally, the range for our 2001-base Subnational population projections of forecast error and relative error for the period, 2001-2006, was between 0% to 11.1%, and 1.9% to 14.6%, respectively. The median forecast and relative errors were 0.8% and 10.05%, respectively.

These differences between population projections show there is a significant risk of misrepresentation of the Māori population when using these for important policy and funding decisions. In particular, estimates at the regional level were especially bad, such as the West Coast (period 1996-2001) or Nelson (period 1996-2006), with relative errors of 25.6% and 21.7%, respectively.

Attitudes towards Māori culture and multiculturalism in the NZ General Social Survey

Tahu Kukutai and Arama Rata, National Institute of Demographic and Economic Analysis (NIDEA)

In recent decades the field of migration studies has stretched to encompass a vast range of theoretical orientations and research foci, from migrant integration and adaptation, to transnationalism and diaspora, diversity and multiculturalism. However, an area that remains under theorised and unexamined within the 'migration paradigm' is the intersection between indigenous peoples and migrants. Against a fraught colonial history of 'demographic swamping', and in light of contemporary shifts in ethnic composition, in this research we use data from The General Social Survey to assess how much importance participants place on Māori culture and multiculturalism in defining New Zealand, and the psycho-social correlates of these attitudes. Regression analyses revealed that age, gender, ethnicity, trust, sense of belonging to New Zealand, te reo Māori proficiency, and attitudes to te reo Māori all predicted the importance placed on both Māori culture and multiculturalism in defining New Zealand. The strongest predictor of both of these outcome variables was attitudes to te reo Māori.

Creating an iwi specific Index of Multiple Deprivation of Ngai Tahu iwi to measure against health and other outcomes

Rajas Kulkarni, Stats NZ

The New Zealand's Index of Multiple Deprivation (IMD) provides a meaningful view of area based deprivation across New Zealand. Based on similar methodology, this report presents the development of New Zealand's first iwi based index of multiple deprivation for the iwi of Ngāi Tahu.

This report briefly discusses the processes undertaken for variable selection and discussions about geographical issues that ensued. A total of 7 domains were used for the calculation of a final iwi Index of Multiple Deprivation (IIMD). Each domain was assigned its' own deprivation rank that was ultimately used for the calculation of the final rank. Overall, a total of 29 indicators of deprivation were identified and used across health, social development, tax, education, police and justice databases; combined with geospatial data to represent the domains of deprivation namely: Employment Domain, Income Domain, Crime Domain, Housing Domain, Education Domain, Health Domain and the Access Domain. All of the domains can be used separately or together to explore deprivation in areas and find associations with certain outcomes. Geospatial variations in the distribution of the IIMD and its domains can be analysed across various regional territories throughout New Zealand.

The report ends with a brief discussion about identified limitations of the index, certain aspects that need to be taken into consideration when using the index for any analysis; and recommendations for the future along with some additional methodologies that were not implemented.
