

National
SCIENCE
Challenges

HIGH-VALUE
NUTRITION

Ko Ngā Kai
Whai Painga



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Challenge Host



Challenge Collaborating Parties



He Rourou Whai Painga: The Team



Prof Jeremy Krebs



Prof Richard Gearry



Dr Andrea Braakhuis



A Prof Troy Merry



Dr Denise Conroy



A Prof Fiona Lithander



Dr Meika Foster



Arohaina Owen



Cheryl Davies



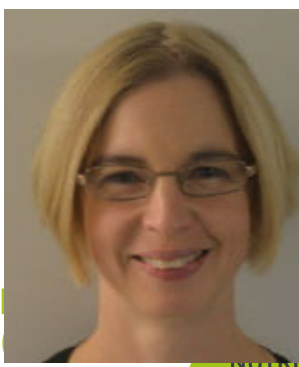
Dr Anna Rolleston



Prof Mark Weatherall



Dr Rajshri Roy

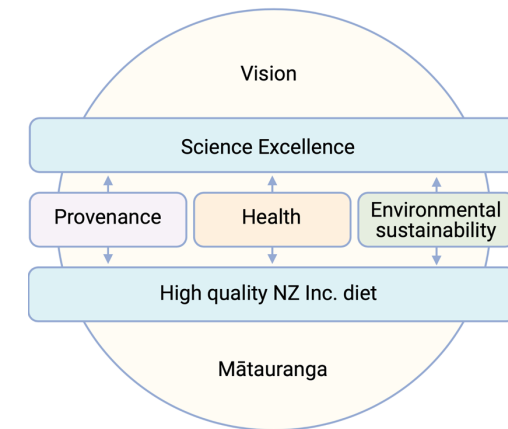


Dr Amber Parry-Strong



Cecilia Ross

“An ambitious, long-term, multi-centre, dietary intervention study that will explore whether consumption of a New Zealand whole diet that includes high quality New Zealand F&B products improves metabolic, cardiovascular, and wellbeing profiles in people at risk of cardiometabolic disease and their families”

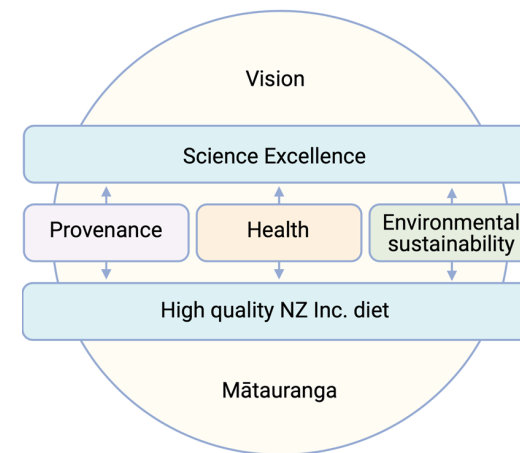


Naka te rourou, nāu te rourou, ka ora ai te iwi

With my contribution and yours, the people will thrive.

He Rourou Whai Painga: Early Discussions

- Key features of the study include the following:
 - Study population enriched for Māori
 - Whānau wellbeing approach
 - Provision in collaboration with industry, including Māori F&B entities, of New Zealand foods that are high in nutritional value and sustainably sourced
 - Multi-centre (Auckland, Wellington, Christchurch and one region (tbc) to promote capability building for Māori communities)
 - Long-term intervention and follow-up / maintenance phase
 - Consumer science integrated into the study



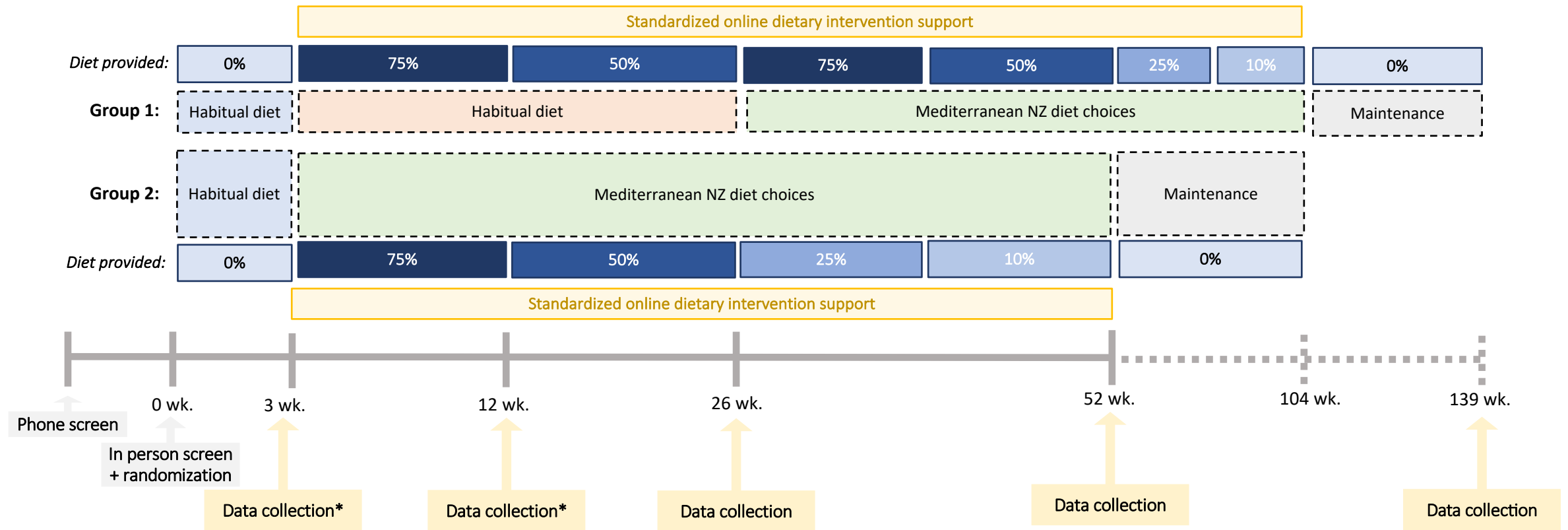
He Rourou Whai Painga: Early Discussions

- What dietary pattern?
- What study design?
- What primary outcome?
- Vision Matauranga
 - Participation, partnership and kaitiaki
 - Capability and capacity building
- What industry to include and how?
- What is the brand?



Characteristic components of a Mediterranean dietary pattern include a preponderance of plant-based foods (vegetables, legumes, fruits, unrefined cereals, nuts), extra virgin olive oil, a moderate intake of fish, low to moderate intake of dairy products, a low intake of meat and poultry, and a minimal intake of confectionary, cakes, biscuits, and ultra-processed items.

He Rourou Whai Painga: Early Study design



Eligibility/screening

- n=250-300 indexed individuals
- MetS-Z >X?, aged 35-65 y?
- Exclude pregnancy/lactating, certain chronic disease
- >1 person in house to take part?
- Include family/house (enrich children?)
- Enrich Maori/Pacific

Screening

- Phone questionnaire
- In person for MetS-Z (lipids, glucose), MAP, WC).

Diet + implementation

- NZ version of Mediterranean with lots of options to select from for whole whanau
- Either click and collect/deliver

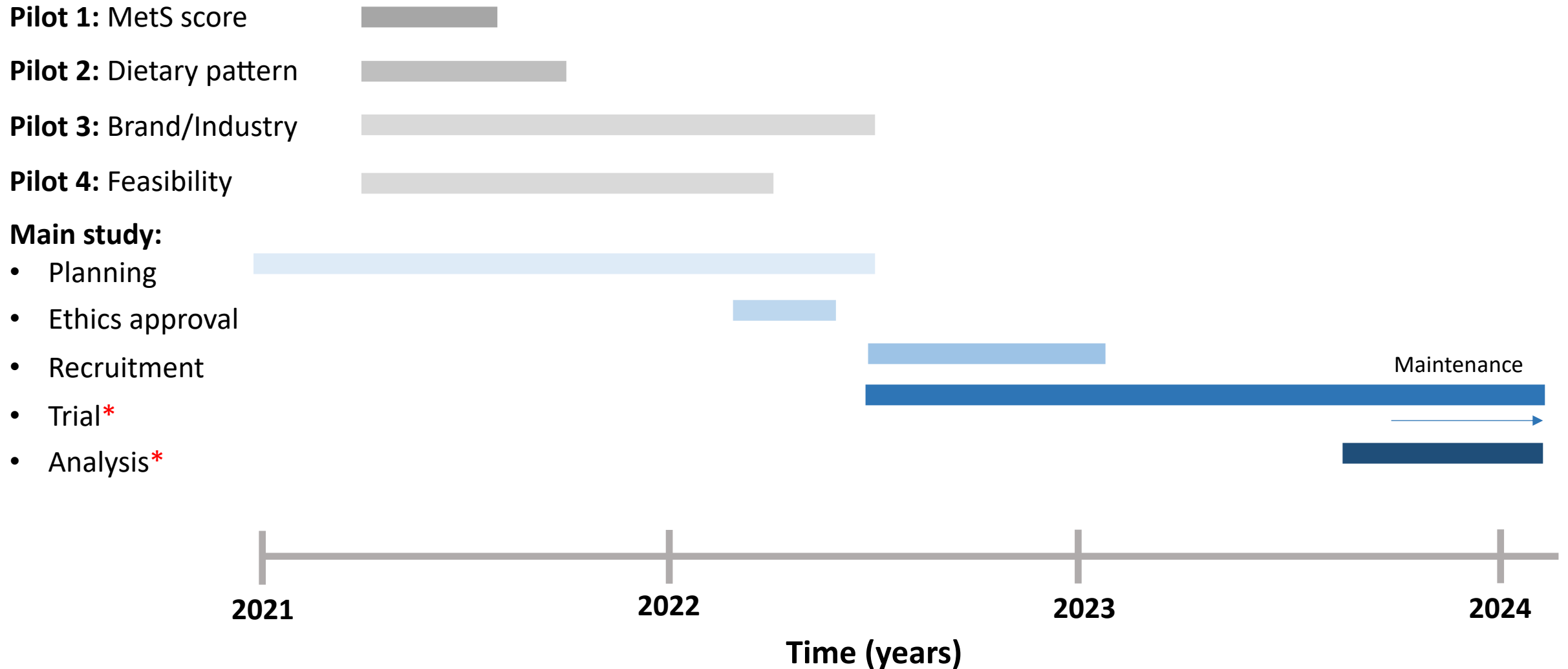
Support

- Text message?
- Online: Recipes, Dietary advice, Other support?, Monthly zoom with dietitian?

Data collection

- Dietary: FFQ + 2 x 24h food recalls
- Wellness, physical activity, eating behavior, sleep/mental health/GI questionnaires etc
- Blood pressure
- Fasted blood samples: Glucose, lipids, lots others (bank)
- Anthropometry (including DXA)
- Other? DNA, feces?
- *more detailed at these timepoints: GTT/MMTT, REE?
- Less data collected for non-indexed individuals?

He Rourou Whai Painga: The Journey



*6 and 12-month primary and secondary outcomes. Maintenance phase continues into 2024.

Pilot 1: Metabolic Syndrome Severity Score Validation



Dr Patricia Metcalfe A Prof Troy Merry

- **Workforce Diabetes Survey (WDS).**
Cross sectional survey, worksites in Auckland and Tokoroa 1988-1990. Participants aged 40-64 (n=5,806). Prevalence of diabetes.
- **Diabetes Heart and Health (DHAH) survey** was carried out between 2002 and 2003 (n=4,049 adults 35-74yrs). Random sample from the Auckland adult population. However, only 4,040 could be classified into a diabetes status group.

Table 1: Cohort demographics

	WDS cohort	DHAH cohort	Combined
Sex (m/f)	4203/1603	1919/2091	6122/3694
<i>Ethnicity</i>			
European	4573	1734	6307
Māori	443	1009	1452
Pacific	680	993	1673
Asian	110	274	384
Age (y)	48.3 ± 6.6	53.6 ± 11.6	50.5 ± 9.36
Weight (kg)	79.8 ± 14.7	84.0 ± 19.3	81.5 ± 16.81
Height (cm)	171.2 ± 8.3	167.9 ± 9.1	169.9 ± 8.80
BMI (kg/m ²)	27.2 ± 4.6	29.7 ± 6.2	28.2 ± 5.46
Waist circumference (cm)	90.7 ± 12.5	96.6 ± 14.3	93.1 ± 13.57
SBP (mmHg)	123.5 ± 14.0	125.8 ± 21.7	124.4 ± 17.60
DBP (mmHg)	76.5 ± 10.1	77.3 ± 11.3	76.8 ± 10.59
Fasting glucose (mmol/l)	5.5 ± 1.35	5.6 ± 1.73	5.5 ± 1.52
HDL (mmol/l)	1.26 ± 0.32	1.40 ± 0.38	1.32 ± 0.35
Triglycerides (mmol/l)	1.59 ± 1.01	1.52 ± 0.99	1.56 ± 1.00
MetSSS-WC	0.073 ± 0.85	0.130 ± 0.999	0.096 ± 0.911
MetSSS-BMI	0.148 ± 0.819	0.185 ± 1.000	0.163 ± 0.898

Data are expressed as n or mean ± SD. BMI, body mass index; SBP, systolic blood pressure; DBP, diastolic blood pressure; HDL, high density lipoprotein cholesterol; MetSSS, metabolic syndrome severity score; WC, waist circumference.

Met-S severity score by Ethnicity

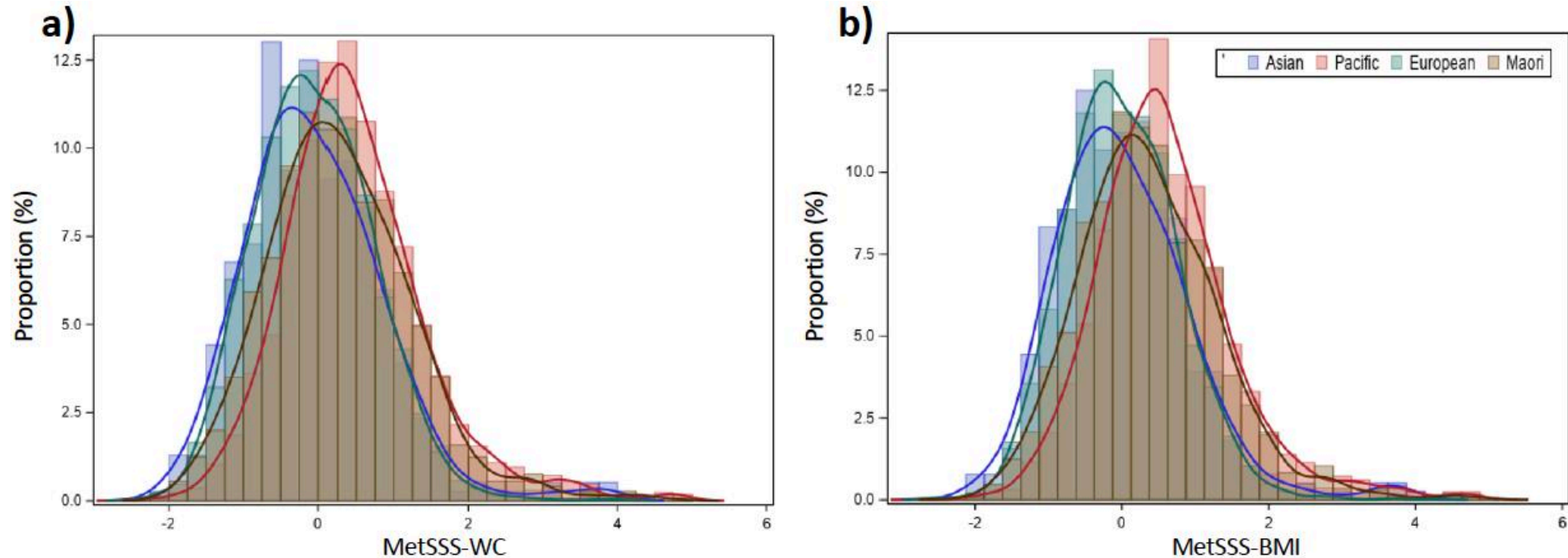


Figure 1. Distribution of waist circumference (WC) a) and body mass index (BMI) b) metabolic syndrome severity score (MetSS) by ethnicity.

Met-S severity score by Glycaemic and Cardiovascular status

Table 2. MetSSS by glucose regulatory status and CVD history

	Glucose regulatory group				CVD history	
	Normal	IGT	IFG	T2D	No	Yes
<i>WDS cohort</i>						
n	3697	64	265	158	969	3215
MetSSS-WC	-0.09 ± 0.01	0.48 ± 0.09*,#	0.55 ± 0.04*,#	1.37 ± 0.06*	-0.07 ± 0.02	0.32 ± 0.02*
MetSSS-BMI	-0.01 ± 0.01	0.54 ± 0.09*,#	0.63 ± 0.04*	1.41 ± 0.06*	0.00 ± 0.01	0.40 ± 0.02*
<i>DHAH cohort</i>						
n	2929	354	128	619	3010	1020
MetSSS-WC	-0.17 ± 0.02	0.45 ± 0.04*,#	0.55 ± 0.07*,#	1.29 ± 03*	-0.02 ± 0.02	0.58 ± 0.02*
MetSSS-BMI	-0.12 ± 0.02	0.50 ± 0.05*,#	0.63 ± 0.08*,#	1.35 ± 03*	0.03 ± 0.02	0.63 ± 0.03*

Data are expressed as mean ± SE adjusted for age and sex. *p<0.0001 vs Normal or No; #p<0.001 vs T2D. MetSSS, metabolic syndrome severity score; CVD, cardiovascular disease; IGT, impaired glucose tolerance; IFG, impaired fasting glucose; T2D, type 2 diabetes; BMI, body mass index; WC, waist circumference.

Pilot 2: Dietary Patterns in New Zealanders at risk of diabetes



Dr Amy Lovell

Dr Rajshri Roy

Aims:

- Compare the habitual dietary patterns of those that are low, intermediate and high diabetes risk as defined by AUSDRISK.
- Investigate the preferences of food and beverage products that are consistent with a Mediterranean diet
- Determine to what extent people of low, intermediate and high diabetes risk, as defined AUSDRISK, are currently adhering to a Mediterranean-style diet (and thus answer the question, would a Mediterranean-style diet intervention significantly alter diet pattern?).
- Survey online adults 18-70yr (n=936 responses)
- Food Frequency Questionnaire
- Self reported data for AUSDRISK
- Mediterranean-style diet score

Pilot 4: Feasibility Study

Aims:

- Is it feasible to create a NZ food bag and distribute this to individuals and their whānau?
- What are the recruitment rates?
- What is the acceptability and uptake of whānau members to be included in the study?
- What is the mean and SD of each of the variables to be included in the primary outcome composite measure?

Methods:

- 12-week longitudinal single arm study (n=30)
- Inclusion and Exclusion criteria as for proposed main study
- Recruitment using screening with AUSDRISK score
- Participation at Kokiri Marae (n=10)
- Utilise existing recipes and infrastructure of My Food Bag
- Integrated consumer insights study

Pilot 4: Feasibility Study

Conclusions:

- It is feasible to create a NZ food bag and distribute this to individuals and their whānau for use in the main study.
- Approx 50% of those who express interest and pre-screen with AUSDRISK ≥ 12 are enrolled in trial.
- Generally acceptable for whānau to participate
- Covid causes problems!
- Confirmed power calcs for primary outcome for main study n=200 to detect clinically relevant difference in Met-S z score.
- Using MFB works, but too much food and participants need more support.

Research progress

Completed

Preliminary Work (pilot studies)

- Validated metabolic score
- Dietary patterns
- Brand development
- Feasibility study including consumer insights

He Rorou Whai Painga study design

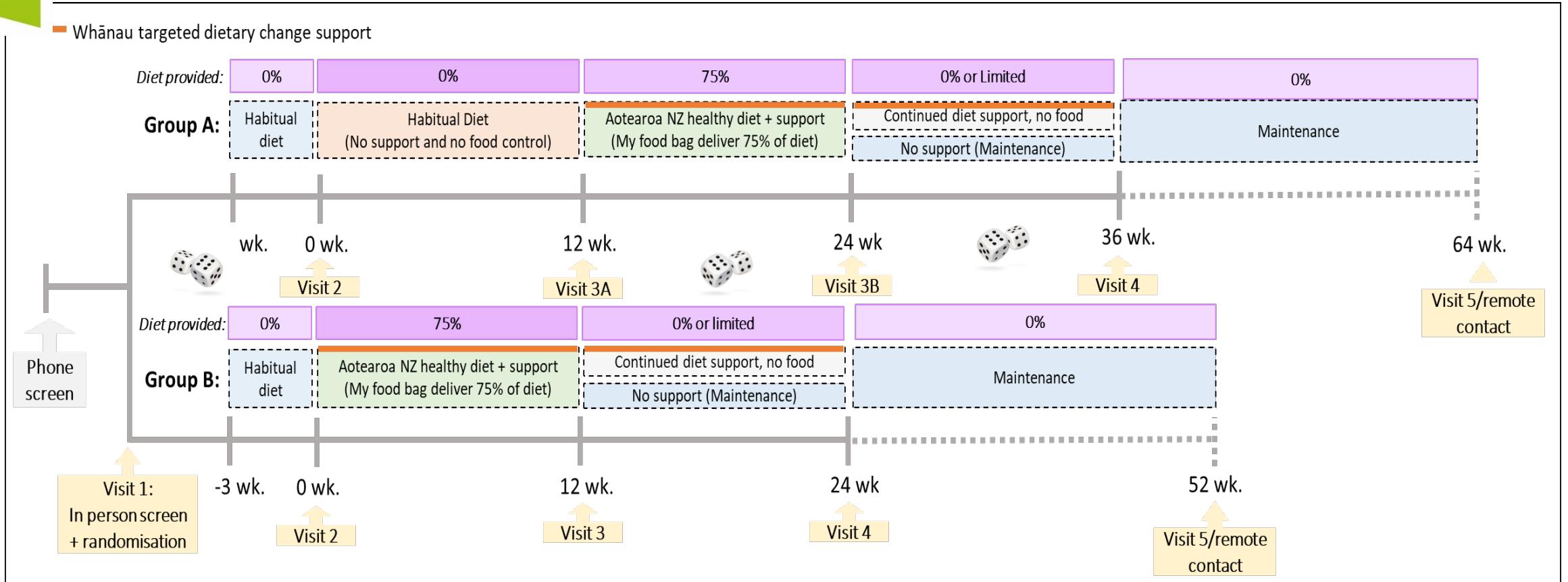


Figure 1. Study design overview

Outcome measures

- **Primary outcome**

- Metabolic Syndrome Z score at 12 weeks of RCT

- **Secondary outcomes**

- MetS z score over 12 months of longitudinal study
- Effect of dietary change support on long-term adherence with dietary pattern (Secondary randomisation)
- Body comp (DXA)
- Dietary intake, metabolic health in whole whānau
- Long term dietary change and associated health outcomes
- Wellbeing (SF36 and Kaupapa wellbeing)

- **Qualitative**

- what participants believe a nutritious diet to be
- how they engage with the diet intervention
- how likely they are to adopt the diet long-term post-intervention

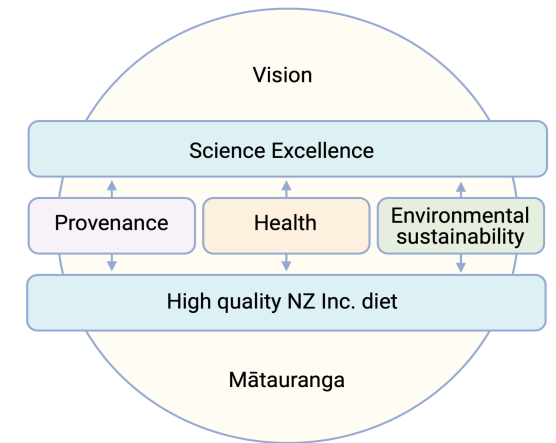
- **Secondary outcomes opportunities**

- Metabolic
- Inflammation
- Gut health markers (faecal samples)

What makes HRWP unique?



- New Zealand context using predominantly NZ sourced foods & beverages
 - Inclusion of industry partners and branding: Creating effective narrative and collateral for industry to support the translation of this research into market
- Underpinned by Vision Mātauranga
 - Study population enriched for Māori
 - Capability and Capacity building for Māori researchers
 - Kaupapa Māori wellbeing assessment
 - Māori F&B partners and narrative aligned with Te Ao Māori principles
- Whānau-based intervention and whānau included in measurements
- Mixed methodology - Consumer Science integrated into the study
- Combined design of RCT and longitudinal cohort
- Use of Metabolic Syndrome Z-score as primary outcome measure



Research progress

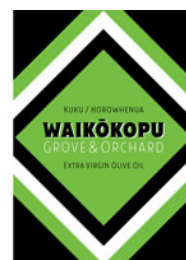
Completed

Preliminary Work (pilot studies)

- Validated metabolic score
- Dietary patterns
- Brand development
- Feasibility study including consumer insights

Industry Partner Engagement

- Food basket
- Logistics
- Consumer insights



Food; each box contains food from industry partners

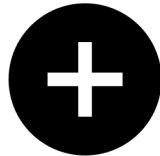
One-off delivery by Supie: Starter Box

Delivered weekly by My Food Bag

Delivered weekly by Supie



Pantry items



Evening meals and fruit



Breakfast, lunch, snacks

Research progress

Completed			
Preliminary Work (pilot studies)	Industry Partner Engagement	Ethics Approval & Trial Registration	Assembly and Training of Researchers
<ul style="list-style-type: none"> Validated metabolic score Dietary patterns Brand development Feasibility study including consumer insights 	<ul style="list-style-type: none"> Food basket Logistics Consumer insights 	<ul style="list-style-type: none"> Protocol Participant information sheets Questionnaires International clinical trials registers 	<ul style="list-style-type: none"> PhD students Research Assistants At 4 research sites

He Rourou Whai Painga: Up and Running

- Over 1000 expressions of interest generated from Media launch
- Over 300 index participants eligible for screening after AUSDRISK
- All four sites are operational
- Approx 20 index and whānau enrolled and randomised
- Food deliveries rolling out



He Rourou Whai Painga: The Team



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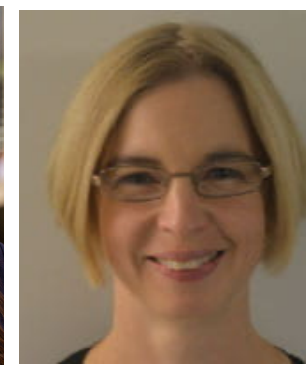
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