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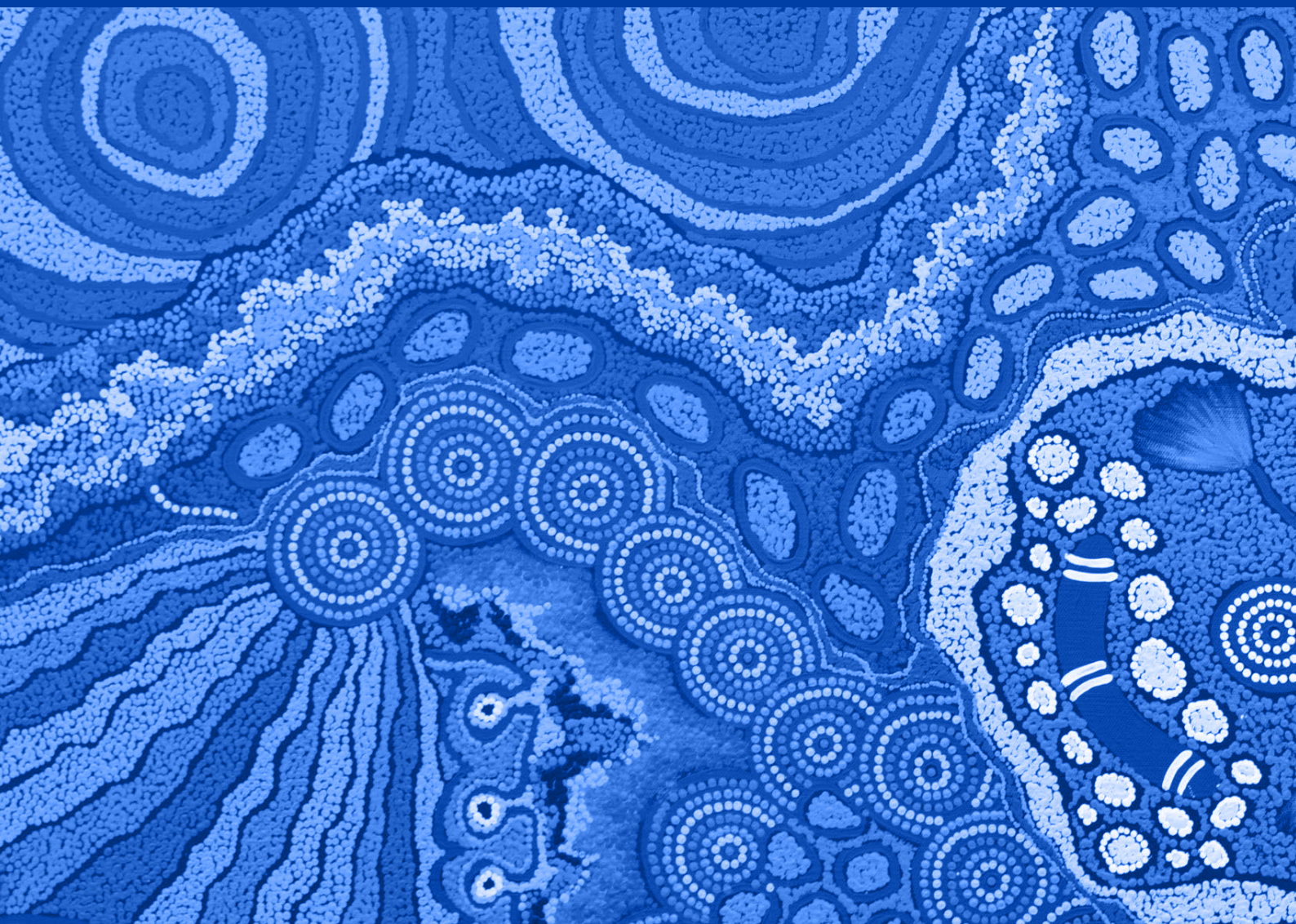
Queensland Aboriginal and Islander Health Council

Hypertension Scoping Study

Exploring Mobile Health Technology for the Management of Hypertension in the Aboriginal and Torres Strait Islander Community Controlled Health Sector



Acknowledgements

QAIHC and CSIRO would like to acknowledge the Traditional Custodians of this country upon which we live and work, for their continuing connection to land and community. We pay our respects to them and to their Elders past and present.

The Project Team involved in the Scoping Study would also like to acknowledge the Traditional Custodians of the lands on which we met during the course of consultations, and thank them for the warm welcomes offered into their communities.

We are grateful for the generosity of knowledge, time and welcomes provided by the Aboriginal and Torres Strait Islander Community Controlled Health Organisation representatives who participated in the Scoping Study. Their support, coordination and valuable insights are integral to the Project.

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This report features designs by Casey Coolwell. Casey is a Quandamooka, Nunukul woman from Minjerribah (North Stradbroke Island) with links to the Eulo and Biri people of Bowen.

ISLANDS: This artwork represents the connections between land and sea. The solid lined circles represent each island/community and the small gathered dots represent the waters connecting each place.

Cover image: Shutterstock

Abstract

Background: Chronic disease is the greatest contributor to the mortality gap between Aboriginal and Torres Strait Islander people and non-Indigenous people in Australia with Cardiovascular disease (CVD) the leading cause of death for Aboriginal and Torres Strait Islander people. Hypertension, that is, elevated blood pressure (BP) above 140/90 mmHg, is a causal risk factor of CVD.

Inequity in levels of access to health information and services is a contributing factor to the disparity in CVD diagnosis and mortality among Aboriginal and Torres Strait Islander people and non-Indigenous populations. This difference highlights the need for approaches aimed at increasing access to CVD-specific information, as well as innovation that can empower individuals to play a role in supporting positive health outcomes. In addition to the provision of clinical care, effective hypertension management requires patient engagement. Initiation of lifestyle modifications as well as appropriate medical interventions are necessary to support sustainable and person-centred hypertension treatment.

The use of mobile health digital platforms (m-health) have shown promising results in the prevention, treatment and management of a variety of health conditions. With the growing prevalence of smartphones and other mobile devices, m-health represents an increasingly useful way for people to access health information and tools to understand, monitor and improve their health. This is particularly relevant for people in remote and regional areas who often have reduced access to health services and locally appropriate information.

Methods:

The Scoping Study was undertaken as a preliminary exploration to determine whether further consideration of hypertension m-health is a relevant priority with the Aboriginal and Torres Strait Islander Health Sector (the Sector). The Scoping Study rationale was twofold. It aimed to provide valuable insights about the needs, preferences and priorities of how Aboriginal and Torres Strait Islander people may wish to engage with m-health for hypertension management; and how m-health may apply to hypertension management within Aboriginal and Torres Strait Islander Community Controlled Health Organisation (ATSICCHO) Models of Care. A consultation approach was undertaken for the Study as it enabled flexibility to suit the preferences of each site. Local protocols were respected. The consultations were largely informal and were not restricted by pre-determined and narrow interview questions. The approach was culturally sensitive and promoted an environment responsive to local communities.

It does not represent a formal research project and consultation was undertaken accordingly. As such, the involvement of patients and the broader community were not within the scope, and representatives of ATSICCHOs were invited to participate. If further investigation of hypertension m-health is identified as an outcome of the findings, it is envisaged that a research framework including relevant ethical approval would be commissioned.

Results:

Six overarching themes were identified. Technology, was raised in multiple contexts at each of the consultations and considered fundamental for successful implementation of m-health. Models of Care, similar to the theme of Technology, MOC consultation content provided unique and often essential components necessary to underpin effective implementation of m-health. Interoperability, each consultation site emphasised the importance of integrating digital platforms as much as possible to increase clinician uptake and lessen additional processes. Screening Risks and thresholds, feedback about the role hypertension related m-health could play in screening risk and thresholds were overwhelmingly positive. Education, m-health could potentially add value through providing education about hypertension risk and management for patients and families/carers. Patient Engagement, potential to facilitate positive engagement with patients across the life-span, and for varying degrees of disease burden.

A large proportion of the content had considerable generalisability across the sites, indicating Sector-wide relevance. However, there were also multiple instances of nuanced feedback applicable only to the particular site/s. It is logical to suggest that this region-specific information would resonate with other ATSICCHOs in similar settings.

Findings:

There are two key outputs of the Scoping Study.

Firstly, consultation findings contribute narrative information about the perceived value that hypertension m-health may have in the contexts of ATSICCHO patients and MOC. A foundation of possible enablers and barriers for how m-health may improve hypertension outcomes for Aboriginal and Torres Strait Islander people has been documented and provides a reference point to underpin further consideration.

Finally, the Scoping Study consultation process and subsequent findings have built a culturally respectful foundation to guide engagement, potential partnership, co-design and implementation of hypertension m-health with ATSICCHOs in their communities.

List of Terms and Abbreviations/Acronyms

Abbreviation/Acronym	Meaning
AEHRC	The Australian e-Health Research Centre
App	Mobile application
ATSICCHO	Aboriginal and Torres Strait Islander Community Controlled Health Organisation
BP	Blood pressure
CHD	Coronary heart disease
CSIRO	Commonwealth Scientific and Industrial Research Organisation
CVD	Cardiovascular disease
e-health	Electronic health
EMR	Electronic medical records
Members	QAIHC Members
m-health	Mobile health
mmHg	Unit of measure for blood pressure (millimetres of mercury)
NACCHO	National Aboriginal Community Controlled Health Organisation
MOC	Models of Care
Project Team	QAIHC and CSIRO Project Members
QAIHC	Queensland Aboriginal and Islander Health Council
The Sector	Aboriginal and Torres Strait Islander Health Sector
The Study	The Scoping Study carried out by QAIHC and CSIRO as reported in this document

Table of Contents

Table of Contents

List of Figures and Tables

Figures

Tables

1 Introduction

1.1 Chronic disease

Chronic diseases are complex health conditions which persist over time and can become immediately life threatening. Once diagnosed, chronic diseases require intensive management across the life span, and are rarely cured. However, they may not always be the underlying cause of death. Quality of life can be significantly compromised due to associated complications such as mobility impairment and loss of independence.

Chronic disease is the greatest contributor to the mortality gap between Aboriginal and Torres Strait Islander people and non-Indigenous people in Australia. In 2011, chronic diseases accounted for 70% of the mortality gap, and 64% of the total burden of disease for Aboriginal and Torres Strait Islander people (Al Yaman, 2017).

1.2 Hypertension in Aboriginal and Torres Strait Islander populations

Cardiovascular disease (CVD) is the leading cause of death for Aboriginal and Torres Strait Islander people (Al Yaman, 2017). In 2011, CVD accounted for 18.6% of all deaths of Aboriginal and Torres Strait Islander people in Queensland (Al Yaman, 2017). Hypertension, that is, elevated blood pressure (BP) above 140/90 mmHg, is a causal risk factor of CVD.

Significant advancements have been made in reducing CVD-related mortality rates amongst Aboriginal and Torres Strait Islander populations. A 40% decrease in CVD-related deaths was recorded between 1998 and 2012 (Heuvel, 2015). However, CVD continues to account for nearly 20% of the difference in life expectancy between Aboriginal and Torres Strait Islander people and non-Indigenous people (Al-Yaman, 2017). It affects all age groups in Aboriginal and Torres Strait Islander peoples, with the prevalence up to 3.2 times higher for young Aboriginal and Torres Strait Islander people (Australian Bureau of Statistics, 2016).

Inequity in levels of access to health information and services is a contributing factor to the disparity in CVD diagnosis and mortality among Aboriginal and Torres Strait Islander people and non-Indigenous populations. This difference highlights the need for approaches aimed at increasing access to CVD-specific information, as well as innovation that can empower individuals to play a role in supporting positive health outcomes.

1.3 Hypertension management

In addition to the provision of clinical care, effective hypertension management requires patient engagement. Initiation of lifestyle modifications as well as appropriate medical interventions are necessary to support sustainable and person-centred hypertension treatment. Consideration of co-morbidities and other conditions such as pregnancy must also be considered in risk assessment and treatment planning.

1.3.1 Lifestyle modifications

Healthy lifestyle choices and behaviours are vital for the lowering of BP and control of other CVD risk factors. Continued emphasis on weight loss, healthy diet, smoking cessation and moderation of alcohol intake is required to prevent CVD events and avoid organ damage.

1.3.2 Medical interventions

Medical intervention is dependent on the stage of hypertension, and involves administering medication to lower BP within recommended ranges. Drug up-titration is usually necessary until optimal BP is achieved and the maintenance of the normalised levels requires close monitoring through engagement with patients and carers. Two or more medications are commonly required to achieve the treatment goal of BP <140/90 mmHg.

Every 10-mmHg systolic BP-lowering achieved through medical therapy and optimal management has demonstrated an aggregate reduction in CVD events by 20%, coronary heart disease (CHD) by 17%, stroke by 27%, and heart failure by 28% (Karmali & Lloyd-Jones, 2017).

1.4 Mobile Health Technology

The use of mobile health digital platforms (m-health) have shown promising results in the prevention, treatment and management of a variety of health conditions. With the growing prevalence of smartphones and other mobile devices, m-health represents an increasingly useful way for people to access health information and tools to understand, monitor and improve their health. This is particularly relevant for people in remote and regional areas who often have reduced access to health services and locally appropriate information.

1.4.1 Hypertension-specific mobile health technology

m-health has the potential to improve diagnosis of CVD, as well as effective hypertension management via remote monitoring of key health indicators. It is also suitable for providing information about risk factors such as exercise levels, quality of diet, smoking habits and alcohol consumption. m-health can be designed to encourage timely monitoring of BP levels and medication adherence, as well as empower individuals to actively engage in their patient journey. The ultimate goal is to improve patient outcomes through features which focus on reciprocal information sharing, remote monitoring, medication adherence, physical activity and encouraging sustainable healthy lifestyle behaviours.

Research demonstrates the potential m-health has for adding value to CVD treatment. An m-health application (app) known as *HeartCycle* was developed by Salvi and colleagues (2018) to aid in cardiac rehabilitation for patients diagnosed with coronary artery disease in Europe. The intervention aimed to improve patient adherence to rehabilitation programs and included tools for exercise monitoring, guidance, motivational feedback and educational content. The researchers recruited 118 participants and assigned 55 individuals to the treatment condition. Due to a myriad of technical problems related to connectivity and usability, only 19 participants successfully completed the intervention. Of these 19 participants, researchers observed improved adherence to exercise habits and greater knowledge of heart health. They also observed better exercise habits at a six month follow up. Unfortunately, the result was not able to be measured for significance due to the small sample size. However, the results were encouraging and suggest that m-health may improve adherence to CVD treatment programs such as exercise. Study findings also emphasise the importance of considering how connectivity and usability are essential for effective implementation.

The *Care4Heart* program was employed in a Singapore-based study involving patients with coronary heart disease (CHD). Zhang and colleagues (2017) recruited 80 participants who were randomly assigned to either a treatment or a control condition. Participants in the treatment group received a four-week intervention whilst the control group were offered access to health promotion websites. The results showed participants receiving the intervention had better overall knowledge of CHD and better understanding of how behaviours such as reducing sugar intake and maintaining a healthy weight can decrease the risk of CHD when compared with a control group. The *Care4Heart* program study demonstrates the capacity of CVD focussed m-health for improving knowledge of both the disease and the key behaviours linked to health outcomes.

In Australia, a m-health computer app known as the *Cardiovascular Disease Health Tracker* was utilised in 40 general practices and 20 community-controlled health organisations throughout Queensland and New South Wales in 2012. The app was used to collect patient

information for migration with the Medical Director or Best Practice electronic medical records for clinician access. The app provided data about the absolute risk of a heart attack or stroke alongside relevant information about management of a patient's health. Cardiovascular Disease Health Tracker also provided an interactive display where participants could observe future health projections based on 'what if' scenarios (e.g. changing smoking status, lowering cholesterol). A review of the apps effectiveness was undertaken by the University of Sydney, yet results have not yet been made publicly available.

1.4.2 Aboriginal and Torres Strait Islander-specific mobile health technology

Emerging evidence shows potential for m-health to contribute to improving health outcomes and patient journey experiences for CVD. However, the technology and supporting platforms have not been developed or explored with consideration of Aboriginal and Torres Strait Islander people at a national or state level. Whilst some incidental findings from the above-mentioned studies may apply to the experiences of Aboriginal and Torres Strait Islander people, the QAIHC and CSIRO Project Team (Project Team) are not aware of any consultation, co-design, trialling or evaluation of CVD m-health with Aboriginal and Torres Strait Islander populations. Further, consideration of how m-health may complement and integrate within community-controlled health organisation Models of Care (MOC) is also unknown (See Section 2.2).

A review of literature for apps specific to Aboriginal and Torres Strait Islander people was undertaken to provide context for this Study. One mobile health app was found to align with improving health outcomes and used a co-design approach with Aboriginal and Torres Strait Islander peoples. This app, known as *iBobbly*, is a suicide prevention app, developed by the Black Dog Institute in Australia.

iBobbly has a strong emphasis on usability and connectivity to enhance user engagement. The app was developed with the aim of reducing suicidal ideation for Aboriginal and Torres Strait Islander people. It includes culturally relevant treatment methods, metaphors, stories and images. A pilot study was carried out by Tighe and colleagues (2017) to determine the effectiveness of the app in five remote Aboriginal communities in the Kimberley region of Western Australia. The study involved 61 participants, aged between 18 and 35 years, and participants were randomly assigned to a treatment or waitlist condition. The results showed a significant improvement in clinical depression scores for participants in the treatment condition from baseline to post-intervention. Additionally, participants in the treatment condition showed a significant reduction in psychological distress and depression severity compared with the waitlist condition. The *iBobbly* pilot results indicate that a mobile platform may be an effective modality to improve health and wellbeing outcomes for Aboriginal and Torres Strait Islander people in remote communities. Moreover, it highlights the importance of culturally relevant tools for effective participant engagement.

Hobson and colleagues (2019) recently published a systematic review of mobile health for Aboriginal and Torres Strait Islander people. Thirteen studies (dated 2005–2018) reported on m-health interventions with First Nations populations in Canada, Australia, New Zealand and the United States. A large number of these studies (n=9) were conducted in Australia with Aboriginal and Torres Strait Islander people. Six mHealth studies noted favourable end-user perspectives and two studies noted high acceptability of the m-health modality, irrespective of previous device experience. Whilst this review confirms there is emerging evidence for the use of m-health with First Nations populations, none of the studies were designed to address hypertension. This highlights a knowledge and practice gap in the m-health sphere, suggesting that m-health initiatives may provide an appropriate avenue to pursue hypertension management with Aboriginal and Torres Strait Islander communities.

An important consideration for m-health feasibility is not only device ownership, but access to internet services. Several research studies report rapid social adoption of mobile technologies (Brusse, Gardner, McAullay & Dowden, 2014; Taylor 2012). However data shows mixed levels of phone ownership and a sharing culture within Aboriginal and Torres Strait Islander communities (Auld & Henderson, 2012; Brady & Dyson 2009; Dyson & Brady, 2009; Tangentyere Council & Central Land Council, 2007). Additionally, contrasting reports of connectivity to the Australian 3G and 4G network could be a significant barrier to m-health platforms to support hypertension management (National Rural Health Alliance, 2019).

1.4.3 Summary of mobile apps specific to Aboriginal and Torres Strait Islander people

Research suggests that m-health may be effective in improving awareness of health conditions and adherence to lifestyle modifications. Literature also indicates that m-health focussed on usability, relevance and interoperability may be effective in maintaining adherence to a program or treatment plan.

It is worth noting that none of the reported m-health programs are known to have included a comprehensive range of CVD management tools, with health promotion information specific to the needs and preferences of Aboriginal and Torres Strait Islander people. Inclusion of mobile platform features and functionalities developed through co-design and with consideration of cultural and clinical preferences in a health-oriented platform is relatively novel in the Australian context. As such, this Study represents an important opportunity to determine and document the views of Aboriginal and Torres Strait Islander representatives with respect to CVD management within community-controlled Models of Care (MOC)(See Section 2.2).

2 Aboriginal and Torres Strait Islander Community Controlled Health Sector

Self-governance of primary health care for First Nations Peoples is recognised nationally and internationally as best practice. Community-control is a process which allows the local community to be involved in the priorities, protocols and procedures as determined by the community.

In Australia, community-controlled health services embody a model of self-determination. The core of community-controlled primary health care is the initiation and operation of holistic, comprehensive and culturally appropriate health care to the community which controls it. Governance is led by a locally elected board.

One hundred and forty-three community-controlled health organisations across Australia are represented by the national peak organisation, the National Aboriginal Community Controlled Health Organisation (NACCHO). Community controlled health organisations are referred to by a variety of names throughout Australia, which are determined by the relevant state. In Queensland, community-controlled health services are known as Aboriginal and Torres Strait Islander Community Controlled Health Organisations (ATSICCHOs).

2.1 Queensland Aboriginal and Islander Health Council (QAIHC)

The Queensland Aboriginal and Islander Health Council (QAIHC) is a leadership and policy organisation. It was established in 1990 and is the peak organisation body representing ATSICCHOs in Queensland at both a state and a national level.

QAIHC membership is comprised of ATSICCHOs located throughout Queensland which deliver holistic care that is patient and family centred, at no cost to the patient and at a single location. In delivering comprehensive primary health care, ATSICCHOs also provide treatment, prevention and early intervention, rehabilitation and recovery services. There is flexibility in providing services, and many services include home visits, outreach, telehealth and family care plans.

The values and perspectives of the local communities shape the design and delivery of services, evaluation, cultural policies, engagement mechanisms and the physical attributes of the medical services. Empowering Aboriginal and Torres Strait Islander people to take charge of their own health advancement is a core element of the ATSICCHO MOC.

Collectively, QAIHC's Members have established over 50 clinics across Queensland, focussed on providing culturally appropriate primary health care services to their communities and improving Aboriginal and Torres Strait Islander Peoples' health status. Images of QAIHCs Members are presented in Figure 1.

Figure 1: *QAIHC Member Services*

2.2 Models of Care

ATSICCHO MOC help ensure that Aboriginal and Torres Strait Islander people receive holistic care in a single location that is free from institutionalised racism. ATSICHHO MOCs promote flexibility to include services such as home visits, outreach and telehealth. QAIHC works with Members to ensure patients have access to multidisciplinary teams, which is increasingly important in the context of comorbidities and increasingly complex health care systems.

Figure 2 depicts the holistic and strengths-based nature of the ATSICCHO MOC.

Figure 2: *Model of Care for ATSICCHOs*

CONTROLLED HEALTH ORGANISATIONS'

Care

We are built from self determination, governed by and answerable to our communities

Our service delivery is guided by our **cultural values**.

We provide a care environment that is **culturally safe** and **engage** our communities and **consult** on matters that affect them.

We value **capacity building** of individuals, families and communities.

We provide single-point of **comprehensive** primary health care at no cost to our patients.

Our multidisciplinary team is coordinated by **Aboriginal and Torres Strait Islander Health Workers**. Our patients have access to a range of clinicians on site.

We have a highly skilled **Aboriginal and Torres Strait Islander workforce** committed to Continuous Quality Improvement.

We provide assistance to our patients to **reduce practical barriers** and actively practice **clinical excellence**.

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3 Study partners

3.1 The Commonwealth Scientific and Industrial Research Organisation

The Commonwealth Scientific and Industrial Research Organisation (CSIRO) is Australia's largest scientific research organisation. The Australian e-Health Research Centre (AEHRC) is a business group within CSIRO, based at the Royal Women's and Brisbane Hospital in Queensland. AEHRC started as a joint venture between CSIRO and the Queensland Government over 14 years ago and has delivered considerable impact within the e-Health space at both state and national levels.

AEHRC undertakes research in a number of e-Health areas including Medical Imaging, Medical Text Analysis, Health Services research (including, remote and mobile health), Health Informatics, specifically in the field of data interoperability (e.g. Snomed CT, FHIR an HL7 architecture development) and Health Data Analytics.

3.2 QAIHC

The Policy and Research Division of QAIHC were commissioned to partner on the Scoping Study with CSIRO. Further detail about QAIHC can be found in Section 2.1.

3.3 QAIHC Member Services Representatives

A selection of ATSICCHO and community representatives participated in the Scoping Study. Details are described in Section 5.2.

4 Study rationale

4.1 Exploring how mobile health technology may improve hypertension outcomes

Research supports that m-health has the potential to improve hypertension management and patient outcomes (e.g. Tangada et al., 2018). However, fundamental gaps exist in understanding how the technology may be applied to benefit Aboriginal and Torres Islander people who are ATSICCHO patients in the context of hypertension.

The Scoping Study rationale is twofold. It aims to provide valuable insights about:

1. The needs, preferences and priorities of how Aboriginal and Torres Strait Islander people may wish to engage with m-health for hypertension management; and
2. How m-health may apply to hypertension management within ATSICCHO MOC.

4.1.1 Scoping Study parameters

The Scoping Study was undertaken as a preliminary exploration to determine whether further consideration of hypertension m-health is a relevant priority with the Aboriginal and Torres Strait Islander Health Sector (the Sector). It does not represent a formal research project and consultation was undertaken accordingly. As such, the involvement of patients and the broader community were not within the scope, and representatives of ATSICCHOs (with one exception noted in Section 5.3.2) were invited to participate. If further investigation of hypertension m-health is identified as an outcome of the findings, it is envisaged that a research framework including relevant ethical approval would be commissioned.

It is also worth noting that the 'Scoping Study Findings' section of this document (delineated in Section 5) derives from a selection of QAIHC Members rather than the entire Queensland Sector.

5 Consultation

5.1 The consultation process

As the state peak body, QAIHC have an important role in promoting culturally appropriate and purposeful engagement with the Sector. QAIHC are well-placed to understand Member priorities and use this knowledge to help guide engagement both internally and externally.

The process for determining how to best engage with the Sector for the study was developed by a range of experts including Aboriginal and Torres Strait Islander stakeholders and non-Indigenous stakeholders from QAIHC and CSIRO. The Scoping Study approach aimed to build an evidence base through consultation and collaboration. Recognition was given to the need for developing mutually beneficial and sustainable relationships between ATSICCHOs, CSIRO and QAIHC. Consideration of creating partnerships that could support any future co-design and localisation of m-health for hypertension guided consultation planning.

5.1.1 Selection of consultation sites

Several factors influenced which ATSICCHOs were approached for participation in the Scoping Study. Initial identification of potential sites was guided by the health priority areas of specific ATSICCHOs, as known to QAIHC through existing engagement with Member Chief Executives and clinical workforce. ATSICCHOs who had identified CVD as a health priority were noted for possible involvement.

Geographic location was a further consideration. The nature of the Scoping Study required contemplation of local environments and perspectives from regional, remote and urban communities. Geographic characteristics are known to substantially influence accessibility to health services for Aboriginal and Torres Strait Islander Queenslanders. m-health adds an additional layer of complexity, as the viability of such technology is contingent upon internet access for both patients and clinicians. The selection of sites from a range of geographic locations was anticipated to strengthen the Scoping Study findings through the inclusion of diverse and comprehensive perspectives.

5.2 Consultations sites

Four QAIHC Members were approached for potential participation in the Scoping Study. Of the four ATSICCHOs, specific clinics of the Member Services agreed to host the consultations. Figure 3 depicts the geographic diversity of the sites, with a description of each provided in Sections 5.2.1–5.2.4.

Figure 3: *Participating ATSICCHOs*

5.2.1 Galangoor Duwalami (Hervey Bay clinic)

Galangoor Duwalami operates in Hervey Bay and Maryborough, and services the entire Fraser Coast. Galangoor Duwalami Primary Healthcare Service was conceived by the Aboriginal and Torres Strait Islander Elders in Hervey Bay. Korrawinga Aboriginal Corporation established Yama Gu, a Health Program within Korrawinga Aboriginal Corporation in 2005. In 2006, an interim Board of Directors was established to oversee the initial establishment and development of the health program into a separate incorporated community-controlled organisation. In 2007, Galangoor Duwalami Primary Healthcare Service was established under the auspice of Korrawinga Aboriginal Corporation. In March 2008, Galangoor Duwalami Primary Healthcare Service became incorporated under the Corporations (Aboriginal and Torres Strait Islander) Act 2000.

Galangoor Duwalami Primary Healthcare Service vision is based on taking a holistic approach to addressing Aboriginal and Torres Strait Islander health and social inequities within the Fraser Coast by maximising existing health services and connecting clients to appropriate and accessible programs. The mission of the organisation is to ensure that all Aboriginal and Torres Strait Islander people in the Fraser Coast have access to a range of culturally safe and comprehensive multidisciplinary primary health care. Galangoor Duwalami Primary Healthcare Service has now implemented a comprehensive program of primary health care delivery to the communities of the Fraser Coast. The services include Doctors, Clinic Nurses, Administration staff, Practice Manager, Community Liaison Officers, Aboriginal and Torres Strait Islander Health Workers, Podiatrists, Dietitians and Nutritionists, Diabetes Nurses Educators and visiting specialists.

Galangoor Duwalami consultation (left to right) Roderick Wright, Ann Woolcock, Stevan Ober, Dr Ray Mahoney, Dr Manuel Gonzalez-Garcia, Dr Kelly Dingli

5.2.2 Wuchopperen (Cairns clinic)

Wuchopperen Health Service Limited was established in 1979 and began providing primary health care services in 1981. Their main aim is to improve quality of life for Aboriginal and Torres Strait Islander people. Wuchopperen has primary health care facilities in Manoora and Edmonton and a child service in Atherton. The organisation provides a range of services addressing physical, social, emotional and spiritual wellbeing of individuals and families. Wuchopperen also provides child wellbeing services including foster and kinship care and a Family Wellbeing service which support at-risk families. Wuchopperen is a not-for-profit, membership based ATSICCHO that delivers an integrated, holistic primary health care service to Aboriginal and Torres Strait Islander peoples in the greater Cairns area. The organisation is governed by a 10-person Board of Directors elected annually by Wuchopperen Members. The organisation has around 200 staff with approximately 70% identifying as Aboriginal and/or Torres Strait Islander. Wuchopperen offers culturally appropriate, comprehensive primary health care which includes medical and social and emotional wellbeing services.

5.2.3 **Mulungu** (Mareeba clinic)

Mulungu Aboriginal Primary Health Care Service is run by the Aboriginal community of Mareeba, located in the Tablelands region. Mulungu Aboriginal Primary Health Care Service is an Aboriginal Community Controlled organisation working to improve health outcomes and wellbeing for the Indigenous population of Mareeba.

Mulungu achieves this through providing comprehensive primary health care services that respond to the physical, spiritual, cultural and emotional and social wellbeing needs of the community and by empowering the community to manage their own health and wellbeing. Mulungu strives to provide high quality medical services and support to the Aboriginal and Torres Strait Islander communities by providing culturally appropriate health care for all ages of the community. Mulungu has 80 staff members with 95% identifying as Aboriginal and Torres Strait Islander.

Mulungu consultation (left to right) Jason Leon, Wyomie Roberston, Dr Kelly Dingli, Aunty Gail Wason (QAIHC Chair), Dr Ray Mahoney, Roderick Wright, Dr Manuel Gonzalez-Garcia

5.2.4 **Gidgee Healing** (Mornington Island clinic)

The Gidgee Healing primary health service provides a range of medical and clinical services to Aboriginal and Torres Strait Islander people living in Mount Isa, Normanton, Doomadgee, Mornington Island and the surrounding region. Gidgee Healing provides a dedicated team of Doctors, Nurse, Indigenous Health Professionals, Administration and Transport Staff.

The goal of Gidgee Healing is to make a significant and growing contribution towards achieving equity in health outcomes for the Aboriginal and Torres Strait Islander peoples across their geographic service area. The vision of Gidgee Healing is to provide high quality, sustainable and comprehensive primary health care services that are culturally safe, responsive to community needs, and integrated with other complementary services.

Gidgee Healing consultation (left to right) Dr Shannon Robertson, Dr Kelly Dingli, Dr Ray Mahoney, Dr David Hansen

5.3 Consultation methodology

A consultation approach was undertaken for the Study as it enabled flexibility to suit the preferences of each site. Local protocols were respected which included a Welcome or Acknowledgement of Country. Following introductions of attendees, a brief presentation on the purpose of the visit, CSIRO, m-health and QAIHC was provided for context. The consultations were largely informal and were not restricted by pre-determined and narrow interview questions. The approach was culturally sensitive and promoted an environment responsive to local communities.

Consultations also involved tours of the clinic and/or local community which were initiated and lead by the hosting site.

5.3.1 Discussion prompts

A standardised set of discussion prompts was prepared for the consultations and available to generate and direct discussion if required (see Table 1.).

5.3.2 Participants

Thirteen individuals participated in the consultations including 12 representatives from four QAIHC Members, and one from a local Health Council. Participants were predominately female (69%).

Table 1. *Discussion prompts*

1.	Do you think hypertension is a problem in your community?
2.	What do you consider to be a bigger challenge: • Lack of awareness about having hypertension, or • Management of hypertension once it has been diagnosed?
3.	How do you manage hypertension in your community? • Are you happy with the current situation?
4.	Do you think there is need to improve in the management of hypertension? • If so, how do you think it should be addressed?
5.	What is your current level of knowledge on the use of smartphones in your community?
6.	What is your current level of knowledge on the use of smartphones for health issues in your community?
7.	Would you be interested to learn more about the possibilities of mHealth for the management of hypertension?

6 Scoping Study findings

Commentary from the consultations was grouped into themes that emerged from the four meetings. The categories of 'Enablers' and 'Barriers' were used to further classify input received from the participating ATSICCHOs.

The category of 'Enablers' was used to describe components considered necessary for m-health to add value to the management and treatment of hypertension. It also encompasses existing strengths and opportunities that could enable successful integration of m-health into ATSICHHO MOC.

The category of 'Barriers' was used to describe potential obstacles that may impede or prevent m-health from adding value to the management and treatment of hypertension in ATSICCHO MOC, as well as areas that would require consideration and co-design.

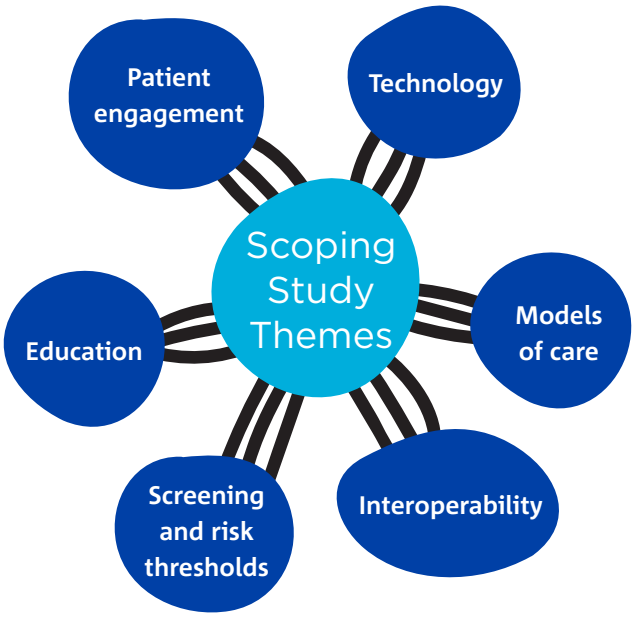

Figure 4: *Overarching themes*

6.1 Themes

Six overarching themes were identified and are presented in Figure 4. The numbering of themes is in no particular order and does not indicate weighting. Consultation input used to inform the themes often represented examples of both enablers and barriers. A large proportion of the content had considerable generalisability across the sites, indicating Sector-wide relevance. However, there were also multiple instances of nuanced feedback applicable only to the particular site/s. It is logical to suggest that this region-specific information would resonate with other ATSICCHOs in similar settings. Sections 6.1.1 to Section 6.1.6 describe the key features of each theme.

6.1.1 Technology

Technology was raised in multiple contexts at each of the consultations. The topic generated discussion about what was considered fundamental for successful implementation of m-health. Implications of introducing m-health without adequate technology to support effective implementation were noted, including:

- Poor buy-in from clinicians and patients;
- Reduced confidence in m-health and similar innovations; and
- Marginalisation of hypertension patients wishing to engage with m-health.

6.1.1.1 Internet access

Reliable internet access to support m-health for clinicians and community was identified as essential. Existing infrastructure in some remote communities was highlighted as insufficient to implement m-health as proposed in the CSIRO presentation. ATSICCHO representatives shared examples of previous attempts to engage community members through technology which had been largely unsuccessful due to unreliable and limited internet. Similarly, some clinicians highlighted that they would not be able to use m-health as way to monitor patient data as they faced the same internet issues at a clinic level. These

concerns were not recognised to be problematic for the urban or regional sites, however, urban and regional attendees did reinforce that internet access would likely prevent m-health from being effective for their remote counterparts.

m-health capacity for data storage and data synchronisation was queried and considered a possible way to increase the relevance of m-health if it could continue to store patient data without internet access. It was thought that the potential to store data for later transmission and synchronisation when the phone was within range would be effective.

6.1.1.2 Smart phone access and literacy

Levels of patient access to smart phones was raised at each consultation. It was noted several times that the necessity of requiring a smart phone for m-health would exclude some patients from participation. The key impediments were highlighted as:

- Older patients who were perceived to have less uptake with smartphones and still using 'flip-phones'; and
- Households that may only have access to one smart phone, which is further exacerbated in situations of overcrowding.

Levels of smartphone literacy were also identified as a barrier for patients who may not have a smart phone, or who did have one, but not the level of smart phone literacy required to support engagement with m-health.

6.1.2 Models of Care

Similar to the theme of Technology, MOC consultation content provided unique and often essential components necessary to underpin effective implementation of m-health.

6.1.2.1 m-health alignment with ATSICCHO models of care

The holistic nature of clinical care provided at an ATSICCHO was noted as being an asset for m-health as clinics already encourage innovative ways of engaging with patients and promoting ownership of individuals in their patient journey. The potential to utilise m-health patient data to inform allied health program goals, such as fitness programs with health physiologists, was considered an efficient way of promoting transparency and greater use of patient information to achieve common goals.

Discussion was held about how patients could be identified or chosen for involvement with hypertension m-health. Suggestions for choosing or prioritising target cohorts included the following patient groups:

- Identified to be at-risk of hypertension;
- Diagnosed with hypertension;
- No known risk of hypertension and approached for participation during a medication review; and
- Pregnant women.

Processes to help determine how and when hypertension m-health would be considered suitable for individual patients was highlighted as necessary.

It was recognised that m-health will not be suitable or preferable for all patients, and it would need to be proposed as one element in a suite of clinical care options, and with respect for the individual to choose how they wish to engage in their own clinical care.

The need to localise m-health to accommodate variation found in MOC throughout the Sector was highlighted as vital for gaining buy-in from clinicians.

6.1.2.2 Adaption and generalisation

The potential to adapt effective hypertension m-health to other medical conditions was noted as a logical progression. Generalisation of the underlying platform to other health priorities indicated recognition of the need to get the co-design and community engagement right in the first instance. The findings of any potential trials were considered crucial evidence for demonstrating how the technology could be expanded within ATSICCHO MOC. This knowledge could then be leveraged to inform future adaptations and pilots.

6.1.3 Interoperability

Four different Electronic Medical Records systems (EMRs) operate across the Sector in Queensland. Concern was conveyed about introducing technology that could not complement or integrate with existing systems. Each consultation site emphasised the importance of integrating digital platforms as much as possible to increase clinician uptake and lessen additional processes.

Consideration of how m-health is supported at a clinic level needs to be commensurate with efforts to understand how to best engage with patients. The provision of support for localisation and ongoing maintenance were identified as important, as well as concerns for any associated costs (immediate and ongoing).

In the context of interoperability, m-health was considered to have potential benefits in the areas of:

- Recording BP;
- Eliminating errors and falsifications;
- Patient follow-up and notification;
- Data sharing and integration; and
- Augmenting existing systems.

6.1.4 Screening risk and thresholds

Feedback about the role hypertension related m-health could play in screening risk and thresholds were overwhelmingly positive.

6.1.4.1 Identification and notification of risk

The technology was identified as having potential to improve how patients are identified of being at risk, as well as monitoring against risk thresholds. Flexibility in allowing for m-health to be localised was thought beneficial for empowering clinicians to establish culturally and locally appropriate thresholds. For example, the ability to move beyond information sources or tools based on mainstream population data.

The capability of supporting real-time intervention based on notifications where practicable was considered important and raised debate about how this could be achieved in remote areas where adequate workforce levels were an issue, as well as access to health services and internet access.

At a patient level, real-time notification was thought to be an asset for encouraging ownership in the patient journey, as well as promoting prompt help-seeking behaviour when thresholds were seen as critical by the individual, rather than waiting for an emergency situation to develop.

6.1.4.2 Screening

Hypertension m-health was identified as having a role in universal screening as well as targeted screening. In addition to improving screening of hypertension risk, m-health was also viewed as an engagement tool and conduit to talk about hypertension. Suggestions included:

- Initiate m-health engagement with all patients during a medication review, with the aim of uncovering patients who may not otherwise be assessed for hypertension risk; and
- Use m-health routinely for all young people for early identification and intervention, irrespective of known or perceived hypertension risk.

6.1.5 Education

At all consultations, it was highlighted that m-health could potentially add value through providing education about hypertension risk and management for patients and families/carers. The integration of relevant health promotion materials within m-health was considered a valuable way of increasing engagement, and providing timely and culturally appropriate information that could benefit the patient and their families/carers.

Flexibility to customise content for the patient as well as their local services (e.g. referral pathways) was suggested as a way to personalise m-health and increase its relevance to both clinicians and patients. It was also

noted that the information could assist families/carers in identifying their own hypertension risk as well as providing support to reduce risk for their loved one. For example, provide information about how to create and support healthy eating patterns. Localisation to specific communities was also seen as a way to provide culturally appropriate information rather than having to rely on education materials developed for mainstream populations or generic Aboriginal and Torres Strait health promotion.

6.1.6 Patient engagement

Patient engagement discussions highlighted how hypertension m-health aligns with the holistic nature of ATSICCHO MOC. The use of m-health in the management of hypertension was viewed as a way of facilitating positive engagement with patients across the life-span, and for varying degrees of disease burden. Any increase in efficiencies and system improvements that could be gained at the clinic or patient level were regarded favourably.

6.1.6.1 Culturally appropriate and responsive

The ability to participate in a co-design process for the development and trialling of hypertension m-health was welcomed and expressed as necessary for achieving buy-in and support. If genuine co-design were to be undertaken, ATSICCHO representatives conveyed preliminary support for introducing the concept as a way of engaging their patients with technology that is culturally appropriate and responsive to local needs. Recognition of the necessity to co-design m-health that was accessible, understandable and culturally sensitive was emphasised throughout all consultations.

Resources and communication strategies to educate patients about hypertension m-health were identified as essential. Specifically, content that could help address the following questions:

- How does m-health benefit me?
- Is my data confidential and safe? and
- How does m-health differ from other digital platforms such as *My Health Record*?

It was acknowledged that the level of consultations undertaken during the Study were adequate for preliminary conversations, but not inclusive or comprehensive enough to provide a community-wide viewpoint about m-health.

m-health was also considered to be a culturally responsive way of engaging with patients who experience periods of transience. Examples about the challenges of medication and treatment compliance for patients who travel between communities were shared. m-health was seen as a way of adding value by providing an information source that could assist both patients and clinicians in multiple locations. For example, a clinician would be able to access hypertension management data from the m-health platform and reduce ambiguity about essential information such as medication type and dosage. Patients would not have to rely on memory or paper records and could participate in their clinical care irrespective of which clinic they attend.

6.1.6.2 Empowerment

Consultation input supported that m-health was an innovative way of empowering patients to play a greater role in their hypertension management than existing practices. It was suggested that medication compliance could be improved if patients relied on a central source of information such as m-health. The technology was seen as a way of providing the patient with one information source that was dynamic (e.g. recording BP), as well as educational (e.g. healthy lifestyle plan such as recommendations for daily calorie intake). Improvements in reciprocal communication sharing opportunities between patients and clinicians was seen as a way of strengthening patient engagement and supporting better CVD outcomes.

As noted in Section 6.1.1.2, m-health will not be suitable for all patients with hypertension, and recognition of individual preferences for clinical care embodies empowerment. m-health is one potential facet of clinical care that would need to be offered as part of a range of hypertension management tools.

7 Dissemination of Study process and findings

7.1 Post-consultation communication with participating ATSICCHOs

Consistent with the consultation process undertaken in the planning phase of the Scoping Study, emphasis was placed on ensuring on-going transparency, inclusion and flexibility with the participating ATSICCHOs. The Project Team advised they would be in contact at the completion of the consultations, with an offer to return to and provide a summary of findings. At the time of publication, all participating ATSICCHOs have been contacted, with plans in place for return visits or meetings at QAIHC.

7.2 Communication strategy

The processes supporting culturally appropriate community engagement are often considered as important as the interactions themselves. Whilst the participating ATSICCHOs may have more immediate interest in the Scoping Study than the broader Sector, it was considered important to ensure QAIHC Members and other key stakeholders had access to timely and appropriate communication regarding the project's status and findings. These updates are critical for ensuring that any advancements made towards improving hypertension outcomes for Aboriginal and Torres Strait Islander patients of ATSICCHOs are shared across the Sector.

Communication to date has involved a variety of platforms to achieve broad reach, and details are presented in Table 2.

Table 2. Dissemination of Study related material

Date	Communication platform
18 June 2019	Interview involving Dr Ray Mahoney on Bumma Bippera Media, Cairns Indig-enous Radio
11 July 2019	CSIRO Sphere NAIDOC feature article
July 2019	QAIHC Sector Leader article (Appendix A)
19 September 2019	Conference presentation, Public Health Association of Australia (PHAA) Con-ference 2019. *Scoping Study: mHealth Hypertension Intervention for Aboriginal and Torres Strait Islander peoples* • Dr Ray Mahoney, Senior Scientist, Australian E-Health Research Centre, CSIRO • Dr Kelly Dingli, Manager Research and Evidence, Policy and Research Di-vision, QAIHC • Dr Manuel Gonzalez-Garcia, Cardiologist, University Hospital of UMEA, Sweden
30 September 2019	Gidgee Healing (Mount Isa), Multi-agency presentation by CSIRO and QAIHC
18 October 2019	Apunipima (Cairns), Multi-agency presentation by CSIRO and QAIHC
25 October 2019	Australian Cardiovascular Health and Rehabilitation Association - Queensland (ACRA-Qld) – Heart Foundation, Secondary Prevention in Cardiology Symposium. mHealth: Is it the solution for cardiac rehabilitation/secondary prevention for Aboriginal and Torres Strait Islander people?

8 Summary

Consultation feedback informed introductory findings from a sample of ATSICCHO representatives regarding hypertension m-health. Participating representatives are experts in their communities, and shared valuable insights through cultural, clinical and patient lenses. The duality of roles that many ATSICCHO employees have in community, strengthen these perspectives as they include contextual knowledge influenced by culture and historical legacies.

There are two key outputs of the Scoping Study. Firstly, consultation findings contribute narrative information about the perceived value that hypertension m-health may have in the contexts of ATSICCHO patients and MOC. A foundation of possible enablers and barriers for how m-health may improve hypertension outcomes for Aboriginal and Torres Strait Islander people has been documented, and provides a reference point to underpin further consideration.

Finally, the Scoping Study consultation process and subsequent findings have built a culturally respectful foundation to guide engagement, potential partnership, co-design and implementation of hypertension m-health with ATSICCHOs in their communities.

9 Next steps

Discussions with ATSICCHOs' that participated in the scoping phase as potential trial sites are on-going. Opportunities for co-design and future partnerships are being explored by relevant stakeholders.

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Appendix A

RESEARCH

WITH
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MANAGER, RESEARCH AND EVIDENCE, QAIHC

Customising mobile health technology for our models of care

Exploring how it may work for hypertension management

Hypertension is the most commonly reported causal risk factor of cardiovascular disease (CVD).[1] In 2017, 19% of Aboriginal and Torres Strait Islander deaths in Queensland were caused by CVD. Despite recent advancements in reducing CVD mortality rates, the disease still accounts for one quarter of the difference in life expectancy between Aboriginal and Torres Strait Islander peoples and non-Indigenous people. Effective management of CVD requires engagement with patients to encourage blood pressure monitoring, medication adherence, and lifestyle modifications such as weight loss and increased physical activity.

The use of mobile health technology (mHealth) has shown encouraging results in the management of a variety of health conditions from clinician and patient perspectives. There are currently no mHealth digital platforms (e.g. apps) developed for the screening and management of hypertension specific to the needs of Aboriginal and Torres Strait Islander peoples and the Aboriginal and Torres Strait Islander Community Controlled Health Organisation Sector's (the Sector) models of care.

QAIHC have partnered with the Commonwealth Scientific and Industrial Research Organisation (CSIRO) to conduct a scoping study about how mHealth may add value to the management of hypertension for Aboriginal and Torres Strait Islander peoples in the context of the Sector. QAIHC staff and CSIRO Scientists visited several Member Services in May and June 2019 to seek feedback from a range of regions.

The consultations provided valuable opportunities to demonstrate the potential technology and learn more about what Members Services would like to see in a digital platform.

> *"It's a way of helping our mob and it's visual. [The App] would help people to understand a little bit more and it's a good way of engaging people and educating them."*

Members also shared suggestions for inclusions and highlighted possible barriers that would require consideration for successful design and implementation as relevant to CVD, patient needs, and models of care.

Findings of the scoping study will be available in July 2019 and preliminary results indicate high levels of support for developing a digital platform that incorporates consultation feedback. Scoping study findings will inform potential funding opportunities for CSIRO and QAIHC to develop the mHealth digital platform, and project updates, along with opportunities for sector involvement, will be communicated with Member Services.

The QAIHC and CSIRO project team would like to thank everyone who participated in the scoping study consultations for welcoming them into their communities and their generosity of time and wisdom.

Jason Leon, Wyomie Robertson, Dr Kelly Dingli, Aunty Gail Wason, Dr Ray Mahoney, Roderick Wright, Dr Manuel Gonzalez-Garcia at Mulungu

Roderick Wright, Ann Woolcock, Stevan Ober, Dr Ray Mahoney, Dr Manuel Gonzalez-Garcia, Dr Kelly Dingli at Galangoor Duwalami