

Mobile health and health behavior change: cultural adaptation and clinical application in low resource settings.

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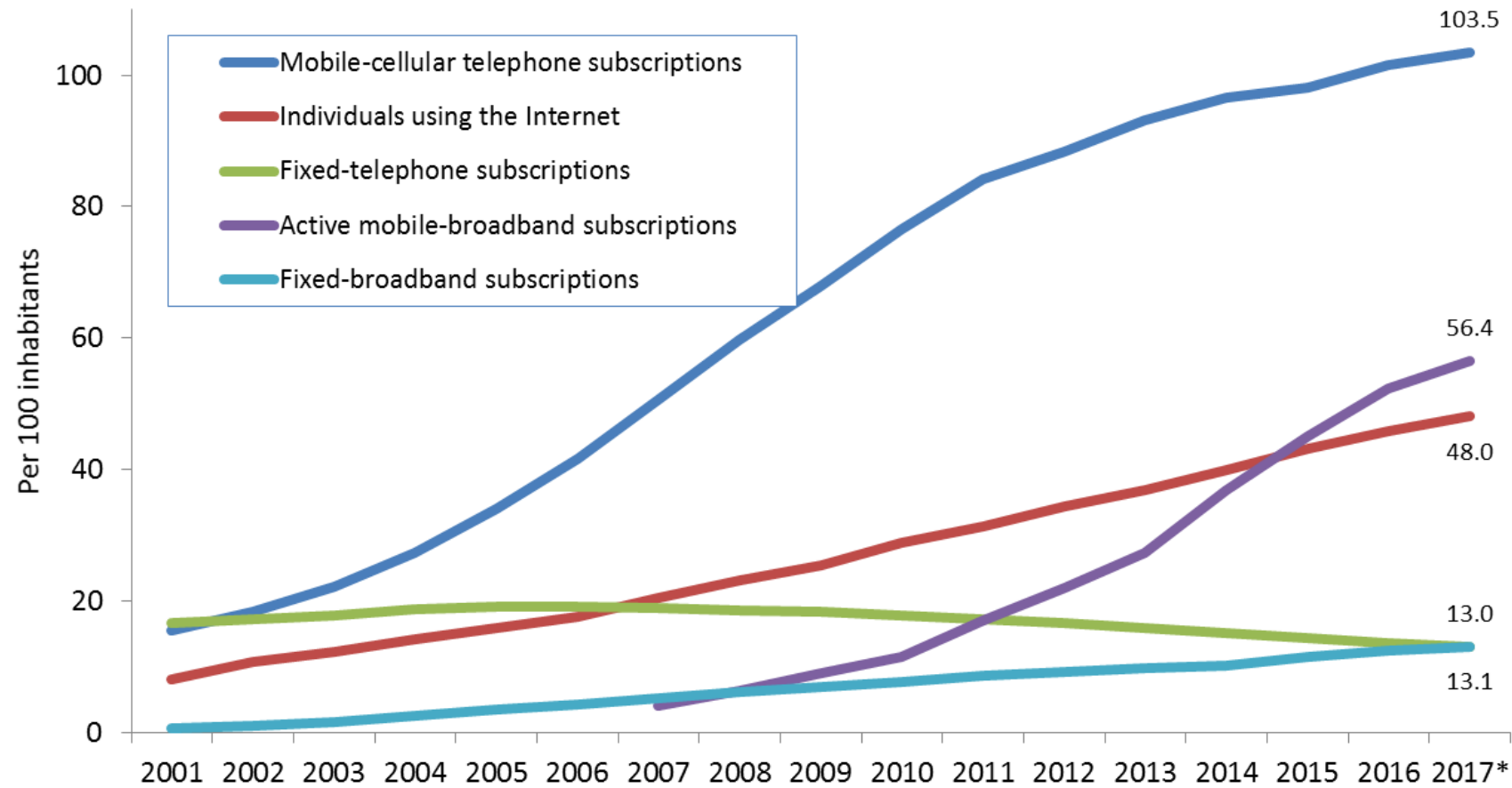


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mHealth in low resource settings

- mHealth has proven itself in many fields as being a viable alternative method of delivery
- Very little is written about the large scale implementation of mHealth
 - Particularly in low resource settings or targeting those who need it most
 - Even though mobile phones are our most ubiquitous communications delivery method in those settings
- Need to share lessons to avoid repeating issues each time
- Need for a consistent way to measure impact in the real world for decision makers, for comparison, and for improvement

Global ICT developments, 2001-2017*



Note: * Estimate

Source: ITU World Telecommunication /ICT Indicators database



mCessation

2018 Review of mCessation BHBM

- Costa Rica
 - MoH – shifting priorities affected promotion
 - Local provider for technology, technology issues early, only works with one telco provider
 - Innovative financing model using tobacco taxes
 - Want it more personalised & WhatsApp
- The Philippines
 - MoH, integrated with national quitline
 - Change of staff in MoH and local WHO
 - Technology issues led to low registrations
- Tunisia
 - World Diabetes Foundation & MoH
 - Technology capacity building to support programme an issue

Early lessons

- Promotion vitally important
- Ease of use, particularly registration, and free
- Technology critical
- Broad & high level support



TextMATCH

(Text Messaging for MATernal and Child Health)

A FREE text messaging programme to support pregnant women and their families with information about eating well and being active.



HBHF Consortium:

Waitemata & Auckland DHBs Maori & Pacific Health Teams,
Chinese New Settlers Services Trust, The Asian Network,
The FONO, Pacific Health Alliance, HealthWest, Toi Tangata

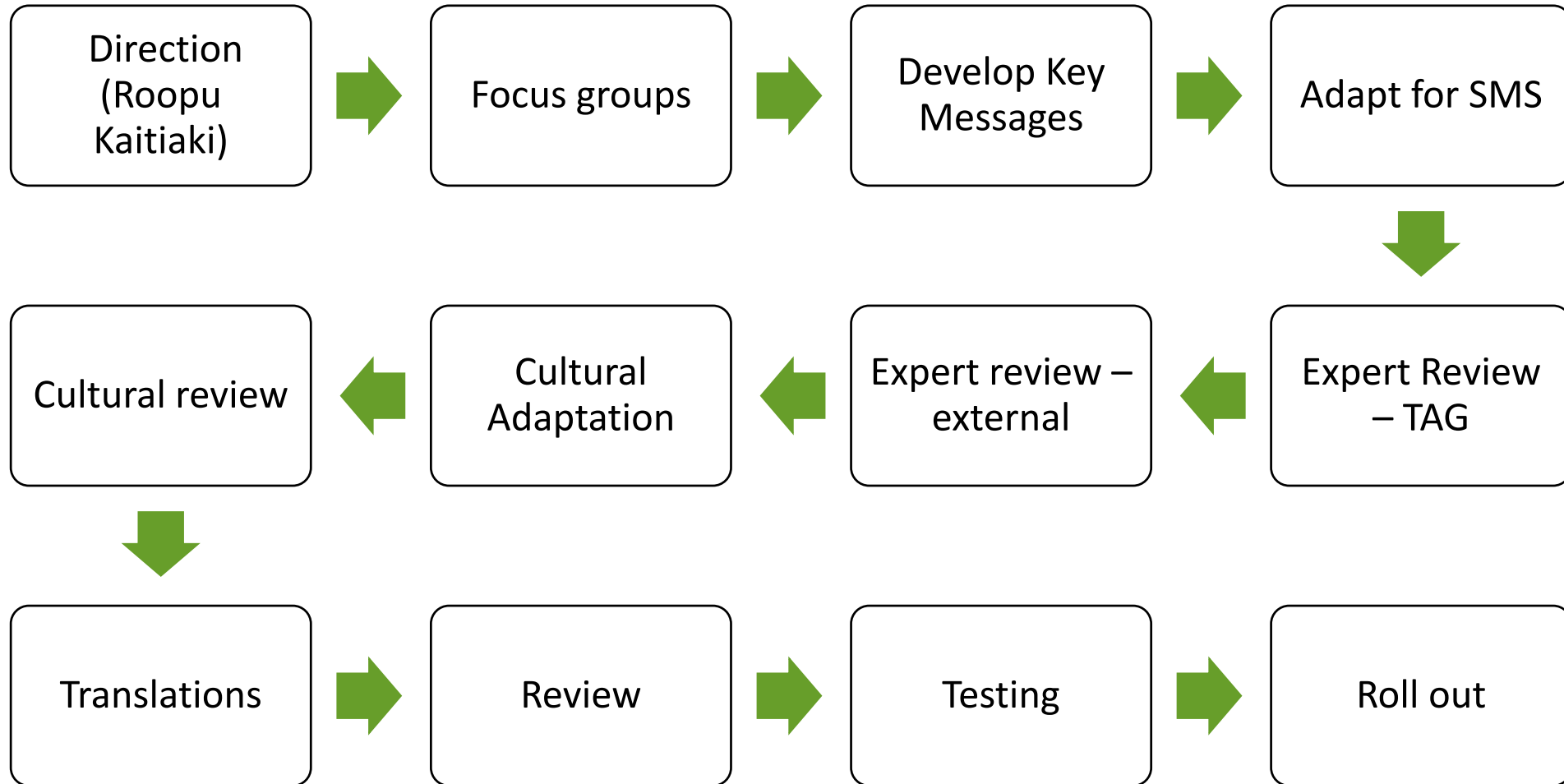


TextMATCH

Context

- 11% of children (aged 2–14 years) were obese
 - A further 21% were children were overweight but not obese
 - 15% of Māori children were obese
 - 30% of Pacific children were obese
- Children living in the most deprived areas are 3 times as likely to be obese those living in the least deprived areas
- The child obesity rate is increasing
 - 8% in 2006/07 to 11% in 2014/15

Development process



Focus groups

- Views of pregnancy and nutrition during pregnancy heavily influenced by culture and tradition
- Translations needed for Chinese and Korean
- Pacific and South Asian wanted messages in English
- Asian group use WeChat rather than SMS
- Keen for NZ-based information



Cultural adaptation

- Core messages adapted into four cultural versions
 - Words, tone, foods, activities, pregnancy practices
- Reviewed to ensure cultural appropriateness and relevance
 - Maori, Pacific, Asian, South Asian
- Translations
 - Chinese, Korean, Japanese, Te Reo
 - Key words/terms in other languages

Iron is important to prevent you becoming too tired during pregnancy. Lean red meat, chicken, eggs, bajra flour, cowpea, masoor dal & moth beans contain iron

Kia ora [firstname]. Kua rēhita koe ki TextMATCH. Ka tuku i te 3 karere iti iho rānei ki a koe ia wiki mō te kai pai me te kori tinana i te wā e hapū ana



TextMATCH

Intervention type:

Support

Information

Tailoring variables:

Culture

Ethnicity

Language

Gestational age/
child's age

Relationship to baby

Personalisation variables:

Name

Baby's name

Baby's gender

Kia ora [name]. Kua rēhita koe ki TextMATCH. Ka tuku i te 3 karere iti iho rānei ki a koe ia wiki mō te kai pai me te kori tinana i te wā e hapū ana

Hi. Throwing, catching & kicking balls are fun activities for the whole family & also help [babynome] to develop balance & physical coordination

안녕하세요. 아이들은 스스로 먹을 것을 준비할 때 새로운 음식을 시도하는데 관심을 갖습니다.
[babynome]가 크래커나 샌드위치를 만드는 것을 도와주도록 해주세요.

Talofa [name]. Keeping active towards the end of pregnancy can be tough but the health benefits make it worth it. Try swimming or a very gentle walk

Give your baby the best start in life by not drinking alcohol or using drugs. Talk to your LMC or call the Alcohol & Drug helpline (0800787797) for support

Kia ora. If you are feeling emotional & struggling to cope support is available. Talk to a nurse/doctor or call the Postnatal Distress Support Network 098366967

Hi [name]. Congratulations on the birth of [babynome]. We hope you are enjoying this special & exciting time. Thanks for having TextMATCH on board

您的宝宝现在7周大，手臂和腿都正在生长。如果您想了解亚裔女士在妊娠期间可以得到的帮助，请致电华人社区服务中心 09 5701188

By feeding [babynome] healthy foods & encouraging [him/her] to be active you will help [him/her] to create good habits & set [him/her] up for a healthy future

Malo e lelei .Taking time to care for yourself is important. Ask a trusted friend or family member to come & care for [babynome] while you take a break

PROGRAMME ALLOCATION

CULTURE

Maori

Pacific

Asian

South Asian

LANGUAGE

Te Reo

English

English

Chinese

Korean

Japanese

English

English

RELATIONSHIP

Mother

Other family

Mother

Other family

Mother

Other family

Mother

Other family

Mother

Other family

Mother

Other family

Mother

Other family

Mother

Other family

1

2

3

4

5

6

7

8

9

10

11

12

13

14

15

16

ETHNICITY

(messages include greetings and key words according to ethnicity)

Tongan

Niuean

Cook Island Maori

Tokelauan

Samoaan

Fijian

Tuvaluan

Other Pacific Islander

Indian

Sri Lankan

Pakistani

South African Indian

Bangladeshi

Fijian Indian

Nepalese

Other South Asian

Implementation

Today, over 4,500 people have been through TextMATCH

"They are great. I feel as if someone is constantly there to help me through parenting. Although virtual, I am extremely satisfied with the help you provide. Most of your messages are coincidental and valuable piece of information."

"Kia ora. I enjoy receiving the messages. Even though I am confident that I am doing the right things with my Pepe the messages are reassuring. The service is very much appreciated"

"I absolutely appreciate the messages. They motivate me to make the right choices.. I especially like the fact that they are specific to my culture. Thank you."

"Awesome texts, great reminder even after 7 babies it's nice to be reminded, encouraging, supportive. Love the texts keep them up please."



Evaluation

	YES (%)
Found messages to be relevant & culturally appropriate	100%
Specific food practices & activities in the messages were appropriate	93%
Improvements to eating habits	62%
Improvements to family's eating habits	55%
Positive changes to food shopping	66%
Positive impact on exercising	52%
Improvements to knowledge or understanding	72%
Feeling more supported	100%
Would recommend TextMATCH to others	100%



there's a lot of time in isolation when it's just you and bubba, it's quite nice to receive that message

[when it's] a stressful time and then you get the message and realize you're not doing too bad

it's quite empowering actually just to get that little bit more information... you think you know everything after seven children so it's actually quite cool

Hi, your txts r really helpful. They give me helpful ideas for my son's development. Thanks a lot

He rawe ēnei pātuhi hei awhina i ta māua pēpi. Tēnā koe.

Its great to listen from you the most useful tips...in fact it supports me n my kids in best way. I would say 100 out of 100 for you. Thanks for your support and care

非常好！很有用，能学到很多知识，希望能接收更多的信息，感谢！

종종 주시는 문자 받고 지키지 못했던 것들 상기시켜 주셔서 좋아요! 유용하게 이용하고 있습니다

Thank you team... we find the messages extremely helpful and I share it with my husband. It is a great way to remind us of how we can do our best to bring up baby into healthy lifestyle. Thank you once again



I really appreciate the reminders and especially like that they are personalised with our names

SMS4BG:

Text message-based diabetes self-management support

Need

Growing burden of diabetes +
Health disparities in prevalence and outcomes



Need for innovative solutions to support patients to increase motivation for good diabetes control in their day to day lives.

People that
current
services not
reaching

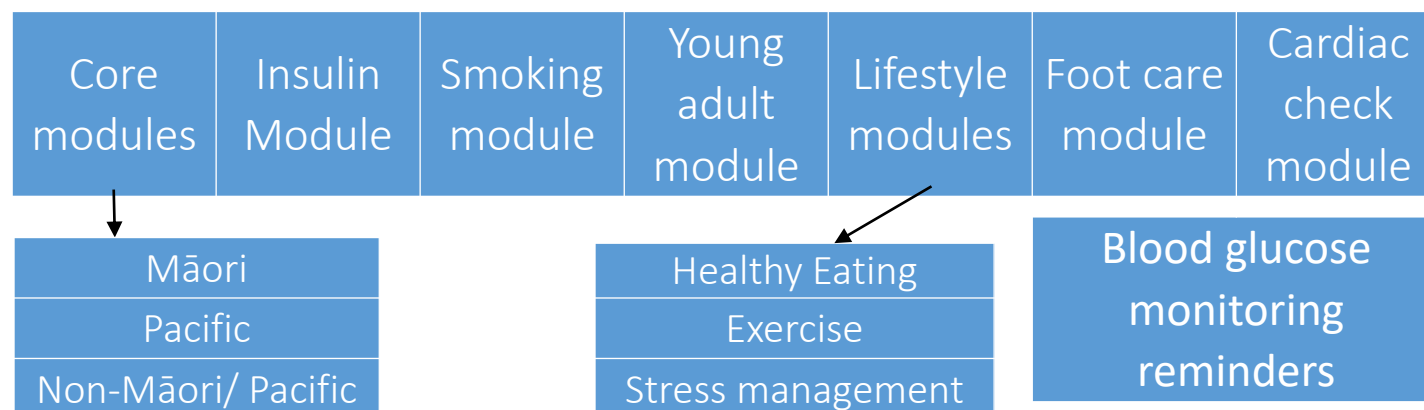
People
who
live
rurally

People from
indigenous and
ethnic minority
groups

Those who
have limited
technology
access

Designed to support patients in their everyday lives to increase motivation for good blood glucose control

Modules



Personally tailored

Text message based

Feedback via website



SMS4BG: Hi [name].
Your diabetes can be controlled, reducing the impact on your health & your life!
Do it for your [motivation1] & [motivation2]

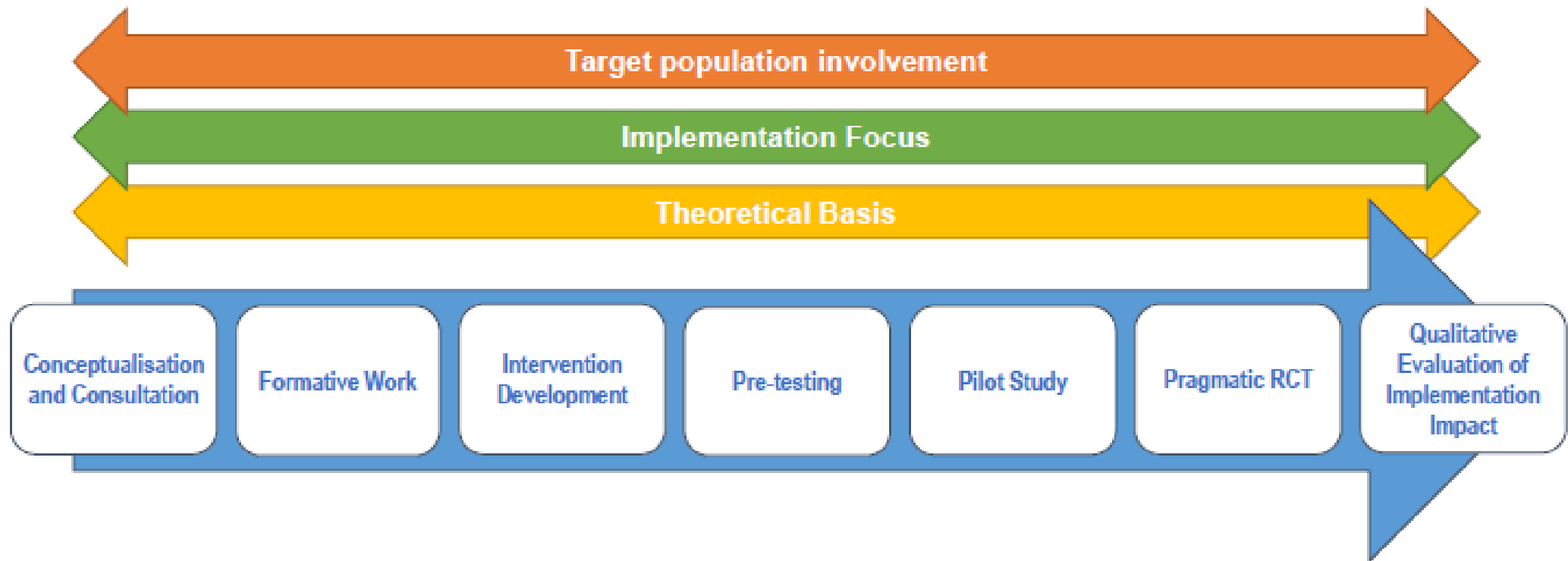
SMS4BG: Good foot care as well as managing your blood glucose, eating healthy & keeping active will help to prevent problems with your feet in the future

SMS4BG: Kia ora.
Control of your glucose levels involves eating the right kai, exercising & taking your medication. Your whanau, doctor & nurse can help you

SMS4BG: Hi [name].
Good management of your diabetes & your future health includes not smoking. Call Quitline on 0800 778 778 for support

SMS4BG: Self-care is key to feeling good & managing stress.
Good self-care involves eating well, regular exercise, good sleep & relaxation time

SMS4BG



Adapted from Whittaker, 2012

Evaluation

An RCT of SMS4BG vs usual care found it to:

- Be effective at improving glycemic control
- Be highly acceptable
- Improve feelings of diabetes related support
- Be cost-effective

A great way of getting to people with diabetes, text is personal and comes to you, it gives you a better a chance to do well having someone there for you, you weren't on your own with it
(Male, 40-60yrs, non-Maori/Pacific, Urban , Type 2)

RESEARCH

 **OPEN ACCESS**

Effectiveness of text message based, diabetes self management support programme (SMS4BG): two arm, parallel randomised controlled trial

Rosie Dobson,¹ Robyn Whittaker,^{1,2} Yannan Jiang,¹ Ralph Maddison,³ Matthew Shepherd,⁴ Catherine McNamara,⁵ Richard Cutfield,⁵ Manish Khanolkar,⁶ Rinki Murphy^{6,7}

ABSTRACT
OBJECTIVE
To determine the effectiveness of a theoretically based and individually tailored, text message based, diabetes self management support intervention (SMS4BG) in adults with poorly controlled diabetes.
DESIGN
Nine month, two arm, parallel randomised controlled trial.
SETTING

beliefs about diabetes, health related quality of life, perceived support for diabetes management, a intervention engagement and satisfaction at nine months. Regression models adjusted for baseline outcome, health district category, diabetes type, ethnicity.
RESULTS
The reduction in HbA1c at nine months was significantly greater in the intervention group (mean -8.85 mmol/mol (standard deviation 14.84)) than

Loved it. It really made you know where your levels are at. I became very lazy after having diabetes for 10 years and I wouldn't test, I just didn't pay attention to myself, the messages made me more aware of what you should be doing and whether you're doing it or not.
(Female, 60+, non-Maori/Pacific, Rural, Type 2)

[I liked the] empowerment I have felt by the constant text messages...my HbA1c is the lowest it's been in 12 years, I'm more active, can spend more time with my kids, and I will live a longer life because of it.
(Male, 40-60yrs, Maori/Pacific, Urban, Type 2)

Dobson, R. et al. BMJ, 2018

Users wanted to see SMS4BG made available

When is it going be available to everyone?
Even if it only helps some people I fell it is
still a worthwhile service.

(Female, 40-60yrs, Maori/Pacific, Urban, Type 2)

“I think you guys are doing an awesome
job, hopefully the programme can get
out there to other people like my
brothers and sisters”

(Female, 40-60yrs, Maori/Pacific, Rural, Type 2)

“Just make the programme more readily
available to anyone with diabetes. As I said it
helped me feel less alone and isolated.”

(Female, 40-60yrs, non-Maori/Pacific, Urban, Type 1)

“I would love it to continue”

(Male, 25-40yrs, non-Maori/Pacific, Urban, Type 2)

Implementation

- SMS4BG:
 - Was developed in consultation with clinicians, patients, Māori advisory group, decision makers and researchers
 - Is evidence based
 - Is effective at improving clinical outcomes
 - Is cost-effective
 - Is highly acceptable to end users
- But this doesn't mean it will get implemented



Lessons learnt

- **Funding** for effectiveness and implementation need to be considered together right from the start
- Fundamental to successful implementation are (clinical) **champions**
- **Evidence** of effectiveness as well as user experience **feedback** are needed to inform the decision to implement a programme.
- Starting small with implementation and building **momentum** can be more successful and quicker

TXTTaofiTapaa

Example from Samoa

Judith McCool,¹ Robyn Whittaker,² Helen Tanielu,³ Elaine Umali¹

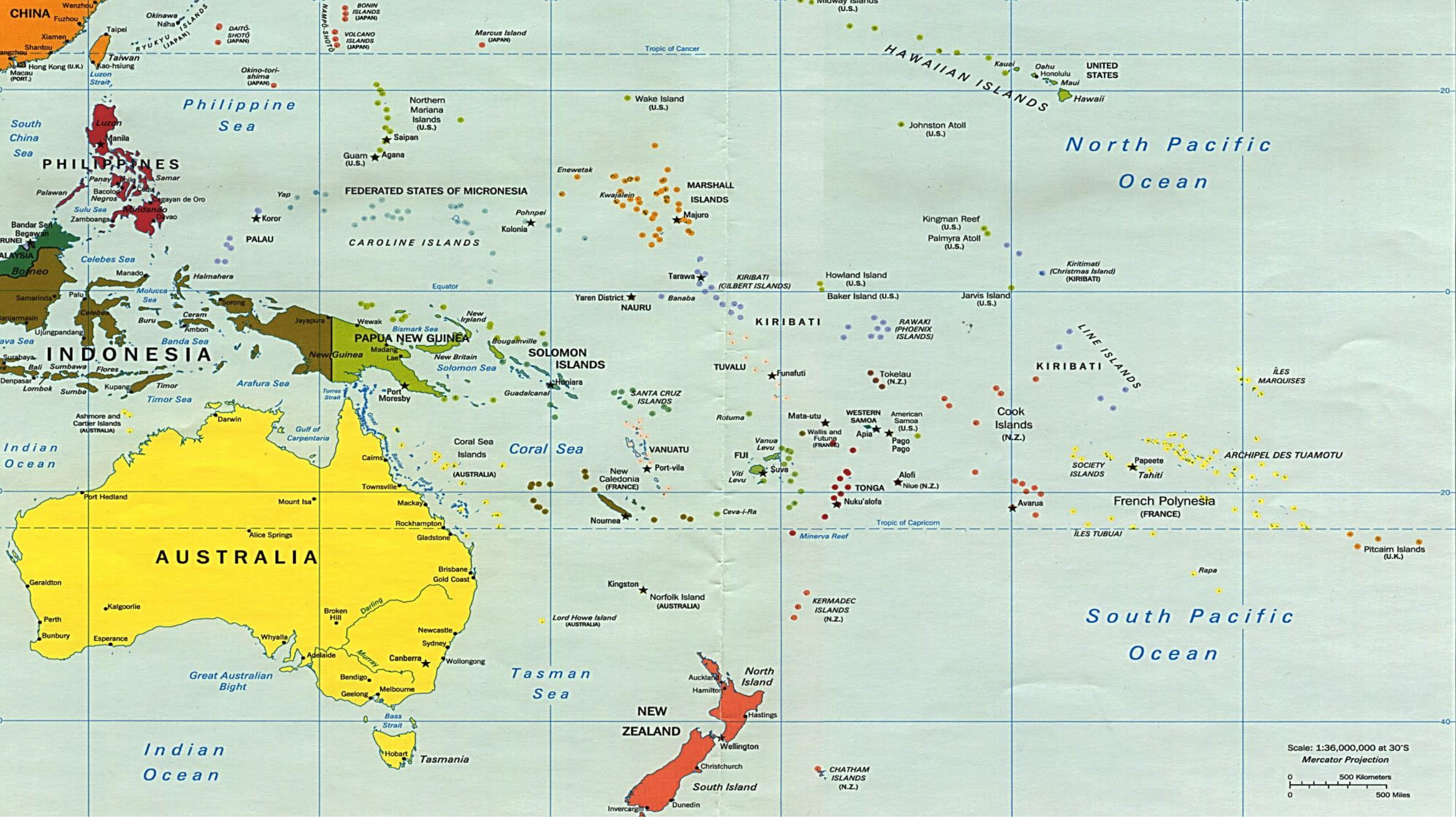
¹Epidemiology and Biostatistics, School of Population Health, University of Auckland, New Zealand

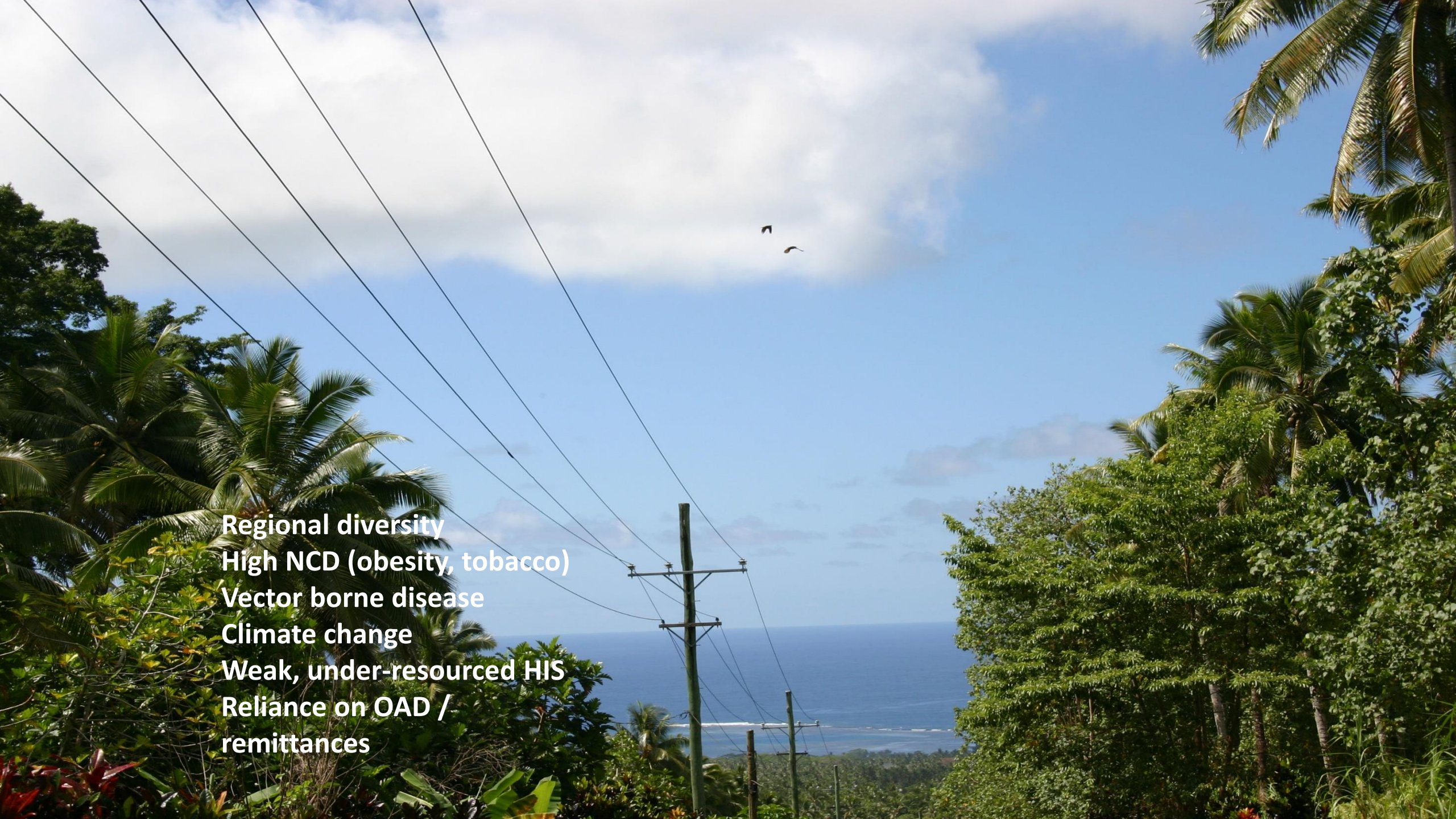
²National Institute for Health Innovation, University of Auckland, New Zealand

³National University of Samoa, Apia, Samoa.



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A tropical landscape featuring lush greenery, including palm trees and dense foliage, framing a view of the ocean under a blue sky with scattered white clouds. Several power lines run diagonally across the upper portion of the image. Two birds are visible in flight in the sky.

Regional diversity
High NCD (obesity, tobacco)
Vector borne disease
Climate change
Weak, under-resourced HIS
Reliance on OAD /
remittances

Pacific digital ecosystem

Connectivity gaps decreased / increase
smart phone and internet usage

Subscriber penetration range 16% (Marshall
Is to 80% New Caledonia)

Mobile ecosystem growing with regional
investment (but lower than other LMIC reg)

Global mobile data surveillance glosses
socio-demographic and geographic
variations



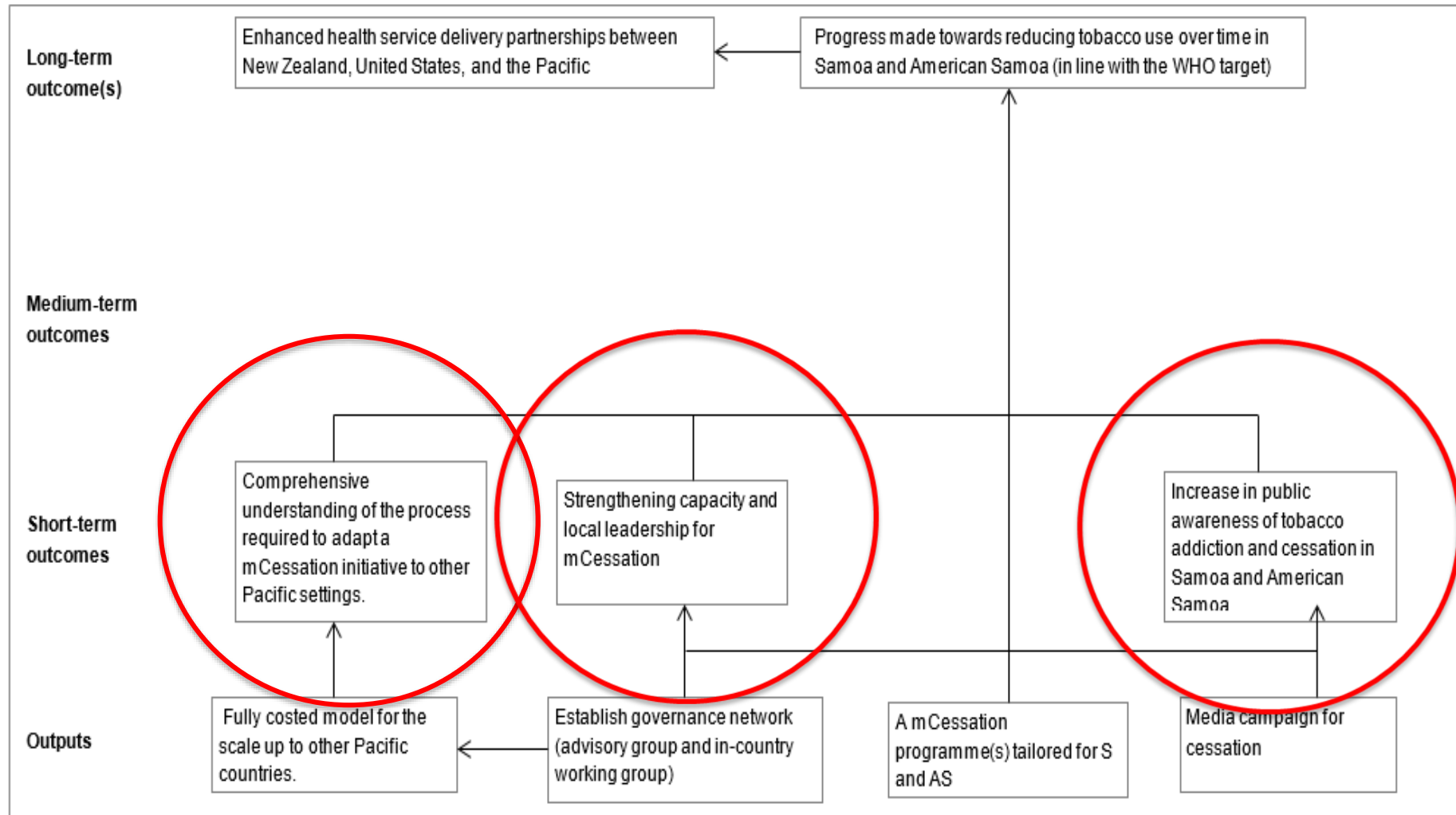
TXTTaofiTapaa (TXT Stop Smoke)

- A **NZ /US** initiative to find a technology based initiative to reduce NCD risk factors in Pacific*
- Adapt and pilot test an mCessation tool to **support tobacco control** goals in Samoa
 - Increase quit attempts
 - Reduce tobacco use
- Understand the **process** (and outcome) to adapt a successful mHealth programme (STOMP, TXT2Quit) to different settings*



Results Diagram

Goal of the Activity: Reduce tobacco use in Samoa and American Samoa



Project overview



Initial engagement and ethical approval

This phase included consultation with local stakeholders, establishing a Pacific Advisory Group, and gaining both local Pacific and New Zealand ethics approval.



Exploratory study and intervention pilot

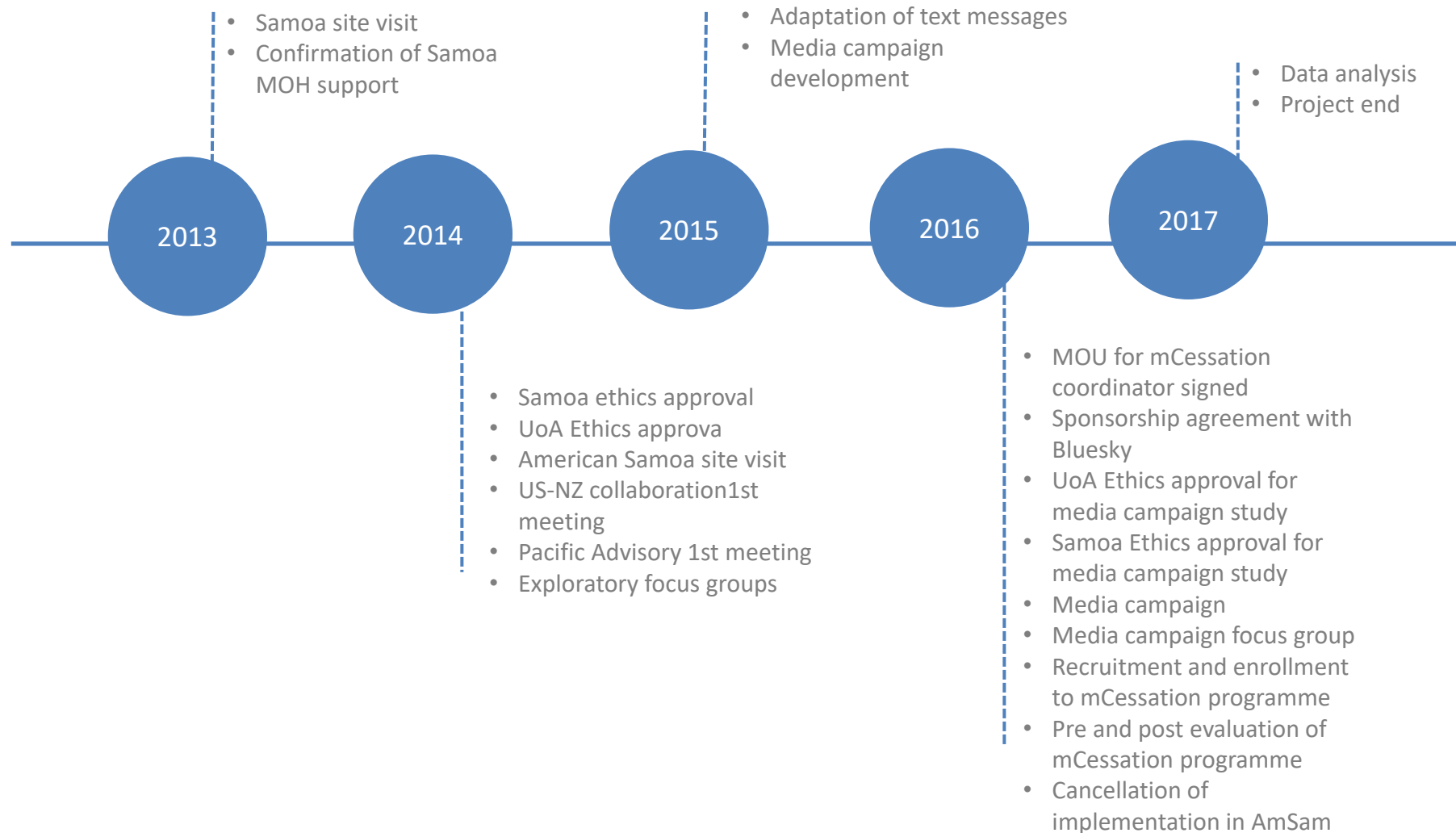
This phase included an exploratory study consisting of local focus groups, and testing of draft text messages, technical set-up of the mCessation intervention, media campaign development and implementation, and an 8-week pilot of the mCessation intervention.



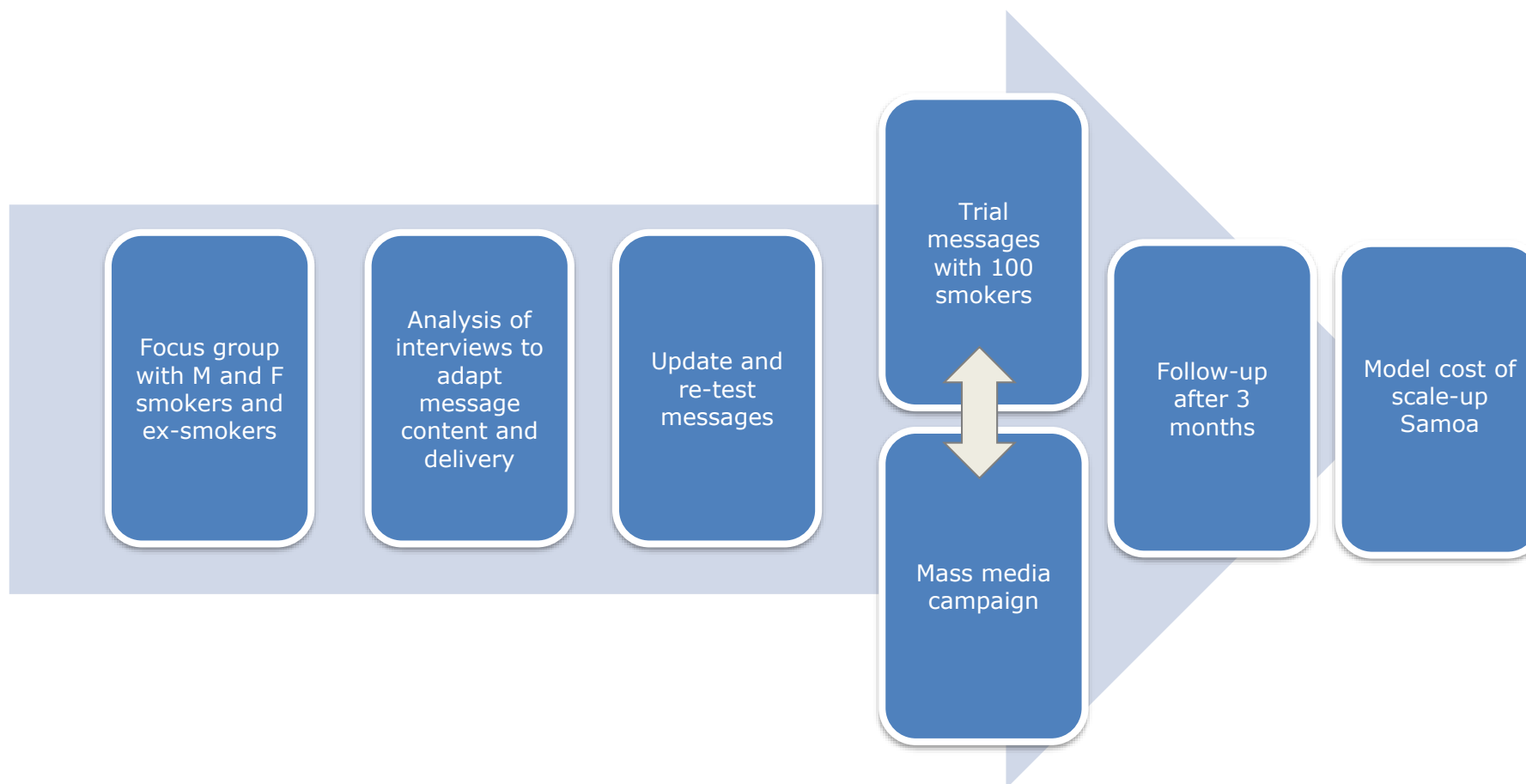
Analysis and development of mCessation intervention

This included stakeholder interviews, a cost-effectiveness evaluation, protocol development and modelling for potential scale-up.

Project timeline



The process

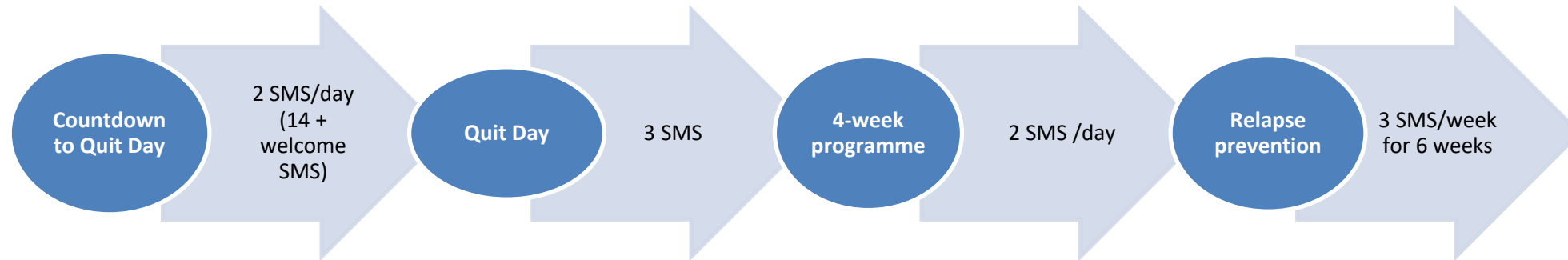


Exploratory focus group (mobile phone use)

Characteristic	% of sample
<i>Sharing a mobile phone</i>	
Yes	39%
No	61%
<i>Using a smartphone</i>	
Yes	53%
No	31%
<i>Use of SMS</i>	
Everyday	58%
Most days	11%
Few times a week	17%
Few times a month or less	3%

mCessation Programme

TXTTaofiTapaa text messages



Cultural translation and adaptation

- Assessing the appropriateness of text messages in terms of:
 - current tobacco policies in Samoa (i.e., smoke-free environment)
 - local activities and traditions (e.g., replacing ‘savings to be used for shopping’ to ‘savings to be used for family’)
 - reference to family as support and beneficiary to the smoker’s quitting
- Text messages were personalized (i.e., names/nicknames were used)
- Changing text message delivery timing (e.g., after meals, church times)

mHealth adaptation?

- Basic premise that a prescribed sequential suite of messages, delivered via mobile phone, stimulates **cognitive** processes required for **behaviour change**.
- Theoretical origin in health psychology (trans-theoretical model of behaviour change) provide a **accepted** framework for message development and adaptation
- Stages of change: iterative, sequential, rational and **individual**
- Adaptation works with a validated tool to reflect **contextual** and **cultural nuances** (e.g. focus group data)

Linear process in non-linear worlds



Thoughts and questions

- Adaptation is feasible but local expertise essential.
- How far to adapt – cultural, values, social, linguistic only?
- Impacts are potentially sustainable [? incl meso and macro elements]
- Adaptation is acceptable but may undermine local investment in de novo and co-design
- Dominance of individualistic approach to behaviour change models
- How can TXT initiative promote broader social change processes?
- Who needs and who gains access to mobile based support?
- Measuring impacts (M+E) at multiple levels (user to systems level)