National SCIENCE Challenges

A BETTER START

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

Barry Milne

COMPASS Colloquium

Statistics New Zealand, Wellington

25 October 2022

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

Host Institution

The University of Auckland New Zealand | Liggins Institute

UC University of Canterbury

University of Otago

AUT University

The University of Waikato

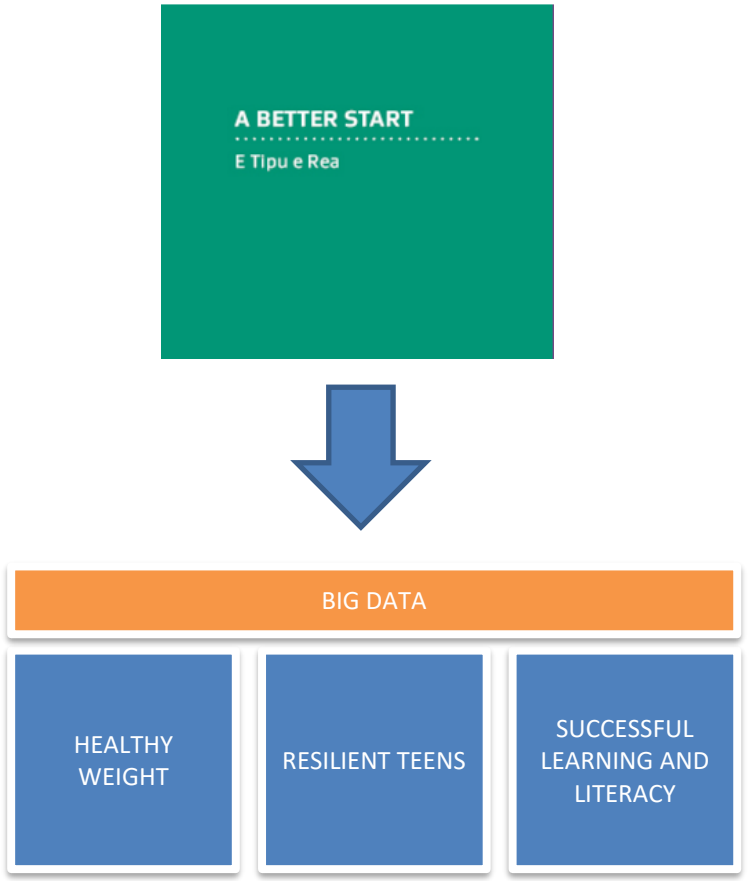
Massey University

Victoria University of Wellington

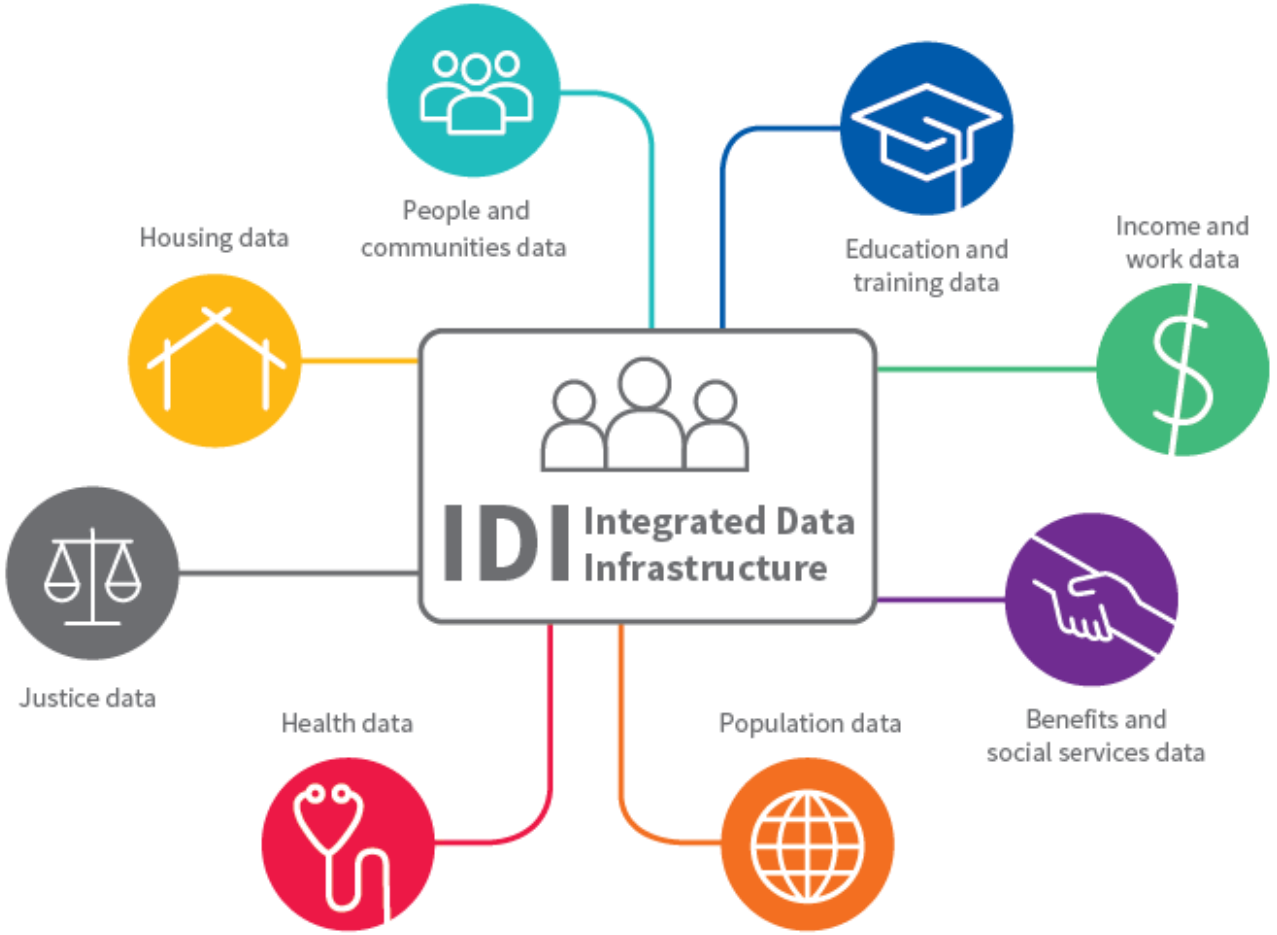
AgResearch

Big Data's role

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



Integrated Data Infrastructure (IDI)



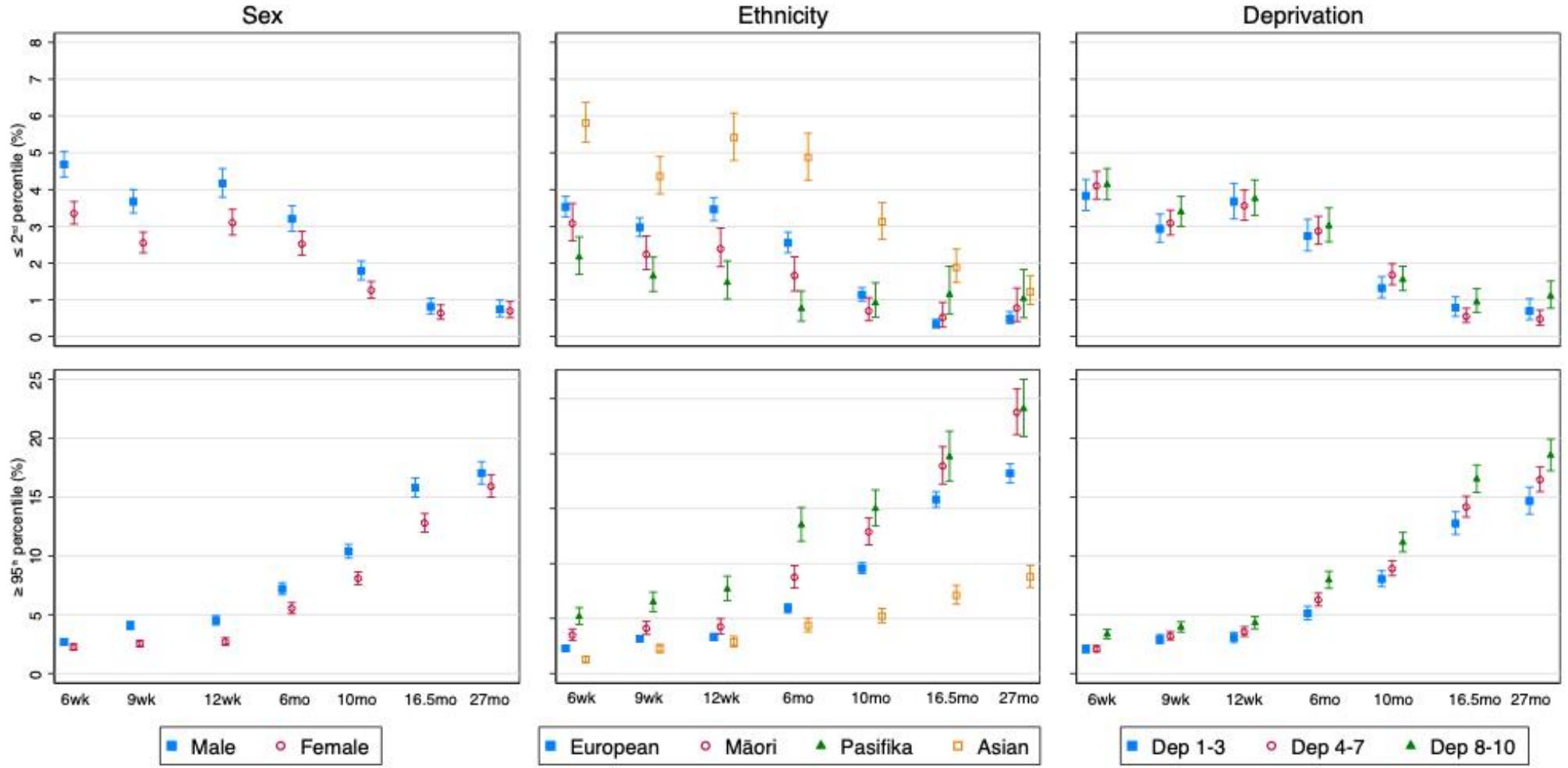
DISCLAIMER

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.

Healthy weight

1. Early growth (0–27 months)
   - Data: Plunket
   - Lead: Lisa Daniels
2. Trends in healthy weight, 2011–2019
   - Data: B4SC
   - Lead: Nichola Shackleton & Lisa Daniels

Early growth trends (Under review: Pediatric Obesity)



Further reductions in the prevalence of obesity in 4-year-old New Zealand children from 2017 to 2019

Lisa Daniels[1,2,3], Barry J. Taylor[1,2], Rachael W. Taylor[2,3], Barry J. Milne[4,5], Justine Camp[3], Rose Richards[6] and Nichola Shackleton[4,5]

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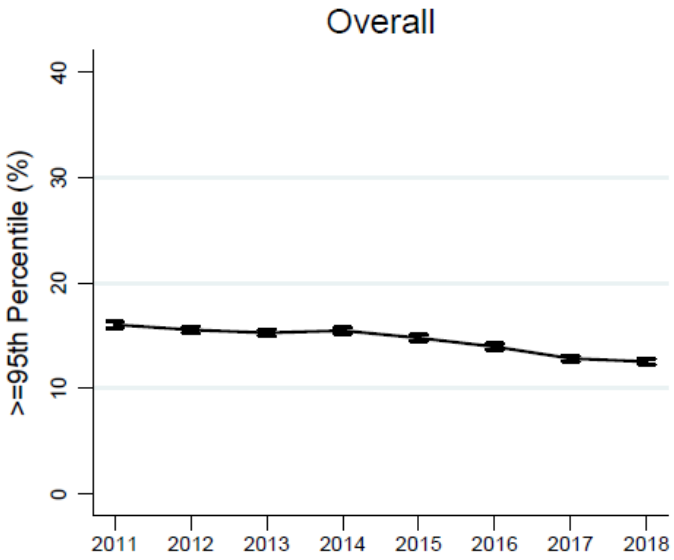
OBJECTIVE: To examine whether the prevalence of age- and sex-adjusted BMI at, or above, the 85th, 95th and 99.7th percentiles continues to decline in New Zealand preschool children, over time.

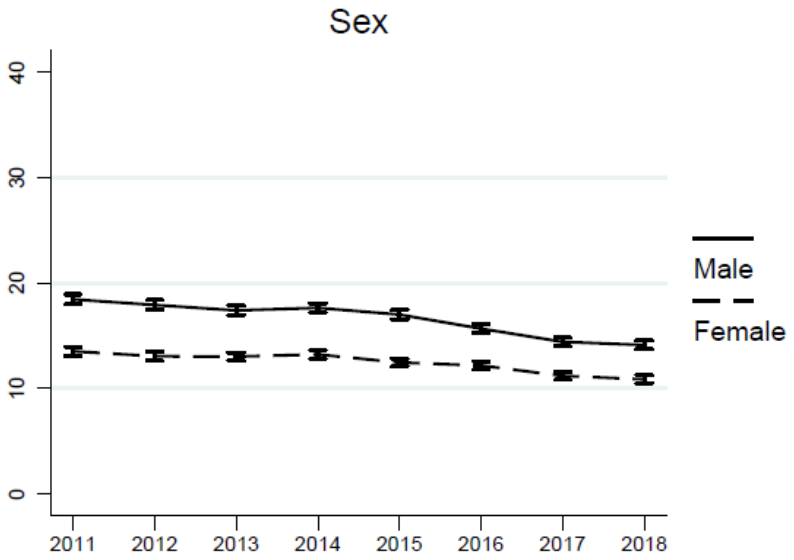
METHODS: As part of a national screening programme, 438,972 New Zealand 4-year-old children had their height and weight measured between 2011 and 2019. Age- and sex-adjusted BMI was calculated using WHO Growth Standards and the prevalence of children at, or above, the 85th, 95th, and 99.7th percentiles and at, or below, the 2nd percentile were determined. Log-binomial models were used to estimate linear time trends of ≥85th, ≥95th and ≥99.7th percentiles for the overall sample and separately by sex, deprivation, ethnicity and urban-rural classification.

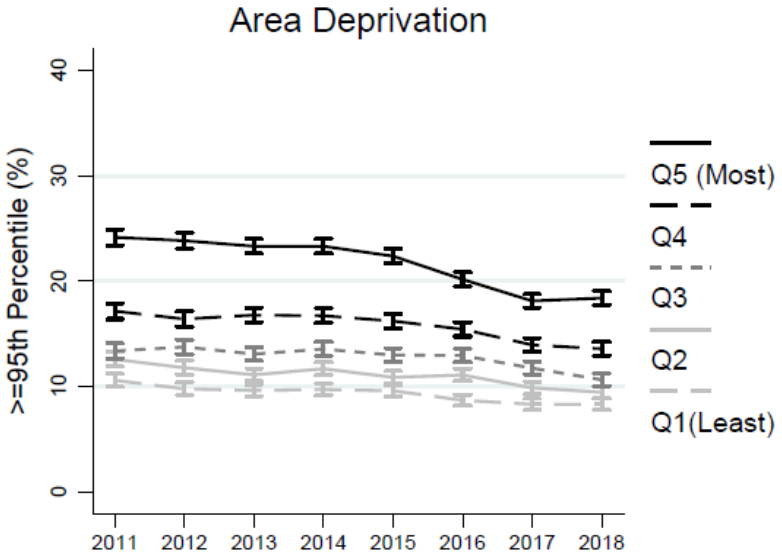
RESULTS: The percentage of children at, or above, the 85th, 95th and 99.7th percentile reduced by 4.9% [95% CI: 4.1%, 5.7%], 3.5% [95% CI: 2.9%, 4.1%], and 0.9% [95% CI: 0.7%, 1.2%], respectively, between '2011/12' and '2018/19'. There was evidence of a decreasing linear trend (risk reduction, per year) for the percentage of children ≥85th (risk ratio (RR): 0.980 [95% CI: 0.978, 0.982]), ≥95th (RR: 0.966 [95% CI: 0.962, 0.969]) and ≥99.7th (RR: 0.957 [95% CI: 0.950, 0.964]) percentiles. Downward trends were also evident across all socioeconomic indicators (sex, ethnicity, deprivation, and urban-rural classification), for each of the BMI thresholds. Larger absolute decreases were evident for children residing in the most deprived compared with the least deprived areas, at each BMI threshold. There appeared to be no consistent trend for the percentage of children ≤2nd percentile.

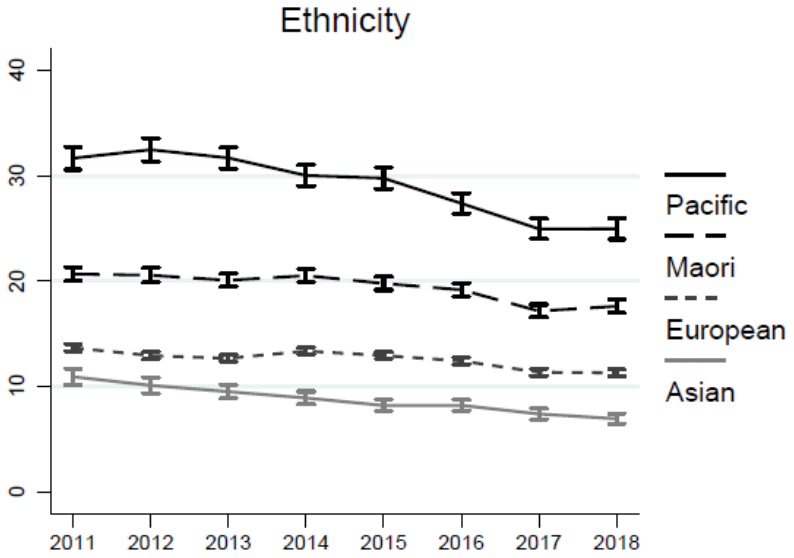
CONCLUSIONS: Reassuringly, continued declines of children with age- and sex-adjusted BMI at, or above, the 85th, 95th and 99.7th percentiles are occurring over time, overall and across all sociodemographic indicators, with little evidence for consistent trends in the prevalence of children at, or below, the 2nd percentile.

International Journal of Obesity (2022) 46:1176–1187; https://doi.org/10.1038/s41366-022-01095-2


Overall
>=95th Percentile (%)
0
10
20
30
40
2011
2012
2013
2014
2015
2016
2017
2018


Sex
0
10
20
30
40
2011
2012
2013
2014
2015
2016
2017
2018
Male
Female

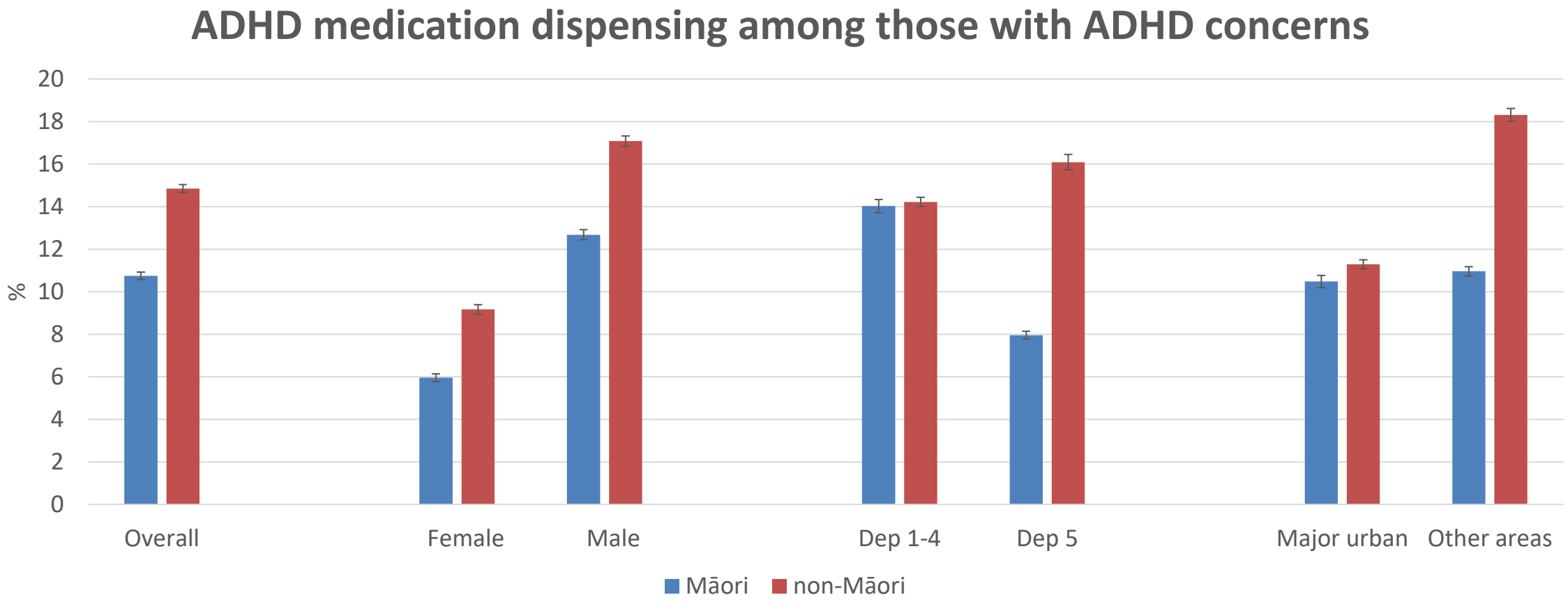

Area Deprivation
>=95th Percentile (%)
0
10
20
30
40
2011
2012
2013
2014
2015
2016
2017
2018
Q5 (Most)
Q4
Q3
Q2
Q1(Least)


Ethnicity
0
10
20
30
40
2011
2012
2013
2014
2015
2016
2017
2018
Pacific
Maori
European
Asian

Resilient Teens

1. ADHD: medication use trends, medication use by those with ADHD concerns
   - Data: NMDS, PHARMS, B4SC
   - Lead: Steph D'Souza
2. Autism Spectrum Disorder: identification, polypharmacy, criminal justice system interactions, educational support
   - Data: NMDS, PRIMHD, Socrates, PHARMS, MOJ, MOE
   - Lead: Nick Bowden
3. Understanding mental health in Pacific communities
   - Data: New Zealand health Survey
   - Lead: Barry Milne, Jesse Kokaua, Anita van der Veer, Ata Forrest

Medication dispensing amongst Māori and non-Māori screened for preschool ADHD (Accepted, NZMJ)



JAMA Pediatrics | Original Investigation

Association Between High-Need Education-Based Funding and School Suspension Rates for Autistic Students in New Zealand

Nicholas Bowden, MCom; Sheree Gibb, PhD; Richard Audas, PhD; Sally Clendon, PhD; Joanne Dacombe; Jesse Kokaua, PhD; Barry J. Milne, PhD; Himang Mujoo, PhD; Samuel William Murray, MPP; Kirsten Smiler, PhD; Hilary Stace, PhD; Larah van der Meer, PhD; Barry James Taylor, MB, ChB

JAMA Pediatr. 2022;176(7):664-671. doi:10.1001/jamapediatrics.2022.1296
Published online May 16, 2022.

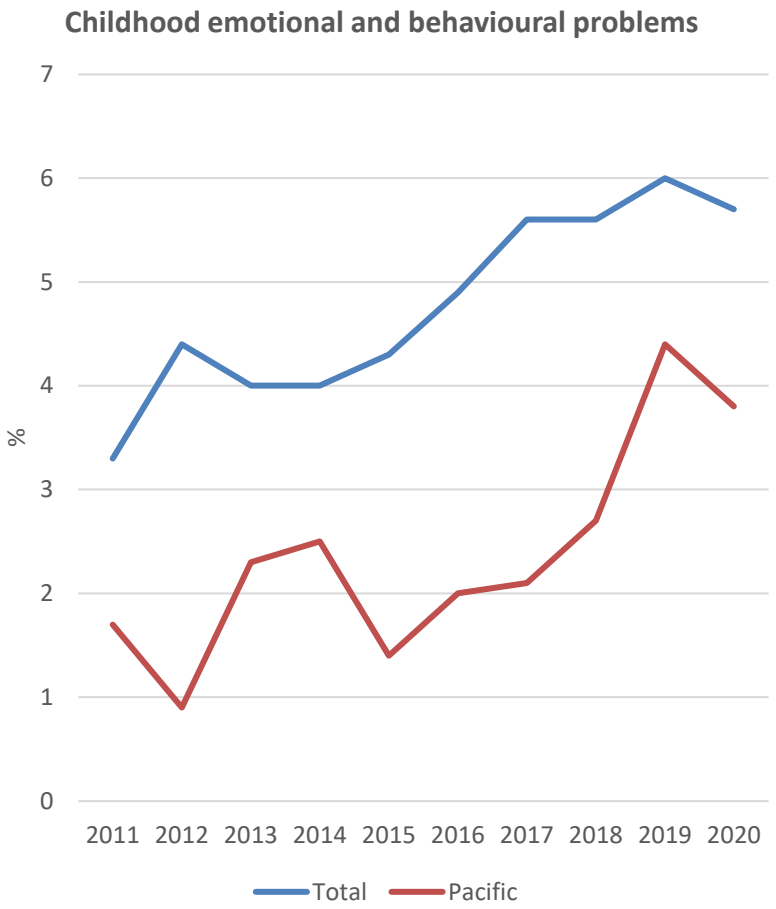
Table 2. Suspension Rates for Students With or Without Autism and Complete-Case Unadjusted and Adjusted Odds of Suspension Based on Autism Status

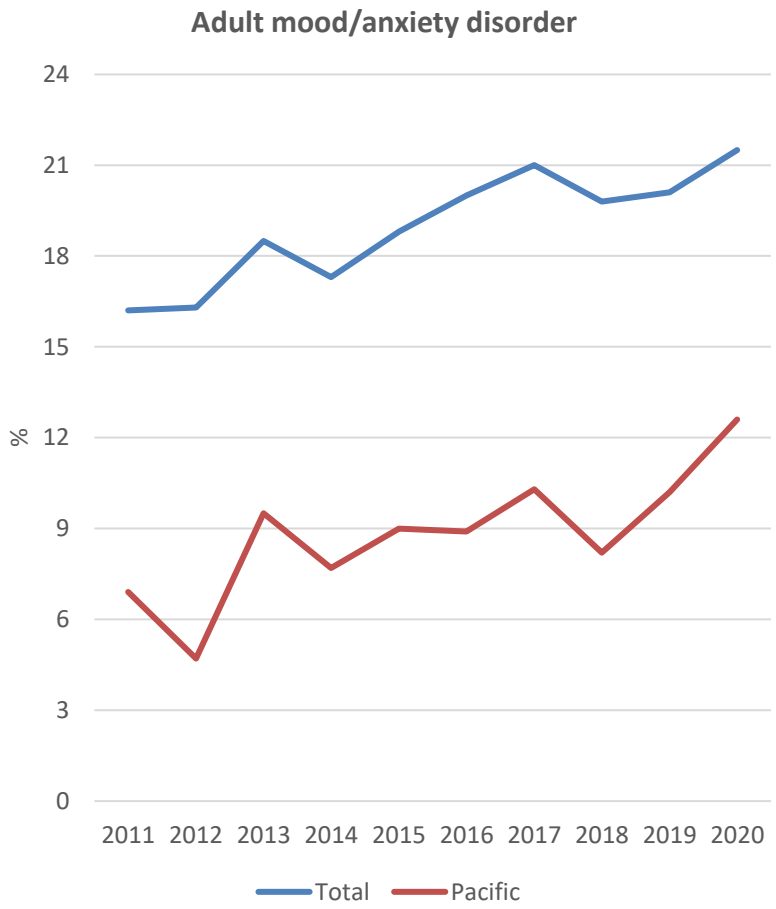
Students	Suspension rate, No. (%)	Odds ratio (95% CI)	
		Unadjusted	Adjusted[a]
With autism (n = 9741)	504 (5.2)	3.15 (2.86-3.47)	2.81 (2.55-3.11)
Without autism (n = 727 170)	13 845 (1.9)	1 [Reference]	1 [Reference]

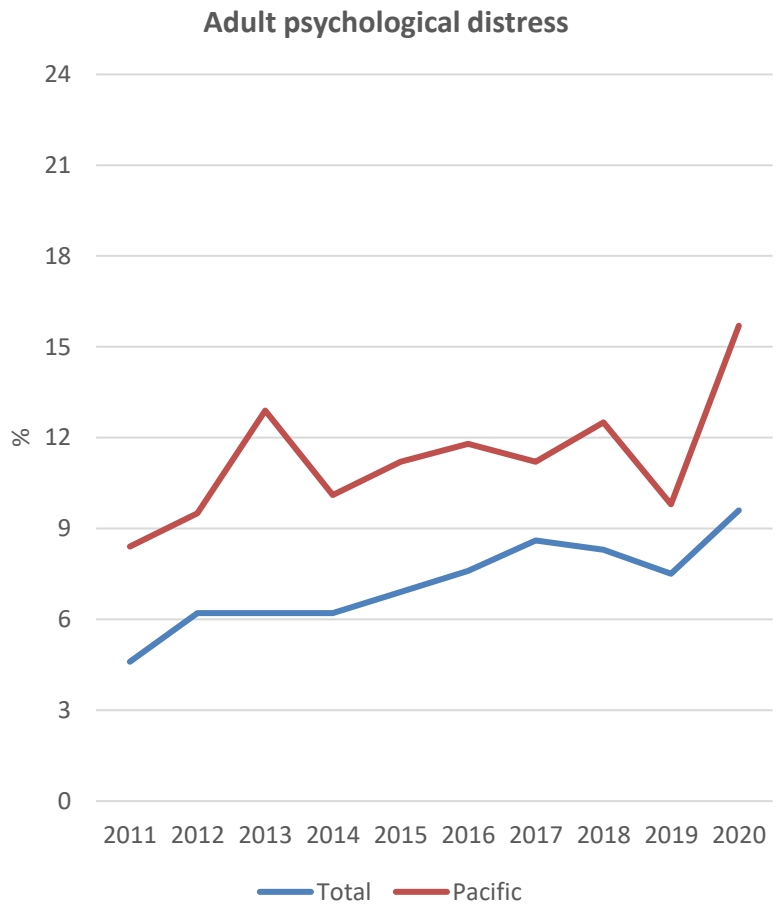
Table 4. Suspension Rates of Autistic Students Who Received or Did Not Receive High-Need Education-Based Funding and Complete-Case Unadjusted and Adjusted Odds of Suspension Based on High-Need Education-Based Funding Status

Funding status	Suspension rate, No. (%)	Odds ratio (95% CI)	
		Unadjusted	Adjusted[a]
Received funding (n = 2895)	57 (2.0)	0.31 (0.23-0.41)	0.29 (0.21-0.40)
Did not receive funding (n = 6849)	447 (6.5)	1 [Reference]	1 [Reference]

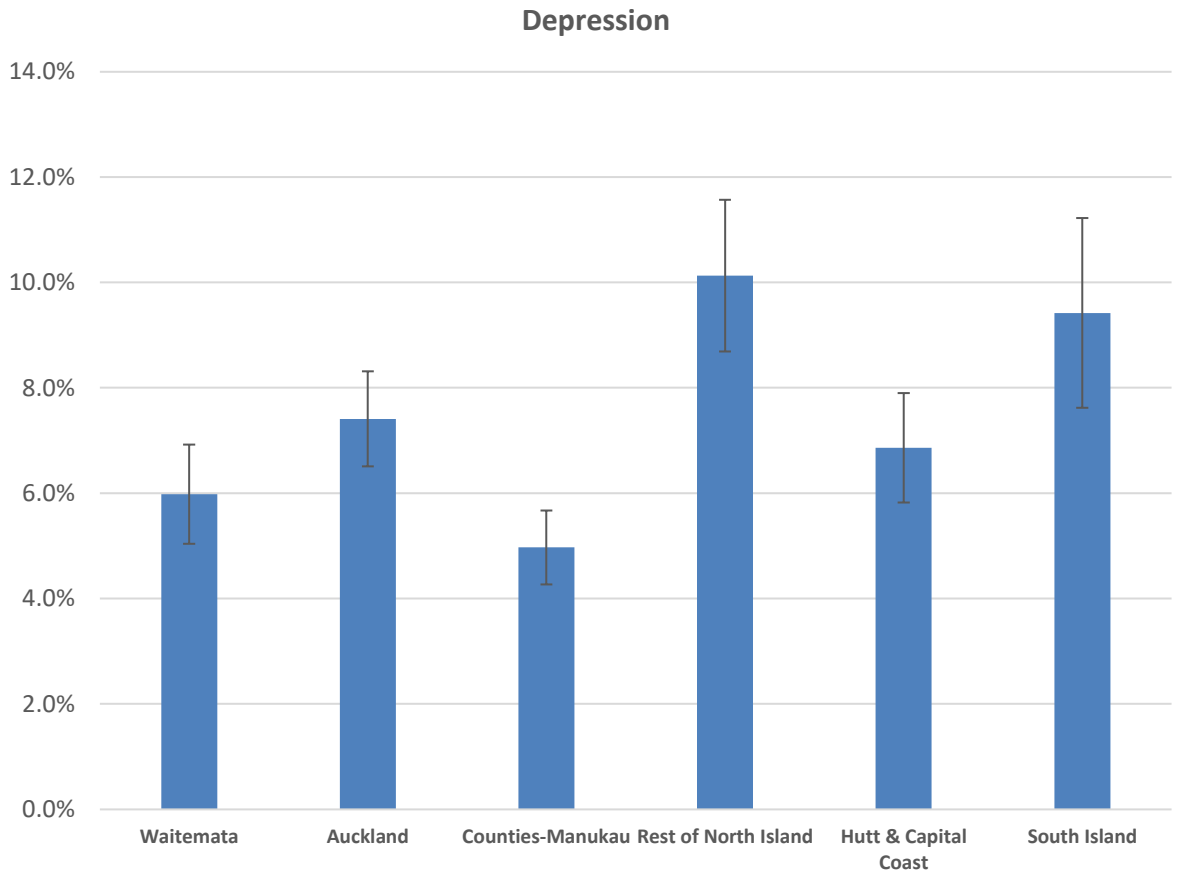
Mental health in Pacific communities

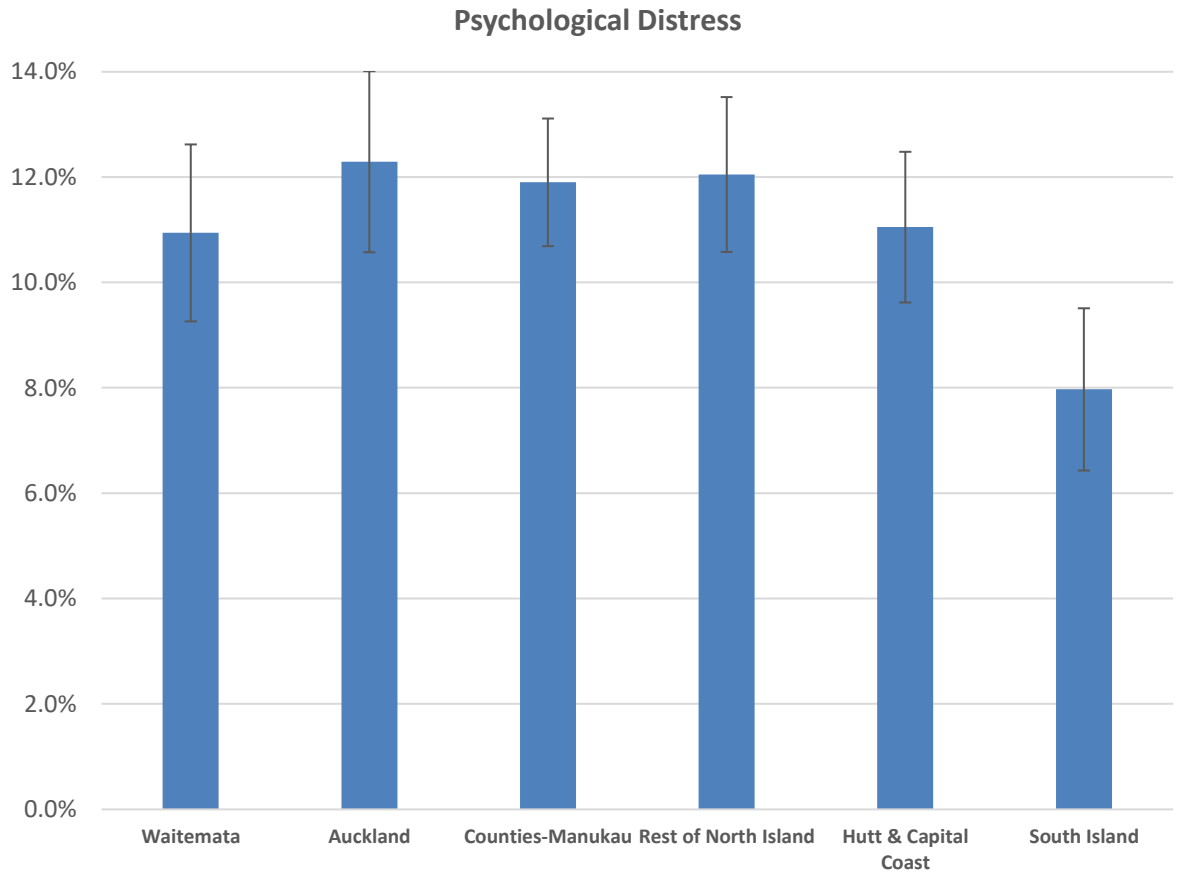






Mental health in Pacific communities

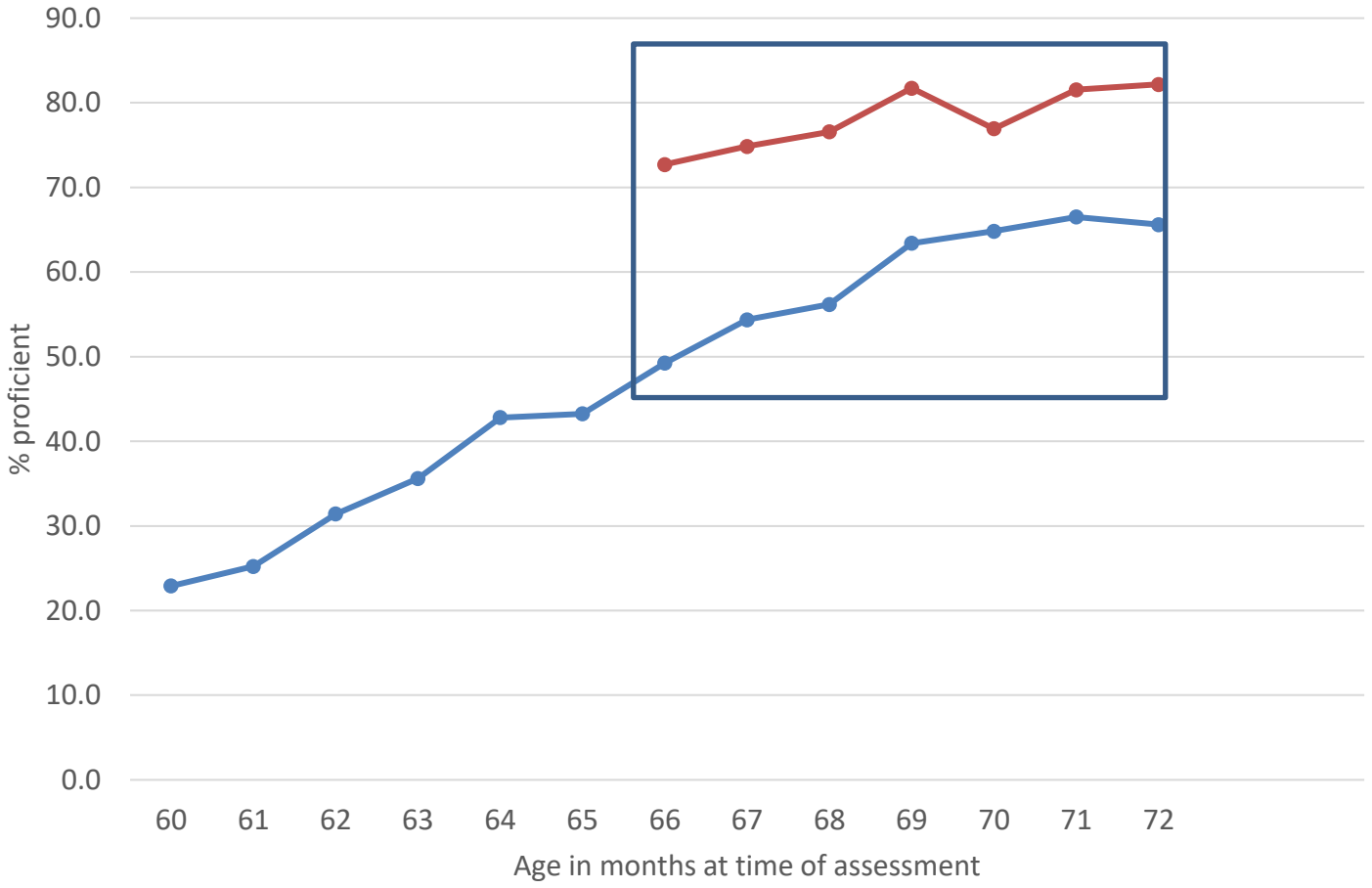


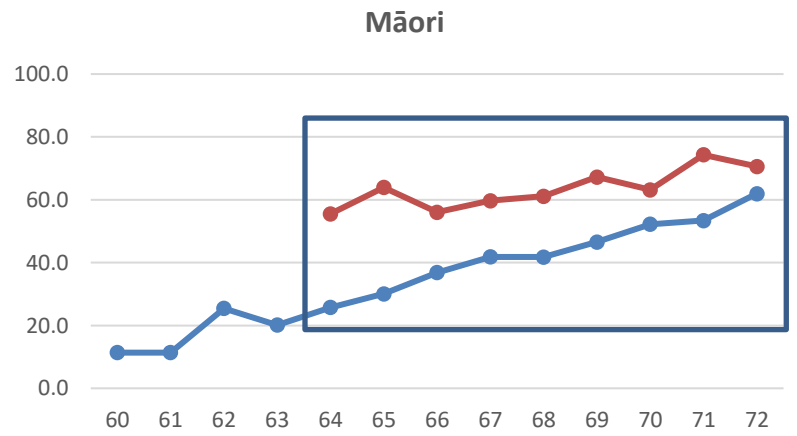


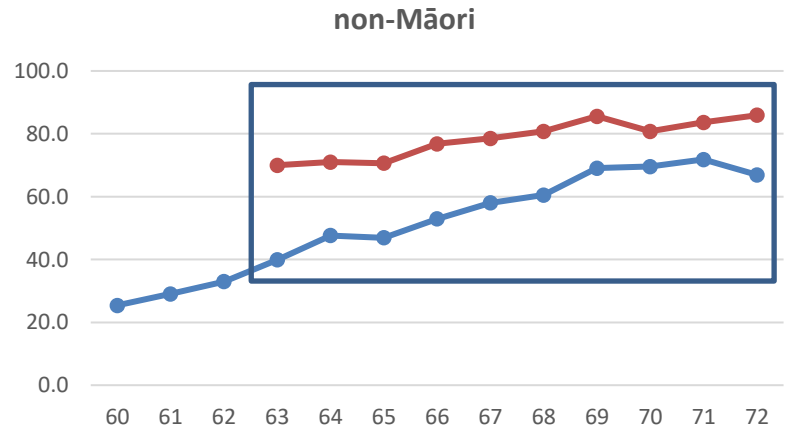
Successful Learning and Literacy

1. Evaluation of the Better Start Literacy Approach (BSLA)
   - Advances skills essential for the development of reading among children in their first year of school.
   - “The term more appropriately conveys how teachers monitor children’s response to the BSLA teaching and then scaffold, adapt activities, or increase teaching intensity as necessary to ensure all children progress towards their next steps for learning.”(Gillon et al., 2022)
   - Data: BSLA
   - Lead: Sheree Gibb, Megan Gath

Proficiency in the phoneme identity task







What's Next?

1. Impact of *Ka Ora Ka Ako* (free school lunch programme) in the Hawkes Bay (funded!)
   - Lead: Boyd Swinburn
2. Simulation Modelling of A Better Start Interventions (proposed)
   - Lead: Barry Milne

Knowledge Lab

- First Page
- Model input
- Scenario Builder
- Table Builder

Project upload

Choose Project File

Browse... No

Scenarios Run

Select Scenario for comparison:

Name the Project:

Save Project

Latest Update:
2019-03-06
Contact email:

Instruction

HOVER OVER an arrow to see the coefficient and citation for that path.

CLICK ON an arrow to open the citation for that coefficient.

HOVER OVER a bubble to see the levels of that variable.

CLICK ON a bubble to highlight all paths for models involving that variable. NB., clicking on a variable will pre-load this variable in scenario builder and table builder – click on scenario builder or table builder to go there.

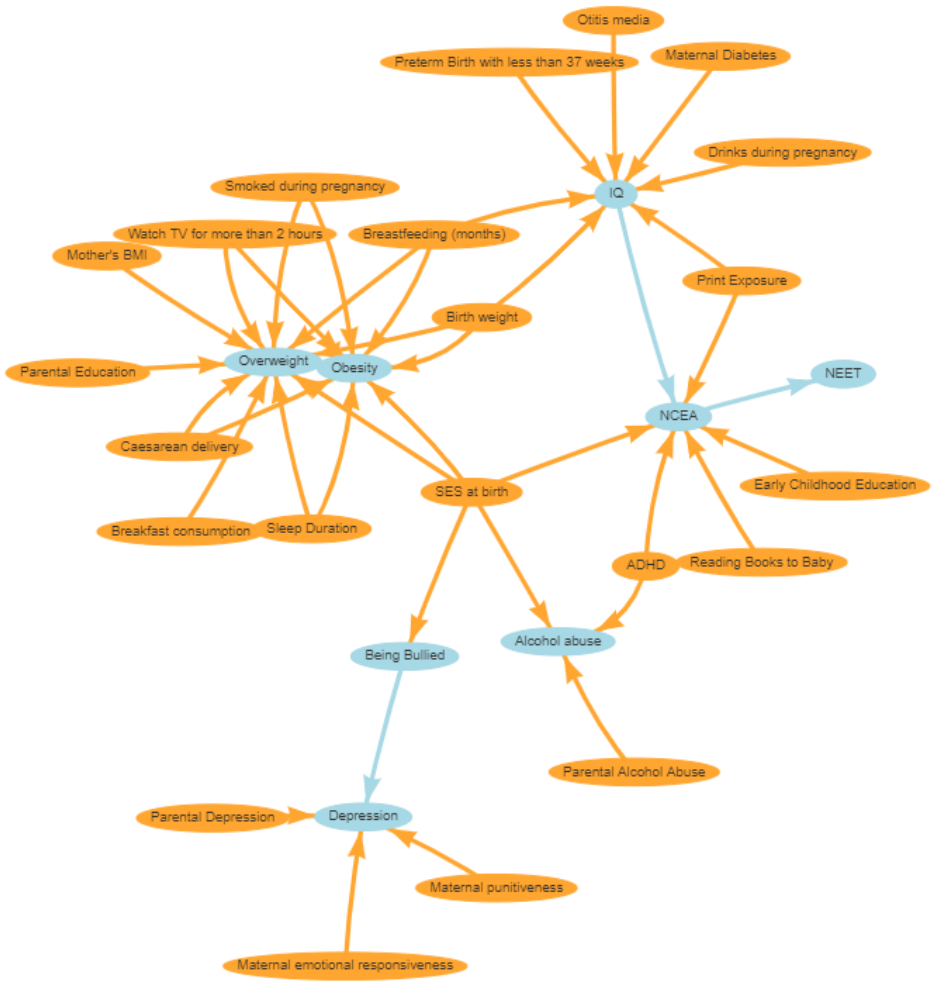
Comments and Suggestions

We encourage users to provide comments and suggestions about the conceptual framework and estimates. In particular, we welcome suggestions for changes and additions where supporting evidence from the literature can be provided.

Contact email:

Barry Milne
Kevin Chang

Conceptual Framework



Big Data summary

- Worked with experts in weight, mental health, and literacy toco-produce a number of publications, reports and analyses
  - And had fun doing it!
- Primarily IDI work but also
  - Plunket data
  - New Zealand Health Survey
  - Data collected in schools
- Evaluation research planned and simulation modelling proposed for 2023–24

Publications

Bowden, N., Gibb, S., Audas, R., Clendon, S., Dacombe, J., Kokaua, J., Milne, B. J., Mujoo, H., Murray, S. W., Smiler, K., Stace, H., van der Meer, L., & Taylor, B. J. (2022). Association Between High-Need Education-Based Funding and School Suspension Rates for Autistic Students in New Zealand. JAMA Pediatrics, 176(7), 664–671. https://doi.org/10.1001/jamapediatrics.2022.1296

Bowden, N., Milne, B., Audas, R., Clasby, B., Dacombe, J., Forster, W., Kokaua, J., Gibb, S., Hughes, N., MacCormick, C., Smiler, K., Taylor, B., & Mirfin-Veitch, B. (2021). Criminal justice system interactions among young adults with and without autism: A national birth cohort study in New Zealand. Autism, 13623613211065540. https://doi.org/10.1177/13623613211065541

Bowden, N., Thabrew, H., Kokaua, J., Audas, R., Milne, B., Smiler, K., Stace, H., Taylor, B., & Gibb, S. (2020). Autism spectrum disorder/Takiwātanga: An Integrated Data Infrastructure-based approach to autism spectrum disorder research in New Zealand. Autism, 24(8), 2213–2227. https://doi.org/10.1177/1362361320939329

Bowden, N., Thabrew, H., Kokaua, J., & Braund, R. (2020). National prescribing rates and polypharmacy for children and young people in New Zealand with and without autism spectrum disorder. Research in Autism Spectrum Disorders, 78, 101642. https://doi.org/10.1016/j.rasd.2020.101642

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Gillon G, McNeill B, Scott A, Arrow A, Gath M, Macfarlane A. (2022). A better start literacy approach: Effectiveness of Tier 1 and Tier 2 support within a response to teaching framework. Reading and Writing. https://doi.org/10.1007/s11145-022-10303-4

Gillon G, McNeill B, Scott A, Denston A, Wilson L, Carson K, Macfarlane AH. (2019). A better start to literacy learning: Findings from a teacher-implemented intervention in children's first year at school. Reading and Writing, 32(8), 1989–2012. https://doi.org/10.1007/s11145-018-9933-7

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D'Souza, S., Bowden, N., Gibb, S., Shackleton, N., Audas, R., Hetrick, S., Taylor, B., & Milne, B. (2020). Medication dispensing for attention-deficit/ hyperactivity disorder to New Zealand youth. New Zealand Medical Journal, 133(1522), 84–95.