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Stats NZ
Tatauranga Aotearoa

Value of the census for Māori

Purpose of this report

This report was commissioned by Stats NZ in response to a query from the Data Iwi Leaders' Group that sought to better understand the value of the census for Māori in New Zealand. It forms part of a response to that query and builds from the valuation for the whole census developed in 2013.

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This report has greatly benefited from the input from a wide range of people. However, the views, opinions, findings, and conclusions expressed in this report are strictly those of the author, and do not necessarily reflect the views of Stats NZ.

The author acknowledges the suggestions made on an earlier draft by a range of Stats NZ staff and external reviewers.

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Executive summary

Value of the census for Māori sets out the results from the first part of a process designed to provide an estimate of the value of the census for Māori in Aotearoa New Zealand. The census delivers considerable value for Māori, well above its costs and proportionately somewhat higher than for other New Zealanders. Estimated conservatively, the benefits for Māori are around eight times the costs and provide a net present value gained from use of the census of around $500 million.

Of the three key areas where census collects specific information on Māori (ethnicity, descent, and iwi affiliation), the main benefits at this time come from the use of ethnicity data in allocating government funding and services.

In many areas, use of the census delivers a set of benefits that are shared with other New Zealanders, for whom benefits were estimated at around six times the costs. But for Māori, there are two other significant benefits:

1. The census provides the only overall authoritative data on the numbers of people identifying Māori descent (some 16 percent higher than those choosing Māori ethnicity) and their iwi affiliations.
2. The census, including Te Kupenga (the survey of Māori wellbeing), provides the sole reliable collective source of information that connects information about individual Māori with whānau/iwi and their household characteristics.

Crucially, the census provides generally reliable and authoritative visibility for a group whose outcomes are often less desirable than for many other New Zealanders.

Looking forward, benefits will probably be greater as the demand for iwi affiliation information grows. The government is increasingly focused on designing and delivering policies and services in partnership with iwi, hapū, and whānau so that they more consistently strengthen capabilities and lift outcomes. A reliable census offers some of the key information that will be needed to help shape these initiatives.

What does this report provide?

This report sets out the results from the first part of a process designed to estimate the value of the census for Māori in Aotearoa New Zealand. It builds from the 2013 overall census valuation report. It explores the areas in which value is delivered for Māori and/or where the value is particularly influenced by using a wider framework that incorporates outcomes for Māori and a wellbeing lens. This first-stage report focuses at a relatively high level on the value of services and resources that are improved by using census data. Value for Māori in the context of this report refers specifically to the financial value of benefits accruing to Māori as result of those services and resources. The report does not consider non-financial value and does not purport to consider value in terms of what are the best and most appropriate programmes for Māori. Subsequent stages are intended to look more closely at the impact and value of the census as it affects design, choices, and delivery of services and resources to iwi.

Value for Māori in the context of this report refers specifically to the estimated welfare or wellbeing benefit accruing to Māori as a result of those resources and programmes. The report briefly considers some non-quantifiable benefit areas but does not purport to estimate whether the value derived represents the best or most appropriate programmes for Māori.

The context introduces new and complex challenges to any valuation process. The 2013 report necessarily adopted a mix of valuation approaches, requiring a range of techniques to estimate

values where explicit prices/willingness to pay were not available. While some small developments have taken place since then in the non-use valuation literature, the task remains difficult. This is further complicated by the lack of a clearly unified and agreed Māori or wellbeing framework across the domains of likely interest, although this is an area of active development.

Another critical determinant of the value of the census (including Te Kupenga) for Māori is its unique role in providing a comprehensive (and independent) count of Māori, together with their iwi connections, location, and many associated household characteristics. These outputs have been particularly impacted by the low response rate in the 2018 Census. There is no comprehensive and reliable alternative, and the value of this information is increasing at this time as the government emphasises the focus on shaping some service delivery to best deliver desired outcomes within an iwi-based framework.

What are the benefits?

Benefits come primarily from using ethnicity data to shape policies or services that help improve Māori wellbeing, for example, in encouraging Māori to leave school with more skills or receive better health treatment. In the areas covered, the design and execution of services and policy have been improved through using data and insights from census information. One of the key factors explaining why the benefit ratio for Māori is higher than for other New Zealanders is that this report looks closely at government services, many of which serve more Māori than if solely based on population shares. Some smaller level of benefit arises from reduced activity costs, such as sampling through the use of census data.

The estimations of benefit are subject to considerable uncertainty but can be grouped into three categories:

- **Measured benefits** use some form of externally determined yardstick (most rigorous).
- **Assessed benefits** use market norms and plausible impact assessments.
- **Proposed benefits** use expert opinion to propose a range for the value of the benefits (least rigorous).

To compensate for this level of uncertainty and provide a reliable guide to the likely value generated, benefits have been estimated conservatively. The resultant overall value estimates are significantly less precise than those applicable in commercial markets, but this in part is balanced by the deliberately conservative approach adopted.

Overall, this report identifies a very large net benefit to Māori from using census data now and in the future, estimated to be in the range of $500 million, and where the main benefits at this time come from the use of ethnicity data in the allocation of government funding and services. This provides benefits of around eight times the cost of conducting the census. On an even more conservative basis, using just the two most rigorously measured/assessed benefit categories provides benefits of double the costs. Uncertainty around the overall central estimate though is large, perhaps, plus or minus 40 percent. The final net present value uses a standard national welfare cost-benefit approach and the currently applicable 6 percent discount rate set by The Treasury.

Table 1

Overall benefits for Māori from using the census	
	Net present value in 2019 $m
Benefits to Māori	572

Census costs apportioned to Māori	74
Overall net benefit	498
Ratio of benefits to costs	8 times

While many of the valuations used are subject to significant uncertainties, given the conservatism of the approach adopted in this report, we can assume that benefits from accurate census data are very much greater than costs of data collection and that, in most cases, inaccurate data could impose losses well in excess of the costs required to ensure accuracy. However, this report does not identify the most efficient ways of collecting the data.

We recognise that not all benefits can be quantified. This is an increasing challenge where, from a te ao Māori lens, there are wellbeing domains that have not been explored well and there are no reliable measurement tools or approaches. Some of these challenges are discussed further in this report.

Next steps

This is a first-stage report examining the value of census data for Māori. It has provided an indication of some major areas of funding and potential benefit, where a next stage would dig deeper into examining just how that data was used by agencies and iwi to shape services/resources delivered to Māori.

Background

The brief

Following a request from the Data Iwi Leaders' Group (Data ILG), Stats NZ commissioned an independent valuation of the benefits delivered to Māori in New Zealand from using census data.

A full response to the request will comprise three parts:

- Phase 1: Valuing the services and resources delivered that derive value for Māori from census data use
- Phase 2: Valuing the ways in which / how value is derived from census data in shaping services/resources delivered to iwi
- Phase 3: Qualitative and case study material on ways in which / how census data are used to secure funding/resources/services and the value of this data to iwi.

This report represents the response for phase 1, building from the valuation for the whole census developed in 2013 (Bakker, 2013). It is intended to provide a conservative and credible valuation that informs future decisions on use and investment but, given methodological and resource constraints, is necessarily less precise than a market valuation for a commercial set of services.

Key information sources

This report includes data derived from the census and the associated Te Kupenga survey.

Increasingly many datasets from government agencies, Stats NZ surveys, and non-government organisations (NGOs) are now being included within the Integrated Data Infrastructure (IDI) – the large research database managed by Stats NZ. (See Benefits and social services data for the full list of data sources.) The IDI holds microdata about people and households, including the census, and provides links across datasets. The census is the single most complete record of all individuals and their household characteristics and is linked into the IDI so it provides connectivity to other data. In turn, the census is important in enabling additional and more detailed analysis. These secondary uses are not directly considered in this report but will add considerably to the overall value delivered from the census.

Data on current uses and flows have been sourced directly from publicly available material on agency websites and from consultations with officials from the Ministries of Housing and Urban Development, Education, Health, and Social Development; Oranga Tamariki; Social Investment Agency; Stats NZ; Te Arawhiti, Te Puni Kokiri, and some members of the Data ILG. As a result of the reliance on publicly available material, data are not fully aligned in terms of time periods, but given the purpose of this report and relatively slowly changing positions, the overall picture presented seems robust.

Definitions: ethnicity and descent

An ongoing issue for those working with population definitions is how ethnicity is measured. While a standard has been developed by Stats NZ for official statistics, this has evolved over time and is often not followed by agencies when collecting data for their own administrative purposes.

Importantly for this report, it is worth distinguishing the three levels of information collected that are relevant specifically to Māori: ethnicity, descent, and iwi affiliation.

Ethnicity

Using the Stats NZ standard, ethnicity is defined as the ethnic group or groups that people identify with. Ethnicity is a measure of cultural affiliation, as opposed to race, ancestry, nationality, or citizenship. It is self-perceived, and people can belong to more than one ethnic group. An ethnic group is made up of people who have some or all of the following characteristics:

- a common proper name
- one or more elements of common culture which need not be specified, but may include religion, customs, or language
- unique community of interests, feelings and actions
- a shared sense of common origins or ancestry
- a common geographic origin.

Statistics are available for five broad ethnic groups at the highest level of classification:

- European or Other ethnicity (including New Zealander)
- Māori
- Pacific peoples
- Asian
- Middle Eastern / Latin American / African.

These ethnic groups are not mutually exclusive because people can and do identify with more than one ethnicity. Stats NZ ethnicity counts include people who identify with more than one ethnicity in each ethnic group, and ethnic population proportions consequently may total to more than 100 percent.

This distinction is important and can create anomalies when comparing results with some other administrative datasets. For instance, the Ministry of Education, for some datasets, prefers to report ethnic group by prioritised ethnicity. Under this approach, for example when providing teacher numbers by ethnicity, a teacher with multiple ethnicities is counted in only one of the ethnic groups they affiliate with. This allocation is performed using a predetermined order of ethnic groupings, for example, teachers are prioritised in the order of Māori, Pacific, Asian, MELAA (Middle Eastern, Latin American, African), Other groups except European/Pākehā, and European/Pākehā.

A number of other agencies also use ethnicity definitions and counting rules (especially for those declaring multiple ethnicities) that do not fully align with Stats NZ's definitions.

While not a significant issue for this report, it is worth noting that ethnicity is self-identified (except in some cases where children's ethnicity is identified by parents/caregivers, for example, in school or health situations). There have been shifts in the level of identification with various groups over time and at some stages in life (for example, some trend for higher identification as Māori when entering tertiary education).

Māori descent and iwi affiliation

In addition to ethnicity, the census collects data on Māori descent and iwi affiliation to meet the demand for information on the number, distribution, and characteristics of tangata whenua.

Māori descent is a biological concept. A person is defined as having Māori descent if they are of the Māori race of New Zealand, and this includes any descendant of such a person. In the electronic

format for Census 2018, iwi affiliation was only sought if respondents had stated they were of Māori descent.

For statistical purposes, an iwi is defined as a whakapapa-based kinship that generally has several hapū and one or more active marae and a recognised structure that represents the interest of the iwi, such as a rōpū whakahaere, committee, or board.

Questions in the 2018 Census individual form provided for identifying up to four iwi connections (see Appendix 1). Some groups were only added to the iwi classification (iwi list) following a comprehensive review of the iwi statistical standard in 2017, and as a consequence of the low response rate by Māori, iwi affiliation data will not be published as official statistics – so this means those new iwi will have no independent iwi data.

Other agencies have quite varied data collection processes for ethnicity and iwi for their clients/population serviced. Typically, fewer iwi connections are provided for, and in some cases there are inconsistent and/or incomplete processes for collecting even this data.

Of importance for this report are the alternative sources for iwi information. All iwi have developed and maintain their own tribal registers. Although each iwi has a unique process for registration on their tribal register, most require registrants to demonstrate their membership based on whakapapa. Processes also vary in terms of updating, verification, and inclusion of family. Crucially though, processes are not aligned across iwi, and for privacy reasons, registers are not accessible beyond iwi members. The iwi registers do not of themselves (except in some limited circumstances) contain any connections to wider household information, although most contain an address, nor do they all connect systematically to other datasets. Some iwi have developed their own surveys, which collect additional household information, as conducted recently by Ngai Tahu.

The impact of these different definitions and corrections is significant. The 2013 Census summary data indicates 598,605 people chose Māori ethnicity, which, when adjusted for non-response, net undercount, and residents overseas, moves to a population estimate of 692,300.

But the equivalent estimate for the Māori descent population is 811,800 (some 17 percent above the ethnicity figure). This compares with the census count for the Māori descent population of 668,724. The figure used for Māori proportionate estimates in this report is the ethnicity population as taken from Stats NZ population estimates tables (744,800 at 30 June 2018, or 15 percent of the total estimated resident population, Stats NZ 2018c).

Adding to the complexity is that neither group is neatly contained or explained by the other. In 2013, 84 percent of people of Māori descent belonged to the Māori ethnic group, and 16 percent did not. Of those people belonging to the Māori ethnic group, 94 percent had Māori descent and 6 percent had no Māori descent.

Structure of this report

After a background section setting out just what specific data are delivered by census (relevant to Māori) this report:

- Sets out the framework for determining and measuring value:
    - How value might be determined. A unique contribution of this report is the inclusion of a range of te ao Māori outcome domains/wellbeing frameworks that pick up recent developments in articulating these values.

  - The tools and approaches to actually measuring and quantifying possible benefits – a challenge given the non-market/unpriced nature of almost all the benefits. It also outlines the counterfactual – what is the quality/benefit delivered in the absence of census data.
- Assesses the benefit from major government funding areas and services.
- Identifies some other major benefits and notes areas of unquantified benefits.
- Provides an overall net present value, along with a discussion of some of the key risks and uncertainties.

What does the census (including Te Kupenga) provide?

The census

The census is a comprehensive record of all people in New Zealand, with information on location and a wide range of demographic and socio-economic factors. Of particular importance for this report, it is the only complete record of all Māori, together with iwi affiliations and related household information.

The first New Zealand census was held in 1851. The interval was set at three years until the Census Act of 1877 set a requirement for censuses to be held every fifth year. Since 1881 censuses have been held every five years, apart from 1931 during the Depression and 1941 due to the Second World War, and a deferral in 2011 (to 2013) due to the Christchurch earthquake. (See History of the census in New Zealand.) A major driving factor behind the retention of this frequency is the high rate of population change in New Zealand, where our external and internal migration rates are high in international terms.

Census information can be broadly characterised as follows:

- counts of population units – people, households and dwellings
- population structures – for example, family and household composition, ethnic groups
- population and housing characteristics – for example, educational qualifications, labour force characteristics, household size and occupancy.

A unique aspect of the Census is that these statistics are produced for very small areas and for very small population groups, with the potential for cross-tabulation between different variables. (Meshblocks are the smallest administrative areas used by Stats NZ, containing a population of between 60 and 120 persons in 2018.)

Census outputs

In summary, the census is a snapshot of the whole New Zealand population at a given point in time. It acts as a de facto population register and has been used to underpin the validity of all other data sources.

Examples where the census is the only reliable source of information are:

- the overall numbers and associated individual and household characteristics for Māori based on iwi affiliations
- the basis for estimates and projections of population and households, including internal migration patterns
- comprehensive information on dwellings and the housing stock in New Zealand
- the number, types, and distribution of households and families
- comprehensive information about sub-population groups, for example, Māori and iwi, Pacific, Asian and other smaller ethnic groups, older New Zealanders, external migrants, single-parent and other household and family types, occupation groups, crowded households
- comprehensive information about subnational areas, for electoral boundaries, territorial authorities and local communities

- detailed and very local information derived from census variables at meshblock level, for example, school deciles, transport patterns, relative disadvantage (NZ deprivation Index)
- information to a very detailed level on some variables, for example, occupation, country of birth, language (Bycroft, 2011).

Census 2018

At the current time, Stats NZ is still working on analysing the results of the 2018 census and Te Kupenga, with some delays in reporting due to lower completion of returns than expected. In many areas, various sources of administrative data have been used to help fill gaps and provide the data required to effectively fill coverage or accuracy gaps, most relevant for ethnicity and almost impossible for iwi affiliation. Stats NZ currently reports that effective coverage, in most areas, is at or above previous census levels (including for Māori ethnicity, not descent) where the 2018 coverage rate is 96 percent compared with 94 percent in 2013). However, the challenge for Stats NZ is the much lower return completion for Māori, where response rates were only 74 percent for census field responses (90 percent in 2013) and 68 percent for traditional form returns (89 percent in 2013). These rates compare with population averages of 88 and 83 percent respectively (compared with 93 and 92 percent in 2013). For Māori ethnicity, descent, and iwi data, the latest relevant Stats NZ release comments (Stats NZ, 2018a and b):

> "We are confident that we are including genuine information about people we are sure were in New Zealand on Census Day, to help us provide as complete a picture as we can. For example, data on Māori ethnicity and Māori descent is likely to be more comprehensive than what was released from the 2013 Census," Ms MacPherson said.
>
> Ethnicity data is used in the DHB funding model and Māori descent data is used for the electoral population counts.
>
> However, using other government data to compensate for missing data is not a silver bullet for all the information that a census traditionally provides.
>
> "While Stats NZ has been able to use administrative data for key variables like age, sex, ethnicity, and Māori descent, we know we can't do this for all census topics. As a result, following rigorous evaluation, some census data may not be judged of sufficient quality for release as official statistics. We will work through the implications of this with our customers as we confirm the data quality of each topic."
>
> The first of these determinations relates to iwi affiliation. Stats NZ will not release official statistical counts of iwi, because of the level of missing iwi affiliation data, and the lack of alternative government data sources to fill the gaps.

The issue for Stats NZ with respect to iwi affiliation data highlights the significance of the census. While other data sources can be reliably used to fill gaps, there is no reliable alternative to the census for affiliation connections. As a consequence, related data/searches that require linkage to affiliation will be more limited or will need to be based on 2013 data – an issue for a population that is both young and mobile, and where iwi affiliations have been updated as new iwi are registered.

Te Kupenga

Te Kupenga is Stats NZ's survey of Māori wellbeing. It was first run in 2013 after the 2013 Census of Population and Dwellings and then again after the 2018 Census. The sample size in 2018 was 11,500 people.

Te Kupenga was developed to provide insight into Māori wellbeing. It collects information on a wide range of topics to give an overall picture of the social, cultural, and economic wellbeing of Māori in New Zealand Aotearoa. The survey provides key statistics on four areas of Māori cultural wellbeing: wairuatanga (spirituality), tikanga (Māori customs and practices), te reo Māori (the Māori language), and whānaungatanga (social connectedness). One of the things that makes Te Kupenga unique is that it collects information about topics of importance to Māori where there has been little or no information before, particularly around aspects of cultural wellbeing, for example, knowledge of pepeha, marae tūpuna, and if they have ever visited a marae.

How value is determined and measured

Overview

Estimating a value for Māori and iwi from the census is not a simple task and requires several analytical steps, which are discussed in the following sections:

1. Establishing clarity on the underlying economic approach by which value is determined, and how it can be aggregated across individuals
2. Establishing the domains in which possible value gains will be explored
3. Being clear about how census data are used and how use of that data delivers different and better outcomes
4. Using a wide range of economic tools and approaches to assess the size of gains. This requires finding ways to include areas where gains are hard to quantify and/or might be subject to widely differing valuations amongst individuals.

Each of these steps poses challenges for an economist/valuer. Many areas are genuinely hard to value given a lack of observable prices for the goods/services/gains being delivered. In addition, the understanding of outcome areas and their value in te ao Māori are still emerging, let alone clarity for application within a 'standard' economic framework.

As a consequence, the approach adopted in this report is deliberately conservative. Where any tight quantitative measurement is not well supported, it points to both possible areas of gain and valuation ranges.

This report aggregates a value from use of census information and does not attempt to split benefits derived between the various components (ethnicity, descent, and affiliation) and Te Kupenga, although the particular use areas set out below generally identify the relevant source and counterfactual.

Clarity on exactly how value is assessed

In common, everyday transactions, a market value is easily determined – goods and services are sold at a price determined between willing buyers and willing sellers.

For an economic valuation, a possible difference arises in how value is measured. The final value to consumers is a combination of the price paid plus any consumer surplus; the difference between the costs to the consumer of the good or service, and the amount the consumer is willing to pay for it.

While a range of valuation challenges are discussed below, a particular challenge arises from the need to aggregate gains across a group of people. Where the good or service is produced under market conditions, with frequent transactions and the free ability of buyers and sellers to enter/exit the market, the final market price acts as an auction price reflecting an overall fair economic value. But where goods or services are infrequently traded, or under restricted market conditions, it is likely that an observed price may contain elements of producer and/or consumer welfare. Of relevance to this report is that valuing a benefit may vary very significantly between individuals. This poses challenges for assessing such benefits and aggregating them across individuals. For instance, learning te reo is not taken up fully by all Māori (while recognising that is also not an option for all) but is highly valued by many, and that value is clearly changing as uptake (and opportunity) has increased significantly in recent years.

Another issue is the measurement of willingness to pay. In the national accounts, goods and services delivered by government agencies are valued at the cost of their production – clearly often well below the value for citizens. For example, immunisations might be delivered for some small fraction of the value that people might pay for the lives saved. This report will estimate the full consumer valuation (for Māori) of welfare gains from improvements achieved using census data. Then a final value will be determined after any additional costs are deducted.

Outcome domains and frameworks

Valuation techniques in both market and non-market settings are continuing to evolve. For market valuations, the emerging challenge is how to value intangible assets, often related to datasets and information search and use/application capabilities. For wider economic and national cost-benefit work, the challenges, tackled progressively since the 1960s, have been around how to include non-market impacts (initially described as external impacts, but frequently found to have been internalised in some unexpected way).

Consequently, analyses now contemplate a wider set of possible impacts across a wider set of outcome areas. This has been accompanied by a developing set of measurement techniques.

In New Zealand, expert cost-benefit analysis has recognised a growing set of possible impacts across a wide set of domains and has employed a wider set of measurement techniques (as discussed below).

Of particular relevance to this report are two broad, and linked, developments: the development of a Living Standards Framework (led by The Treasury), and the articulation of a set of clearer outcomes that better reflects a te ao Māori perspective (led now by Te Puni Kokiri (TPK)). A recent Treasury and TPK report summarises this, and the ongoing challenge:

> There is no one way to look at wellbeing. People view wellbeing differently depending on their values, beliefs and social norms. The way Māori view wellbeing is different from the way other New Zealanders view wellbeing. It is informed by te ao Māori (a Māori world view) where, for example, whenua (land) is not seen just for its economic potential, but through familial and spiritual connections defined by cultural concepts such as whakapapa (genealogy) and kaitiakitanga (stewardship). A te ao Māori perspective of wellbeing is also informed by life experiences – similar to that of other indigenous populations across the globe – of significant disparity and inequitable access to the tools, resources and opportunities that form the foundation to wellbeing (Treasury and Te Puni Kōkiri, 2019).

Summarised very simply, the living standards work aims to recognise a wider set of factors that contribute to wellbeing than have been typically applied in most economic cost-benefit analyses. As such it has articulated a set of four broad wellbeing domains (social, human, natural, and financial/physical) together with possible indicators. Alongside this work has been the extension of the Treasury's cost benefit analysis tool, CBAX, so that it now includes a range of outcome valuations for some of the wider indicator set. This tool though only provides a somewhat partial coverage of the much wider set of domains identified. Many areas still possess few measures or do not have measurement tools that are yet tractable. This leaves analysts with the need to identify a range, now over a wider set, of possible impacts as unquantified.

Identifying a more commonly agreed set of outcome areas, and indicators, using a te ao Māori lens has been a relatively recent area of work. Summarised simply, this work has sought to incorporate

views of wellbeing and values that reflect a te ao Māori world view and integrate that with a community (whānau and iwi) perspective on wellbeing that is more than individually based.

Some of the pathbreaking articulation was provided by Mason Durie (see Durie, 2006). His work on wellbeing (tapa whā) developed thinking around individual wellbeing and highlighted four dimensions of measured wellbeing: taha wairua (spiritual health), taha hinengaro (mental health) taha tinana (physical health) and taha whānau (relationships with family and community). This framework was extended further to reflect a Māori perspective, wider than a typical European model based on the individual, that include domains for whānau and then iwi/population levels (Durie, 2006).

From that time, work has moved ahead in defining a set of outcomes and indicators as part of the Whānau Ora initiative. While using a te ao Māori lens, it also has a deliberate focus on capacity building and strengthening indicators; a more future-focused indicator set that is heavily based on causal/contributing factors or capabilities that lead to wellbeing, in part a response to many typical current/backward-facing measures that emphasise current low levels of wellbeing. This outcomes framework indicates that Whānau Ora is achieved when whānau are:

- self-managing
- living healthy lifestyles
- participating fully in society
- confidently participating in te ao Māori
- economically secure and successfully involved in wealth creation
- cohesive, resilient, and nurturing
- responsible stewards of their natural and living environments.

Alongside these seven domains, a set of short- and long-term indicators has been developed, each specified for whānau, te ao Māori, and Treaty of Waitangi dimensions. A 2015 articulation of this framework is included in Appendix 2.

The framework has been further discussed and developed since then, with additional effort put into defining measures more clearly and identifying relevant measures. Te Puni Kokiri has been leading this work across a number of agencies and progress has been made on developing an overview of Māori wellbeing outcomes. This and any revised framework were not available in time for this report. Nonetheless, the main indicators and domains under discussion are carried through from earlier work, and as such have been used in this report to highlight key measures and outcomes of relevance to Māori.

Fitting together with these specific Māori wellbeing measures is an early 2019 Treasury and Te Puni Kōkiri paper that discusses wellbeing from a Māori worldview and incorporates this view, with associated indicators, inside the Living Standards Framework. A simple table showing the result is included in Appendix 3.

Nonetheless, as one commentator stated:

> There are a number of Māori frameworks developed both internally [by individual government agencies] and externally. They tend to focus on varying aspects of Māori wellbeing so this is a strength. Frameworks developed within te ao Māori can easily speak to each other and can be synthesized as a consequence. There is no one framework to rule them all, nor should there be.

Implications for this report

This work on outcome indicators provides useful pointers to a wider set of domains that need to be included when assessing areas where value might have been delivered for Māori. The indicators so far available have been used where relevant, but to some degree their strong focus on effective skills and strengths for the future makes them less generally useful as a complete set of indicators to assess areas where value might currently be being delivered. This effect is probably most significant for this phase 1 report, as subsequent work on the design and delivery of initiatives and services for/with iwi and Māori will typically relate much more closely to the TPK outcomes and indicator set.

Measurement tools and approaches

In the first instance, economic valuations are based on observed market prices where the stream of outputs/benefits from a project can be observed and measured. These do not exist for almost all census outputs and direct uses.

While the first preference is market-based prices, if these cannot be obtained a sequential set of tools can be applied, each time trying to obtain the best proxy for a price but with decreasing objectivity and robustness. The principal options are some form of willingness to pay and/or revealed preference techniques. Recent reviews of these approaches also indicate that while they are theoretically sound, much depends on the actual way they are applied. As with survey questions, framing can be critical.

This approach works well especially when there is a range of reasonably close substitutes for the good or service being valued. Observing the amount spent on some near substitute reveals the willingness to pay. A challenge however is that in many areas there are no close substitutes for the census data for iwi, particularly in applications where both a total population frame is required and, more significantly, one that then connects with iwi and associated demographic and socio-economic factors.

For some domains of interest to Māori, primarily those associated with stewardship of the natural environment, another set of tools may need to be applied (New Zealand Institute of Economic Research, 2018). In these circumstances non-use valuations can become important and measures need to be applied that measure such passive or existence values (for example the knowledge that a river or lake is clean even if not personally visited or used for any commercial or recreational purpose).

Techniques applied in this report

Benefit estimates can be grouped loosely on the basis of the degree of rigour associated with their assessment:

1. **Measured benefits** use some form of externally determined yardsticks. In this report this includes the accuracy of health funding and Stats NZ frame-setting categories.
2. **Assessed benefits**, measured using market norms and plausible impact assessments: all investment planning, census-based analysis, and market research categories.
3. **Proposed benefits**, where expert opinion is used to propose a range for the value of the benefits, but that range cannot currently be independently tested; all the other categories in the summary table.
4. **Unquantified benefits**, which are likely to be significant, but there is really no way at present of giving a reasoned range for their likely value.

Various forms of assessed willingness-to-pay measures are most commonly used. Non-use values, most relevant for environmental outcomes, do not feature as no identified relationship with census could be clearly identified.

Counterfactual – alternatives to using the census and Te Kupenga for Māori issues

Typically the counterfactual is some form of administrative data collected from current users or clients. Relevant counterfactual datasets will be covered in each area valued later in this report, but three overarching observations apply:

1. There is no other even remotely complete set of the full Māori population, or a connection between Māori and detailed household characteristics, or systematic measures of Māori wellbeing on more specific Māori outcome domains. The long existence of the census has reduced the need for any such alternate data source at a national level.
2. There is no other comprehensive collection of iwi affiliation data.
3. Administrative datasets vary considerably in terms of data collected and their accuracy. Often such data (including some form of ethnicity, perhaps with iwi connections) reflect a legislated data requirement or have a legacy component to the form and level of data collected, and most importantly reflect typically an historic need for data in that form. As such, where future service provision is very heavily dominated by existing clients, then administrative datasets may be relatively fit for purpose (for that service provider) and little direct need or benefit from census data may exist. In some respects, a reasonable example of this is the Ministry of Social Development and the payment of benefits. Increasingly, as agencies seek to develop more holistic and joined up interventions, often seeking to work more closely with iwi in service design and delivery, there will be emerging benefits from better census connection and use (and from improved alignment between agency systems).

Benefit assessment

Overview

In this section, major possible areas of benefit from census use are identified, with some of those areas quantified, while others are noted as important but not quantifiable. Where benefits are identified, they are apportioned to Māori using the best basis for relevant share easily identified.

Benefits are typically estimated on an annual basis, which is then summed into a single net present value (NPV). This is a standard tool that provides a single amount that represents the value now of that stream of future benefits (with future benefits discounted by an interest rate – the discount rate – taken from Treasury guidance).

Techniques applied in this report

The approach used in this report, given time, budget, and value-for-money constraints is to focus on areas that are likely to be relatively high value, including both those that seem amenable to quantification and those that, while hard to quantify, are worth recognising as likely to contribute significant value. The valuation section consequently applies a sequential set of tests:

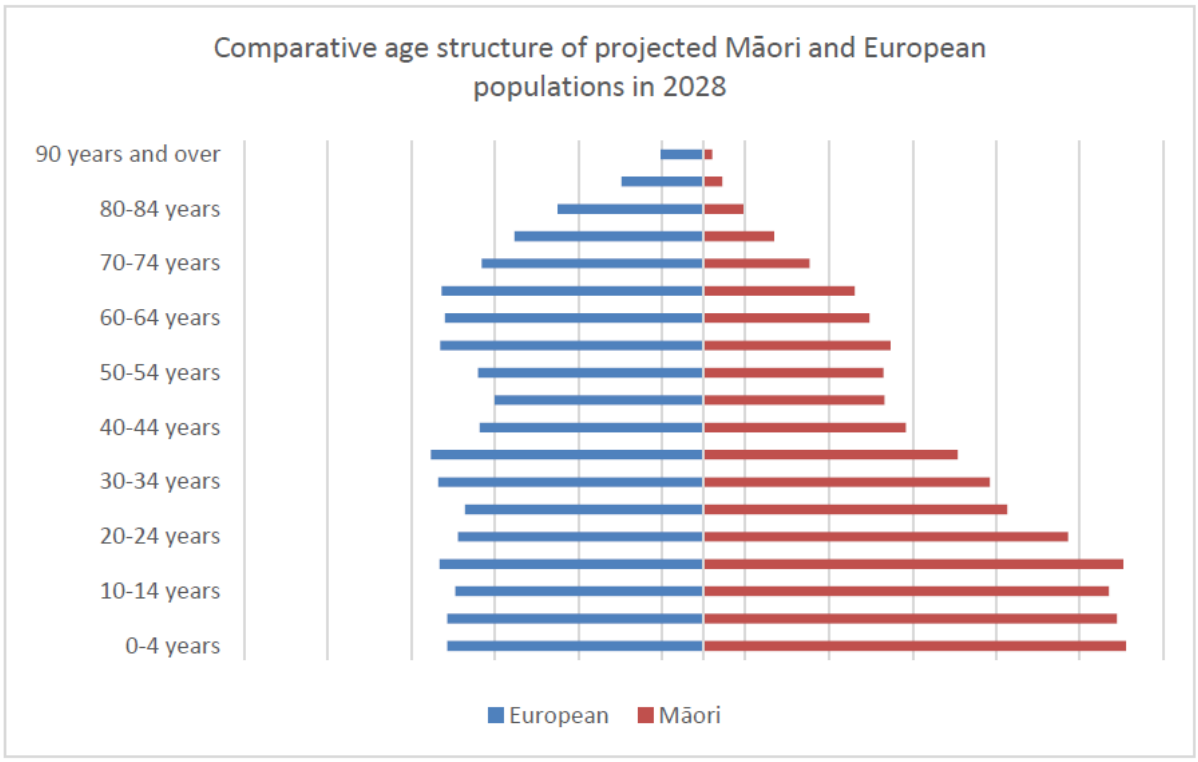
- Are the flows/services involved of significant size and/or value?
- Does the expenditure impact on areas that are within an outcome domain of interest and relevance to Māori?
- Can a reasonably clear causal linkage be identified that shows census data are used to shape that set of expenditure/service delivery?

The approach taken reflects the constraints discussed above, but is necessarily subject to a wide range of uncertainty. As such, it is also deliberately intended as a conservative estimate, with final benefits likely to well exceed the estimates in the report, both in specific areas and because of the multitude of potential benefit areas that have simply not been addressed. Time constraints also mean a relatively pragmatic approach has been used for data collection. The report relies on publicly available data, which does not always fully align in terms of definitions or time periods, although as much care as possible has been taken to align and make overall estimation robust.

Detailed administrative and population data are used where available, often providing a clear picture of relevant populations including that of Māori and iwi data. In addition, two broader contextual features are relevant and help inform possible priority areas for Māori and iwi:

1. Māori have a much younger population profile, with higher fertility and lower life expectancy than for non-Māori (see for instance figure 1 below).
2. Māori are more geographically mobile, as indicated by the following conclusion in the Motu 2015 working paper (Sin & Stillman, 2015): “we find that Māori are more mobile on average than similar Europeans”.

Figure 1



Source: Stats NZ

Benefits from major government service and operational funding, including policy design

Outline summary

Table 2 below sets out the major areas of New Zealand Government expenditure in 2019/20. It then breaks some expenditure areas down into more distinct service flows and uses various population and administrative data sources to identify the Māori proportion of the populations served by that funding stream. This is then compared with the relevant population share for Māori and non-Māori to produce the relative share. This is the extent to which Māori are more intensely impacted by that service/funding area (where the ratio is greater than 100 percent) or less. For example, with NZ Super the lower proportion of Māori in the over-65 population produces a relative share of 57 percent. In later sections these proportions are used to allocate the proportion of any benefits that flow from census data use in that area between Māori and non-Māori.

Outcome domains and indicators are taken from the TPK Whānau Ora framework, with the final columns indicating, at a relatively high level, the extent to which census data are used to shape services and funding levels. This serves to provide a quick overview of possible priority areas to investigate further for large benefits; this work follows in subsequent sections.

Table 2

Government spending and connections to high-value Māori outcomes

	Spending	Connection to high-value outcomes for Māori					Reliance/use of census data
Functional area	**Forecast, year ending 30 June 2020 $m**	**Proportion of Māori identified in serviced population**	**Proportion of Māori in total relevant population**	**Relative share**	**Relevant outcome domain and indicator, Whānau Ora framework**	**Indicator**	**Census connection for Māori**
Social security and welfare	30,915				Whānau are economically secure		Used for forecasting, and specific service provision
NZ Super	15488	6%	10%	57%	Whānau are economically secure	Adequate income	Low – uses admin data
Jobseeker and emergency benefits	1976	39%	13%	288%	Whānau are economically secure	Income and employment	Low – uses admin data
Supported living	1589	26%	13%	191%	Whānau are economically secure	Adequate income	Low – uses admin data
Sole parent support	1175	48%	13%	354%	Whānau are economically secure	Adequate income	Low – uses admin data
Tax credits	2731				Whānau are economically secure	Adequate income	Low – uses admin data
Accommodation assistance	1810		13%		Whānau are economically secure	Adequate income	Low – uses admin data
Income-related rents	1093		13%		Whānau are economically secure	Adequate income	Low – uses admin data
Oranga Tamariki	1144	68%	25%	275%	Whānau are cohesive, resilient, and nurturing	Children in state care	Medium – immediate needs driven by admin data but used for service provision and forecasting
Health	19,198				Whānau are living healthy lifestyles		High – used in funding allocations and forecasting, and in service and intervention design
Payments to DHBs	15424	14%	15%	89%	Whānau are living healthy lifestyles		High – used in funding allocations and forecasting, and in service and intervention design
National disability support services	1345	18%	15%	114%	Whānau are living healthy lifestyles		High – used in funding allocations and forecasting, and in service and intervention design
Public health services	440		15%		Whānau are living healthy lifestyles		High – used in funding allocations and forecasting, and in service and intervention design

Education	14,919							
Early childhood education		2037	24%	27%	89%	Whānau are participating in te ao Māori	Te reo, participation in MME	Medium – used to set reporting frame and inform policy/intervention and Māori-medium education (MME)
Primary and secondary schools		6796				Whānau are participating in te ao Māori	Te reo, participation in MME	Medium – used for funding, to set reporting frame and inform policy/intervention and MME
Tertiary funding		4589	15%		189%	Whānau are participating in society	Participation in MME	Medium – used to set reporting frame and inform policy/intervention and Māori-medium work
Core government services	5,608							Low – but some use for forecasting and intervention response design/delivery
Law and order	4,890							Low – but some use for forecasting and intervention response design/delivery
Police		1,883						
Family violence offenders			53%	14%	377%			Low – but some use for forecasting and intervention response design/delivery
Ministry of Justice		573				Whānau are cohesive, resilient, and nurturing, Whānau are participating in society	Treaty settlements	Medium – some use for Treaty settlement and Crown relations, forecasting and intervention response design/delivery
Department of Corrections		1,521	51%	12%	426%	Whānau are cohesive, resilient, and nurturing	Incarceration rates	Low – but some use for forecasting and intervention response design/delivery
Transport and communications	3,103							Limited
Economic and industrial services	4,328							Low – but used for specific policy areas, analysis and intervention design
Defence	2,541							Limited
Heritage, culture and recreation	996							Limited
Primary services	1,036							Limited

Housing and community development	897						Low – but some use for forecasting and intervention response design/delivery
Environmental protection	1,281				Whānau are stewards of the living and natural environment		Limited
Emissions Trading Scheme	566						
Total core Crown expenses excluding losses	93,262						
Electoral					Whānau are participating in society	Electoral participation	High – used in setting electoral boundaries

Education

Significance for Māori outcomes

Education provides outcomes of high significance to Māori, providing a major platform for participation in society and providing economic security and personal wellbeing. The education system also provides specific opportunities for learning te reo and participation in Māori-medium education (MME).

Population demographics indicate that Māori by ethnicity form 25 percent of the population under 20 years, above the overall population share of 15 percent.

Historically, participation in pre-school education by Māori has been below overall average rates, as has achievement through the compulsory schooling system. Participation in tertiary education is above average, although dominated by lower-level courses.

Resourcing flows affected by use of census data

While most direct resourcing flows are driven by administrative roll data, education forecasting, for both operational and capital spending uses census population data and location information. These overall population data help provide the frame for reporting against population proportions, for example, for participation in early childhood education. While schools do collect iwi data for children, this dataset is heavily influenced by varying quality across schools and often has limited iwi and Māori descent information. While indicative, it is of lower quality and comprehensiveness than census data.

The majority of education funding is on a per student basis, adjusted most significantly by school size. Some operational funding has been allocated based on deciles, Targeted Funding for Educational Achievement, the Special Education Grant, and the Careers Information Grant (totalling around $170 million in 2017 or about 11 percent of all operational funding).

Note: Currently deciles are determined using five core sets of information, only one of which is directly census-based. However, the information is connected through the census and compiled on the basis of census-determined meshblocks. The proposed (not yet finalised) equity funding seems likely to continue a census connection, although using a much wider indicator set (including ethnicity) for which data are linked through census and the IDI.

Funding and operating effective MME and recruiting Māori language teachers rely on good forecasts of Māori numbers coupled with location and te reo competency information.

In addition, the Ministry of Education allocates a range of other smaller funding streams, which are also determined by a school's decile. These include Kura Kaupapa Māori transport, Priority Teacher Supply Allowance, National Relocation Grant, Decile Discretionary Funding for Principals, Resource Teachers of Learning and Behaviour (RTLBs) Learning Support Funding, RTLBs for years 11 to 13, School Property Financial Assistance scheme, Study Support Centres, and District Truancy Service.

Impacts and value of census data for Māori

Understanding participation and achievement for Māori is of very high value, helping shape the design of policy and any initiatives to bring positive change, for example, higher participation in early childhood education or better attainment through schooling.

While census data are important in anchoring the overall reporting frame (for example, the percentage of Māori participating in early childhood education), and providing some additional insights, they will be a small input into the policy design and delivery response that brings change, and as such are hard to value.

A very partial indication of this value created is illustrated below, using some approximations based on available data.

Example: Value of increased educational achievement for Māori

> 2017 educational achievement data show that 76 percent of Māori students achieved NCEA L2 or above compared with a European student rate of 88 percent, although this gap has been reducing at around two percentage points a year for the most recent two to three years.
>
> Using CBAX impact values for a close approximation (no qualification to L3) indicates a gain worth $616/year per person. Applying this value to the two percentage point catch-up (an additional 216 students) produces an overall net present value gain, assuming a 40 year working life, and a 6 percent discount rate, of around $2 million for each year the catch-up continues or about $10 million NPV if the gap were closed steadily in the following six years. (Note the CBAX impact value is deliberately set at only some 25 percent of the possible income gain to conservatively allow for displacement impacts and opportunity costs.)
>
> What proportion of this gain can be attributed to the census? It has helped highlight the issue and provide good metrics for measurement, but most of the gain will have been delivered through whatever new policies and resources were mobilised. But if 5 percent could be attributed to census information, this alone would provide a net present value benefit of $0.5 million for the census.

Another very specific area of high-value use of census data is in understanding the potential pool (size, location, and competency) of te reo speakers as demand for Māori language teachers increases. Census data inform choices about the speed of scaling up that are feasible and options for training.

Health

Significance for Māori outcomes

Good health is a very significant area of wellbeing and a crucial component to other aspects of participation and activity, feeding into multiple outcome domains.

Māori have higher rates than non-Māori for many health conditions and chronic diseases, including cancer, diabetes, cardiovascular disease, and asthma. Māori also experience higher disability rates. Consequently, health outcomes for Māori are generally below those for other New Zealanders (although at times similar to those of Pacific Island ethnicity), and often, reported satisfaction with engagement in the health system is lower (Health Quality and Safety Commission NZ, 2018).

Perhaps one summary statistic is life expectancy. Based on death rates in New Zealand in 2012–14, overall life expectancy at birth was 83.2 years for females and 79.5 years for males. This compares with 77.1 years and 73 years for Māori females and males, and 83.9 years and 80.3 for non-Māori respectively. Overall life expectancy had increased by 1 year for females and 1.5 years for males

since 2005–07, and the gap between Māori and non-Māori at birth had reduced to 7.1 years, down from 8.2 years in 2005–07 (Stats NZ, 2015).

Resourcing flows affected by use of census data

The health system has multiple funding streams, often with quite specific access rules and funding formulae. However, at a high level, two main funding mechanisms can be distinguished:

1. **Overall district health board (DHB) funding**, $15.4 billion in 2019/20 (covering among other items, primary and hospital care).
   This is dominated by funds allocated by the Population Based Funding Formula (PBFF), which allocates $13.4 billion (in 2019/20) amongst the DHBs. This formula is heavily based on census data for detailed population numbers broken into areas and age bands, ethnicity, a deprivation index (NZDep2013, a small-area-based index providing a measure of neighbourhood deprivation based on nine socioeconomic variables from the 2013 Census) and then a variety of cost weightings (derived from service cost data).
2. **DHB allocations of funding**, particularly payments to Primary Health Organisations (PHOs). Many of these payment flows are driven by hospital service information and PHO enrolment data, and in a number of cases include significant payment differentials based on Māori ethnicity (and often Pacific). At this level, census-related data are generally not directly relevant but may be used to help shape some service delivery options, particularly in the community for public health and primary care. These systems, where sometimes payments have a rate determined by ethnicity, rely directly on administrative data.

Impacts and value of census data for Māori

Census data are used extensively, and this use can be categorised at three levels:

1. **Priority setting and policy targeting**
   A reliable overall population count of all individuals joining location, ethnicity, and household characteristics, which then enables further linking through the IDI, provides the platform that enables an overall view of health outcomes connected to household level data. An example of this is the Ministry of Health's Tatau Kahukura (2015), a compendium of Māori indicators that is "designed as a tool for all parts of the health sector and the results highlight the areas we need to focus efforts in order to improve the health of Māori and reduce Māori health inequalities". Given the strong connection between several key socio-economic factors and health outcomes (which often themselves have a strong correlation with Māori ethnicity), the census ensures that overall priority outcomes can be reliably identified, as the population frame is complete when contrasted with the next best alternative, DHB enrolment populations (discussed further below). Policy can also then be designed to target key causal factors more precisely, for example, policy about smoking cessation including estimating impacts of the tax on tobacco.
2. **The level of funding**
   Funding is shaped by the policy and analytical work that identifies linkages and causal factors, including various census-based elements. These can heavily influence the size of funding allocations and rates of payment.
3. **Service design and delivery**
   Increasingly, where services are expected/intended to service a predominantly Māori group, they are being developed in conjunction with Māori. While some of the relevant information will be driven by HSU and DHB enrolment data, the detailed census material on Māori is used to help inform design choices.

1: Priority setting and policy targeting

Census population data provide the authoritative frame for health reporting, providing a more accurate overall population count. Table 3 highlights the accuracy of the next best alternative, DHB enrolments, when compared with the census. Of significance is the level of undercount for Māori, which has been a consistent finding over several years.

Table 3

PHO enrolment rate by DHB and ethnicity in third quarter 2013, using estimated resident population as the denominator (the 'standard method')					
DHB	**Māori**	**Pacific**	**Asian**	**NZ European & others**	**Overall**
Auckland	79%	115%	71%	102%	93%
Bay of Plenty	93%	93%	93%	99%	97%
Canterbury	80%	96%	74%	99%	95%
Capital & Coast	86%	99%	79%	96%	93%
Counties Manukau	89%	111%	77%	105%	97%
Hawke's Bay	92%	96%	90%	99%	97%
Hutt	85%	94%	98%	100%	97%
Lakes	100%	90%	73%	102%	100%
MidCentral	85%	94%	76%	96%	93%
Nelson Marlborough	87%	93%	97%	99%	98%
Northland	104%	83%	93%	102%	102%
South Canterbury	77%	104%	115%	101%	99%
Southern	79%	99%	68%	95%	92%
Tairāwhiti	100%	93%	81%	98%	98%
Taranaki	87%	84%	76%	100%	97%
Waikato	94%	100%	75%	100%	97%
Wairarapa	103%	105%	96%	103%	103%
Waitemata	79%	100%	76%	101%	94%
West Coast	91%	102%	115%	96%	96%
Whanganui	87%	108%	73%	100%	96%
New Zealand	**89%**	**106%**	**76%**	**100%**	**96%**

Source: Table 2 from Chan et al (2015)

At one level, this means some 94,000 Māori are missing from DHB rolls, so are missing out on PHO services. Average per capita funding for them (an average of around $3,000 per annum) would be missed by the DHB that covers their locality if funding was solely based on DHB rolls. Considered

from this viewpoint, the census more fairly allocates funds across all people, and especially Māori, since the proportional undercount is much greater than for New Zealand European and others, and Pacific. But the roll count difference doesn't affect overall funding levels since most DHB funding is based on shares of a politically determined overall health funding pool.

An area of active research within the health community is the extent to which the enrolment gap (DHB vs census) affects actual health service delivery. The core issue here is the evidence that health service utilisation (HSU) data indicate that actual use of health services aligns very well with DHB enrolment data, from an ethnicity perspective (see Chan et al, 2015). This does not however resolve the issue of potential loss of access by those not enrolled, as exposed by census data, nor provide the more detailed understanding of related individual and household characteristics provided by census/census links.

Valuing the benefits of better policy and targeting is difficult. Multiple elements are combined in policy design and then these are coupled with new or changed resourcing to deliver a new/revised service. But better policy design and delivery continue to contribute to improved overall health outcomes for New Zealanders (at least as evidenced by life expectancy), and of particular relevance for this report, the improved relative life expectancy for Māori.

Life expectancy data indicate that for Māori over the last 10 years an additional one year has been added, over and above the increase gained by the overall population. This reflects a wide set of changes and programmes, designed in response to data about outcomes and the characteristics that are associated with those outcomes, using census and health system data combined with research and international evidence. As such, it is not possible to provide a precise estimate of the contribution solely from census data, but some estimates provide an indication of possible impacts.

In 2015, Stats NZ provided updated life tables (Stats NZ, 2015). These indicate that the gap between Māori and non-Māori life expectancy at birth had narrowed to 7.1 years, compared with 8.2 years in 2005–07, 8.5 years in 2000–02, and 9.1 years in 1995–97. The value gain from these increased life years can be assessed using available data from CBAX for the value of a life, in turn derived from the New Zealand Transport Agency's analysis (NZTA, 2016). Using a very average set of calculations, the value gain arises from an additional one-tenth of a year of life at birth for Māori who have an average life expectancy of around 75 years. Using an average for annual Māori births of about 16,000 and an annual gain of 1/10th $\times$ 1/75th of a life, delivers an annual benefit of $100 million. At a 6 percent discount rate this provides a net present value benefit of around $1.6 billion. Attributing a benefit from the use of census-related data, over and above the benefits from administrative data, of between 1 and 3 percent seems not implausible. This would provide a benefit to Māori of $16 million to $48 million.

2: Impacts on major funding allocations and flows

In our 2013 valuation of the census, an estimate is provided of the benefit from the improved allocation of funds from use of the census. This estimates benefits, for all New Zealanders, using a simplified welfare calculation (based on Her Majesty's Treasury (HMT) approaches). The approach uses a consumer welfare function based on diminishing marginal utility, that is, extra dollars (used for health services) deliver diminishing benefit as expenditure rises. The welfare function used is borrowed from the HMT approach and has no specific validation for New Zealand settings, so the results should be seen as indicative, but provide a plausible picture of some DHBs winning and others losing from the funding reallocations. Assuming that losers are compensated by winners, and that losses are valued more highly, produces an overall value gain for more accurate funding. Leaving the basic calculation methodology unchanged but updating for the increased DHB funding in 2019/20, and a discount rate of 6 percent, provides a central estimate NPV gain of $250 million, for

the whole population. The Māori share of this (using a simplifying equal share assumption) provides an NPV benefit of $38 million.

3: Service design and delivery

More detailed analysis of the impact of census on service design and delivery will form the major part of later stages of this review. However, at this stage it is worth noting there is a range of health service options, some of which are contracted to / delivered by Māori health service providers, and an expectation this will continue to grow in coming years.

There is evidence that key aspects of wellbeing for whānau and iwi are still not well achieved, demonstrated for instance in the survey about experiences of care below. Understanding where Māori live, and some related individual and household circumstances, as contributed by census data, can assist work aimed at improving system experiences for Māori.

Table 4

Number of questions about experiences of care where Māori, Pacific, Asian, and other ethnic groups' responses were significantly different from those of the European group, 2017		
Ethnic group	**More positive**	**Less positive**
Asian	0/20	5/20
Māori	0/20	8/20
Other	0/20	5/20
Pacific peoples	1/20	5/20

Source: Primary care patient experience survey; Table 3 of HQSC 2018

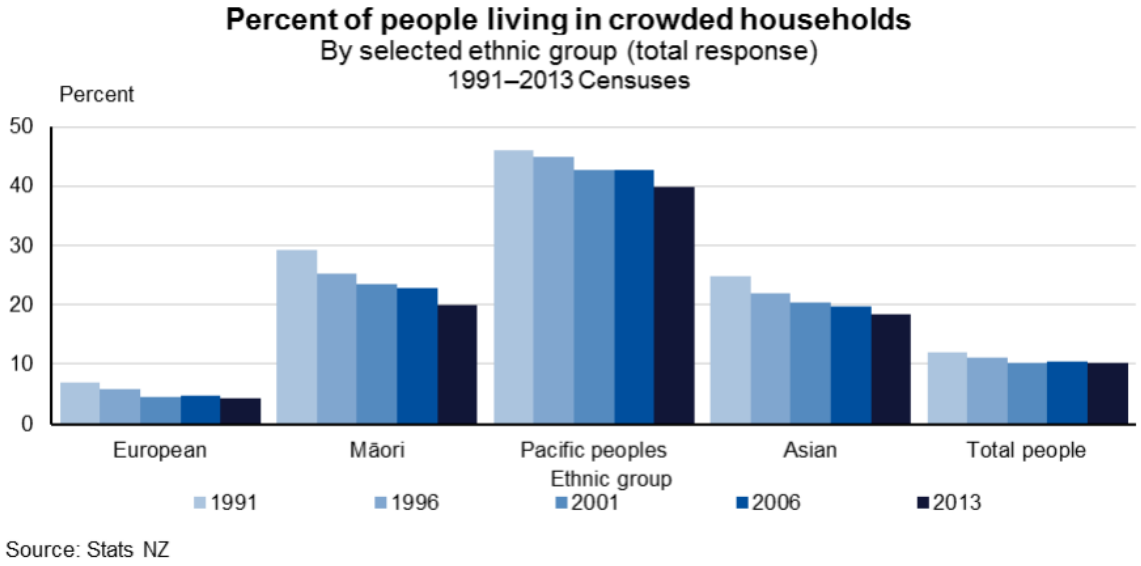
Housing and urban development

Significance for Māori outcomes

Good housing affects multiple outcomes, and poor housing is often associated with a variety of factors that indicate poor wellbeing. Positive housing outcomes fit clearly within the Whānau Ora domain of "whānau are stewards of the living and natural environment". Suggested indicators for this include whether housing meets whānau needs and the ability to access papakāinga housing.

Research in New Zealand and overseas links higher rates of infectious diseases, such as meningococcal disease and rheumatic fever, with household crowding. The impact of household crowding was greater for Māori and Pacific peoples than for other ethnicities. Baker et al (2013) estimates crowding accounted for an estimated 790 hospitalisations a year (17 percent of admissions for Māori), and 692 admissions a year for Pacific people (25 percent), on average for 2007–11. This research found that Māori and Pacific children had higher rates of meningococcal disease, with their increased exposure to household crowding contributing to these high rates.

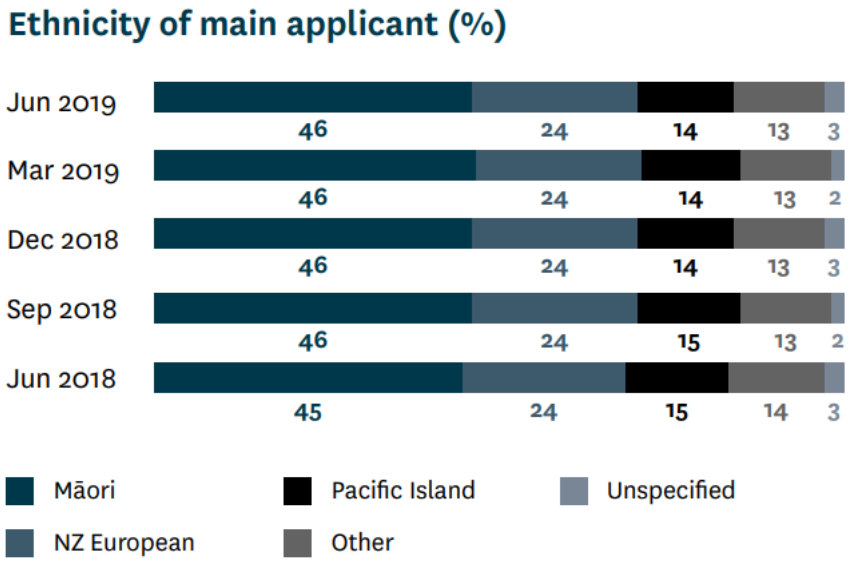
Figure 2



Source: Stats NZ

Another indicator of housing stress is available from the Housing Register, which captures the housing requirements of people who have applied for public housing through the Ministry of Social Development. The Ministry of Housing and Urban Development's (HUD's) *Public housing quarterly report* of June 2019 shows the following ethnic distribution of those on the register (totalling 12,311 people).

Figure 3



Source: *Public housing quarterly report*, June 2019

HUD works with central and local government agencies, the housing sector, and communities across New Zealand to improve housing affordability and supply, ensure tenants live in warm, dry, healthy, and safe rental housing, and improve housing quality and choices for Māori and their whānau. While

its work provides housing help for all affected New Zealanders (including Māori) it also has a specific strategy for Māori housing, He Whare Āhuru He Oranga Tāngata which has two major outcomes:

- improving housing for Māori and their whānau
- increasing housing choices for Māori by growing the Māori housing sector.

Resourcing flows affected by use of census data

Most direct housing-related expenditure flows are primarily driven by administrative or contractual data. Census and related data do, though, provide data of significant value for:

- understanding the overall level of housing issues such as overcrowding, and enabling forecasting future patterns of potential demand
- providing an ability to identify associated elements, such as location, ethnicity, and other individual and household characteristics, and contributing to the design of policies that more effectively respond to the needs
- enabling specific policy design and delivery in conjunction with iwi providers.

Impacts and value of census data for Māori

While census data do provide value for understanding housing needs and associated factors, this report does not attempt to measure these. Phase 2 will explore the more detailed benefits from the use of data in the design and implementation for instance of He Whare Āhuru He Oranga Tāngata.

Ministry of Social Development (MSD)

Significance for Māori outcomes

Ensuring that whānau are economically secure is a crucial outcome area, achieved by the payments and support provided through MSD. As indicated in table 2, Māori are significantly over-represented in those receiving Jobseeker and emergency benefits (39 percent of the recipient population), supported living payments (26 percent), and sole parent support (48 percent) as against an approximate 13 percent relevant population share.

MSD also has responsibility to deliver not just to individuals, some who may identify as having Māori ethnicity, but to communities and organisations some of which may be identified as representing Māori, such as iwi or pan-Māori organisations (funding community level initiatives).

Resourcing flows affected by use of census data

Most direct social welfare expenditure is driven by administrative data, that is, those enrolled and qualifying for the benefit. Census and related data do provide data of significant value for other flows and areas:

- contributing to the design and delivery of funding for improved employment and social outcomes support ($765 million in 2019/20)
- contributing to the design and delivery of community support ($245 million of MSD and NGO funding combined)
- improving policy design and forecasting ($38 million).

Some very specific local initiatives involve direct iwi-based linkages and may be informed by census data but these have not been explored in this stage.

Impacts and value of census data for Māori

As set out in the census valuation (Bakker, 2013), census data are a crucial component in MSD's tasks in forecasting and policy design. In that report, a central value for this was estimated at 10 percent of the spending on policy analysis. Based on current spending this would be $3.8 million per annum delivered to all citizens. If it is assumed that benefits from this accrue in relation to the beneficiary population, then the value for Māori is 36 percent of that value, or $1.4 million per annum.

This report identifies additional value derived from better design and delivery of two other funding streams, providing employment, social outcomes, and community support. Census data would form an input into this work but would be combined more intensively with local and other administrative data to deliver final funding designs, so a lower impact seems reasonable. While no precise valuation can be identified, a conservative assumption is that good data from census contributes a 1-percent improvement overall. This would deliver a total annual benefit of $10 million, or $3.7 million based on the share of Māori in the beneficiary group.

Oranga Tamariki

Significance for Māori outcomes

Ensuring that whānau are cohesive, resilient, and nurturing is an important outcome area, in particular reducing the number of tamariki in state care who are Māori. The latest data available (to 31 March 2019) show that 6,570 tamariki are in the custody of the Chief Executive, with 170 relating to youth justice, some 68 percent (59 percent Māori and 9 percent Māori and Pacific) of the total in state care are identified as Māori , where the number and percentage share have been gradually increasing over the last five years.

Section 7AA of the Oranga Tamariki Act 1989 places specific responsibilities on Oranga Tamariki to recognise and provide practical commitment to the principles of the Treaty of Waitangi, including requirements to reduce disparities by setting measurable outcomes for Māori children who come into contact with the department and, inter alia, that the department develops strategic partnerships with iwi and Māori organisations, including iwi authorities.

Resourcing flows affected by use of census data

Entitlement for those enrolled and qualifying for a payment is driven by administrative data. Census and related data do though provide data of significant value for other flows and areas:

- contributing to the design and delivery of funding for statutory intervention and transition ($855 million in 2019/20)
- contributing to the design and delivery of measures that assist prevention and provide early intervention opportunities ($277 million)
- improving policy design and forecasting ($17 million) using data and analytics and evidence to better inform government decision-making on vulnerable children and young people. This covers a variety of areas, for example, recent work on estimating demand for the Youth Court used census regional demographic data.

Increasingly, as required by its legislation, Oranga Tamariki is working much more closely with whānau, hapū, and iwi in managing children in care and in designing arrangements. This work uses census data, for instance, in identifying numbers of iwi within specific geographic areas together with data on household characteristics.

Impacts and value of census data for Māori

Using the policy advice valuation process as set out above for MSD but using the value of Oranga Tamariki's spending, provides an annual benefit of $1.7 million per annum delivered to all citizens. If it is assumed that benefits from this accrue in relation to the children in care, with a 10-year life, then the value for Māori is 62 percent of that value, or $1.2 million per annum.

This report identifies additional value derived from better design and delivery of two other funding streams – statutory intervention and the design and delivery of measures that assist prevention and provide early intervention. Census data forms an input into this work but would be combined more intensively with local and other administrative data to deliver final funding designs, so a lower impact seems reasonable. While no precise valuation can be identified, a conservative assumption is that good data from census contributes a 1 percent improvement overall. This would deliver a total annual benefit of $11 million, or $8 million based on the share of Māori children in care.

Phase 2 will look more closely at the initiatives and programmes underway. It should also include consideration of some other specific programmes including those provided within schools (funded by Oranga Tamariki and delivered by NGO providers) including:

- Social Workers in Schools (available to most decile 1–3 schools)
- Youth Workers in Secondary Schools (available in 27 decile 1–3 schools)
- Multi-Agency Support Services in Secondary Schools (available in 21 decile 1–3 schools).

Te Puni Kōkiri

Significance for Māori outcomes

Te Puni Kōkiri (TPK) works within government and communities to support Māori collective success so its work spans broadly across almost all outcome areas, generally as an influencer rather than primary service provider. As such, its role includes providing a clear frame of reference for measuring current wellbeing and trends over time, helping influence and design programmes and policies that promote Māori success, as well as some direct funding responsibility for te reo and culture promotion and Whānau Ora.

Resourcing flows affected by use of census data

In a number of areas, census data are used to inform analysis, funding, and policy work. While at times reliance can be placed on regional and or information from on-the-ground presence, census was used due to the weakness of other data on iwi, which were seen as hard to get due to privacy and administrative issues, as well as having variable coverage and accuracy as it was collected for a different purpose. The census was seen as the only place that provided a whole view of the Māori population with iwi information and related household information. Iwi-based, and regional, data were seen as crucial for many applications and users. It is also the primary reliable overall source for information on the state of the language. Te Kupenga data are also particularly relevant.

Census data can form the frame for reporting and the baseline information for new programmes and initiatives, and Te Kupenga the specific source for several key data, for example, te reo use.

The funding flows most directly impacted by use of census information are:

- Language promotion ($107 million in 2019/20). For this report, a 5 percent benefit from use of census data in this area has been assumed.

- Regional engagement ($40 million). For this report, a 5 percent benefit from use of census data in this area has been assumed.
- Practical assistance and resources to whānau and Māori housing providers ($38 million). For this report, a 5 percent benefit from use of census data in this area has been assumed.
- Māori development through community investments ($27 million). A 5 percent benefit from use of census data in this area has been assumed.
- Promotion of Māori economic development ($12 million). A 5 percent benefit from use of census data in this area has been assumed.
- Supporting wellbeing of Māori ($8 million). For this report, a 5 percent benefit from use of census data in this area has been assumed.
- Policy advice ($18 million) plus spending on monitoring and evaluating Whānau Ora ($10 million). A 10 percent benefit from use of census data in this area has been used to reflect the significant impact of the work in this area for Māori.

Impacts and value of census data for Māori

All benefits from work by TPK are assumed to be delivered for iwi/Māori. Using the assumptions above (necessarily approximate given the lack of any near comparators) provides the following annual benefits from better outcomes achieved through use of census data.

Table 5

Benefits to Māori from TPK's use of census data			
	2019/20 spend		**Annual benefit $m**
	$m	**Census impact**	
Policy advice	18	10%	1.8
Language promotion	107	5%	5
Regional engagement	40	5%	2
Assistance to Māori housing providers	38	5%	2
Community investments	27	5%	1.4
Promoting economic development	12	5%	0.6
Supporting wellbeing of Māori	8	5%	0.4
Purchasing and achieving Whānau Ora outcomes	91	5%	4.6
Implementing and evaluating the Whānau Ora approach	10	10%	1
Total			19

Other areas

Policy advice by all other agencies

The 2013 Bakker report used a 2011 Treasury review, which estimated that in 2009/10 some $888 million was spent on policy advice by the New Zealand Government. It recognised that while good policy advice requires a combination of factors for effectiveness, good data is a significant contributor. While there is no single measure of the contribution of census data, its use is

widespread and goes well beyond the highlighted examples set out above. A very conservative impact estimate, that the availability of census data lifted the value of this advice by 1 percent, would support an annual benefit of $8 million per annum (using an inflated spend and deductions for the specific policy spending separately included above). This benefit is for all citizens so would be shared by Māori on a population share (15 percent), a benefit of $1.3 million per annum.

Te Arawhiti uses iwi affiliation data for several reasons, including to build understanding of the groups it is negotiating with or to create regional profiles to help the public sector with information on iwi. More specifically, the size of iwi groups and their populations are secondary factors that the Crown considers when developing its Treaty settlement quantum offers. Census data are considered alongside any beneficiary registers or other information groups provide to the Crown to support this part of their settlement package.

Benefits from capital investment

Population projections derived from census data are used widely to forecast demands for capital investment by many government agencies (for example, new schools) and other long-term infrastructure investors, such as local government and NZTA, Transpower, and water and electrical utilities.

For simplicity and efficiency, rather than redo the work in the 2013 census valuation (Bakker, 2013), the results are effectively carried through in this report, with expected capital spending simply inflated by a common inflator and the discount rate adjusted to the current rate.

It is worth briefly restating the rationale for a benefit from census data: essentially a reduction in the accuracy of population data will affect the accuracy of longer-term investments. In some cases, pressure points will emerge that mean urgent and more costly fixes are required. In other cases, assets may be underused. Estimating these impacts precisely requires very complex and detailed analysis, so a simplifying approach has been adopted that uses a range of accuracy estimates and impacts.

Accuracy effects are measured in terms of how much investment in a given year might be affected by the non-availability of census data, for example, investment that was built ahead of time or in the wrong place. To estimate costs, accuracy impacts of between 1 and 5 percent were used. The cost of mis-investment is based on these assets not returning their cost of capital.

One further step is then required for this report – allocation of only the proportion of those benefits that accrue to Māori. Table 6 sets out the updated results (for further details see the Capital Investment section of *Valuing the census* (Bakker, 2013)).

Table 6

Benefits to Māori from improved investment planning			
	NPV $m benefit from census Central estimate	**Māori share**	**Value for Māori**
Infrastructure providers	259	15%	40
Local government infrastructure	301	15%	46
Aged care	173	10%	17
Total			**103**

Other benefits for statistical and research purposes

The 2013 census valuation identified benefits arising from use of the census for market research companies and other companies that commercially provide analysis using census derived data. It also provided a benefit estimate to Stats NZ from having the census as a reference point that allowed more accurate (and smaller) frame setting/sample size determination.

The results from that study are set out below, updated for inflation and the 6 percent discount rate. Benefits are uniformly attributed to Māori on an overall population share of 15 percent.

Table 7

Benefits from improved research and statistical frame setting			
	NPV $m benefit from census, central estimate	**Māori share**	**Value for Māori**
Census-based analysis	37	15%	6
Market research	80	15%	12
Stats NZ frame setting	117	15%	18

Electoral representation

The number of Māori electorates and their population quota are calculated using the electoral Māori descent census usually resident population count from the census and the results of the Māori Electoral Option. The calculation of the Māori electoral population (as defined in the Electoral Act 1993) requires data on the number of Māori – by descent – ordinarily resident in New Zealand. Information on the number of Māori by descent in New Zealand, including by age group, is currently only derived from the census. The size of the Māori roll contributes to determining the number of Māori seats in Parliament, an outcome that is currently quite sensitive to the final determined populations and roll choice.

The Māori wellbeing outcomes framework includes an outcome of whānau self-managing and empowering leaders, including as an indicator under the Treaty lens the percentage of local and central government representatives who are Māori.

Māori having a specific option to select representatives is a value recognised in statute, and one chosen by just over half of Māori on electoral rolls. As detailed in figure 4 there are ongoing changes in the exercise of choice over which roll to enrol on, with a slight flow from the Māori roll to the

general roll in the last option period (ended 2 August 2018) ending with 52.4 percent of Māori enrolled on the Māori roll compared with 52.8 percent at the start of the option period.

Figure 4

CHANGES TO ELECTORAL ROLL TYPE		NEW ENROLMENTS OF MĀORI DESCENT		IMPACT ON ROLLS		TOTAL ROLLS AT END OF OPTION	
Māori Roll to General Roll (A)	General Roll to Māori Roll (B)	General Roll (C)	Māori Roll (D)	Net Impact on Māori Roll +/(-) (E)	Net Impact on General Roll +/(-) (F)	Māori on Māori Roll	Māori on General Roll
10,163	7,956	1,808	3,407	1,200	4,015	247,494 (52%)	224,755 (48%)

Column E = B-A+D

Column F = A-B+C

Source: Electoral Commission, 2018

Providing a value for the specific benefit of Māori electorates poses challenges at several levels. Not least is identifying a robust valuation mechanism, but this is further complicated by:

- the mixed set of choices exercised by Māori on whether or not to use the Māori roll; this choice though could be substantive or in part tactical
- the presence of many MPs with identified Māori descent, 29 in the current Parliament (Koit, 2017), far more than the seven Māori seats
- the benefit perceived by some from having a focused voice based on Māori kaupapa.

Given these challenges, this report follows the general approach used in the 2013 census valuation. A lower limit on value could be assessed from the amounts spent by the Electoral Commission administering parliamentary elections and referenda and providing services relating to the maintenance of electoral rolls ($46 million in 2019/20). The census is an important but partial contributor to a fair outcome, so assessing a benefit in the 5–10 percent of the amounts spent each year maintaining rolls and reviewing arrangements does not seem unreasonable, and for Māori an estimate at the higher end seems appropriate given the added complexity and significance of the Māori electoral rolls. This produces an annual benefit of $46 million times the proportion of Māori on electoral rolls as a share of the entire roll times 10 percent, or $8 million.

Wider and less-quantifiable benefits

This report has identified a few key areas of census data use that are reasonably amenable to some form of quantification, involving 23 identified benefits from use within five specified government agencies and seven broad groups of organisations (public and private sector).

Time and resource constraints mean these benefits are not comprehensive valuations of all census data use by those organisations and also do not include possible benefits from many other agencies' use of census data. Examples of this are Police and Corrections, which involve significantly higher engagement and involvement of Māori and impact heavily on important wellbeing domains, where spending is dominated by internal datasets but overall resource estimates and some design of interventions may be based on census data about iwi and related data.

Census data are widely used to provide a reporting frame for many agencies and organisations. As described in one consultation, the census provides visibility of what may otherwise be invisible. For instance, it allows visibility of the level of unserved primary health care by Māori. At the other end of the spectrum, a small example is that it provides the most overall reliable data on homelessness. These impacts are hard to value but will contribute to higher level decisions on the priority of areas for work and funding by government and agencies.

There are also census-based tools or datasets that have been developed and now have potentially wide sets of users. These include most significantly the IDI where census data form one of the key linkages across data, and link to detailed household characteristics that are not available in any other dataset. The IDI is used by a wide set of organisations for policy and research purposes. Other examples include TPK's interactive tool Te Whakahura a Kupe, which enables users to draw on census information for iwi and rohe, providing an evidence-base for allocating resources and managing assets, and meeting changing demands. The Ministry of Health has developed Tatau Kuhukura, based on census and health system data, designed as a tool for all parts of the health sector to focus efforts to improve the health of Māori.

Iwi are also directly increasing their use for census data and demand for specific, related data requests.

Some significant wellbeing domains, perhaps most notably those related to stewarding the living and natural environment, have not been specifically covered. Census data are an input to modelling work underlying the calculation of some climate change impacts on population areas, sustainable pathways for regional councils, and the ecological modelling used to estimate potential future environmental loads and impacts. Census data on iwi also contribute to a sense of autonomy and control, where iwi are provided with improved knowledge and understanding of iwi numbers and the demographic characteristics of their members.

Indirect uses are also widespread. Many economic models rely on robust demographic analysis for which the census provides the only comprehensive and reliable time series dataset. The difficulty and/or cost of identifying values on these means it is not cost-effective to develop further, but a consequence is that the overall value of the census to Māori can be expected to be significantly above the quantified benefits outlined in this report.

Summary

Table 8 summarises the benefits identified in the preceding sections. It is important to note these are gross benefits, the overall benefit resulting from the use of census data when compared with the next best source of data that would otherwise have been used. The estimates are presented as single net present values (NPVs) and should be seen as an estimate within a broad uncertainty range, often plus or minus 30–40 percent. They are intended as conservative estimates. Values are in 2019 dollars.

Table 8

Present value of quantified benefits, central estimate					
		Value from use of census data			
Area	**Impact/funding affected**	**Annual value ($m)**	**Benefit to Māori (%)**	**Annual benefit to Māori ($m)**	**NPV at 6% ($m)**
Education					
	Increased achievement, no qualifications to L3	0.1	100%	0.10	0.5
Health					
	Improved accuracy of DHB funding	22	15%	3.3	38
	Increased life expectancy	2	100%	2.0	33
Housing					
Law and order					
Social security and welfare					
MSD					
	Improved employment and social outcome support	7.7	36%	2.8	32
	Community support	2.5	36%	0.9	10
	Policy advice	3.8	36%	1.4	16
Oranga Tamariki					
	Statutory intervention and transition	8.6	68%	5.8	43
	Prevention and early intervention	2.8	68%	1.9	14
	Policy advice	1.7	68%	1.2	9
Te Puni Kōkiri					
	Policy advice including Whānau Ora monitoring		100%	6	32
	Promotion of Māori language and culture		100%	5.4	61

	Regional engagement		100%	2.0	23
	Assistance to Māori housing providers		100%	1.9	22
	Development through community investments		100%	1.4	15
	Promoting economic development		100%	0.6	7
	Supporting physical and mental wellbeing		100%	0.4	5
	Purchasing and achieving Whānau Ora outcomes		100%	4.6	52
Other policy advice			15%	1.3	15
Environmental protection					
Electoral commission					8
Investment planning					
	Infrastructure providers		15%		40
	Local government infrastructure		15%		46
	Aged care		10%		17
Statistics and research					
	Census-based analysis		15%		5
	Market research		15%		12
	Stats NZ frame setting		15%		18
Total					**572**

Grouped by their degree of rigour, these benefits can be broken down into the following.

Table 9

Benefits grouped by category		
Benefit group	**$m 2019 NPV**	**Proportion of total benefits**
Measured benefit	56	10
Assessed benefit	120	21
Proposed benefit	396	69

Costs of data collection

For this report, the costs used are based on a five-yearly pattern of costs that simplistically reflect the costs for the 2018 Census. These costs of $119 million in total over the five years were provided

by Stats NZ and represent a real increase of some 20 percent on costs used in the census valuation (Bakker, 2013). Costs were applied on a constant per-person basis to future years (using the 5-yearly pattern, and levels) but using the projected population from long-term population projections. As such, this represents a base case where future censuses are carried out in effectively the same way as the most recent census, at a similar overall cost. This approach provides a base costing for any proposed changes to census methods in the future. These costs can then be apportioned to Māori (after first deducting the specific Māori questions whose costs are all attributed to Māori) based on their overall population share of 15 percent. For this report another set of costs needs to be included, those related to the effort required by Stats NZ to analyse the specific three additional Māori population questions ($7.3 million), plus Te Kupenga costs ($5.9 million).

Another cost needs to be added, the cost of time spent by those who complete the census. This is estimated in table 10 from a national welfare perspective using data available as at completion of this report. Given the lack of more detailed data, it assumes a conservative approach assuming full form completion by the relevant population, which is clearly too high but the impact is not significant to overall estimates.

Table 10

Compliance costs				
	Time to complete in minutes	**Value of time $/hour in 2019**	**Population numbers as at 31/3/2018**	**Total cost ($m)**
Individual forms for those 15 years and over	9	11.94	3,922,550	6.2
Individual forms for those under 15 years	5	6.00	949,050	0.5
Overseas visitors				0.0
Dwelling and household forms	7	11.97	1,961,275	1.6
On-line efficiency saving (for 83%)	10%			
Total compliance cost				**8.7**

Note: Values have been taken from New Zealand Transport Agency, 2016, Table A4.1(A): Base values for time.

Total costs are summarised below, including both the cost to Stats NZ and those of respondents.

Table 11

Overall cost summary	
	Present value of costs, using a 6% discount rate, in 2019 $m
Census costs including compliance costs, excluding ethnicity question costs	300
Māori share of general costs	46
Costs of Māori specific questions and Te Kupenga	28
Total costs attributable to Māori	74

Discussion

Interpreting the results of this valuation

Given the difficulties in assessing values for many benefits, this report provides a conservative lower bound estimate, but still having wide ranges of uncertainty either side. In most cases given the lack of stated or revealed preference valuations, estimates have been made using externally referenced data on investment and/or expenditure and an assessed accuracy impact has been applied. In some cases, this has been checked with practitioners, but in most instances, it reflects the application of a set of judgements. Only in the health expenditure and census sampling areas has this been able to be rigorously estimated.

A cost for carrying out the census (including compliance costs) has been deducted from these benefits to provide an overall net present value. This has been derived on the basis of carrying forward the level of costs on a constant real per head cost for the census.

The value estimates represent 25 major areas of benefit out of the much larger range of unquantified benefits discussed. On this basis, it does not seem unreasonable to conclude that a true estimate of the census's value for Māori is safely in a range for which the estimates provided in this report represent a lower bound.

This work does not comment on the optimal level of data accuracy or any specific recent quality changes, rather it estimates values derived from patterns that have appeared over several censuses.

Comparison with other census valuation work

There have been two other studies using parts of the methodology employed in this report, the UK ONS 2009 valuation work for their business case and the 2013 New Zealand census by this author. Considerable care needs to be taken when comparing results however.

a) All these studies have been constrained measurement exercises; given time, cost, and complexity challenges each has chosen to apply measurement to some large areas which indicate sufficient level of benefits to justify key decisions (that is, that benefits are reliably well in excess of possible census costs). The ONS 2009 work covered just three user groups, the 2013 work extended this to 11 areas, and this study to 14 (of which some user areas were disaggregated to provide an overall total of 25 areas). As noted in ONS's 2009 work:

> Furthermore, these quantified benefits relate to only 2 of the 6 types of use of census data and only 3 groups of users. When considering that over 500 organisations responded to the Census topics consultation, that there are a further four very significant key uses of census data (service planning, policy making and monitoring, academic and market research, and as a benchmark for other National Statistics), and that the Neighbourhood Statistics Service (just one route of access to census data) has over 100,000 hits per month, the unquantified benefits will be very substantial. The quantified discounted benefit of £720m is therefore a very significant under-estimate.

b) Each study has used relevant net present value methodologies, but they need to be aligned to provide comparable cost estimates. ONS uses a 3.5 percent discount rate and a 10-year horizon to produce results in 2009 pounds. The 2013 and 2019 reports use 8 percent and 6 percent

discount rates with 20-year horizons and provide results in current dollars. Table 12 shows adjusted benefit levels that are more technically comparable.

Table 124

Comparison of benefit levels assessed in various census valuations				
	2009 ONS benefit in 2019 $NZ	**2013 census valuation in 2019 $NZ**	**2019 valuation 2019 $NZ**	**Comment**
Per person benefits from more accurate health funding	24.20	41.90	50.10	The higher NZ than UK figure may reflect the impact of greater inaccuracy due, among other factors, to higher population mobility and under-enrolment by Māori. The increase in NZ numbers reflects real increases in health expenditure (and a wider base) over that time.
Per person benefits assessed on strictly comparable basis (health accuracy and statistics frame-setting)	39.20	59.60	66.20	Higher in NZ reflecting the impact of higher health benefits.
Overall benefit assessed per person		326	768	The higher 2019 benefit level reflects a combination of additional areas included in the estimation, and many areas where Māori benefits are proportionally higher.

Risks and sensitivities

In addition to the uncertainties in estimating impacts discussed above, when considering patterns of benefits (and costs) over reasonably long timeframes, additional sources of uncertainty arise. These include:

- changing demands for some specific Māori information collected by the census. A recent trend within many government agencies is to work more closely with iwi groups in the design and delivery of services. If sustained, this will tend to raise the value of this census data for Māori. For instance, this need to work closely with iwi and whānau is highlighted as the central requirement in the Department of Correction's 2019 strategic plan, *Hōkai Rangi 2019–2024*.
- the potential for significant relative real cost shifts. While the census relies on a mix of skilled staff and IT resources, there seems no particular reliance on an input that is likely to move significantly relative to other factors. Rather the main change is likely to come from competing information sources which increase in availability at reducing cost. This may for instance include use of the IDI which provides a useful joining tool for various datasets with census data.

Generally, the net present values developed in this report span a 20-year period (for costs and benefits), and a 6 percent discount rate as recommended by The Treasury (2018). For this analysis the results are not particularly sensitive to discount rate used, as both costs and benefits move in a relatively consistent period through time. As such, a lower discount rate will increase the size of costs and benefits, and a higher rate reduce them, but the ratio between costs and benefits will be largely unchanged at eight times.

Further work, phases 2 and 3

This report provides a relatively high-level estimate of the value of the census for Māori in Aotearoa New Zealand. Further possible phases of this work could move into a deeper and more specific exploration of valuing the ways in which/how value is derived from census data in shaping services/resources delivered to iwi (Phase 2) and then developing qualitative and case study material on ways in which/how census data are used to secure funding/resources/services and the value of this data to iwi (Phase 3).

Conclusion

Valuing the benefits derived by Māori from use of the census is a complex challenge. It combines the difficulty of placing a value on a set of services which are unpriced with the additional complexity of applying a set of wellbeing domains that at times reflect a particular te ao Māori understanding and perspective. While an area of active analysis and discussion, the lack of a clearly unified and agreed Māori or wellbeing framework across the domains and with it indicators that provide for measurement, means any valuation at this stage must be evolutionary.

A critical determinant of value for the census (including Te Kupenga) for Māori is its unique role in providing a comprehensive (and independent) count of Māori together with their iwi connections, location, and many associated household characteristics. There is no comprehensive and reliable alternative, and the value of this information is increasing at this time as the Government places stronger focus on shaping some service delivery so that it can best deliver desired outcomes within an iwi-based framework.

This first stage report does provide an overall value estimate, focusing at a relatively high level on the value and impact of flows of services and resources that derive value from use of census data. It builds from the techniques used for the valuation of the census, for all New Zealanders, carried out in 2013. It uses a mix of valuation approaches, requiring a range of techniques to estimate values where explicit prices/willingness to pay are not available, and as a result the valuations are necessarily less precise than those developed in commercial settings, but can be viewed in three groups which provide varying levels of rigour around the level of benefits assessed. To counter the uncertainty a deliberately conservative approach has been adopted.

Benefits arise from gains achieved as a result of policies or services that contribute to improved wellbeing for Māori for example in improved educational outcomes or reduced household crowding. In the areas covered, the design and execution of services and policy has been improved through utilisation of data and insights from census information. One of the key factors explaining why the benefit ratio for Māori is higher than for other New Zealanders is that this report looks closely at government services, many of which provide services to a higher than population-share of Māori. Some smaller level of benefits arise from a reduction in activity costs through use of census data.

Of the three key areas where census collects specific information on Māori, ethnicity, descent and iwi affiliation, the main benefits at this time come from the use of ethnicity data in the allocation of government funding and services.

The overall costs and benefits to Māori from use of census data are set out in table 13, as net present value estimates using the currently applicable 6 percent discount rate. Both gross and net benefits are very large even using the conservative approach adopted in this report. Put simply, this report identifies gross benefits to Māori in the order of $570 million or providing a ratio of benefits which are about eight times their cost. The net benefit is some $500 million. Even on the basis of the most rigorously measured benefits (measured and assessed groups), benefits are more than double the costs attributed.

Table 13

Overall central estimate of benefits for Māori from using census data	
	Net present value in 2019 $m
Benefits to Māori	572
Costs apportioned to Māori	74
Overall net benefit	498
Ratio of benefits to costs	8 times

While many of the valuations are subject to significant uncertainties, given the conservatism in the approach adopted in this report it can be confidently assumed that benefits to Māori from accurate census data are very much greater than the costs of data collection, and that in most cases inaccurate data could impose losses well in excess of the costs required to ensure accuracy. This report though does not identify the most efficient ways of collecting the data, nor evaluate the extent to which current census techniques provide the most efficient means of obtaining the necessary data.

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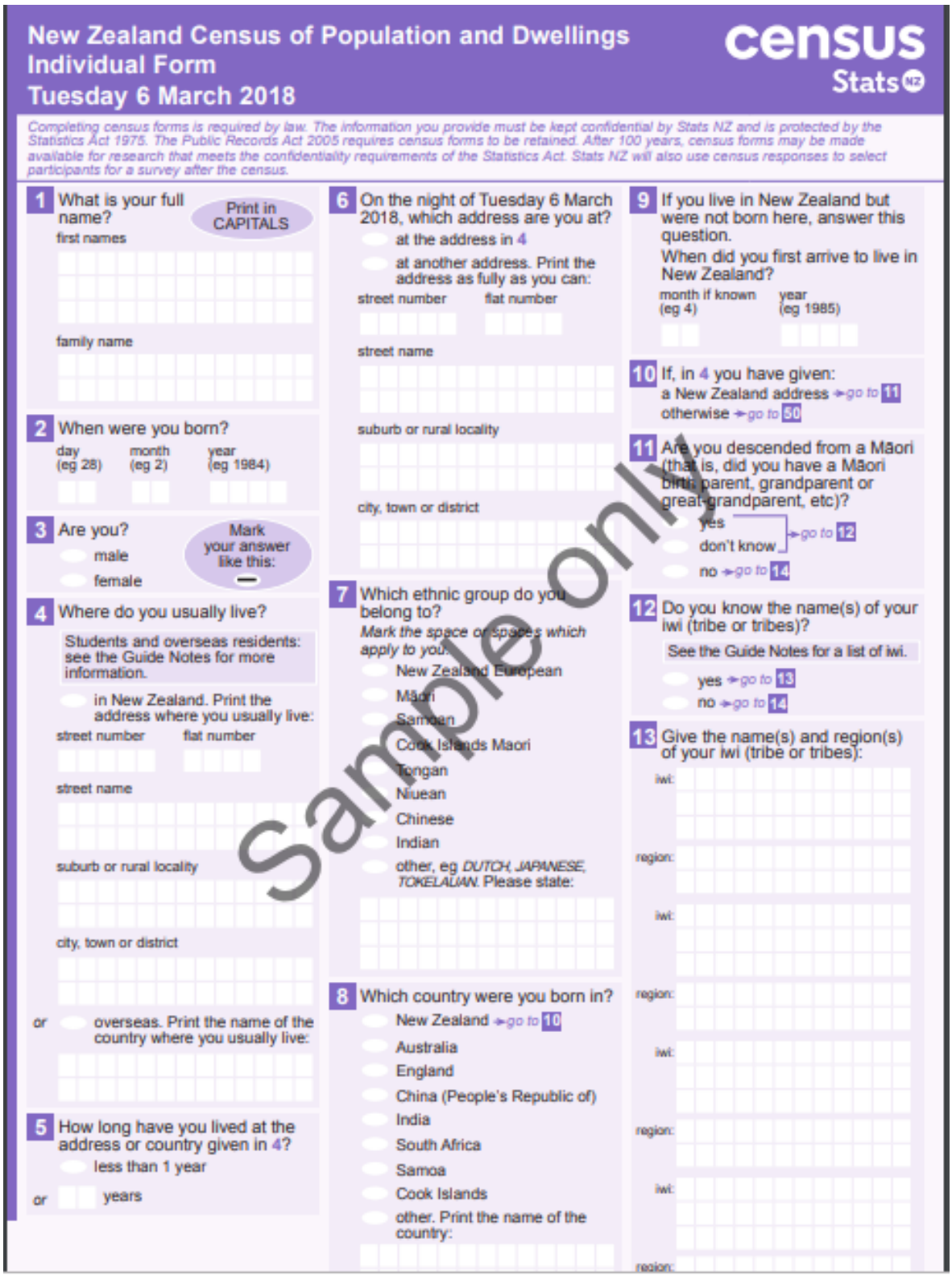
Appendix 1: 2018 Census ethnicity questions



New Zealand Census of Population and Dwellings
Individual Form
Tuesday 6 March 2018

census Stats NZ

Completing census forms is required by law. The information you provide must be kept confidential by Stats NZ and is protected by the Statistics Act 1975. The Public Records Act 2005 requires census forms to be retained. After 100 years, census forms may be made available for research that meets the confidentiality requirements of the Statistics Act. Stats NZ will also use census responses to select participants for a survey after the census.

1 What is your full name? Print in CAPITALS
first names
family name

2 When were you born?
day (eg 28) month (eg 2) year (eg 1984)

3 Are you? Mark your answer like this: —
male
female

4 Where do you usually live?
Students and overseas residents: see the Guide Notes for more information.
in New Zealand. Print the address where you usually live:
street number flat number
street name
suburb or rural locality
city, town or district
or overseas. Print the name of the country where you usually live:

5 How long have you lived at the address or country given in 4?
less than 1 year
or years

6 On the night of Tuesday 6 March 2018, which address are you at?
at the address in 4
at another address. Print the address as fully as you can:
street number flat number
street name
suburb or rural locality
city, town or district

7 Which ethnic group do you belong to?
Mark the space or spaces which apply to you.
New Zealand European
Māori
Samoan
Cook Islands Maori
Tongan
Niuean
Chinese
Indian
other, eg *DUTCH, JAPANESE, TOKELAUAN.* Please state:

8 Which country were you born in?
New Zealand →go to 10
Australia
England
China (People's Republic of)
India
South Africa
Samoa
Cook Islands
other. Print the name of the country:

9 If you live in New Zealand but were not born here, answer this question.
When did you first arrive to live in New Zealand?
month if known (eg 4) year (eg 1985)

10 If, in 4 you have given:
a New Zealand address →go to 11
otherwise →go to 50

11 Are you descended from a Māori (that is, did you have a Māori birth parent, grandparent or great-grandparent, etc)?
yes →go to 12
don't know →go to 12
no →go to 14

12 Do you know the name(s) of your iwi (tribe or tribes)?
See the Guide Notes for a list of iwi.
yes →go to 13
no →go to 14

13 Give the name(s) and region(s) of your iwi (tribe or tribes):
iwi:
region:
iwi:
region:
iwi:
region:
iwi:
region:
iwi:
region:

Sample only

Appendix 2: Whānau Ora outcomes framework

Approved by Whānau Ora Partnership Group 26 August 2015

Whānau Ora Outcomes	Whānau are self-managing & empowered leaders	Whānau are leading healthy lifestyles	Whānau are participating fully in society	Whānau and families are confidently participating in Te Ao Māori (the Māori World).	Whānau and families are economically secure and successfully involved in wealth creation	Whānau are cohesive, resilient and nurturing	Whānau and families are responsible stewards of their living and natural environments
Long term outcomes 11-25 years	Whānau exercise rangatiratanga on a daily basis by being self-managing, independent,and making informed decisions. Whānau recognise they are repositories of knowledge about themselves and their communities, and they contribute to their communities' understanding of them. Whānau determine the nature of their own leadership according to their own traditions. They value and grow their leadership that represents their notions of a leader. Whānau are self-determining in the management, control and aims they determine for their collective assets and resources.	Whānau have a quality of life that meets their health needs and goals across their lifespan. Whānau members enjoy positive and functional relationships with others to meet their health needs and goals across their lifespan. Whānau are health literate and they have access to evidence-based information to make decisions about their health needs and goals. Whānau have timely access to exemplary and culturally adept health and disability services to meet their health needs and goals.	Whānau can demonstrate educational success by an increase in the number of Māori entering higher learning and professional careers. Whānau have opportunities for formal learning that equips them with the skills and knowledge to follow their chosen path to employment, advanced learning or self-fulfilment. Whānau are enjoying educational success across all ages. Whānau recognise, value and nurture leadership that supports and enables them. Whānau leaders actively engage with community leaders and institutions for collective good.	Whānau are secure in their cultural identity as Māori and actively participate in activities and events that celebrate their cultural make-up. Whānau are confident and proud that they are at least bi-lingual in Te Reo Māori and English/Te Reo Māori and NZ Sign, and able to transfer that knowledge to their members. Whānau access opportunities to be immersed in their culture and language in their communities. Whānau are major contributors to the cultural vibrancy and development of their own communities.	Whānau business leaders are innovative, entrepreneurial and successful. Whānau are active participants in research and development that advances their prosperity. Whānau are employed in occupations and positions that provide them with the income to achieve the standard of living they aspire to. Whānau have the knowledge and skills to manage their assets that enable them to achieve their life long aspirations.	Whānau relationships are positive, functional and uplifting of all members. Interpersonal skills between whānau members have improved and Whānau conduct positive relationships and demonstrate good parenting. Whānau experience and contribute to the development and maintenance of safe and nurturing environments for themselves and their communities. Whānau access communication technology to sustain engagement with each other. All members of a whānau are valued.	Whānau exercise mana whakahaere (authority and control) and mana-kaitiaki over their natural environment. Whānau lead sustainable management of their natural environment. Whānau cultural, physical and spiritual wellness is nurtured by their access to, and engagement with, their natural environment. Whānau have choices about their living arrangements and in all cases, their living environment is safe, secure, warm, dry.
Medium term outcomes 5-10 years	Whānau are supported and enabled to take responsibility for their own lives and wellbeing. Whānau are making informed choices about the support they require and who they access support from. Whānau are able to draw on the skills of their own members to advance their collective interests. Whānau are actively participating in the management and growth of assets held in common. Whānau with disabilities participate equally in society. Whānau use, and understand the point of using, data both quantitative and qualitative to inform their decisions making.	Whānau can model to other whānau members their ability to take personal responsibility for their own health and wellbeing by making choices about: • Living drug free and smoke free. • Maintaining a healthy weight for their age and height. • Achieving exercise and fitness regimes for heart health. • Monitoring regularly the efficacy of their prescribed medicines or medical devices in conjunction with health professionals. • Engaging in health screening programmes. • The quality of the interpersonal relationships they have.	Whānau identify the added value they bring to a school community. Whānau can articulate the importance of early childhood education to the preparation of their children's future. Whānau choose and access culturally adept schools for their children's learning. Whānau can articulate and implement healthy living habits in the home that will support their children's educational success. Rangatahi are achieving the knowledge, skills sets and qualifications to pursue training and employment that provides them with financial security and career options. More whānau members are trained and serving as public, community & cultural leaders. Whānau have access to quality and timely services that are fully responsive to whānau priorities and whānau values.	Whānau participate in their community using their language of choice. Whānau access cultural knowledge, engage in knowledge creation, and transfer that knowledge amongst themselves.	Increasing numbers of whānau are engaged in business, entrepreneurship, and innovation. Increasing numbers of whānau own their own businesses or benefit from the improved productivity and prosperity of their businesses. Whānau see improvements in the value of business they own. Whānau have increased financial literacy, improved access to capital and a practice of saving for key 'life' milestones. Whānau achieve at least a living wage.	Whānau live in homes that are free from abuse and violence. Whānau transform their lives through support from rehabilitation services (when needed). Whānau are confident to address crises and challenges. Whānau are stable, organised, and provide their tamariki with the best possible start in life. Whānau understand the importance of school attendance and support and encourage their tamariki and mokopuna to attend school. Rangatahi are supported and nurtured in their transition to adulthood.	Whānau are active participants and contributors to responsible and sustainable environmental management. Whānau access a range of housing options and the support required to pursue those options. Whānau are increasingly satisfied with their housing situation. Whānau increase the use of their land to provide housing, sustenance and food for themselves.
Short term outcomes 1-4 years	More whānau develop pathways to independence, including from government assistance and intervention in their whānau life. Whānau are knowledgeable about the capability that exists in their whānau network, and begin to tap into it. Whānau decision-making and planning is informed by timely access to personal information and data which is held about them by government or other agencies. Whānau are aware of their interests in assets held in common and knowledgeable about their rights and responsibilities in regards to those assets. Whānau are planning for emergencies, and taking appropriate action such as having insurance and plans for asset replacement.	Increased number of whānau are setting and achieving personal health goals for their physical, emotional, spiritual and mental wellbeing. Increased number of whānau are improving their knowledge and practice in healthy eating and physical activity. Whānau are managing chronic health conditions, including eczema, asthma and diabetes. And know when and how to access support to manage their conditions.	Rangatahi Māori are achieving NCEA level 2 as a minimum qualification. and increasing numbers are achieving level 3. Increased number of tamariki and mokopuna enrolled and attending early childhood education. Increased number of whānau entering tertiary education or other advanced areas of learning and leaving with qualifications. Increased number of whānau exercising their right to vote in national and local council elections. Increased number of whānau engaged in sport and/or clubs or other community groups including kapa haka and waka ama. Whānau are choosing the services they wish to access, on the basis of good information. Whānau are confident to access services and advocate in their own right. Successfully rehabilitate and reintegrate whānau who have had contact with the corrections system back into communities.	Increased numbers of whānau take up Te Reo Māori programmes. Increased number of whānau participating in iwi or cultural events or activities. Increased number of whānau registered with their iwi are exercising their democratic right in tribal elections.	Increased uptake by whānau in business training, skills acquisition, education and professional development. Increased numbers of whānau are self-employed, and whānau businesses are growing. Increased number of whānau improving their financial literacy. Whānau are engaged in savings and investment.	Parents build skills and strategies to nurture and care and provide for their children. Where necessary, whānau address violence, addiction, substance abuse, and risk of self-harm through increased uptake of affordable and culturally appropriate support services. Increase the number of tamariki from vulnerable whānau who are attending school on a regular basis. Relationships between partners are strong and supportive. Whānau are developing nurturing environments that provide for their physical, emotional, spiritual and mental wellbeing.	Increased opportunity for Whānau to participate in environmental management practices. Increased number of whānau accessing services to improve the health of their homes.

Whānau Goals and Aspirations

Appendix 3: An indigenous approach to the Living Standards Framework

Seven wellbeing domains	Indicators generated by applying an indigenous approach	
Confident in language and culture	• % Learning te reo • % Believe they have acquired enough knowledge of mātauranga and whakapapa to teach their children • % Participate in the transfer of te ao Māori knowledge • % Feel they have the opportunity to participate in cultural activities • % Marae functioning well (in good state of repair) • % Confident in organisations upholding their rights • % Satisfied that advocacy efforts are consistent with tribal history and values	Social
Cohesive, resilient and nurturing	• % Whānau/family satisfied with the amount of time spent intergenerationally • % Whānau/family that give care to older/younger members • % Whānau/family provide a nurturing environment	
Confidently participating in society	• % Voting in local elections • % Voting in school board of trustee elections • % Feel/trust that their whānau/family is treated fairly • % Feel their whānau are able to live as Māori • % Feel their whānau/family has satisfactory access to all necessary services • % Satisfactory access to early childhood education • % Truancy	Human
Living healthy lifestyles	• % Feel their whānau encourage healthy lifestyle choices	
Self-managing	• % Believe they have gained the skills/knowledge to adequately manage their lives • % Believe they have gained the skills and knowledge needed to contribute to their whānau/family • % Whānau that are aware of the capability that exists in their whānau network • % Whānau/households have a household emergency plan • % Whānau/households have home contents insurance • % Aware of their rights and interests regarding assets held in common	
Responsive to living and natural environment	• % Land development and productivity • Value of whānau landholdings • % Whānau/family have access to involvement in environmental management processes • % Whānau/family are satisfied with their access to physical environment/resources • % Homes are insulated • % Land type that housing is on (papakāinga) • % Whānau have access/opportunity to visit sites of significance	Natural

Economically secure and wealth creating	• % Whānau/family have a retirement savings plan • % Believe they have the skills to adequately manage the financial situation for themselves and their whānau/family • % Whānau/household have sufficient employment • % Increasing employees • % Whānau/household feel they would have the support needed to start a business	Financial/ physical

Note: Red signifies indicators that are Māori-specific rather than for the full population.

Source: Treasury & Te Puni Kōkiri, 2019, Table 1, p21