

A BETTER  
START

E Tipu e Rea

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## A Better Start National Science Challenge: An update on recent findings

Barry Milne

COMPASS Colloquium

Statistics New Zealand, Wellington

7 August 2019

A Better Start is funded by the Ministry  
of Business, Innovation and Employment

Host Institution



LIGGINS  
INSTITUTE

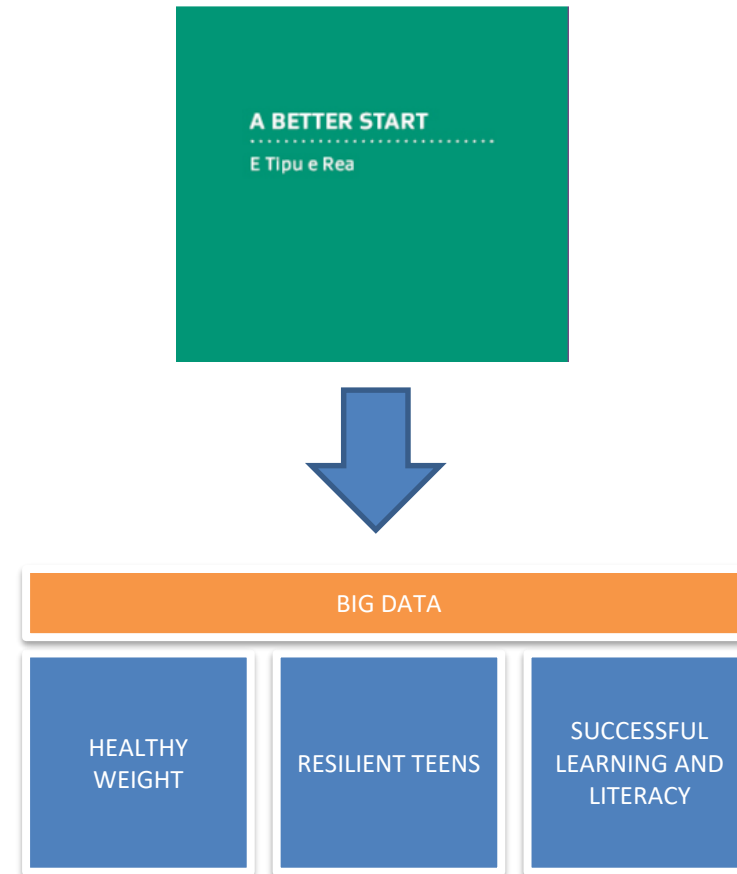


# Big Data Team

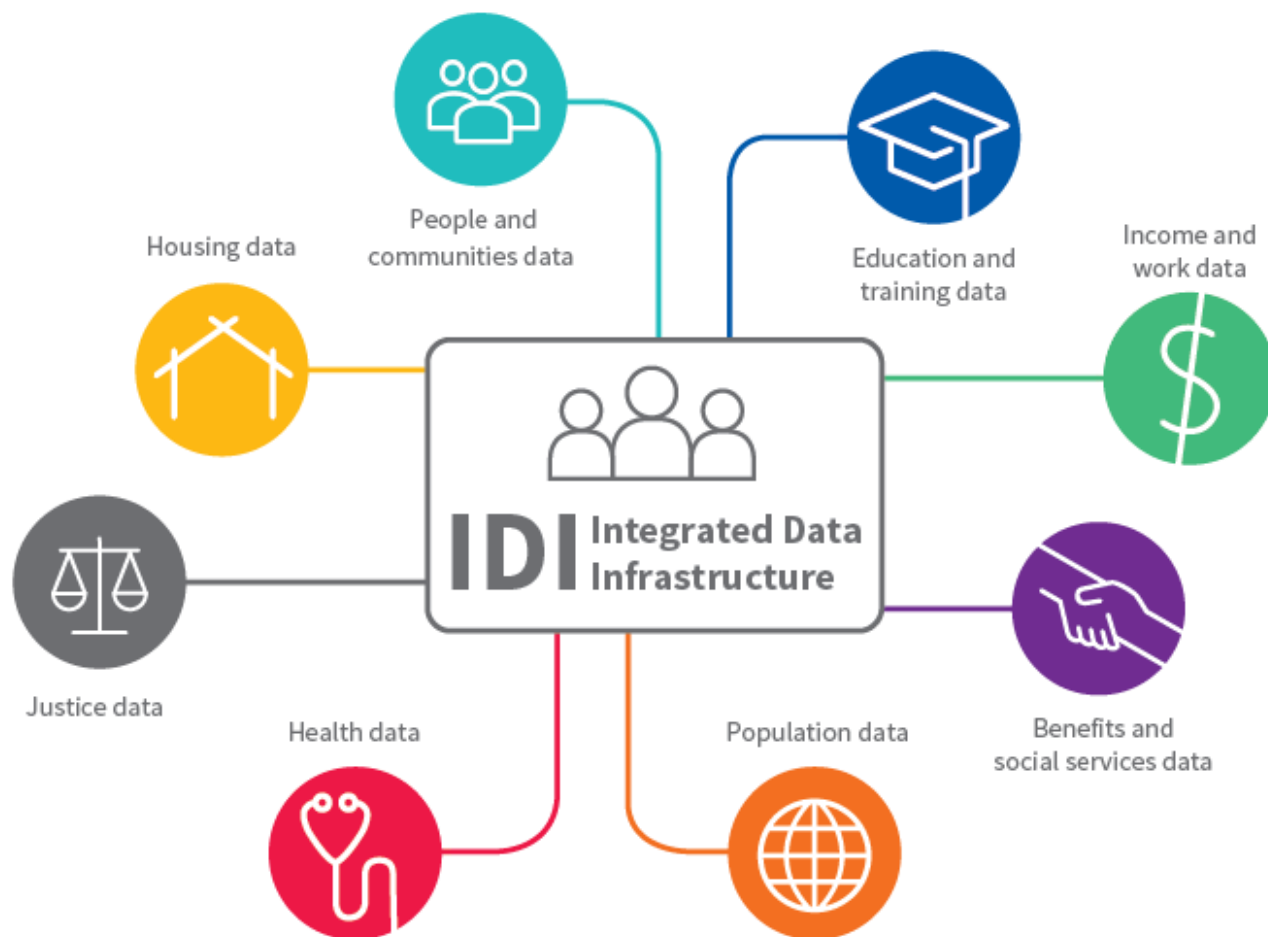
- Barry Taylor – Principal Investigator (DSM)
- Rick Audas – Theme co-lead (DSM)
- Justine Camp, Nick Bowden (DSM)
- Rose Richards, Jesse Kokaua (Centre for Pacific Health, Va'a o Tautai)
- Barry Milne – Theme co-lead (COMPASS)
- Nichola Shackleton, Stephanie D'Souza (COMPASS)
- Sheree Gibb (UOW)

# Big Data's role

- Work with the three themes to assess time trends, spatial distribution, and answer other key questions using whole population data (IDI)
- Healthy weight
  - B4 School Check
- Resilient Teens
  - Pharmaceutical data
- Successful Learning and Literacy
  - B4 School Check, School data



# Integrated Data Infrastructure (IDI)



## DISCLAIMER

Access to the data presented was managed by Statistics New Zealand under strict micro-data access protocols and in accordance with the security and confidentiality provisions of the Statistic Act 1975. Our findings are not Official Statistics. The opinions, findings, recommendations, and conclusions expressed are those of the researchers, not Statistics NZ, or the University of Auckland.

# B4 School Check: Who gets one?

## BMJ Open How universal are universal preschool health checks? An observational study using routine data from New Zealand's B4 School Check

Sheree Gibb,<sup>1,2</sup> Barry Milne,<sup>2,3</sup> Nichola Shackleton,<sup>2,3</sup> Barry J Taylor,<sup>2,4</sup>  
Richard Audas<sup>2,5</sup>

### B4 School Check

The B4 School Check is a nationwide programme offering a free health and development check for 4-year-olds.

The B4 School Check aims to identify and address any health, behavioural, social, or developmental concerns which could affect a child's ability to get the most benefit from school, such as a hearing problem or communication difficulty.

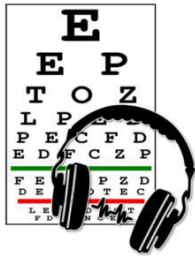
It is the 12th core contact of the Well Child Tamariki Ora Schedule of services.



### B4 School Check

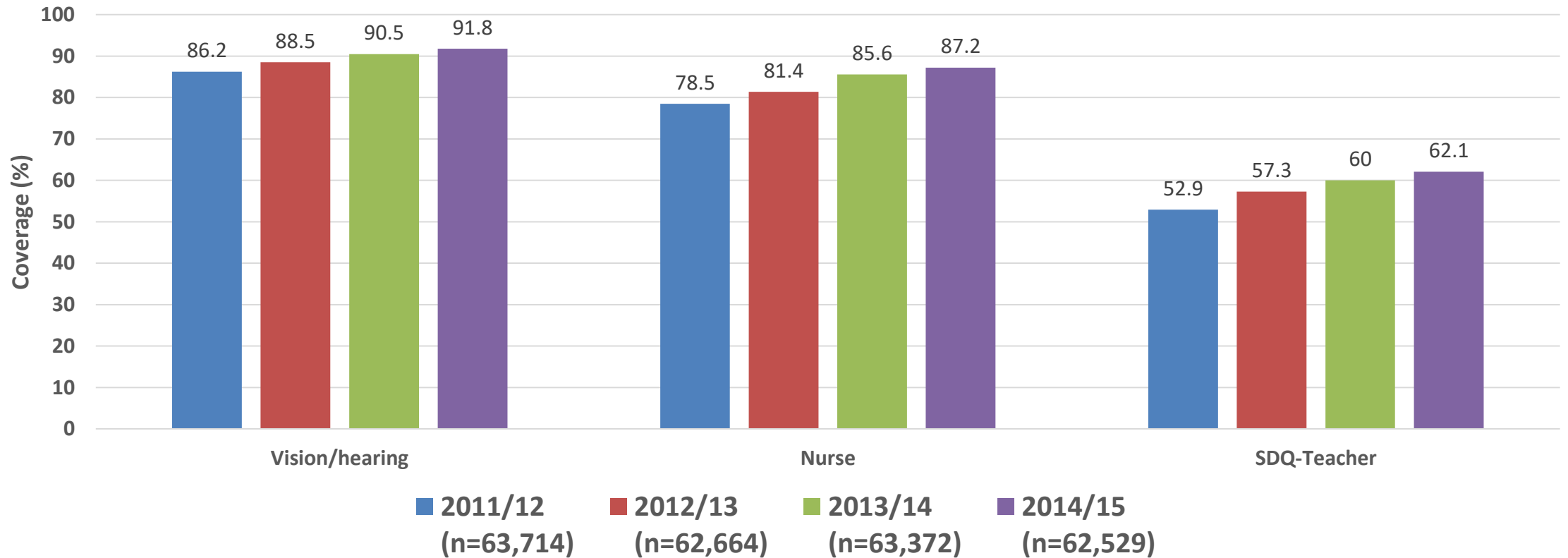
- Established September 2008 (we use 2010/2011 to 2015/2016)
- Eligible children are those who are enrolled with a PHO on their 4<sup>th</sup> birthday
- Coverage between 72 and 92%

# Who gets a B4 School Check?

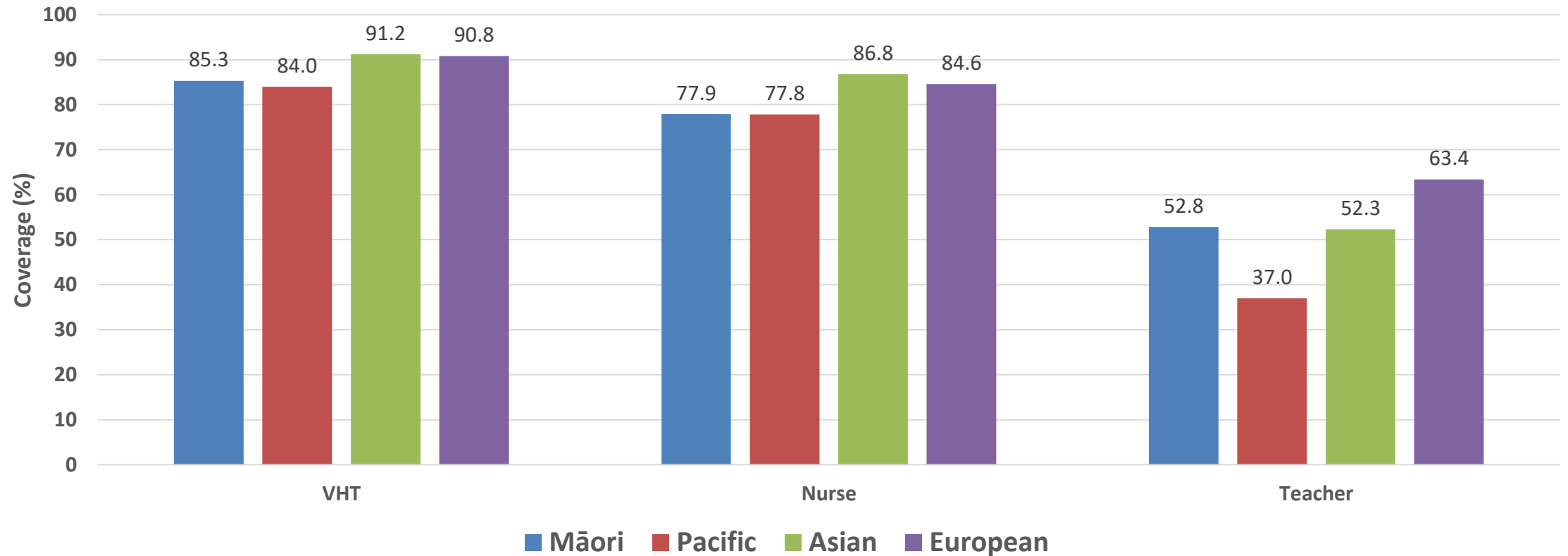


- **Vision and Hearing Tests**
- **Nurse Checks**
  - Growth
  - Dental
  - Immunisation
  - Parents Evaluation of Developmental Status (PEDS)
  - Strengths and Difficulties Questionnaire (SDQ)
- **ECE Teacher**
  - Strengths and Difficulties Questionnaire (SDQ)

# Who gets a B4 School Check? Time trends

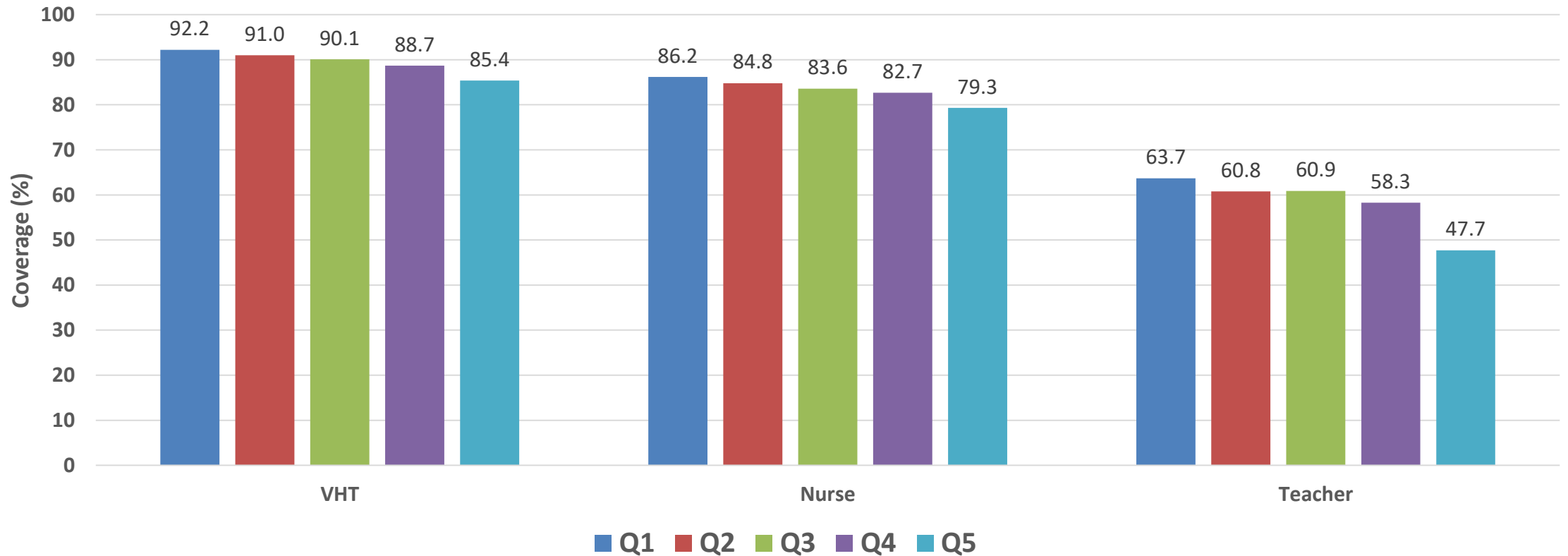


# Who gets a B4 School Check? Ethnicity





# Who gets a B4 School Check? Deprivation



# Who gets a B4 School Check?

- Not all children are receiving a B4 School Check
- Benefits from the B4SC will be unevenly spread across the population
- Focus groups with low income Māori and Pacific parents identified concerns
  - About relevance of B4SC
  - About language and cultural understanding
  - That they will be judged

# Healthy weight: Community level trends

## Child obesity prevalence across communities in New Zealand: 2010-2016

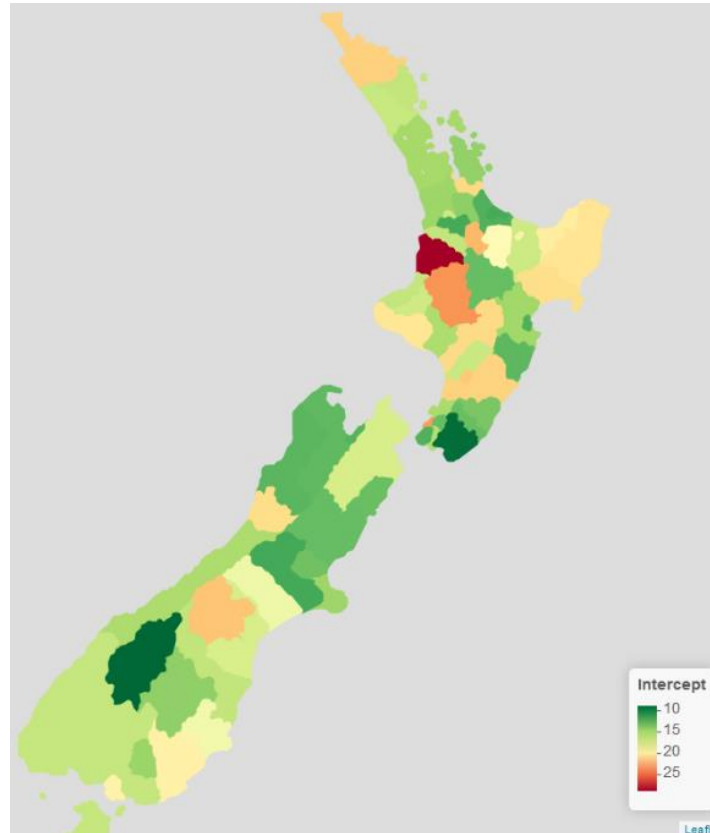
Sheree Gibb,<sup>1,2</sup> Nichola Shackleton,<sup>2,3</sup> Rick Audas,<sup>2,4</sup> Barry Taylor,<sup>2,4</sup> Boyd Swinburn,<sup>5</sup> Tong Zhu,<sup>2,3</sup> Rachael Taylor,<sup>2,6</sup> José G.B. Derrak,<sup>2,7</sup> Wayne Cutfield,<sup>2,7</sup> Barry Milne<sup>2,3</sup>

# Healthy weight: Community level trends

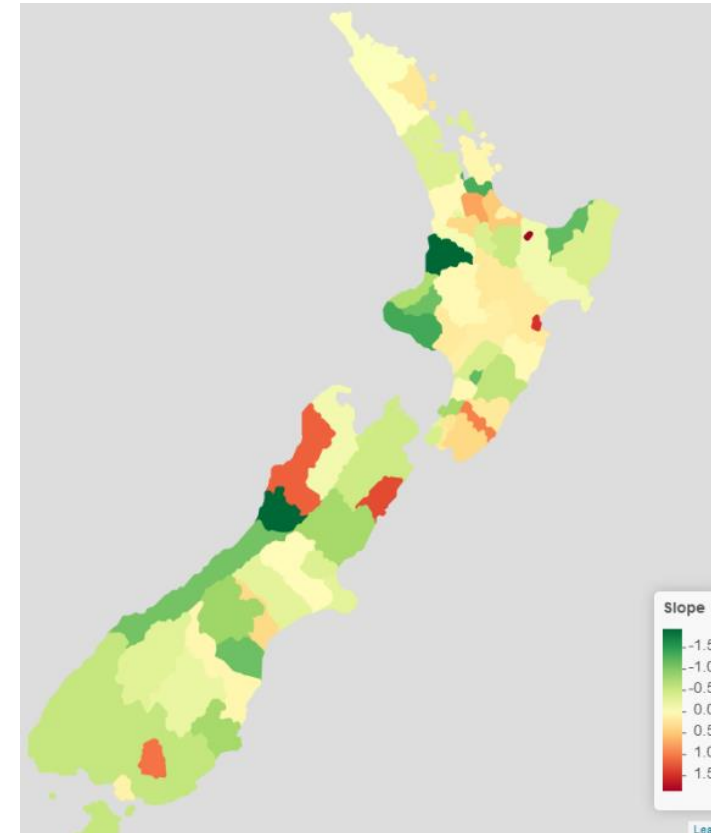
- Do levels of childhood obesity vary between communities in NZ?
- Do trends in childhood obesity in 2010/11 to 2015/16 vary between communities?
- To what extent can variations in obesity between communities be explained by differences in socioeconomic deprivation, ethnic composition and urbanicity?

# Healthy weight: Community level trends

Prevalence



Slope



<https://compassnz.shinyapps.io/BetterStart/>

# Healthy weight: Community level trends

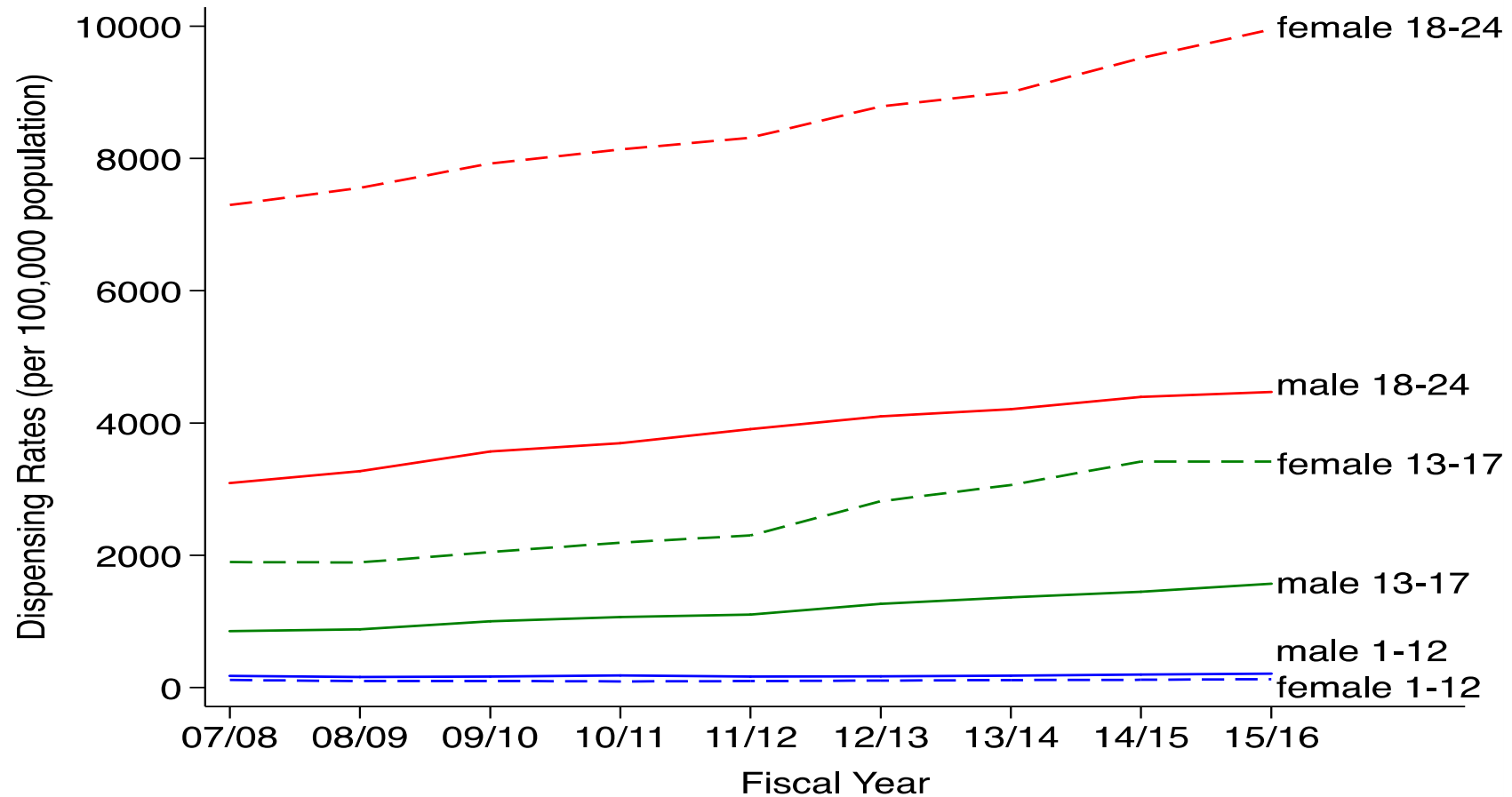
- Do levels of childhood obesity vary between communities in NZ?
  - Considerable community-level differences in obesity prevalence, ranging from less than 10% to over 25%.
- Do trends in childhood obesity in 2010/11 to 2015/16 vary between communities?
  - Pattern of change over time was similar across communities, with the majority of communities experiencing a similar rate of decline in obesity.
- To what extent can variations in obesity between communities be explained by differences in socioeconomic deprivation, ethnic composition and urbanicity?
  - More than a third of the variation in community obesity prevalence could be explained by the socioeconomic and urban composition of the community, with around a further 10% explained by ethnic composition of communities

# Resilient teens: Antidepressant trends

## AIMS

- To describe trends in antidepressant dispensing to children and young people
  - SSRIs (Citalopram, Fluoxetine, Paroxetine, Escitalopram, and Sertraline)
  - MAOIs and related (Tranylcypromine, Phenelzine and Moclobemide)
  - Tricyclics and related (Amitriptyline, Nortriptyline, Dosulepin, Doxepin, Clomipramine, Imipramine, Trimipramine, and Maprotiline)
  - SNRI (Venlafaxine); Tetracyclic (Mianserin); Noradrenergic and specific serotonergic agent (Mirtazapine)
- To explore how antidepressant prescribing to children and young people varies by gender, age, ethnicity and socioeconomic status

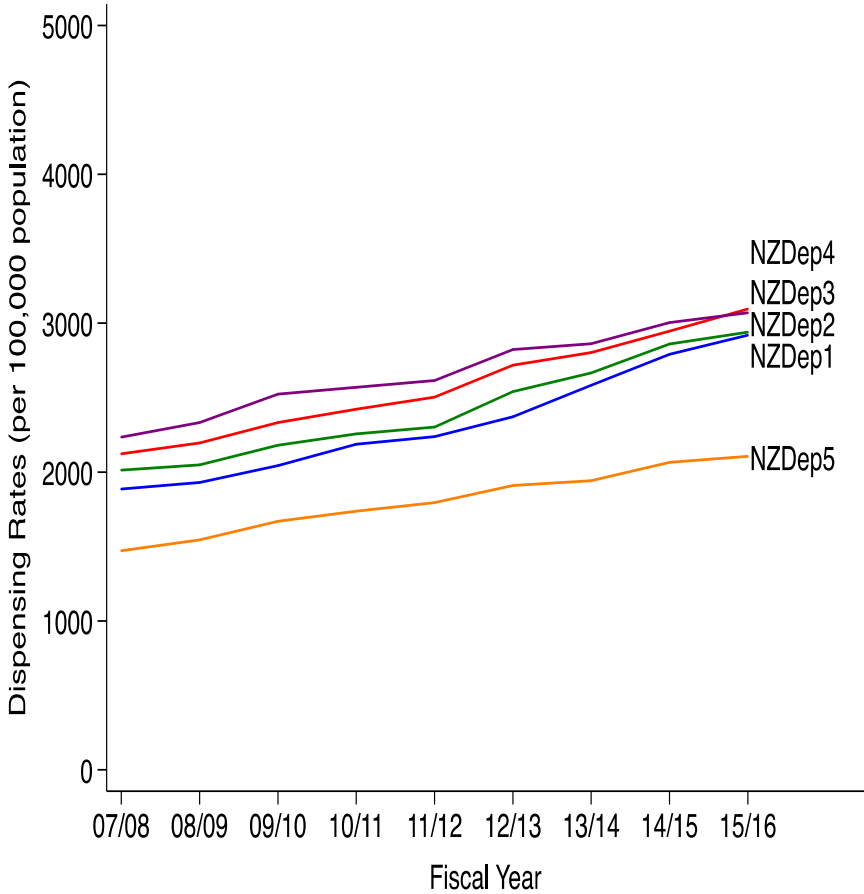
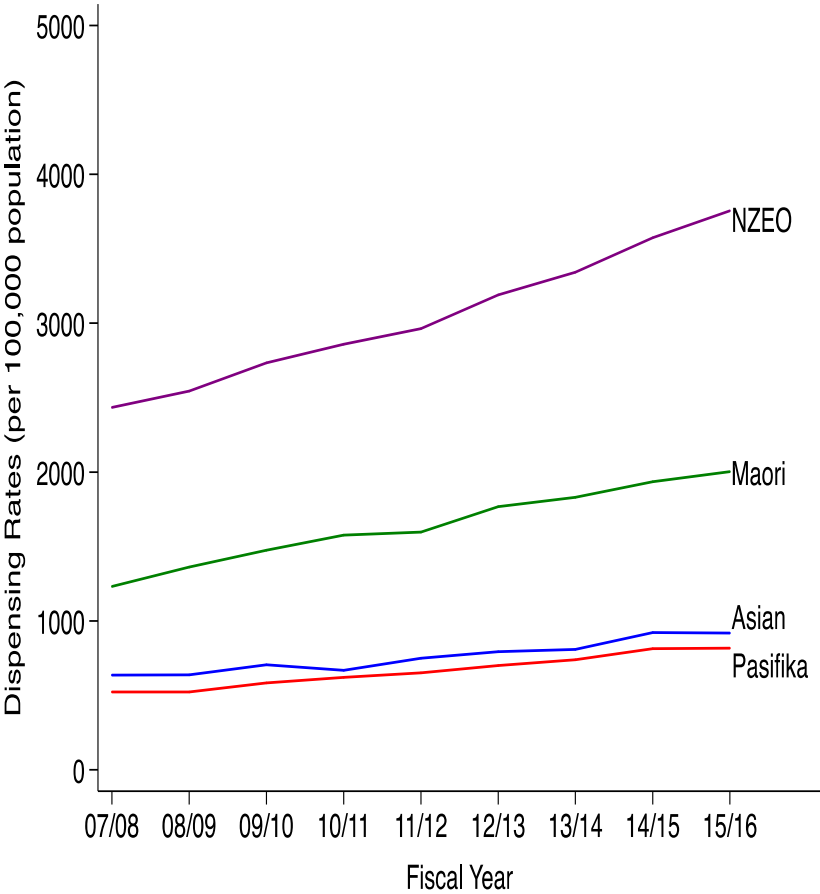
# Resilient teens: Antidepressant trends



Bowden et al., under consideration *Journal of Child Psychology and Psychiatry*



# Resilient teens: Antidepressant trends



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# Resilient teens: Antidepressant trends


## CONCLUSIONS

- Trends in antidepressant dispensing to children and young people
  - Increases by 49% over 9 year period
- Variation by gender, age, ethnicity and socioeconomic status
  - Dispensing prevalence double for females vs males
  - Dispensing prevalence far higher for NZ European than Māori and Pacific and Asian (especially)
  - Lower dispensing prevalence for NZDep Q5; others very similar

# Successful learning and literacy: Pacific Literacy Interventions

Child Development, xxxx 2018, Volume 00, Number 0, Pages 1–18

## The Efficacy of Preschool Developmental Indicators as a Screen for Early Primary School-Based Literacy Interventions

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*University of Canterbury—Te Whare Wānanga o Waitaha*

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Barry Taylor

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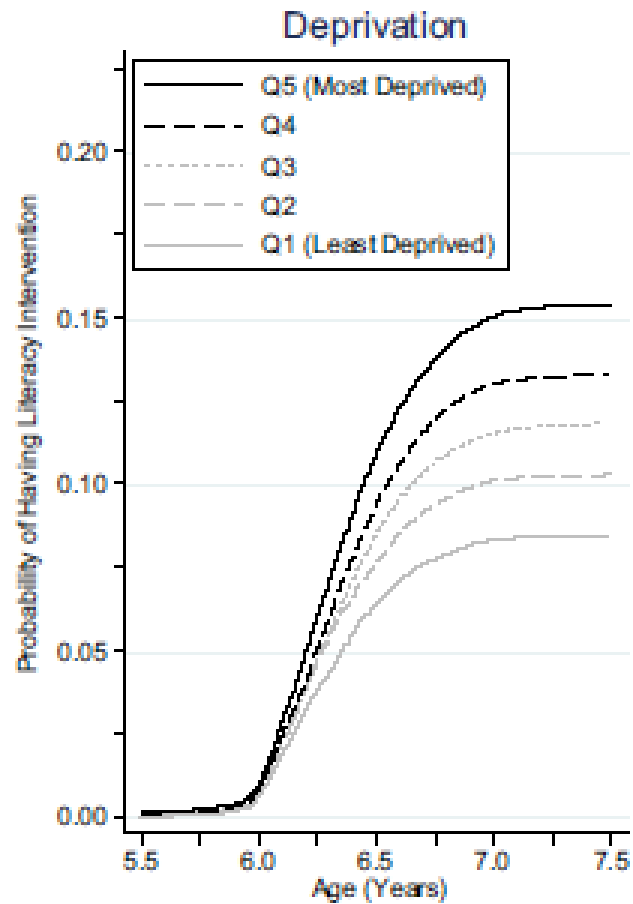
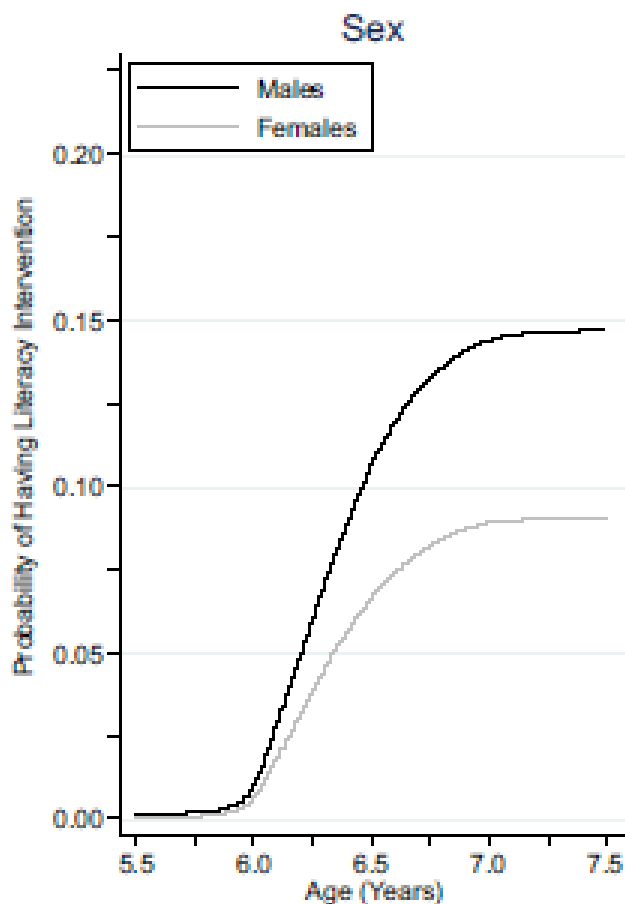
*University of Auckland*

Gail Gillon

*University of Canterbury—Te Whare Wānanga o Waitaha*

AIM: Evaluate efficacy of B4SC indicators as a screen for early primary school literacy interventions

# Successful learning and literacy: Literacy Interventions



- Demographic factors and all B4SC screens do predict literacy intervention
- But... predictive ability of B4SC data is poor (AUC = 0.624)
  - Follow-up paper with Pacific children found same result, with AUC = 0.592
- B4SC not a useful marker of who needs (receives??) literacy intervention.

# Big Data summary

- Developed research projects with each of the themes which make use of whole population (IDI) data
- Other projects
  - Antibiotics and obesity; Factors explaining ethnic disparities in obesity
  - Trends in ADHD medication dispensing; Identification of mental health cases; Identification of Autism Spectrum Disorder (ASD) cases
  - Caesarean births and child education outcomes
- Future work will explore (i) intergenerational impacts; and (ii) simulating cost-benefit of approaches