

# Change • Challenge • Opportunity

## Injury & Disability Schemes Seminar

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# An investment approach to welfare – applying traditional actuarial techniques in new fields

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*This presentation has been prepared for the Actuaries Institute 2017 Injury & Disability Schemes Seminar. The Institute Council wishes it to be understood that opinions put forward herein are not necessarily those of the Institute and the Council is not responsible for those opinions.*

## Introduction

“a new flexible social support system that is simpler, sustainable, coherent and outcomes focused, with investments directed towards achieving clear, measurable improvements for people at risk of income support reliance” – McClure Review, 2015





# The Investment Approach

**Aims:** reducing welfare dependence and improving the lifetime wellbeing of people and families

**Premise:** the idea that there are some segments of the population for whom investment / early interventions can deliver positive changes in their life trajectories, helping them achieve better outcomes and become more self-sufficient

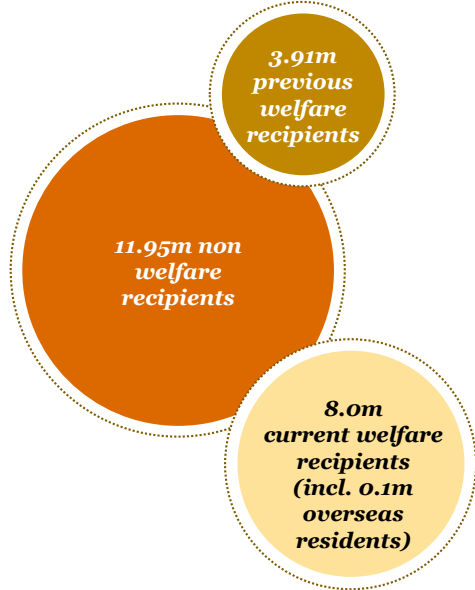
## Goals:

- Identifying the 'segments' where there is potential to deliver positive changes in people's life trajectories.
- Investing to move people away from being at risk to leading productive, happy and fulfilling lives.
- Reducing avoidable spend.

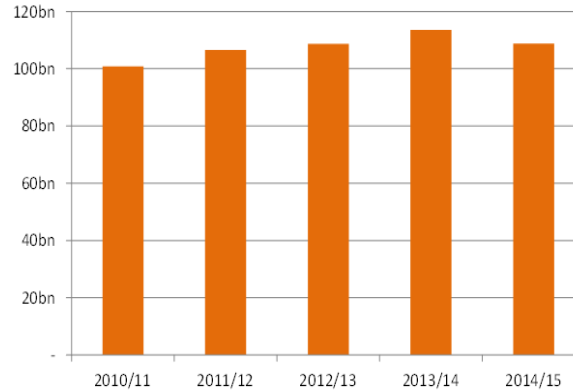


# Welfare in Australia

Australian resident population of 23.9m at 30 June 2015

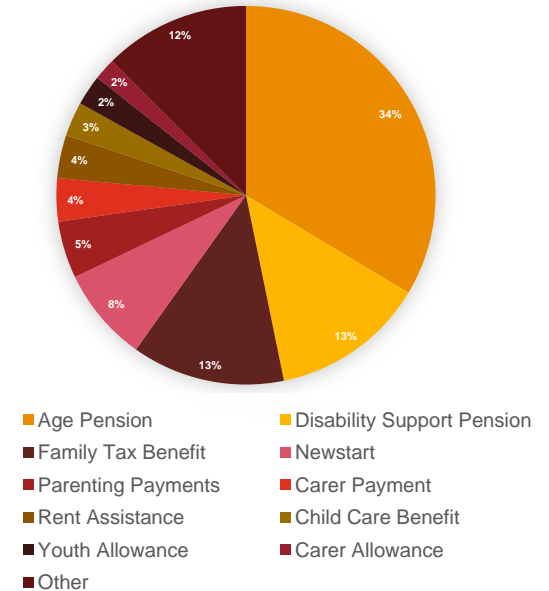


In 2014/15 DSS provided \$109bn\* of entitlements



\* Note 2014/15 data is not fully mature

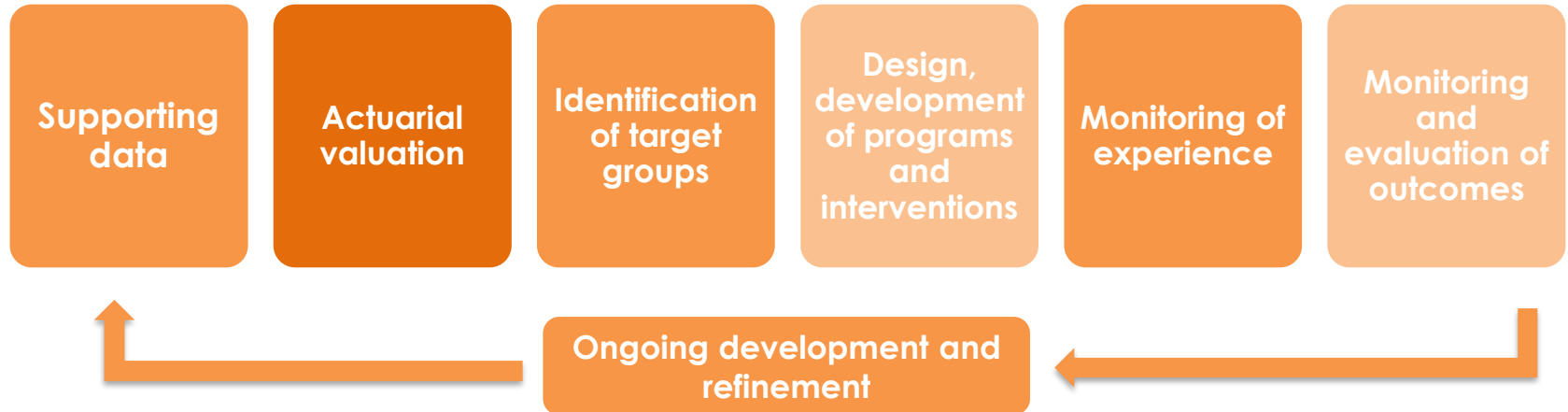
Age pension is the largest spend by payment type





## How actuaries are involved

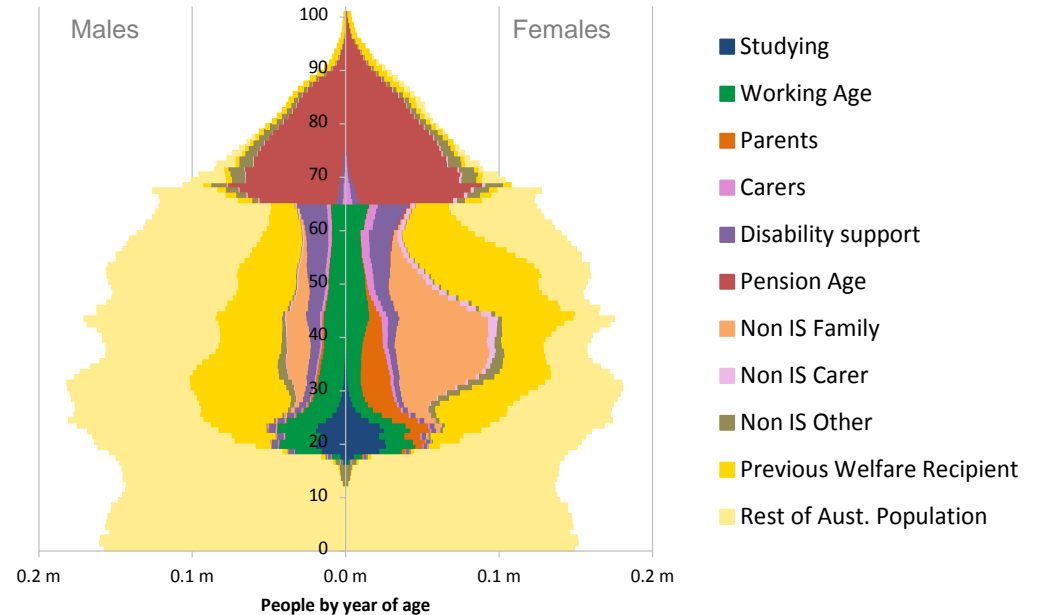
### Australian Priority Investment Approach





## Model population

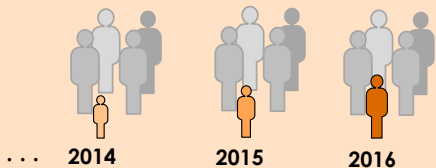
- Contains record for each person in population (23.9m).
- Developed using administrative data for current and previous welfare recipients and census derived 'synthetic' data for rest of population.





# Actuarial model - overview

Historic population data  
up to valuation date

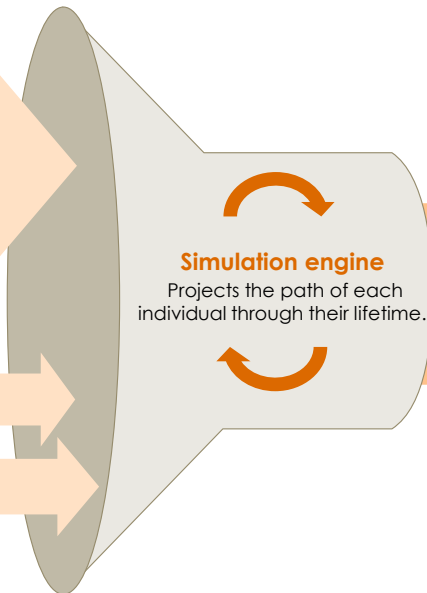


Longitudinal data reflecting the **full population** to the valuation date.

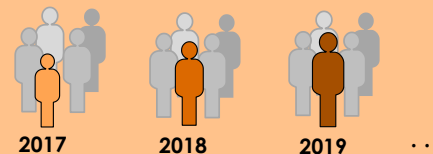
**Statistical analysis of past experience**

Initial valuation using simple  
“**foundation**” assumptions

Enhanced using statistically derived  
“**risk-based**” assumptions



Projections of peoples’  
lifetime path, service usage,  
and characteristics



**Adjustments Module**  
e.g. allowance for current policy settings

**Results Module**  
Summarises & presents lifetime results

**Supporting analysis:**

Historic expenditure

Population segmentation &  
analysis

Changes in policy settings

**Supporting data:**

Longitudinal data development of population of interest



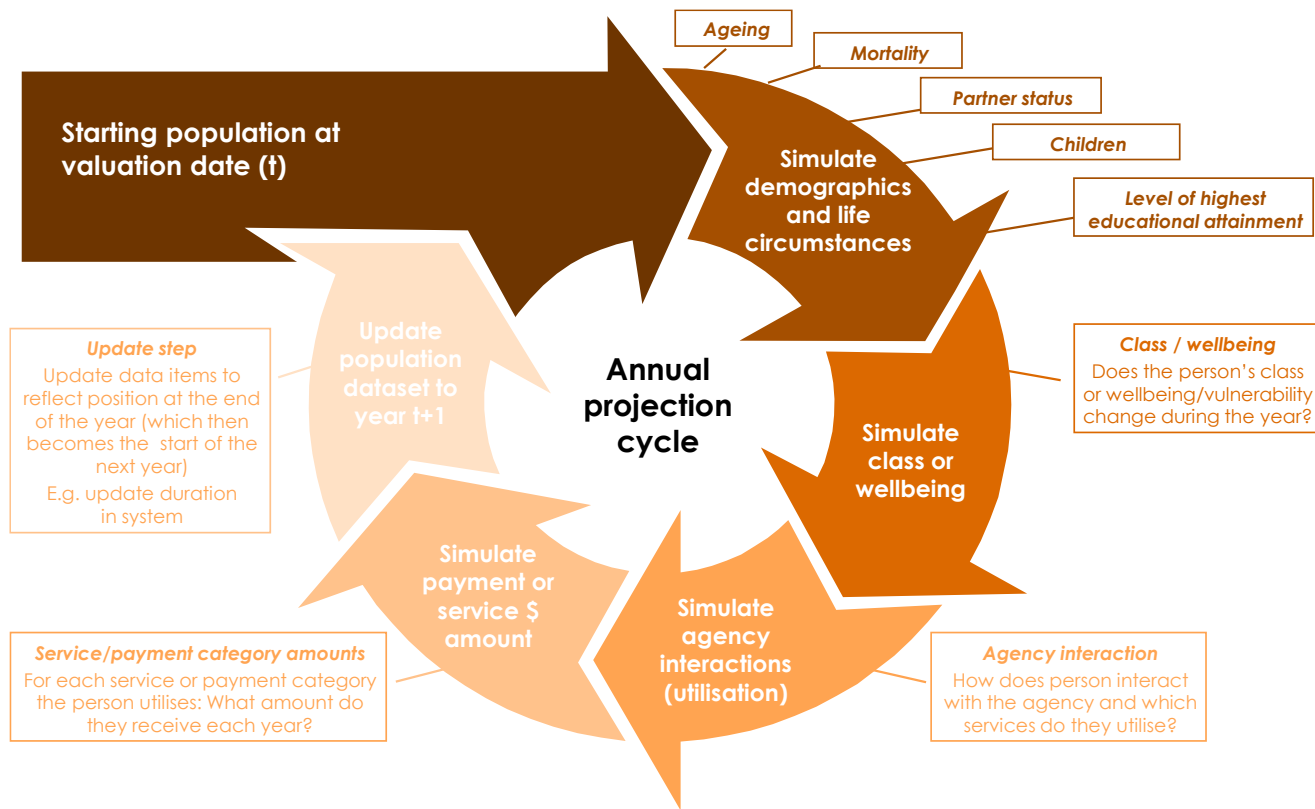


# Actuarial model – simulation cycle

## Starting population

For each person:

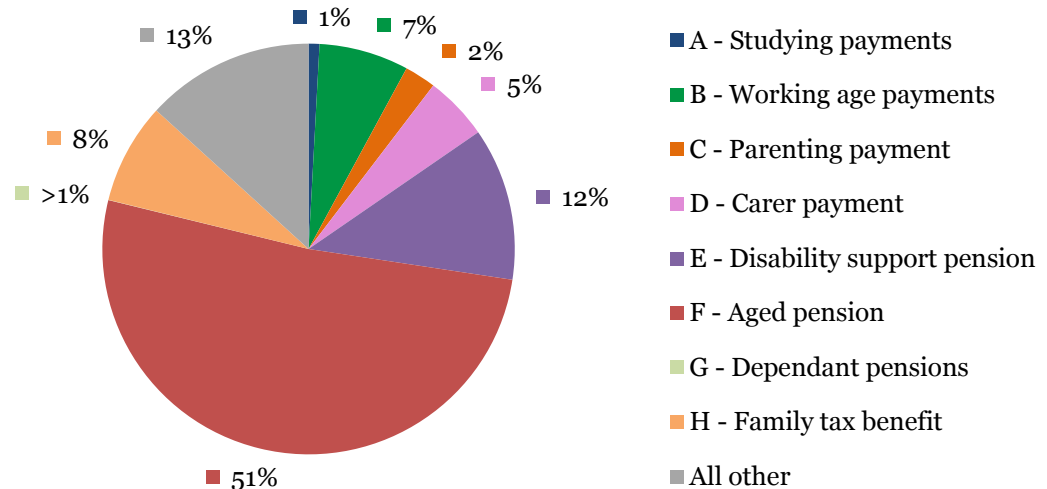
- What are their current demographic characteristics? (e.g. age, gender, indigenous status)
- What is their current and past interaction with the system? (e.g. age at entry to system, recent payments)





## A few results – total lifetime costs

- The total lifetime cost is estimated to be **\$4,764bn**.
- Largest payment category is Aged Pension (51% of total cost, \$2,451bn).
- Second largest is Disability Support Pension (12% of total cost, \$573bn)

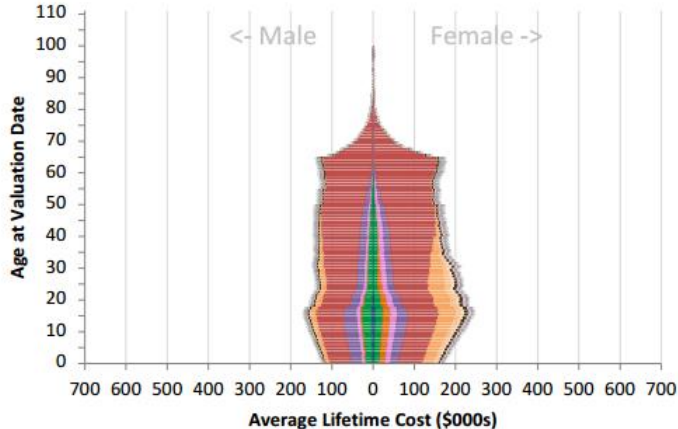




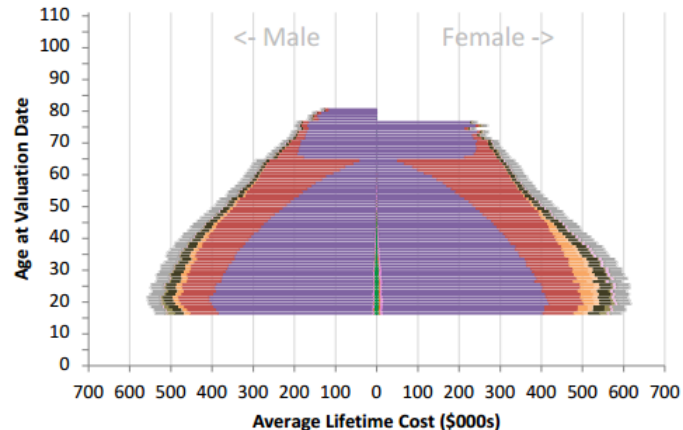
## A few results – average lifetime costs

- The average lifetime cost across the 24m people in Australia is **\$200,000**.
- Wide variation between lifetime cost for different groups.

Non welfare recipients



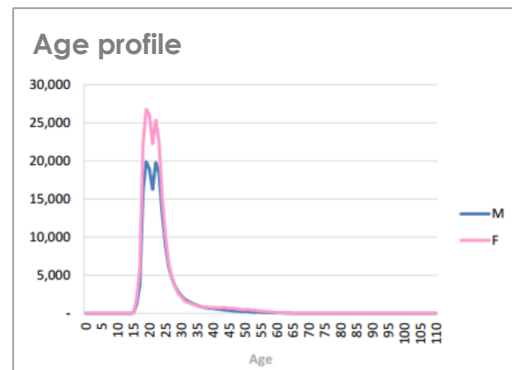
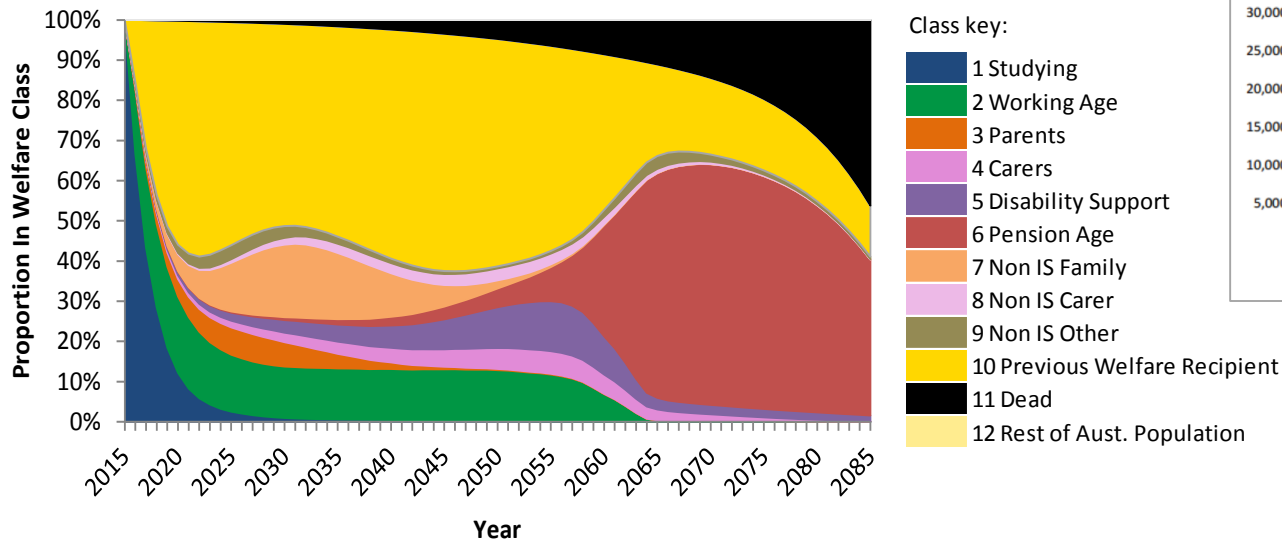
Disability support pension recipients





## A few results – transitions from studying payment

- 392,000 studying payment recipients in 2015 – average lifetime cost **\$250,000**.





## How the model is being used

- Individual person model provides facility for detailed consideration of population and groups within it.
- Macro uses
- Micro uses
  - 2016-17 budget announced Try, Test and Learn Fund.
    - \$96.1m fund to trial new or innovative approaches
    - 389 ideas received for first tranche
    - Shortlist being developed for trial



# Observations

- Approach
  - Multi-state transition model
  - Individual person level
  - Assumptions developed from both DSS and external data sources
- Design
  - Scope – which people? Which payments?
  - Outcomes to model – Payments? Wellbeing? Other?
  - Which explanatory variables to include?
- Implementation
  - Require longitudinal data to underpin assumptions
  - Model is only as good as your data
  - Very detailed assumptions – care in choosing where to focus modelling effort
  - Big datasets => Storage and processing considerations



# Beyond welfare?



- **Australia Welfare – since 2015**
- **Models under consideration by a number of states**

- **NZ Welfare - since 2011**
- **NZ Social housing – since 2015**
- **NZ Justice – development commenced 2016**
- **NZ Vulnerable Children – development commenced 2016**



# Questions?

Link to PwC baseline valuation report

[https://www.dss.gov.au/sites/default/files/documents/09\\_2016/baseline\\_valuation\\_results\\_report\\_accessible\\_version\\_1\\_2\\_july\\_2016\\_2pwc.\\_2.pdf](https://www.dss.gov.au/sites/default/files/documents/09_2016/baseline_valuation_results_report_accessible_version_1_2_july_2016_2pwc._2.pdf)