

Mana Tū: a whānau ora approach to type 2 diabetes

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ABSTRACT

In 2017, the National Hauora Coalition, a Māori-led Primary Health Organisation (PHO), was awarded a Long-Term Conditions Partnership Research grant to test the effectiveness of Mana Tū: a whānau ora approach to type 2 diabetes. With moves to replicate aspects of it in programmes around New Zealand, it is timely to describe the rationale for Mana Tū and the key components of its unique model of care. Mana Tū was developed in response to current ethnic and social inequities in type 2 diabetes rates, outcomes and wider determinants. It attempts to address various system, service and patient factors that impact on the whānau's ability to 'mana tū' or 'stand with authority' when living with a long-term condition. Results, including clinical, implementation and cost-effectiveness data, will be collected and analysed over the next two years.

Type 2 diabetes is a major long-term condition in New Zealand. Importantly, for every type 2 diabetes indicator, there are significant ethnic inequities with Māori, the indigenous people of New Zealand, and Pacific and Indian peoples, most affected.¹ Type 2 diabetes incidence, hospitalisation and mortality rates are increasing in New Zealand,² as are ethnic disparities.¹ Of note, Māori, Pacific peoples and people living in areas of high deprivation are at increased risk for poorly controlled type 2 diabetes (defined here as HbA1c >65), have higher hospital admission rates with diabetes complications and have more severe diabetes-related illnesses.^{1,3}

Achieving equity in Type 2 diabetes outcomes requires a comprehensive and determined approach to ensure we "measure it, understand its risk factors, develop valid and efficient approaches to screening and diagnosis, and develop and implement culturally specific interventions for prevention and treatment".² Primary healthcare is key but to date much of the focus for primary care funders, planners and providers has been on doctor and nurse-led prevention, screening and diagnosis, education and starting medical management including initiation of insulin.⁴ Importantly, there are few proven effective interventions in the community for managing poorly controlled type 2 diabetes.⁵ Most research

to date has focused on tailoring the medical management model⁶ with mixed results for Māori and Pacific peoples.^{1,2}

Development of an evidence-based kaupapa Māori programme for diabetes in primary care—Mana Tū

In 2010 the National Hauora Coalition (NHC), a Māori-led Primary Health Organisation (PHO) based in Auckland, convened an expert advisory group including consumers to develop an evidence-based kaupapa Māori programme for people and their whānau living with complex LTCs—the Oranga ki Tua (OKT) Advisory Roopu. Members included primary and secondary clinicians, rehabilitation and kaupapa Māori researchers and providers, health literacy experts and people living with long-term conditions including diabetes. Their remit was to design a primary care programme to support Māori and their whānau to 'live well' with a long-term condition.

Given the burden, and what appeared to be inertia in service development, a kaupapa Māori programme for type 2 diabetes—Mana Tū—was prioritised by the group. Mana Tū, meaning 'to stand with authority', is a mana-enhancing programme that supports people with poorly controlled type 2 diabetes to 'take charge' of it and its associated conditions. The OKT group designed a programme that aligned with recommendations in the *Equity of Health Care for*

*Māori: A Framework.*⁷ Based upon literature in the field of quality improvement and research on improving access to health services for Māori, indigenous peoples and minority ethnic groups, the Framework provides guidance on key actions to be taken at health system and health service levels to achieve equitable healthcare for Māori. It is focused on long-term conditions including diabetes. Mana Tū was further informed by He Korowai Oranga's aspiration for 'Rangati-ratanga' or people's right to participate in making decisions about their health and to have meaningful ways to decide how health services might be provided for their benefit.⁸

Mana Tū is based in primary care and has three major components: a Network Hub, Kai Manaaki (skilled case managers who work with whānau with poorly controlled diabetes) and a cross-sector network of services to whom whānau can be referred to address the wider determinants of health. The Network Hub supports the delivery of the intervention through training of Kai Manaaki, referrals management, cross-sector network development and quality improvement of the programme. Mana Tū works across the three—system, service and individual/whānau—levels described above. More detail about the specific elements for each of the three levels is provided below and although we have attempted to ascribe elements to one level, as set out in the Framework⁷ and He Korowai Oranga⁸, many will sit across two or three system level elements, including Māori leadership, a focus on health equity and addressing wider determinants including discrimination. Service level features for Mana Tū are the Network Hub, its workforce of Kai Manaaki, integrated primary care and information management. Individuals and whānau are empowered in the 'taking charge', whānau ora and 'the journey' factors of Mana Tū that impact on the whānau's ability to 'mana tū'.

System level

Māori leadership, defined as "championing the provision of high-quality healthcare that delivers equity of health outcomes for Māori",⁷ is a key factor in successful health programmes.^{9,10} At the system level, Mana Tū has demonstrated Māori leadership by engaging Māori governors, developers and providers; setting health equity as a clear expectation; putting in place monitoring and evaluation mechanisms⁷ including kaupapa

Māori research methodologies,¹¹ and training its workforce to be responsive to the needs and aspirations of Māori.⁷ Importantly, optimal health outcomes will not be achieved unless there is a system-wide commitment to supporting it. Therefore, Mana Tū promotes Māori leadership and system responsibility.⁷

Mana Tū also aligns with the Government's priorities for health research and service development that contributes to Māori health and eliminates health inequities.¹² Achieving *health equity* requires a primary healthcare system that is committed to mitigating rather than extending diabetes inequities.¹¹ Evidence suggests that health interventions designed specifically for those 'currently missing out' will ultimately achieve health gain and equitable outcomes for all.¹³ Those currently 'missing out' in terms of receiving quality type 2 diabetes care that achieves equitable outcomes are Māori, Pacific peoples and people living in communities with markers of socio-economic disadvantage; and people with pre-diabetes.¹ Therefore, Mana Tū was designed by and for these people. The potential benefits of achieving health equity, when realised by our people, our health system and our society, are clear.

However, achieving health equity requires more than just addressing the immediate cause of disease. A focus on the socially determined conditions in which people grow, live, work and age,¹⁴ also known as the *wider determinants* for health, is required. All societies have social hierarchies in which resources, power and privilege are distributed unequally. However, the idea that this is inevitable or immutable not only harms the nation's population and its economy,¹⁴ but is unjust and discriminatory. Mana Tū specifically asks people about the wider determinants that impact on their wellbeing, and provides a Network Hub for relevant sectors (eg, education, housing, justice) to engage with people and their whānau. In doing so it attempts to address the wider determinants in ways that support people's freedom to lead lives in which they feel valued.¹⁴

In hui held with whānau, clinicians, funders, researchers and policy makers during the development and implementation of Mana Tū, stakeholders were clear that improved outcomes for Māori

and Pacific people require identifying and addressing *discrimination* in the health and social care system. Stakeholders' reports align with the literature: discrimination occurs at policy, funding and service levels in both health and social settings.^{15,16} This creates a context in which the social issues are often not addressed, where Māori and Pacific peoples do not feel safe when engaging with the health or social services, further compounded by a system with no clear commitment to sustainable funding for approaches to LTC management that target these issues. Mana Tū seeks to tackle discrimination by working with decision-makers and providers at regular and formal meetings, building evidence, providing ongoing education and working through examples of better practice.

Service level

Mana Tū's *Network Hub* stemmed from previous NHC experience leading and implementing successful large-scale whānau ora programmes and initiatives such as Mana Kidz and AWHI.¹⁷ In these programmes, care is delivered by a diverse range of providers within a network of contributing stakeholders and the Hub's role is to provide equal access to quality clinical care, population health activity and services that address social determinants in a connected way.¹⁸ The Mana Tū Hub has a critical organising function which supports the delivery of the intervention across multiple providers, including general practice clinics and district health boards, education, housing and social programmes. It also operationally supports Mana Tū delivery through the provision of Kai Manaaki workforce training and development, programme design and implementation, clinical leadership, project management, service quality improvement and data management. The Hub is supported by a network lead manager along with information management and analytical support.

The evidence for case managers or community health workers working with individuals on clinical indicators and in geographically isolated areas to improve health outcomes is well established.¹⁹⁻²¹ Mana Tū has engaged *Kai Manaaki* to provide case management via the person's GP clinic. Kai Manaaki are unique in that they also undertake case management with family/whānau; and in ways that

support people to take charge of the clinical conditions and the social determinants of wellbeing.²² The six Kai Manaaki have a range of diabetes-related backgrounds including nursing, social work, educators and community workers. In addition to the 'usual' training about diabetes and its management, KM are trained in motivational interviewing, cultural safety and health literacy. Kai Manaaki live and contribute in the local communities with whom they are working, currently across metro-Auckland and in Whangaroa in Te Tai Tokerau. Importantly, they meet regularly for peer support and review,²³ quality improvement activities and mentorship with qualified health professionals^{24,25} and are provided with other capacity building opportunities (ie, conferences, report writing).

Patients receive regular home visits from Kai Manaaki over a period of 12 months. During these visits, patients have ample time and support by Kai Manaaki to express any clinical issues related to their condition, as well as social or psychological issues. This information informs the next steps in which the Kai Manaaki work with the person's primary care clinician to refer onto appropriate services. The Kai Manaaki manages the referral process, supporting the patient into and through it. The patient receives both clinical and social support that otherwise may not have been identified or offered in standard care.²²

Key to the success of Mana Tū is its *integration in primary care clinics* rather than being co-located or coordinated.²⁶ Although studies have shown that a greater degree of integration between primary and secondary healthcare improves patient outcomes,²⁶ evidence has also highlighted issues with, and therefore lack of, integration of horizontal care necessary to manage the spectrum of clinical, psychological and social determinants of LTCs with patients and their families.²⁷ The whānau ora approach in the title speaks to Mana Tū's role in cutting across multiple sectors, services, providers and settings to enhance quality of care and quality of life for people with complex, long-term health issues and their whānau/families.²⁸ Integration of the Kai Manaaki into GP clinics has the added benefit of ensuring that the relationships between Kai Manaaki and health and social care professionals are maintained and nurtured.²⁹

Mana Tū utilises a sophisticated information platform to allow innovative data capture in general practice and patient home visits. Mōhio is a clinical platform developed by the NHC and is designed to support general practice and PHO information management, claims, referrals, compliance reporting, budget management and clinical decision support and analysis. The Mōhio system has been further developed specifically for the Mana Tū programme to allow Kai Manaaki to regularly capture patient progress on a mobile tablet device. All data is stored in a secure server, with live reporting enabled to feedback to practices. Mōhio is efficient and innovative in the way it collects, analyses and views patients' data and progress.

Individual and whānau

Self-management or *taking charge* is fundamental to supporting people live well with diabetes;¹ yet SM is difficult for people with type 2 diabetes to sustain. Successful self management programmes with indigenous people are culturally safe, relevant, community-based and focused on small changes over longer periods of time.⁵ Previous research with Māori and Pacific peoples living with another long-term condition (stroke) tested the effectiveness of a programme with these elements and found that the ability to direct aspects of

one's life with a long-term condition or to 'take charge' was highly valued and associated with a better quality of life.²² Mana Tū has incorporated features of the Taking Charge intervention, including a full initial assessment and prioritised self-directed goal setting based on the assessment. The assessment includes clinical, social, health literacy and whānau-wellbeing related questions that are validated and reliable; and specifically seek whānau participation.³⁰ Importantly, by going through a checklist, listening and facilitating the process where the person and their whānau identify opportunities to take charge, people take ownership and are more engaged about living with their long-term condition.²² Feedback on goals is provided at regular, agreed-to intervals including blood test results, which are reported back to patients and their clinician every three months in keeping with best practice.⁵

'Patient' factors include *family/whānau and community engagement*, as the evidence is overwhelming that this will enhance diabetes outcomes.³¹ As a result, there are calls to introduce interventions that address family support and functioning in diabetes management plans.¹ Involving whānau is also a great opportunity to engage others, particularly those at risk, in activities to prevent type 2 diabetes, including slowing the progression of pre-diabetes to diabetes.

Figure 1: The Mana Tū Journey.

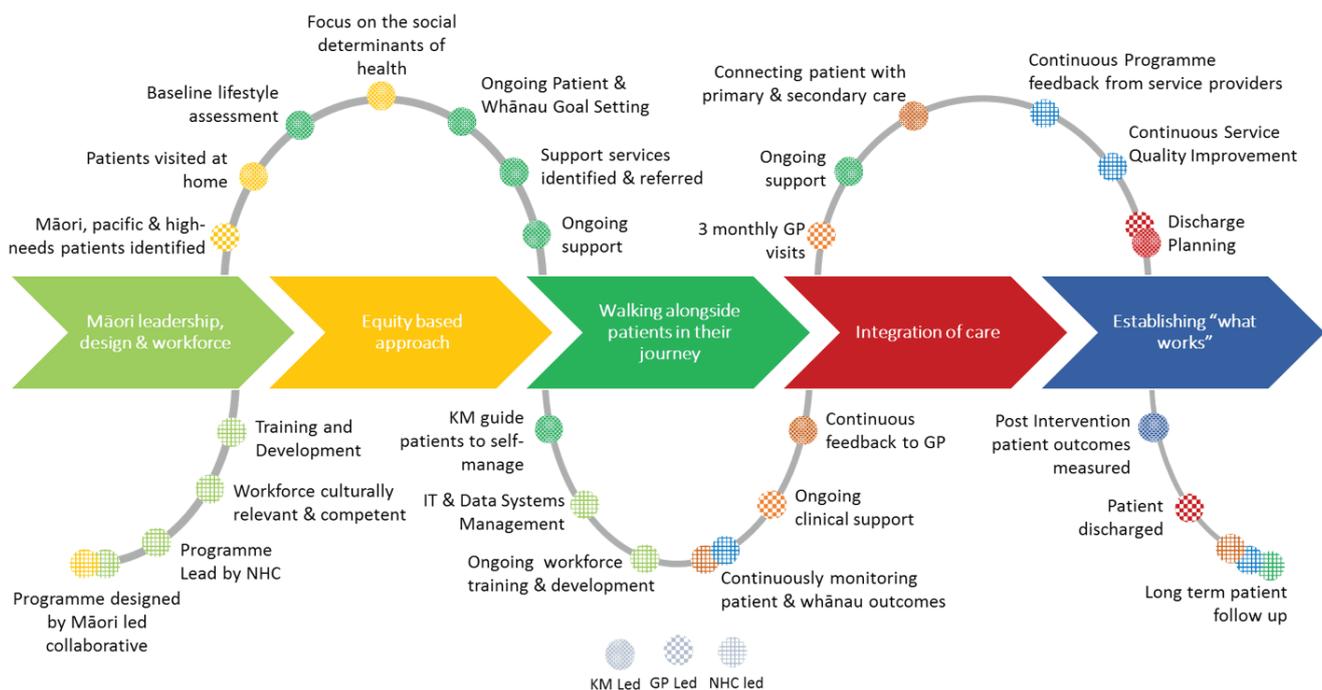


Table 1: Mana Tū framework for change.

<p>Programme goal: To support general practice to establish an environment in which discrimination is addressed in order for patients and whānau engage in improving their health and social outcomes.</p>			
<p>Theory of change:</p> <ul style="list-style-type: none"> The Kai Manaaki will support the patients and whānau to determine goals and access services to achieve those goals Addressing institutional discrimination within the health system will help improve patient engagement and trust in the practice Support is required to help general practices support their patients in improving social outcomes Improving engagement with the practice will improve diabetes self-management Building linkages across health and social agencies will support patient engagement Building an evidence base for Mana Tū will support sustainable funding 			<p>Outcomes</p> <p>Short-term outcomes</p> <ul style="list-style-type: none"> General practice commitment to enrolling and participating in programme Increased awareness and understanding among general practice teams about identifying and addressing social needs Improved feedback into practices on patient outcomes Improved patient clinical outcomes Increased sense of understanding and feeling heard by the patient An improved experience of the clinical engagement An improved treatment and management plan Kai Manaaki principally responsible for the LTC management General practices better able to support whānau/patients to better enable the management of diabetes <p>Medium/longer-term</p> <ul style="list-style-type: none"> Patients have improved literacy Whānau are thriving as a result of meeting goals Patients are self-managing increased multi-disciplinary team practice within the general practice setting Increased trust among whānau of the general practice environment Patients lead healthier lifestyles Improvements in social determinants, eg, employment, education, housing There is stable and secure funding for Mana Tū Reduced hospitalisations Social issues are identified and addressed Changes in attitudes and behaviours within the general practice setting in regard to the needs of Māori and Pacific people and their families Reduced intergenerational diabetes
<p>Context and need</p> <ul style="list-style-type: none"> There are poor outcomes for Māori and Pacific peoples There is a variable quality of care, with social issues often not addressed There is systemic institutional racism within the health system Many Māori and Pacific peoples distrust the health system There is a mismatch between clinical services and the person's needs There is not a commitment to sustainable funding for innovative approaches to LTC management 	<p>Inputs</p> <ul style="list-style-type: none"> 5 FTE of Kai Manaaki 1 FTE network manager .5 FTE research manager Central IT hub General practices and patients and whānau Tablets for collection of patient information Programme team support for resource development and administration for Kai Manaaki 	<p>Activities</p> <ul style="list-style-type: none"> Referrals from general practices to programme Promotion of the programme on brochures, videos, website, and patient information sheet Patients enrol in programme Kai Manaaki visits the patient to start working on goals Goals are identified and Kai Manaaki accesses services and resources to support goals Kai Manaaki visits patient six times over a 12-month period Patient receives health literacy training General practices receive decolonisation training workshops Kai Manaaki meet quarterly to discuss programme outcomes and area for quality improvement Promotion of Mana Tū success stories on NHC communications and media 	<p>Outputs</p> <ul style="list-style-type: none"> General Practices enrolled in programme Patient goals developed Action plan implemented Central hub established and functioning Network of social agencies established General Practice staff engaged in programme Kai Manaaki visit both patient and whānau
<p>Enablers</p> <ul style="list-style-type: none"> Clinical champion in practices Whānau champions There is a number of funding channels available NHC has a track record of designing programmes that are effective A focus on whānau moko 		<p>Challenges</p> <ul style="list-style-type: none"> There is an obesogenic environment There is a near total reliance on Kai Manaaki as relationship brokers A need to address the wider social determinants of health Patient can be hard to reach and engage Limited understanding on what drives the range of social agencies that Mana Tū needs to work with There is turnover of staff in social agencies, which creates a need to be renewing relationships A focus on mental health is currently lacking in the Mana Tū design 	

Finally living well with a long-term condition such as type 2 diabetes is *a journey*¹ over time. The duration of navigator-type interventions for long-term conditions reported in the literature ranges from 1–18 months.³² Careful consideration was given to the duration of Mana Tū and 12 months was deemed suitable to see changes in clinical indicators.²⁹ Mana Tū seeks to commence discharge planning at nine months, well within the 12-month limit. It also provides for patient-led exits at any point in the 12-month programme and possible re-entry and/or support to access other services. Therefore, it is important that all (patient, whānau, Kai Manaaki and health and social providers) have a clear expectation of Mana Tū and its role in setting people up with tools and skills for life. As Figure 1 shows, Mana Tū is a series of pragmatic steps to support the person's journey across all three levels.

A framework for change

Notably, the overarching programme goal for Mana Tū is *change*. A Mana Tū framework for change was developed which brings all three levels (individual/whānau, service, system) together (Table 1) to improve a set of short- and longer-term outcomes. In the short term (12 months), improved engagement from general practice with Mana Tū will improve their understanding about addressing the wider determinants. This leads to the patient feeling they are understood better, leading to an improved experience of their clinical engagement and subsequently improved clinical outcomes. In the longer term (1–3 years) Mana Tū is designed to have impacts for the whānau of the patient, with increasing levels of trust of the general practice environment, and improvements in social determinants (eg, employment, education, housing). The programme aims to have broadened attitudes and understanding in general practice, particularly with regard to its responsibilities to meet the rights of Māori and Pacific peoples to excellent healthcare and outcomes. Finally, as a result of whānau meeting goals there will be a reduction in hospital resource utilisation.

Evaluation and next steps

In 2017 the NHC was awarded a Long-Term Conditions Partnership Research grant (Healthier Lives National Science Challenge Health Research Council and Ministry of

Health³³) to test the effectiveness of Mana Tū. The study is registered with the Australia and New Zealand Clinical Trials Register (ANZCTR registration number 12617001276347) and has ethical approval (HDEC 17/NTB/249). The research is part-way through—recruitment commenced in March 2018 and full results will not be available until 2020.

The funded research project is also distinctive and has four separate studies: (1) a cluster randomised controlled trial with 400 participants across 10 GP clinics, the primary clinical outcome being a reduction in HbA1c at 12 months; (2) qualitative research that explores the implementation process from an indigenous perspective,³⁴ including acceptability, adoption, fidelity, penetration and sustainability; (3) an investigation of the efficiency and cost effectiveness of Mana Tū; (4) qualitative interviews with clients and their whānau regarding their aspirations and how well Mana Tū met them. Each study is conducted over the programme's timeframe of 12 months, and outputs from each inform the other. Additional research regarding the Kai Manaaki, to be undertaken by a PhD student, will provide important information about how they work. With multiple requests to replicate aspects of Mana Tū in other services and programmes around New Zealand, it seemed timely to describe Mana Tū including its rationale and the key components of its unique model of care. However, the implementation of Mana Tū elsewhere is not recommended until the findings from its evaluation are available. The potential to report on wider benefits including a focus on the health of the population, enhanced patient experience and control of rising costs is worth noting. The tensions associated with these principles have been raised in a number of programmes for the management of long-term conditions and diabetes across New Zealand and with other indigenous populations,^{35,36} and though many pilots are successful,³⁷ challenges are faced in scaling them up or transferring them to other contexts. The researchers plan to contribute to these critical knowledge gaps by gaining a better understanding of the features that make Mana Tū successful; and leading the development of strategies for scaling them up. We look forward to reporting the outcomes in 2020.

Competing interests:

Mana Tū is a foundation project of the Long-Term Conditions research funding partnership between Healthier Lives - National Science Challenge, Health Research Council of NZ and the Ministry of Health. Dr Matire Harwood's salary as principal investigator for Mana Tū is funded by this grant.

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<http://www.nzma.org.nz/journal/read-the-journal/all-issues/2010-2019/2018/vol-131-no-1485-9-november-2018/7742>

REFERENCES:

1. Ministry of Health. Living Well with Diabetes: A plan for people at high risk of or living with diabetes 2015–2020. Ministry of Health, Wellington 2015.
2. Herman WH, Zimmet P. Type 2 diabetes: An epidemic requiring global attention and urgent action. *Diabetes Care*. 2012; 35:943–944.
3. Coppell KJ, Mann J, Williams SM, et al. Prevalence of diagnosed and undiagnosed diabetes and prediabetes in New Zealand: findings from the 2008/09 Adult Nutrition. *The New Zealand Medical Journal*. 2013; 126(1370).
4. New Zealand Guidelines Group. Guidance on the management of type 2 diabetes 2011. New Zealand Guidelines Group, Wellington 2011.
5. Cram, F. Improving Māori Access to Diabetes Healthcare: Literature Review. Prepared for the Ministry of Health, Wellington 2014.
6. Kenealy T, Orr-Walker B, Cutfield R, et al. Does a diabetes annual review make a difference? *Diabetic Medicine*. 2012; 29(8):e217–22.
7. Ministry of Health. Equity of Health Care for Māori: A Framework. Ministry of Health, Wellington 2014.
8. Ministry of Health. 2014. The Guide to He Korowai Oranga – Māori Health Strategy. Wellington: Ministry of Health.
9. Ellison-Loschmann L, Pearce N. Improving Access to Health Care Among New Zealand's Maori Population. *American Journal of Public Health*. 2006; 96(4):612–617.
10. Rangihuna D, Kopua M, Tipene-Leach D. Mahi a Atua: a pathway forward for Māori mental health. *The New Zealand Medical Journal*. 2018; 131(1471).
11. Reid P, Paine SJ, Curtis E, et al. Achieving health equity in Aotearoa: strengthening responsiveness to Māori in health research. *The New Zealand Medical Journal*. 2017; 130(1465):96–103.
12. Ministry of Health. New Zealand Health Strategy: Future Direction. Ministry of Health, Wellington 2016.
13. Sheridan NF, Kenealy TW, Connolly MJ, et al. Health equity in the New Zealand health care system: a national survey. *International Journal for Equity in Health*. 2011; 10:45.
14. Marmot M, Friel S, Bell R, et al. on behalf of the Commission on Social Determinants of Health. Closing the gap in a generation: health equity through action on the social determinants of health. *The Lancet*. 2008; 372(9650):1661–1669.
15. Came H, Doole C, McKenna B, et al. Racism in public health contracting processes in New Zealand: Findings of a nationwide survey. *Social Science and Medicine* doi: 10.1016/j.socscimed.2017.06.002.
16. Paine S, Harris R, Stanley J, et al. Caregiver experiences of racism and child healthcare utilisation: cross-sectional analysis from New Zealand Archives of Disease in Childhood Published Online First: 23 March 2018. doi: 10.1136/archdischild-2017-313866
17. Anderson P, King J, Moss M, et al. Nurse-led school-based clinics for rheumatic fever prevention and skin infection management:

- evaluation of Mana Kidz programme in Counties Manukau. *The New Zealand Medical Journal*. 2017; 129(1428):37–46.
18. DeSalvo KB, O'Carroll PL, Koo D, et al. Public Health 3.0: Time for an Upgrade. *American Journal of Public Health*. 2016; 106(4): 621–622.
 19. McDermott RA, Schmidt B, Preece C, et al. Community health workers improve diabetes care in remote Australian Indigenous communities: results of a pragmatic cluster randomized controlled trial. *BMC Health Services Research*. 2015; 15:68.
 20. Kim K, Kim MT, Lee HB, et al. Community Health Workers versus Nurses as Counsellors or Case Managers in a Self-help Diabetes Management Programme. *American Journal of Public Health*: 2016; 106(6): 1052–1058.
 21. Thomas SL, Zhao Y, Guthridge SL, Wakerman J. The cost-effectiveness of primary care for Indigenous Australians with diabetes living in remote Northern Territory communities. *Medical Journal of Australia*. 2014; 200(11):658–662.
 22. Harwood M, Weatherall M, Talemaitoga A, et al. Taking charge after stroke: promoting self-directed rehabilitation to improve quality of life—a randomized controlled trial. *Clinical Rehabilitation*. 2012 Jun; 26(6):493–501.
 23. Dennis CL. Peer support within a healthcare context: a concept analysis. *Int J Nurs Stud*. 2003 Mar; 40(3):321–22.
 24. Gardner KL, Dowden M, Togni S, Bailie R. Understanding uptake of continuous quality improvement in Indigenous primary health care: lessons from a multi-site case study of the Audit and Best Practice for Chronic Disease project. *Implementation Science*. 2010; 5:21.
 25. Gibson O, Lisy K, Davy C, et al. Enablers and barriers to the implementation of primary health care interventions for Indigenous people with chronic diseases: a systematic review. *Implementation Science*. 2015; 10:71.
 26. Kodner DL, Spreeuwenberg C. Integrated care: meaning, logic, applications, and implications – a discussion paper. *Integrated Care*. 2002; 2(4).
 27. Walker RJ, Williams JS, Egede LE. Influence of Race, Ethnicity and Social Determinants of Health on Diabetes Outcomes. *Am J Med Sci*. 2016; 351(4):366–73.
 28. Benatar J, Armstrong N, Cameron D, Harbour E. Improving Engagement with Healthcare Using a Whānau Ora Approach- a Case Report. *Heart and Lung Circulation*. 2016; 25 (suppl 1):S35.
 29. Doolan-Noble F, Smith D, Gauld R, et al. Evolution of a health navigator model of care within a primary care setting: a case study. *Australian Health Review*. 2013; 37(4):523–528.
 30. Harwood M, Weatherall M, Talemaitoga A, et al. An assessment of the Hua Oranga outcome instrument and comparison to other outcomes measures in an intervention study with Māori and Pacific people following stroke. *NZMJ* 2012; 125(1364).
 31. Singla M, Jain NP, Chaudhry R. Correlation of type 2 diabetes mellitus with perceived stress and family functioning. *Thieme Diabetologie und Stoffwechsel*. 2018; 13(S 01):S20–S21.
 32. Manderson B, McMurray J, Piraino E, Stolee P. Navigation roles support chronically ill older adults through healthcare transitions: a systematic review of the literature. *Health and Social Care in the Community*. 2012; 20(2):113–127.
 33. Health Research Council. Major push to tackle diabetes with \$5.7m research funding. February, 2017. Retrieved from <http://www.hrc.govt.nz/news-and-media/news/major-push-tackle-diabetes-57m-research-funding>
 34. Oetzel J, Scott N, Hudson M, et al. Implementation framework for chronic disease intervention effectiveness in Māori and other indigenous communities. *Global and Health* 2017; 13(69).
 35. Zhao Y, Connors C, Lee AH, Liang W. Relationship between primary care visits and hospital admissions in remote Indigenous patients with diabetes: A multivariate spline regression model. *Diabetes Research and Clinical Practice*. 2015; 108(1):106–12.
 36. Segal L, Nguyen H, Schmidt B, et al. Economic evaluation of Indigenous health worker management of poorly controlled type 2 diabetes in north Queensland. *Medical Journal of Australia*. 2016; 204(5):196.
 37. Carswell P. Te Whiringa Ora: person-centred and integrated care in the Eastern Bay of Plenty, New Zealand. *International Journal of Integrated Care*. 2015; 15(6).