

Helping  
people  
access and  
use quality  
evidence

---



# KA ORA, KA AKO | NEW ZEALAND HEALTHY SCHOOL LUNCHES PROGRAMME IMPACT EVALUATION



31 October 2022

# Authorship

---

Standard of Proof was created out of passion. Passion for making a difference, for making the lives of individuals, communities and organisations better through evidence. We pride ourselves on providing the highest standard of evidence that is appropriate and useful for the context.

Standard of Proof provides specialist services in:

- Evaluation: We encourage high standards of evidence, we promote relevant and inclusive processes, and we focus on informing decisions.
- Monitoring: We inspire progress through evidence, and we make quality data accessible.
- Measurement: We design, test and validate measures, and we enable efficient and accurate measurement practice.
- Research: We review, analyse and synthesise existing evidence, and we investigate new ideas and concepts.
- Data science and analytics: We apply statistical modelling, data analysis, and machine learning to unlock data.

The authors of this report include Dr Patricia Vermillion Peirce, Beau Jarvis-Child, Dr Luke Chu, Kirsty Lennox, Dr Nick Kimber, Nancy Wang, Trinh Nguyen Chau and Paige Winthrop.

We work with our partners and clients to ensure the right data and the right insight are brought to every project. Dr Eberhard Feess provided guidance on the evaluation design, Owen Hall MSc (statistician) and Dr Michele Morris provided guidance and peer review in the analytical approach and decisions.

[www.standardofproof.nz](http://www.standardofproof.nz)

## Acknowledgements

---

This evaluation wouldn't be possible without the support of many individuals and organisations. We would like to extend our sincere gratitude to them, including Alessandro Stollenwerk Cavallaro, Angelique Praat, Mira Peter, Andrew Webber, Bethany Charlton, Maryse Anderson-Kereti and Gary Basham for their invaluable contributions to the original design and/or the ongoing support throughout delivery; the regional leads for facilitating initial engagements with schools and kura, and providing advice on how to best engage; Jeff Lean and Alan Bristow who shared their knowledge and expertise in relation to the attendance data and analysis.

When referencing the content of this report, please cite:

Vermillion Peirce, P., Jarvis-Child, B., Chu, L., Lennox, K., Kimber, N., Clarke, H., Wang, N., Nguyen Chau, T. and Winthrop, P. (2022). *Ka Ora, Ka Ako New Zealand Healthy School Lunches Programme Impact Evaluation*. Ministry of Education.

Images: Ministry of Education

# CONTENTS

Executive Summary .....	1
Introduction .....	2
Food security in New Zealand .....	2
School-based food programmes .....	3
Ka Ora, Ka Ako New Zealand healthy school lunches programme.....	5
The evaluation.....	5
Context .....	7
Putting things in perspective .....	8
Evidence quality overview.....	14
Evaluation approach and methods.....	15
Evidence quality and use.....	16
Value of the programme .....	17
Findings & supporting evidence.....	19
Food security among secondary school-aged ākonga .....	20
Food security .....	20
Ka Ora, Ka Ako resulted in better wellbeing, in particular for those most underserved ākonga.....	30
Ka Ora, Ka Ako resulted in better mental wellbeing. ....	31
Ka Ora, Ka Ako resulted in improved health quality of life.....	34
Ka Ora, Ka Ako resulted in an overall better health quality of life. ....	41
Ākonga hauora.....	42
Māori secondary school-aged ākonga.....	45
The benefits of providing food.....	47
Ka Ora, Ka Ako did not contribute to overall attendance.....	50
Conclusions & Discussions.....	54
How well did Ka Ora, Ka Ako perform against expectations?.....	55
What do the results mean?.....	56

Ka Ora, Ka Ako contributes to healthier and happier ākonga overall, which will likely result in better health outcomes.....	56
Attendance is not one of the programme's benefits for the average ākonga within the given context.....	57
The programme's focus on healthy lunches (if sustained) may have longer-term benefits for ākonga.....	58
The programme's focus on providing sufficient quantities of food (if sustained) may have longer-term benefits and more equitable outcomes for our most underserved ākonga.....	59



Approximately 15% of New Zealand children lived in households without adequate and safe food in 2020/2021. This level of food-insecure children is concerning as food insecurity and hunger have been linked to lower levels of concentration, cognitive functioning, engagement and school achievement, as well as worse developmental outcomes later in life.




In 2020, a government-sponsored healthy school lunches programme – Ka Ora, Ka Ako – was introduced. The programme focused on providing healthy lunches to all ākonga in schools with the highest levels of deprivation. The pilot programme provided lunches to primary and intermediate ākonga in three regions. In response to the COVID-19 pandemic Ka Ora, Ka Ako was expanded to make school lunches available to secondary school ākonga as well as covering more regions in New Zealand. Providing regular access to healthy lunches was intended to reduce the risk of food insecurity, improve wellbeing and promote attendance at school.

**Why evaluate?**

The evaluation serves an accountability function. It informs the New Zealand Government (funders), the Ministries responsible for implementation and the New Zealand public about the (non-monetary) value of the Ka Ora, Ka Ako programme for ākonga. For this purpose, the evaluation demonstrates the extent to which the programme impacted on ākonga wellbeing (in secondary schools) and overall attendance. The evaluation also estimates the programme’s impact on wellbeing among ākonga who otherwise rarely have enough food to eat at home (the ‘most underserved’ ākonga).

**How do we know it has been effective?**

The evaluation evidence included:

-  standardised wellbeing assessments from 10,694 secondary-aged ākonga (learner wellbeing questionnaire)
-  two years of attendance data for ākonga in more than 70 schools (administrative data)
-  multiple interviews with staff, providers, ākonga and whānau at 8 schools (case studies).

The information was used to estimate the impact of the programme on two outcomes: wellbeing among secondary school-aged ākonga and attendance for ākonga across all age groups.

WELLBEING

ATTENDANCE

WHAT WAS ACHIEVED BY THE PROGRAMME?

Large benefits for secondary school-aged ākonga

The programme performed exceptionally well with regards to wellbeing, demonstrating broad and significant benefits for secondary school-aged ākonga in Ka Ora, Ka Ako schools.



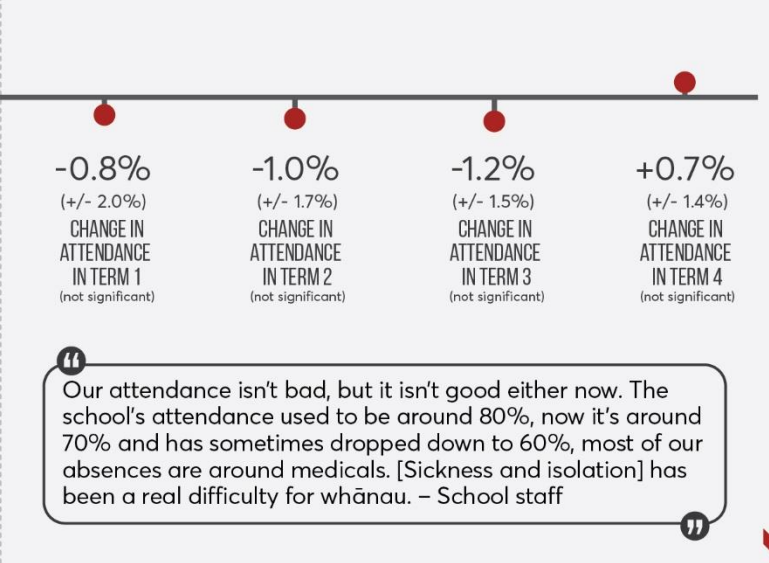
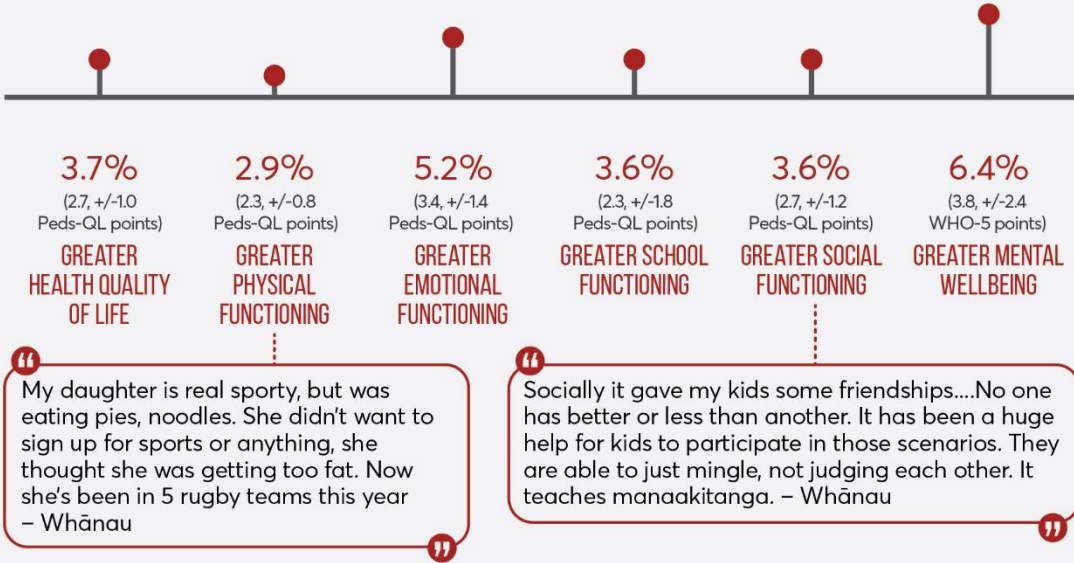
No clear benefits for ākonga

There were no clear benefits for ākonga with regards to attendance. The available evidence was not sufficient to determine if there were any benefits for the most underserved ākonga.



WHAT IMPACT\* DID KA ORA, KA AKO HAVE ON SECONDARY SCHOOL-AGED ĀKONGA?

\*The difference between those ākonga within the programme when compared to those ākonga not in the programme.



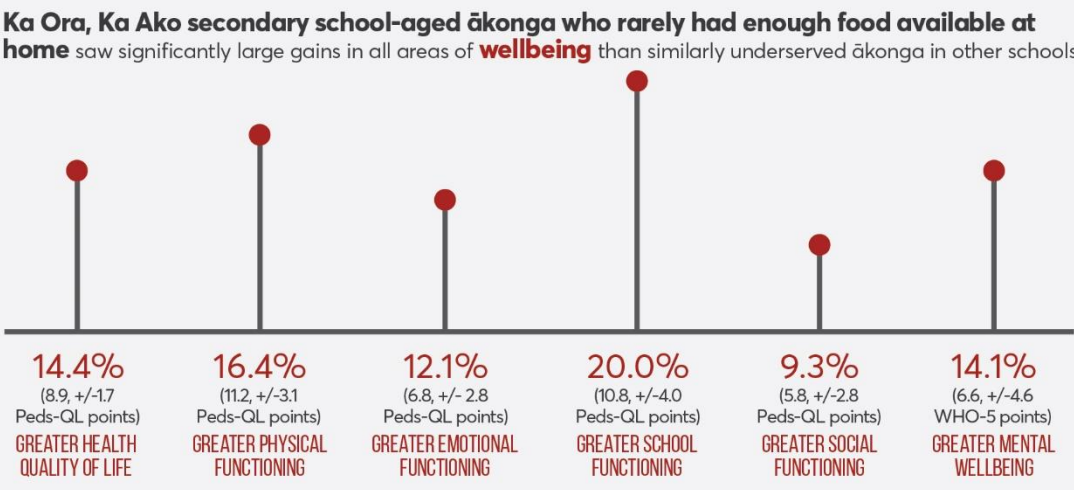
HOW HAS THE PREVALENCE OF NEED CHANGED IN PROGRAMME SECONDARY SCHOOLS?



with low overall health quality of life and 'at risk' of impaired health quality of life (according to a USA threshold)

WHAT IMPACT DID KA ORA, KA AKO HAVE ON THE MOST UNDERSERVED\* ĀKONGA?

\*Those ākonga who rarely had access to enough food at home to feel 'just right' (not too hungry and not too full) in the past week.



WHAT DO THE RESULTS MEAN?



The evaluations of the pilot and expanded programme both demonstrated that Ka Ora, Ka Ako provided significant benefits for ākonga. Ka Ora, Ka Ako resulted in significantly happier and healthier ākonga across the different age groups and an overall better health quality of life. The most underserved ākonga benefitted even more than other ākonga. The longer-term benefits are not yet known but research suggests these programme benefits, and more broadly adopting healthy eating habits early in life, may lead to positive lifelong benefits for ākonga and more equitable outcomes for those most underserved ākonga.



# INTRODUCTION

## Food security in New Zealand

Food insecurity in New Zealand is a real issue for many households, with the latest 2020/21 New Zealand Health Survey indicating approximately 15% of children live in households with moderate to severe food insecurity (i.e. they lacked access to sufficient amounts of nutritionally adequate and safe foods).<sup>1</sup> Insufficient amounts of nutritionally adequate food can have serious and long-lasting effects on physical and cognitive development during childhood.<sup>2</sup> Young people in New Zealand experiencing food insecurity are more likely to report higher rates of truancy, poor general health, mental health concerns and obesity.<sup>3</sup> Food insecurity typically leads to an increased intake of energy-dense, highly refined grains, sugar and fat with lower amounts of fresh, nutrient-rich foods.<sup>4</sup> <sup>5</sup> Chronic deprivation of adequate nutrient-dense food also results in reduced learning and productivity and increased chronic disease risk later in life.<sup>6</sup>

Ka Ora, Ka Ako | New Zealand Healthy School Lunches pilot evaluation<sup>7</sup> found that before the lunch programme was introduced, 21% (+/-1.6%) of primary and intermediate school-aged ākonga were hungry after consuming the lunch available to them. This finding suggested inadequate food quantities were available for these ākonga. The larger concern was the type of food available and consumed by ākonga. In terms of food availability, approximately 89% of the ākonga lunches (87.6%–90.2%) had at least one snack or sweet item while 51.4% (47.2%–55.5%) did not have any of the 15 vegetables available over the assessed four-day period.

For children and adolescents to achieve optimal health and growth, adequate consumption of essential nutrients is required on a daily basis when schools and kura are open for instruction. In particular, food and drink consumption at lunchtime is considered to make a significant contribution to their daily nutrient intake.<sup>8</sup> Data on New Zealand children's dietary intake during school hours indicates that lunch (between 12pm and 2pm) provides approximately

<sup>1</sup> Ministry of Health Annual Update of Key Results 2020/21: New Zealand Health Survey, <https://www.health.govt.nz/publication/annual-update-key-results-2020-21-new-zealand-health-survey>, downloaded 10 August 2022.

<sup>2</sup> Shankar, P., Chung, R., & Frank, D. A. (2017). Association of Food Insecurity with Children's Behavioral, Emotional, and Academic Outcomes: A Systematic Review. *Journal of Developmental and Behavioral Pediatrics* : JDBP, 38(2), 135–150.

<sup>3</sup> Utter, J., Izumi, B.T., Denny, S., Fleming, T., & Clark, T. (2018) Rising food security concerns among New Zealand adolescents and association with health and wellbeing. *Kōtuitui: New Zealand Journal of Social Sciences Online*, 13:1, 29–38.

<sup>4</sup> Fram, M. S., Ritchie, L. D., Rosen, N., & Frongillo, E. A. (2015). Child experience of food insecurity is associated with child diet and physical activity. *The Journal of Nutrition*, 145(3), 499–504.

<sup>5</sup> Darmon, N., & Drewnowski, A. (2008). Does social class predict diet quality? *The American Journal of Clinical Nutrition*, 87(5), 1107–1117.

<sup>6</sup> Ke, J., & Ford-Jones, E. L. (2015). Food insecurity and hunger: A review of the effects on children's health and behaviour. *Paediatrics & Child Health*, 20(2), 89–91.

<sup>7</sup> Vermillion Peirce, P., E. Blackie, M. Morris, B. Jarvis-Child and S. Engelbertz (2021). New Zealand Healthy School Lunch pilot Ka Ora, Ka Ako Interim Evaluation. Ministry of Education. [https://assets.education.govt.nz/public/Ka-Ora-Ka-Ako-Evaluation\\_ImpactFinal\\_20210517\\_revisedFINAL.pdf](https://assets.education.govt.nz/public/Ka-Ora-Ka-Ako-Evaluation_ImpactFinal_20210517_revisedFINAL.pdf)

<sup>8</sup> Harrison, F., Jennings, A., Jones, A., Welch, A., van Sluijs, E., Griffin, S., & Cassidy, A. (2013). Food and drink consumption at school lunchtime: the impact of lunch type and contribution to overall intake in British 9-10-year-old children. *Public Health Nutrition*, 16(6), 1132–1139.

20% of their daily energy and macronutrient intake, and approximately 15% of daily calcium, iron and vitamin A intake.<sup>9</sup>

In 2009, however, research showed that New Zealand children's lunches were often lacking in nutrition. The cross-sectional survey of school foods from 927 lunchboxes revealed an over-representation of the food groups high in fat, sodium and sugar, and an under-representation of fruit and vegetables.<sup>10</sup> Photos in this study also showed other essential food groups such as dairy products and higher protein foods were below 10% of the items in the lunchboxes. Of further concern was the high proportion (over 80%) of healthy foods (mainly fruit and vegetables) that were thrown away.

Nutrient-rich dietary intake during childhood has both short and long-term effects on physical and mental health.<sup>11</sup> Evidence now exists that demonstrates reduced nutrient intake during childhood is a predictor of adult health, including increased risk of chronic disease and a higher incidence of acute illness, physical pains, insomnia and depression.<sup>12 13</sup> Both the amount and quality of the food consumed during childhood is also related to developmental, cognitive and behavioural outcomes important for health, wellbeing and school life.<sup>14 15</sup> Another impact of poor nutrition is compromising children's behaviour, concentration and cognitive ability, which has an immediate effect on their ability to engage in school.<sup>16</sup>

Conversely, adequate nutrient intake can have numerous benefits for childhood physical and psychological wellbeing. In a cross-sectional study of adolescents in South Auckland, New Zealand, a significant association between healthy eating and improved emotional health was observed, while unhealthy eating resulted in greater emotional stress.<sup>17</sup> In addition, an association between a higher quality of nutrient intake and lower depression scores were observed in young Australians aged between 10 and 14 years.<sup>18</sup>

## School-based food programmes

School-based food programmes focus on reducing food insecurity, specifically among children and young people, and provide food to children while at school (e.g. school lunches, breakfast clubs) and/or provide food to children to take home with them (e.g. food backpacks). School-based food programmes have demonstrated effectiveness across a number of pertinent outcomes and in many international settings. One systematic review of 216 programmes in 52

<sup>9</sup> Regan, A., Parnell, W., Gray, A. & Wilson, N (2008) New Zealand children's dietary intakes during school hours. *Nutrition & Dietetics*, 65, 205-210.

<sup>10</sup> Dresler-Hawke, E., Whitehead, D., & Coad, J. (2009). What are New Zealand children eating at school? A content analysis of 'consumed versus unconsumed' food groups in a lunch-box survey. *Health Education Journal*, 68(1), 3-13.

<sup>11</sup> Sorhaindo, A. & Feinstein, L. (2006) What is the relationship between child nutrition and school outcomes? [Wider Benefits of Learning Research Report No. 18]. Centre for Research on the Wider Benefits of Learning, Institute of Education, University of London: London.

<sup>12</sup> Lanigan, J., & Singhal, A. (2009). Early nutrition and long-term health: a practical approach. *The Proceedings of the Nutrition Society*, 68(4), 422-429.

<sup>13</sup> Qi, Y., & Niu, J. (2015). Does childhood nutrition predict health outcomes during adulthood? Evidence from a population-based study in China. *Journal of Biosocial Science*, 47(5), 650-666.

<sup>14</sup> Darnton-Hill, I., Nishida, C., & James, W. P. (2004). A life course approach to diet, nutrition and the prevention of chronic diseases. *Public health nutrition*, 7(1A), 101-121.

<sup>15</sup> Feinstein, L., Sabates, R., Sorhaindo, A., Rogers, I., Herrick, D., Northstone, K., & Emmett, P. (2008). Dietary patterns related to attainment in school: the importance of early eating patterns. *Journal of Epidemiology and Community Health*, 62(8), 734-739.

<sup>16</sup> Belot, M. & James J. (2011), Healthy school meals and educational outcomes. *Journal of Health Economics*, 30, 489-504.

<sup>17</sup> Kulkarni, A. A., Swinburn, B. A., & Utter, J. (2015). Associations between diet quality and mental health in socially disadvantaged New Zealand adolescents. *European Journal of Clinical Nutrition*, 69(1), 79-83.

<sup>18</sup> Jacka, F. N., Kremer, P. J., Leslie, E. R., Berk, M., Patton, G. C., Toumbourou, J. W., & Williams, J. W. (2010). Associations between diet quality and depressed mood in adolescents: results from the Australian Healthy Neighbourhoods Study. *The Australian and New Zealand Journal of Psychiatry*, 44(5), 435-442.

low-and middle-income countries found that school food programmes are one of the few education-relevant interventions that show a positive impact on school enrolment, attendance and completions, and learning.<sup>19</sup>

These same broad benefits, however, are not always replicable, particularly when comparing these results with those from trials conducted in high-income countries in the short term. For instance, one Virginia (USA) school-based food programme found no change in food security<sup>20</sup> due to the programme providing both food at school as well as food backpacks for weekends and school breaks.<sup>21</sup> However, when they examined their measure of food security more closely, they identified a decrease in the most severe form of food insecurity in children, such as skipping meals due to lack of food or money, and an increase in other, less severe forms of food insecurity in children, adults and households.

Similarly, an evaluation of the New Zealand school-based breakfast pilot did not find a statistically significant effect on school attendance or academic achievement over the 1-year period, but found significant positive effects on children's short-term satiety.<sup>22</sup> While another school breakfast programme in the USA was found to only offset food-related concerns among at-risk families,<sup>23</sup> suggesting that the programme may strengthen food security among families at the margin of food security as it provided a dependable meal for children and provided at least a portion of their food needs. The authors recognised such achievements, although apparently less than desired, were valuable; although "marginal food insecurity is a comparatively mild condition, it has been linked to worse developmental trajectories for children... suggesting that it is a meaningful indicator of child wellbeing".<sup>24</sup>

Other studies show mixed results of school food programmes on the short-term educational impacts. One American school food programme focused on nutritional standards, and was found to increase test scores,<sup>25</sup> while another Chilean school food programme focused on increasing caloric intake was found to have no impact on test scores.<sup>26</sup>

In one systematic review of universal free school meals in economically developed countries (to 2020), 47 robust<sup>27</sup> studies highlighted mixed results. While nearly all studies examining universal free school meals found positive associations with school meal participation (e.g. diet quality, food security and academic performance), the research findings showed only

<sup>19</sup> World Food Programme. (2019). [The impact of school feeding pilots](https://docs.wfp.org/api/documents/WFP-0000102338/download/). Rome; <https://docs.wfp.org/api/documents/WFP-0000102338/download/> (downloaded 8 Feb 2021).

<sup>20</sup> Burke, M., C. Cabili, D. Berman, S. Forrestal, P. Gleason (2021). A Randomized Controlled Trial of Three School Meals and Weekend Food Backpacks on Food Security in Virginia, *Journal of the Academy of Nutrition and Dietetics*, Volume 121, Issue 1, Supplement, January 2021, pages S34-S45.

<sup>21</sup> The authors suggested this unexpected result may have been due to the pilot providing apparent low-cost food, and the items in the questionnaire asking if they rely on low-cost foods to feed their children. In other words, the additional food that treatment households received could have worsened food insecurity by creating a perception that the food was low cost and they were unable to afford more.

<sup>22</sup> Ni Mhurchu, C, D. Gorton, M. Turley, Y. Jiang, J. Michie, R. Maddison, J. Hattie (2012). Effects of a free school breakfast programme on children's attendance, academic achievement and short-term hunger: results from a stepped-wedge, cluster randomised controlled trial, *Journal of Epidemiology and Community Health* 2013, 67: 257-264.

<sup>23</sup> Bartfeld, JS & HM Ahn (2011). The School Breakfast Program Strengthens Household Food Security among Low-Income Households with Elementary School Children, *The Journal of Nutrition*, Volume 141, Issue 3, March 2011, pages 470-475.

<sup>24</sup> Ibid, pg. 475.

<sup>25</sup> Belot, M. James, J. (2011). Healthy school meals and educational outcomes, *Journal of Health Economics*, Volume 30, Issue 3, Pg 489-504.

<sup>26</sup> McEwan, P. J. (2013). The impact of Chile's school feeding program on education outcomes. *Economics of Education Review*, 32, 122-139.

<sup>27</sup> The search was conducted in accordance with the Preferred Reporting Items for Systematic Review and Meta-Analyses (PRISMA), and 47 studies were identified, and the Newcastle-Ottawa Scale (NOS) was applied to assess bias in relation to these studies. The Newcastle-Ottawa scale is a tool used for assessing the quality of non-randomized studies included in a systematic review and/or meta-analyses.

some significant effects for attendance and only for specific subpopulations rather than overall.<sup>28</sup>

Another study<sup>29</sup> showed longer-term benefits from a school lunch programme and suggested that a lunch programme in Sweden reduced socioeconomic inequalities later in life. The programme, providing nutritious school lunches to ākonga in Swedish primary schools from 1959 to 1969, focused on improving nutritional intake rather than poverty relief, hunger or increasing caloric intake. They found large and positive effects on years in schooling and university attendance for these children later in life, while they found no evidence for increased attendance after the programme was introduced at the schools.

## Ka Ora, Ka Ako New Zealand healthy school lunches programme

The New Zealand school-based healthy lunches programme, Ka Ora, Ka Ako, was first announced in 2019 as a New Zealand Government initiative focused on reducing food insecurity among ākonga. The programme is administered through the Ministry of Education (hereafter, the Ministry). Rather than targeting individual ākonga, it targets schools and kura with the highest concentration of ākonga that face socio-economic barriers<sup>30</sup> and provides lunches to all of the ākonga within the school, free of cost and on a daily basis when schools and kura are open for instruction. This universal approach, rather than the targeted provision of lunches to specific ākonga, was intended to reduce the stigma associated with 'needing food' and ensure those most in need took up the lunches.

The short-term goal to ensure children and young people have what food they need, and have regular access to nutritious food while at school was a key indicator of success. The expectation was that the programme will improve food security (alleviating hunger and improving nutrition) and ākonga wellbeing. Secondary benefits were then expected in terms of promoting attendance at school. It has also been suggested there may be further benefits for whānau as they may experience improved financial security and wellbeing because of the healthy school lunches programme.

## The evaluation

This evaluation assesses the impact of the Ka Ora, Ka Ako programme on secondary ākonga wellbeing as well as the impact of the programme on attendance among all age groups. It extends upon the earlier evaluation of the Ka Ora, Ka Ako pilot that focused on the programme's impact on wellbeing and attendance among primary and intermediate-aged ākonga involved in the initial roll out.

The evaluation serves an accountability purpose for the New Zealand Government (funders) and the Ministry of Education (responsible for implementation), and provides the New Zealand

<sup>28</sup> Cohen JFW, Hecht AA, McLoughlin GM, Turner L, Schwartz MB. Universal School Meals and Associations with Student Participation, Attendance, Academic Performance, Diet Quality, Food Security, and Body Mass Index: A Systematic Review. *Nutrients*. 2021; 13(3):911. <https://doi.org/10.3390/nu13030911>

<sup>29</sup> Lundborg, P., D.O. Rooth, J.A. Petersen (2021). Long-Term Effects of Childhood Nutrition: Evidence from a School Lunch Reform, *Review of Economic Studies* 0, 1-33.

<sup>30</sup> These targeted schools and kura are defined as being in the 25% of households that are most materially deprived when compared against a standard basket of goods and measured according to the Ministry of Education Equity index.

public with an understanding of what has been achieved by the tax-payer funded programme. The evaluation, approved by the Ministry of Education and agreed with Cabinet, assesses the (non-monetary) value of the programme for New Zealand in terms of wellbeing among secondary school-aged ākonga and overall attendance. It was of particular interest to estimate the programme's impact on wellbeing among ākonga who rarely would otherwise have enough food to eat (those '**most underserved**' ākonga). This evidence was intended to inform decisions about any future roll out of the programme.



### **Key evaluation question (KEQ)**

What difference does the Ka Ora, Ka Ako programme make for ākonga in terms of wellbeing (for secondary school-aged ākonga) and attendance, and in particular for the most underserved ākonga?



# CONTEXT



# Putting things in perspective

---

## **New Zealand Government is committed to reducing child poverty and improving child wellbeing.**

On 20 December 2018, the New Zealand Government passed into law the Child Poverty Reduction Act 2018 and the Children's Amendment Act 2018, with the goal to ensure successive governments retain a commitment to reduce child poverty and improve child wellbeing. The Child Poverty Act requires governments to set goals, report annually on the measures and report in relation to the national Budget and child poverty indicators. The Children's Amendment Act requires governments to develop and publish a strategy to improve wellbeing with a focus on child poverty and those with greater needs.

New Zealand's first Child and Youth Wellbeing Strategy<sup>31</sup> was launched in 2019. The child and youth wellbeing framework, as part of the strategy, sets out the vision, guiding principles and a set of six wellbeing outcomes for New Zealand. The framework is intended to be used quite widely to support collective action to improve child and youth wellbeing. The outcomes reflect the social and broader economic and environmental factors needed to improve the overall wellbeing of children and young people.

The Ka Ora, Ka Ako programme is part of the Government's Child Youth and Wellbeing Strategy. One of the six child and youth wellbeing outcomes most relevant to Ka Ora, Ka Ako is that children and young people have what they need, and notably that they have regular access to nutritious food. As stated in the Child and Youth Wellbeing Strategy, pg. 39 (*italics added*):

*... On the primary measures in the Child Poverty Reduction Act 2018, between 150,000 and 250,000 children and young people are living in poverty.<sup>32</sup> Poverty can involve various forms of hardship, such as **going hungry**, living in cold, damp houses, and missing out on important opportunities like school outings and sports activities.... Many families in New Zealand struggle to provide enough food for their children and young people. Around one in five children in New Zealand live in households that report that a lack of money means that food runs out at least sometimes, with around 40,000 children reporting it runs out often.<sup>33</sup> Evidence shows that food insecurity and inadequate nutrition impact negatively on children's health, development, learning, and general wellbeing.<sup>34</sup>*

Further expected outcomes are that children and young people are happy and healthy (including good mental wellbeing), are learning and developing, and are accepted, respected and connected. Again, Ka Ora, Ka Ako's focus on wellbeing aligns with these strategic goals.

<sup>31</sup> <https://www.chilyouthwellbeing.govt.nz/resources/child-and-youth-wellbeing-strategy>

<sup>32</sup> Statistics New Zealand, 'Child Poverty Statistics: Year ended June 2018', <https://www.stats.govt.nz/news/child-poverty-statistics-released>

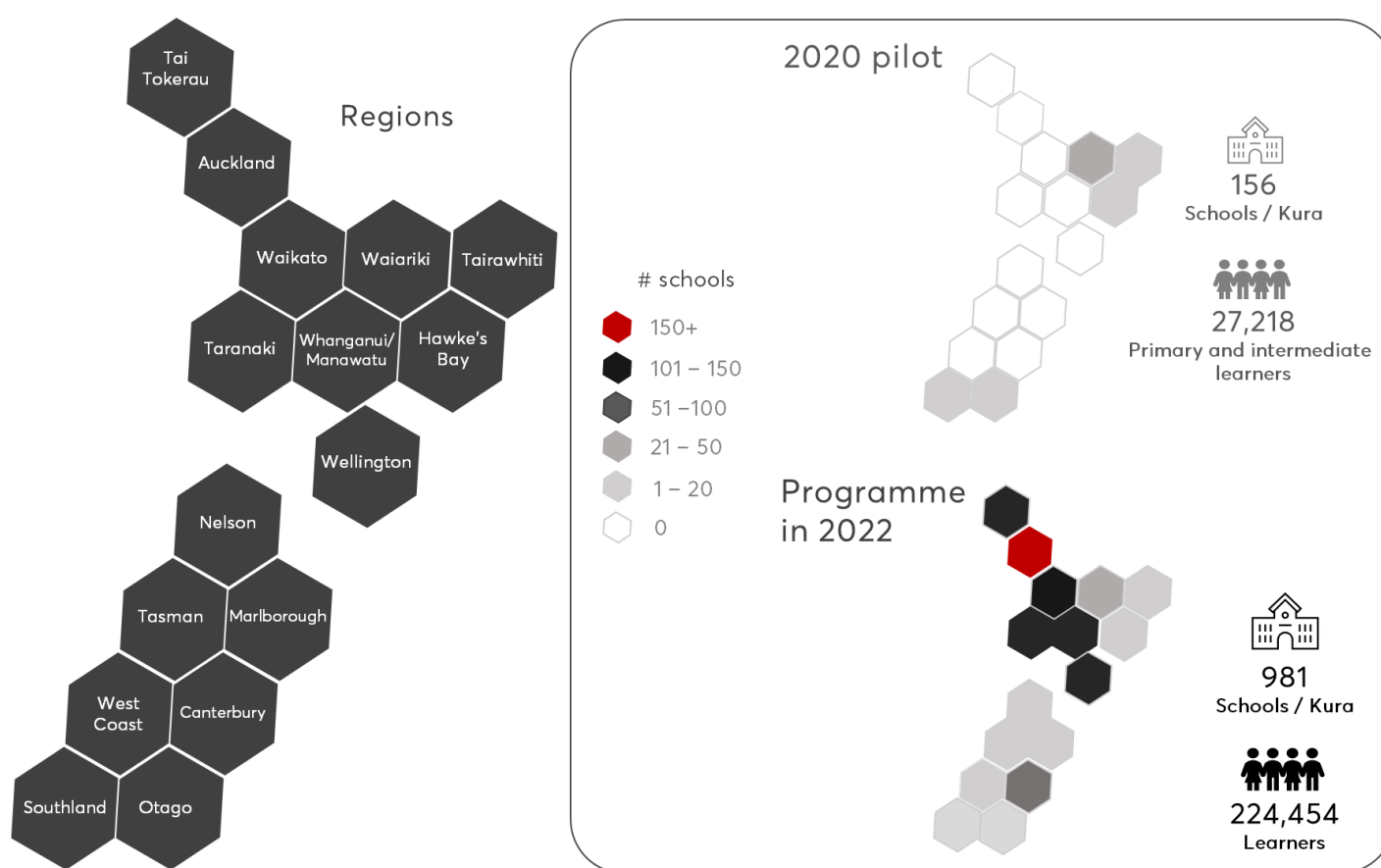
<sup>33</sup> Perry, Bryan 'The Material Wellbeing of New Zealand households', Ministry of Social Development, 2018, p. 91.

<sup>34</sup> the evidence sources cited by Utter, Jennifer, et al, 'Rising Food Security Concerns Among New Zealand Adolescents and Association with Health and Wellbeing', *Kōtuitui: New Zealand Journal of Social Sciences Online*, 13:1, 2017, pp. 29-38.

**Since 2019, Ka Ora, Ka Ako has grown and now reaches approximately 215,000 ākonga in schools and kura with ākonga populations that face the greatest economic barriers.**

The Ka Ora, Ka Ako pilot programme was delivered throughout 2020 and released in tranches across three regions: Hawke's Bay/Tairāwhiti, Otago/Southland and Bay of Plenty/Waiariki. In response to the COVID-19 pandemic Ka Ora, Ka Ako was expanded, making school lunches available to secondary school-aged ākonga<sup>35</sup> as well as covering more regions in New Zealand. School enrolments continued into 2022, with increasing numbers of ākonga benefiting from the healthy lunches across New Zealand. By 5 September 2022, there were 981 schools and kura enrolled in Ka Ora, Ka Ako and up to 224,454 ākonga receiving daily lunches as part of the programme.

**Figure 1: Ka Ora, Ka Ako 2020 pilot and expanded programme by region and number of ākonga enrolled in all participating schools and kura.**



The selection of schools and kura eligible for participating in the programme is informed by the Ministry's Equity Index (EQI). The EQI is a statistical model that indicates the extent to which a school's students might face socio-economic barriers that could get in the way of them achieving at school.<sup>36</sup> The higher EQI scores indicate greater barriers among ākonga at

<sup>35</sup> At least two schools in the pilot programme were providing lunch to secondary school-aged ākonga.

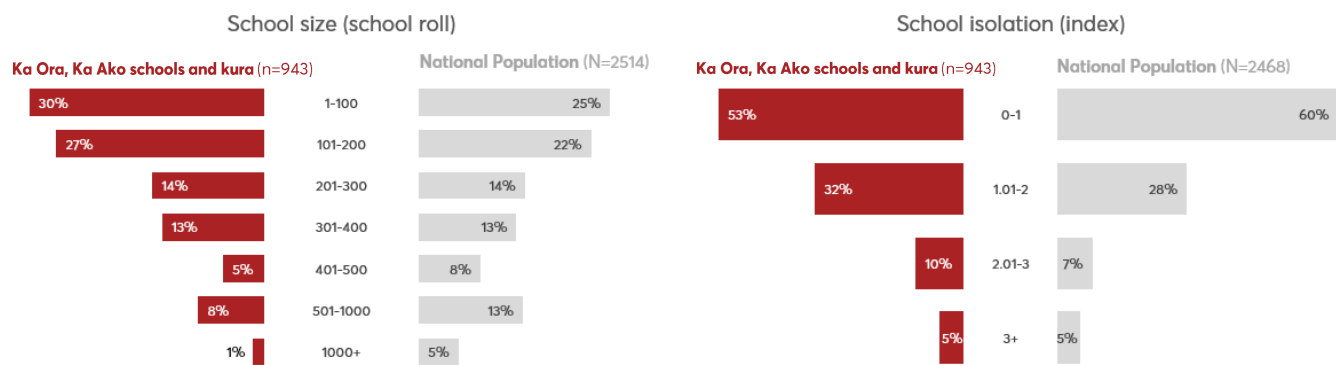
<sup>36</sup> <https://www.education.govt.nz/assets/Documents/Ministry/Information-releases/2019-releases/R-131-133-Redacted.pdf>, downloaded 12 March 2021.



the school or kura, and schools and kura above the 461 school-level EQI were deemed eligible for the programme.

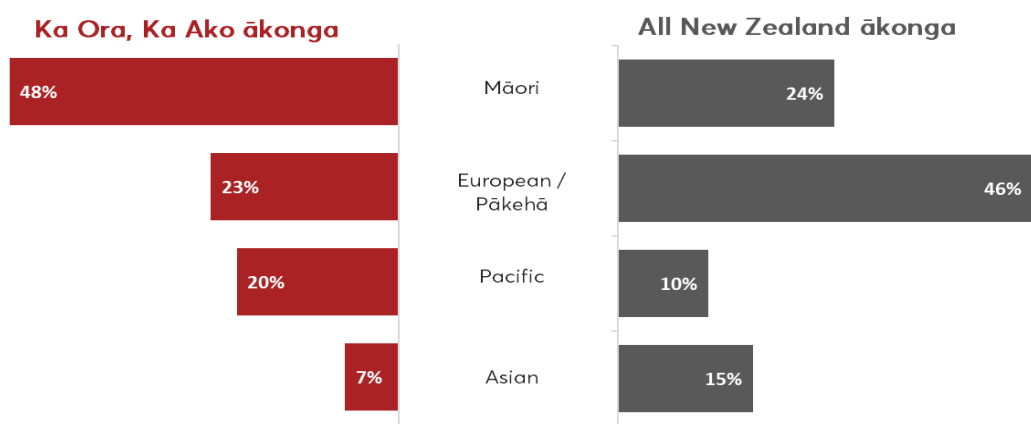
Even though the schools and kura were selected as those with the highest level of need, each school is unique and the ākonga within these schools and kura are diverse in terms of food security and their specific needs. Figure 2 below highlights the subtle uniqueness of the Ka Ora, Ka Ako schools and kura, showing proportionally more schools and kura in Ka Ora, Ka Ako with smaller roll sizes than the national average.

**Figure 2: Size (based on school roll) and isolation (based on isolation index) of Ka Ora, Ka Ako schools and kura (red) compared to the New Zealand national average (grey), Sources: Ministry of Education Master data 5 Sept 2022; New Zealand Schools Directory 1 August 2022.**



The demographic make up of the schools and kura highlights the disproportionate representation of Māori in Ka Ora, Ka Ako schools and kura, with 48% of ākonga in Ka Ora, Ka Ako identifying as Māori in comparison to 24% of the whole ākonga population.

**Figure 3: Ethnicity of ākonga in Ka Ora, Ka Ako schools and kura (red) in comparison to the ethnic makeup across all New Zealand schools and kura (grey), Sources: Ministry of Education Master data 5 Sept 2022; New Zealand Schools Directory 1 August 2022.**

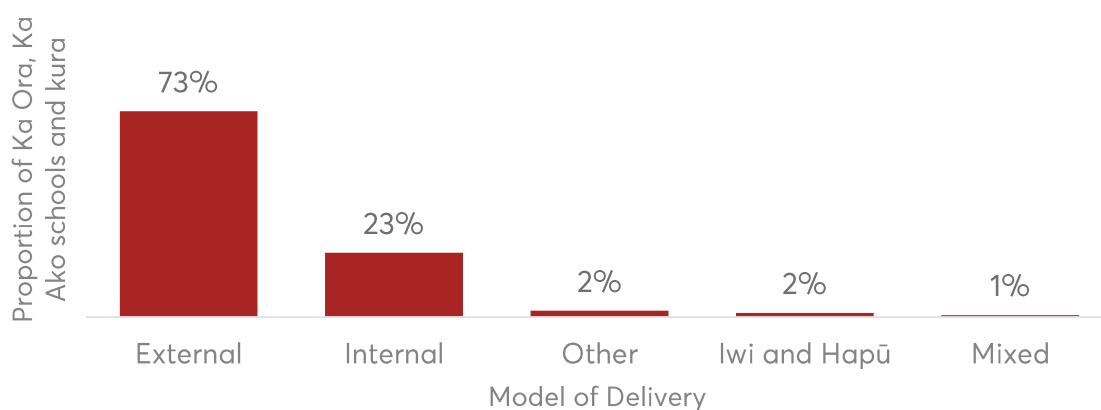


## The Ka Ora, Ka Ako programme varies across schools and kura.

The context of New Zealand schools and kura is that governance is a local responsibility bestowed onto their Board of Trustees. The localised decision making means that schools and kura decide which programmes they take part in and how they take part, reflecting their existing policies, priorities, facilities and activities.

Nearly all of the invited schools and kura (97.3%) agreed to take up the programme. Most of these participating schools and kura (n=715) are providing lunches through a company who purchases, prepares and provides lunches to their ākonga every day – the “external” delivery model. Fewer schools and kura (n=231) hire staff and/or use school facilities to provide lunches to their ākonga, or work in partnership with other schools and kura who have hired staff – the “internal” delivery model. The “iwi and hapū partnership” model started in 2022, and by September 2022, there were 15 schools and kura working with their iwi or hapū to provide lunches to ākonga. “Other” school lunch providers send prepared meals to six schools and kura because of distance and isolation, and the schools and kura reheat these themselves.

**Figure 4: Delivery models of Ka Ora, Ka Ako schools and kura, as of September 2022, Source: Ministry of Education Master data 5 Sept 2022.**



In October 2020, the Ministry of Health and the Ministry of Education confirmed their nutrition guidelines for the Ka Ora, Ka Ako Healthy School Lunches Programme, aligning it to the principles in the Ministry of Health Healthy Food and Drink Guidance – Schools document.<sup>37</sup>

The nutrition guidelines offer a range of principles and set out the expectation that school lunches offer a variety of food from the four groups:<sup>38</sup>

- plenty of vegetables and fruit
- grain foods, mostly wholegrain and naturally high in fibre
- milk and milk products, mostly low and reduced fat
- legumes, nuts, seeds, fish and other seafood, eggs, poultry and/or red meat with fat removed.

The guidelines also make clear the expectation to have minimal saturated fat, salt and sugar added, and only water and unflavoured milk as drink options.

<sup>37</sup> <https://www.health.govt.nz/publication/healthy-food-and-drink-guidance-schools>, retrieved October 2022.

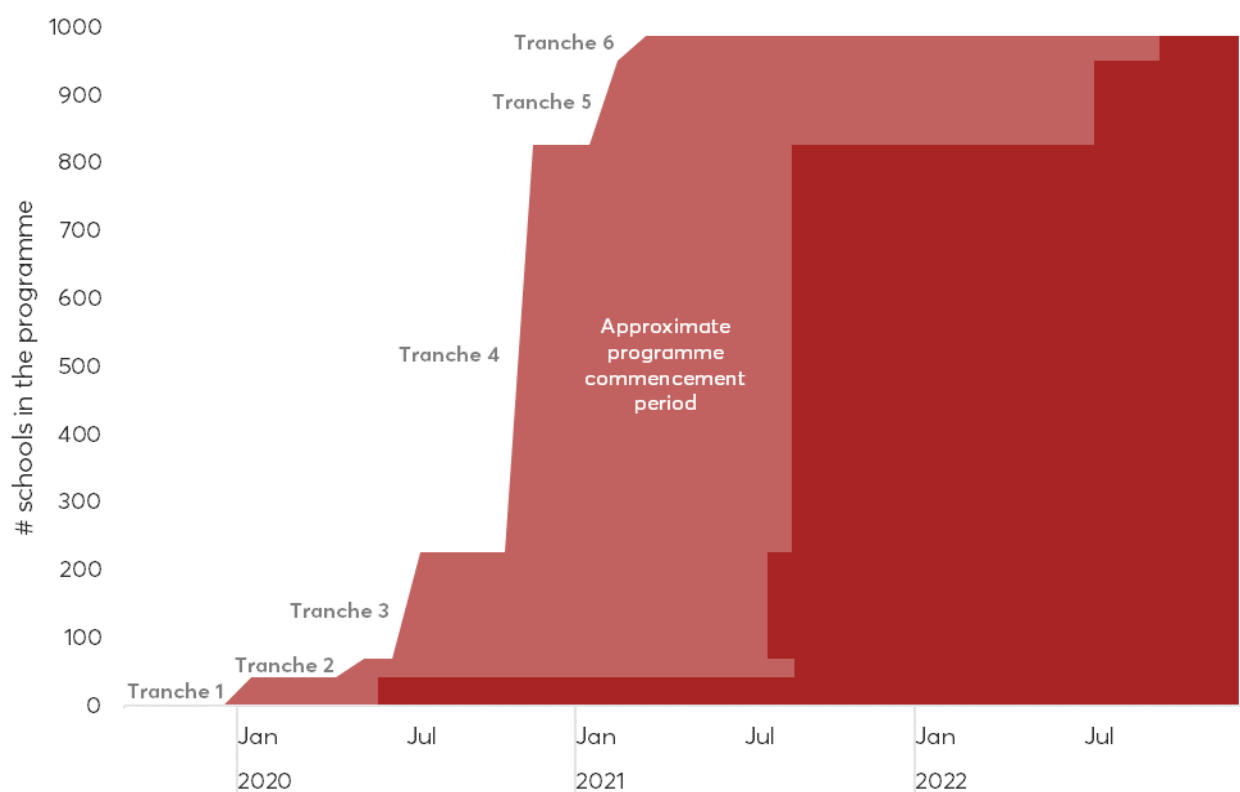
<sup>38</sup> Ka Ora, Ka Ako | Healthy School Lunches Programme Nutrition Guidelines, October 2020, pg. 2: [Ka-Ora-Ka-Ako-Nutrition-Guidance-OCT-2020.pdf \(education.govt.nz\)](#), retrieved 14 September 2021.

It further sets out nutrition criteria to help ensure that ākonga are accessing nutritious food in their lunch. The criteria classifies food and drinks as green, amber and red, providing a way for providers to categorise food options as healthy or less healthy. Green identifies food items that are a good source of nutrition and the basis of a healthy diet, and the main meal of the school lunch must be 75% of these ingredients. Amber identifies items that may have some nutritional value but are not part of an everyday diet, while red items have poor nutritional value, are often highly processed foods and drinks, high in saturated fat, salt and/or added kilojoules. The criteria aim to help school lunch providers make healthy choices for their school lunches that meet the Ministries expectations. The guidelines provide additional advice in applying these principles to school lunches.

Schools and kura were enrolled in Ka Ora, Ka Ako in tranches from Term 1 in 2020. This meant that some cohorts of schools and kura and their relevant providers began the programme earlier than other cohorts. The Ministry expected that lunch providers are on a pathway towards providing nutritious foods and monitors this pathway for providers by taking samples of school lunches and giving feedback. As such, we expected that the longer the provider is delivering the programme, the more able they are to provide lunches that meet the health quality standards set out by the Ministries of Health and Education.

The figure below shows the delivery timeline of schools and kura in the programme for each of the six tranches. As schools started at different times the approximate period of programme commencement is detailed in pink, with confirmed delivery dates in red. Exact delivery start dates for each school were used in the analysis for the evaluation where necessary.

**Figure 5: Approximate timeline of programme commencement (pink) and continued delivery (red) across Ka Ora, Ka Ako schools, Source: Ministry of Education Master data 5 Sept 2022.**





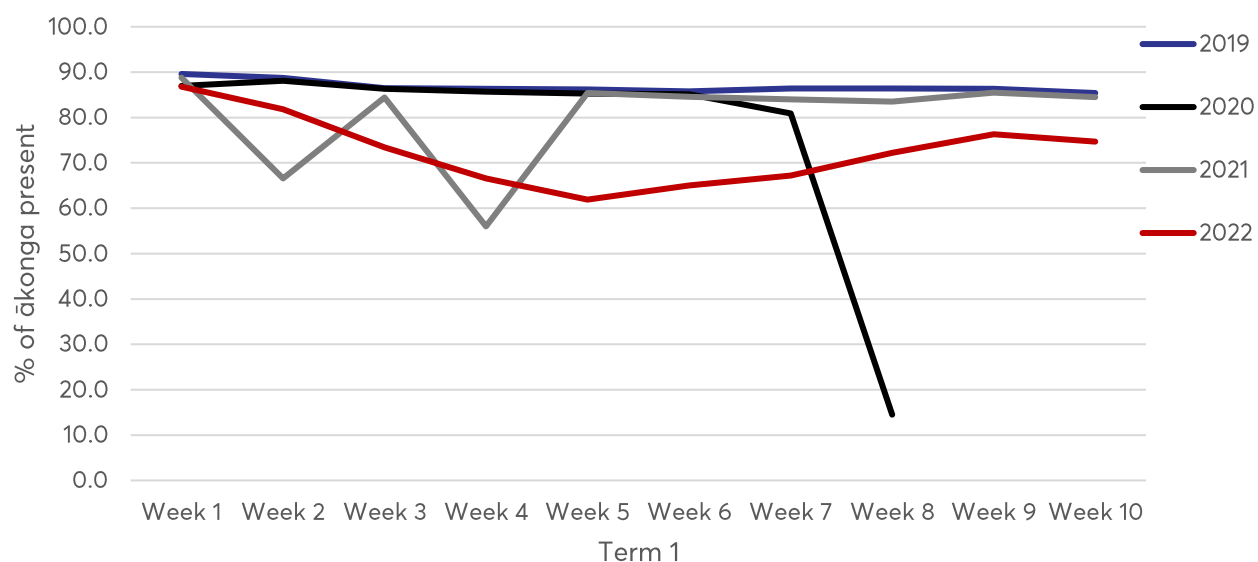
## COVID-19 likely affected progress

The COVID-19 pandemic was a significant factor influencing programme delivery. Schools and kura started delivering the programme in January 2020, which was quickly followed by the first documented COVID-19 case in New Zealand (28 February 2020), travel and public gathering restrictions (March 2020) and ultimately self-isolation for the whole country (25 March 2020). While the Ministry developed a COVID-19 response plan with schools, kura and suppliers, New Zealand moved between national and regional lockdowns, with Auckland, Northland and Waikato experiencing longer lockdowns than other regions throughout the 2020-2021 period.

Shifting from a four-tiered alert level system at the end of 2021, the Government moved to the COVID-19 protection framework (traffic lights) and then introduced Omicron phases, with the focus shifting to testing and isolating individuals and household contacts as case numbers grew. Further, vaccinations were mandated and masks were required within school settings from 15 November 2021 until 4 April 2022.

On 16 February 2022, at the start of the 2022 school year, all of New Zealand moved to Phase 2, meaning that all COVID-19 cases along with household and close contacts were required to isolate at home and test for COVID-19. Although schools and early services were allowed to stay open during this phase, this change meant some school staff, ākonga and whānau chose not to engage in school while others engaged but managed periodic home isolation throughout this period. These COVID-19 effects are clearly evidenced in ākonga school attendance rates, comparing 2019 (before the pandemic) with 2020, 2021 and 2022.

**Figure 6: Percentage of time ākonga were present at school, by week for Term 1 2019-2022, Source: Education Counts.<sup>39</sup>**



<sup>39</sup> [https://www.educationcounts.govt.nz/\\_data/assets/excel\\_doc/0011/216578/Data-2011-2022-Regular-Attendance.xls](https://www.educationcounts.govt.nz/_data/assets/excel_doc/0011/216578/Data-2011-2022-Regular-Attendance.xls), Time, Week table, downloaded 27 October 2022.



# EVIDENCE QUALITY OVERVIEW





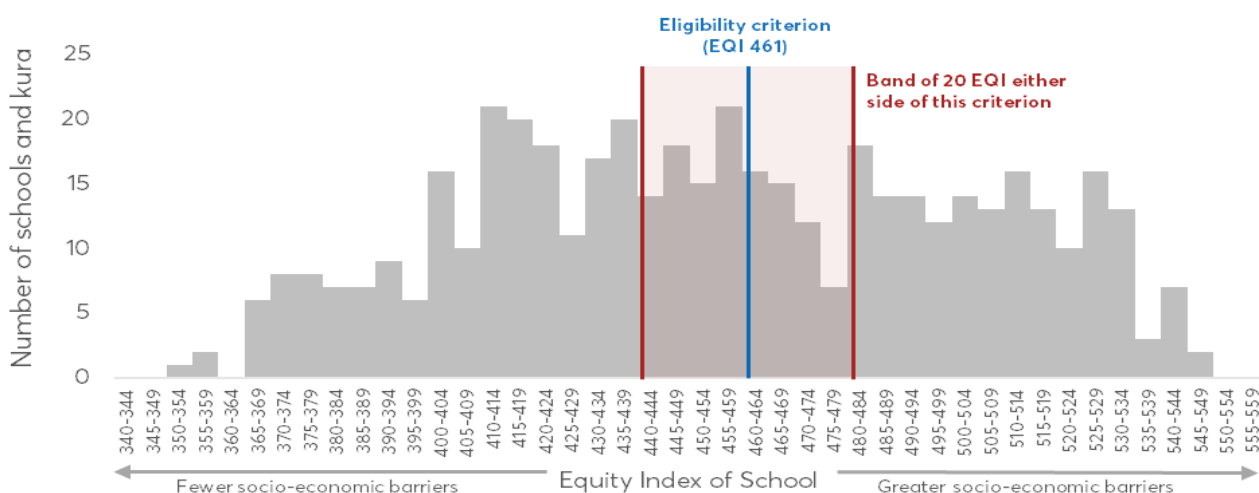
# Evaluation approach and methods

The evaluation was commissioned to help the Ministry of Education's Te Puna Kaupapahere (Policy) and Special Projects teams to understand the effectiveness of the programme, and to inform the New Zealand Government (funders) and the public about the impact of the programme on secondary ākonga wellbeing and attendance across all age groups. The evaluation evidence will be used by the Ministry to inform Cabinet decisions about the continuation of the programme in New Zealand.

The key requirement for this evaluation was to help the Government understand the effects of the programme – those effects above and beyond what would have been achieved otherwise (without the programme). Precise estimates of the effect were essential given that the resultant decisions would affect, most directly, a significant proportion of ākonga in New Zealand. It was also necessary that the evaluation approach was ethical within the context of the New Zealand school sector,<sup>40</sup> and appropriate given the COVID-19 environment and the stage of programme implementation.<sup>41</sup> We applied the principles and techniques from the Real World Evaluation approach<sup>42</sup> to support these objectives, strengthening the evaluation design and validity of conclusions while working within the given context.

The evaluation made use of a mix of methods, albeit relying heavily on the Regression Discontinuity design<sup>43</sup> to provide robust estimates to answer the key evaluation question. Most notably, the evaluation takes advantage of the programme's eligibility criterion, and compares the ākonga in the most advantaged eligible schools and kura (e.g. EQI range of 461-480) with the ākonga in ineligible schools that are the least advantaged (e.g. EQI range of 440-460).

**Figure 7: The distribution of secondary schools and kura across the Equity Index.**



<sup>40</sup> The Privacy Impact Assessment of the evaluation was approved by the Ministry of Education on 22 November 2021, and the evaluation was also approved by the Ministry of Education Ethics Committee in January 2022.

<sup>41</sup> The evaluation was commissioned after the programme was fully implemented, and therefore capturing pre-programme data was no longer possible.

<sup>42</sup> Bamberger, M. Rugh, J. Mabry, L. (2006). Real World Evaluation. Sage Publications: London.

<sup>43</sup> Regression Discontinuity design (RD) is an evaluation approach used to assess the impact of a programme, making use of comparison groups based on a cutoff or eligibility score relevant to a programme. RD design does not require random assignment but rather compares groups around this cutoff criterion as these groups are expected to be largely similar, to evaluate the effectiveness of a programme.

By selecting and comparing schools and kura with moderate disadvantage (c.f. Figure 7 between the red bars), we are likely to both underestimate the benefits for the highest EQI schools and kura implementing the programme, and overestimate the benefits of providing healthy school lunches for the most advantaged schools and kura in New Zealand.

The evaluation evidence included:

- **Survey of wellbeing among secondary-aged ākonga**, estimating the relative effect of the programme on ākonga wellbeing, using validated measures of wellbeing<sup>44</sup> and methodological techniques<sup>45</sup> to compare groups of ākonga – those in and not in Ka Ora, Ka Ako schools and kura. Where necessary, we controlled for factors that could influence the results.
- **Ministry of Education's school attendance data**, highlighting attendance rates across Terms 1, 3 and 4, for both 2020 (before the pilot) and in 2021 (after the pilot). Methodological<sup>46</sup> and statistical techniques<sup>47</sup> were used to select similar comparison groups and estimate the relative effects of the programme on attendance.
- **Case studies**, exemplifying how the programme has benefitted some ākonga, schools and kura, providers and whānau, using a strengths-based, storytelling approach.

The evidence is summarised against quality standards in Table 1 and the detailed methods are provided as a technical report for this evaluation.<sup>48</sup>

## Evidence quality and use

---

The evaluation serves an accountability function, and serves as the evidence base by which decisions can be made about this large-scale programme moving forward. The standard of evidence was therefore high, as the evaluation will have broad implications for the New Zealand public in terms of continued provision of the Ka Ora, Ka Ako programme.

For this context, the evaluation was required to collate balanced evidence that were sufficient in number to statistically compare wellbeing (among secondary school-aged ākonga) and attendance (all ākonga) in Ka Ora, Ka Ako schools and kura with other ākonga. The data used to estimate the effects of the programme are summarised below (c.f. Table 1).

<sup>44</sup> The wellbeing measures included: the World Health Organisation 5-Wellbeing Index (WHO-5), Pediatric Quality of Life Inventory (Peds-QL) and Hua Oranga (c.f. Vermillion Peirce, P., Jarvis-Child, B., Chu, L., Lennox, K., Kimber, N., Clarke, H., Wang, N., Nguyen Chau, T. and Winthrop, P. 2022. Ka Ora, Ka Ako New Zealand Healthy School Lunches Programme Impact Evaluation: Technical Report and Appendices. Ministry of Education).

<sup>45</sup> As noted above, the evaluation takes advantage of eligibility threshold to be included in the programme and the known school-level variation around this threshold (RD), and applied a cluster sampling approach to evaluate the programme. This means we surveyed ākonga within the schools (our 'cluster') and selected the specific schools around the eligibility threshold, comparing the ākonga in schools immediately above (within the programme) and below (not in the programme) this threshold.

<sup>46</sup> As done with wellbeing, RD was used to evaluate the programme in relation to ākonga attendance. Comparable groups of ākonga were identified according to baseline attendance rates, as well as school characteristics.

<sup>47</sup> A difference in difference estimation was used, applying a fixed effects model.

<sup>48</sup> Vermillion Peirce, P., Jarvis-Child, B., Chu, L., Lennox, K., Kimber, N., Clarke, H., Wang, N., Nguyen Chau, T. and Winthrop, P. 2022. Ka Ora, Ka Ako New Zealand Healthy School Lunches Programme Impact Evaluation: Technical Report and Appendices. Ministry of Education.

**Table 1: Overview of the quality of evidence used in the evaluation**

	Ministry administrative data	Survey of secondary ākonga	Case study interviews
	<b>73–81 schools and kura</b> (of 981 Ka Ora, Ka Ako schools and kura and 1,575 non-programme schools and kura)	<b>10,694 secondary ākonga</b> (of 224,454 ākonga)	<b>8 schools and kura</b> (of 981 schools and kura)
Are there sufficient numbers of data to estimate impact (i.e. power)?	Yes	Yes	No. Data should only be used as examples of benefits where these exist.
Are the results balanced, with low- to-moderate risk of bias?	Yes	Yes	No. Data are prioritised to positive experiences.
Are the results likely generalisable to New Zealand schools?	Data are limited in terms of generalisability to all New Zealand. <sup>49</sup>	Data are limited in terms of generalisability to all New Zealand. <sup>49</sup>	No. Data are not likely generalisable to New Zealand.
Are relevant comparison groups used?	Yes	Yes	No

The quality of evidence used here was deemed appropriate for the agreed purpose of this evaluation, and the findings should be used in the context of these evidence standards.

## Value of the programme

The value of Ka Ora, Ka Ako was determined according to the measured impacts among ākonga, and more aptly, how widely these impacts were felt among the ākonga population. As noted earlier, the programme was delivered as a universal approach to reduce the stigma associated with receiving free food from the Government. As such, we expected those most likely in need of the programme would benefit significantly while the whole population of

<sup>49</sup> The approach prioritised helping the Government understand the effects of the programme – those effects above and beyond what would have been achieved otherwise (without the programme) – using Regression Discontinuity design. This approach came at the expense of obtaining data that could be generalised to the population of New Zealand ākonga.

ākonga would benefit to a lesser extent. These expectations set out different levels of success for the programme:

- Significant and large benefits realised by the population of ākonga, as an average, would indicate an "excellent" programme achievement.
- Significant and large benefits realised by those most underserved ākonga, on average, would indicate a "very good" programme achievement.
- Some benefits realised would indicate an "adequate" outcome of the programme
- Negative or negligible benefits would indicate a "poor" programme outcome.

The evidence demonstrate the level of change and breadth of the wellbeing benefits for secondary-aged ākonga, and attendance benefits for ākonga across all (school) ages. We also summarise the findings from the earlier (pilot) evaluation with primary and intermediate-aged ākonga to enable an overall judgement of the programme.



# FINDINGS & SUPPORTING EVIDENCE



# Food security among secondary school-aged ākonga

---

The findings in this section are derived from the responses to the learner wellbeing questionnaire. Secondary school-aged ākonga were asked to complete two sets of questions asking them about the frequency at which they ate different types of food at home, and separately at school. The food types included fresh fruit, fresh or cooked vegetables, fizzy drinks and snacks and sweets. These same secondary ākonga were also asked about how often they had access to enough food to feel 'just right' (not too hungry and not too full) at home, and separately at school.

Although food security would theoretically change for ākonga within the programme schools and kura, at least while at school, the availability and consumption of food would likely have remained largely similar at home for many individuals. We used the availability of food within this home context to identify ākonga with similar levels of food insecurity.<sup>50</sup> This information also describes food insecurity among secondary ākonga in schools and kura with moderate disadvantage,<sup>51</sup> and compares ākonga inside and outside of Ka Ora, Ka Ako schools and kura.

This section is being used to describe food insecurity, rather than being used as part of the evaluation.

## Food security

### **1.1. About 7.3% ( $\pm 0.8\%$ ) of secondary ākonga within schools and kura with moderate disadvantage didn't have sufficient food at home on any day in the previous week.**

Research suggests that having sufficient quantities of food is necessary to promote focus and concentration, engagement and school achievement.<sup>52</sup> The large majority of our select group of secondary ākonga had sufficient food to feel 'just right' at home. As shown below in Figure 8, nearly three-quarters (74%,  $n=7812$ ) had enough food available to them every day while another 10% ( $n=1052$ ) believed they had enough food nearly every day at home (5-6 days in the past week). Another 8.8% ( $n=926$ ) of ākonga had sufficient food for about half of the previous week (3-4 days).

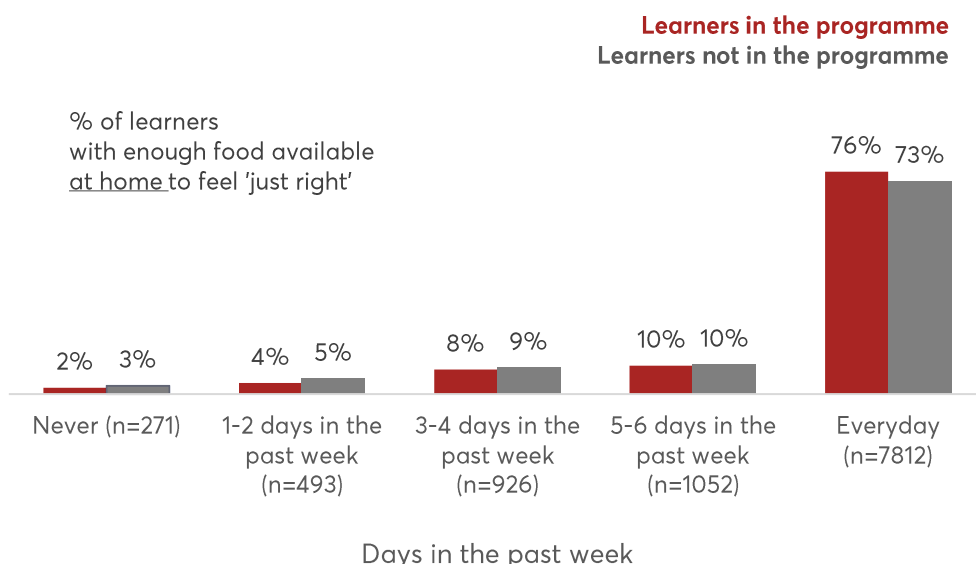
<sup>50</sup> The evaluation team was contracted in August 2021, after nearly all secondary schools were delivering the programme. The timing in relation to the programme delivery meant that collecting baseline evidence, estimating what wellbeing was like before the programme was introduced, was not possible. As relevant and consistent secondary data were not available at the scale required, it was necessary to construct comparison groups through reconstructed 'baseline information' which here was the home environment.

<sup>51</sup> 440-480 equity index

<sup>52</sup> Alaimo et al. (2001). Food Insufficiency and American School-Aged Children's Cognitive, Academic, and Psychosocial Development. *PEDIATRICS*, 108(3), 824–824. <https://doi.org/10.1542/peds.108.3.824-a>; Ni Mhurchu et al. (2013). Effects of a free school breakfast pilot on children's attendance, academic achievement and short-term hunger: Results from a stepped-wedge, cluster randomised controlled trial. *Journal of Epidemiology and Community Health*, 67(3), 257–264. <https://doi.org/10.1136/jech-2012-201540>; Ball, J. and Watts, C. (2015). [External Evaluation of Fruit in Schools Final Report](#). Report prepared for 5+ A Day Charitable Trust; Quigley and Watts 2005.

Conversely, there were approximately 7.3% ( $\pm 0.8\%$ ,  $n=764$ ) who rarely had enough food at available at home. More specifically, 2.6% ( $n=271$ ) of the secondary ākonga never had enough food available at home to feel just right, and another 4.7% ( $n=493$ ) of secondary ākonga had sufficient food at home just 1 or 2 days in the previous week.

**Figure 8: The numbers and proportion of secondary ākonga, according to the frequency at which they have enough food at home to feel just right, Source: learner wellbeing questionnaire.**



Given the increasing nutritional needs with physical growth, these results may demonstrate some secondary ākonga are simply 'always hungry' or that they are consuming 'empty calories'. Alternatively, it may also be that food insecurity is a real issue for many whānau in New Zealand, as suggested in previous research,<sup>53</sup> and is again demonstrating a sizeable proportion of children who never or rarely had sufficient food available to them at home.

It should be remembered that the ākonga included in the evaluation were those in schools and kura around the eligibility threshold – those with moderate disadvantage (c.f. Figure 7). This means that they were not in the schools and kura with the greatest needs, nor are they representative of needs across New Zealand. Rather, they were ākonga in schools and kura with just sufficient, or nearly sufficient, levels of socio-economic barriers to be eligible for the Ka Ora, Ka Ako programme. New Zealand schools and kura with higher levels of need would likely have greater proportions of ākonga who never or rarely have access to sufficient quantities of food at home.

<sup>53</sup>Ministry of Health Annual Update of Key Results 2020/21: New Zealand Health Survey, <https://www.health.govt.nz/publication/annual-update-key-results-2020-21-new-zealand-health-survey>, downloaded 10 August 2022.

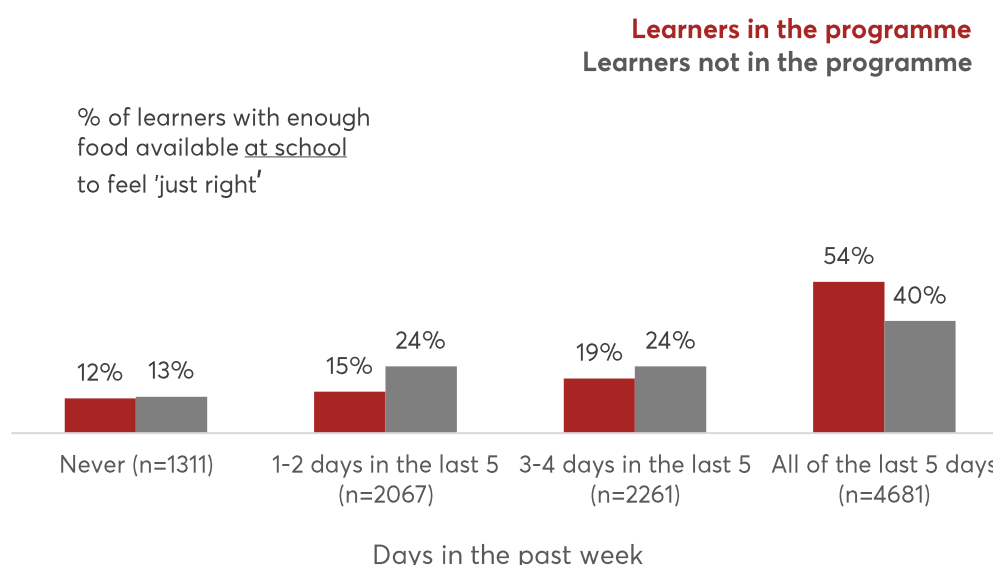
**IT WAS THAT STRUGGLE JUST TO BUY THE BREAD, IT'S LIKE \$3 NOW. I HAD TO DO THREE LUNCHES EVERY MORNING. MY ELDEST SON IS A BIG EATER. HE WANTS 4 SANDWICHES. IT WOULD COST \$120 A WEEK FOR 3 CHILDREN. THE STRUGGLE IS REAL. — WHĀNAU (CASE STUDY)**

**1.2. More Ka Ora, Ka Ako secondary ākonga have access to enough food everyday while at school than other ākonga, giving them an advantage over their peers.**

The learner wellbeing questionnaire was also used to estimate whether or not ākonga had sufficient quantities of food while at school. We expected those receiving the healthy school lunches would have access to enough food to feel 'just right' at school, or at least more frequently than their peers who did not receive the healthy lunches.

Although there are still a large proportion of ākonga that don't have sufficient amounts of food available everyday while at school, irrespective of whether they get healthy lunches or not, Ka Ora, Ka Ako ākonga have a clear advantage over their peers. Notably, more than half of the secondary ākonga respondents in Ka Ora, Ka Ako schools and kura had sufficient food in school every day (54%), which is significantly greater than the 40% of their peer respondents without the healthy lunches having daily access to sufficient food.

**Figure 9: The numbers and proportion of secondary ākonga, according to the frequency at which they have enough food at school or kura to feel just right, Source: learner wellbeing questionnaire.**



The Ka Ora, Ka Ako pilot evaluation used a different measure of hunger that was relevant to these younger ākonga. Nevertheless, the pilot was found to significantly improve satiety among those ākonga most in need, with the effect of the pilot on the ākonga feeling 3.8% fuller ( $\pm 3.4\%$ ), on average, than those who were not receiving the healthy school lunches.

### **1.3. Case study: School lunches contribute to food security for one Rotorua Girls' High School whānau.**

Food security is a real issue for the community, according to staff at Rotorua Girls High School. In this case study, the school lunch food provider explained how Ka Ora, Ka Ako is delivered, while the school staff member and an ākonga talked about the benefits of Ka Ora, Ka Ako in relation to their community and whānau.



## Case Study 1: Ka Ora, Ka Ako at Rotorua Girls' High School

Rotorua Girls' High School (RGHS) is a mid-size school with a school roll of approximately 700 ākonga. Having a positive impact on their ākonga, whānau and wider community is central to everything the school does, and the implementation of Ka Ora, Ka Ako is part of this. The programme has made a *"massive difference"* to the ākonga and plays a significant role in removing the barrier of hunger, which had previously prevented the RGHS ākonga from learning effectively. Ka Ora, Ka Ako ensures all ākonga can consistently eat familiar and healthy kai. Since the start of the programme, the ākonga have been described as being, *"more alert"* and *"the afternoons are more calm."*

Tikanga Māori is fundamental to this school and is reflected in the relationship they have with their school lunch provider. The school utilises an external provider model, where they partner with a charitable trust of the same kaupapa. With a 100-year vision, this provider is committed to bringing about intergenerational nutritional change to learned food behaviours in their community. The provider refers to the ākonga as, *"our kids,"* and provides 6,000 substantial meals daily to 25 schools and kura throughout the Bay of Plenty. Currently, they employ 55 full-time staff, a big increase from 11 in 2020. The provider focuses on offering meaningful employment through creating a positive working environment and paying all their staff a living wage. They have significant pride and belief in what they do for a wider societal impact.

The external food provider's goal is for kids to attend school, and they hope to achieve this through food. The provider aims to deliver four hot lunches a week and five during the winter to their schools. In summer they provide, *"incredible sandwiches and salads"*. As well as a hot meal, the provider offers fresh fruit, yoghurt, and snacks such as cheese and crackers, and popcorn. Menu construction is a collaborative process for the provider's experienced team of seven chefs. The provider creatively uses food that is familiar to the ākonga, and then makes it healthier. They use

wholegrains as their staple and then they, *"hide the vegetables"*. It's *"like a game to them"* to see how many vegetables they can include in one meal. The school's relationship with the provider is effective for feedback, ensuring accountability. On the rare occasion that a lunch isn't successful with the ākonga, the school informs the provider and the feedback is acknowledged. That food is not provided again.

Every day, two staff deliver the food and set up long tables in the school canteen 'buffet style'. At lunchtime, the ākonga line up outside the canteen and choose what food they are going to eat that day. It is an effective, efficient process and encourages autonomy, which was found to be particularly valuable for the RGHS girls. There is little waste for the school with this model. The provider places bins around the grounds and clears away any rubbish when they leave. The school has also invested in a large fridge where they put the leftovers and the ākonga can take as much as they like. There is enough food for the ākonga to have second helpings, particularly those who are participating in sports. In addition, the food provider delivers lunches to ākonga when they are off site on school trips or events. During the COVID-19 school closures, the school set up a daily drive-through to pick up the healthy lunches for their ākonga and whānau.

Lia\* is an ākonga at RGHS with a parent on a disabilities benefit. One day, a staff member found her sneaking leftover Ka Ora, Ka Ako lunches out of the school fridge to feed herself and her whānau for dinner.

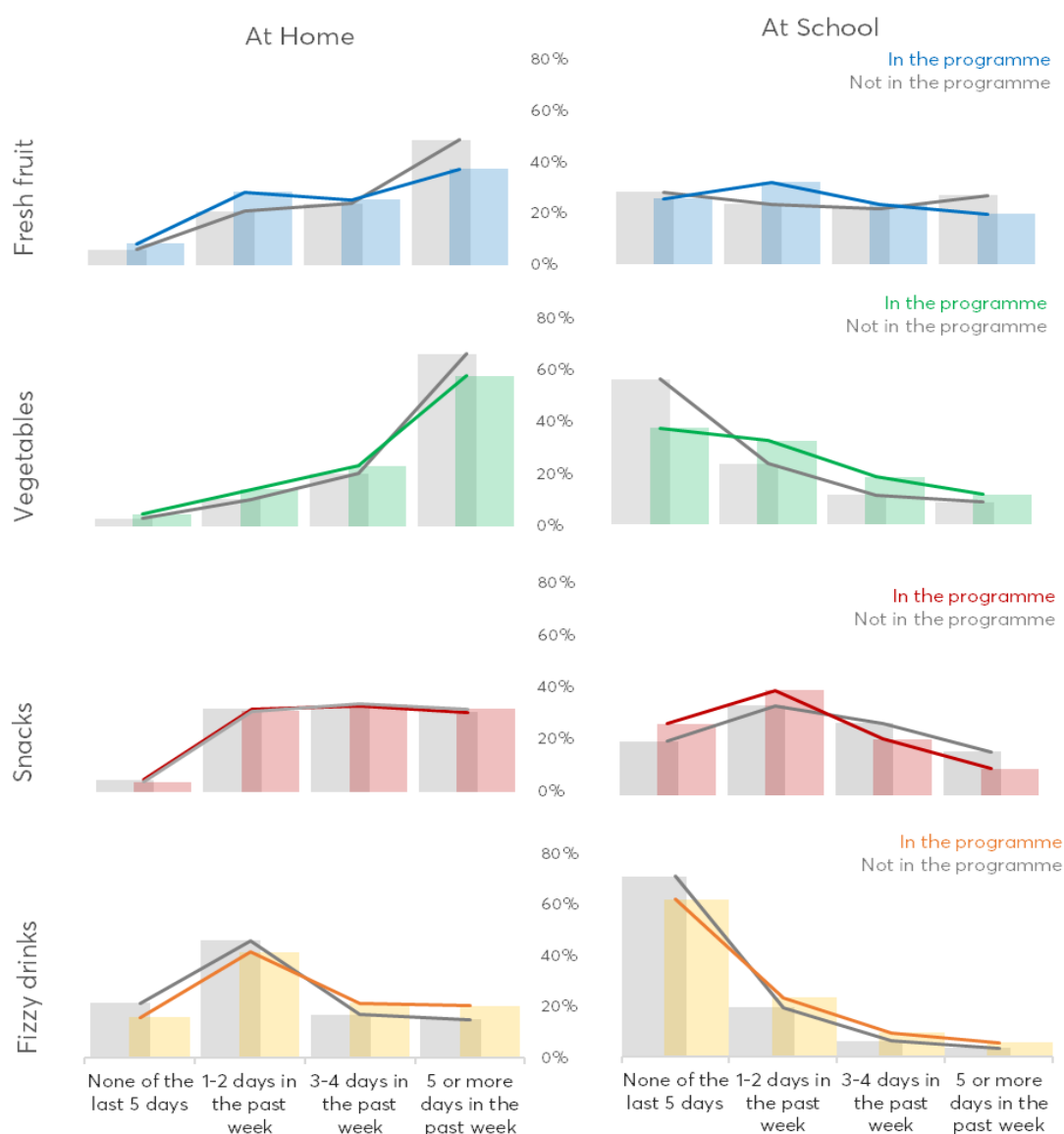
RGHS encourages Lia and others to regularly take the Ka Ora, Ka Ako food home without shame or judgement. *"Families are getting four portions of food from the school and that's their dinner for that night. It's better than \$5 fish and chips, which is often what has been feeding the families here, and I think that's a really good service we can provide to our community."*



## 1.4. Food consumption

The learner wellbeing questionnaire was used to determine the prevalence of secondary ākonga consuming different types of food over the previous week. The figure below shows the frequency that Ka Ora, Ka Ako ākonga (colours) and other ākonga (grey) consumed different foods. What is clear is that the proportions of Ka Ora, Ka Ako ākonga and other ākonga eat these food types at remarkably similar frequencies at home (left side), albeit with proportionally more ākonga outside of the programme eating fresh fruit regularly at home. The school environment shows different results (right side), which we would expect given those in the programme are provided with Ka Ora, Ka Ako lunches. The secondary ākonga in the programme appear to be eating vegetables more often and snacks less often than their peers in other schools and kura.<sup>54</sup>

**Figure 10: Frequency of foods consumed by secondary ākonga at home (left side) and at school or kura (right side), Source: learner wellbeing questionnaire.**



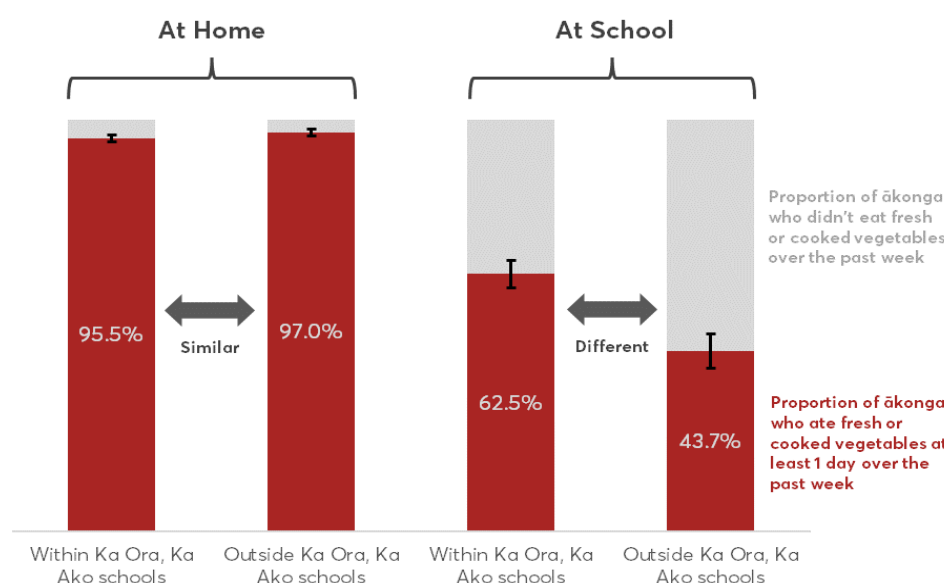
<sup>54</sup> The results are descriptive only, showing high-level patterns of eating behaviours according to frequency of consumption by food type.

## 1.5. More secondary school-aged ākonga are eating vegetables at Ka Ora, Ka Ako schools and kura.

The learner wellbeing questionnaire was also used to determine the prevalence of ākonga who had eaten fresh or cooked vegetables at home over the previous week. The results showed similar proportions of ākonga eating at least some vegetables over the last week when at home. More specifically, the proportion of those ākonga that ate fresh or cooked vegetables in the past week was 96.1% ( $\pm 0.7\%$ ), and this was similar for those ākonga in the programme (95.5%,  $\pm 0.9\%$ ) and those ākonga not in the programme (97.0%,  $\pm 0.9\%$ ).

Secondary ākonga were notably less likely to eat vegetables at school than at home. However, there was a larger proportion of ākonga in the programme who ate vegetables at school (62.5%,  $\pm 4.2\%$ ) than those not in the programme (43.7%,  $\pm 3.4\%$ ) in the previous week.

**Figure 11: Proportions of secondary school-aged ākonga consuming fresh or cooked vegetables over the previous 7 days at home (left side) and the previous 5 days at school (right side), comparing the differences between those ākonga in and outside of the programme schools and kura (95% confidence intervals), Source: learner wellbeing questionnaire.**



These results are mirrored in the pilot evaluation, where most Ka Ora, Ka Ako lunches included at least one vegetable (66.8%,  $\pm 6.0\%$ ) while significantly fewer non-Ka Ora, Ka Ako lunches included at least one vegetable (30.7%,  $\pm 6.5\%$ ).

Studies suggest that dietary habits acquired in childhood persist into adulthood.<sup>55</sup> Consequently, food intake in adolescence is considered to be a significant predictor of intake in adulthood.<sup>56</sup> Although the long-term benefits of these eating habits are outside

<sup>55</sup> Te Velde, S. J., Twisk, J. W., & Brug, J. (2007). Tracking of fruit and vegetable consumption from adolescence into adulthood and its longitudinal association with overweight. *The British journal of nutrition*, 98(2), 431–438.

<sup>56</sup> Lake, A. A., Mathers, J. C., Rugg-Gunn, A. J., & Adamson, A. J. (2006). Longitudinal change in food habits between adolescence (11–12 years) and adulthood (32–33 years): the ASH30 Study. *Journal of public health (Oxford, England)*, 28(1), 10–16.

of scope for the current evaluation, this broader research suggests that such habits could persist into adulthood and lead to more advantageous health outcomes.

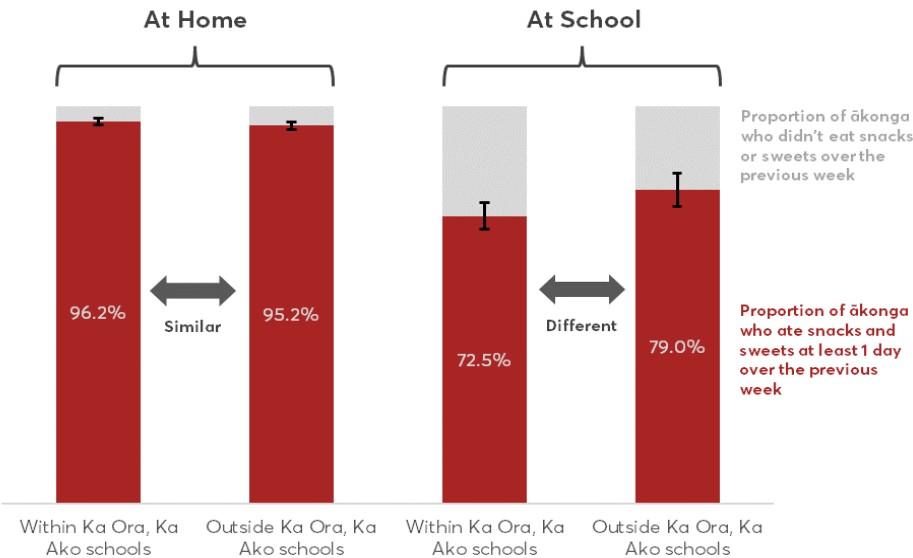
**I LOVE HOW THEY ARE EATING VEGETABLES NOW... AT HOME, THE COST OF VEGETABLES, BROCCOLI IS LIKE \$3 FOR ONE. IT'S ABOUT COSTS, AND WE NOW DON'T HAVE TO WORRY SO MUCH.**  
**- WHĀNAU (CASE STUDY)**

**1.6. Proportionally fewer secondary school-aged ākonga are eating snacks and sweets at Ka Ora, Ka Ako schools and kura.**

The prevalence of snack and sweet items, such as chippies, lollies, biscuits or chocolates, was also examined for the home and school environments of ākonga. The results showed the proportion of secondary school-aged ākonga that consumed snack and sweet items over the past week were just marginally different at home. The results showed that marginally more ākonga in the programme (95.8%,  $\pm 0.40\%$ ) were eating snacks and sweets at home at least one day in the previous week than those outside of the programme (94.9%,  $\pm 0.30\%$ ).

What was markedly more noticeable was the difference in consuming this food type at school, with proportionally more ākonga outside of Ka Ora, Ka Ako schools and kura consuming snacks and sweets at school (79%,  $\pm 2.1\%$ ) than those ākonga inside Ka Ora, Ka Ako schools and kura (72.5%,  $\pm 3.1\%$ ). While the consumption of snacks and sweets is still high in schools and kura, this is not outside the Ministry of Health guidelines, which allow for two servings of such items per week.

**Figure 12: Proportions of secondary school-aged ākonga consuming snacks and sweets over the previous week at home (left side) and at school or kura (right side), comparing the difference between those ākonga in and those outside the programme schools and kura (95% confidence intervals), Source: learner wellbeing questionnaire.**



For primary and intermediate school-aged ākonga, as reported in the pilot evaluation, the proportion of those lunches with at least one snack or sweet items was 73.8% ( $\pm 3.2\%$ ) for those ākonga inside Ka Ora, Ka Ako schools and kura and 90.1% ( $\pm 2.8\%$ ) for those outside the pilot. The consistent differences between those in and outside the programme highlight the healthy food advantage that Ka Ora, Ka Ako ākonga have over their peers.

For secondary school-aged ākonga, little difference was observed in the consumption of fresh fruit between these two cohorts. More specifically, the proportion of ākonga consuming fresh fruit at least one day over the past week at home was 91.6% ( $\pm 1.0\%$ ) for those in the programme and 93% ( $\pm 1.2\%$ ) for those not in the programme. When at school, 74.4% ( $\pm 4.6\%$ ) of ākonga in the programme and 71.8% ( $\pm 4.3\%$ ) of ākonga outside of the programme consumed fresh fruit.

This result for secondary ākonga was again mirrored among the primary and intermediate ākonga. The pilot evaluation found no significant difference in fresh fruit between those younger ākonga lunches in the pilot and not in the pilot, with 71.1% ( $\pm 3.6\%$ ), of ākonga programme lunches and 74.3% ( $\pm 5.0\%$ ) of other ākonga lunches had fresh fruit in it.

### **1.7. Case study: Healthy school lunches contribute to wellbeing at the Levin Teen Parent Unit.**

Both the pilot and programme Ka Ora, Ka Ako evaluations, using different methodologies with respective younger and older-aged cohorts, showed that Ka Ora, Ka Ako ākonga consume vegetables more frequently and snacks and sweets less frequently at school or kura. The different diets could have far-reaching benefits for individuals. One case study, which included interviews with three individuals at the Levin Teen Parent Unit, exemplified how the healthy Ka Ora, Ka Ako lunches contributed to an improved sense of pride and wellbeing for these individuals. Their stories are provided below.



## Case study 2: Ka Ora, Ka Ako at Levin Teen Parent Unit

Levin is the largest town and council seat of the Horowhenua District in the Manawatū-Whanganui region. The non-residential Levin Teen Parent Unit provides support to teen parents (Poipoia) alongside a kindergarten for their children (Arohanui). The unit is a separate school located on Waipahu College grounds.

One kaiako explained how the Teen Parent Unit provides NCEA education and incorporates Te Whare Tapa Whā as a holistic wellbeing model. The Ka Ora, Ka Ako programme sits well within this context, providing food that feeds the ākonga *"wellness bank"*. This improved overall wellbeing over time was believed to lead to improved concentration, engagement and attendance, *"you can't self-actualise when your baseline needs repairing."*

The Ka Ora, Ka Ako programme is provided as an internal model for this school and unit as a whole. The school employs a mix of six full-time and part-time kitchen staff, either from the school (mothers of ākonga, recent school graduates) or from the local community. All staff support the preparation and delivery of approximately 650 lunches every day. Staff prepare lunches and deliver fresh fruit, yoghurt, cheese and crackers to refrigerators for the *"grazing teenagers"* in the school and the pregnant and new mothers in the unit, some of whom will be breast feeding.

The lunch provided to ākonga on this day included corned beef, edam cheese and salad sandwiches on whole grain bread with a light mayo spread and a small square of carrot cake. For the hapū māmā (pregnant mothers) in the unit, lunch consisted of a piece of carrot cake and temperature-checked chicken salad to keep pepe (baby) safe. Beyond the lunches provided to ākonga, any left over food is also given to those still hungry as well as to the broader community through the local food bank Hope Kete Trust.

Prior to the Ka Ora, Ka Ako programme, young mothers in the unit didn't always have the knowledge or facilities to cook healthy meals at home, for example, only having a microwave available to prepare meals for their whānau. Prior to the programme young mothers would cook either *"noodles"* or *"toast"* in the unit's hub which has full cooking facilities, or visit the dairy that's a two-minute walk from the school. The mothers would eat *"typical dairy food, like fried foods and snacks, the yummy stuff."*

Kaiako spoke about young mothers that wouldn't take the food from Ka Ora, Ka Ako in the initial days of the programme at the risk of appearing to be *"needy"*. Over the last year, the unit has created a culture of safety,

focused on modelling tikanga (karakia, cleaning up after ourselves) and standards (how we eat, appreciation and gratitude), which has meant the mothers now feel safe to take up this opportunity.

The programme broadened the mothers' knowledge of food to include food items such as tofu, falafel and orange kumara that some ākonga were not familiar with. According to one kaiako, the learning from having access to a variety of healthy foods, and the generational impact this learning will have on new mothers and their children was the most significant success of Ka Ora, Ka Ako. These learnings set the foundations for wellbeing for young mothers and their children. For other staff, Ka Ora, Ka Ako provided the personal benefits of having a rewarding role helping the community and feeding local kids who may not have had *"breakfast that day or even dinner the night before"*. Ka Ora, Ka Ako was also rewarding for the younger employees as it gave them an opportunity to gain work experience and upskill in hospitality.

Nicole\* has always lived in Levin, a community she loves because of the warm and caring nature of the people. Being hapū (pregnant), she has been studying at the Poipoia, while her 3-year-old daughter attends the Arohanui in the same building. Nicole's favourite subjects at school are English, where she enjoys expressing herself through her writing, and health, because she hopes to be a social worker in the future.

The school staff support Nicole not only in terms of education, supporting her English and health studies, but also her *"overall wellbeing."* She speaks highly of those around her at the school and feels supported by the school and staff *"to make better life decisions in every way possible."* Ka Ora, Ka Ako is part of this.

Nicole feels valued by the unit and has growing relationships with the staff partly because of Ka Ora, Ka Ako and the care the staff give her. Her eating habits have also changed because of the healthy food provided as part of the programme, as well as advice from the dietician provided by the unit. However, for Nicole, the most significant change resulting from Ka Ora, Ka Ako has been to her sense of pride.

*"Before the lunches, I was feeling horrible. I would eat deep fried food every day. I was eating lollies for lunch and fizzy drinks from the dairy. I felt yuck and less motivated. I honestly wouldn't come to school because I would feel crappy about myself. My daughter was eating the same things as me – a very unhealthy diet. Once the lunches came, I was aware of what I was putting into our bodies. Everything started to change. It was a physical and emotional feeling that everything that I was putting in my body was gross. After the lunches were provided, I was more aware of how more balanced food made me feel. It makes me feel good, motivated, and better about myself. It makes me feel proud of myself. My daughter sees it, she is happy, calmer, more content. That feeling of pride had an impact on her."*

## Ka Ora, Ka Ako resulted in better wellbeing, in particular for those most underserved ākonga

---

The evidence from the pilot evaluation conducted with primary and intermediate ākonga demonstrated mixed results in terms of wellbeing. Some small but statistically significant benefits on aspects of wellbeing were identified, while other areas showed no significant change. This was noted as unsurprising given the early stage of the pilot initiative.

One year later, we considered the wellbeing effects of the programme on secondary school-aged ākonga using a similar set of wellbeing measures: Peds-QL (health quality of life and constructs of individual functioning), WHO-5 (mental wellbeing) and Hua Oranga (hauora). The evaluation estimated the effect of the programme on secondary school-aged ākonga as those effects above and beyond what would have been achieved without the school lunches (i.e. by similar ākonga not in the programme). As such, the effect is sometimes referred to as the 'benefit' of the programme.

The evaluation also estimated the effect of the programme on the most underserved ākonga. These secondary school-aged ākonga within Ka Ora, Ka Ako schools and kura as well as those outside of the programme, were identified as those that in the past week rarely<sup>57</sup> had enough food at home to feel 'just right'. The programme expects to see the biggest impact amongst these ākonga, who are experiencing the greatest relative food insecurity.

Although the design<sup>58</sup> ensures that these two groups of ākonga and their school contexts are similar, we nonetheless controlled for potential factors that may influence the results,<sup>59</sup> such as:

- ākonga factors (e.g. age, sex and ethnicity of the ākonga)
- school factors (e.g. school isolation index, region, and whether or not those in the programme had other food programmes).

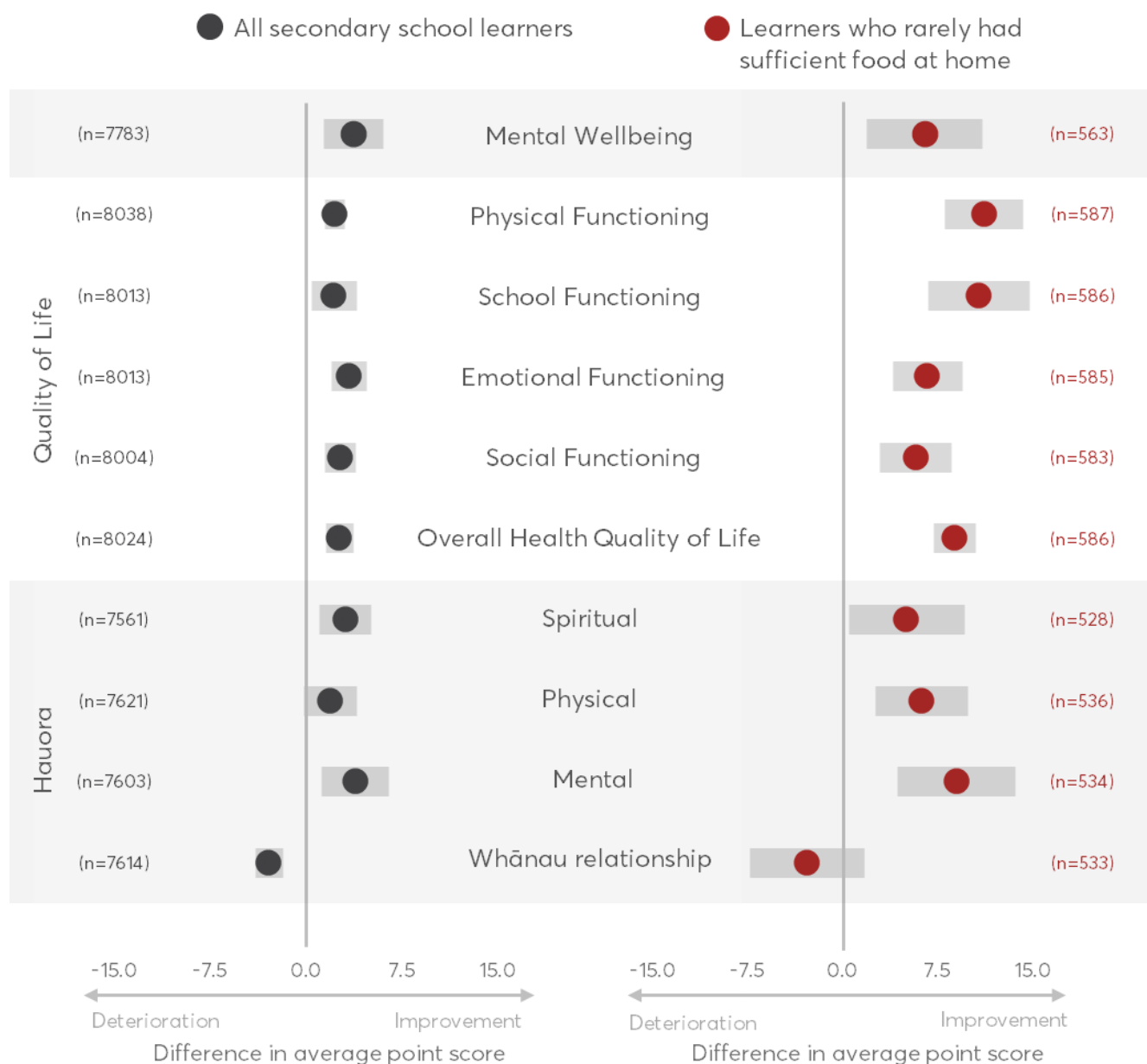
The evaluation demonstrated that the programme exceeded expectations in terms of wellbeing, with large and significant benefits realised for the secondary school-aged population of ākonga, and even larger benefits for those most underserved ākonga. An overview of the wellbeing results is illustrated below, showing the effect as the percentage advantage that Ka Ora, Ka Ako ākonga have over their peers in other schools and kura.

<sup>57</sup> Either "never" or "1-2 days in the past week".

<sup>58</sup> The evaluation approach adopted a regression discontinuity (RD) design that utilizes the arguably exogenous variation at the policy threshold to estimate the impacts of the Ka Ora, Ka Ako programme on ākonga wellbeing. The balance test supported the validity of the RD design (c.f. Vermillion Peirce, P., Jarvis-Child, B., Chu, L., Lennox, K., Kimber, N., Clarke, H., Wang, N., Nguyen Chau, T. and Winthrop, P. 2022. Ka Ora, Ka Ako New Zealand Healthy School Lunches Programme Impact Evaluation: Technical Report and Appendices. Ministry of Education).

<sup>59</sup> The model controlled for the background factors of age, sex, notably (Māori and Pasific), school isolation index, control schools with existing programmes, and region (notably Auckland). Effects were estimated using regression discontinuity (RD) regressions.

**Figure 13: Estimated effects of Ka Ora, Ka Ako across a range of wellbeing measures (95% confidence interval). All measures represented on a 100-point scale to allow comparability, Source: learner wellbeing questionnaire.**



These results for each wellbeing measure are further described below.

## Ka Ora, Ka Ako resulted in better mental wellbeing.

### 2.1. Ka Ora, Ka Ako resulted in better mental wellbeing of secondary school-aged ākonga, with those underserved ākonga within the programme realising a 14% advantage in mental wellbeing than their underserved peers in other schools.

The World Health Organisation-5, or WHO-5, is an internationally recognised measure of mental wellbeing, and among the most widely used in questionnaires assessing subjective psychological wellbeing in the world. It is based on five individual items, measuring positive

mood (good spirits, relaxation), vitality (being active, waking up fresh and rested), and general interest (being interested in things). The overall WHO-5 score is often used to indicate mental wellbeing over the preceding two weeks. While a higher score is viewed as better mental wellbeing, a low score may indicate risk and psychological support needs for these young people,<sup>60 61 62</sup> with a WHO-5 score of less than 50 suggesting poor emotional wellbeing.<sup>63</sup>

The evaluation results showed that those most underserved Ka Ora, Ka Ako ākonga, on average, had significantly greater mental wellbeing than those similarly underserved ākonga in non-programme schools and kura. The result represents a 14% advantage<sup>64</sup> in mental wellbeing for Ka Ora, Ka Ako ākonga, with those in the programme benefiting an additional 6.6 ( $\pm 4.6$ ) WHO-5 points<sup>65</sup> above their similarly underserved peers not receiving healthy school lunches.

This benefit of the programme also appeared to spill over into the broader population of ākonga. Although smaller, the programme resulted in a 6.4% advantage in mental wellbeing for the average Ka Ora, Ka Ako secondary ākonga, who benefited an additional 3.8 ( $\pm 2.4$ )<sup>66</sup> WHO-5 points above the average ākonga not in the programme.

In comparison to the younger Ka Ora, Ka Ako ākonga, the pilot evaluation didn't detect any statistically significant mental wellbeing benefits for the overall primary and intermediate-aged ākonga population. It did, however, find a statistically significant increase in mental wellbeing for those ākonga with previously insufficient quantities of food over and above that for ākonga with sufficient quantities of food.<sup>67</sup> The consistency for those most underserved ākonga provides weight to the attributional claims that the Ka Ora, Ka Ako programme results in better mental wellbeing.

## **2.2. Case study: Ka Ora, Ka Ako offsets food-related concerns and improves wellbeing at Porirua School.**

These positive wellbeing results may be demonstrating that eating healthier food, such as increased vegetables and/or decreased eating of snacks and sweets (c.f. sections 1.5 and 1.6) increases mood, vitality and general interest. The results may also be showing that having food reliably available may be alleviating concerns among ākonga and their families, providing greater food security and improved positivity, and allowing ākonga to shift the focus from foundational needs (e.g. needing food for survival) towards broader interests.

One of the eight case studies exemplified how Ka Ora, Ka Ako is reducing stress and improving overall wellbeing for one whānau. At Porirua School, the Ka Ora, Ka Ako lunches

<sup>60</sup> Allgaier, A.K., Pietsch, K., Fruhe, B., Prast, E., Sigl-Glockner, J., Schulte-Körne, G., 2012. Depression in paediatric care: is the WHO-five wellbeing index a valid screening instrument for children and adolescents? *Gen. Hosp. Psychiatry* 34, 234-241.

<sup>61</sup> Lowe B, Spitzer RL, Grafe K, Kroenke K, Quenter A, Zipfel S, Buchholz C, Witte S, Herzog W: Comparative validity of three screening questionnaires for DSM-IV depressive disorders and physicians' diagnoses. *J Affect Disord* 78:131-140, 2004

<sup>62</sup> M Al-Shamari, R Puttha1, R Thalava, J Diegnan, C Brown, C Neail (Validity of world health organisation-wellbeing index as a psychology screening tool in children with diabetes, British Society for Paediatric Endocrinology and Diabetes and British Society of Paediatric Gastroenterology, Hepatology and Nutrition.

<sup>63</sup> Of the 10,340 secondary school-aged ākonga who had completed the WHO-5 questionnaire, 35.9% would have been labelled as having poor emotional wellbeing among this ākonga cohort.

<sup>64</sup> The net benefit is the effective change, calculated as the net benefit  $\beta$  divided by the mean for the control group. Here, 13.96% represents the net percentage point change as  $\beta = 6.55 / \text{control } \bar{x} = 46.92$

<sup>65</sup> RD results:  $\beta = 6.55, \pm 4.57, p < 0.001, n = 563$ ; treatment  $\bar{x} = 50.05$ , control  $\bar{x} = 46.92$

<sup>66</sup> RD results:  $\beta = 3.88, \pm 2.35, p < 0.001, n = 7783$ ; treatment  $\bar{x} = 57.52$ , control  $\bar{x} = 59.12$

<sup>67</sup> The net gain in mental wellbeing for ākonga with **insufficient quantities of food** at the outset over those with sufficient food was  $6.2\% \pm 3.7\%$  ( $\beta = 6.2\%$ ,  $p = 0.001$ ,  $n = 946$ ).



provide a dependable meal, meeting some of their daily food requirements and in turn easing at least some whānau financial concerns.

### Case study 3: Ka Ora, Ka Ako in Porirua School

Porirua City is situated in the greater Wellington region, and has a population of approximately 57,000 people, 22% of which identify as Māori according to the 2018 Census. Porirua School is centrally located, across from a large shopping centre, library and aquatic centre, and caters for approximately 138 ākonga from Year 1 to 6.

Prior to Ka Ora, Ka Ako, a significant proportion of ākonga were not eating healthy, substantial lunches. For two years before the school started the programme, the staff were making cheese toasties at lunchtime to supplement any food the ākonga brought from home. A charitable trust made these toasties possible through the donation of bread, cheese and spreads.

When the school started the Ka Ora, Ka Ako programme, they were *"able to provide good nutritious, filling food, because the lunch packs that the kids would love from the dairy, don't fill them up, and they were hungry."*

This year, the school changed from an external to an internal delivery model. Now the school employs three staff, including a full-time kitchen coordinator who was already well known to the school as a teacher aide and parent. It's *"a great model because we've employed local people in our community."*

On the day of the visit, the ākonga were served cottage pie containing beef mince and mixed vegetables such as capsicum, cucumber, and broccoli *"chopped up real fine, so they don't see it,"* mash and white sauce. The kids also have fruit every day in both the classroom and at lunchtime, which is provided by the Fruit in Schools programme. The kids are the provider's *"biggest critics"* and if they enjoy the food, they will come back for seconds, and thirds if supply allows.

Since the implementation of the Ka Ora, Ka Ako programme, *"kids are having a healthy lunch every day. That's important because if your tummy's full, your brain can engage."* There have also been noticeable behaviour changes, for example, the kids have been *"more calm"* and their confidence is increasing.

The wellbeing of the ākonga at Porirua School depends on the wellbeing of their whānau, particularly with increasing health and financial pressures. For this school, *"more than ever, right now, this programme is so important. I've had whānau in tears thanking me for the fact that we have the lunches because they are struggling so much."*

Nauri\* is a parent whose children receive the Ka Ora, Ka Ako meals. Before the programme, Nauri was spending a substantial amount buying groceries for lunches weekly; *"It was a struggle to buy lunches, even just buying the bread, which was 99c at the time."* It was very stressful to make the food last for the week. Another challenge Nauri faced was when her kids would lose their lunchbox – *"Can you imagine? It's like \$5 for a lunchbox now."*

Nauri's children are eating healthier and there are *"major changes financially."* The programme is helping her family, particularly with the high cost of living. *"The cost of vegetables is high. You know when they say, 'eat healthy' but then you go shopping and broccoli is \$3 for one."*

Thanks to the programme, Nauri's children are fed fruit and vegetables at lunchtime. Her children also bring home extra lunches, which are shared with Nauri's whānau. Because of Ka Ora, Ka Ako Nauri is *"very happy, I feel stress free, I don't lose it anymore. I don't even have to worry about lunchboxes... Now I don't have to worry about anything. It makes you feel good."*

## Ka Ora, Ka Ako resulted in improved health quality of life.

### **2.3. Ka Ora, Ka Ako resulted in improved energy and ability to undertake a range of physical activities among secondary school-aged ākonga, with the programme contributing to a 16% physical functioning advantage for the most underserved ākonga.**

It could reasonably be expected that improved nutritional intake would improve the ability for ākonga to undertake day-to-day physical activities, resulting in greater energy and ability to participate in sport and exercise. Indeed, learners in Australia aged 7 to 17 report that major benefits of eating healthy food include improved cognitive and physical performance, fitness, endurance, psychological benefits, physical sensation (feeling good physically) and production of energy.<sup>68</sup>

A measure within the learner wellbeing survey, PedsQL™ is a widely used and brief measure of quality of life. It is a multidimensional scale measuring physical, emotional, social and school functioning of the learner, estimating the frequency of problems experienced over the previous month. Collectively, it also estimates the health quality of life as a total score, from 0 to 100.

The evaluation results showed that Ka Ora, Ka Ako ākonga realised significantly greater physical functioning than their peers, with the Ka Ora, Ka Ako ākonga realising a 2.9% advantage – an additional 2.3 ( $\pm 0.8$ )<sup>69</sup> physical functioning Peds-QL points, on average – over their peers who were not in the programme. What this means is that the Ka Ora, Ka Ako ākonga experienced problems less frequently than other ākonga, at least insofar as their ability to walk, run, play sport, help around the house and shower without help, and in their energy levels.

Even more profound were the evaluation results showing the programme resulted in a 16.4% physical functioning advantage for those most underserved ākonga. More specifically, the most underserved ākonga had achieved (on average) an additional 11.2 ( $\pm 3.1$ )<sup>70</sup> Peds-QL points above what was achieved by their similarly underserved peers who were not receiving the school lunches.

These positive results were mirrored in the pilot evaluation, which also found the programme resulted in small physical functioning benefits for primary and intermediate aged ākonga.<sup>71</sup>

<sup>68</sup> O'Dea J. A. (2003). Why do kids eat healthful food? Perceived benefits of and barriers to healthful eating and physical activity among children and adolescents. *Journal of the American Dietetic Association*, 103(4), 497–501.

<sup>69</sup> RD results:  $\beta = 2.3, \pm 0.8, p < 0.001, n = 8038$

<sup>70</sup> RD results:  $\beta = 11.2 \pm 3.1, p < 0.001, n = 587$

<sup>71</sup> 3.7% ( $\pm 3.0\%$ ) net positive effect for ākonga in pilot schools.

**MY DAUGHTER IS REAL SPORTY, BUT WAS EATING PIES, NOODLES... SHE DIDN'T WANT TO SIGN UP FOR SPORTS OR ANYTHING, SHE THOUGHT SHE WAS GETTING TOO FAT ... NOW SHE'S BEEN IN 5 RUGBY TEAMS THIS YEAR.**  
— WHĀNAU (CASE STUDY)

**2.4. Ka Ora, Ka Ako resulted in improved ability to function in school, with the programme contributing a 20% school functioning advantage for the most underserved ākonga.**

At the outset of the programme, it was expected that Ka Ora, Ka Ako would support the ability for ākonga to engage in school. Research has shown that poor nutrition compromises children's behaviour, concentration and cognitive ability,<sup>72 73</sup> and skills such as concentration and focus are pertinent for children to be able to learn.

The evaluation used PedsQL™ to estimate the frequency at which ākonga struggle to pay attention in class, forget, have trouble keeping up, and were away from school because of sickness or visiting doctors (i.e. attendance). Collectively, the frequency of experienced problems indicates how well (or not well) the ākonga are functioning in school.

The results showed that Ka Ora, Ka Ako secondary school-aged ākonga realised significantly better school functioning<sup>74</sup> when compared to their peers in other schools and kura. In other words, these Ka Ora, Ka Ako ākonga were able to pay attention and keep up in school more frequently than their peers. More specifically, ākonga realised a 3.6% school functioning advantage, and 2.3 (±1.8)<sup>75</sup> more school functioning points than ākonga in other schools and kura. Those ākonga who rarely had enough food at home realised an even greater advantage from the programme, notably a 20% advantage, achieving an additional 10.8 (±4) school functioning points over those similarly underserved ākonga in other schools and kura.

**KIDS ARE FULLER FOR LONGER WITH THE MEALS THAT THEY GET RIGHT NOW. THEIR MOOD AND BEHAVIOURS HAVE BEEN IMPACTED BY HAVING HEALTHY, CONSTANT MEALS. THE CHILDREN ARE MORE SETTLED. — SCHOOL STAFF (CASE STUDY)**

<sup>72</sup> Bellisle F. Effects of diet on behaviour and cognition in children. Br J Nutr. 2004 Oct;92 Suppl 2:S227-32.

<sup>73</sup> Taki, Y., Hashizume, H., Sassa, Y., Takeuchi, H., Asano, M., Asano, K., et al. (2010). Breakfast staple types affect brain gray matter volume and cognitive function in healthy children. PLoS ONE 5:e15213. doi: 10.1371/journal.pone.0015213

<sup>74</sup> RD results:  $\beta = 10.8, \pm 4.0, p < 0.001, n = 586$

<sup>75</sup> RD results:  $\beta = 2.25, \pm 1.8, p < 0.01, n = 8013$

The pilot evaluation didn't detect any statistically significant school functioning benefits for the Ka Ora, Ka Ako primary and intermediate school-aged ākonga population. Given the smaller sample size in the Ka Ora, Ka Ako pilot evaluation and the early stage of the pilot programme, it is nevertheless reassuring that the trend in results between the primary and intermediate school-aged ākonga and the secondary school-aged ākonga were similarly showing a positive trend.

## **2.5. Case study: The focus on nutrition supports healthy decisions at Nelson Teen Parent Unit.**

The evaluation results clearly align with the research showing how nutrition contributes to greater focus, concentration and cognition. However, these measured wellbeing benefits may also demonstrate that having a greater focus on health, such as through the Ka Ora, Ka Ako lunches, may provide the necessary impetus to actively make healthy decisions. One of the eight case studies exemplified how both eating and learning about healthy food is supporting the focus and energy for one teen mother in the Nelson Teen Parent Unit.



## Case study 4: Ka Ora, Ka Ako in Nelson Teen Parent Unit

Nelson Teen Parent Unit (aka Nelson Young Parent School) is a small school currently providing for eight teenage mothers. It is a unit attached to Nelson College for Girls. The school is situated alongside an early childhood education provider where the ākonga children are cared for. Given the additional challenges and responsibilities that young mothers have, the school caters for its ākonga in a variety of capacities. The school focuses on providing education that is relevant to its cohort of ākonga, such as budgeting, driver licencing, parenting, life skills and creating CVs. The school also helps ākonga achieve NCEA and University Entrance.

Nutrition education has become a key component of learning for the school, which has been aided by a co-head teacher who is formally trained as a home economics teacher. Prior to Ka Ora, Ka Ako, the school staff wanted to compensate for ākonga who often came to school without breakfast and purchased "easy" food (i.e. sandwiches and pies) from the local service station. To counteract this, school staff were preparing lunches such as soups and pasta for their ākonga every other day. The school also participated in a breakfast programme that supplied their ākonga with Weetbix, which often wasn't eaten.

Participating in Ka Ora, Ka Ako was an easy decision for the school. After reviewing food provider menus, the school opted for an internal model of delivery, where their emphasis remained on quality and relevant food for new mothers.

The school employs a part-time nutritionist as a kitchen coordinator to plan and prepare Ka Ora, Ka Ako lunches. She has extended the menu variety using her expertise and vegan background to provide vitamin-rich vegetarian and protein-rich meat lunches. On this day vegetable sticks, hummus dip and high-fibre Omega-3-rich seed crackers were prepared as a snack, and there was beef kofta, tzatziki and tabbouleh with carrot for lunch.

Ka Ora, Ka Ako ensures the mothers are fed and helps build awareness of a variety of healthy foods. The ākonga are inspired to think about cooking instead of relying on easily available food. Now, the ākonga are asking for menus and building their knowledge about nutrition, which has an impact on both them and their children. Knowing that the mothers eat one healthy daily meal reassures the school that the ākonga are receiving many of the nutrients they need to better care for themselves and their children.

Chelsea\* is 19 years old, and the mother of a 2-year-old. She is trying out different school subjects and is keen to take up as many learning opportunities as possible, while her daughter attends the ECE in the adjoining building. Chelsea has a strong affinity with animals, especially dogs, and aims to become a veterinary nurse.

Chelsea feels supported and genuinely cared for by the school staff, *"it feels like a family."* The teachers guide her in her study and potential career pathways for her interests. Since starting in this school at the beginning of the year, Chelsea's grades have been *"really amazing."* This is something she attributes to the school's support and the healthy food provided through the Ka Ora, Ka Ako programme.

*"At home I couldn't do as much because I had to look after my child all the time. I would eat whatever was available and what we had, eating junk food and just fruit. My child is fussy, and I eat what she eats. I tend to make quite plain food because she doesn't really eat vegetables, she eats sausages, pasta, and fruit. The food here changed the way I was thinking about food. I am now more aware of needing to eat this kind of food. I think about eating enough veges and it makes me feel healthier, like I have more energy. I have been able to focus a lot more and get work done. I have been doing really well with my studies and getting really amazing grades. The food has contributed to that."*

## **2.6. Ka Ora, Ka Ako resulted in improved emotional and social functioning among secondary school-aged ākonga, with the programme contributing to a 9-12% advantage for the most underserved ākonga.**

As reported above, previous research has found a significant association between healthy eating and improved emotional health,<sup>76</sup> and an association between a higher quality of nutrient intake and lower depression scores.<sup>77</sup> Further research has also found evidence for the inverse relationship that poor nutrition significantly increases the odds of persistent bullying among youth,<sup>78</sup> with clear links between infrequent health foods, frequent junk foods, and meal deprivation elevating bullying risk.<sup>79</sup>

A recent longitudinal study of Norwegian children and adolescents supports that receiving school meals can facilitate making new friends and learning new social skills, aid in forming healthy eating habits, improve school functioning and increase social equality among students.<sup>80</sup> We could therefore reasonably assume that healthy school lunches would have an impact on both emotional and social functioning.

Indeed, the evaluation results showed that the Ka Ora, Ka Ako ākonga benefited from the programme in terms of reduced frequency of problems with feelings of sadness, anger or fear (emotional functioning). Ka Ora, Ka Ako secondary school-aged ākonga realised a 5.2% emotional functioning advantage –  $3.4 \pm 1.4$ <sup>81</sup> Peds-QL points higher, on average – than their peers not receiving the school lunches. Those most underserved ākonga benefited even more from the programme, realising 12.1% better emotional functioning than their peers in other schools and kura ( $6.8$ <sup>82</sup>  $\pm 2.8$  Peds-QL points).

Ka Ora, Ka Ako ākonga also benefited in terms of having a reduced frequency in problems with friendships, getting along with and keeping up with their peers (social functioning). Secondary school-aged ākonga benefited by a 3.6% greater social functioning than their peers in other schools and kura ( $2.7 \pm 1.2$ <sup>83</sup> Peds-QL points), while those most underserved ākonga realised a 9% social functioning ( $5.8$ <sup>84</sup>  $\pm 2.8$  Peds-QL points) advantage over ākonga in other schools and kura who rarely had enough food at home.

These same positive trends were evidenced in the pilot evaluation, whereby those primary and intermediate ākonga with insufficient quantities of food at the outset made more than double the gains in emotional functioning<sup>85</sup> and greater gains in social functioning.<sup>86</sup> Although these greater gains in emotional and social functioning were present and sizeable, they were not statistically significant, which was likely due to the smaller sample sizes.

<sup>76</sup> Kulkarni, A. A., Swinburn, B. A., & Utter, J. (2015). Associations between diet quality and mental health in socially disadvantaged New Zealand adolescents. *European Journal of Clinical Nutrition*, 69(1), 79–83.

<sup>77</sup> Jacka, F. N., Kremer, P. J., Leslie, E. R., Berk, M., Patton, G. C., Toumbourou, J. W., & Williams, J. W. (2010). Associations between diet quality and depressed mood in adolescents: results from the Australian Healthy Neighbourhoods Study. *The Australian and New Zealand Journal of Psychiatry*, 44(5), 435–442.

<sup>78</sup> Jackson, DB, Vaughn, MG, Salas-Wright, CP (2017). Poor nutrition and bullying behaviors: A comparison of deviant and non-deviant youth, *Journal of Adolescence*, Volume 57, June 2017, pages 69-73.

<sup>79</sup> Jackson, DB, Vaughn, MG (2018). The bully-victim overlap and nutrition among school-aged youth in North America and Europe, *Children and Youth Services Review*, Volume 90, July 2018, pages 158-165.

<sup>80</sup> Illøkken KE, Johannessen B, Barker ME, Hardy-Johnson P, Øverby NC, Vik FN. Free school meals as an opportunity to target social equality, healthy eating, and school functioning: experiences from students and teachers in Norway. *Food Nutr Res*. 2021 Jul 9;65

<sup>81</sup> RD results:  $\beta = 3.4 \pm 1.4$ ,  $p < 0.001$ ,  $n = 8013$

<sup>82</sup> RD results:  $\beta = 6.8 \pm 2.8$ ,  $p < 0.01$ ,  $n = 585$

<sup>83</sup> RD results:  $\beta = 2.7 \pm 1.2$ ,  $p < 0.001$ ,  $n = 8004$

<sup>84</sup> RD results:  $\beta = 5.8 \pm 2.8$ ,  $p < 0.001$ ,  $n = 583$

<sup>85</sup> The net gain in emotional functioning for hungry ākonga was  $3.0\% \pm 3.4\%$  ( $\beta = 3.0$ ,  $p = 0.08$ ,  $n = 867$ ).

<sup>86</sup> The net gain in social functioning for hungry ākonga was  $1.9\% \pm 3.8\%$  ( $\beta = 1.9$ ,  $p = 0.33$ ,  $n = 867$ ).

**SOCIALLY IT GAVE MY KIDS SOME FRIENDSHIPS... WHEN THEY HANG TOGETHER, THEY ARE EQUAL, NO ONE HAS BETTER OR LESS THAN ANOTHER. IN TERMS OF MĀORITANGA, FOOD IS WHAT WE DO AND HOW WE COME TOGETHER. IT HAS BEEN A HUGE HELP FOR KIDS TO PARTICIPATE IN THOSE SCENARIOS. THEY ARE ABLE TO JUST MINGLE, NOT JUDGING EACH OTHER. IT TEACHES MANAAKITANGA.**

**— WHĀNAU (CASE STUDY)**

## **2.7. Case study: Ka Ora, Ka Ako strengthens connections within the community at Ōwhata School.**

The research clearly shows that nutrition is associated with emotional functioning, and therefore greater emotional and social functioning among Ka Ora, Ka Ako ākonga may be the result of better nutrition within the programme than otherwise. Better emotional and social functioning may also be due to the programme improving equity within schools and kura, ensuring all ākonga have the same food available to them. It may also be that positive relationships are fostered where ākonga appear equal to each other and can share and engage during lunch. One of the eight case studies suggested that Ka Ora, Ka Ako creates equity and inclusion among ākonga, and exemplifies how the programme enhances connections and confidence for some within Ōwhata School.

## Case study 5: Ka Ora, Ka Ako in Ōwhata School

Rotorua has a population of approximately 72,000 people, of which 40% identify as Māori. Ōwhata school is in eastern Rotorua. The school whakapapa links both the Ōwhata marae and Ōwhata school with hapū Ngāti Te Roro O Te Rangi and Ngāti Whakaue iwi, and proudly displays their connections with their mountain, Whakapoungakau; their river, Waingaehe; and lake Rotorua-nui-a-Kahumatamomoe in their pepeha.

Ōwhata School caters for 267 Year 1 to 6 ākonga, with KidsCan and Fruit in Schools supporting some of them with snacks, fruit and clothing. Prior to the Ka Ora, Ka Ako programme, a local whānau-run charitable trust Save Our Babies also provided up to 20 lunches a day for tamariki at the school.

Ōwhata school wanted to ensure access to food was equitable so they started providing lunches through the Ka Ora, Ka Ako programme in 2019. They also saw the programme as supporting cultural identity and contributing to positive relationships at the school, teaching and living whanaungatanga, manaakitanga and kaitiakitanga.

The school changed from an "external delivery model to a iwi/hapū model of delivery" to fit with their ethos and better serve their community. The model, managed by local hapū Ngāti Te Roro O Te Rangi, now employs up to four community members to prepare fresh lunches every day for the 267 ākonga. The provider's favourite dish to prepare is spaghetti bolognese, wherein they hide the mixed frozen and leftover fresh vegetables from the week by "blitzing" these and combining them with red lentils, prime (low fat) mince and wholemeal spaghetti. "The kids love it, and we love to make it."

The most significant change for both the provider and the school staff was the connectedness the kai enhanced by having wholesome kai prepared for the ākonga by members of the marae and hapū, and creating connections between the kura, hapū, whānau and community. "For us, the most significant change is that the kai is made for our people by our people... when the children leave here, we hope they take the teachings they received here regarding maara kai, a sense of belonging, identity, kaitiakitanga, a sense of contribution. We want our tamariki to grow up

*and be contributing members of their society and sustain the aspirations of our community."*

Addrianne\*, a part-time childcare worker, has three children. They moved to Rotorua several years ago, and her two younger children are now attending Ōwhata School. Rotorua is special to Addrianne, not only because of its awe-inspiring natural resources but because it feels "more normal" being Māori. Of even greater importance to Addrianne is that Rotorua provides greater opportunity for her children, showing them Māori people succeeding as Māori and providing inspiration for their lives.

Addrianne wants the best future for her children, although it wasn't always easy. "I was very broke and struggling to feed my kids. My power was cut off all the time and I was evicted from my house. I felt bad I couldn't provide for my kids. When I moved to Rotorua, I still couldn't pay for food. At that time, my son was diagnosed with ADHD. I didn't want to medicate him, and so it was even harder to pay for food because I needed to take the sugar and preservatives out and healthy food is more expensive. It got too hard and too expensive, so we'd run out of food."

Addrianne would keep her children home from school from time to time, which was particularly hard knowing that education would later help her children succeed in life. She asked for help from the organisation Save Our Babies. "They were bringing my kids lunch at school for a little bit, but then everyone saw my kids as the poor kids. My daughter wasn't picking it up from the office, and she wasn't eating the food because of the shame. She was just going hungry."

The Ka Ora, Ka Ako lunch programme provided broad and significant benefits for Addrianne and her children. Her son is now engaging positively, and neither of her children at Ōwhata School are worried about having food available during school. The programme is teaching and living manaakitanga. The food from the programme allows Addrianne's children and their school friends to fully participate, to come together and share their food where they are all equal. Bullying and theft centred on food has all but disappeared for her children. Her daughter is now healthy and proudly participates in multiple sports clubs. For Addrianne, however, the most significant change was her ability to provide for her children.

"There were a whole bunch of steps getting to where I am at now. Before the school lunches, I would keep my kids home from time to time. I had a really low self-esteem and no confidence - I couldn't even provide for my own kids. I was embarrassed. Getting the school lunches, I was able to get over the shame and regain the confidence. I didn't have to worry about them as they were being fed. I didn't have to keep them home from school because there was no food. I didn't have to worry about doing anything differently or special for my son, all of the food was suitable. I was able to build my confidence, and I had some time. I was able to get a job and I can now provide for my kids. My daughter is in multiple sports clubs, and she wants to learn the guitar, which is now possible. I can now help others because I know what it's like. I want to tell my story so it may help others."



Ka Ora, Ka Ako resulted in an overall better health quality of life.

## **2.8. Ka Ora, Ka Ako resulted in an overall better health quality of life for secondary school-aged ākonga.**

PedsQL™ measures quality of life, and across the constructs described above it estimates the health quality of life as a total score (HQoL) from 0 to 100. Again, Ka Ora, Ka Ako ākonga realised significantly better overall health quality of life when compared to their peers in other schools and kura. Most specifically, the programme resulted in a 14.4% benefit in health quality of life for the most underserved Ka Ora, Ka Ako ākonga, with those in the programme benefiting an additional 8.9 ( $\pm 1.7$ )<sup>87</sup> HQoL points more than their similarly underserved peers in other schools. The effects of the programme were also felt more broadly among the secondary school-aged population, with Ka Ora, Ka Ako ākonga realising a 3.7% advantage - 2.7 ( $\pm 1.0$ )<sup>88</sup> additional HQoL points, on average over secondary ākonga in other schools.

This result is similar to that found for primary and intermediate ākonga, with the pilot evaluation showing that Ka Ora, Ka Ako had a small but statistically significant effect on the overall health quality of life for these younger ākonga.<sup>89</sup>

## **2.9. Ka Ora, Ka Ako resulted in an 8.4% reduction in secondary school-aged ākonga designated 'at risk' of impaired health quality of life.**

The self-rated health quality of life estimate, HQoL, has been validated and is useful to assess risk to health conditions, track health status and measure treatment outcomes in paediatric populations.<sup>90 91</sup>

To understand the prevalence of risk among the overall secondary school-aged population, and the associated benefits of the programme, the HQoL scores were also grouped according to above or below the thresholds designating an 'at risk' status for impaired HQoL for children and adolescents in the USA. Although this threshold is from a different population (USA), the results provide useful guidance on how the secondary school population compares.<sup>92</sup>

<sup>87</sup> RDD regression results:  $\beta = 8.9\%$ ,  $\pm 1.7\%$ ,  $p < 0.001$ ,  $n = 586$

<sup>88</sup> RDD regression results:  $\beta = 2.7\%$ ,  $\pm 1.0\%$ ,  $p < 0.001$ ,  $n = 8024$

<sup>89</sup> The net gain in total health quality of life for ākonga in the pilot beyond that for ākonga not in the pilot was  $3.0\% \pm 2.0\%$  ( $\beta = 3.0$ ,  $p = 0.007$ ,  $n = 1157$ ,  $R^2_{\text{cond}} = 0.04$ ).

<sup>90</sup> Varni JW, Seid M, Kurtin PS. Med Care. 2001. PedsQL 4.0: reliability and validity of the Pediatric Quality of Life Inventory version 4.0 generic core scales in healthy and patient populations. Aug;39(8):800-12.

<sup>91</sup> I-Chan Huang, L.A. Thompson, Y.Y. Chi, C.A. Knapp, D.A. Revicki, M. Seid, E.A. Shenkman, 2009. The Linkage between Pediatric Quality of Life and Health Conditions: Establishing Clinically Meaningful Cutoff Scores for the PedsQL, Value in Health 12, 5: 773-781.

<sup>92</sup> At risk levels were defined for the Health Quality of Life Total Score as  $\leq 69.71$  (PedsQL Generic Core Scales) for children and adolescents in the USA, according to Varni JW, Burwinkle TM, Seid M, et al. The PedsQL™ 4.0 as a pediatric population health measure: Feasibility, reliability, and validity. Ambulatory Pediatrics. 2003;3: 338.

The evaluation evidence showed that the programme resulted in an 8.4 percentage point ( $\pm 1.6$ ) reduction<sup>93</sup> in the prevalence of ākonga at risk of impaired health quality of life after controlling for the range of factors that may influence the result.<sup>94</sup>

This result is similar to that for primary and intermediate school-aged ākonga, which showed a statistically significant net reduction in the prevalence of at risk ākonga for those in the pilot against those not in the pilot.<sup>95</sup> These corroborating results, using different methodologies across the two evaluations, adds weight to the statement that Ka Ora, Ka Ako produced an overall better health quality of life for ākonga and a lower prevalence of risk among the school-aged populations.

## Ākonga hauora

### 2.10. Ka Ora, Ka Ako likely resulted in improved aspects of hauora.

Hua Oranga<sup>96</sup> is a wellbeing measure developed in New Zealand and is aligned to the Framework for Measuring Māori Wellbeing (Durie 2006). It measures outcomes consistent with Māori concepts of health and wellness: wairua (spiritual wellbeing), tinana (physical wellbeing), hinengaro (mental wellbeing) and whānau (family and relationship wellbeing). The tool was developed for use by individuals within the clinical setting, and ideally including consideration among those around whaiora (pursuit of wellness) – notably the whānau and clinician. Nevertheless, it can be used as a self-assessment instrument, and was used here to estimate perceptions of hauora among secondary school-aged ākonga on the day of the survey.

The results in relation to Hua Oranga were more tenuous than the other wellbeing measures, showing substantially different and inconsistent results across the different samples of schools and kura.<sup>97</sup> This means that the results were sensitive to the selection of schools and kura, and the result may be unreliable.<sup>98</sup> The following shows the average effect of the programme:

- 6.1% greater spiritual wellbeing for the most underserved ākonga (+0.20 points,  $\pm 0.18$  on the 5-point Hua Oranga measure)<sup>99</sup> and 3.6% greater spiritual wellbeing for

<sup>93</sup> RD results:  $\beta = -0.08$ ,  $p < 0.001$ ,  $n = 8024$

<sup>94</sup> Age, sex, ethnicity (notably Māori and Pacific), school isolation index, control schools with existing programmes, and region (notably Auckland).

<sup>95</sup> The net reduction in prevalence for pilot ākonga at risk of impaired health quality of life against those not in the pilot was 9.0  $\pm$  5.0% ( $\beta = -9.0$ ,  $p = 0.004$ ,  $n = 1959$ ).

<sup>96</sup> Kingi, TK, M. Durie (1997). Framework for Measuring Maori Mental Health Outcomes. A report prepared for the Ministry of Health, Department of Maori Studies, Massey University, Palmerston North, <https://www.massey.ac.nz/massey/fms/Te%20Mata%20O%20Te%20Tau/Reports%20-%20Te%20Kani/T%20Kingi%20&%20M%20Durie%20Hua%20Oranga%20A%20maori%20measure%20of%20mental%20health%20outcome.pdf>, downloaded December 2021.

<sup>97</sup> Regression discontinuity (RD) requires the assumption that schools are similar around the threshold, and the technique determines the width around this eligibility threshold to provide the most robust estimate. Although the RD estimate would change around the bandwidth, the statistical results would ideally be consistent across the different bandwidths, showing the result is robust to subtle changes in sample selection.

<sup>98</sup> The point estimates (ie,  $\beta$  or the effect of the programme) across the different bands around the Ka Ora, Ka Ako eligibility threshold of 461 were close to zero and insignificant when the school selection was marginally modified. In other words, when different groups of schools above and below the threshold (as EQI bands) were selected, the result changed. When using RD design, the result should be consistent irrespective of the specific schools included above and below this threshold.

<sup>99</sup> RD results:  $\beta = 0.20$ ,  $\pm 0.18$ ,  $p < 0.01$ ,  $n = 528$

Ka Ora, Ka Ako ākonga overall (+0.13 points, +/-0.08 on the 5-point Hua Oranga measure)<sup>100</sup>

- 7.4% better physical wellbeing for the most underserved (+0.25 points, +/-0.15 on the 5-point Hua Oranga measure)<sup>101</sup> and 2.1% greater physical wellbeing overall (0.08 points, +/-0.08 on the 5-point Hua Oranga measure)<sup>102</sup>
- 12.2% better mental wellbeing for those most underserved (+0.36 points, +/-0.19 on the 5-point Hua Oranga measure)<sup>103</sup> and 4.7% greater mental wellbeing overall (+0.16 points, +/-0.10 on the 5-point Hua Oranga measure).<sup>104</sup>
- 2.8% worse family and relationship wellbeing overall (-0.11 points, +/-0.04 on the 5-point Hua Oranga measure)<sup>105</sup> and no significant effects for those most underserved.<sup>106</sup>

The variable results may be due to the different interpretations of the subjective response scale (e.g. I feel that my mental health is "extremely good", "good", "just okay", "not good" or "very bad" at present). Measures that capture frequency of behaviours over a month period (Peds-QL) or feelings over a two-week period (WHO-5) may be more relevant for comparisons. It should be emphasised that Hua Oranga, as noted by the developer, is theoretically sound as a cultural measure but needs to complement more clinically focused, targeted measures. It is for this reason that these results should be treated with some caution.

## **2.11. Case study: Ka Ora, Ka Ako lifts the community at Mana College.**

The programme employs people to prepare and provide food to ākonga. More broadly, providing food can build relationships within the school as well as between the school and the community, and even within whānau. Four interviewees at Mana College exemplified how Ka Ora, Ka Ako supports ākonga, and a provider's employee exemplifies the series of programme benefits being realised in unique ways.

<sup>100</sup> RD results:  $\beta = 0.13, \pm 0.08, p < 0.001, n = 7561$

<sup>101</sup> RD results:  $\beta = 0.25, \pm 0.15, p < 0.001, n = 536$

<sup>102</sup> RD results:  $\beta = 0.08, \pm 0.08, p < 0.05, n = 7621$

<sup>103</sup> RD results:  $\beta = 0.36, \pm 0.19, p < 0.001, n = 534$

<sup>104</sup> RD results:  $\beta = 0.16, \pm 0.10, p < 0.001, n = 7603$

<sup>105</sup> RD results:  $\beta = -0.11 \pm 0.04, p < 0.001, n = 7614$

<sup>106</sup> RD results:  $\beta = 0.11, \pm 0.18, p > 0.05, n = 533$

## Case study 6: Ka Ora, Ka Ako in Mana College

Mana College is a co-educational state school for 500 ākonga from Year 9 to 13. It is situated in Porirua in the Wellington region and has significant support systems in place for ākonga. The school has youth workers and social workers on site who regularly engage with their ākonga. At Mana College, several ākonga have Oranga Tamariki involvement, as well as whānau who are navigating a variety of social challenges. For many of these families, *"food becomes the last priority."* This school has always believed that *"If we could provide every child with a free nutritious lunch and a device, then they would at least be on the starting line and not lining up outside the stadium."*

Since Ka Ora, Ka Ako, *"the food has brought multiple benefits."* The ākonga eat their lunch together in a room with their allocated learning advisor (a teacher who is consistent throughout the time the ākonga are enrolled at secondary school). The programme has helped facilitate this important time. *"It's helped develop the relationship between the learning advisor and the class, there has been a significant change."* The ākonga *"now have the fuel to carry on for the day, it has made a massive difference to their learning. Some of the kids don't have breakfast, so lunch is important. For some kids this is it."*

One parent stated that their son Tamati\*, *"Is really excited about the lunches, he enjoys the food."* There is peace of mind for Tamati's whānau knowing that he's fed. *"Once you eat something, your mind is a bit sharper. Some kids come to school and don't have anything to eat, their mind is not on work, it's on food."*

For Mana College, 2022 has been one of the hardest years yet. *"Our attendance isn't bad, but it isn't good either now. The school's attendance used to be around 80%, now it's around 70% and has sometimes dropped down to 60%, most of our absences are around medicals."* Many school families have been isolating with COVID-19 and influenza, *"which has been a real difficulty for whānau."* During this time, the lunch provider has collaborated with

the school to make frozen meals and deliver them to these families.

The lunch provider produces 500 daily meals for the school and employs seven local staff. They view their purpose as being creative and *"Making healthy food that kids want to eat. We try really hard to get it right for the kids."* The ākonga appreciate the food. The ākonga will *"often approach the pick-up van for leftovers, especially if it is a favourite lunch. The hot meals we make are really popular. The meals are comforting, familiar and filling."*

On the day of the visit, lunch was a 'sushi burger'. Inside a patty of brown and white rice with avocado was either tuna mayonnaise or chicken teriyaki, with a topping of nori and toasted sesame seeds. On the side, there were edamame beans and pretzels. The portions are larger to incorporate a good protein content *"that's going to fill them up. They eat with their eyes."*

Kiri\* is 21 years old and works for Mana College's Ka Ora, Ka Ako lunch provider. Kiri is local to Porirua and has whānau who are ākonga, and future ākonga, of Mana College. After being unable to find a job for more than two years, Kiri did a short course with the youth employment charity Talent Rise. After that, Kiri began her current role. Kiri was drawn to the fundamental purpose of the job, *"I loved the idea of being able to feed these kids."* Over a year later, this still holds true. It's hard for Kiri to know that many kids at the school don't have a lot of food at home. However, she enjoys engaging with them and feeding these kids their daily school lunch. Kiri loves her job, she loves the environment and her colleagues. *"The women here are like mother figures."*

Things weren't always easy for Kiri's family when she was growing up, and she wishes there had been the Ka Ora, Ka Ako programme when she was at school. Kiri is glad this programme exists for kids now. *"The kids are happy to come to school and have a kai."* The kids are openly grateful for the food and tell Kiri so every day.

Kiri's job with the programme means that she can help support her family, which is a priority for her. As one example, she used some of her pay to buy a Chromebook to help her younger sister with her schoolwork.



## Māori secondary school-aged ākonga

### **2.12. The effect of Ka Ora, Ka Ako for Māori secondary school-aged ākonga is positive in terms of physical wellbeing, but negative in terms of the WHO-5 mental wellbeing scale.**

By providing lunches to all ākonga, the programme is expected to enable greater equity between Māori and non-Māori through targeting the disproportionate burden of poverty on Māori.<sup>107</sup> It was thus important to consider the benefits of the programme specifically for Māori ākonga.

The evidence showed no significant benefits (or losses) in terms of spiritual or mental wellbeing (Hua Oranga), or overall health quality of life, emotional, social or school functioning (Peds-QL) for Māori ākonga in the programme when compared to Māori ākonga in other schools and kura. This means that Māori ākonga did not benefit (nor worsen) because of the programme, at least insofar as these specific measures.

Nevertheless, the evaluation results showed that, on average, Māori secondary school-aged ākonga in Ka Ora, Ka Ako schools and kura, when compared to Māori ākonga in other schools and kura had significantly:

- lower mental wellbeing, representing an additional 9% disadvantage in mental wellbeing, with Ka Ora, Ka Ako Māori ākonga 5.3 ( $\pm 2.9$ ) WHO-5 points<sup>108</sup> lower than peers not receiving Ka Ora, Ka Ako lunches
- better physical functioning, representing between 2.3-4.5% benefit in physical functioning, with Ka Ora, Ka Ako Māori ākonga benefiting by 1.8 ( $\pm 0.13$ ) Peds-QL points<sup>109</sup> and 0.17 ( $\pm 0.13$ ) Hua Oranga points<sup>110</sup>
- lower whānau relationships, representing 5.4% disadvantage with Ka Ora, Ka Ako Māori ākonga 0.22 ( $\pm 0.09$ ) Hua Oranga points lower (on a 5-point scale) than peers not receiving Ka Ora, Ka Ako lunches.<sup>111</sup> Again, the results derived from Hua Oranga were sensitive to the selection of specific schools and kura (i.e. the bandwidth around the eligibility criterion) and therefore require a degree of caution when using them.

Māori ākonga are benefiting in terms of physical functioning, and this result is supported across two different measures (Peds-QL and Hua Oranga). It is, however, unclear why Māori ākonga scored lower in the WHO-5 measure.

Some may suggest that the WHO-5 measure does not provide valid results for this specific population – Māori ākonga – as the WHO-5 is a western-based wellbeing scale. Nevertheless, it is a scale that is often used in New Zealand and it has been used widely

<sup>107</sup> Ministry of Health (2017) Māori health models: Te Whare Tapa Whā. Retrieved (19 Sept 2010):

<https://www.health.govt.nz/our-work/populations/maori-health/maori-health-models/maori-health-models-te-whare-tapa-wha>

<sup>108</sup> RD results:  $\beta = -5.29, \pm 2.93, p < 0.001, n = 1940$

<sup>109</sup> RD results:  $\beta = 1.85, \pm 0.13, p < 0.001, n = 2021$

<sup>110</sup> RD results:  $\beta = 0.17, \pm 0.13, p < 0.01, n = 1879$

<sup>111</sup> RD results:  $\beta = -0.22, \pm 0.09, p < 0.001, n = 1870$

with adolescent populations, including with Māori populations.<sup>112 113 114 115</sup> The measure also appears to function similarly for Māori and non-Māori populations when examining the item responses in relation to each of the WHO-5 items amongst the secondary school-aged ākonga in this evaluation.<sup>116</sup>

Another possible reason for this lower score in mental wellbeing may relate, at least in part, to the perceived stigma of being associated with a disadvantaged school or kura. Ka Ora, Ka Ako is targeted to schools and kura with ākonga who have high levels of socio-economic barriers. Although the programme was introduced as a universal approach rather than the targeted provision of lunches to specific ākonga to reduce the stigma associated with 'needing food', schools and kura were still targeted. This targeting could be a source of stigmatisation for ākonga, which impacts their mental wellbeing.

The effects of stigma may be compounded by two factors, the first of which is age. Adolescence is a time that individuals shift attention to social evaluations and social standing, sometimes referred to as social sensitivity.<sup>117</sup> The impact of social sensitivity is that:

*"they might be more emotionally reactive to explicit cues indicative of social inclusion or exclusion... They might also be more attuned to instances of real or perceived social evaluation, where individuals are led to believe that they are under evaluative scrutiny within certain contexts... Adolescents might also consider with greater elaboration and emotional import what others are thinking and feeling, supported by mentalizing, or theory of mind processes, which enables speculation as to what others' impressions of them might be."*<sup>118</sup>

Such sensitivity is attributed to, for example, brain development<sup>119</sup> or hormones<sup>120</sup> that are particularly relevant during adolescence.

Further research has supported this view. When experiencing negative social feedback, adolescents endorse a greater drop in mood and increase in anxiety relative to adults<sup>121</sup>

<sup>112</sup> Williams, AD, Clark, TC, and Lewycka, S (2018). The Associations Between Cultural Identity and Mental Health Outcomes for Indigenous Māori Youth in New Zealand, Public Health, 13 November 2018.

<sup>113</sup> Lambert, M. Fleming, T, Ameratunga, S. Robinson, E. Crengle, S. Sheridan, J. Denny, S. Clark, T. And Merry, S. (2014). Looking on the bright side: An assessment of factors associated with adolescents' happiness, *Advances in Mental Health* 12(2): 101-109.

<sup>114</sup> Aminzadeh, K. Denny, S. Utter, J. Milfont, T, Ameratunga, S., Teevaled, T. Clarke, T. (2013). Neighbourhood social capital and adolescent self-reported wellbeing in New Zealand: A multilevel analysis, *Social Science and Medicine*, 84: 13-21.

<sup>115</sup> McKelvie-Sebileau, P. Gerritsen, S. Swinburn, B. D'Souza, E. & Tipene-Leach, D. (2021). Nourishing Hawke's Bay: He wairua tō te kai – food security, health behaviours and wellbeing in children in regional New Zealand, *Journal of the Royal Society of New Zealand* 52: 4, 357-375.

<sup>116</sup> To examine cultural equivalence of the five WHO-5 items and scale, we examined differential item functioning (DIF) graphically and statistically, using RUMM2030, for the variable Māori (yes or no). The results showed near identical slopes and locations of the five item responses that make up the WHO-5 scale. These results were confirmed statistically for all of the five items ( $f \leq 1.507$ ,  $p \geq 0.22$ ), with negligible DIF magnitudes demonstrated by the markedly less-than-small effect sizes ( $d < 0.1$ ). These evidence suggest that the WHO-5 scale does not present a bias measurement favouring either Māori or non-Māori respondents.

<sup>117</sup> Somerville, L.H. (2013), Special issue on the teenage brain: Sensitivity to social evaluation. *Curr Dir Psychol Sci.* 2013 Apr 1; 22(2): 121-127.

<sup>118</sup> Somerville, L.H. (2013), Special issue on the teenage brain: Sensitivity to social evaluation. *Curr Dir Psychol Sci.* 2013 Apr 1; 22(2): 121-127.

<sup>119</sup> Shaw et al., 2008; Somerville, Hare, & Casey, 2011; Asato, Terwilliger, Woo, & Luna, 2010; Liston et al., 2006, as referenced by Somerville (2013).

<sup>120</sup> Ernst, Romeo, & Andersen, 2009; Nelson, Leibenluft, McClure, & Pine, 2005; Sisk & Zehr, 2005, as referenced by Somerville (2013).

<sup>121</sup> Sebastian, Viding, Williams, & Blakemore, 2010, as referenced by Somerville (2013).

and conversely report a boost in positive affect when experiencing social acceptance from a desirable peer.<sup>122</sup> It may be that some ākonga within the Ka Ora, Ka Ako programme believe that they are being evaluated and perceived as being needy. This is particularly true if you, as an individual or as part of a group, are regularly associated with deprivation, such as Māori are in New Zealand. In other words, Māori adolescents may be particularly sensitive to being associated with a school or kura that is “disadvantaged”.

The negative feelings associated with stigma would, at least in part, explain why the WHO-5, which estimates frequency of positive feelings, saw negative results while other measures which estimate the frequencies of experienced problems (e.g. Peds-QL), did not. Without further contextual evidence to test these views, these assertions are merely speculation.

## The benefits of providing food

### **2.13. The benefits of Ka Ora, Ka Ako increase when Ka Ora, Ka Ako ākonga are compared to ākonga in schools and kura that have no alternative food provision.**

The results above demonstrate the impact of Ka Ora, Ka Ako on ākonga wellbeing, irrespective of what other programmes or support the school is providing to ākonga. We know that some schools and kura were providing food to ākonga even though they were not part of the Ka Ora, Ka Ako programme. There were 24 schools and kura that were included in the “control group” (i.e. below the equity index of 461 and not in the programme), and of these schools and kura, half were providing some food to their ākonga, which included for example:

- breakfast club (n=4 schools and kura, 17%)
- free or subsidised lunch for some ākonga (n=3 schools and kura, 12%)
- free or subsidised lunch for all ākonga (n=2 schools and kura, 8%)
- KidsCan (n=2 schools and kura, 8%)
- other food programmes (n=4 schools and kura, 17%).

If these schools and kura were removed from the study, essentially comparing those ākonga who don’t get any school food programme with those who benefit from the Ka Ora, Ka Ako programme, the wellbeing gains are quite profound – in some cases, doubling the benefits of the programme. The Ka Ora, Ka Ako results would have remained the same but the comparison schools without any school food programme would have lower wellbeing results among its ākonga. Thus these results demonstrate that providing school food of any kind through other initiatives resulted in better wellbeing.

The results are set out below. The table shows the gains made by the secondary school-aged ākonga improve if we compare wellbeing between Ka Ora, Ka Ako ākonga with

<sup>122</sup> Guyer et al., 2012, as referenced by Somerville (2013).

ākonga who have no food programme available to them (Table 2, columns 2 and 3). This is true for most estimates of wellbeing. However, when we look at the gains made by those most underserved ākonga (Table 2, columns 4 and 5), the Ka Ora, Ka Ako ākonga realise between 11%-40% better wellbeing across the different constructs than those ākonga who do not have any food provided by their school. Most notably, those most underserved Ka Ora, Ka Ako ākonga realised a 14% net benefit in mental wellbeing above their peers in other schools and kura, but a 40% net benefit above their peers in other schools and kura that don't provide any food programmes. Similarly, profound benefits were realised across the other wellbeing constructs.



**Table 2: Programme impact on secondary school-aged ākonga, estimating the benefit that Ka Ora, Ka Ako ākonga have over and above their peers in other schools and kura without other food programmes (columns 3 and 5) and in other schools and kura with other food programmes (columns 2 and 4). The symbol \* designates statistical significance at the 0.05 level (\*), 0.01 level (\*\*) or 0.001 level (\*\*\*), and colours designate the magnitude of the impact.**

Wellbeing measures		Benefit realised by Ka Ora, Ka Ako secondary school-aged ākonga (on average) over similar secondary ākonga in		Benefit realised by most underserved Ka Ora, Ka Ako ākonga (on average) over similarly underserved ākonga in	
		other schools and kura	other schools and kura without existing food programmes	other schools and kura	other schools and kura without existing food programmes
WHO-5	Mental wellbeing	6.4% advantage ***	12.2% advantage ***	14.0% advantage ***	40.3% advantage ***
Peds-QL	Physical functioning	2.9% advantage ***	4.1% advantage ***	16.4% advantage ***	19.3% advantage ***
	School functioning	3.6% advantage ***	4.8% advantage ***	20.0% advantage ***	28.7% advantage ***
	Social functioning	3.6% advantage ***	5.0% advantage ***	9.0% advantage ***	15.7% advantage ***
	Emotional functioning	5.2% advantage ***	7.3% advantage ***	12.1% advantage ***	25.6% advantage ***
	Overall health quality of life	3.7% advantage ***	5.2% advantage ***	14.4% advantage ***	21.3% advantage ***
Hua Oranga	Spiritual	3.6% advantage ***	3.3% advantage ***	6.1% advantage **	22.6% advantage ***
	Physical	2.1% advantage *	6.3% advantage *	7.4% advantage ***	11.4% advantage
	Mental	4.7% advantage ***	10.6% advantage ***	12.2% advantage ***	27.1% advantage ***
	Relationship	2.7% disadvantage ***	0.7% disadvantage	3.1% disadvantage	5.1% disadvantage
KEY		0-5% negative impact (and p<0.05)	0-5% positive impact (and p<0.05)	5-20% positive impact (and p<0.05)	More than 20% positive impact (and p<0.05)

# Ka Ora, Ka Ako did not contribute to overall attendance

---

Regular attendance rates have been gradually declining in New Zealand since 2015.<sup>123</sup> The more recent drop in attendance, between 2020 and 2021, would be likely largely attributable to the COVID-19 pandemic. Beyond the national and regional lockdowns (c.f. Context section), there were a range of factors that likely influenced attendance, such as ākonga and whānau anxiety about their health and safety,<sup>124</sup> changes to family finances, interpersonal relationships and family dynamics, housing instability, mental health and physical health.<sup>125</sup> As part of the evaluation, we expected that these broad effects would be similar for those ākonga in schools and kura just above and just below the programme eligibility threshold. This meant that the evaluation could detect any programme effects on attendance, albeit within the COVID-19 context. We used the Ministry of Education attendance data that is periodically submitted by schools and kura to the Ministry, to assess the impact of the programme on attendance.

Although there has been mixed evidence about universal lunch programmes effects on attendance in developed countries,<sup>126</sup> the Ministry expected that providing food to ākonga through Ka Ora, Ka Ako would result in an increase in attendance.

The evidence across Ministry attendance data demonstrated *no change* in relation to attendance for the overall population of ākonga.

## Ka Ora, Ka Ako has not contributed to change in attendance across the schools and kura.

The majority of schools and kura began delivering the programme in late 2020. We therefore included attendance rates across terms, comparing Terms 1, 2, 3 and 4, from 2020 to 2021. We compared changes in attendance rates for individuals in Ka Ora, Ka Ako schools and kura just above the equity index eligibility threshold (EQI 461-466) with those in schools and kura just below this threshold (EQI 455-460). These two groups of ākonga, including those receiving school lunches and those not receiving lunches, were considered reasonably similar insofar as previous attendance rates among ākonga and school characteristics.<sup>127</sup>

<sup>123</sup> Ministry of Education (2022). Attendance and Engagement Strategy.

<sup>124</sup> Education Review Office (2021). Learning in a Covid-19 World: The Impact of Covid 19 on Schools. ISBN 978-1-99-000235-9

<sup>125</sup> Tomaszewski, W., Zajac, T., Rudling, E., te Riele, K., McDaid, L. & Western, M. (2022) Uneven impacts of COVID-19 on the attendance rates of secondary school students from different socioeconomic backgrounds in Australia: A quasi-experimental analysis of administrative data. Australian Journal of Social Issues, 00, 1– 20

<sup>126</sup> Cohen JFW, Hecht AA, McLoughlin GM, Turner L, Schwartz MB. Universal School Meals and Associations with Student Participation, Attendance, Academic Performance, Diet Quality, Food Security, and Body Mass Index: A Systematic Review. Nutrients. 2021; 13(3):911. <https://doi.org/10.3390/nu13030911>

<sup>127</sup> There was a bias in terms of ākonga age with the control group having a greater representation of older ākonga than those in the treatment schools. The analysis model accounted for age, as well as other variables that may have influenced the result.

<sup>128</sup> The search was conducted in accordance with the Preferred Reporting Items for Systematic Review and Meta-Analyses (PRISMA), and 47 studies were identified, and the Newcastle-Ottawa Scale (NOS) was applied to assess bias in relation to these studies. The Newcastle-Ottawa scale is a tool used for assessing the quality of non-randomized studies included in a systematic review and/or meta-analyses.

The table below shows that the estimates for mean attendance rates for ākonga in Ka Ora, Ka Ako schools and kura ('treatment') and ākonga in other schools and kura ('control'). Although the changes in attendance differ slightly (c.f. Table 3, 'Change in attendance'), from a 1.5% to 3.4% drop in attendance across both years, there is a consistent negative trend between 2020 and 2021 for both groups of ākonga.

**Table 3: Mean attendance ('estimate') for ākonga in Ka Ora, Ka Ako schools and kura ('treatment') and ākonga in other schools and kura ('control') in 2020 and 2021, with mean change in attendance for each term (lower and upper bounds are 95% cluster robust confidence intervals), Source: Ministry of Education attendance data.**

Term 1	Treatment			Control		
	Estimate	Lower bound	Upper bound	Estimate	Lower bound	Upper bound
Attendance in 2020	91.5%	89.8%	93.2%	91.8%	91.0%	92.6%
Attendance in 2021	89.2%	84.8%	93.6%	89.6%	88.7%	90.5%
Change in attendance	-2.3%	-5.2%	0.6%	-2.2%	-2.9%	-1.6%

Term 2	Treatment			Control		
	Estimate	Lower bound	Upper bound	Estimate	Lower bound	Upper bound
Attendance in 2020	88.8%	87.2%	90.4%	90.0%	89.4%	90.5%
Attendance in 2021	85.8%	82.2%	89.5%	86.6%	85.2%	87.9%
Change in attendance	-3.0%	-5.5%	-0.5%	-3.4%	-4.5%	-2.3%

Term 3	Treatment			Control		
	Estimate	Lower bound	Upper bound	Estimate	Lower bound	Upper bound
Attendance in 2020	89.9%	88.1%	91.6%	90.4%	89.3%	91.4%
Attendance in 2021	87.5%	84.1%	90.8%	87.6%	86.0%	89.2%
Change in attendance	-2.4%	-4.2%	-0.5%	-2.8%	-3.7%	-1.9%

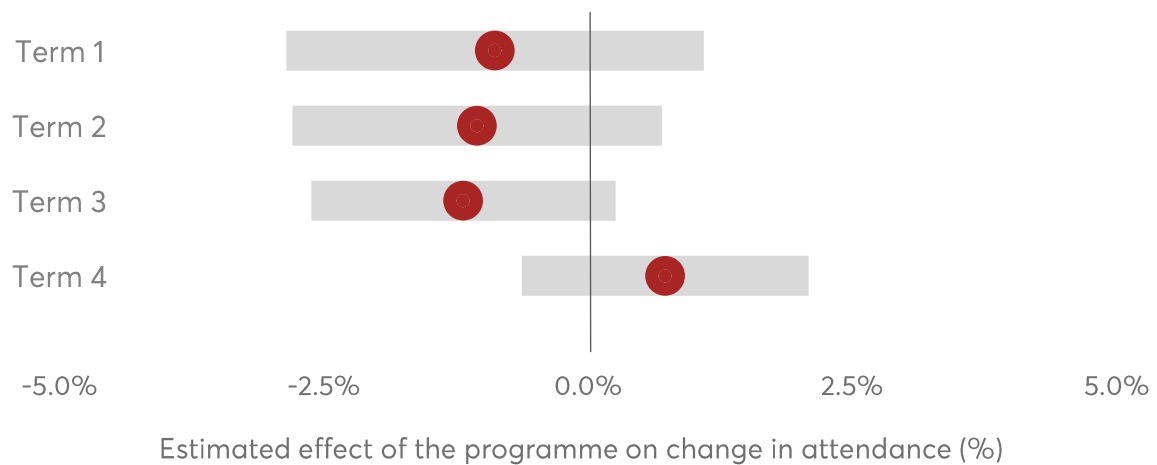
Term 4	Treatment			Control		
	Estimate	Lower bound	Upper bound	Estimate	Lower bound	Upper bound
Attendance in 2020	89.4%	87.9%	91.0%	89.2%	88.0%	90.5%
Attendance in 2021	87.9%	86.6%	89.3%	86.4%	84.8%	88.1%
Change in attendance	-1.5%	-2.7%	-0.3%	-2.8%	-3.7%	-2.0%

We further controlled for potential factors that may have influenced the results<sup>128</sup> such as factors relevant to the ākonga (e.g. age, sex, ethnicity and past unjustified absences). When controlling for these factors, there were no statistically significant effects of the programme on attendance for any of the four terms assessed.

There were marginal, non-significant effects of the programme, showing a net decline in attendance rate in Term 1 (-0.8%,  $\pm 2\%$ ), Term 2 (-1.0%,  $\pm 1.7\%$ ) and Term 3 (-1.2%,  $\pm 1.5\%$ ), and a non-significant net increase in Term 4 (0.7%,  $\pm 1.4\%$ ). These effects are visualised in the figure below.

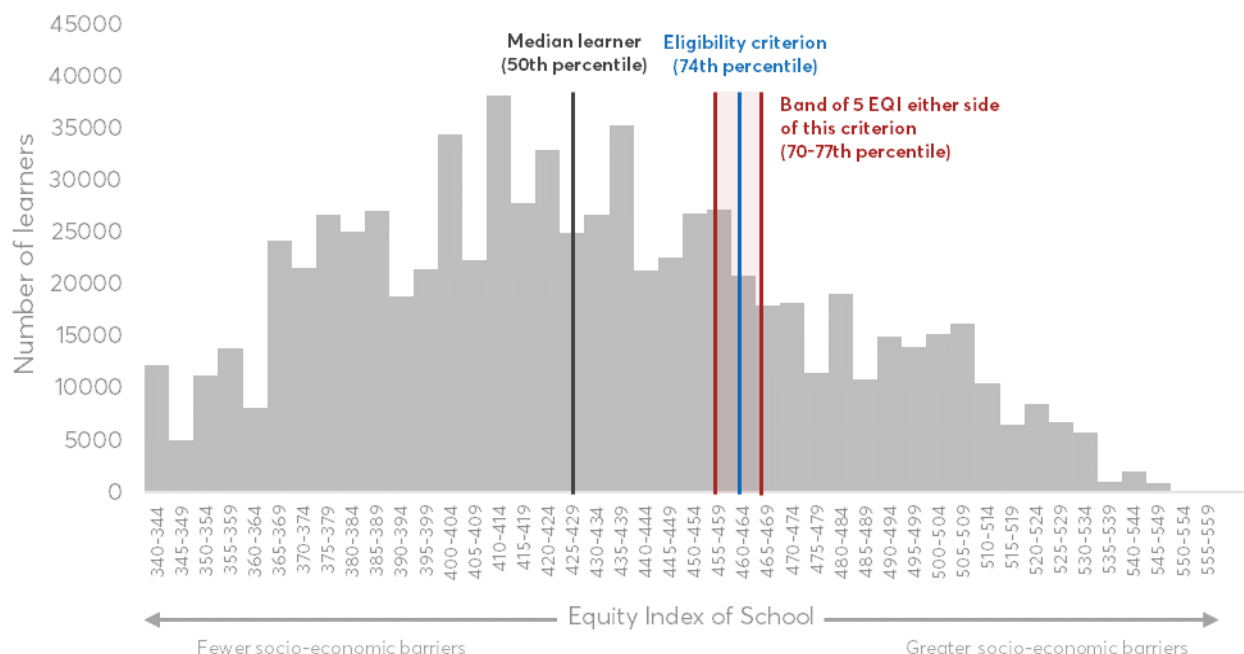
<sup>128</sup> The model controlled for the background factors of age, sex, ethnicity and past unjustified absence rates. Effects were estimated using a Difference-in-Difference approach.

**Figure 14: Ka Ora, Ka Ako contribution to attendance across the school-aged population, within a narrow band around the EQI 461 eligibility threshold (EQI 455-466). Grey bars are 95% cluster robust confidence intervals, Source: Ministry of Education attendance data.**



These results may demonstrate that school lunches are not sufficient to improve attendance rates, at least as far as detectable among the population of ākonga in schools with moderate disadvantage. As noted elsewhere, the ākonga included in the evaluation were those in schools and kura around the eligibility threshold. This means they were not the schools and kura with the greatest needs (i.e. higher EQIs) but rather they were ākonga that were in schools and kura with just sufficient, or nearly sufficient, levels of deprivation to be eligible for the school lunch programme (c.f. Figure 14).

**Figure 15: The distribution of learners across school level Equity Index, highlighting the threshold for the programme (blue), the band of 5 EQI around this threshold used in the attendance analysis, and the median learner (black).**





Given the lack of data available at the time of reporting, we could not determine if the programme affected attendance for those most underserved.<sup>129</sup> This is a particular shortcoming given the existing evidence about the impacts of universal food programmes on attendance, at least for those from lower income families.<sup>130</sup> The Ministry will need to address this information need in relation to Ka Ora, Ka Ako in the coming months, and the required data will likely be available from November 2022.

<sup>129</sup> To make this determination, it would be necessary to know which ākonga were the most underserved, and in the same dataset have attendance data. Child poverty is multi-dimensional such that no single measurement is perfect. We could not identify suitable indicators to identify those most disadvantaged outside of the IDI. Within the IDI, the relevant data were not available within the timeframe required for the report.

<sup>130</sup> Cohen JFW, Hecht AA, McLoughlin GM, Turner L, Schwartz MB. Universal School Meals and Associations with Student Participation, Attendance, Academic Performance, Diet Quality, Food Security, and Body Mass Index: A Systematic Review. *Nutrients*. 2021; 13(3):911. <https://doi.org/10.3390/nu13030911>





# CONCLUSIONS & DISCUSSIONS



## How well did Ka Ora, Ka Ako perform against expectations?

---

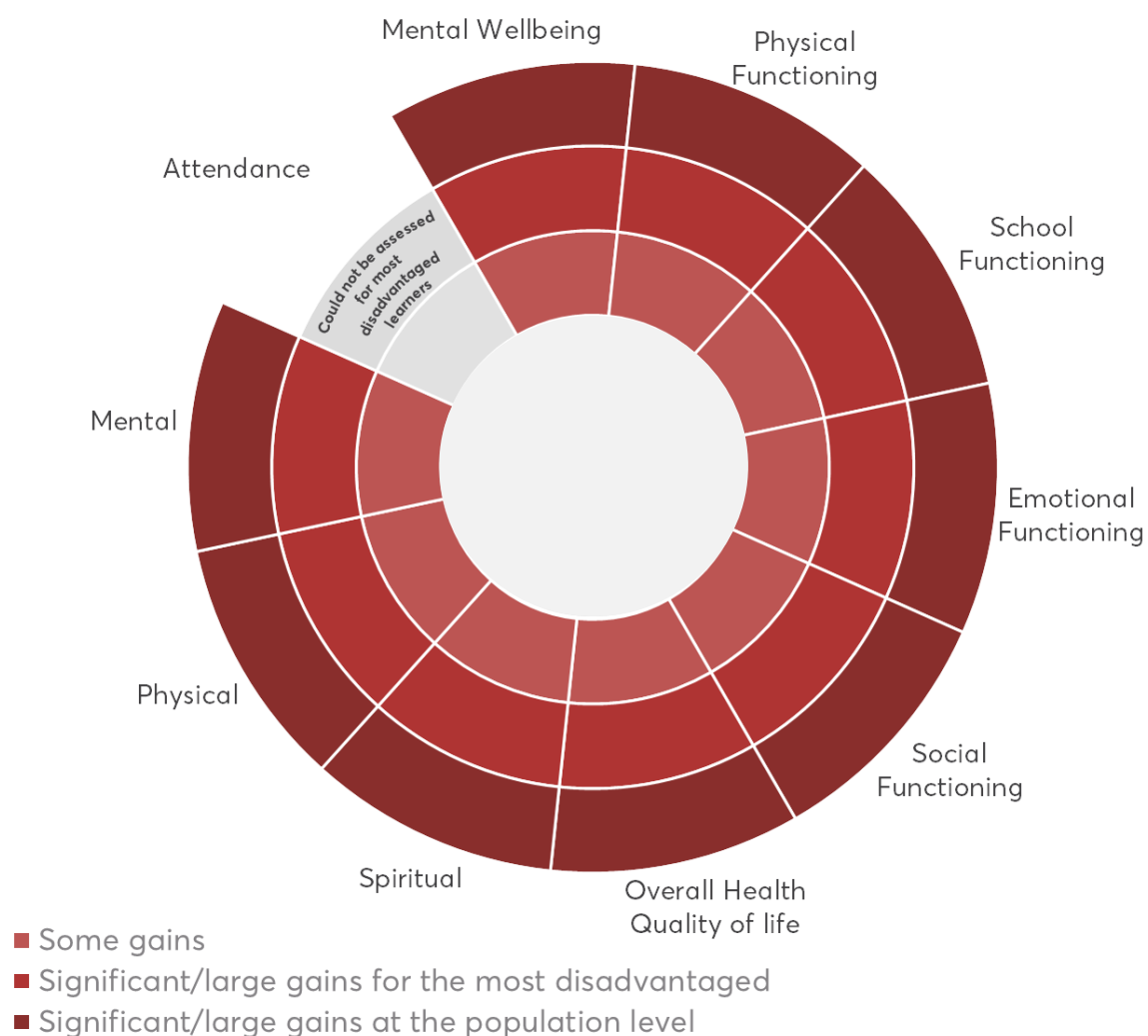
The expectations of the Ka Ora, Ka Ako healthy school lunches programme were to improve food security (alleviating hunger and improving nutrition) and to enhance ākonga wellbeing. Overall, the Ka Ora, Ka Ako programme is a success, particularly for those experiencing the challenge of not having access to sufficient food at home. While food security was not an explicit focus of this specific evaluation, the positive results about frequency of specific foods consumed, coupled with the Ka Ora, Ka Ako pilot evaluation evidence with primary and intermediate ākonga, showed excellent progress towards improving the nutrient intake of ākonga at lunchtime.

Similarly, the wellbeing results demonstrated that Ka Ora, Ka Ako often exceeded expectations, with wellbeing benefits realised across the population of secondary school-aged ākonga and even greater benefits for those ākonga that rarely had enough food available at home. These results build upon the pilot evaluation evidence showing wellbeing benefits for primary and intermediate ākonga and demonstrates the significant wellbeing benefits of the programme for ākonga. Investing in a healthy school lunch programme for New Zealand children and adolescents was highly beneficial for food security and wellbeing among ākonga, in particular for those who experience shortages of food in their homes.

It should not be forgotten, however, that these broad benefits were not realised for all ākonga. The programme was found to have no benefits for Māori primary and intermediate ākonga, and using one (of the 10) wellbeing measures, a negative effect on Māori secondary ākonga. Without further contextual information, it is essential that the Ministry explore why these ākonga are having less positive feelings.

Another expectation of the Ka Ora, Ka Ako school lunches programme was to promote attendance at school. While the pilot did not appear to contribute to improved attendance for ākonga as a whole, the given timeframe and availability of data meant that the evaluation could not determine if attendance changed for those most in need of school lunches within these school populations. If the programme contributes to any changes to attendance this is likely where they will occur.

**Figure 16: The benefits of the Ka Ora, Ka Ako programme, highlighting if some positive (inner circle) or significant gains (middle circle) were realised for the most underserved ākonga, and if they were realised more broadly across the general population (outer circle).**



## What do the results mean?

**Ka Ora, Ka Ako contributes to healthier and happier ākonga overall, which will likely result in better health outcomes.**

Ka Ora, Ka Ako supports the broader role of schools and kura in Aotearoa New Zealand by bringing together education and wellbeing. In recent years, many schools and kura in Aotearoa have evolved into bearing the responsibility for wellbeing, not only for ākonga but also for whānau and the wider community. In the context of COVID-19, this responsibility to look after and care for whānau has likely only intensified for schools and



kura. Caring for ākonga and their whānau through Ka Ora, Ka Ako is central to manaakitanga which prioritises holistic care, of which food is fundamental.<sup>131</sup>

The programme was established under the New Zealand Child and Youth Wellbeing Government strategy, aiming to ensure children and young people have what they need, and are happy and healthy. The outcomes established within the strategy are that children and young people have what they need, and notably that they have regular access to nutritious food. Further outcomes expected are that children and young people are happy and healthy (including good mental wellbeing), are learning and developing, and are accepted, respected and connected (they feel manaakitanga: kindness, respect and care for others). In this case, Ka Ora, Ka Ako has made a significant contribution to the strategy objective.

The average primary and intermediate ākonga made small but significant gains in emotional and physical functioning, and overall health quality of life. Secondary school-aged ākonga benefited even more broadly in terms of wellbeing across all areas of functioning, mental wellbeing and overall quality of life. Collectively the results demonstrate happier and healthier ākonga.

Much evidence exists demonstrating how physical exercise affects brain plasticity, influencing cognition and wellbeing.<sup>132</sup> The gains in emotional functioning are important given the evidence that positive emotion protects against poor health outcomes in later life.<sup>133</sup> Two reviews have documented a robust association between positive emotion and improved health,<sup>134</sup> across experimental and large-scale prospective studies, significant aspects of adult health predicted by positive emotion include self-reported health, physiological responses, physical functioning, disease severity and mortality.

Gains in school functioning (e.g. ability to remember, pay attention and keep up in school, and the frequency of being present or away from school for health reasons) and social functioning (e.g. ability to get along with others and keep up with other ākonga when playing and also acceptance among peers) are both important for learning and engaging in school.

## Attendance is not one of the programme's benefits for the average ākonga within the given context.

Given previous research, it is unsurprising that healthy school lunches alone do not attract the average ākonga to school and improve overall attendance, and this was demonstrated in both the pilot and final evaluation. This result adds to the mixed attendance results found in other research. Most notably, a systematic review referenced

<sup>131</sup> Neill L, Williamson D, Berno T (2015) Manaakitanga and Maori food: Theoretical perspectives of advancement. *Locale: The Australasian-Pacific Journal of Regional Food Studies* 5: 84–101.

<sup>132</sup> Fernandes J., Arida R. M., Gomez-Pinilla F. (2017). Physical exercise as an epigenetic modulator of brain plasticity and cognition. *Neurosci. Biobehav. Rev.* 80, 443–456.

<sup>133</sup> Chida & Steptoe, 2008; Pressman & Cohen, 2005; as cited in Ong, AD, (2010) Pathways linking positive emotion and health in later life, *Current Directions in Psychological Science* 19(6): 358–362.

<sup>134</sup> Chida, Y., & Steptoe, A. (2008). Positive psychological well-being and mortality: a quantitative review of prospective observational studies. *Psychosomatic medicine*, 70(7), 741–756; Pressman, S. D., & Cohen, S. (2005). Does positive affect influence health?. *Psychological bulletin*, 131(6), 925–971.

above<sup>135</sup> found that while there were positive associations with school meal participation (e.g. diet quality, food security and academic performance), the research findings were mixed when examining attendance as an outcome.<sup>136</sup>

*"Of the seven peer-reviewed publications and two government reports conducted in the U.S. that examined attendance (n = 9 studies), five found a positive association between universal free school meals and attendance (primarily among sub-populations) and four found no association" (pg. 9).* Where there were effects on attendance, these subpopulations where attendance effects were detected included: lower income students,<sup>137</sup> or at least some lower income students,<sup>138</sup> and students with improved nutritional intake.<sup>139</sup>

Given the above evidence, and that food insecurity and hunger have been linked to lower levels of attendance,<sup>140</sup> it may be reasonable to expect that attendance would improve only for those without sufficient food available at home. The attendance data available for this evaluation within the given timeframe would not allow us to test the benefits of the programme among those most in need of the programme. It may indeed be that those most underserved ākonga have improved attendance, although this is unclear at this stage.

## The programme's focus on healthy lunches (if sustained) may have longer-term benefits for ākonga.

The programme aims to provide nutritious lunches to ākonga daily. Making healthy food available is only the first step, while ākonga consuming healthier food would be viewed as a key success for the programme. The pilot evaluation demonstrated significant and broad shifts in the foods available *and* consumed by primary and intermediate ākonga, with an average increase in diversity of vegetables and decrease in diversity of snacks and sweet items consumed every lunchtime. Although food security was not a focus of the later evaluation with secondary ākonga, the results showed Ka Ora, Ka Ako ākonga benefited in terms of more frequent consumption of vegetables and less frequent consumption of snacks and sweets at lunchtime.

An increase in consumption of healthy foods, even minimal, has important benefits for young people. The wellbeing benefits from the programme were clearly evidenced quite

<sup>135</sup> The search was conducted in accordance with the Preferred Reporting Items for Systematic Review and Meta-Analyses (PRISMA), and 47 studies were identified, and the Newcastle-Ottawa Scale (NOS) was applied to assess bias in relation to these studies. The Newcastle-Ottawa scale is a tool used for assessing the quality of non-randomized studies included in a systematic review and/or meta-analyses.

<sup>136</sup> Cohen JFW, Hecht AA, McLoughlin GM, Turner L, Schwartz MB. Universal School Meals and Associations with Student Participation, Attendance, Academic Performance, Diet Quality, Food Security, and Body Mass Index: A Systematic Review. *Nutrients*. 2021; 13(3):911. <https://doi.org/10.3390/nu13030911>

<sup>137</sup> Bartfeld, J.S.; Berger, L.; Men, F.; Chen, Y. Access to the school breakfast program is associated with higher attendance and test scores among elementary school students. *J. Nutr.* 2019, 149, 336–343.

<sup>138</sup> Ribar, D.C.; Haldeman, L.A. Changes in meal participation, attendance, and test scores associated with the availability of universal free school breakfasts. *Soc. Serv. Rev.* 2013, 87, 354–385.

<sup>139</sup> Kleinman, R.E.; Hall, S.; Green, H.; Korzec-Ramirez, D.; Patton, K.; Pagano, M.E.; Murphy, J.M. Diet, breakfast, and academic performance in children. *Ann. Nutr. Metab.* 2002, 46, 24–30.

<sup>140</sup> Alaimo et al. (2001). Food Insufficiency and American School-Aged Children's Cognitive, Academic, and Psychosocial Development. *PEDIATRICS*, 108(3), 824–824. <https://doi.org/10.1542/peds.108.3.824-a>; Ni Mhurchu et al. (2013). Effects of a free school breakfast pilot on children's attendance, academic achievement and short-term hunger: Results from a stepped-wedge, cluster randomised controlled trial. *Journal of Epidemiology and Community Health*, 67(3), 257–264. <https://doi.org/10.1136/jech-2012-201540>; Ball, J. and Watts, C. (2015). [External Evaluation of Fruit in Schools Final Report](#). Report prepared for 5+ A Day Charitable Trust; Quigley and Watts 2005.

broadly in the evaluation results. Beyond these detected wellbeing benefits, research has shown that nutrition can have serious and long-lasting effects on physical or cognitive functioning. In a comprehensive systematic review, a positive association was found between healthier foods (e.g. wholegrains, fish, fruits and vegetables) and cognitive processing such as goal-directed behaviours, working memory, attention and planning.<sup>141</sup>

Although our evaluation results cannot be interpreted as an assessment of overall diets among ākonga, the shift is nonetheless reassuring. The results demonstrate consumption of snacks and sweets in fewer lunches among primary and intermediate-aged ākonga in the pilot evaluation, and consumption with less frequency in lunches among secondary school-aged ākonga. The results are important because changes to eating habits early in life from the consumption of unhealthy to healthy food may have longer-lasting effects. In particular, food availability is a fundamental driver for children's eating behaviour.<sup>142</sup> Consequently, providing children with free, accessible fruits and vegetables have been shown to influence long-term eating behaviour.<sup>143</sup> Thus, the change in healthy eating habits may have longer-term health benefits for our young people such that the behaviour extends into adulthood.

## The programme's focus on providing sufficient quantities of food (if sustained) may have longer-term benefits and more equitable outcomes for our most underserved ākonga.

The programme's second immediate aim is to provide sufficient quantities of lunches to ākonga daily. The pilot evaluation demonstrated small but significant gains in terms of feelings of fullness. Although satiety was not a focus with older ākonga, the results showed more than half of the secondary school-aged ākonga in Ka Ora, Ka Ako schools and kura had sufficient food in school every day to feel 'just right' compared to only 40% for ākonga not in the programme who had daily access to sufficient food.

Not only having enough food but also providing food to ākonga most in need of the food was a primary function of the programme. These results showed significant and even larger effects were realised for the most underserved ākonga in primary and intermediate years as well as secondary years. What was further notable is the size of the programme's effect on ākonga when compared to those who don't have any existing food programme in the school, rather than when compared to schools and kura that have some other existing programmes (e.g. KidsCan, breakfasts, subsidised lunches). The advantage was astonishing, with Ka Ora, Ka Ako ākonga having a 40% mental wellbeing advantage when compared to ākonga in schools and kura without any food provision, even for the most underserved. These findings are important because they collectively demonstrate that food programmes result in significant mental wellbeing gains among those most in need of food.

<sup>141</sup> Cohen, J., Gorski, M., Gruber, S., Kurdziel, L., & Rimm, E. (2016). The effect of healthy dietary consumption on executive cognitive functioning in children and adolescents: A systematic review. *British Journal of Nutrition*, 116(6), 989-1000

<sup>142</sup> Rasmussen, M., Rikke Krølner, Knut-Inge Klepp, Leslie Lytle, Johannes Brug, Elling Bere, Pernille Due (2006). Determinants of fruit and vegetable consumption among children and adolescents: a review of the literature. Part I: Quantitative studies, *Int J Behav Nutr Phys Act*. 2006 Aug 11;3:22. doi: 10.1186/1479-5868-3-22.

<sup>143</sup> DeCosta, P. Per Møller, M Bom Frøst, A. Olsen (2017). Changing children's eating behaviour - A review of experimental research, *Appetite* 113, DOI: 10.1016/j.appet.2017.03.004

Providing food to ākongā may have longer-term benefits for those ākongā most in need. Food insecurity and hunger have been reliably linked to lower levels of concentration, cognitive functioning, attendance, engagement and school achievement<sup>144</sup> as well as impaired social skills development and reading development.<sup>145 146</sup> It may be reasonable to assume that providing food may achieve more equitable outcomes later in life for these most underserved ākongā.

<sup>144</sup> Alaimo et al. (2001). Food Insufficiency and American School-Aged Children's Cognitive, Academic, and Psychosocial Development. *PEDIATRICS*, 108(3), 824–824. <https://doi.org/10.1542/peds.108.3.824-a>; Ni Mhurchu et al. (2013). Effects of a free school breakfast pilot on children's attendance, academic achievement and short-term hunger: Results from a stepped-wedge, cluster randomised controlled trial. *Journal of Epidemiology and Community Health*, 67(3), 257–264. <https://doi.org/10.1136/jech-2012-201540>; Ball, J. and Watts, C. (2015). External Evaluation of Fruit in Schools Final Report. Report prepared for 5+ A Day Charitable Trust; Quigley and Watts 2005.

<sup>145</sup> Jyoti DF, Frongillo EA, Jones SJ. Food insecurity affects school children's academic performance, weight gain, and social skills. *J Nutr.* 2005;135:2831–9.

<sup>146</sup> Winicki J, Jemison K. Food insecurity and hunger in the kindergarten classroom: its effect on learning and growth. *Contemp Econ Policy*. 2003; 21:145–57.

