# Population change and its implications for forecasting policy relevant populations 2015–2020 and beyond:

# Initial thoughts on an inter-departmental initiative for 2010

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**19 November, 2009**

### *A new context for SPEaR and supporting inter-departmental collaboration*

The long term fiscal outlook published in October by the New Zealand Treasury signals a long period of continual re-assessment of public programmes on a more intensive scale than we have experienced for nearly two decades. The nature of population change we will experience over the next decade, compounded by social change, means that the population groups who are the target of particular public programmes are likely to have changed markedly by the end of this period of re-assessment, probably much more so than we saw during the 1990s.

The robustness of policy will seriously influence the long run gains from policy change, as the programme interdependencies, social and demographic change, cohort effects and unexpected impacts necessitate remedial responses, often in response to the political context.

We have a rich understanding of much about the nature of the New Zealand population as it will change over the next two decades, and a considerable array of knowledge about the interdependence among programmes. The clear necessity of the fiscal pressure we face, and the breadth of policy which will change as a consequence will put a stronger focus on the more important uncertainties we need to focus our research agenda on.

This paper is intended to build understanding on where there would be strong gains across all departments in strengthening the capacity across government to understand and analyse target populations and draw on the insights that emerge in particular fields that have resonance elsewhere. It will enable the social policy researchers in government to assess:

- whether there is sufficient data currently available - or if not then what extra data (and of what type) is required
- whether the focus is on current 'research gaps" arising from the current data; and
- what are the population 'research questions' we need to have addressed for the future, and whether we have the data streams to support that.
- Where there are policy “cross-overs” that require additional study

There is a plethora of research issues that stem from population change. This project at the interface of research and policy would focus on what are the implications that can be drawn from population research generally?, and secondly, what are the areas that research can offer that potentially create new policy insights'? The capacity to assess potential change in the population base of programmes would be enhanced most particularly where the population base is subject to significant non-demographic influences, or the interaction of several demographic determinants. Assumptions based on the continuity of present trends are no longer relevant, even for the most basic measures of the total population.

Change in the population overall will shape the population base of particular government programmes, and the transmission mechanisms for this could involve some complex mix of demographic, social and economic factors. We will need to draw on knowledge bases and accumulate expertise across government in some highly focused areas, in particular;

- The location and ethnic differences in age structure of the New Zealand population now and over the next three decades,
- Pathways to ageing among regions and communities
- The changed structure of households and demand for housing
- The distinct character of Auckland's population growth
- Imbalances in the supply and demand for some key occupations (nurses, teachers)
- Education and Employment pathways for young Maori and Pacific Island men and women
- The impact of projection uncertainty on policy evaluation
- Supporting and learning from pathfinder projects (Tamaki)

### *The fiscal, social and economic impact of population based change and the consequences for public policy*

Reliably estimating the current and future fiscal cost of current policies, and the effective comparison of alternative policy options is most critically dependent on the quality of forecasts of the relevant population base. Population based change brings social impacts triggered by the changing interrelationships among people, and change in the acceptability of and predisposition to particular social groups. This highlights not only the sensitivity of the population base to demographic drivers of change, but also the interaction with social forces, economic imperatives, and influences from other public policy.

Given the certainty of significant prospective population change, there will undoubtedly be a huge shift in public spending on retirement, health services and custodial programmes. All of this will not only bring about a need for restraint given the imperatives of debt servicing and climate change, otherwise fiscal constraints will crowd out innovation and change in other areas of government spending. This will place New Zealand in a position of considerable vulnerability, whenever we face risks in defence, economic development, health or natural disaster that bring "once a century" demands on government. The "Sustainable Debt" scenario in the Treasury report on "New Zealand's Long-term Fiscal Statement" of October 2009.highlights the extent of prospective growth on public expenditure, and the necessity of understanding the sensitivity of forecasts of policy target populations to demographic, social and other change. We need to understand well the likely size and prospective position of population groups important to public policy over the

period 2015 to 2020 (and beyond), if policy changes made in the next 1-5 years are to have permanence, and not bring net increases in costs through unintended consequences in other areas of public policy.

Much of this change in the policy relevant populations is well under way. We have experienced huge shifts in the nature of household formation, family size and regional concentration of the population, as well as structural change in the age composition of key workforces and regional populations, that will alter longstanding mechanisms that influence change from now on. With the first of the post war baby boomers now retired from the workforce, we are on an unrelenting path of high rates of growth in older populations that have traditionally been the most dependent on health and income support. We will have to find many more scientists, engineers, doctors, nurses and teachers than we will have trained in the previous five years, to replace them.

The period 2015 to 2020 will also see the entry to the workforce of the babies of the new millennium. By 2015, we would expect economies around the world to be showing some or strong growth, and facing strong pressures from the age structures that have resulted from the huge falls in fertility they have experienced since the 1970s, including considerable growth in retired people expecting medical and other care on unprecedented levels. We will then be clearer about the vulnerability we face in maintaining fertility levels above that in most other OECD countries. We expect by then that New Zealanders who were born overseas will reach a record x percent of the population, and that Maori and Pacific births will be x percent of those by Pakeha. Home ownership rates may well decline more significantly by then so that home ownership is no longer a realistic aspiration for a significant group of New Zealanders, as the housing of those who are retired rises in significance.

**Other influences on future policy relevant populations**

The understanding of the policy relevant populations and their likely changes during 2015 to 2020 and later will have a significant influence on policy dependent on;

- *The competitiveness, productivity and wealth creation of the New Zealand economy*
- *The overall fiscal position and prospects of the government*
- *Public expectations, attitudes and understanding behind policy and public services*
- *The continued relevance, efficacy and effectiveness of service delivery models, systems and institutions*
- *New Zealand influence in the expanding international competition for a wide range of skilled workers, including those trained in New Zealand.*

- *The potential crowding out of public spending options through commitments to retirement provision and health, and the high costs of imprisonment, debt servicing and the impact of global warming.*
- *The nature and cost of Treaty settlements and their long run outcome for Maori*

*As an example, the table below identifies the range of information we would need an understanding of, to provide policy leadership in retirement provision policy over the coming decades.*

Table: Sample applications area for long term appraisal of public programmes

| **Population/ Demographic information questions**<br><br>Retirement provision |
|---|
| *Affordability*<br>1. Increased longevity leads to continual rise in the share of government revenue committed to retirement provision.<br>2. Structural ageing also means that growth in the workforce will taper off, and globalisation could tend to reduce the share of jobs in NZ that are of high added value, limiting the overall rate of growth of GDP, and growth in the tax base.<br>3. Compare ageing pathways across regions and communities in New Zealand<br>4. Impact of ageing workforce on ACC obligations<br><br>*Informing policy alternatives*<br>1. Need to model health/ well being/ employment of New Zealanders at ages around the age of eligibility, to assess impact of any potential rise in the age of eligibility on wellbeing.<br>2. Assess wealth holdings and savings of different cohorts at similar ages<br>3. Assess home ownership rates of different cohorts at ages 50 and over<br>4. In order to measure income from Kiwi Saver, assess effective impact of the returns from long term equity investments for each cohort, given timing their retirement in relation to the business cycle.<br><br>*Population base*<br>1. Need to assess the potential eligible population (residence, age), in particular account for New Zealanders living overseas who can become eligible, and those who would be eligible if they remained in NZ, but who choose not to.<br>2. Increased immigration leads to uncertain widening of the eligible population, through family reunification and mixed domiciles of some new citizens.<br>3. Given the different household formation experiences of cohorts, assess changes in the mix of household forms that explain where men and women live at specific age ranges, for different cohorts |

4. Assess impact of potential projection error on policy analysis

*Synergy with other programmes*

1. Need to assess periodically the impact of other benefits for those not in employment and at ages near to the retirement age threshold, to assess their adequacy and form
2. Given the ongoing decline in age specific home ownership rates in New Zealand of successive cohorts, assess the shifts in housing arrangements of people aged 50 and over of each cohort at key age groups
3. Contribution to informing thinking about drivers for shifts in primary care involving the management and treatment of people with chronic and complex conditions

***What population research can now contribute to policy analysis.***

1. There is difficulty in anticipating the wider implications of links between government programmes. Early recognition of the potential significance of change in populations of relevance to particular policies and programmes, and the breadth of whole-of-government interest would reduce policy risk.
2. The evaluation and quantification of long run benefits and costs of policy interventions, where costs and benefits are spread over different time periods, and accumulated over much longer periods than usually needed for government budgeting.
3. The long run implications of present policy settings.
4. Early recognition of significant structural shifts in the nature of populations of interest that are likely to lead to significantly different assumptions, rules of thumb and key associations behind programmes.
5. Highlighting the potential for significant change in the population base associated with programmes targeted at high risk, high cost populations. The comparative effectiveness and efficacy of alternative interventions that reduce the growth in high risk, high cost populations is subject to continued reassessment, and these evaluations are sensitive to assessments of the target populations, who are usually vulnerable groups, some of whom may be in the custody of the state.
6. Public policy has delineated a number of age thresholds for assessing and allocating resources and defining expectations of the nature of what people can expect of government. The capacity to anticipate shifts in the health and general well being of consecutive cohorts as they reach particular ages will enable periodic reassessment of the expectations placed on people in the workforce, community activity and family.
7. Highlighting potentially unstable balances between population targeted groups which indicate where service provision, critical relationships, future capacity,

or significant policy settings will be seriously at risk, in sufficient time for remedial action to be taken.

8. The accuracy of population projections is difficult to assess, and shifts in the underlying levels of fertility and mortality are difficult to foresee. While we can never predict short term migration movements well, we rely on the untestable robustness of long run averages if in and out flows, and are often unable to anticipate shifts in the composition of those gross flows. Policies which depend on life expectancy measures to accumulate liabilities are particularly sensitive to projection revisions..

### *Sharpening the policy capability and assessing policy risk from population change*

Assessing the population base relevant to particular programmes of government generally involves a mix of demographic, social, economic analysis, and a deep understanding of the nature of the entitlements and eligibility or selection criteria associated with programmes. At present we bring varied mix of competencies across government to each of these dimensions, yet given the scale and breadth of population change that will impact on government policy there will undoubtedly be considerable shifts in policy settings that will place unprecedented demands for high quality estimates of current and prospective target populations, and their sensitivity to policy changes. The components of cross government research would focus on several core elements, as identified below.

1. *Determinants of the total population of New Zealand*

    - Natural demographic processes of birth, death and aging,
    - External emigration and immigration
    - Short term employment related immigration and emigration
    - Population movements around New Zealand
    - Population movements of New Zealanders who are non-residents living abroad

| |
|---|
| *Population base*<br>*Fertility*<br>*Mortality, life expectancy*<br>*Gross and net migration flows*<br>*Internal migration*<br>*Non-resident New Zealanders* |

2. *The formation of families, communities and other social groups*

- Social processes of family and household formation
    - Marriage and fertile unions
    - Housing, settlement and urbanisation
- Transformation of individual actions into cohort behaviours
- Ethnic communities
- The growth of Auckland
- The changing form of regional cities and towns

| |
|---|
| *Family and household formation*<br>*Projected age structures of regional populations*<br>*Profile of ethnic communities, their location and demographic drivers of change*<br>*Population outlook for Auckland*<br>*Urbanisation and settlement patterns* |

3. *The health and capacity to contribute of New Zealanders*
    - *Expected impact of cohort differences in predisposition to chronic health conditions*
    - *The education levels and extent of training obtained for employment, of cohorts*
    - Education and training opportunity, access and outcomes in occupations important to public policy

4. *The general economic position of New Zealand in the global economy*
    - Economic opportunity, labour demand and labour market regulation
    - Expanding international competition for a wide range of skilled workers
    - The impact of international labour markets on the share and turnover of high added value employees in New Zealand
    - The nature of capital formation, research and innovation in New Zealand business
    - The distribution of income and wealth among New Zealanders
    - The integrity of infrastructures

- Innovation

| |
|---|
| *Saving and investment levels*<br>*The range and quality of job creation by business*<br>*Trends in income and wealth distribution*<br>*Relationship of national income to GDP*<br>*Training and education levels* |

5. *The nature of past and current public policy and programmes in New Zealand*

    - Availability of and access to health prevention, care and treatment
    - The evolution of public and private housing markets
    - Forms of wealth, deprivation and inequalities
    - Retirement provision and saving
    - The punishment, custody and rehabilitation of offenders at various stages of the life course
    - The care of potentially vulnerable populations, including the protection of children

6. *The International and national causes of prospective shifts in national wealth*

    - Global warming
    - Innovation
    - Impact of financial and other calamity

### *Critical steps in the project*

1. Identify population change[1] that has a significant impact on the quality, costs and fiscal sustainability of public programmes during 2010 to 2020.

[1] Expected common pooling of knowledge, insights, research sources of

- Demographic trends, Fiscal outlook, Global issues, Cohort perspectives, Life course perspectives, International comparisons, Policy directions, coherence and robustness, Policy tensions, Existing insights, Uncertainties, risks and context volatility, Sector interdependencies, International obligations/ implications/ constraints, NZ research agenda,

2. Bring together age specific knowledge of interventions that influence the health, well being and learning capacity of individuals, at later ages.

3. Develop ways of assessing the vulnerability of business and public sector to structural shifts in the age distribution and characteristics of occupation groups of high impact in key policy areas.

4. For particular policy areas that are uniquely complex, make transparent the key stages in the way that the target population base will change.

    - The management of people with multiple conditions in health
    - Housing
    - Retirement Provision
    - The tax base and tax mix
    - Intergenerational deprivation
    - Lifting educational achievement levels of future cohorts to levels comparable with OECD high achieving countries
    - Retaining skilled New Zealanders in NZ
    - Reducing crime

5. Establishing the most relevant researchable questions that will add the most knowledge to understanding of the target population base for social policy, education, health, housing and employment initiatives, and increase the certainty we can have that we are making good policy decisions.

6. Developing a research agenda that can involve academic and other researchers in, both in research, analysis and in building up the competence of the policy analyst community in key elements of population studies.

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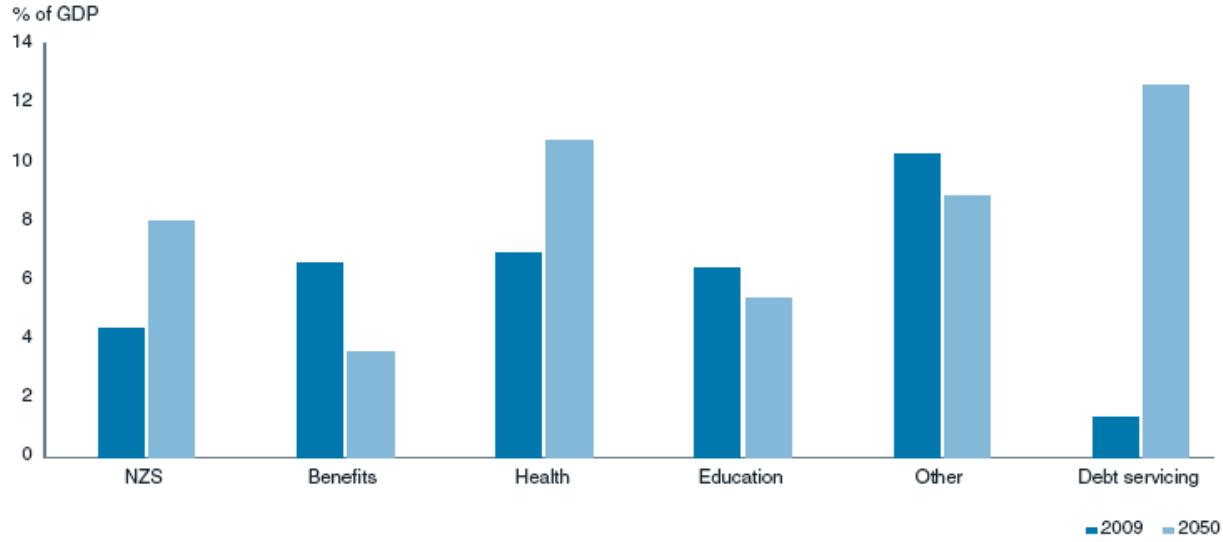
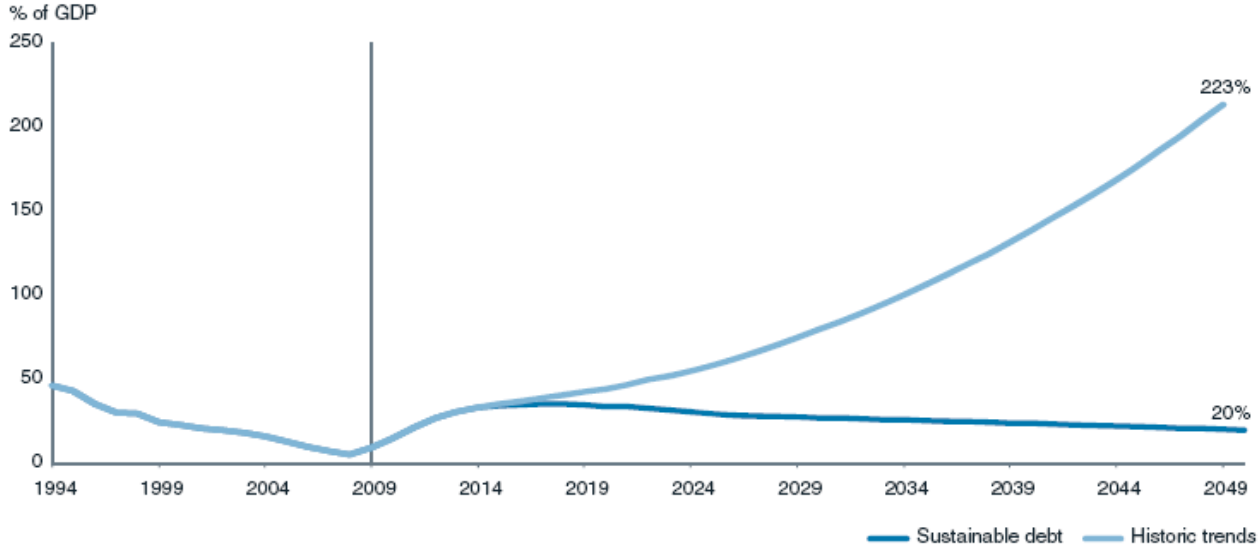
International research agenda, Operational performance, Themes expected to be common across all fields

**Figure 6.1** - Spending - historic trends




Source: *The Treasury*

**Figure 6.2** - Net debt




Source: *The Treasury*

**POLICY CROSS OVERS**

| | | |
|---|---|---|
| **Health Benefits** | **Cut in elective surgery** | **Increase in invalid benefit costs** |
| **Labour ACC** | **Reduce industry training** | **Raise accident costs** |
| **Health Benefits** | **Health improvement and healthy older people** | **Higher participation rates of "retired"** |
| **Health Education** | **Inadequate screening of young with poor hearing, sight** | **Poor learning outcomes** |
| **Crime Lifetime outcomes** | **Young offender diversion reduces use of custodial sentence** | **Reduce recidivism among young** |
| **Education Workforce quality** | **Sure start 0 reduce risk of poor early education** | **Higher education success rates** |
| **Housing Health** | **Housing quality eg insulation** | **Change prevalence of asthma** |

**DEMOGRAPHIC ASSESSMENT**

| | |
|---|---|
| **Structural shifts in age, ethnic distribution** | **Regional**<br>**Key occupations**<br>**Mothers** |
| **Diversity of pathways** | **Ageing pathways (job entrants, elderly to children, births/deaths, total decline)** |
| **Critical balances** | **Students/ teachers**<br>**Clinicians/ patients**<br>**Custodians/ people in custody**<br>**Care force/ those in care**<br>**Classification and assessment versus rehabilitation and care** |
| **Sensitive impacts** | **Ethnic**<br>**Migration**<br>**Take up limits (eg health patient registration)** |
| **Perverse Impacts** | **Stroke treatment and disability** |
| **Estimation risk** | **Population mobility (regions, households, ethnic)**<br>**Missing groups (young men)**<br>**Inherent biases in information sources**<br>**Maori (from race to descent)**<br>**Non resident New Zealanders**<br>**Resident overlaps - Pacific Islands** |

**Pathway to advance population issues paper** Project Overview:

Focus initially on a small number of fundamental trends, in examining the impacts across various policy areas. These could be;

- The location and ethnic differences in age structure of the New Zealand population now and over the next three decades,
- Pathways to ageing among regions and communities
- The changed structure of households
- The distinct character of Auckland of population growth
- Imbalances in the supply and demand for some key occupations (nurses, teachers)
- Education and Employment pathways for young Maori and Pacific Island men and women
- The impact of projection error on policy evaluation

A descriptive project will draw on population estimates and projections to estimate selected variables that can be presented using information mapping methods to highlight to the broad community of social and economic policy researchers the degree of change and diversity of experience across regional and ethnic communities of that change. Where significant transitions occur, we need to identify them so that the usual investment cycles for the key inputs can be forewarned.

This will develop estimates with more relevance to service planning, and with more precision in aggregate, than the approach published by the Treasury on January 28 2010, which noted *"Other than health and education, demographically-driven volume growth is assumed to be equal to growth in the working-age population. In the case of justice sector, this is because criminal offending is generally by those within the working-age population. Other expenditure on public services, which is a relatively small portion of the total, also tends to grow with the size of the economy, which is driven by the working age population."* Variables will be selected from the Stats NZ survey of departmental demographic studies. Amongst the likely selected variables will be many from the list below.

| Variable | Purpose | Application area |
|---|---|---|
| Total population number, rate of change | Assess and compare past and future scale of community, against selected size thresholds | Departments/ agencies with regional or ethnic specific services |
| Contribution of natural increase and migration to population change | Highlight sustainability and volatility of population change, and impact on population structure | Departments/ agencies with regional or ethnic specific services |
| Population aged between 65 and 74 years, and growth rate | Highlight impact of increased longevity on number and share of people in usual retirement ages | Departments/ agencies funding or providing care and support services Potential voluntary or part-time workforce |
| Population aged between 75 and 84 years, and growth rate | Highlight number of people moving into period of increased vulnerability in terms of reduced capacity for full independence | Departments/ agencies funding or providing care and support services |
| Population aged 85 years and over, and growth rate | Highlight number of people in a group that usually has high needs for care and treatment | Departments/ agencies funding or providing care and support services |
| Population under 5, and | Highlights level of natural increase, and | Departments/ agencies funding or |

| | | |
|---|---|---|
| growth rate | projected utilisation rates of existing service infrastructure for young people | providing health, care and support services for children and their education |
| Population aged under 5 years, as share of population aged 75 and over | Highlight rate of change in the age structure of community, and the potential impact on service infrastructures | Departments/ agencies involved in care - anticipate workforce and infrastructure demands |
| Population 16-20, and growth rate | Highlight population in vulnerable migration years | Education and training<br>Police and Justice |
| Women aged 20-45 and rate of change | Highlight shift in potential mothers, and capacity of community to regenerate from natural increase | Potential birth numbers and preschool demand |
| Population aged 16-20, ratio of population aged 20-50 years | Highlight potential employment capacity of community, given future potential workforce | Workforce training, |

Sample applications area for long term appraisal of public programmes

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List of policy areas where policy analysis is highly dependent on the projection of complex target population bases, involving population projections and modelling transmission mechanisms, at a time when assumptions presuming continuity will be severely challenged.

For discussion.

1. GST Consumption tax base
2. Young offenders
3. Prisoner population
4. Population needing renal dialysis
5. Health and housing needs of geriatric patients
6. Nursing services University Grants
7. Location of primary schools
8. District Health Boards - adapting capability to population trends
9. Fitting personal, public and commercial housing investment to population shifts