Need for Palliative Care in New Zealand

Palliative Care Advisory Panel

Ministry of Health

16 June 2016

Outline

NZ Methodology and Model

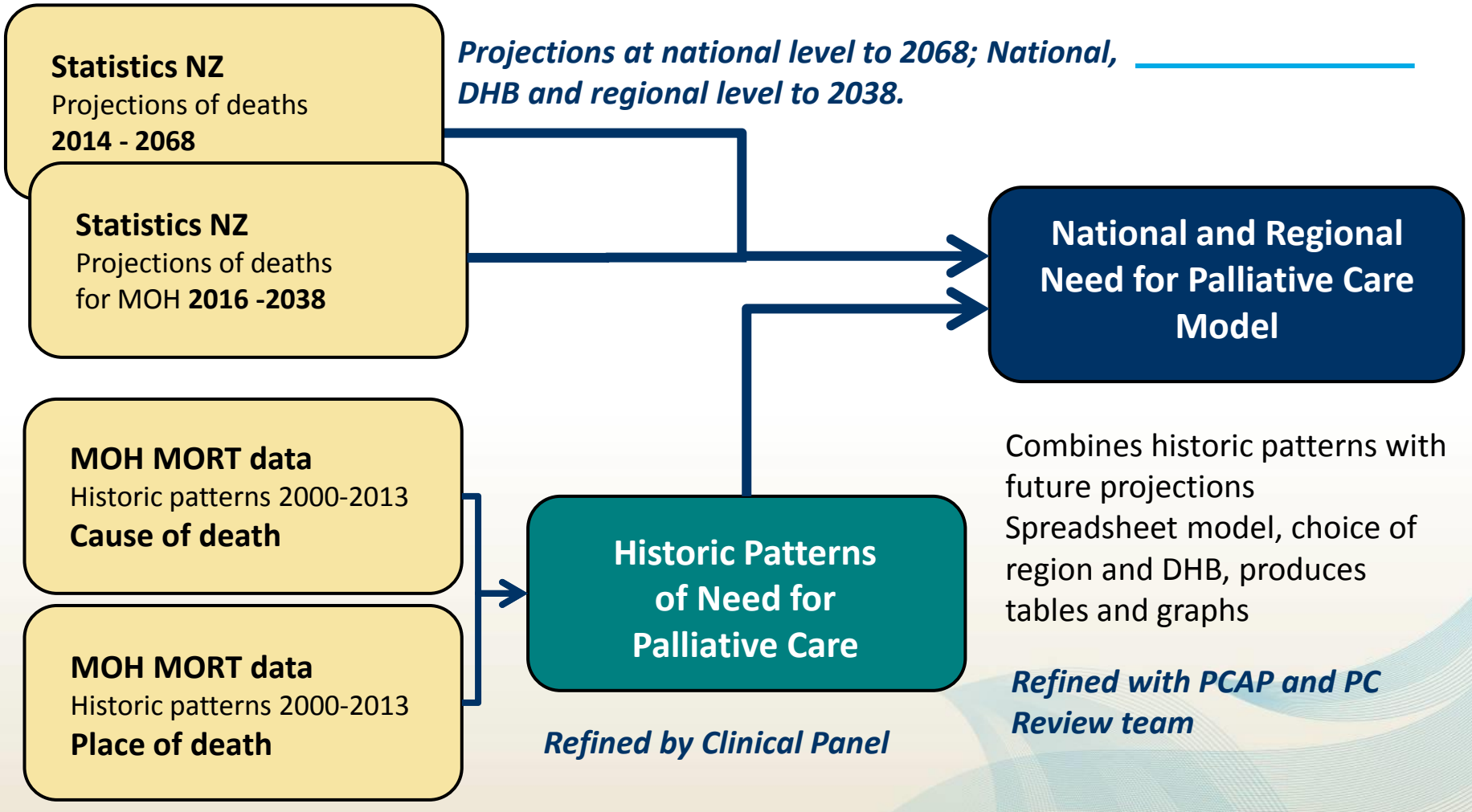
- Comparison to previous estimate and international methodology

Historic Need for Palliative Care

Projected Need for Palliative Care

NZ Model of Need for Palliative Care – features of the spreadsheet model

National and Regional Need for Palliative Care Model



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Methodology

Estimating the Need for Palliative Care

Conceptual Need for Palliative Care

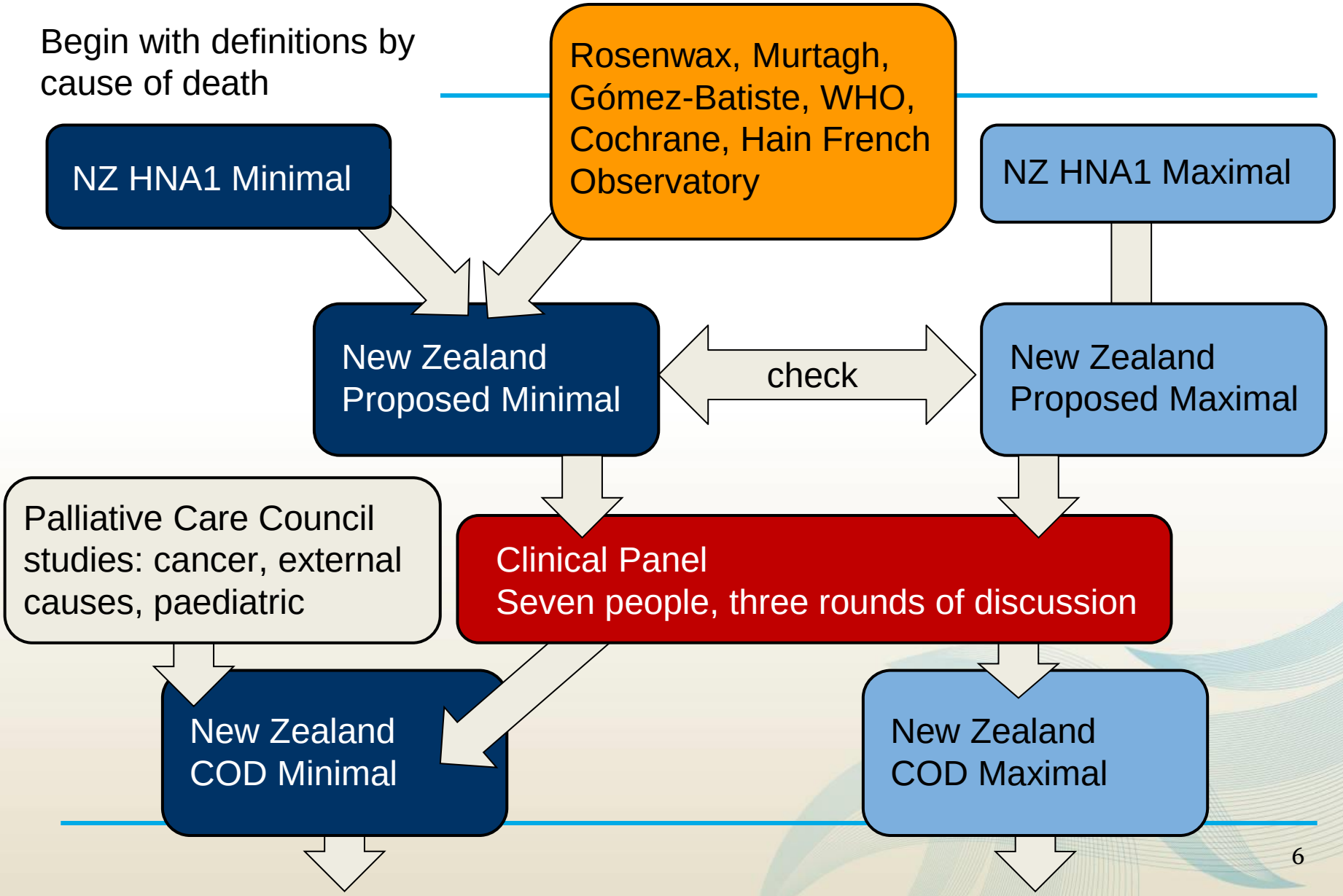
Cause of Death	Place of Death					
	Public Hospital	Residential Care	Hospice Inpatient Unit	Private Residence	Other	Proportion by Cause of Death
Neoplasms	All deaths	All deaths	All deaths	All deaths	All deaths	100.0%
Circulatory System	Clinical panel	All deaths	All deaths	Clinical panel	Clinical panel	Derived
Other Conditions	Clinical panel	All deaths	All deaths	Clinical panel	Clinical panel	Derived
Maternity	None	None	None	None	None	0.0%
Perinatal and Congenital	As agreed with Starship	All deaths	All deaths	As agreed with Starship	As agreed with Starship	Derived
External Causes	Sequelae only	All deaths	All deaths	Sequelae only	Sequelae only	Derived
Proportion by Place of Death	Derived	100%	100%	Derived	Derived	Derived

Only some of the deaths in light blue and purple are included, based on the underlying cause of death as summarised in the **NZ COD Minimal** lists by the Clinical Panel.
The outer proportions of the table (x%) are then calculated.

Data Source: Ministry of Health MORT data 2000-2013

Methodology I

Begin with definitions by cause of death

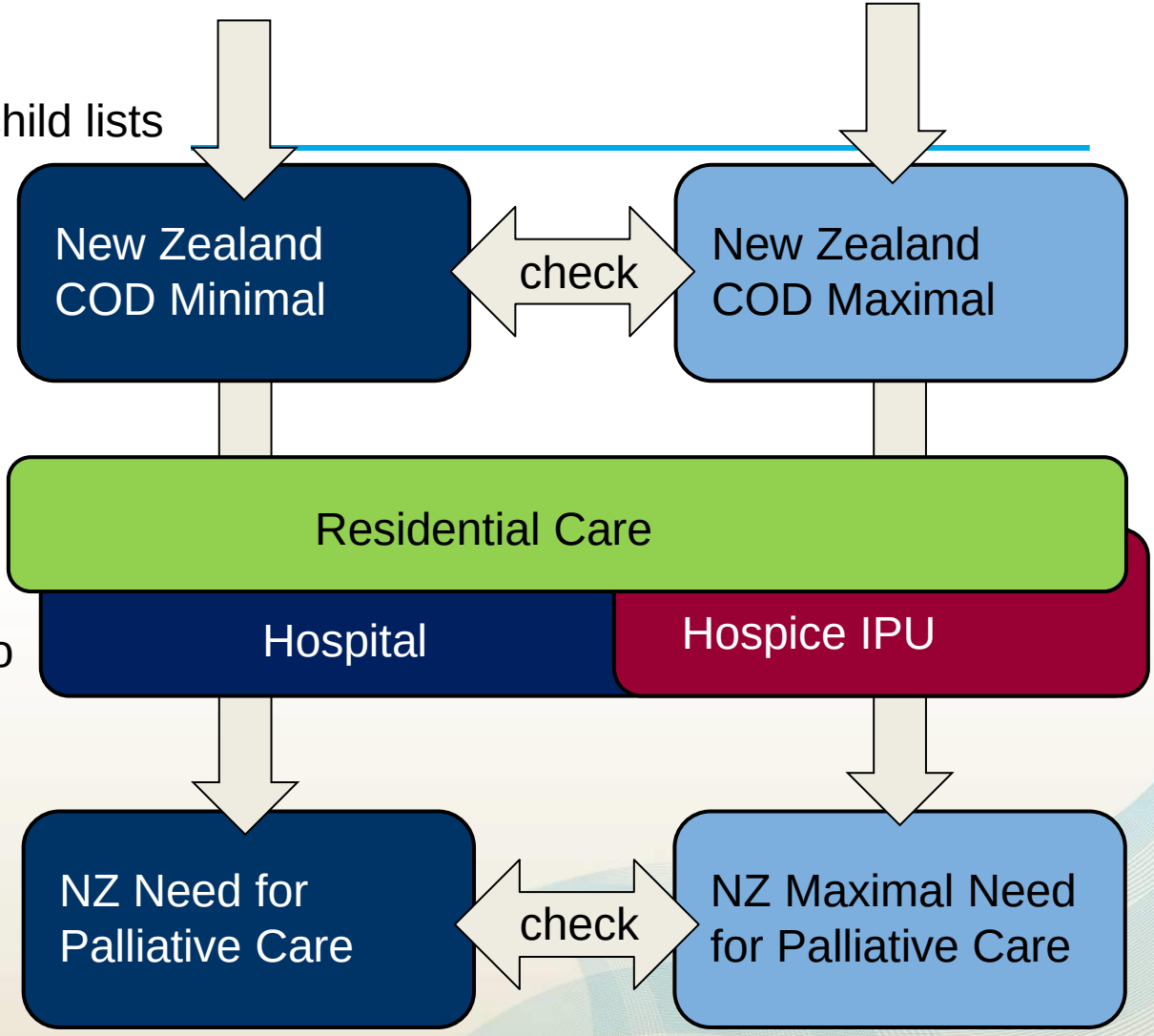


Methodology II

Use across all ages to remove anomalies between adult and child lists

Palliative Care Council studies: place of death and residential care

Test and adjust for place of death, particularly hospice IPU and residential care. Hospital adjustments made to COD lists (e.g. include 50% deaths in public hospital).



Consider age, gender, ethnicity, deprivation and regional results

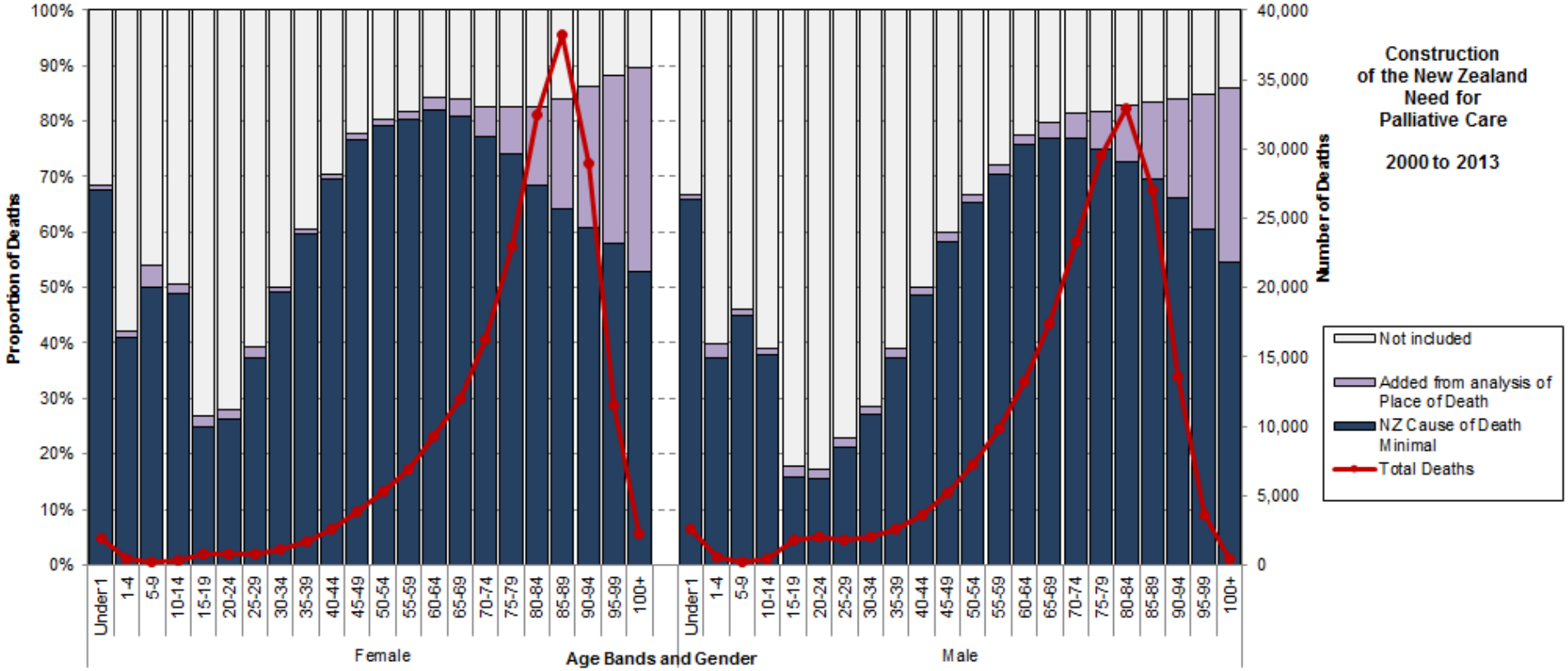
Proportional Need for Palliative Care New Zealand, 2000-13

Cause of Death	Place of Death					
	Public Hospital	Residential Care	Hospice Inpatient Unit	Private Residence	Other	Proportion by Cause of Death
Neoplasms	100.0%	100.0%	100.0%	100.0%	100.0%	**100.0%**
Circulatory System	80.5%	100.0%	100.0%	48.5%	50.3%	**78.4%**
Other Conditions	55.0%	100.0%	100.0%	53.2%	56.4%	**73.9%**
Maternity	0.0%	0.0%	0.0%	0.0%	0.0%	**0.0%**
Perinatal and Congenital	91.2%	100.0%	100.0%	96.4%	94.0%	**92.6%**
External Causes	3.5%	100.0%	100.0%	1.4%	0.3%	**10.0%**
Proportion by Place of Death	**73.5%**	**100.0%**	**100.0%**	**64.9%**	**38.4%**	**79.4%**

Only some of the deaths in light blue and purple are included, based on the underlying cause of death as summarised in the **NZ COD Minimal** lists by the Clinical Panel. In total, **79.4%** of all deaths met the definition of need for palliative care over the period 2000-2013.

Data Source: Ministry of Health MORT data 2000-2013

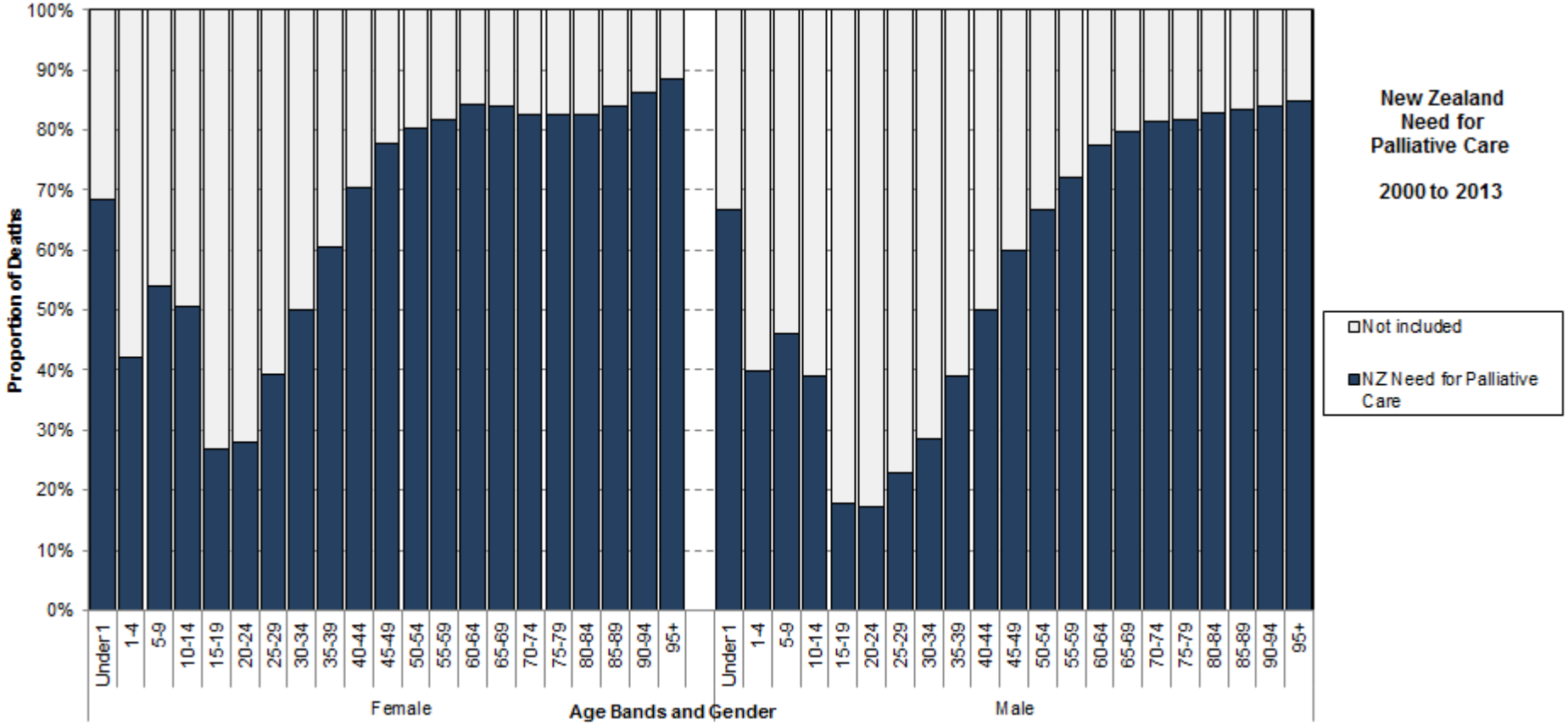
NZ Need for Palliative Care - Construction



NZ COD Minimal is determined by lists of cause of death, with advice from the Clinical Panel. All remaining deaths in hospice IPU and residential care are added to construct the NZ Need for Palliative Care. Shown to age band 100+ but used to age band 95+ to match StatsNZ projections of deaths.

Data Source: Ministry of Health MORT data 2000-2013

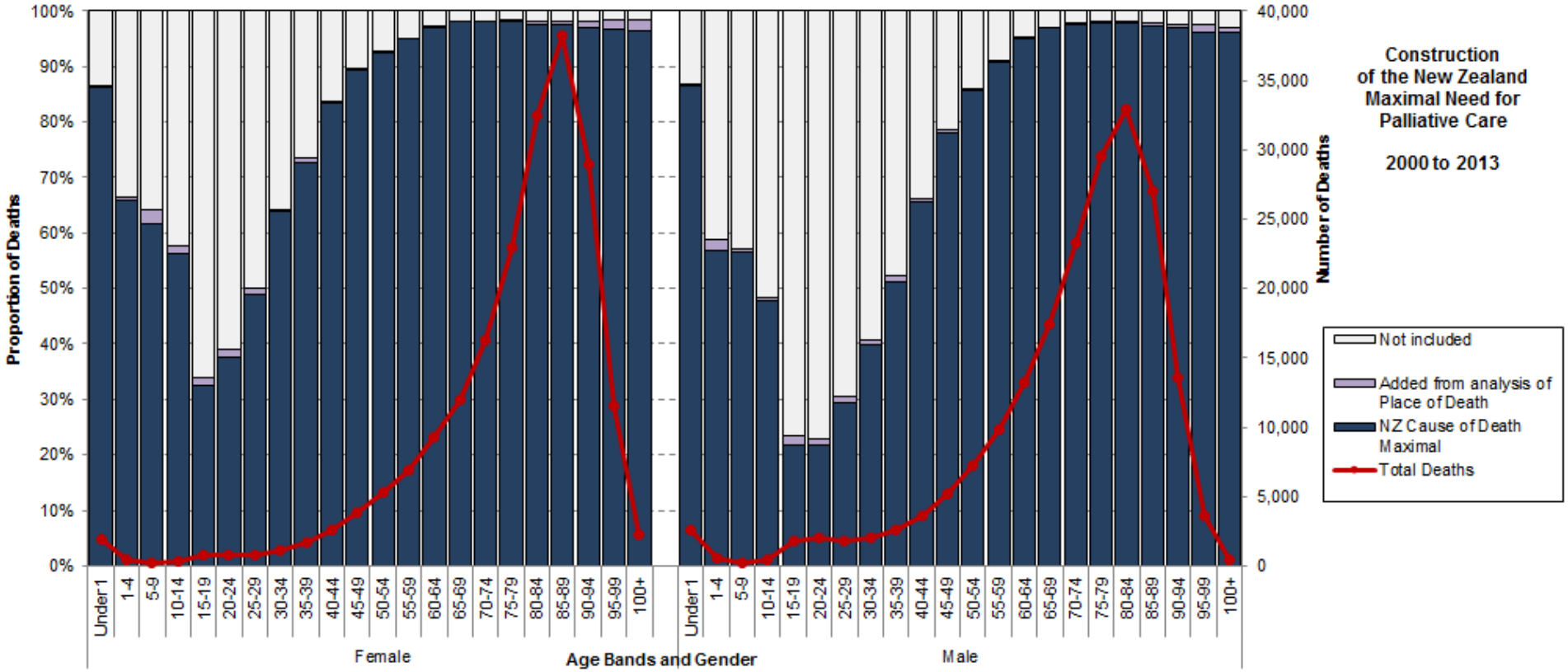
NZ Need for Palliative Care



The pattern for the NZ Need for Palliative Care and the NZ Maximal Need for Palliative Care are shown using the full historic data, 2000 to 2013.

Data Source: Ministry of Health MORT data 2000-2013

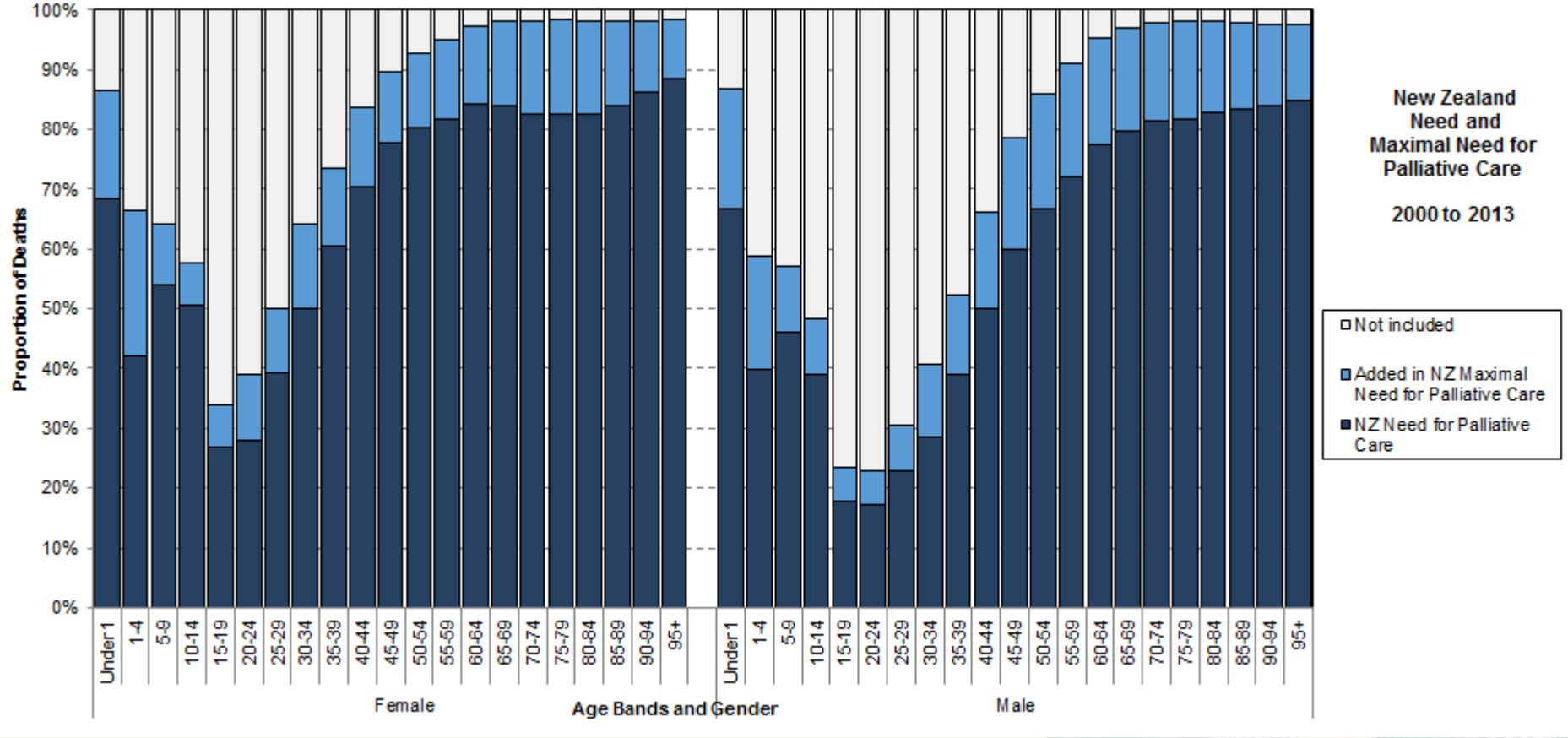
NZ Maximal Need Palliative Care - Construction



NZ COD Maximal is likewise determined by lists of cause of death based on the original estimates in New Zealand with advice from the Clinical Panel. The few remaining deaths in hospice IPU and residential care are added to construct the NZ Maximal Need for Palliative Care.

Data Source: Ministry of Health MORT data 2000-2013

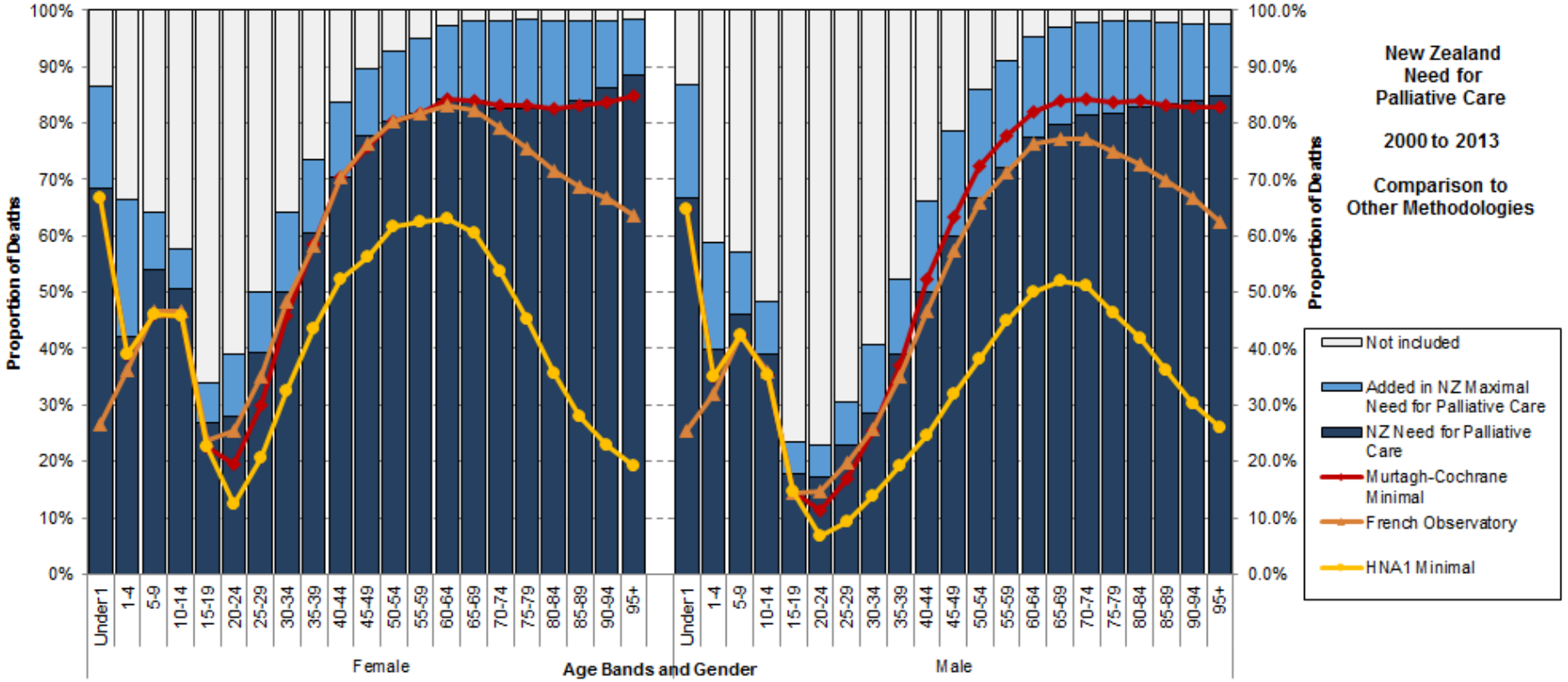
NZ Need and Maximal Need for Palliative Care



The pattern for the NZ Need for Palliative Care and the NZ Maximal Need for Palliative Care are shown using the full historic data, 2000 to 2013.

Data Source: Ministry of Health MORT data 2000-2013

NZ Need for Palliative Care - Comparison of Methodologies



The pattern for the NZ Need for Palliative Care is compared to the previous HNA1 methodology (based on Rosenwax), the Murtagh methodology and the French Observatory methodology.

Data Source: Ministry of Health MORT data 2000-2013

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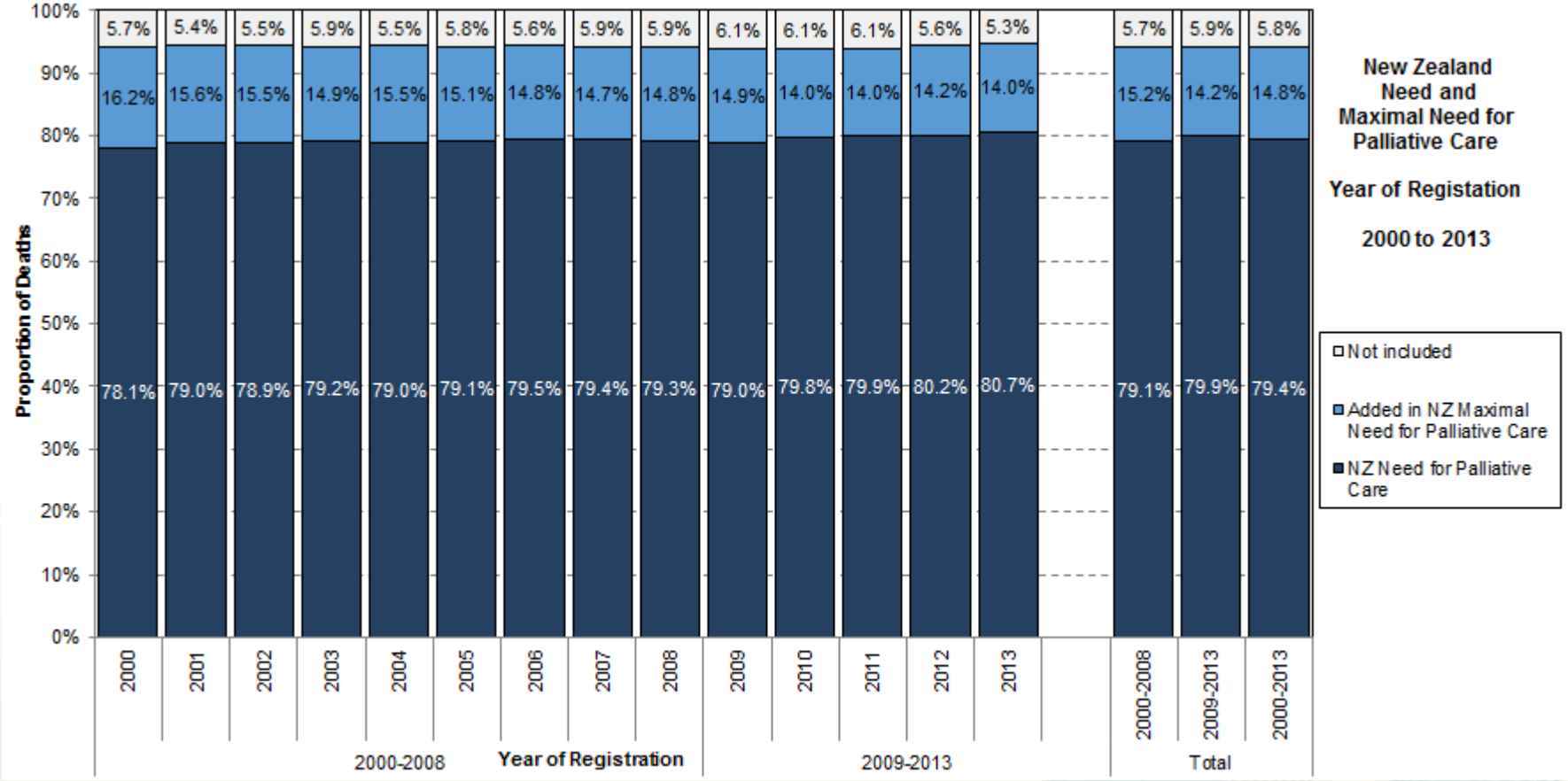
Historic Patterns of Need for Palliative Care

MORT data 2009-2013

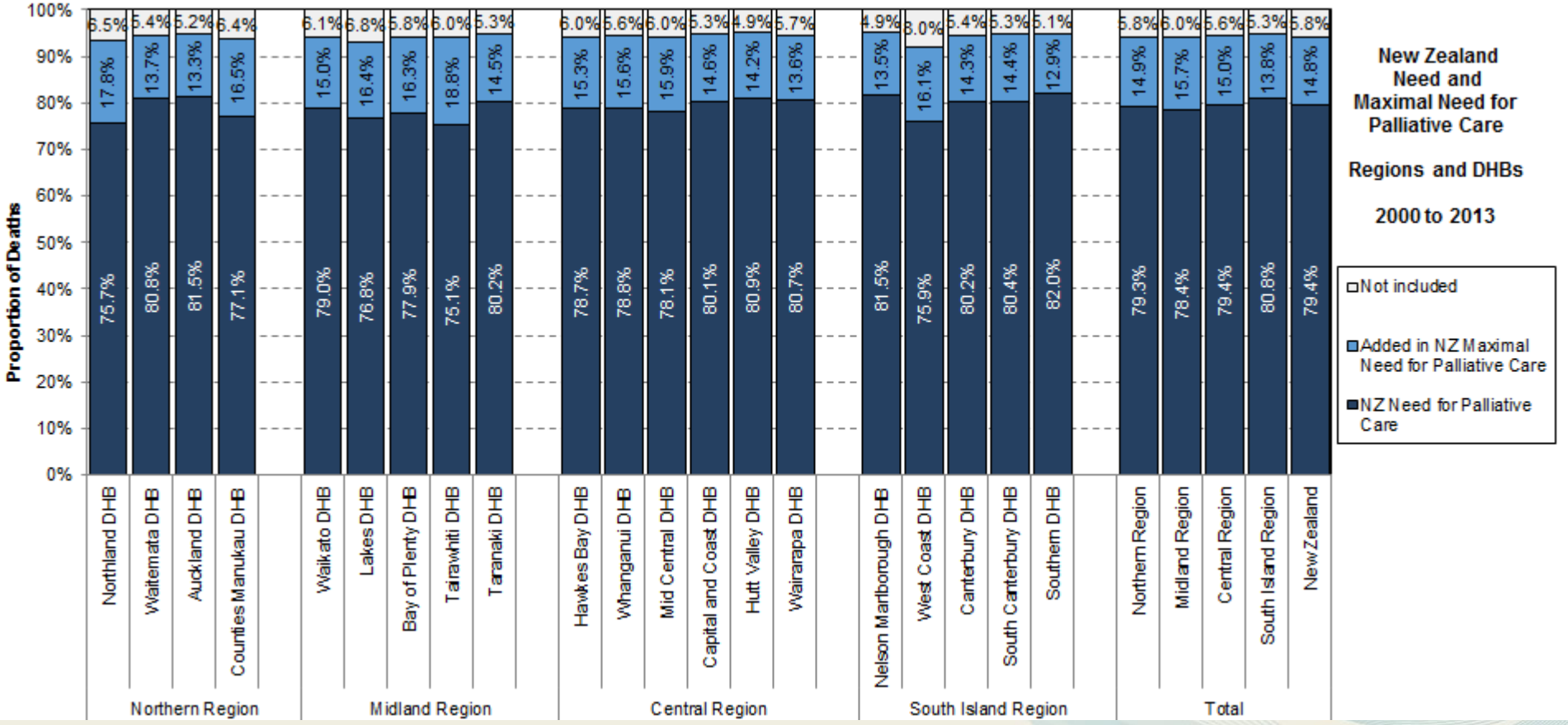
NZ Need for Palliative Care - Historic Proportions



As the population ages, so the need for palliative care increases. The need has increased from **78.1%** of deaths in the year 2000 to **80.7%** of deaths in 2013. The fluctuations in the "not included" category are largely due to external causes.

Data Source: Ministry of Health MORT data 2000-2013

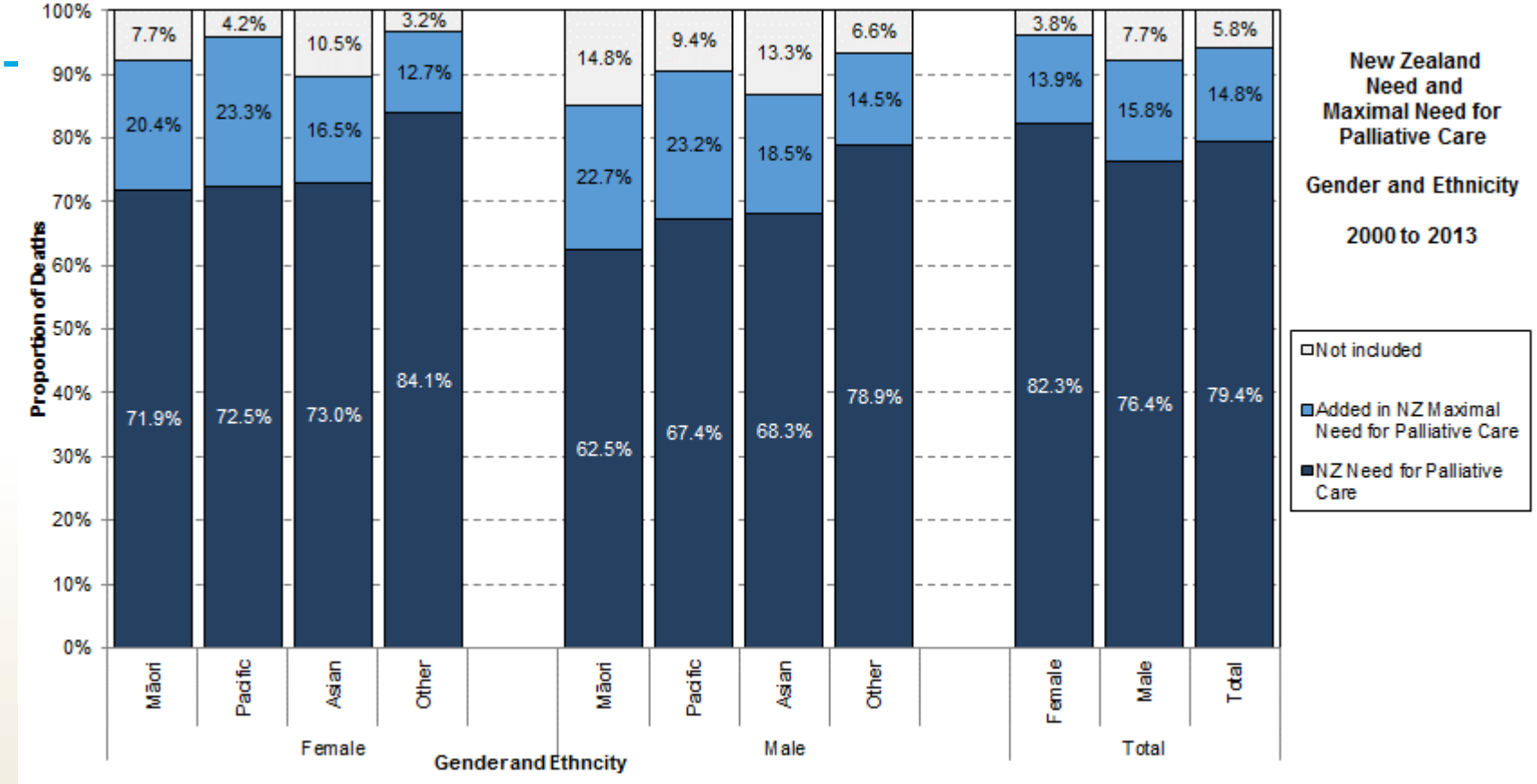
NZ Need for Palliative Care - Regional and DHB



The summary proportions are a consequence of the different age structures and causes of death in each group. Note also that these are the historic values, not the proportions to be used in future.

Data Source: Ministry of Health MORT data 2000-2013

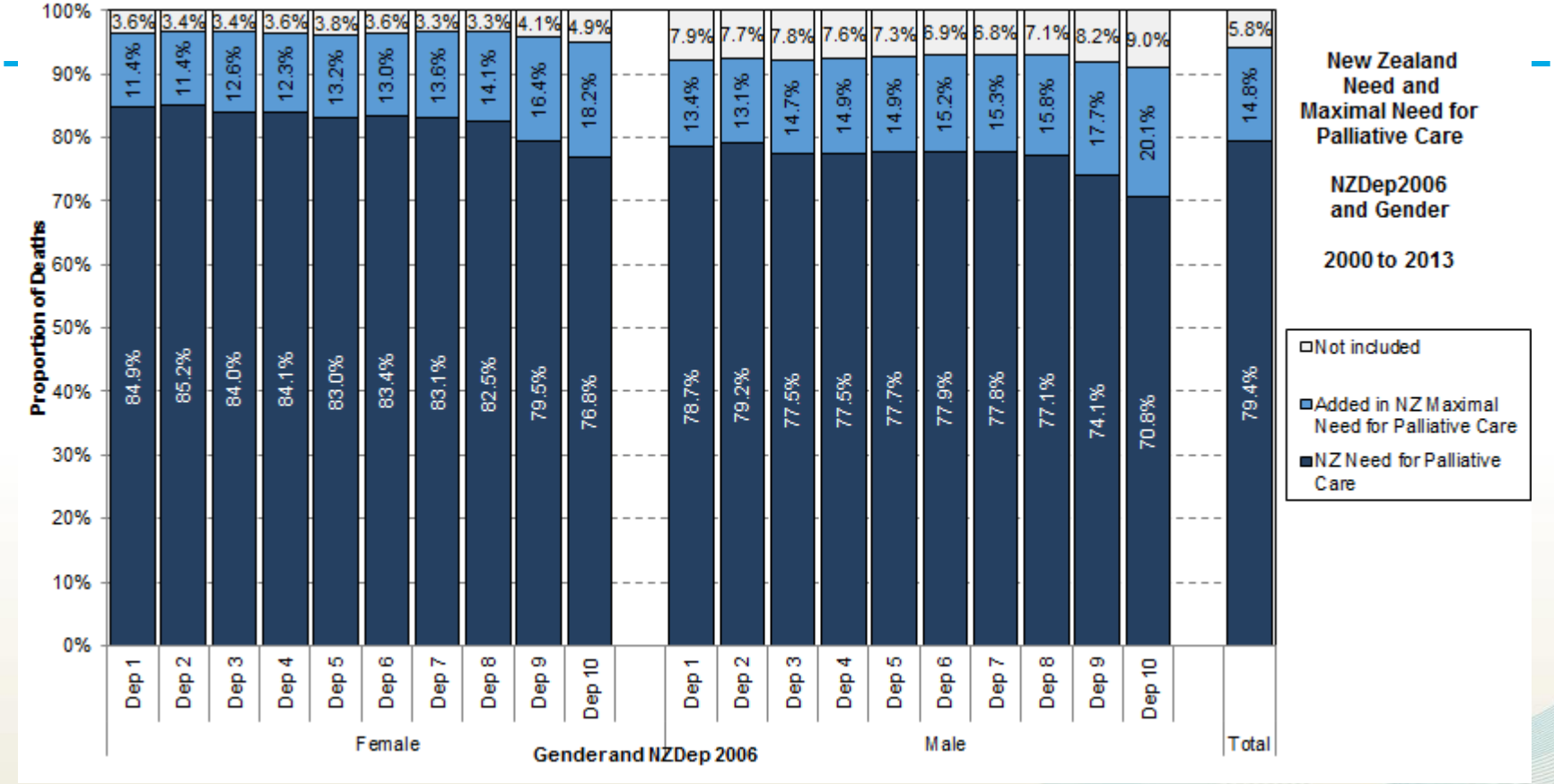
NZ Need for Palliative Care - Ethnicity and Gender



This does NOT mean that women have a higher need or that Māori have a lower need for palliative care. The summary proportions are a consequence of the different age structures and causes of death in each group.

Data Source: Ministry of Health MORT data 2000-2013

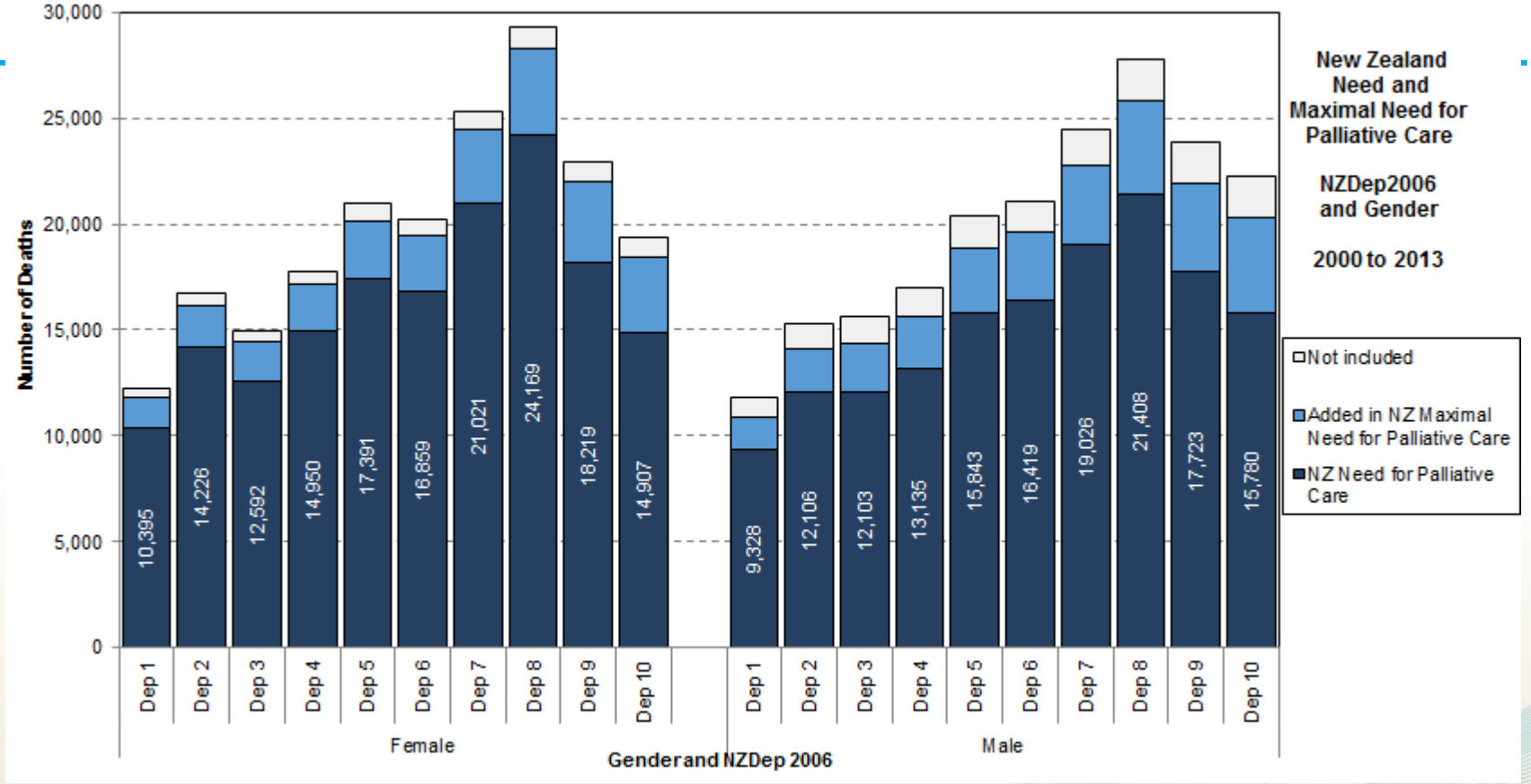
NZ Need for Palliative Care -NZ Deprivation Index



The patterns for women and men are similar, with proportionately lower need for palliative care at higher levels of NZDep. This is a function of the ages and causes of death, which are not identical across the categories.

Data Source: Ministry of Health MORT data 2000-2013

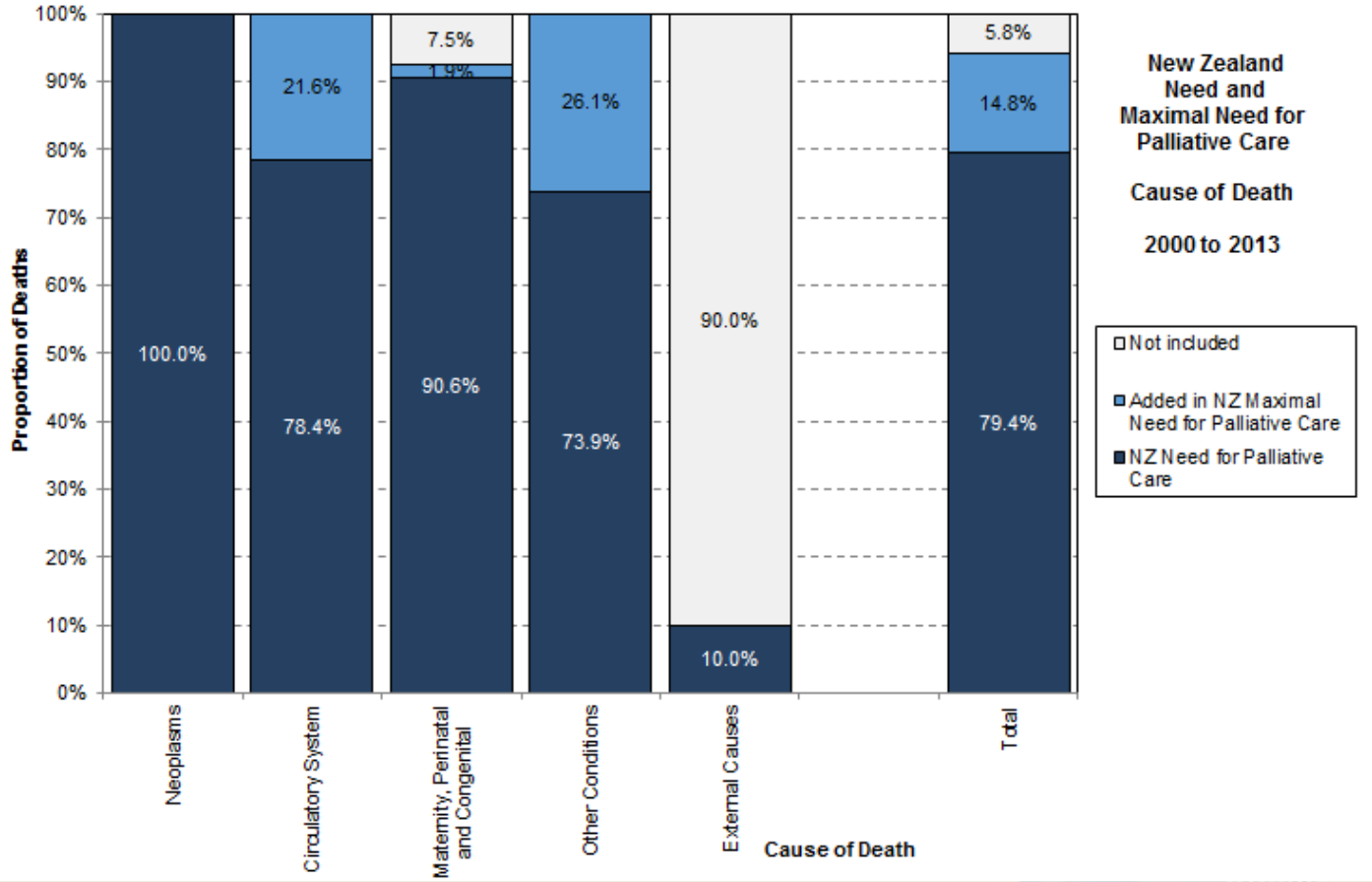
NZ Need for Palliative Care - NZ Deprivation Index



By total numbers, there are more deaths needing palliative care in Dep 7&8 than in any other quintile. The numbers needing palliative care in areas with Dep 7&8 are roughly double those in areas with Dep 1&2.

Data Source: Ministry of Health MORT data 2000-2013

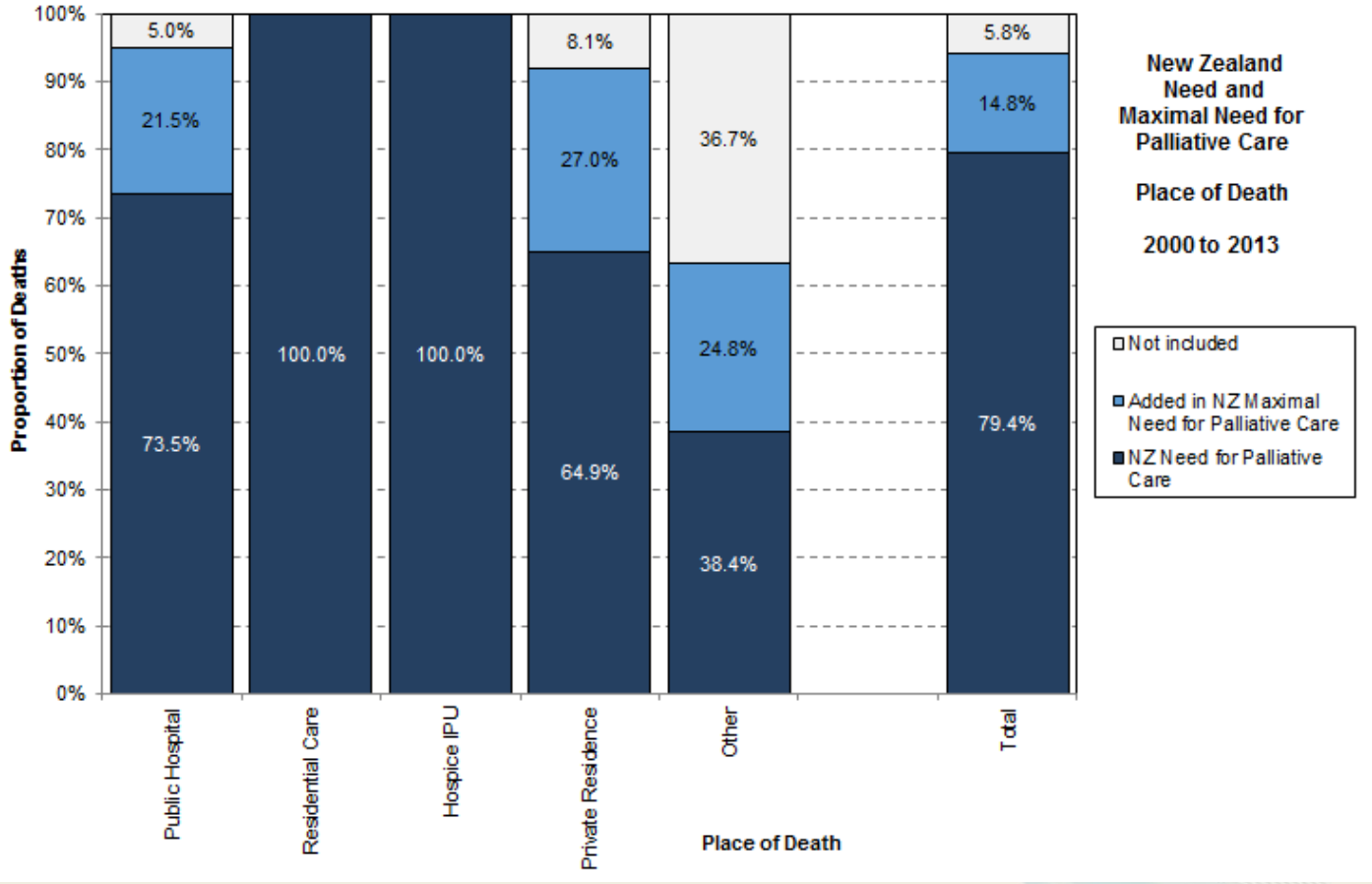
NZ Need for Palliative Care - Cause of Death



100% of deaths from neoplasms are included, with **78.4%** of circulatory system deaths and **73.9%** of deaths from other conditions. Only **10.0%** of deaths from external causes are included.

Data Source: Ministry of Health MORT data 2000-2013

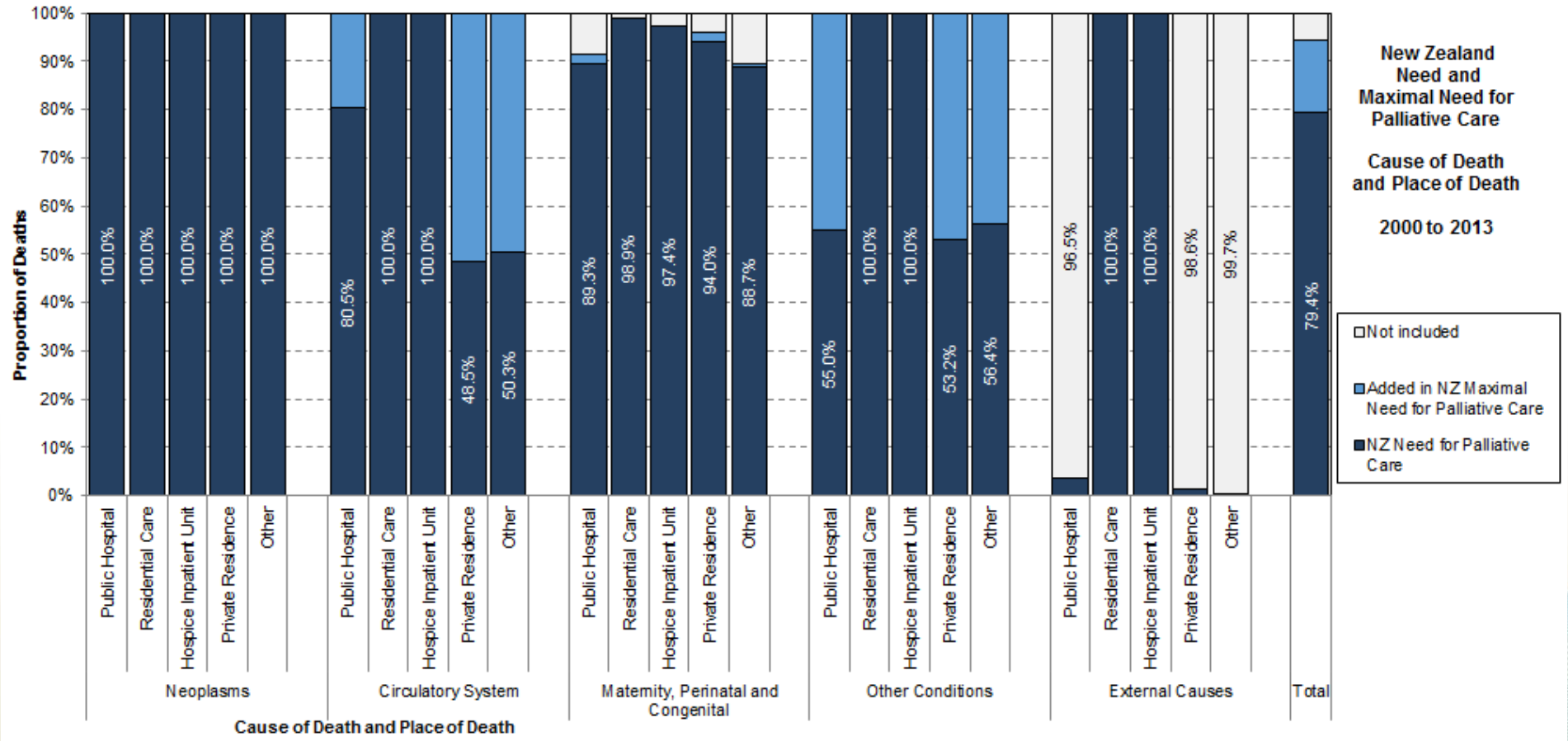
NZ Need for Palliative Care -Place of Death



All deaths in hospice IPU and residential care are included (other than deaths in childbirth). **73.5%** of deaths in public hospital and **64.9%** of deaths in private residence are included.

Data Source: Ministry of Health MORT data 2000-2013

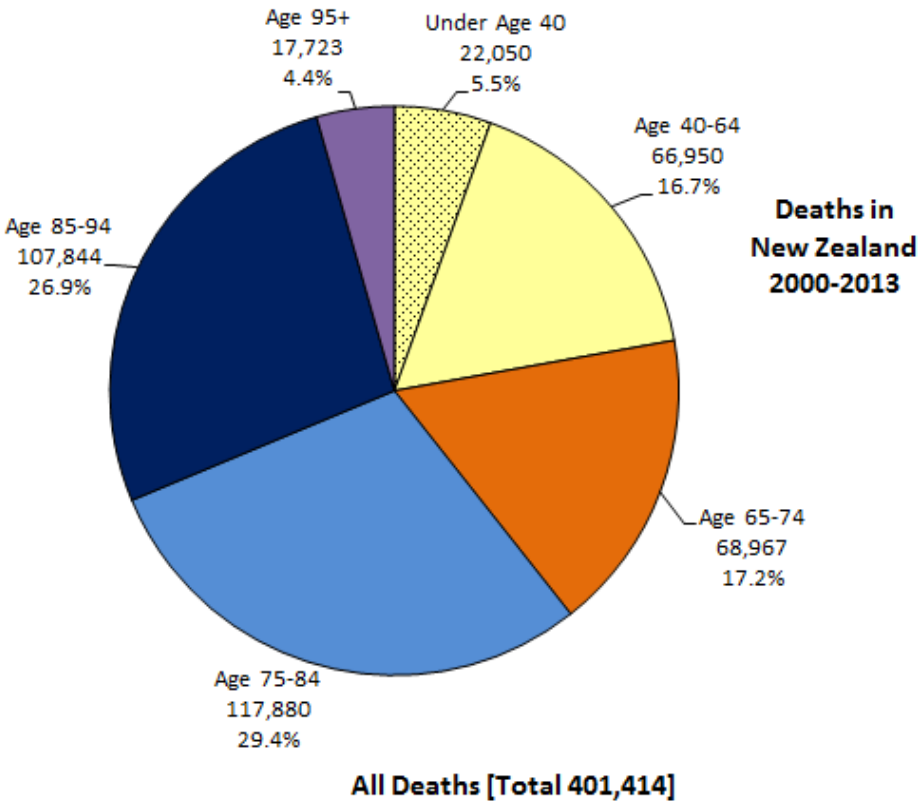
NZ Need for Palliative Care - Cause and Place of Death



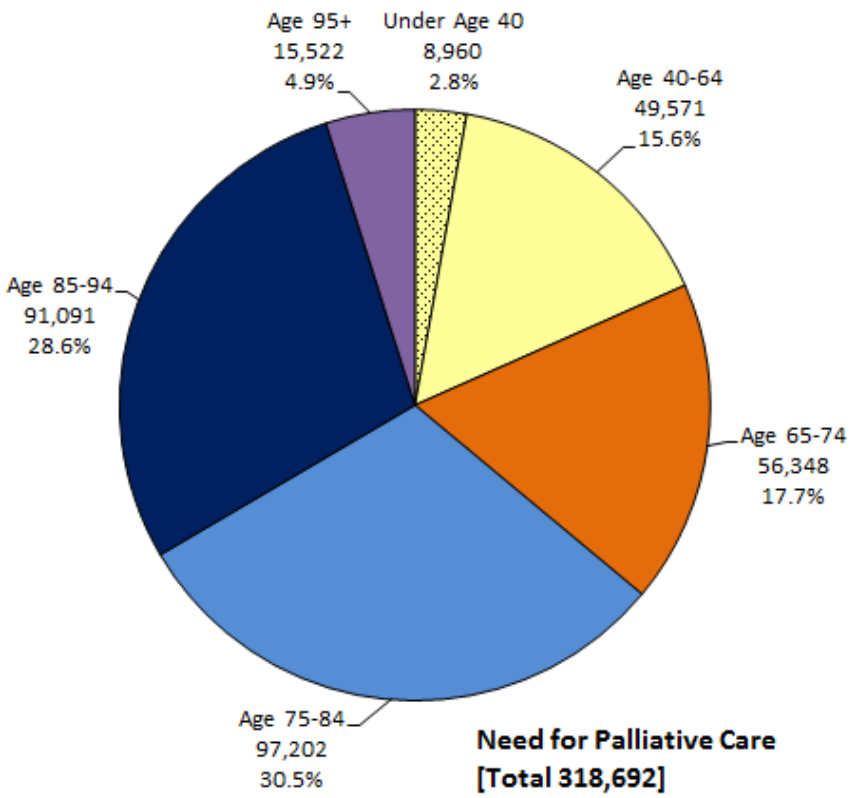
Combining cause of death and place of death. The effects on the circulatory system conditions and other conditions are most noticeable.

Data Source: Ministry of Health MORT data 2000-2013

Need for Palliative Care - Age Bands, 2000-2013



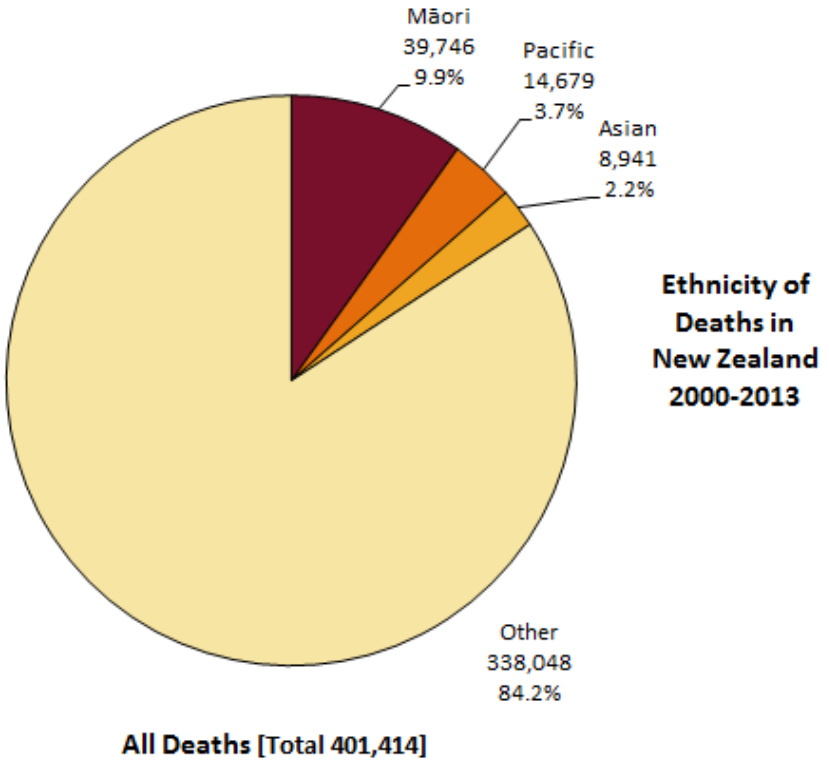
Deaths in New Zealand 2000-2013



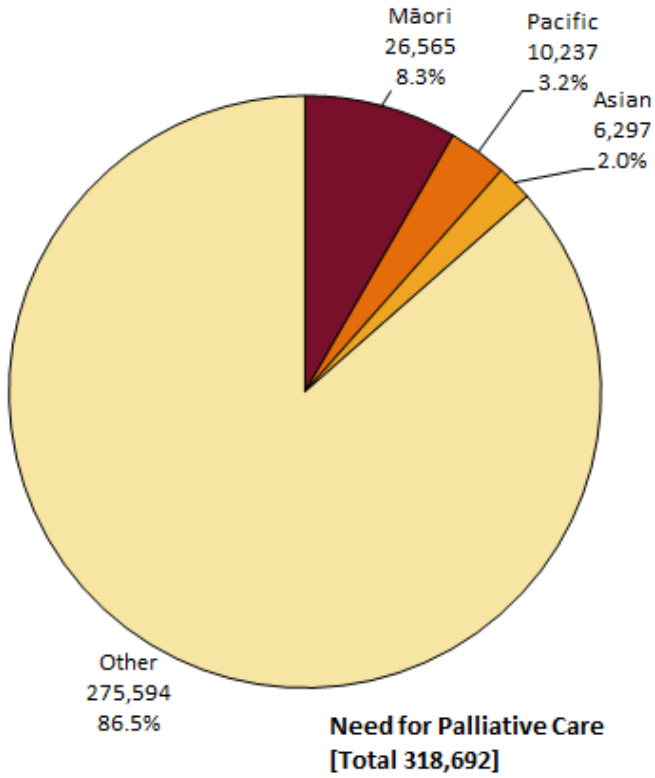
Those in the definition of need are relatively older, with **18.4%** under age 65 (compared to **22.2%** for all deaths). Those age 85 and over are **33.5%** of need (**31.3%** for all deaths).

Data Source: Ministry of Health MORT data 2000-2013

Need for Palliative Care - Ethnicity, 2000-2013



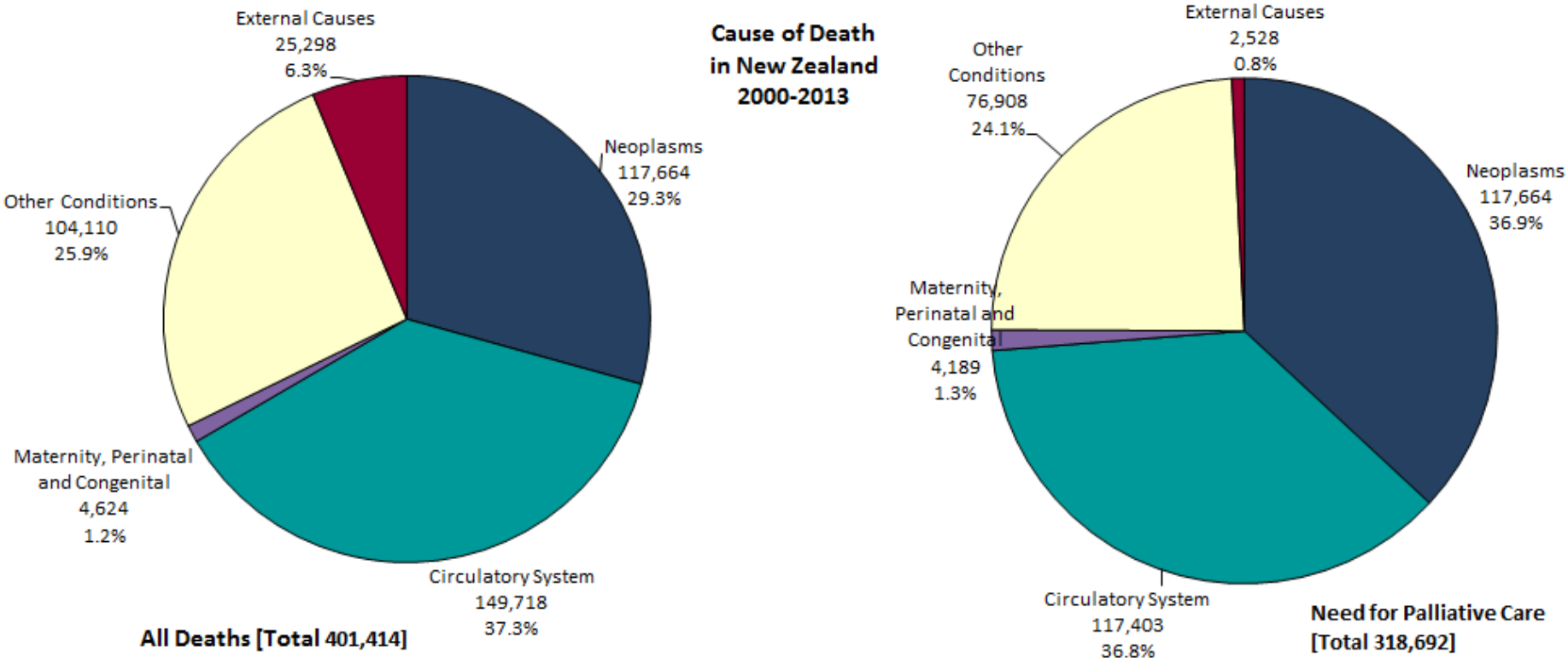
Ethnicity of Deaths in New Zealand 2000-2013



Māori are **8.3%** of need, (compared to **9.9%** for all deaths). Māori, Pacific and Asian together are **13.5%** of need (**15.8%** for all deaths).

Data Source: Ministry of Health MORT data 2000-2013

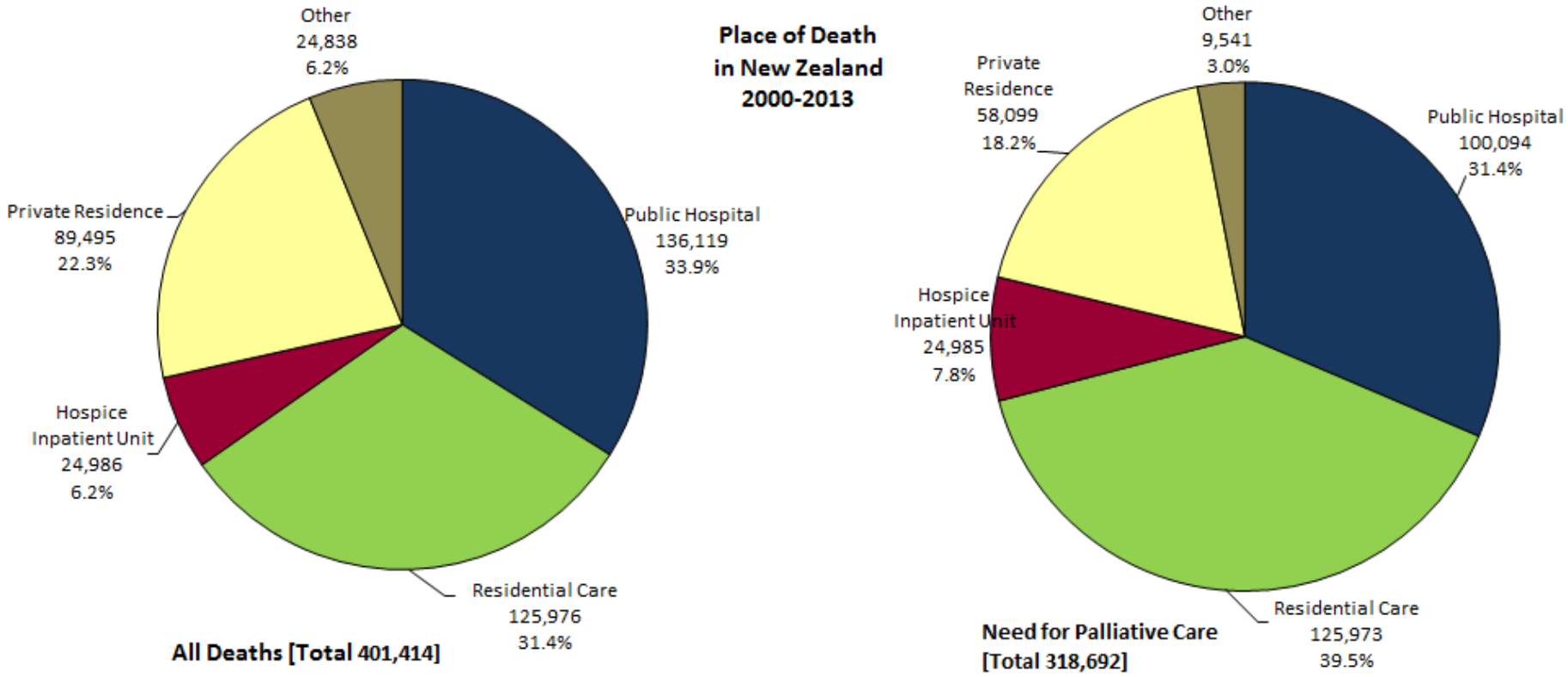
Need for Palliative Care - Cause of Death, 2000-2013



Deaths from neoplasms form a greater proportion of need, at **36.9%** (compared to **29.3%** for all deaths). Deaths from external causes are a very small proportion of need, at **0.8%**, but **6.3%** of all deaths.

Data Source: Ministry of Health MORT data 2000-2013

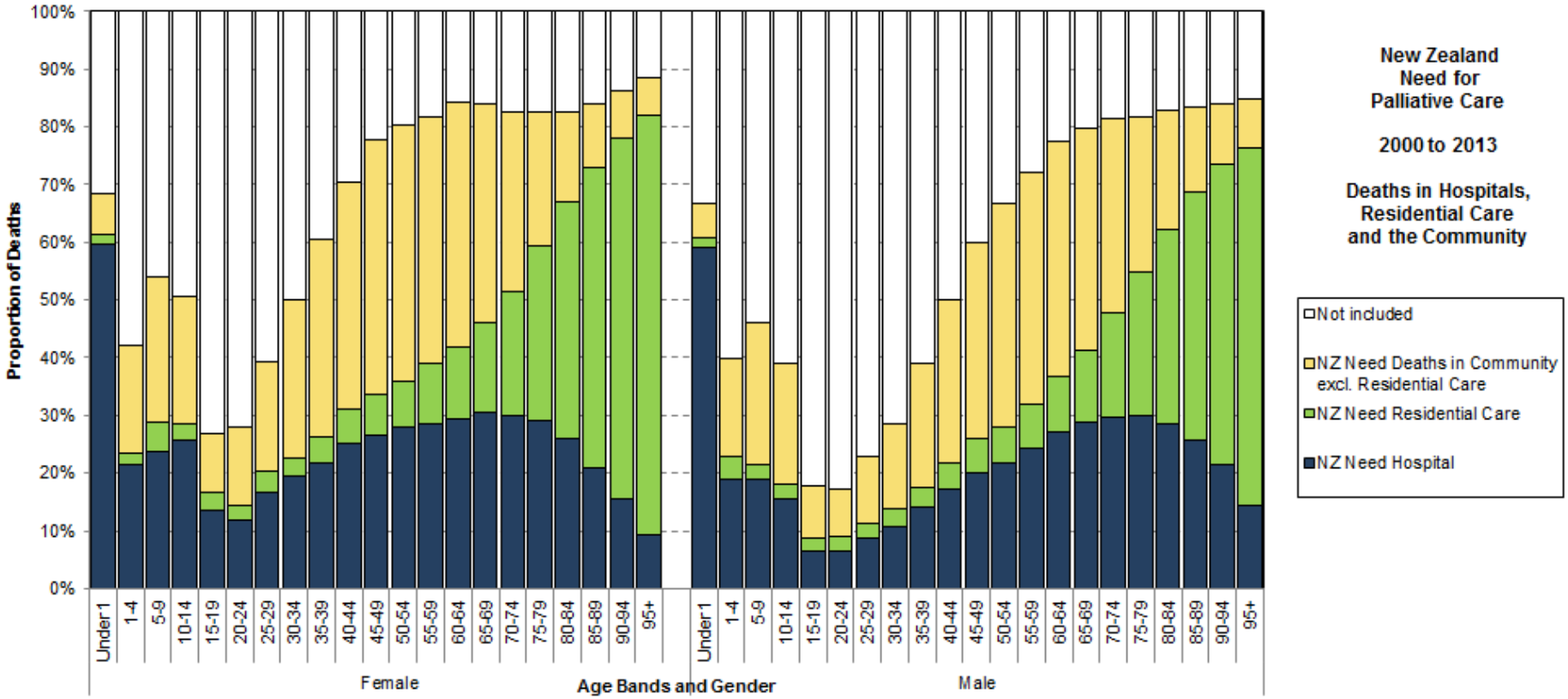
Need for Palliative Care - Place of Death, 2000-2013



Deaths in residential care are proportionately higher for the need for palliative care group, at **39.5%** (compared to **31.4%** for all deaths).

Data Source: Ministry of Health MORT data 2000-2013

NZ Need for Palliative Care - Hospitals and Residential Care



Deaths in public hospital and residential care are mutually exclusive. The balance of deaths under the NZ Need for Palliative Care is shown as being in the community, excluding residential care. NB: This is place of death and not place of care.

Data Source: Ministry of Health MORT data 2000-2013

Comment on Community Definition

The community, excluding residential care, is NOT equal to the coverage of hospice care.

For hospice patients, deaths occur in hospice IPU, in private residences, in public hospitals and in residential care, with a few in other settings.

Important to remember that this analysis uses place of death and not place of usual care:

- People moving between residential care and hospital.
- People moving between private residence and hospice IPU.
- People moving between private residence and hospital.
- Other more complex trajectories.

Hence estimate NZ Need for Hospice Care using a different approach, as used in the Hospice NZ Demand Model (used for new collaborations between hospices and residential care).

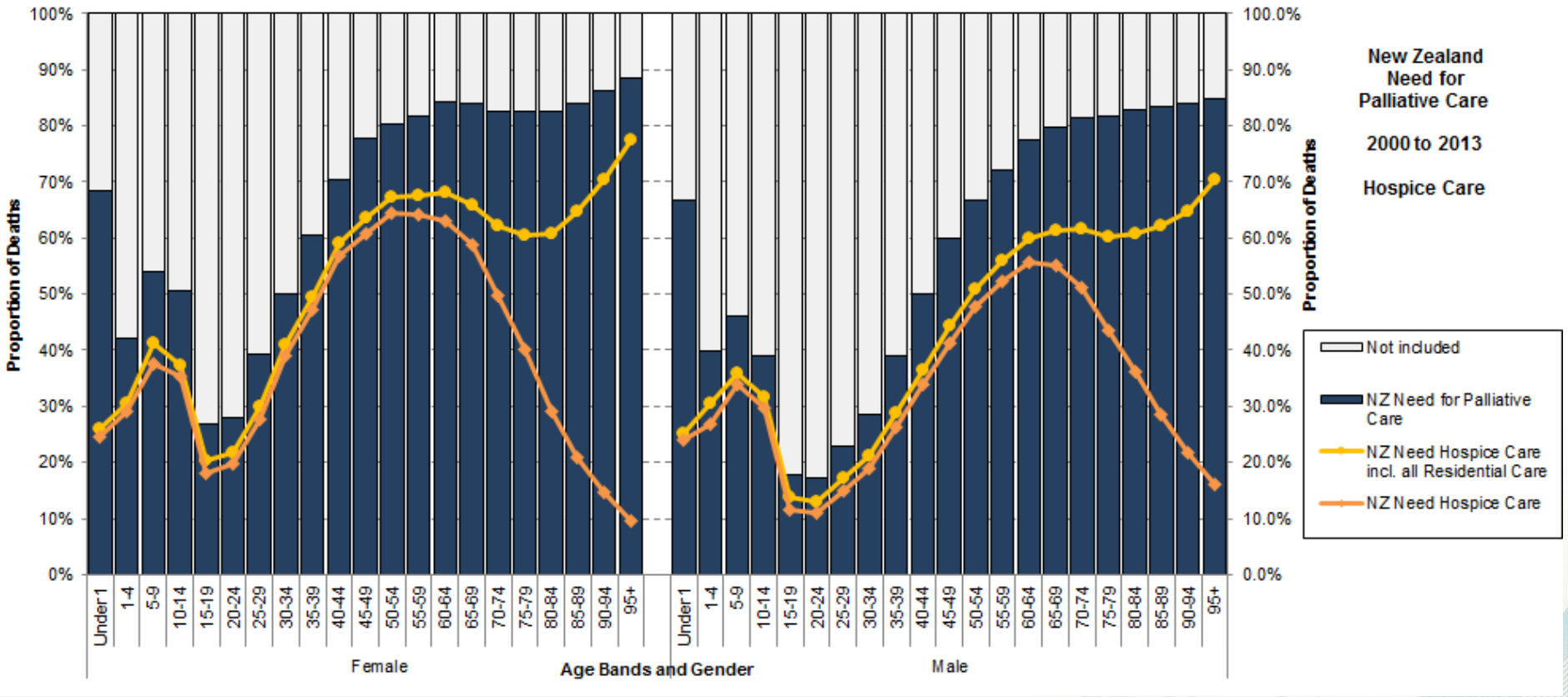
Conceptual Need for Palliative Care - Hospice Care

Cause of Death	Place of Death					
	Public Hospital	Residential Care	Hospice Inpatient Unit	Private Residence	Other	Proportion by Cause of Death
Neoplasms	All deaths	All deaths	All deaths	All deaths	All deaths	100.0%
Circulatory System	None	All deaths	All deaths	48.5%	None	46.2%
Other Conditions	None	All deaths	All deaths	53.2%	None	50.1%
Maternity	None	None	None	None	None	0.0%
Perinatal and Congenital	Congenital only	All deaths	All deaths	Congenital only	Congenital only	53.0%
External Causes	None	All deaths	All deaths	Sequelae only	None	9.0%
Proportion by Place of Death	24.7%	100.0%	100.0%	64.9%	11.3%	60.7%

Hospice care might be in a supportive role to residential care or in some cases might be direct care - models of collaboration are evolving.
This gives a lower need for Hospice Care of **36.6%** and an upper need of **60.7%** of all deaths. The lower estimate has only neoplasms and congenital deaths in residential care, while the latter has all deaths in residential care.

Data Source: Ministry of Health MORT data 2000-2013

NZ Need for Palliative Care - Hospice Care



The need for hospice care is shown relative to the overall NZ Need for Palliative Care. Two versions are shown, the lower line with only cancer deaths and congenital deaths in all settings (close to existing practice) and the upper line adding support to all deaths in residential care.

Data Source: Ministry of Health MORT data 2000-2013

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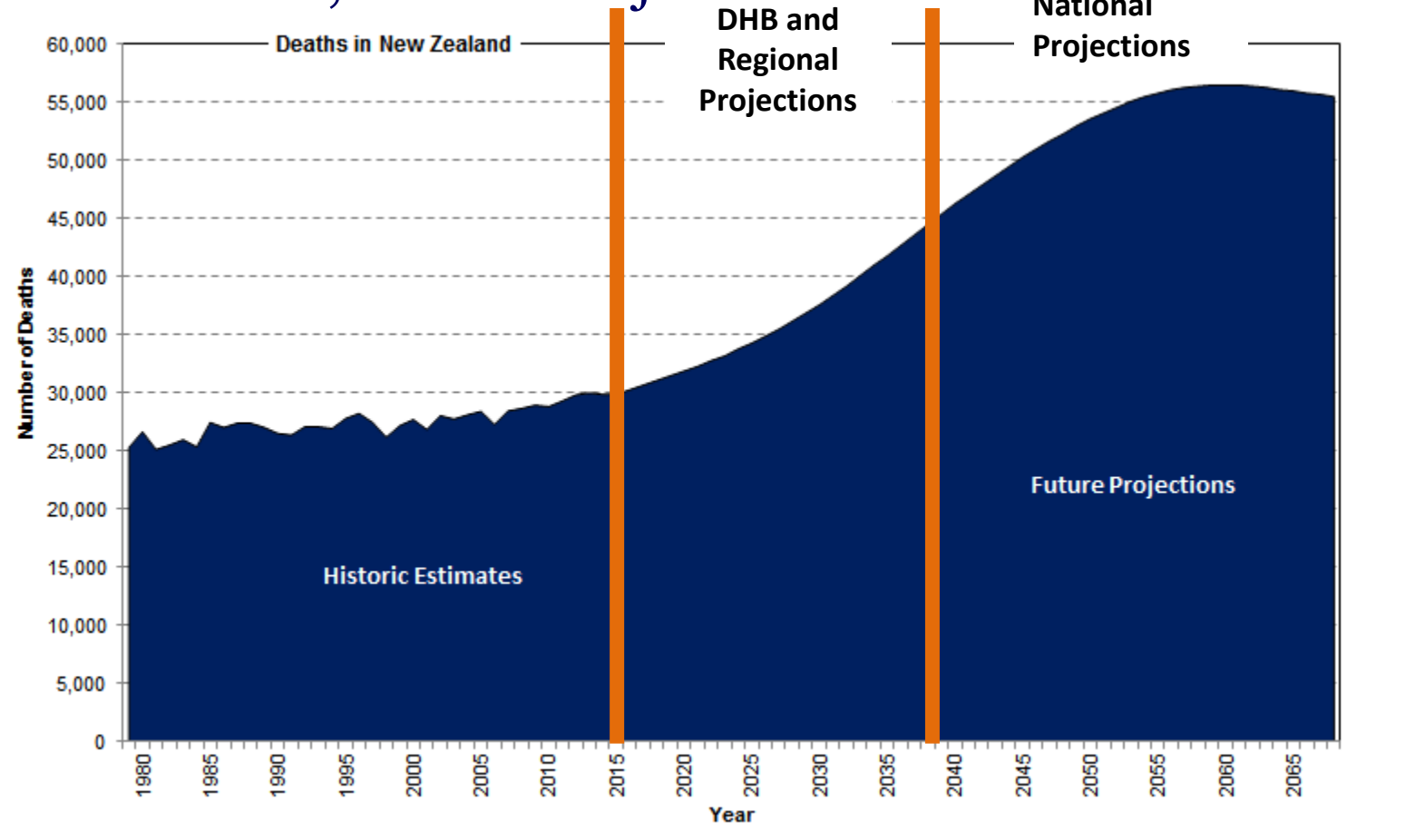
Projected Need for Palliative Care

New Zealand 2016-2068 National, with scenarios

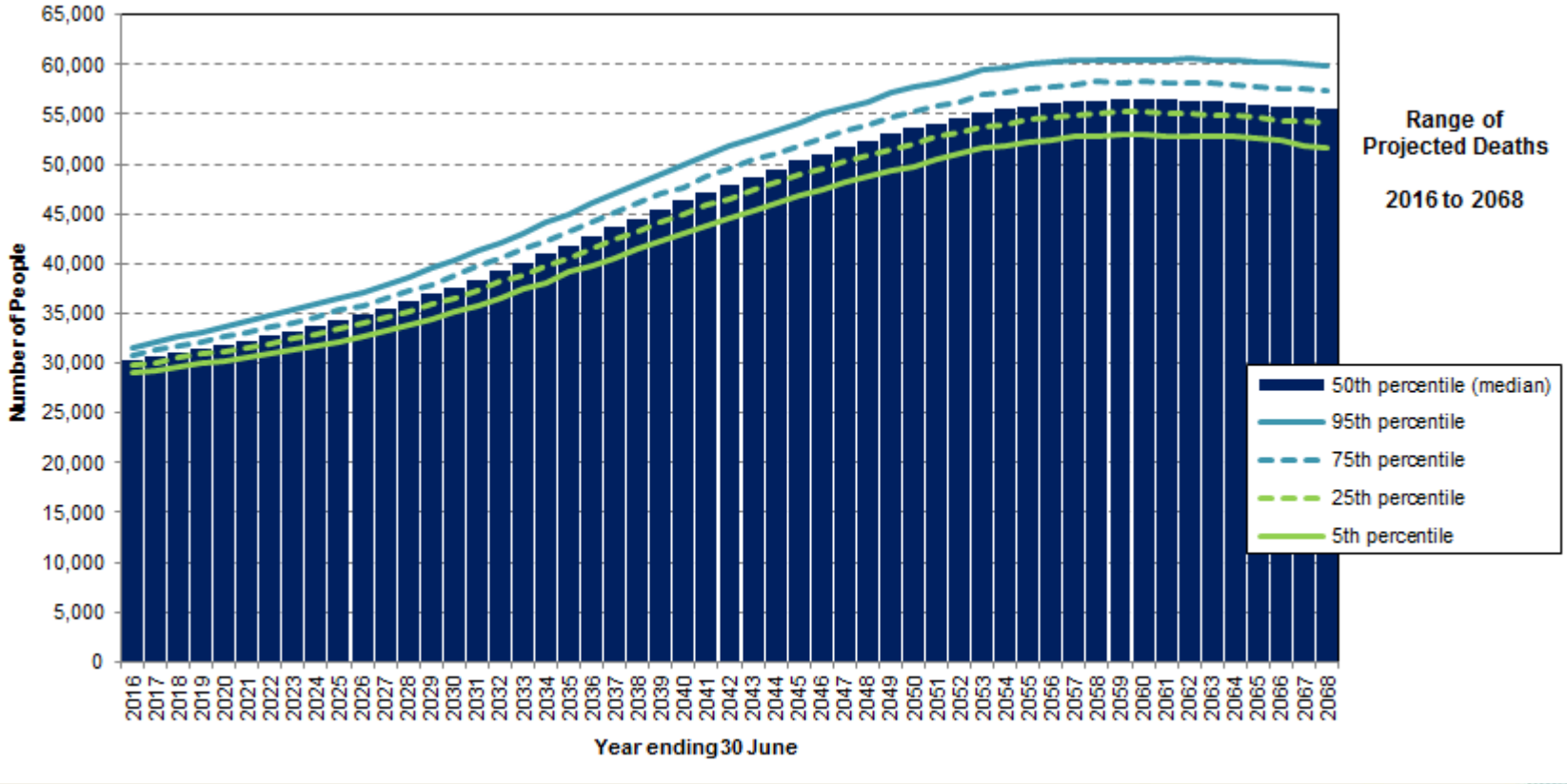
Historic Deaths, Future Projections



The median projection from Statistics New Zealand is that deaths will rise from around 30,000 a year to 55,500 a year by 2068. The more detailed national, regional and DHB projections are to 2038.

Data source: Statistics New Zealand. Historic estimates and National population projections, 2014(base)-2068

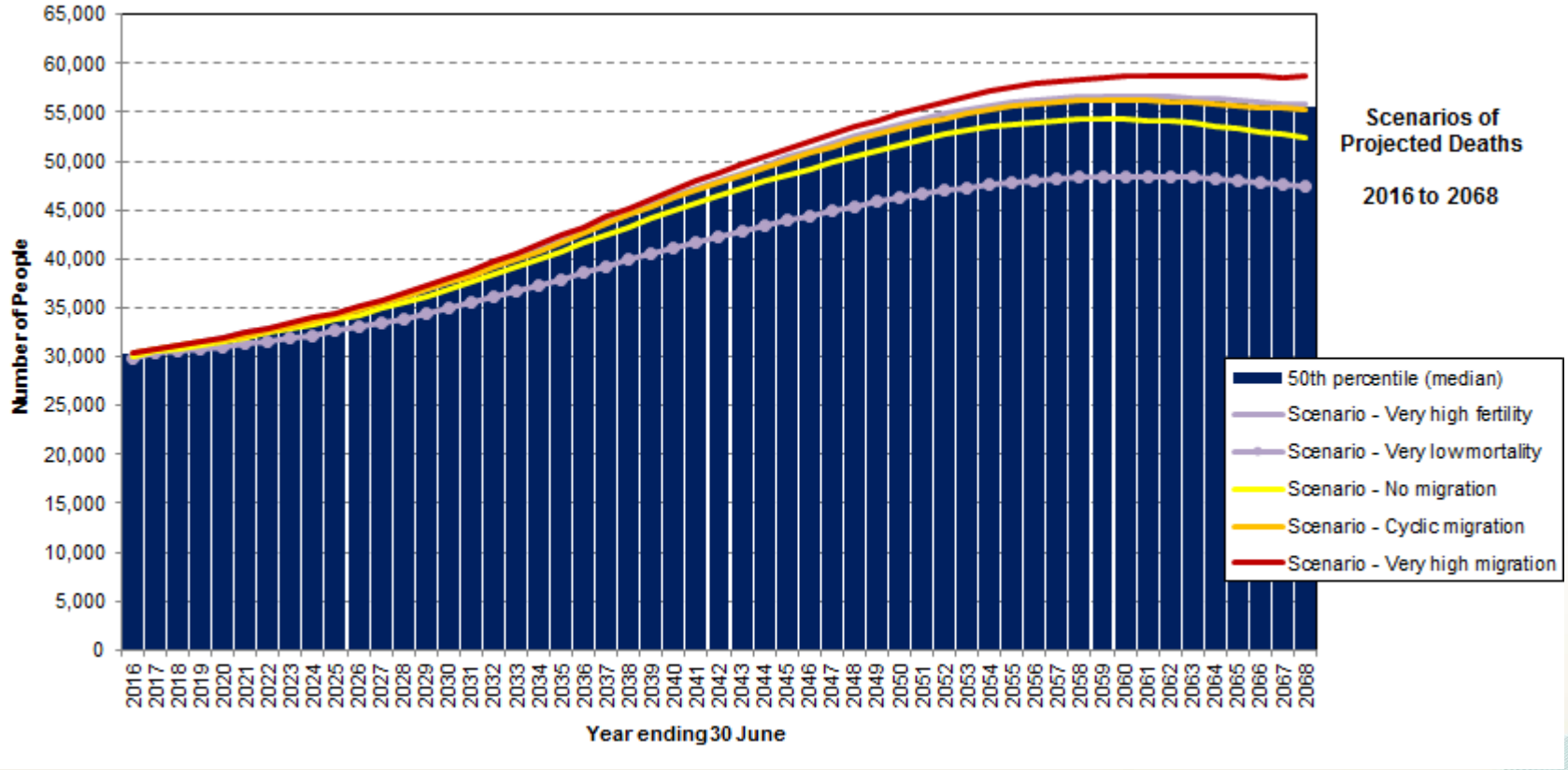
Projected Deaths 2016-2068



Statistics NZ use a stochastic (probabilistic) approach to projections. The median projection is the 50th percentile (half the projections are larger and half smaller than this number). The graph illustrates the range of uncertainty from the 5th to the 95th percentile and the expanding "funnel of doubt" in the projections.

Source: National Model of the Need for Palliative Care

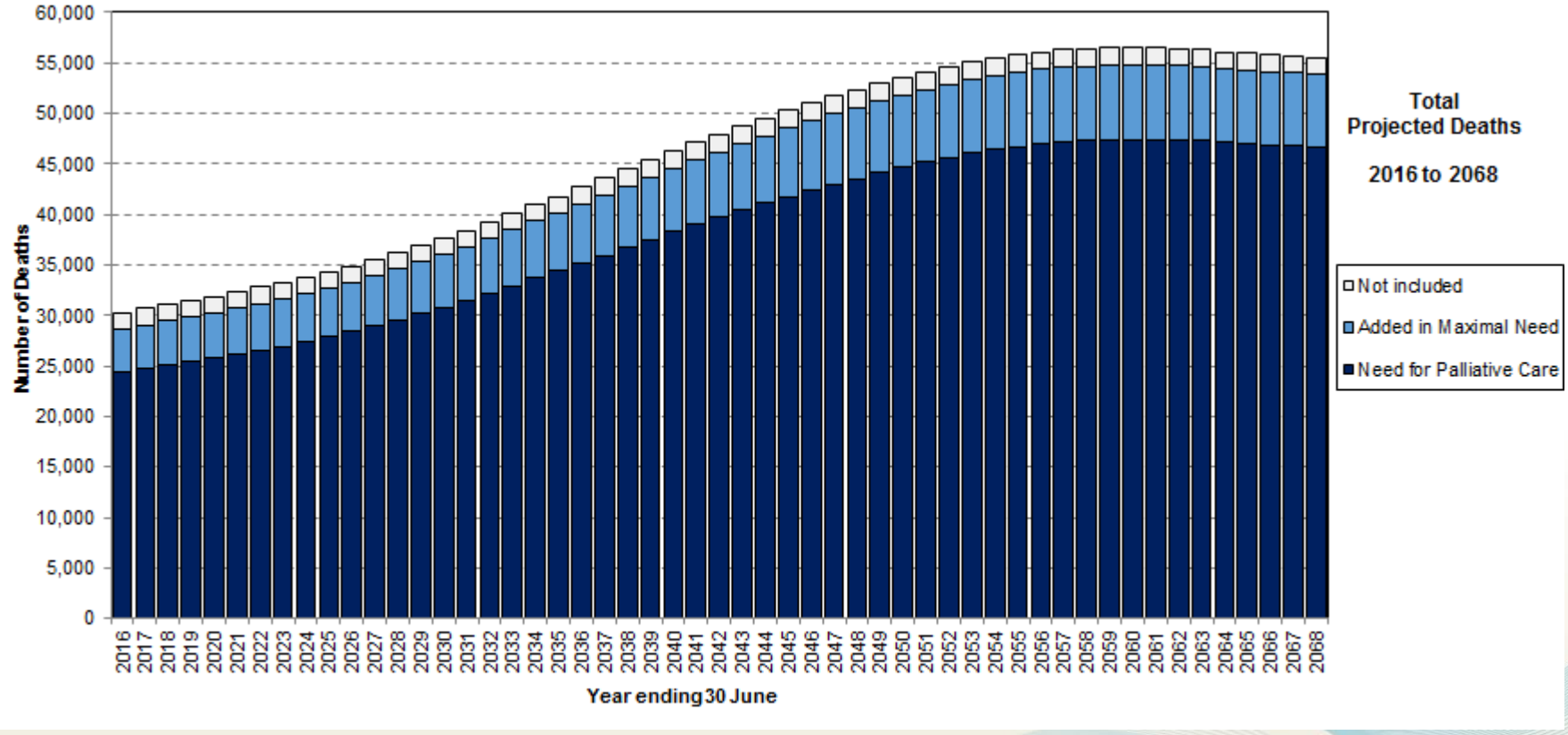
Projected Deaths 2016-2068



Statistics NZ also produce projections using five defined scenarios. Three of these are for estimates of migration (none, cyclic and very high). The very high fertility scenario has little impact on deaths compared to the median projection. Of interest is the very low mortality projection.

Source: National Model of the Need for Palliative Care

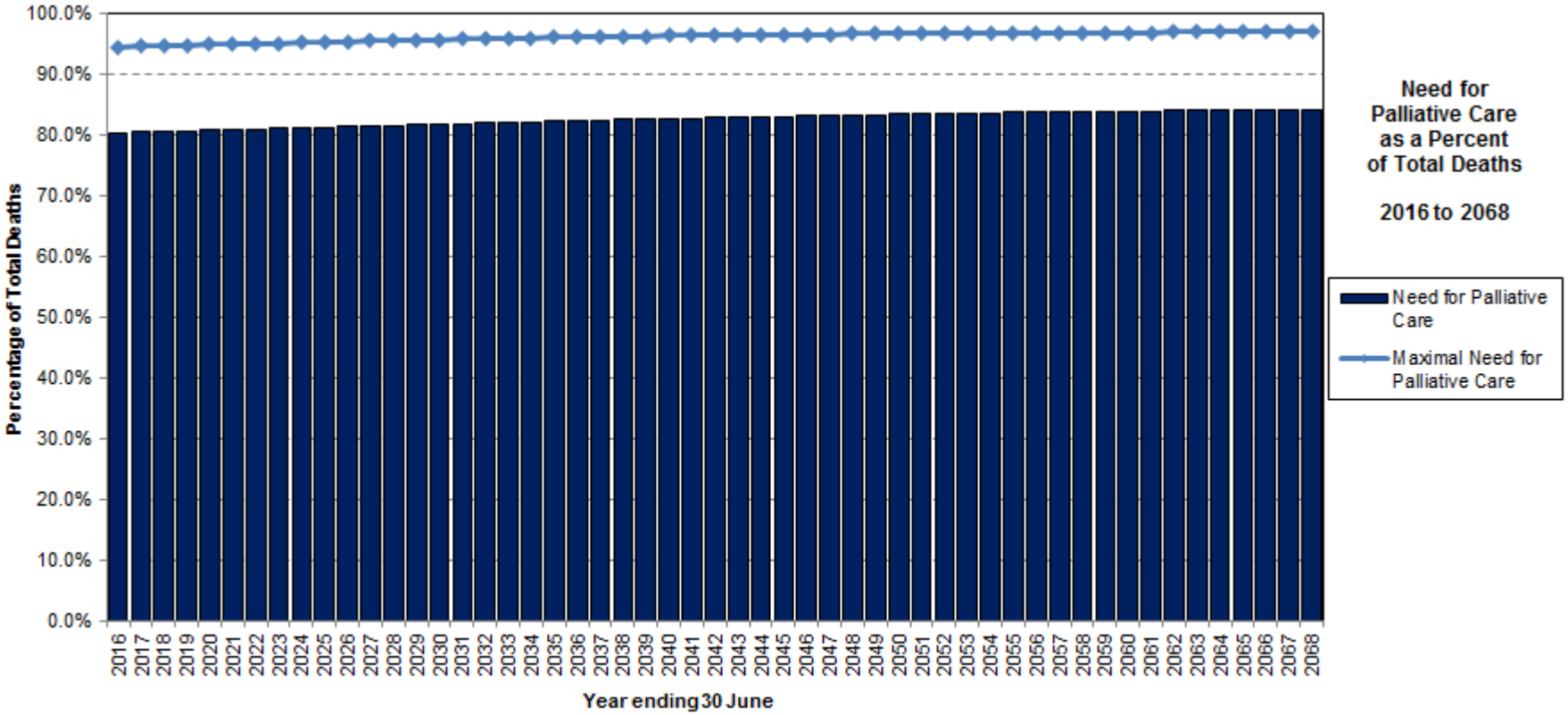
Projected Need for Palliative Care 2016-2068



This illustrates the NZ Need for Palliative Care, the NZ Maximal Need for Palliative Care and the deaths not included in the definition of need, projected from 2016 to 2068.

Source: National Model of the Need for Palliative Care

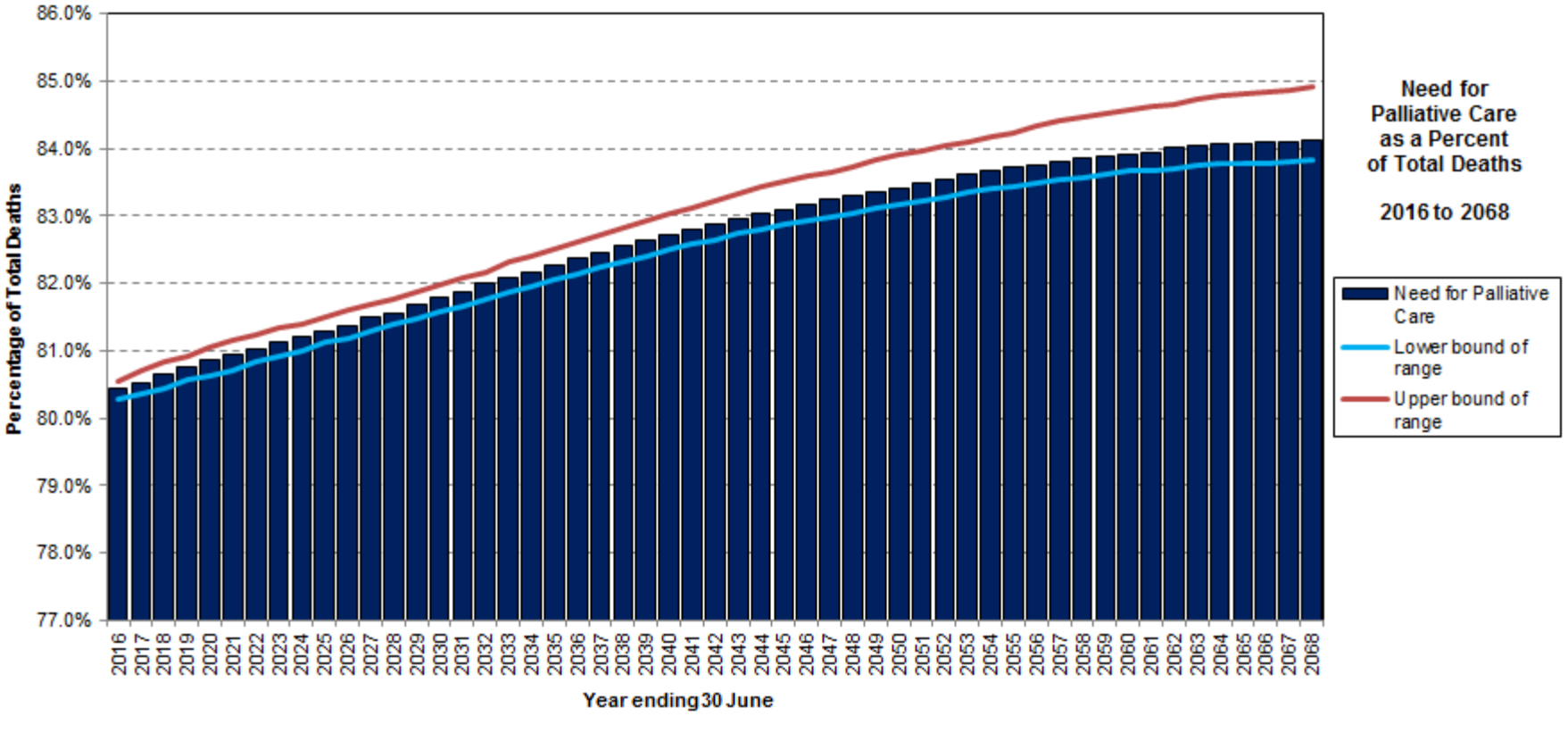
Projected Need 2016-2068 – Percentage of Total Deaths



Over the period from 2016 to 2068, the proportion of deaths in the NZ Need for Palliative Care increases slightly as the population ages.
[see next graph using a different scale]

Source: National Model of the Need for Palliative Care

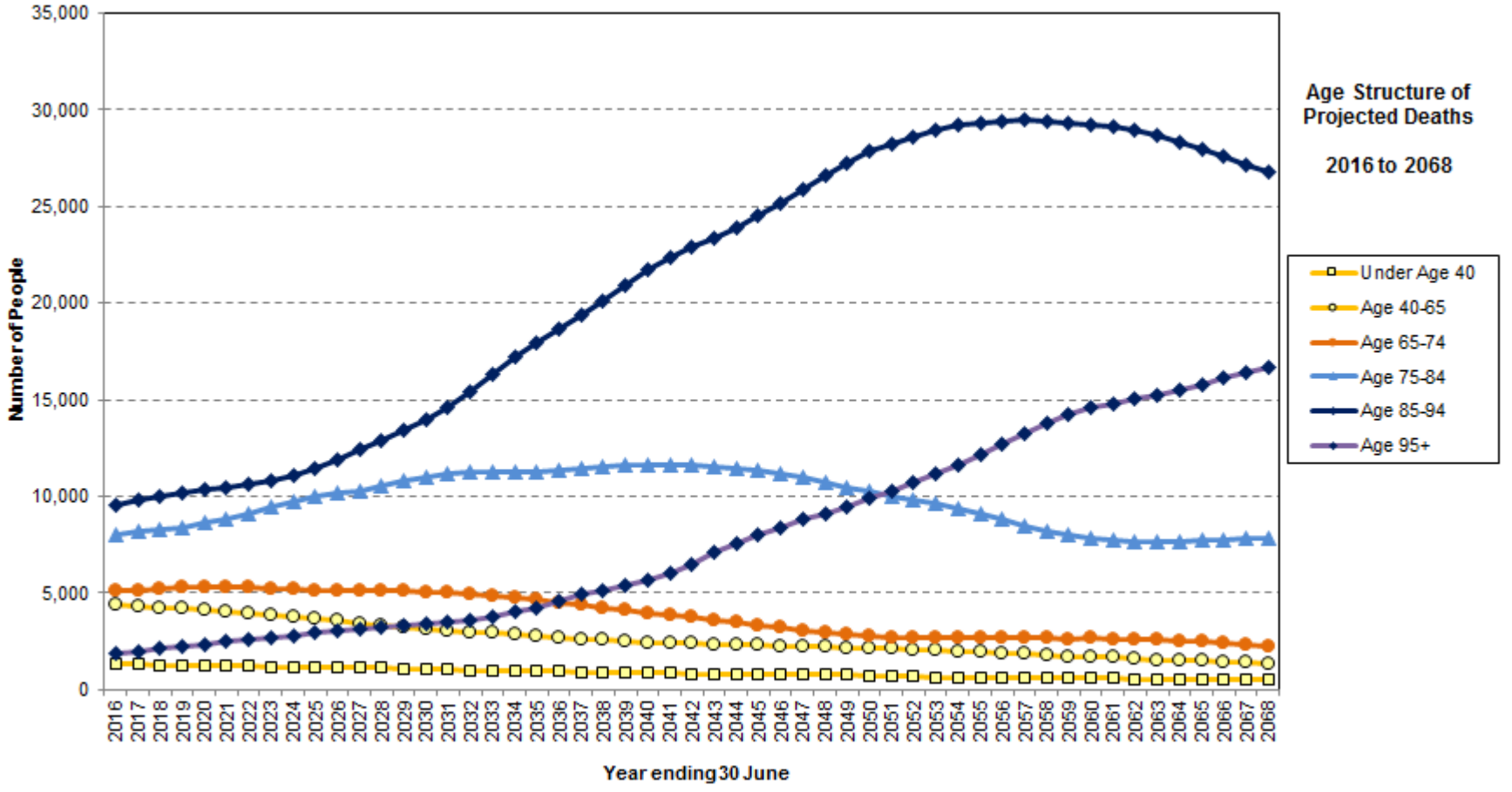
Projected Need 2016-2068 - Percentage of Total Deaths



Note: x-axis does not start at zero. The most important feature, for all projections, is that the proportion of need as a percentage of total deaths increases as the population ages. For the median projection the proportion increases from **80.4%** in 2016 to **84.1%** of total deaths in 2068.

Source: National Model of the Need for Palliative Care

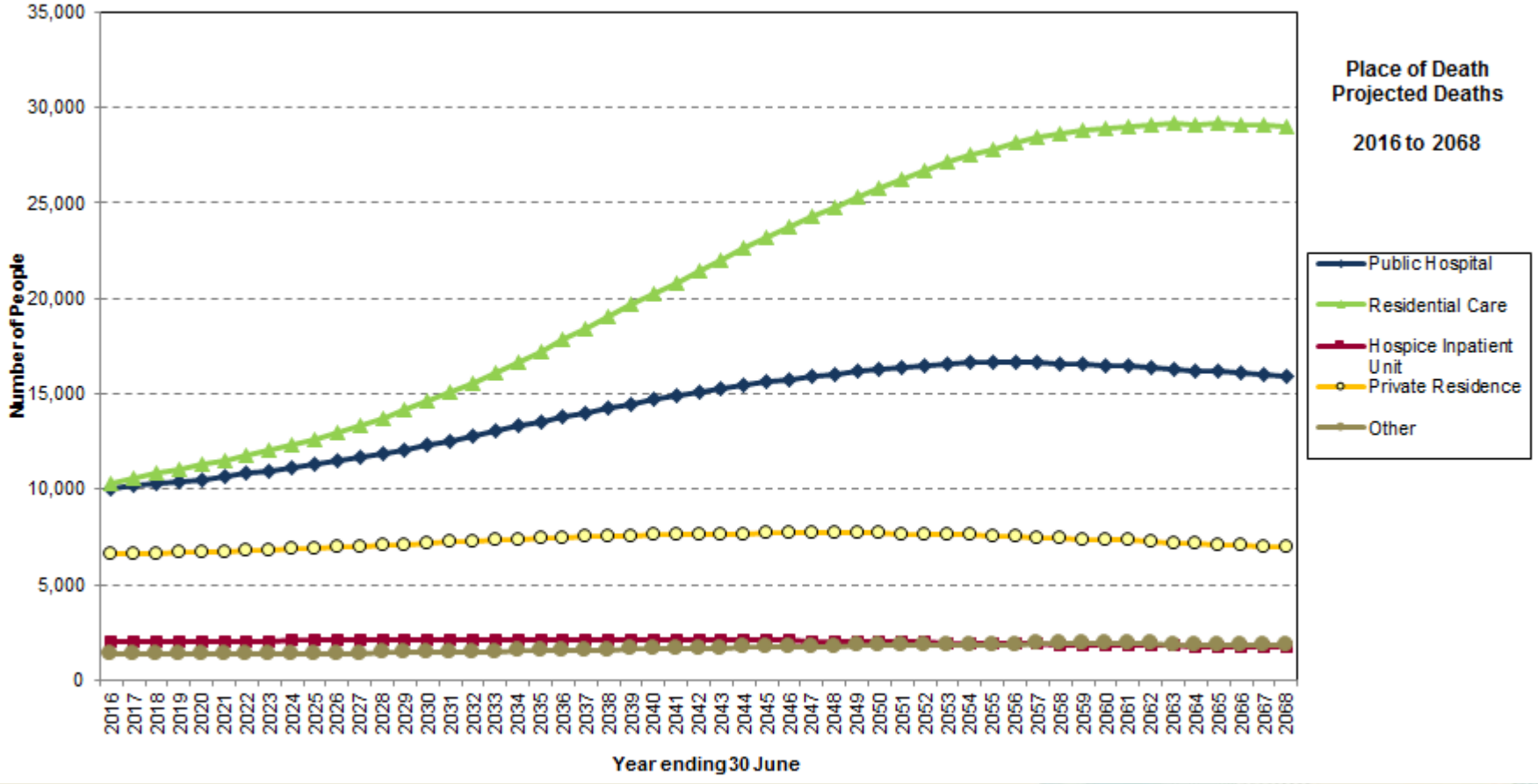
Projected Deaths 2016-2068 - Age Bands



Using the median projection, note the very large increases in deaths age 85-94 and age 95+. The increase in deaths age 95+ is most noticeable in the period from 2038 to 2068.

Source: National Model of the Need for Palliative Care

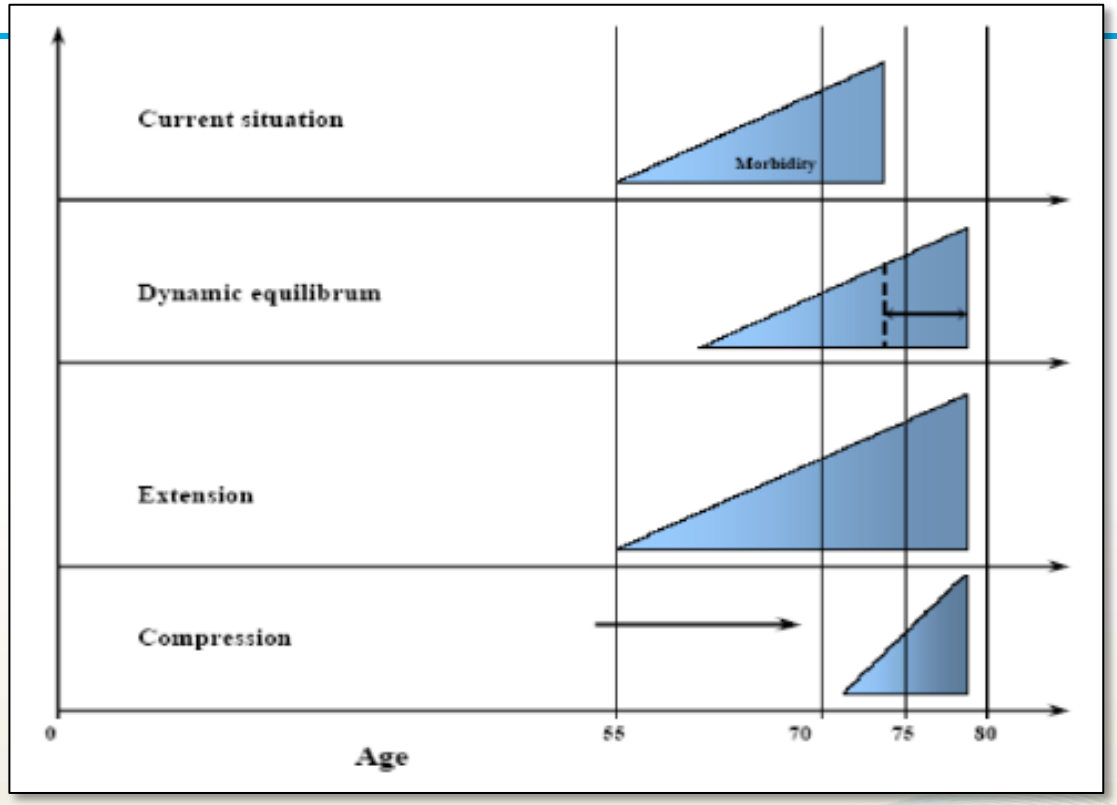
Projected Deaths 2016-2068 - Place of Death



If the historic patterns persist, then deaths in residential care are projected to increase from around 10,000 a year to nearly 30,000 a year by 2068.

Source: National Model of the Need for Palliative Care

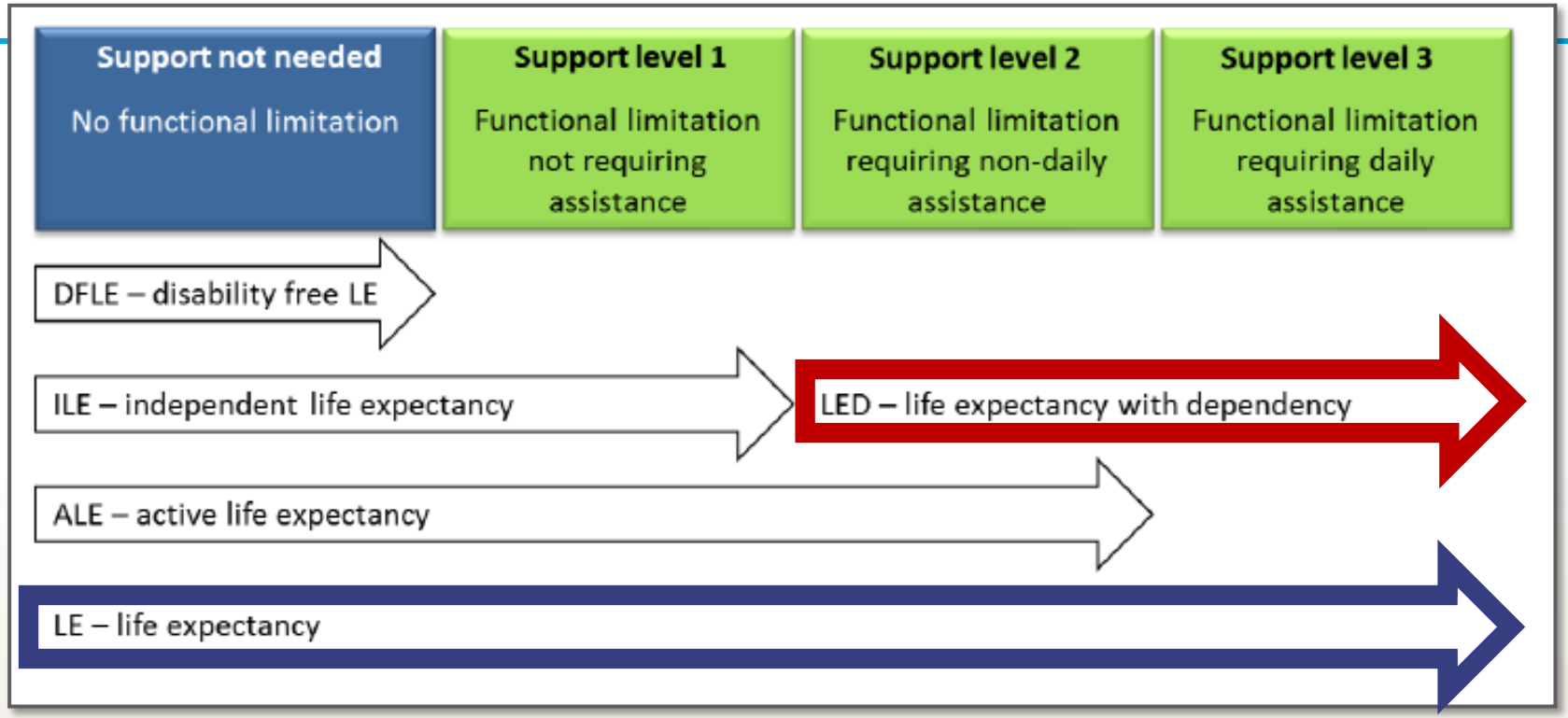
Relationship between Life Expectancy and Morbidity



Heated international debates on whether increased life expectancy leads to more, less or the same amount of disability.

Source: Astolfi, R., Lorenzoni, L., & Oderkirk, J. (2013). *A Comparative Analysis of Health Forecasting Methods. OECD Health Working Papers, No. 59.*

Independent Life Expectancy, 1996–2013



"Today people in New Zealand live longer in good health, but spend proportionally more time living with dependency than before."

Source: Adapted from Ministry of Health (2015) Independent Life Expectancy in New Zealand, 2013.

Independent Life Expectancy, 1996–2013

Between 1996 and 2013, independent life expectancy at birth increased.

But the proportion of years **lived independently (**relative to life expectancy) was lower than it was in 1996.

At the age of 65 years, New Zealanders can expect to live roughly half of their remaining lives independently.

Female New Zealander at **65 years of age** in 2013 can expect to live:

- another **10.6 years** independently, on average, which is 49.5% of her remaining life
- a further **10.7 years** with disability requiring assistance
  - non-daily assistance for **5.9 years**
  - daily assistance for final **4.8 years**.

Source: Ministry of Health (2015) Independent Life Expectancy in New Zealand, 2013.

Allowing for Longevity

Similar to modelling approach for long-term care and healthcare used by National Treasury. Modelled for the 2013 Statement on the Long-term Fiscal Position.

Use increase in the period life expectancy at birth to "stretch" the patterns to the right.

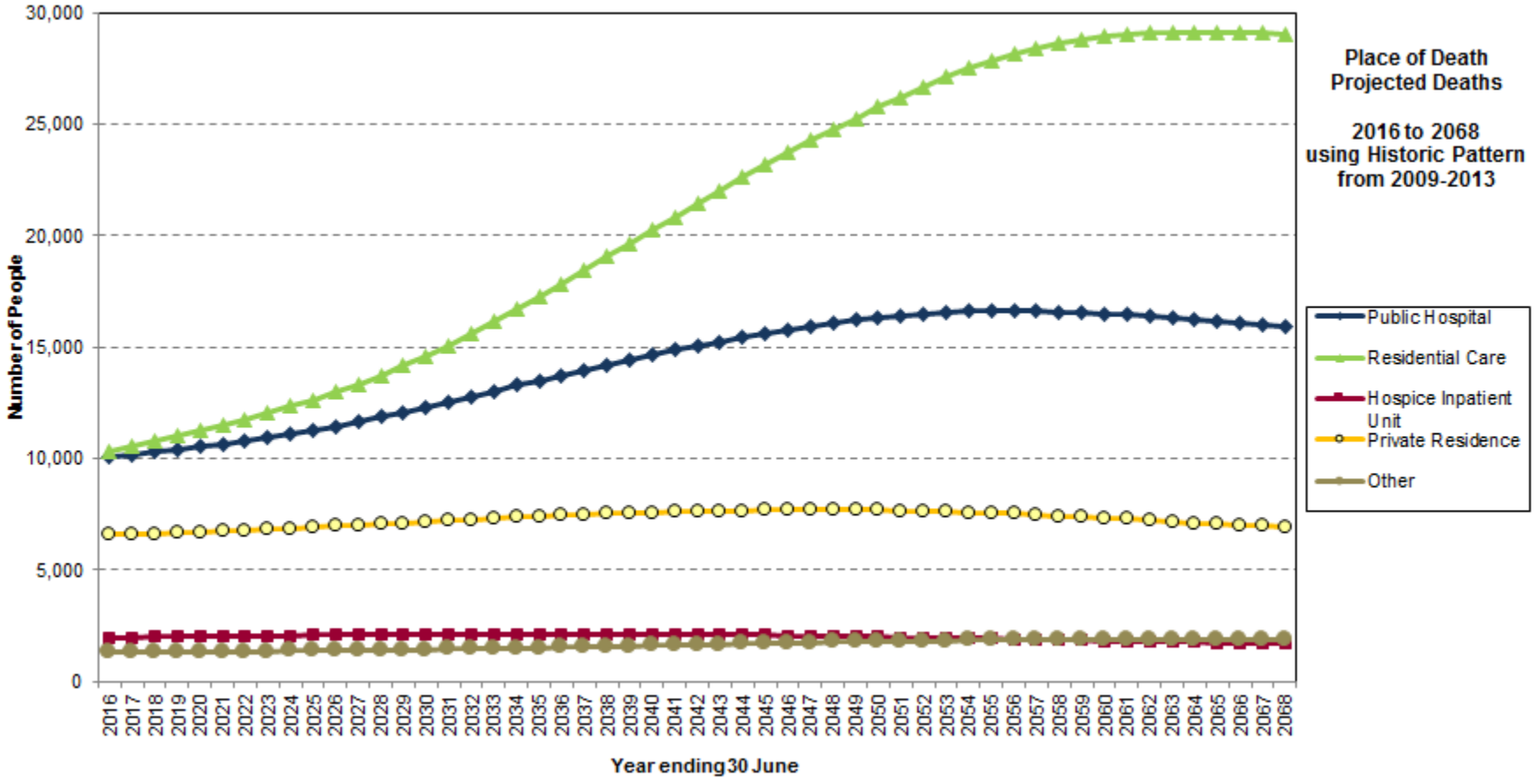
Statistics NZ median projection assumptions in 2068:

- Women will have period life expectancy at birth of **91.5 years**, up from 83.9 years now, an **increase of 7.6 years**.
- Men will have period life expectancy at birth of **89.0 years**, up from 80.2 years now, an **increase of 8.8 years**.

Approach effectively says "91 is the new 84" (for women) for the historic patterns.

Best estimate with data available – ideally need projections to much higher ages to stretch the final categories.

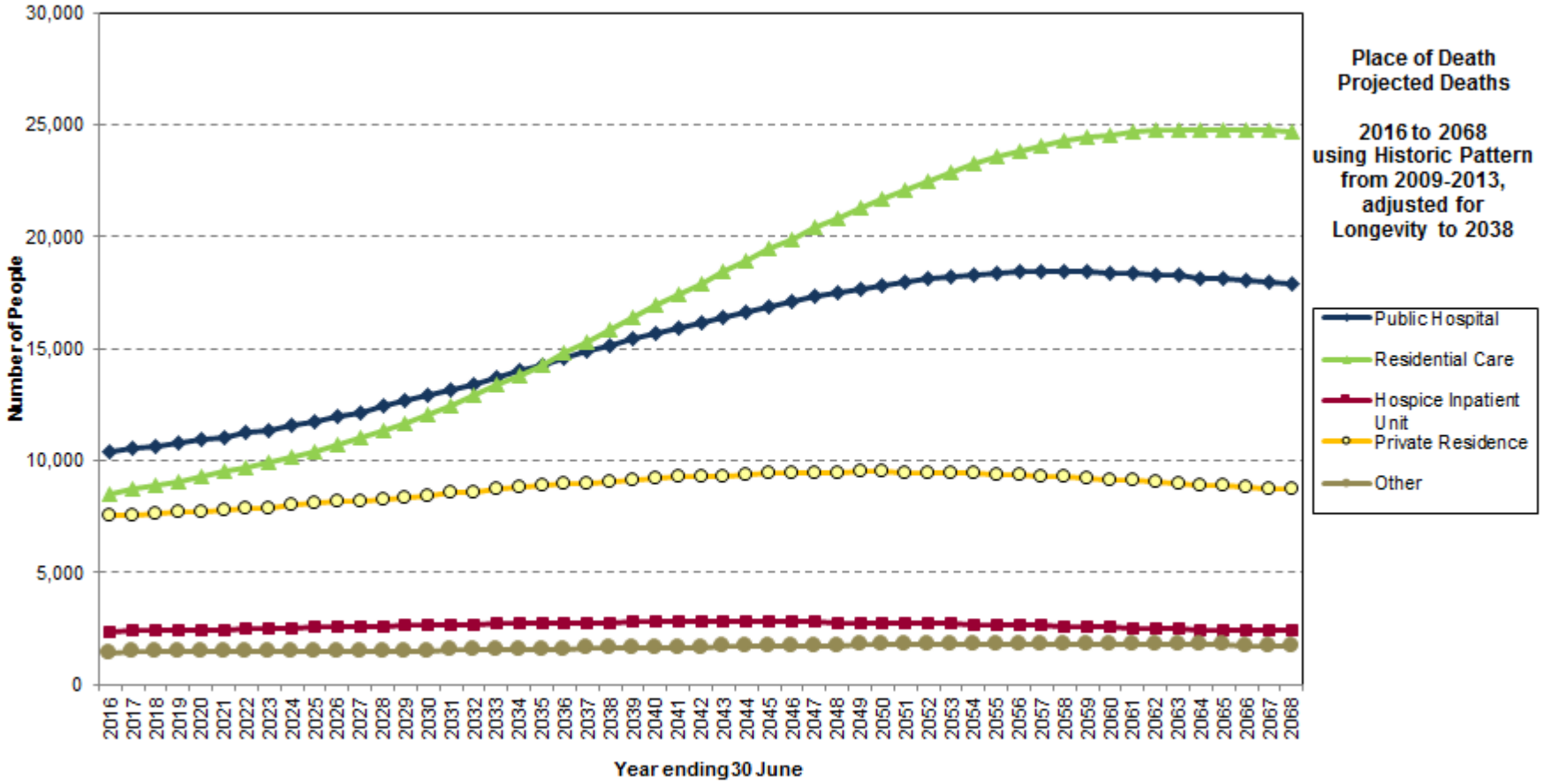
Projected Deaths 2016-2068 - Place of Death – historic pattern



If the historic patterns persist, then deaths in residential care are projected to increase from around 10,000 a year to nearly 30,000 a year by 2068.

Source: National Model of the Need for Palliative Care

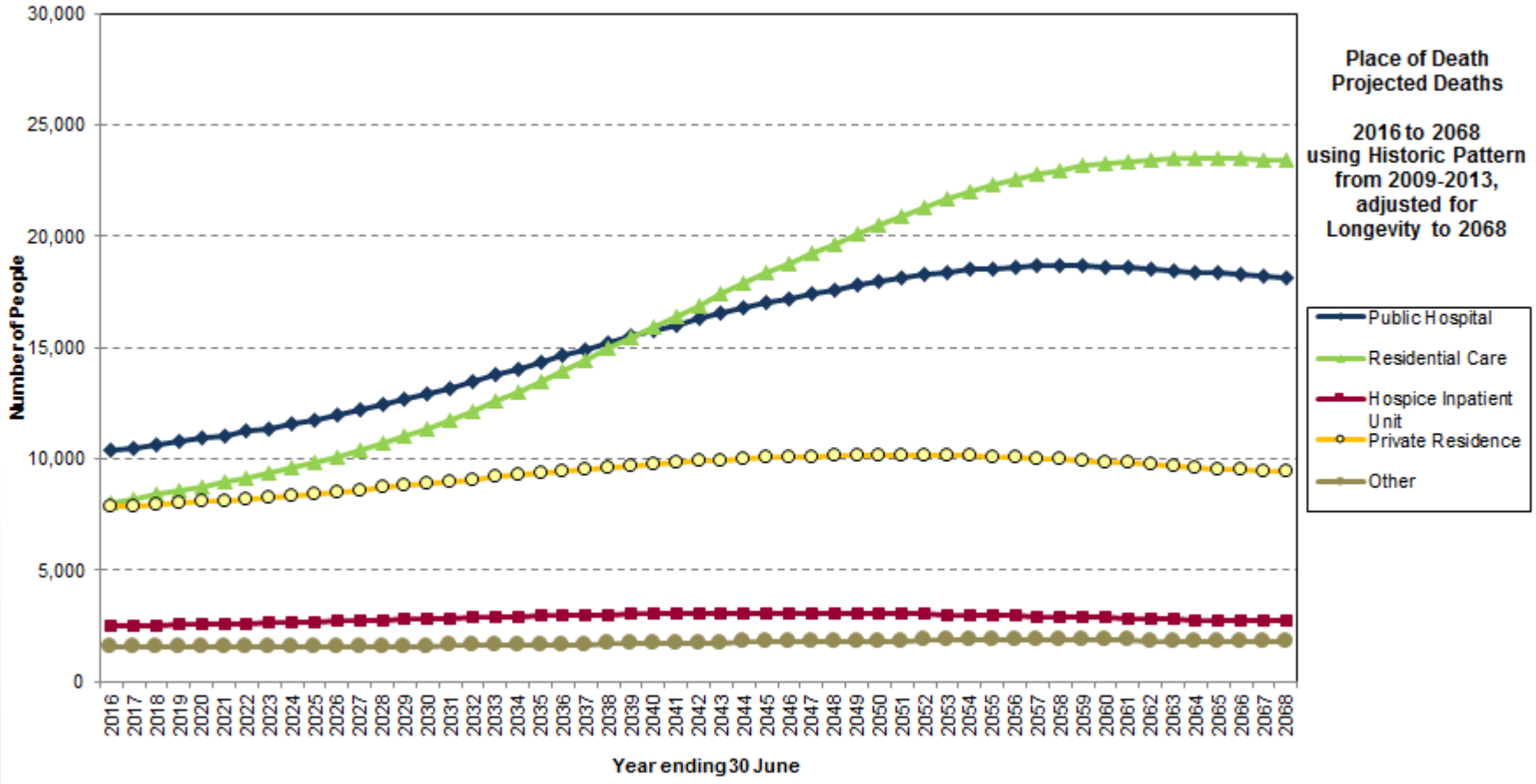
Projected Deaths 2016-2068 - Place of Death – pattern 2038



This uses the pattern from 2038, with assumed longevity in 2038. That 2038 pattern is then applied to the whole period. It is more likely that pattern would only evolve over the middle of the period.

Source: National Model of the Need for Palliative Care

Projected Deaths 2016-2068 - Place of Death – pattern 2068



This uses the pattern from 2068, with assumed longevity in 2068. That 2068 pattern is then applied to the whole period. It is more likely that pattern would only evolve over the latter part of the period.

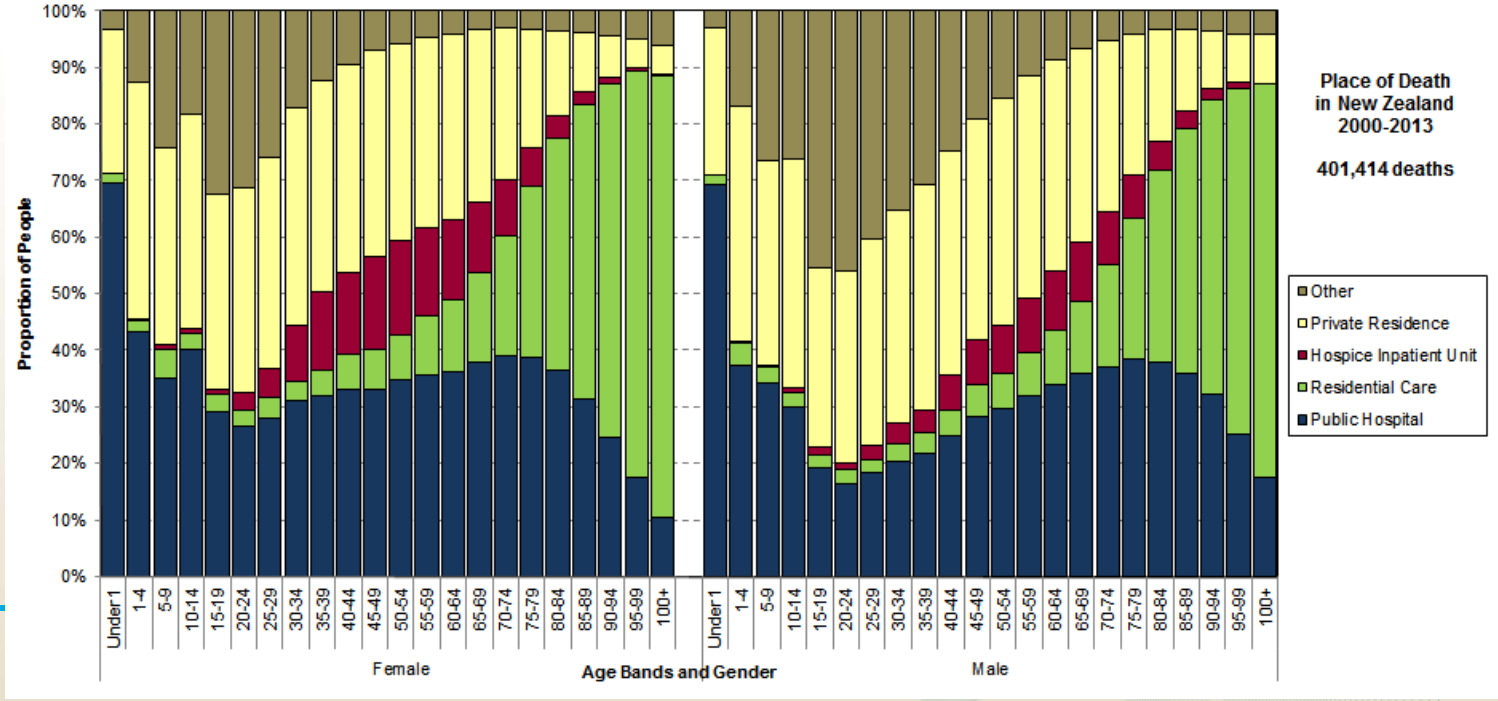
Source: National Model of the Need for Palliative Care

Commentary on Impact of Longevity on Patterns

We could model other scenarios, but the shape of the place of death has an increasing funnel for deaths in residential care at older ages.

Is it feasible to change that model in New Zealand?

Increasing frailty at the very end of life, people living alone and ageing of potential caregivers makes it very unlikely that we can switch deaths in residential care to deaths in private residence.



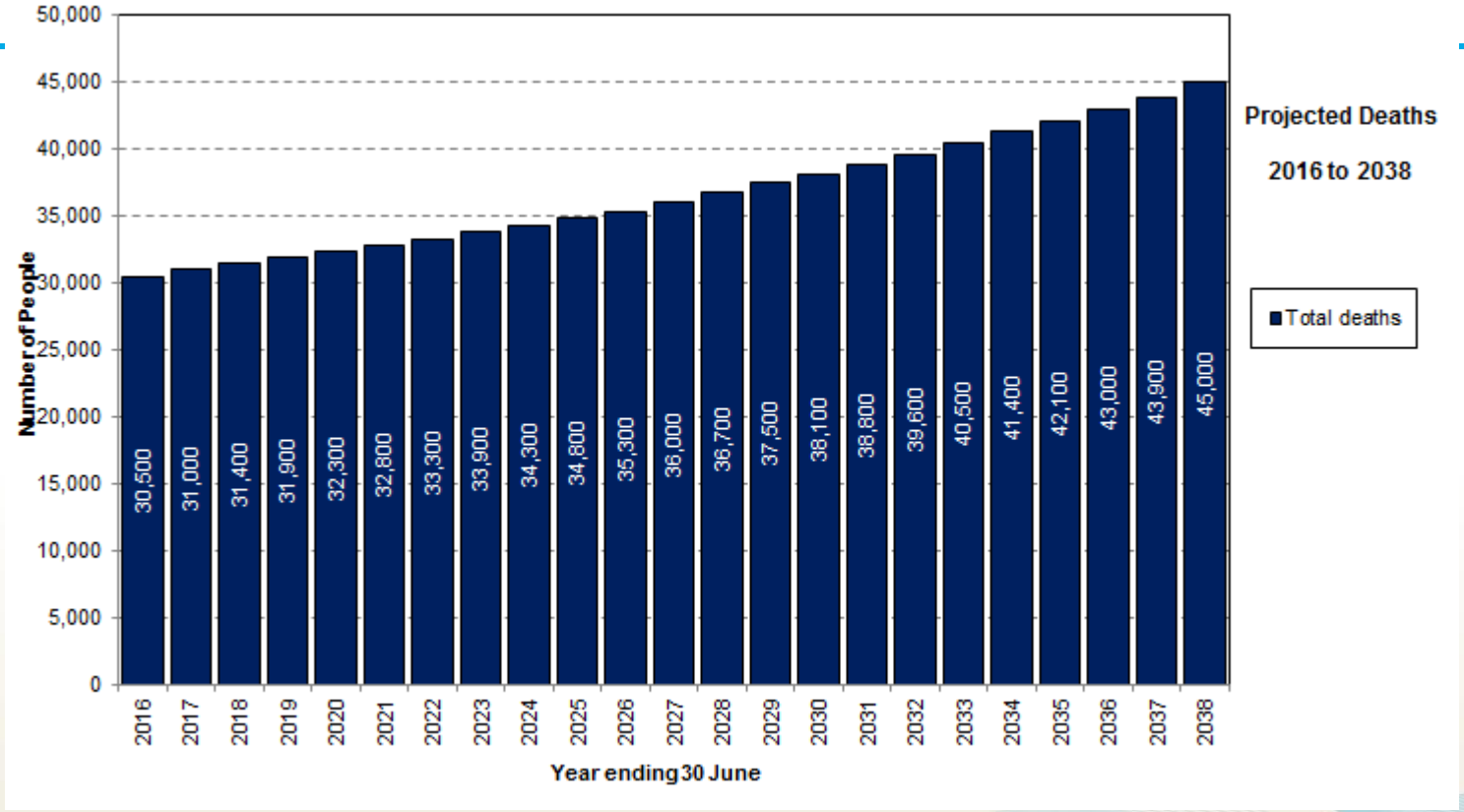
MINISTRY OF HEALTH
MANATŪ HAUORA

Projected Need for Palliative Care

New Zealand 2016-2038

National, Regional, Local

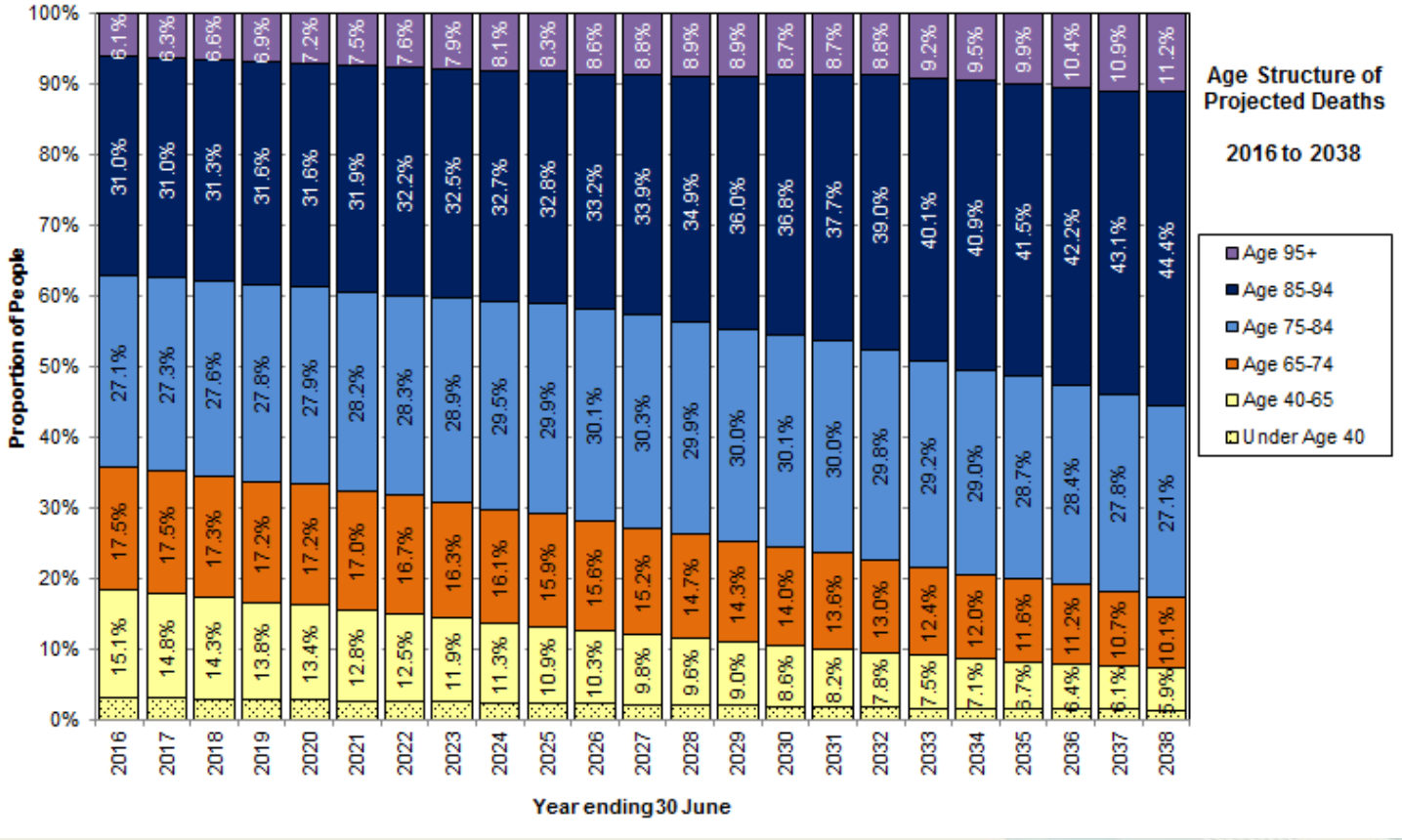
Projected Deaths - New Zealand 2016-2038



For New Zealand, deaths are projected to increase from **30,500** a year in 2016 to **45,000** a year in 2038, an increase of **47.5%**.

Source: National Model of the Need for Palliative Care

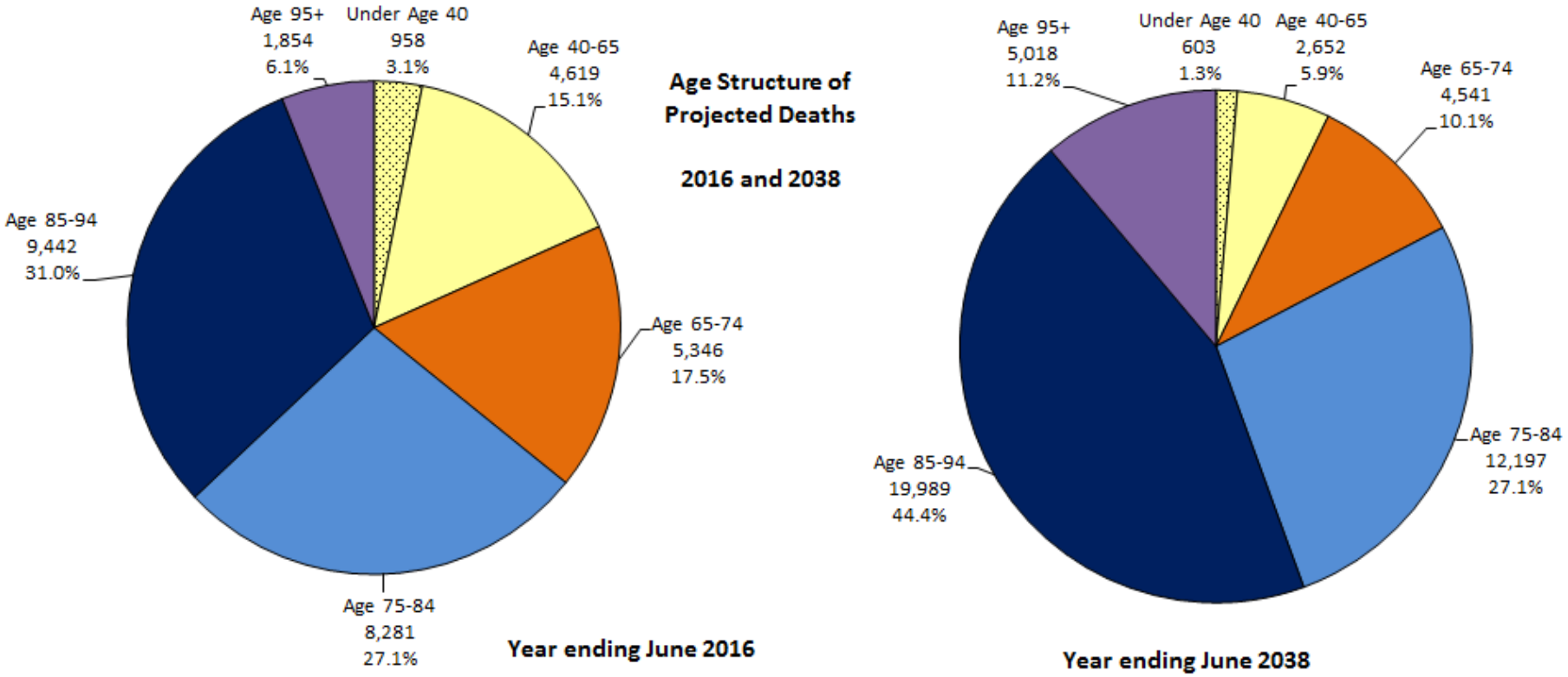
Age of Projected Deaths - New Zealand 2016-2038



Over the period of 22 years, deaths age 85 and over are projected to more than double from some **11,300** to **25,000,** an increase of **121%.** Proportionately, age 85+ goes from **37.0%** to **55.6%** of total deaths.

Source: National Model of the Need for Palliative Care

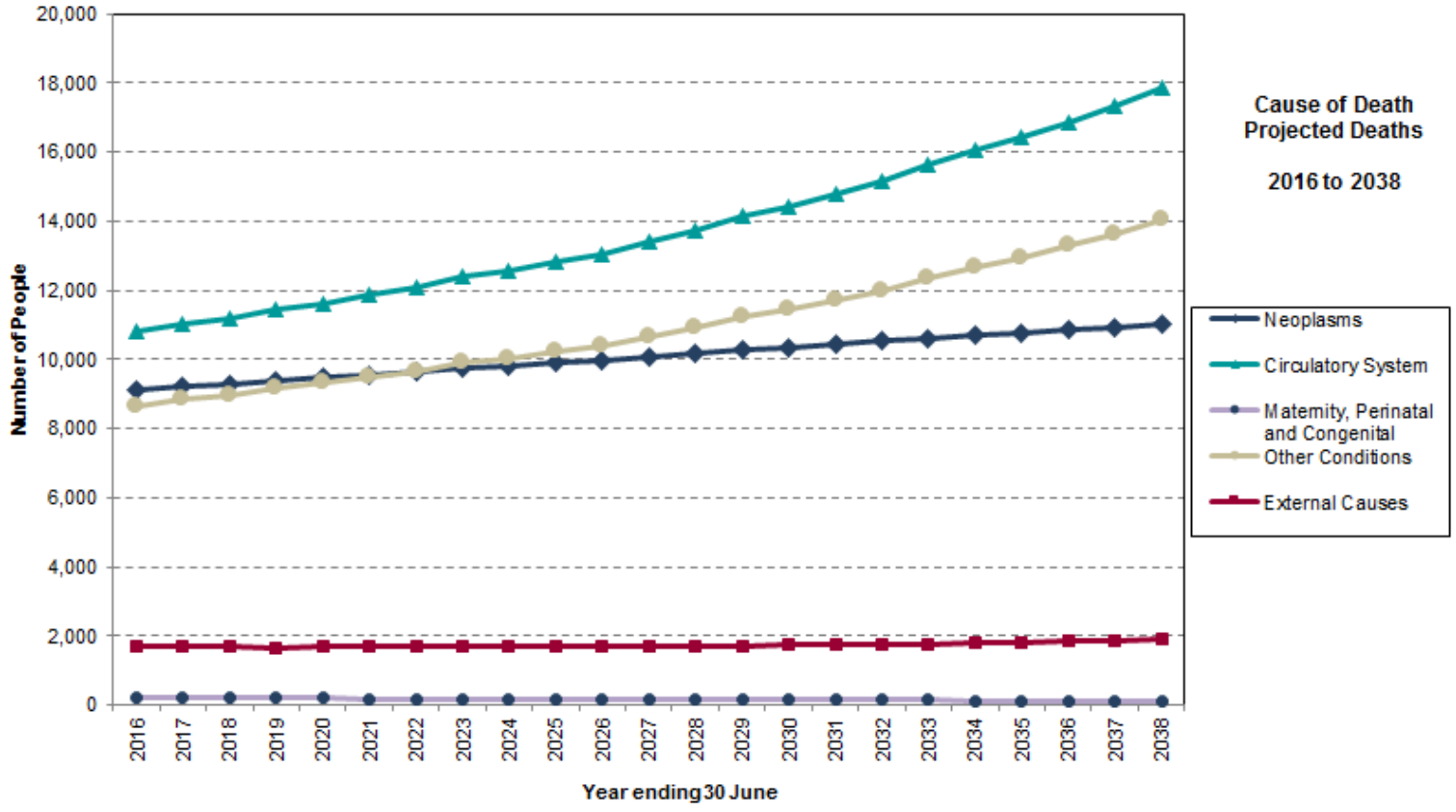
Age of Projected Deaths - New Zealand 2016 and 2038



Over the period of 22 years, deaths age 85 and over are projected to increase from **37.0%** to **55.6%** of total deaths. Deaths age 95 and over are projected to increase from **6.1%** to **11.2%** of total deaths.

Source: National Model of the Need for Palliative Care

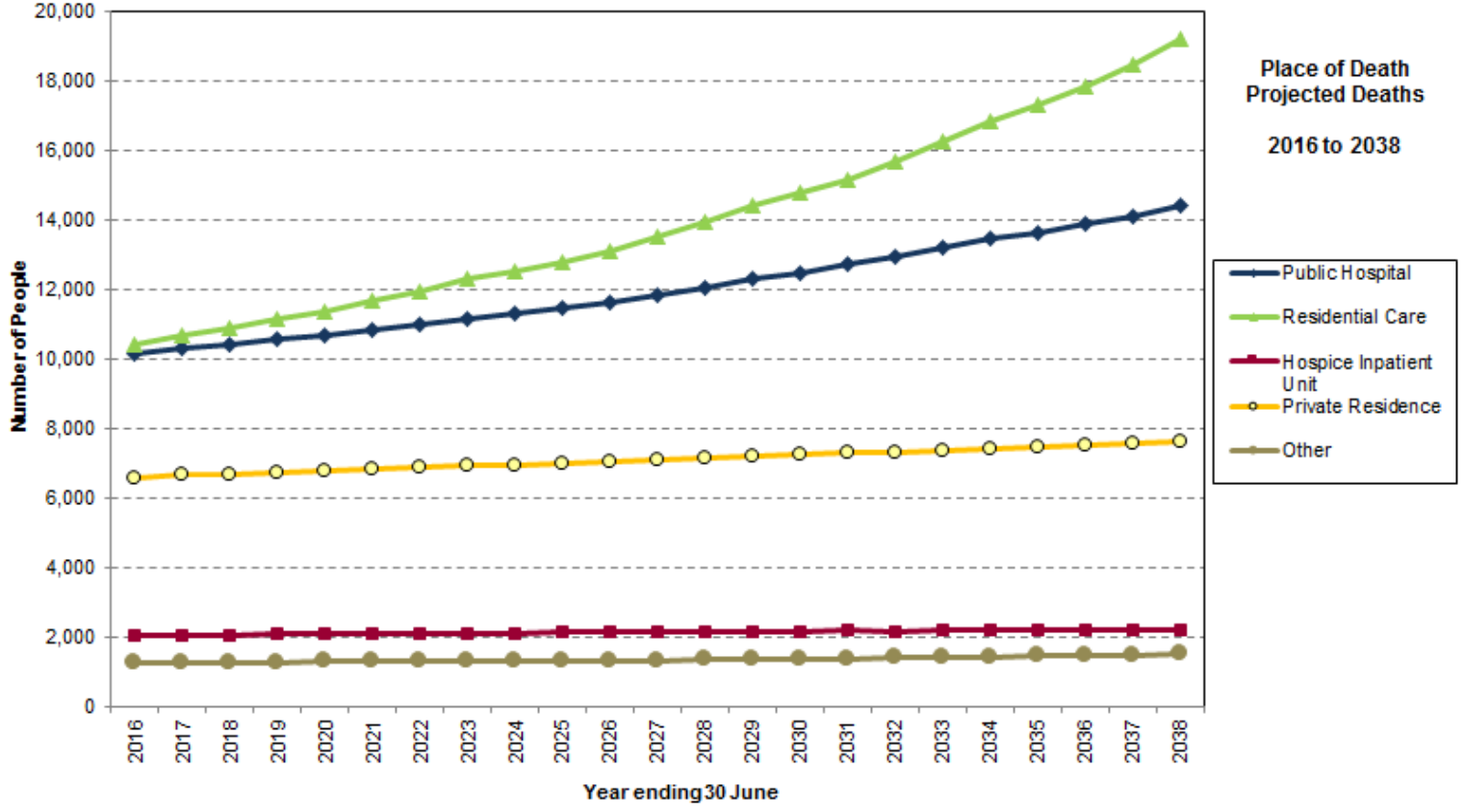
Projected Cause of Death - New Zealand 2016-2038



This is if historic patterns continue. If the long-term trend in reductions in deaths from cardiac conditions continues, the increase in numbers of deaths may switch from circulatory system conditions to other conditions.

Source: National Model of the Need for Palliative Care

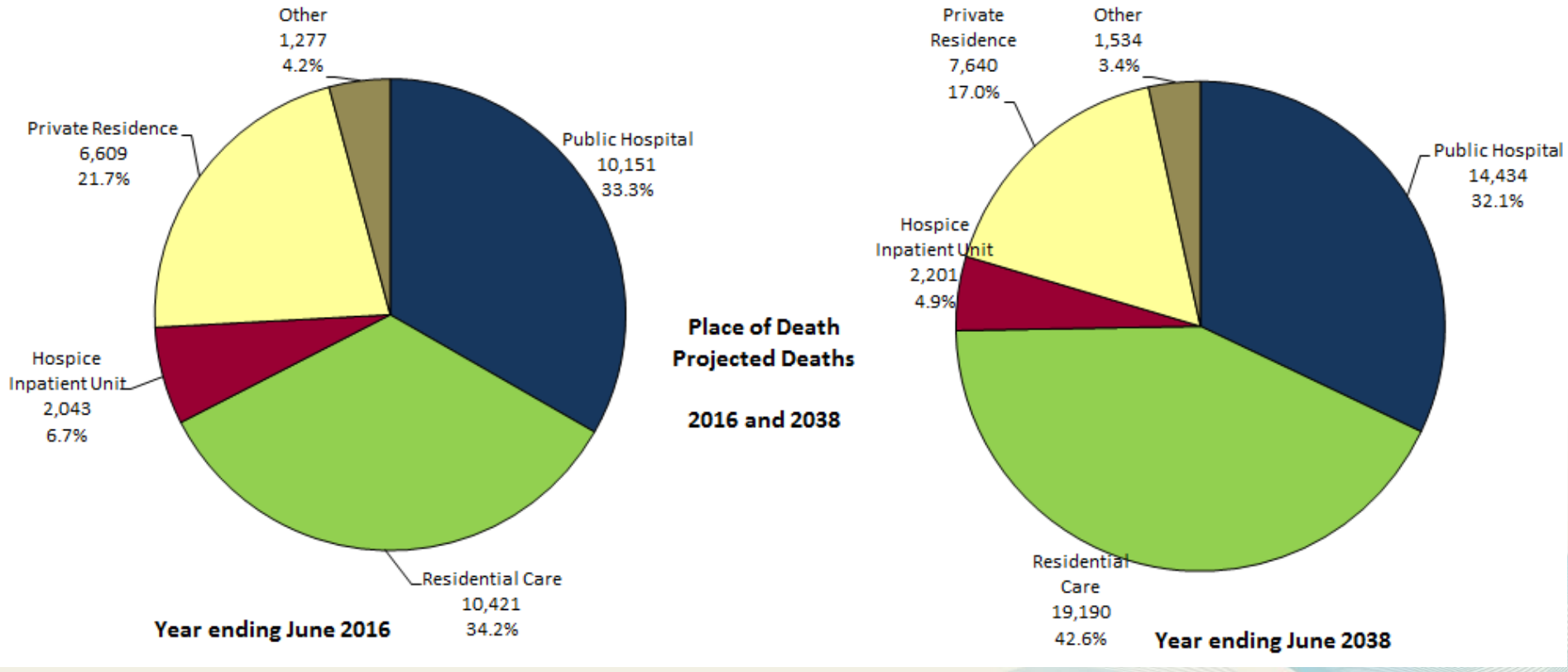
Projected Place of Death - New Zealand 2016-2038



Over this projection period, deaths in hospital continue to increase (**42.2%**), but not as fast as total deaths (**47.5%**). Deaths in private residence are projected to increase **15.6%** and deaths in residential care by **84.2%**.

Source: National Model of the Need for Palliative Care

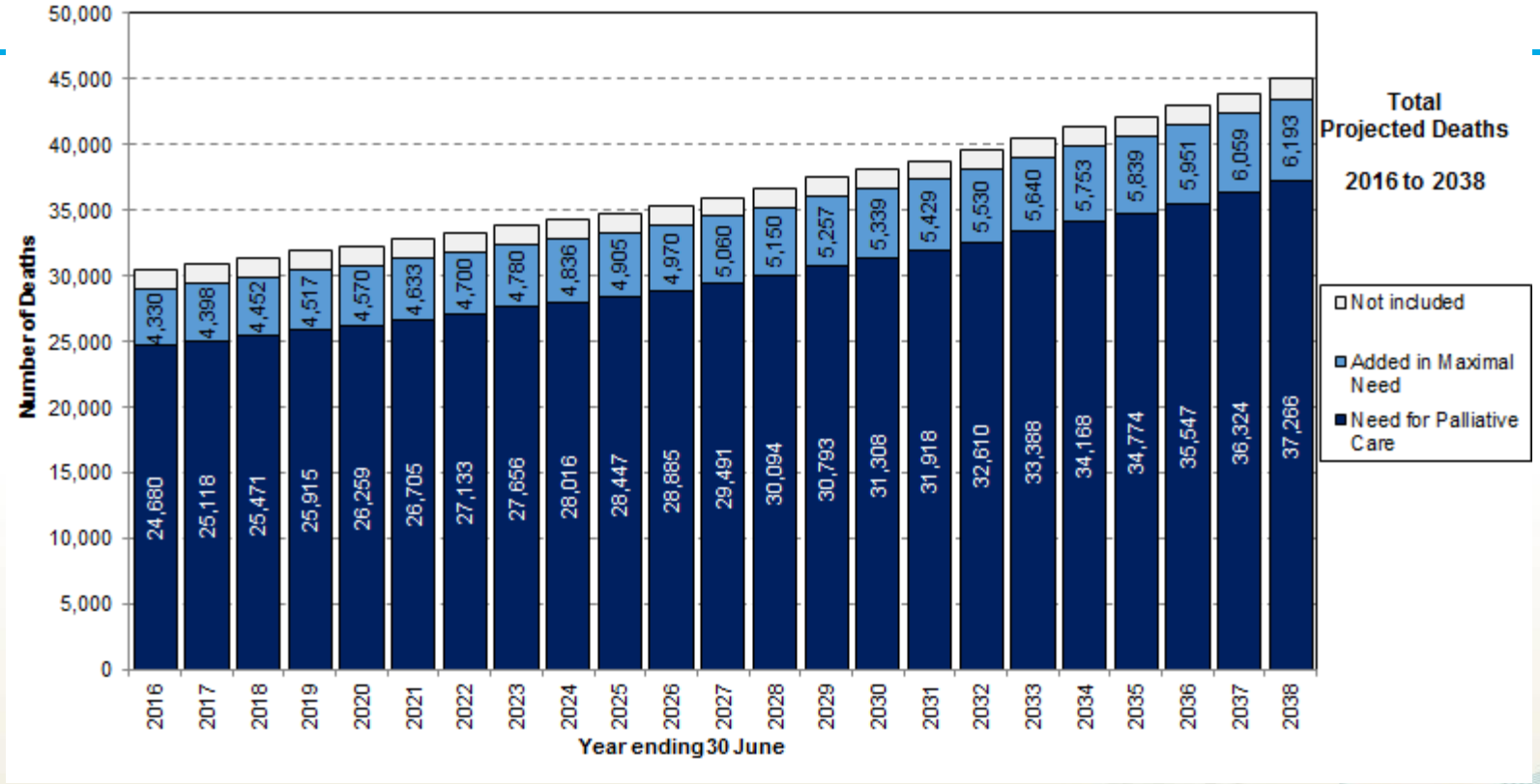
Projected Place of Death - New Zealand 2016 and 2038



Over the period of 22 years, deaths in residential care are projected to increase from **34.2%** to **42.6%** of total deaths.

Source: National Model of the Need for Palliative Care

Projected Need for Palliative Care - New Zealand 2016-2038

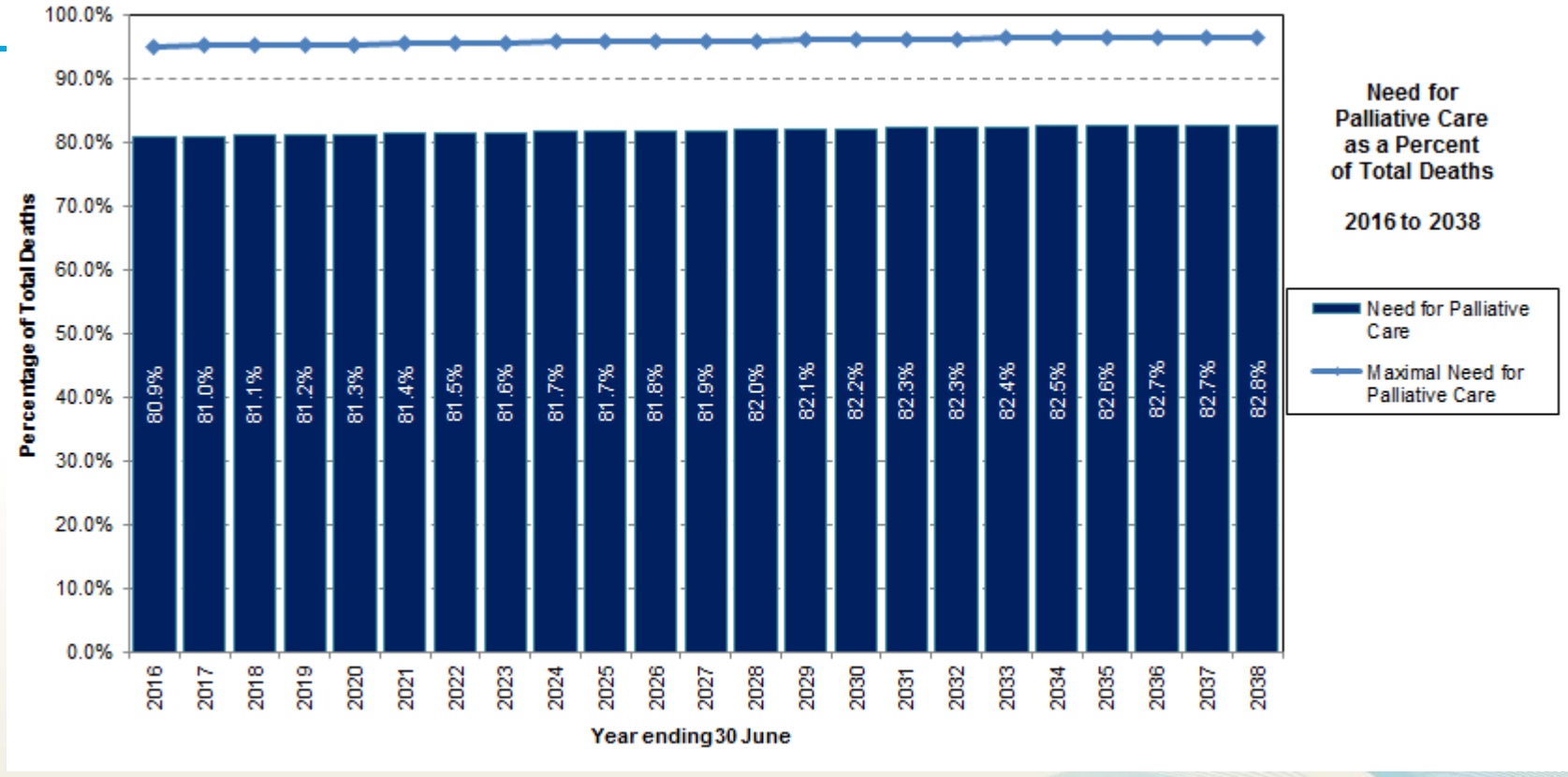


The number of deaths needing palliative care is projected to increase from **24,680** in 2016 to **37,286** by 2038, an increase of **51.0%** in 22 years.

This compares to an increase in the total number of deaths of **47.5%**.

Source: National Model of the Need for Palliative Care

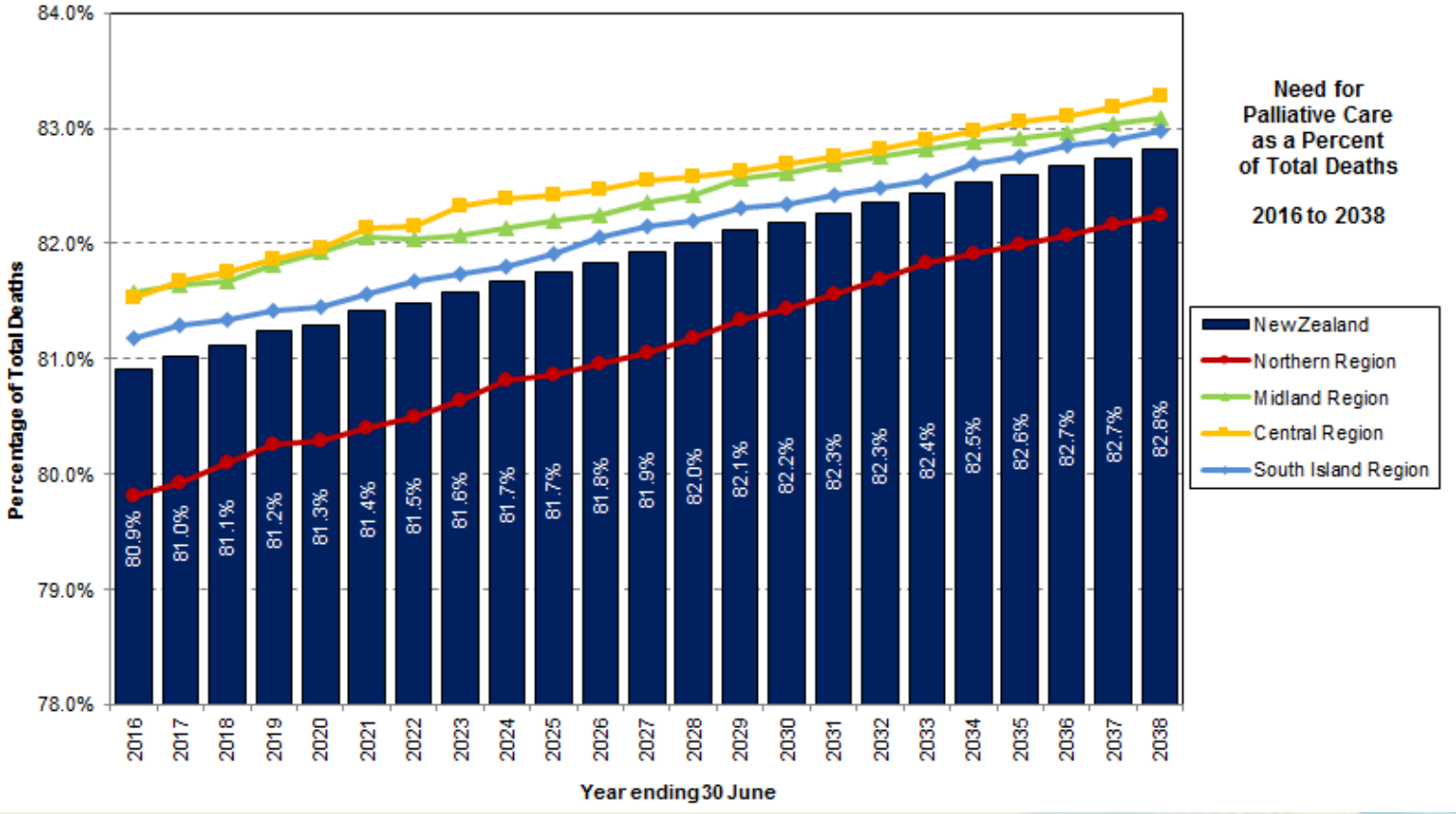
Projected Need New Zealand 2016-2038 - Percentage



With an ageing population, the proportion of deaths needing palliative care increases from **80.9%** in 2016 to **82.8%** in 2038. Important to use the spreadsheet model and not simply apply a flat percentage of need.

Source: National Model of the Need for Palliative Care

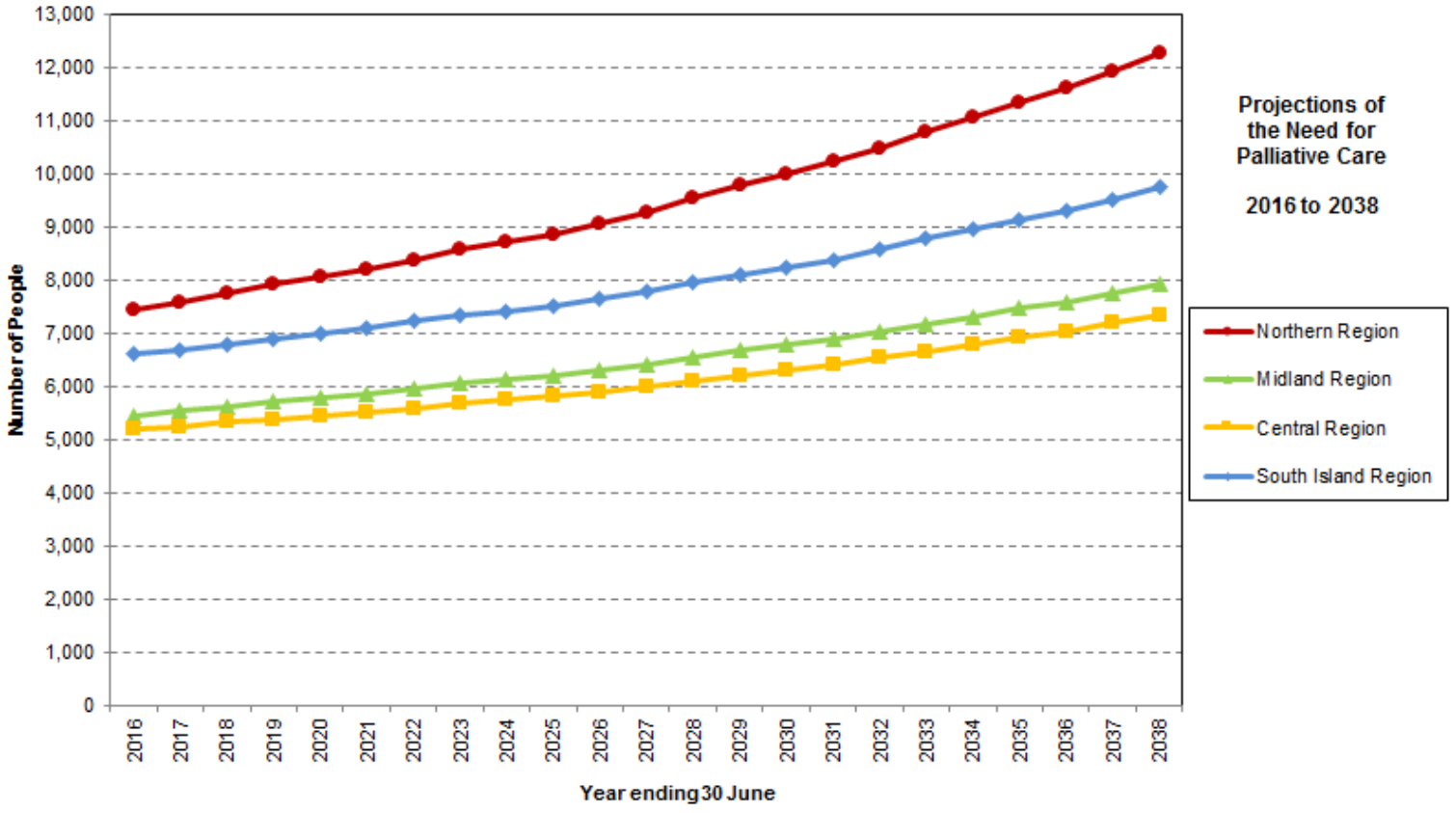
Projected Need NZ and Regions 2016-2038 - Percentage



Note the x-axis does not start at zero. The proportion of deaths needing palliative care is a function of the age and gender of each region and how this is projected to change over time. Important to use the spreadsheet model and not simply apply a flat percentage of need.

Source: National Model of the Need for Palliative Care

Projected Need Palliative Care - Regions 2016-2038



Over the 22 years to 2038, the projected need for palliative care increases by **51.0%** for New Zealand, **64.5%** for Northern, **45.1%** for Midland, **41.3%** for Central and **47.3%** for the South Island region.

Source: National Model of the Need for Palliative Care

NZ Model of Need for Palliative Care

Spreadsheet model with tables and graphs:

National planning from 2016 to 2068

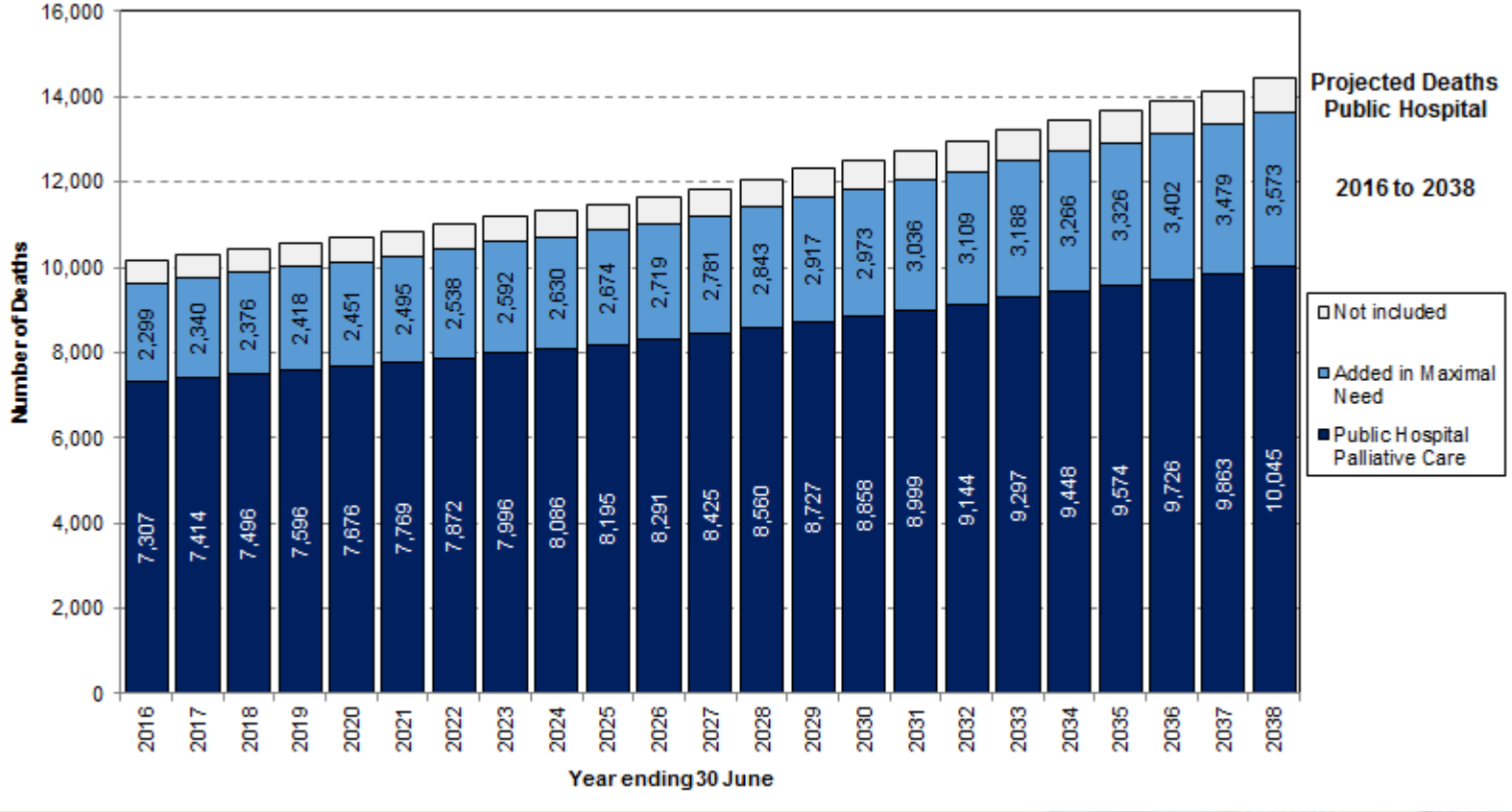
- Range of results, using range of Stats NZ projections
- Best used for policy and high-level planning of future workforce.

National, Regional and Local planning from 2016 to 2038

- Local is a whole DHB or combination/ proportion of DHBs
- Can use historic patterns for New Zealand or region
- Sections with information for planning for hospitals, residential care and hospice care.

Recommend that the spreadsheet model be made freely available.

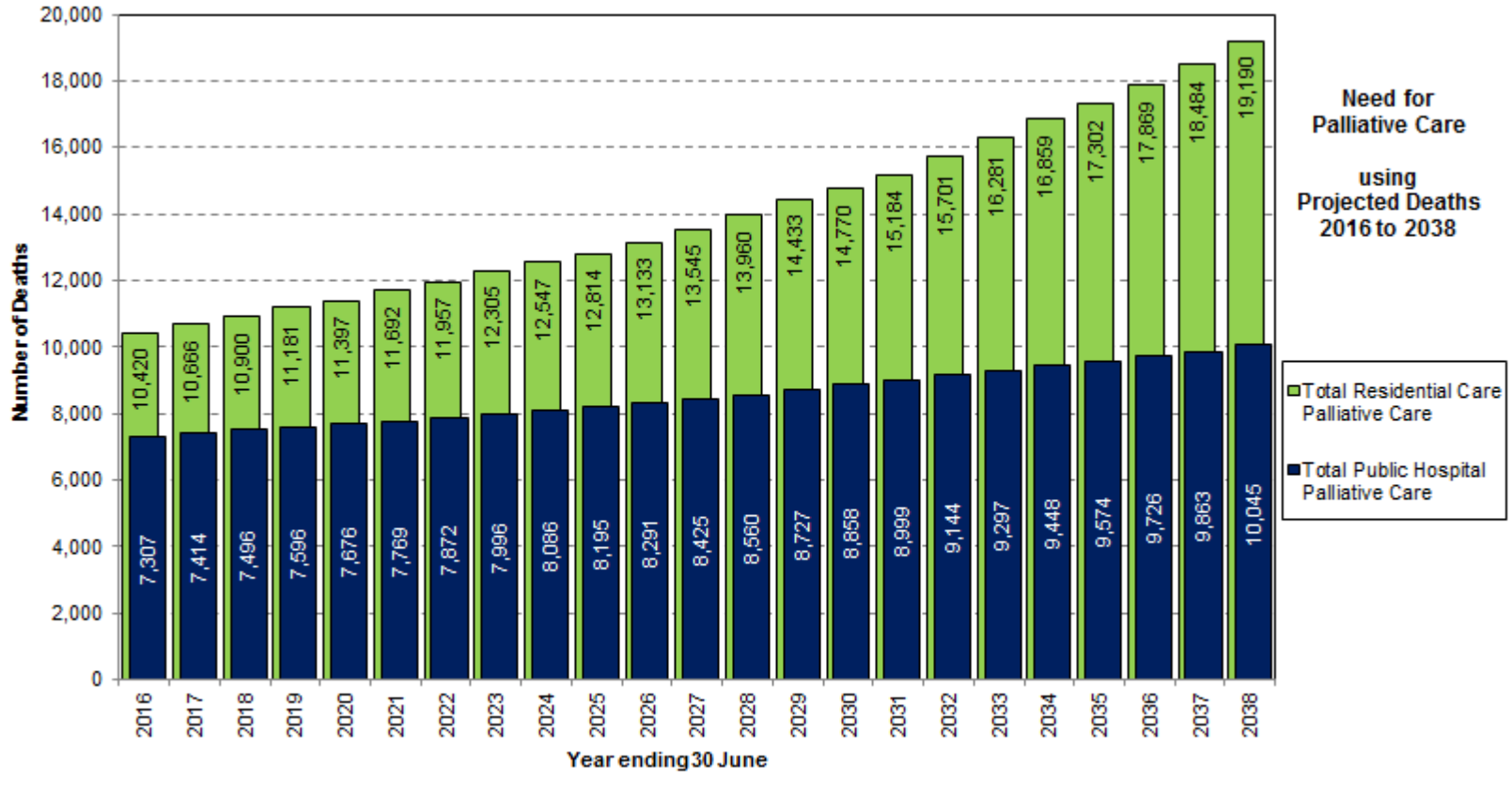
Projected Need Palliative Care - Hospitals 2016-2038



The number of deaths needing palliative care in public hospitals is projected to increase from **7,307** in 2016 to **10,045** by 2038, an increase of **37.5%**.

Source: National Model of the Need for Palliative Care

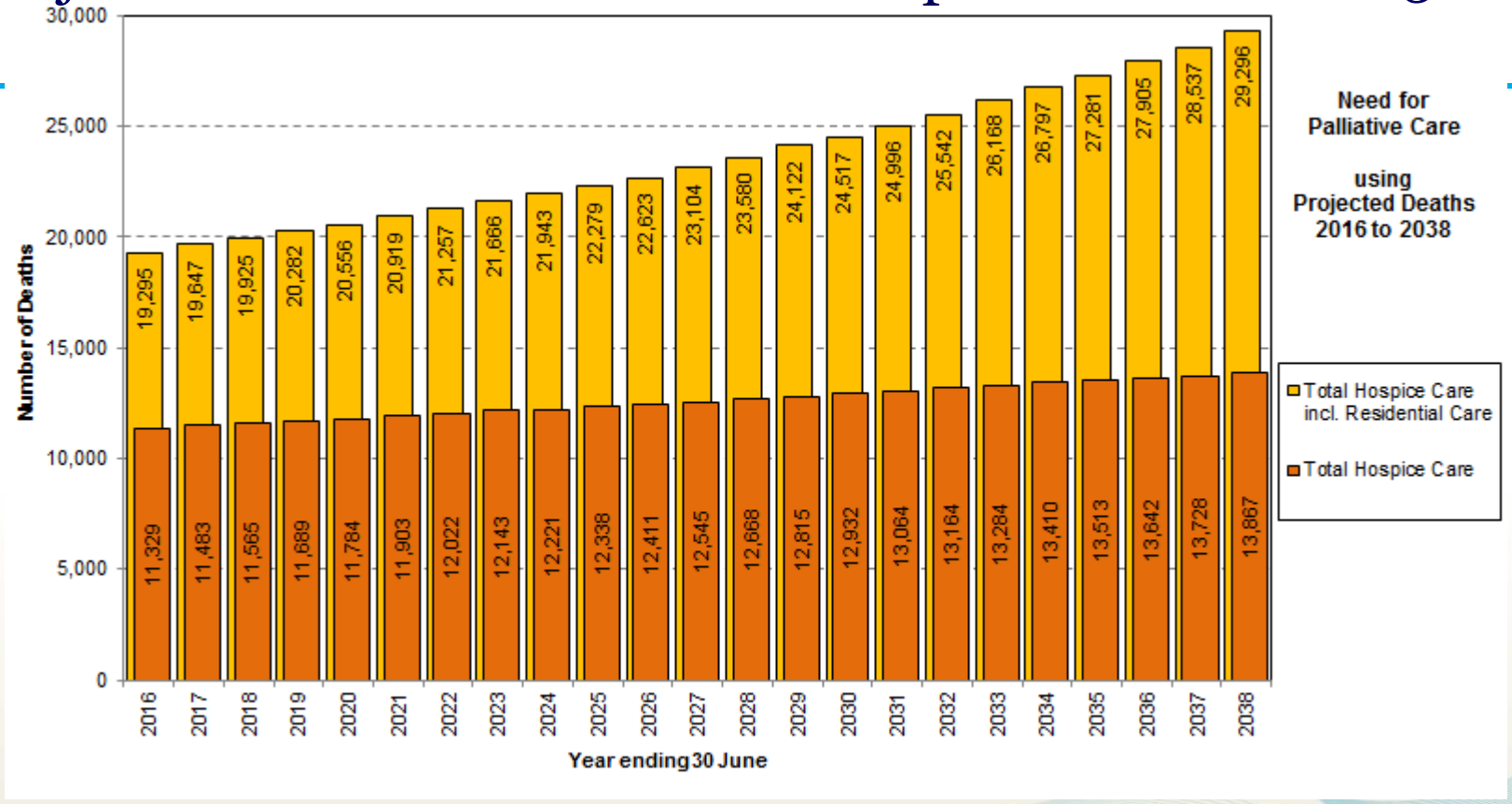
Projected Need Palliative Care - Residential Care 2016-2038



The need for palliative care is projected to increase by **37.5%** in public hospitals and **84.2%** in residential care by 2038. Important for discussions with DHBs and the residential care sector. This does not take capacity in the sector into account.

Source: National Model of the Need for Palliative Care

Projected Need Palliative Care - Hospice Care 2016-2038



The number of deaths needing is projected to increase from **11,329** in 2016 to **13,867** by 2038 (**22.4%**). When support to residential care is included, the increase is from **19,295** deaths in 2016 to **29,296** in 2038 (**51.8%**). Some of these deaths may move into the community rather than be in residential care.

Source: National Model of the Need for Palliative Care

Caveats and Updates of the Model

Projections are NOT predictions.

- StatsNZ: “projections and associated probability intervals should be used as guidelines and an indication of the overall trend, rather than as exact forecasts”

Projections change as new information becomes available:

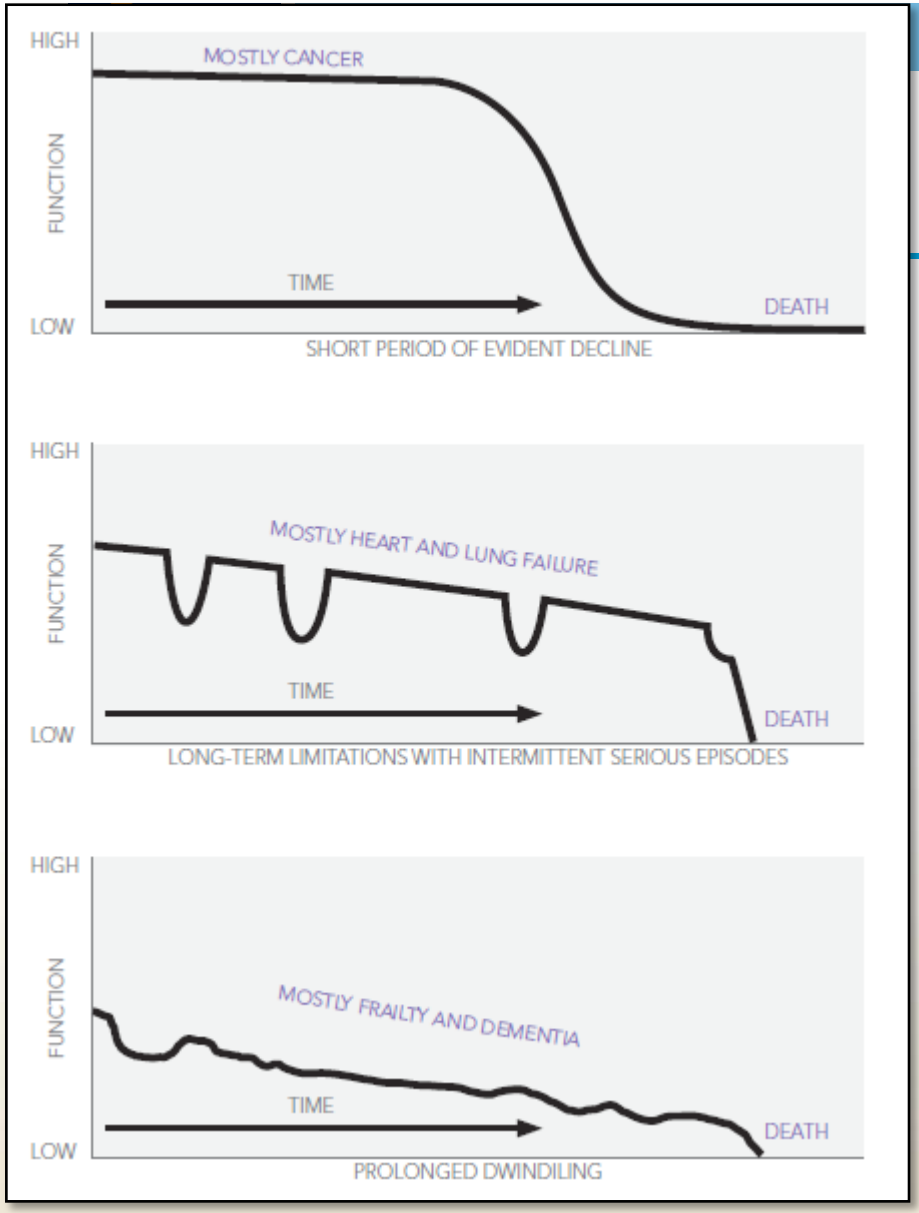
- Annual update to StatsNZ projections for MOH – November 2016
- StatsNZ national projections over long-term updated every two to three years. Important revision about 18 months after census, with next census due in 2018.
- New national projection impacts medium-term assumptions used.

Historic patterns of deaths should be updated every five years.

Need for palliative care definitions change as practice evolves.

Projections based on number of deaths, not whole period of care needed. Need to do work on trajectories of care.

Trajectories at the End of Life



- Accidents
- Cancer
- Organ failure
- Frailty and dementia

Source: Palliative Care Australia (2010). Health System Reform and Care at the End of Life: a Guidance Document. 2010. Canberra: Palliative Care Australia.
Diagram from Lynn, J., & Adamson, D. M. (2003). *Living Well at the End of Life. Adapting Health Care to Serious Chronic Illness in Old Age*. 2003. RAND Health.