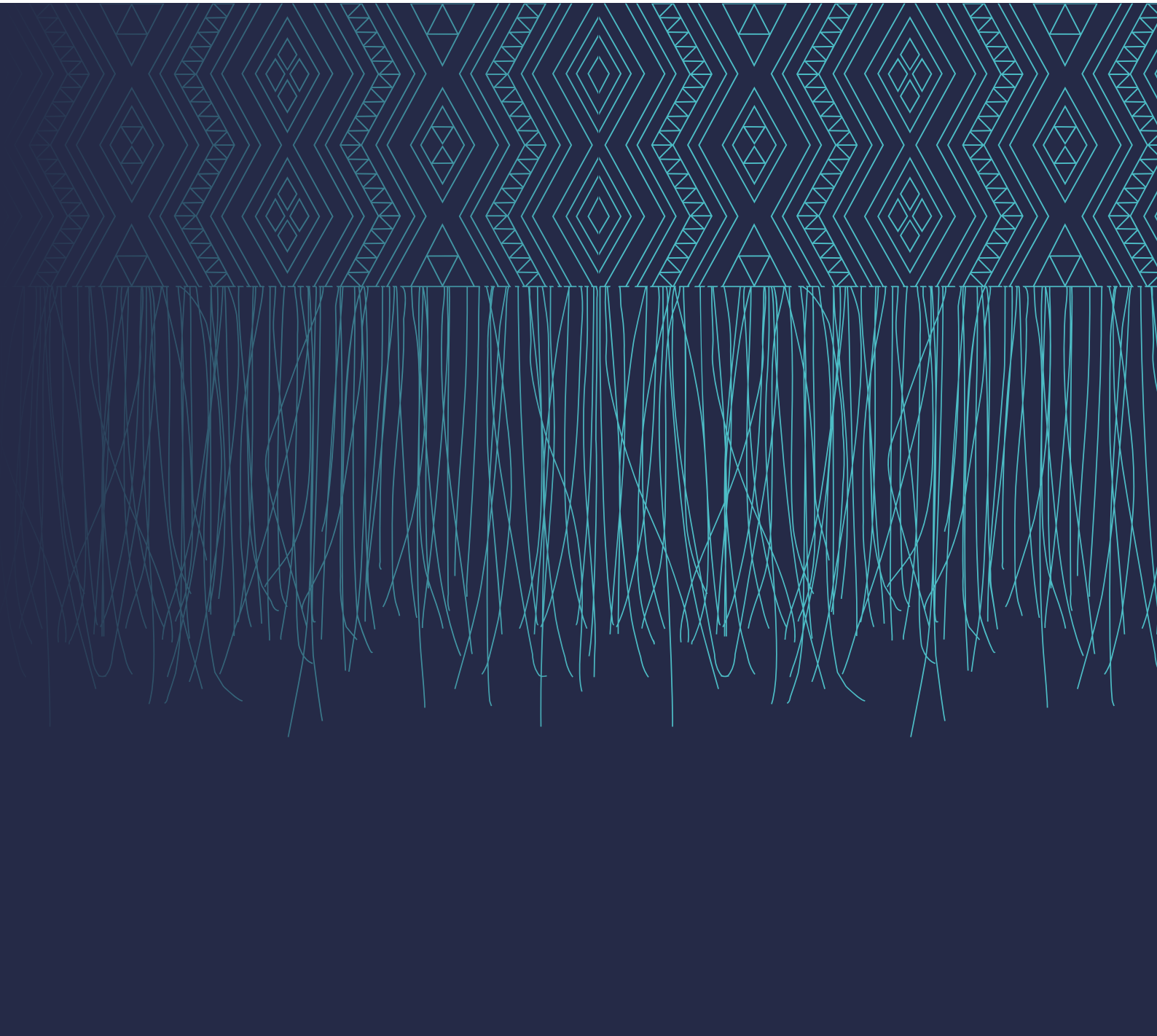
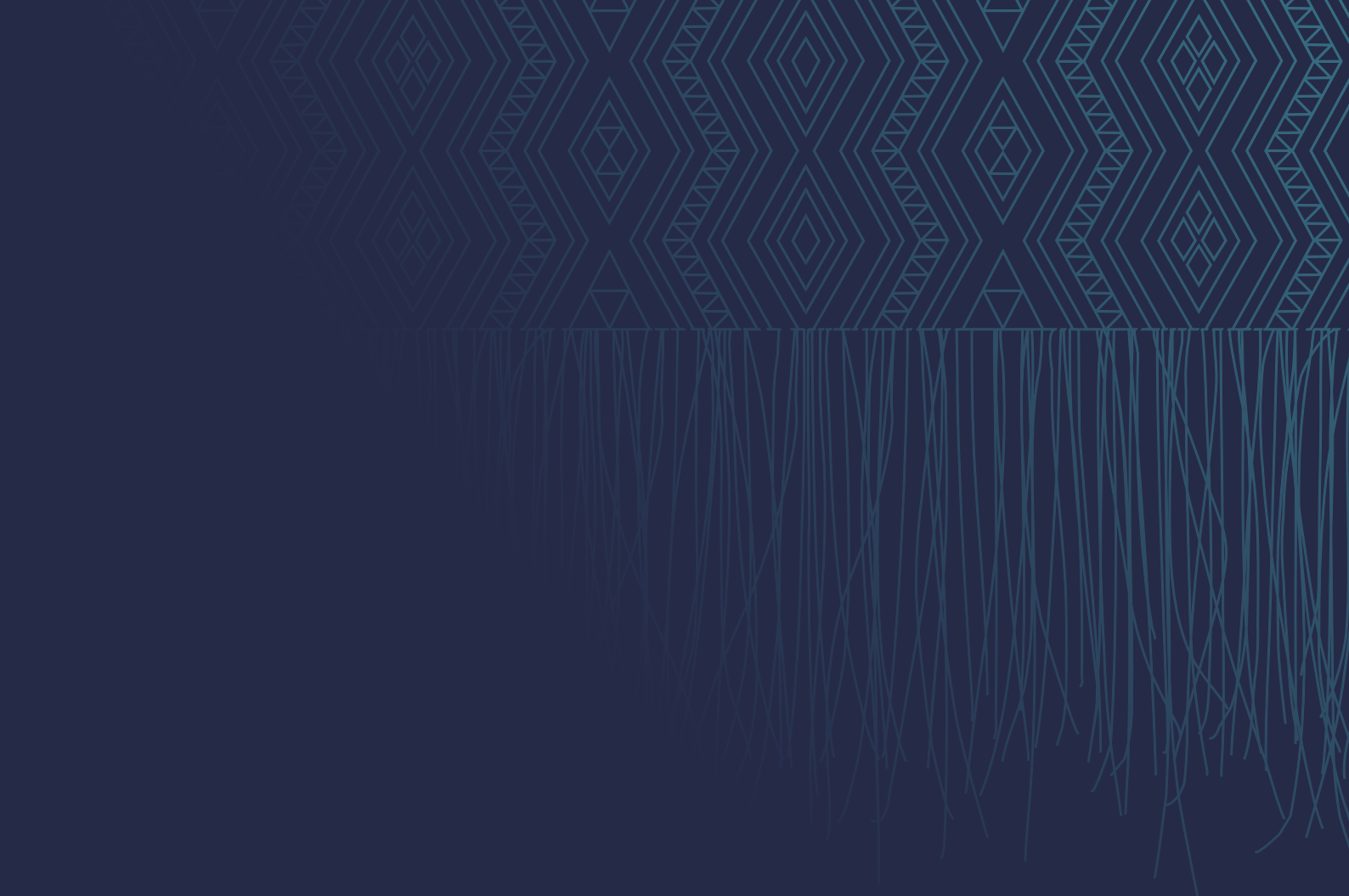


# Evaluation of two tools used for waitlist prioritisation for planned care in Health New Zealand – Te Whatu Ora

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The Review Panel and Technical Working Group recognise their own diverse experiences, expertise and positionalities that they collectively bring to this Review. The methodology adopted by the Review Panel utilised generic public health and analytical tools. Alternative methodological approaches, such as critical epidemiological and public health positioning, kaupapa Māori evaluation<sup>1</sup>, the application of kaupapa Māori or Pacific ethical frameworks, disability or other lenses may have led to different, but equally valid conclusions and recommendations.

These approaches were outside the scope set by this Health NZ commissioned review, but could add strength to any future work in this space.

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- the authors of the commissioned reports, and
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# 1. Executive summary

## 1.1. What was this Review about?

This is a report on the evaluation of two separate tools used in the process of waitlist prioritisation in Health New Zealand – Te Whatu Ora. One tool was developed in Auckland Te Toka Tumai district and expanded to Northland Te Tai Tokerau in the Northern region. The other tool was developed in the Southern district and only deployed there. The Review was commissioned by the Chief Executive of Health NZ in June 2023. An independently chaired Review Panel and Technical Working Group were established to undertake the evaluation from August 2023. This report outlines the evaluation of the waitlist prioritisation tools and considers implications for future use of such tools. Key questions the Review Panel considered are outlined in the Terms of Reference. The sections below outline the Review Panel responses to the Review questions.

## 1.2. How do the tools fit within the broader context of prioritisation and approaches to addressing health equity?

Publicly funded health systems and services are inevitably subject to resource constraints. The prioritisation of health spending is therefore a central function of any health system, in Aotearoa New Zealand as in all other comparable countries.<sup>2,32,3</sup> Priority-setting, or prioritisation, occurs when there is more demand for a service than can be supplied within available resources (funding and workforce), for example waiting lists for the management of the timeliness of planned (non-acute) care. Other comparable countries are also challenged by prioritisation in the context of increasing demand and inequities evident in access to timely care, particularly post COVID-19.<sup>4-7</sup>

Prioritisation is routinely applied explicitly and implicitly in a range of approaches in healthcare from allocation of funding to clinical priority, in Aotearoa New Zealand as in all other comparable countries.<sup>2,32,3</sup> All approaches to explicit priority-setting require the identification of criteria or principles that are to be used to guide decision-making, and justification of those criteria. In all approaches to developing priority-setting criteria, notions of 'need' and 'equity' are central. Indeed the Pae Ora (Healthy Futures) Act 2022 requires Health NZ to take equity into account.

Prioritisation approaches include both implicit individual clinical decisions, balancing patient harm and ability to benefit, and explicit guidelines, clinical pathways, eligibility criteria, services/interventions that are targeted or specifically funded (including co-payment requirements), strategies and broader health funding allocations. While prioritisation within the health system has been occurring for many years, there has been little formal measurement or transparency around how such interventions relatively advantage or disadvantage various subgroups.

The waitlist prioritisation tools are an example of an explicit local (service) level adjustment mechanism in one small part of the planned care decision-making pathway. The care pathway begins with the recognition of early symptoms/signs and ends with the completion of post-surgical care or ongoing care management.

### 1.3. What was the rationale for the application of the tools?

Throughout the evaluation the Review Panel was presented a range of evidence of substantial variation in waiting list management across the country, within districts/regions, and between services (for an example, see Appendix 4).<sup>8-10</sup>

The nature and impact of status quo prioritisation tools and approaches, which may contribute to this variation, are not necessarily transparent or well understood; applying a similar level of evaluation scrutiny to the status quo tools (for example the Clinical Priority Assessment Criteria (CPAC)) was outside the scope of this Review.

The outcome of the status quo systems and processes are not neutral; there is a large and robust body of evidence demonstrating that inequities are present at each stage of the broader planned care pathway, with Māori and Pacific people particularly disadvantaged (see the literature review outlined in Section 5). There are also many examples in this section outlining inequity between socio-economic groups, and between those living in rural areas and those living in urban settings.

The inequities identified across the care pathway are sited within the context of broader health system inequities, and inequities in the determinants of health.<sup>11,12</sup> These broader inequities have impacts at each stage of the care pathway, from the differential risk of developing disease, to the impact of comorbidity on access to treatment and outcomes, in addition to differences in access to both primary/community and hospital care, the quality of care received and the outcomes of this care.<sup>10,13-26</sup>

## 1.4. What are the technical aspects of the tools (inputs into the model), how have the tools been applied, and are they effective?

An adjustor tool was developed approximately three years ago as an internal service initiative in a single Auckland Te Toka Tumai surgical service. The initial adjustor tool was developed as a technical refinement to a previous partially implemented priority-setting approach undertaken during COVID-19. Supported by the Northern Region Planned Care Group, the tool was adapted and refined and was gradually extended to other surgical services and then to all planned care in Auckland Te Toka Tumai. Later, the same tool was adapted and deployed in Northland Te Tai Tokerau in two surgical specialties. The tool was considered, with local work undertaken, but was not deployed in Counties Manukau and Waitematā districts (the other two districts in the Northern region). The Northern tool referred to in this report was therefore fully deployed in one district and partially deployed in a second district in the Northern region.

More recently a similar waitlist prioritisation tool was developed independently in the Southern region. The Southern tool had a similar rationale and application. It was not deployed in any other district in the South Island Te Waipounamu. Both tools are still in use, although no further roll-out of the tools has occurred since June 2023. Prior to this Review, neither tool has been formally evaluated.

The original purpose of the tools was to address known inequities in one step of a much longer care pathway; the timeliness from decision to operate to the date of surgery, through earlier patient engagement, booking and scheduling of elective procedures. In Auckland Te Toka Tumai, the tool was extended to timeliness to First Specialist Appointment (FSA) and to all planned care with the same rationale.

The tools are both a form of score-based algorithm applied to individuals resulting in ordering of the pool of individuals who are placed on planned care waiting lists according to the scores. The Northern tool currently in use includes multiple components in score calculation, including:

- Clinical specialty
- Clinical priority group (surgical priority category; P1-4)
- Days already waited since being placed on the waiting list
- Ethnic group<sup>27</sup>
- Socio-economic deprivation (NZDep decile)<sup>28</sup><sup>i</sup>
- Residence in a metro Auckland or non-metro Auckland location<sup>ii</sup>

Similarly, the Southern tool also includes multiple components:

- Acuity (surgical priority category; urgent, semi-urgent or routine)
- Socio-economic deprivation (NZDep decile)<sup>28</sup>
- Prior emergency department attendance (ED) or rurality
- Ethnic group<sup>27</sup>

i. It is important to note that NZDep estimates relative socio-economic deprivation averaged for aggregated groups of people living in specific geographic areas, not the deprivation experienced by individuals. Therefore, it is likely to be a less accurate measure when applied to individuals.

ii. Individuals residing in a location outside of metro-Auckland (i.e. all patients living in Te Tai Tokerau Northland or those on a Northern region waiting list but living in districts outside of the Northern region).

Initially the waitlist prioritisation tools were applied in a narrow window after a patient has had a CPAC score applied. CPAC is the primary approach to prioritisation in the current system. CPAC is a scoring approach undertaken by the treating clinician usually at the FSA. There are generic CPAC tools and service/procedure specific CPAC tools. CPAC includes assessment of clinical and social factors as part of consideration of an individual patient's ability to benefit and their relative priority from which a resulting surgical priority categorisation is applied when they are placed on the waiting list. The priority categorisation is a Priority (P) score, with P1 indicating urgent or cancer diagnosis, and P2-4 indicating semi-urgent or routine categorisation. P score categories are associated with an anticipated wait time for receipt of care/procedure. There is known variation between districts and across the country in the application of CPAC scores, the determination of priority categorisation, and the thresholds for placing patients onto waiting lists.

The initial adjuster tools result in score-based ordering of the waiting list after CPAC scoring i.e. after clinical decision-making, to offer a procedure and after the placement of patients on the waiting list according to their priority category. Services are then encouraged to book patients using the ordered waiting list, when they reach the 'booking threshold' score, where patients are contacted and provided a date and time for their procedure; this booking threshold score is adjusted by service management based on service-specific capacity.

Therefore, it is important to note that the tool score influenced the timeliness of *being contacted* for booking, but did not explicitly address the timeliness of the procedure or appointment itself. Clinical and service 'over-ride' is allowed in both tools. Tool use is not enforced or required by services.

In the Southern tool, after initial adjustment to the weightings within the tool, there were no further changes made. In the Northern region, the tool was developed and refined iteratively. Adaptations included the variables used within the tool, the parameter weights, and service-specific starting scores. Regular manual refinement and intervention to the tool application is undertaken by analyst and management staff.

Of note, a range of other interventions to improve waiting times overall, and reduce inequities, were also deployed in parallel with the tool. In addition, a range of activities were commenced during COVID-19 and were continued, as well as the requirements of the July 2022 Planned Care Taskforce Report, which included a number of recommended actions to reduce inequities, alongside actions to reduce those waiting longer than 365 days.<sup>29</sup>

After assessing the range of information provided, the Review Panel was not able to determine whether the tools were effective at reducing inequities. The reasons the Review Panel could not make this assessment include:

- The Northern and Southern tools were implemented as just one component of a range of initiatives to improve delivery of planned care during and following the COVID-19 pandemic. The range of initiatives implemented prior to, and throughout the tool development and deployment period, makes it impossible to assess the causal effectiveness of the waiting list prioritisation tools as a single intervention. The Review Panel noted that most staff interviewed felt the tools had been effective within the package of other initiatives implemented. Local data presented to the Review Panel indicated variable findings on waiting time improvements by tool parameter, with some indications of improvement, although improvements were also seen prior to tool deployment in several instances (noting the other interventions occurring in parallel), and no improvement was seen in other assessments.
- The tools themselves were also developed and implemented in a COVID-19 enabling environment of rapid-test projects and an urgency to address worsening inequities in a number of areas of planned care, rather than a more usual process of project or planned quality improvement approach with pre-determined outcome measurement. The Review Panel was unable to quantify the impact on effectiveness of the tool as the data was not collected during the tool development or deployment, and no ongoing systematic audit of the tool was put in place at its introduction.

- The tool developers did not document their process for development, and in the Northern region the timing and type of adaptations and refinements and potential impacts were also not documented. The Review Panel undertook in-person meetings and several follow-up requests for written information with both sites to provide sufficient clarity to enable a written description of the tools.
- The Review Panel was also unable to quantify other relevant issues that influence the referral and waitlisting process such as surgical need, unmet need and systemic barriers to accessing healthcare.

### **1.5. What are the implementation considerations including service impacts, patient support, training, communications, ethical and legal aspects?**

Although meaningful interpretation of any longitudinal trends in elective planned care procedure and waiting list data before and after introduction of the tools was not possible, other co-benefits were articulated by staff involved with the waitlist prioritisation tools. Themes distilled from those interviewed relating to these co-benefits included: having a common vision, improving the systematisation of approaches to waitlist management, transparency of the waitlist across different staff and services, equity education opportunities, engagement of some key Māori and Pacific staff in leadership of the improvement activities, resource for navigation support, and explicit consideration of barriers including transport. In contrast to this, there was also critique of the tool development process that there was insufficient involvement of experts, including Māori and Pacific clinical, algorithm and prioritisation experts, lack of socialisation, lack of consumer involvement and limited communication.



Rights to health enshrined in international agencies (such as the World Health Organization) and international agreements (such as the United National Declaration on the rights of Indigenous People), Te Tiriti o Waitangi and New Zealand law mean that Health NZ is not only justified but is obliged to take action to achieve equity in health outcomes for Aotearoa New Zealand's population groups. The Pae Ora (Healthy Futures) Act 2022 (Pae Ora Act) effective from 1 July 2022, has as one of its purposes the aim to "achieve equity in health outcomes among Aotearoa New Zealand's population groups, including by striving to eliminate health disparities, in particular for Māori." The Pae Ora Act gives express effect to Te Tiriti o Waitangi, outlining health sector principles which, among other things, require Health NZ to "improve hauora Māori outcomes", and ensure Māori and other population groups "have access to services in proportion to their health needs; receive equitable levels of service; and achieve equitable health outcomes."

It is well established in international and domestic law that special measures designed to attain equity between groups, by assisting groups disadvantaged by unlawful discrimination, do not themselves constitute unlawful discrimination. The New Zealand Bill of Rights Act 1990 (NZBORA) states "measures taken in good faith for the purpose of assisting or advancing persons or groups of persons disadvantaged because of discrimination do not constitute discrimination." That provision is also reflected in the Human Rights Act 1993.

However, that position is not unqualified. Both NZBORA and the Human Rights Act require that any measures adopted to attain equity must be rational and proportionate to the identified disadvantage. It is therefore important that any measures implemented

by Health NZ are appropriately designed and underpinned by research and evidence and are monitored and regularly evaluated to ensure they remain appropriate and effective.

### **1.6. Are there unintended consequences or potential harm related to the application of the tools, including disadvantage/impacts on others on the waiting list?**

The Review Panel found assessment of harm challenging. Safety and harm data is routinely collected in hospital systems across a variety of indicators; however, assessment of harms occurring on waiting lists is not routinely assessed outside of the measurement of waiting times. In terms of harms relevant to waitlist prioritisation tools, the Review Panel considered the following potential harms: denial of care or treatment; lesser standard of care; and death, worsening of condition, pain or distress due to longer waiting times.

All of the potential harms noted above may occur in the status quo. It is the task of clinicians and hospital managers to actively manage the waitlist to mitigate these potential harms and keep waiting times within generally accepted priority category parameters. The Review Panel considered there to be clear evidence that longer wait times disproportionately impacted some groups (Māori and Pacific patients, those from areas of high socio-economic deprivation, and those in rural/remote settings), and that these inequities worsened during COVID-19. There was also clear evidence of inter-district variation in waiting times and related processes resulting in differential harms. The current state is therefore not neutral in the receipt of timely surgery or the harm of longer waiting times.

As noted above, the Review Panel was unable to determine the effectiveness of the tools, particularly related to the parallel implementation of a range of other interventions. While redistribution (ordering) of the waiting lists did occur, likely changing the distribution of waiting times and therefore potential harms, the Review Panel was unable to make any assessment of the impact of the tools on individuals or groups in terms of potential or actual harms. There was no evidence of denial of care or lesser standard of care occurring.

One key aspect considered by the Review Panel was whether people in particular clinical priority groups may receive their procedure ahead of those in a higher clinical priority group (e.g. some individuals in P4 category receiving care ahead of others in a P3 category). This was also difficult to assess. Tool parameter settings have been set and altered over time with the intention that an individual in a lower clinical priority category will not score higher than an individual in a higher clinical priority category who has waited the same number of days. Some specific adjustment has been required when patient cohorts crossed, and manual mechanisms were reportedly put in place to identify, review and avoid these occurrences.

The algorithmic components of both tools were developed through primarily stakeholder understanding of known inequities alongside local analyst and clinical expert opinion. Neither tool was derived from local statistical data. Scoring-parameters were not set using service-specific data for that parameter, nor was the refinement process informed by measuring improvements in specific data variables.

Expert biostatistical or epidemiological support was not sought, although some local clinicians with academic interests were involved. The conclusion of the Review Panel and Technical Working Group, particularly noting lack of data-derivation, was that neither waitlist prioritisation tool was developed according to best practice algorithm development. This means that the tools have the potential to be ineffective in addressing specific equity parameters, and may alternatively have the potential to introduce risk, where score values do not accurately reflect the association of those factors with waiting list duration.

### 1.7. What is the oversight of the tools?

Both the Northern and the Southern tool were considered and overseen by a number of project and governance mechanisms, including existing hospital management and specific planned care local and regional governance. There was discussion and consideration through the governance groups of examination of local data related to the tools, and roll-out considerations, including the consideration of an evaluation prior to roll-out in the Northern region (although this was not progressed prior to this Review). Specific consideration did not appear to have been given to the legal, ethical, technical (algorithm development best practice, effectiveness or harm assessment), or public transparency implications of tool deployment.



## 1.8. Are there other equity tools in use across Health NZ ?

A stocktake was conducted by the Review Panel, building on earlier work, to consider whether other similar tools were in use across Health NZ related to planned care waiting list management. The Review Panel found that inequity was a focus in all districts and regions, and that many had considered specific interventions including equity adjustment in various forms, however no other regions had deployed a waitlist prioritisation tool.

## 1.9. Other Review Panel observations

### Urgency and equity championship alongside due diligence

The Review Panel noted that the nature of the tools (algorithms applied to waitlists) was novel, and as such requires due diligence activities such as consideration of legal, ethical, public and technical best practice development (the issues outlined in this Review). However, the Review Panel also noted the context of the post-COVID-19 rapid worsening inequities in planned care, and the urgency and necessity to address these inequities in a comprehensive way. These concerns were reported internationally post-COVID-19, with a variety of interventions implemented in different jurisdictions.<sup>4</sup> The Review Panel highlighted the importance of action on inequities, across the whole care pathway, and notes the districts that undertook development and implemented the tools were acting as equity champions. This Review offers an opportunity to improve Health NZ's approach to concrete actions to address inequity.

### Equity action at other points in the planned care pathway

In considering actions on inequities, a multilevel set of interventions is usually required. In terms of the planned care pathway, the tool application was only at one narrow point of the care pathway. Interventions to address inequities should be considered across all aspects of the care pathway beyond waitlist adjustment considerations.

### Inter-district variation

The Review Panel saw compelling evidence of inter-district variation across the whole country at a high level, and in detail in the Northern region analysis. The greatest inequities were seen in Northland Te Tai Tokerau and Counties Manukau districts. The site interviews also confirmed that CPAC use, priority categorisation and thresholds for waitlisting for specific procedures varied at the district and service levels. The Review Panel considered action to address inter-district variation, important in parallel with action to address other equity parameters under consideration in the tools themselves and across the wider planned care pathway.

### Alternative interventions

There are likely to have been other potential interventions with the same goal of reducing waiting list inequities, including adaptation of the current CPAC tools and a primary focus on those waiting over 365 days. Some of these interventions occurred in parallel with the tools and some were considered in the development of the tools.

## 1.10. Conclusion

The Review Panel's overall conclusion is that an adjustment tool is legally and ethically justifiable in the context of demonstrable status quo inequities, and further that Health NZ has an obligation to achieve equitable health outcomes for all Aotearoa New Zealand populations. The Review Panel found that the staff and districts undertaking this work did so with strong purpose and rationale, initiating work that was novel in the Aotearoa New Zealand context and that was under conditions of urgency due to the worsening inequities related to COVID-19. The evaluation assessment noted that these approaches could have been strengthened with high-quality data-derivation, and alignment with best practice algorithm development. These improvements could enable the tools to be more effective in addressing specific equity parameters. The Review Panel found no evidence of harm. Further development of waitlist adjustment mechanisms, or future prioritisation approaches seeking to address specific demonstrable inequities, should be undertaken with careful consideration of both appropriate people to be involved from the outset, and use of robust approaches and methodology to determine the technical tool components (for example, numerical weightings).

The approach should be transparent, widely socialised amongst staff and communities, and subject to audit, planned evaluation and continuous monitoring. A potential method is proposed by the Review Panel to outline what a best practice approach might look like for an improved waitlist prioritisation mechanism. The Review Panel noted the importance of the co-benefits of equity interventions for staff, patients and the system, and the utility in capturing these in a future evaluation of an improved tool or other equity approaches, alongside opportunities to improve staff engagement and communication. Consideration should be given to how to appropriately include consumer/public perspectives. Most importantly, the Review Panel recommends that the development and evaluation of waitlist prioritisation tools must explicitly consider them in the context of the much wider care pathway with its multiple equity-related challenges.

## 2. Purpose

An evaluation is a structured assessment of a completed or ongoing activity, intervention, programme or policy to determine the extent to which it is achieving its objectives.

Evaluations are an important part of the broader service development, quality assurance, and quality improvement aspects of healthcare. This evaluation sought to consider the following questions

related to the surgical equity adjustor tools developed and deployed in the Northern region (Auckland Te Toka Tumai and Northland Te Tai Tokerau) and the Southern district:

<b>1</b>	How do these tools fit within the broader context of prioritisation and approaches to addressing health equity?
<b>2</b>	What was the rationale for the application of the tools?
<b>3</b>	What are the technical aspects of the tools (inputs into the model), how have they been applied, and are they effective?
<b>4</b>	What are the implementation considerations including service impacts, patient support, training, communications, ethical and legal aspects?
<b>5</b>	Are there unintended consequences or potential harm related to the application of the tools, including disadvantage/impacts on others on the waiting list?
<b>6</b>	What is the oversight of the tools?

The Terms of Reference for the evaluation are set out in Appendix 1.

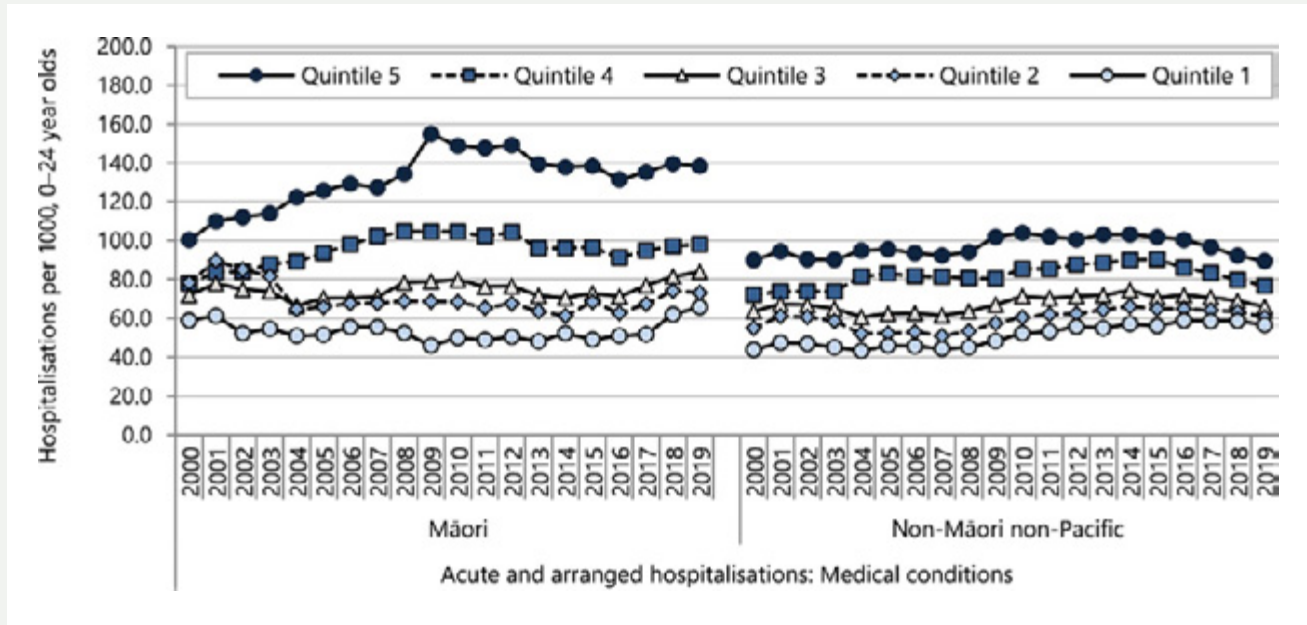
### 3. Health inequities

## Achieving equity is a key priority for the Aotearoa New Zealand health system.

With regards to equity, the Ministry of Health states “In Aotearoa New Zealand, people have differences in health that are not only avoidable but unfair and unjust. Equity recognises different people with different levels of advantage require different approaches and resources to get equitable health outcomes” and that “The Pae Ora (Healthy Futures) Act 2022 puts equity at the heart of the health reforms...Achieving equity includes ensuring Māori and other population groups have access to services in proportion to their health needs, receive equitable levels of service and achieve equitable health outcomes”.<sup>30,31</sup> Equity is also a key focus for Health NZ. “The Equity Work Programme at Health NZ focuses on helping everyone in the health system think about equity when they do their work. It also promotes the cultural change needed for the whole system to reach equity in health outcomes”.<sup>32</sup> While these comments reflect the system’s current unequivocal position on achieving equity, actions to address inequities are not new.

By many measures, Aotearoa New Zealand has a high-performing health system. Our self-rated health score is among the highest in the OECD, life-expectancy is higher than the OECD average, and mortality from the COVID-19 pandemic was comparatively very low.<sup>33,34</sup> However, there is a wealth of evidence that it does not serve all New Zealanders equally well.<sup>35,36</sup> Factors such as where people live, their socio-economic circumstances, and the ethnic group they belong to can result in more or less favourable access to and outcomes from health services. Evidence of these inequities is seen across a wide range of health statistics and in the academic literature. For example, Māori can expect to live seven years and Pacific people five years fewer compared with the total population.<sup>31</sup> Living in rural areas is associated with higher rates of all-cause and amenable mortality for both Māori and non-Māori.<sup>37</sup> Evidence shows that the life expectancy of people living with mental health and addiction issues is reduced by up to 25 years, and this is preventable.<sup>38</sup> Furthermore, health outcomes tend to worsen with increasing socio-economic deprivation. For example, recent studies have shown that ambulatory sensitive dental and medical hospitalisations for children and young people are positively correlated with increasing deprivation.<sup>39,40</sup>

**Figure 1: Trends in Medical-condition hospitalisation rates of under 25-year olds by deprivation and ethnicity, Aotearoa New Zealand 2000–2019**

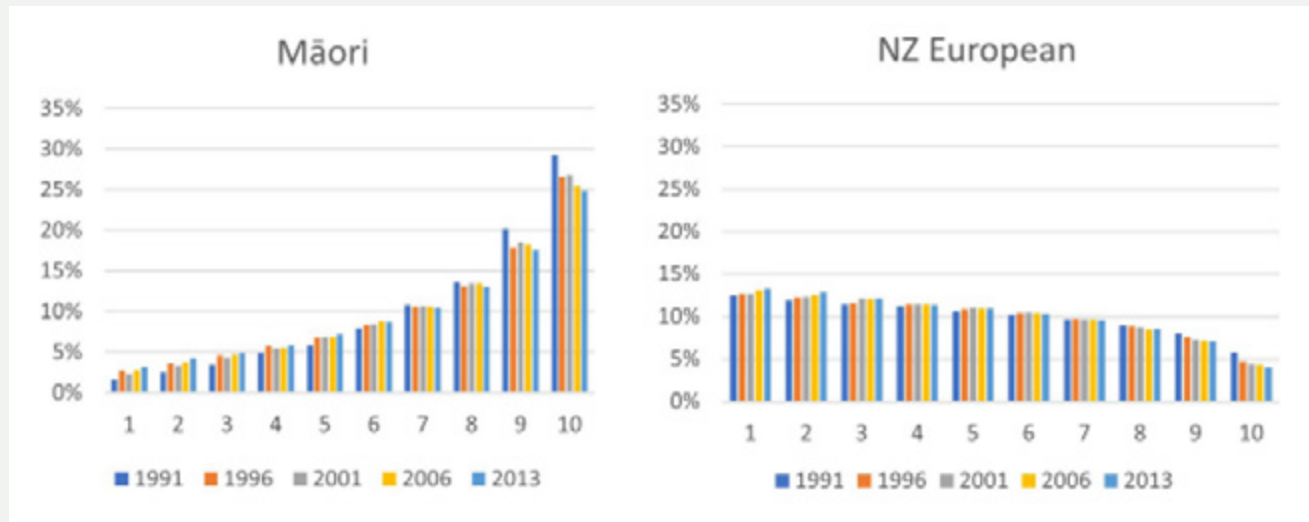


Ethnicity is level 1 prioritised. Rates are age- and gender-standardised. Quintile 1 is least deprived and quintile 5 is most deprived.<sup>40</sup>

There are groups, such as disabled people, who are likely to experience health inequities that are not well-articulated due to a lack of detailed data being routinely collected by the health system. Increasing the visibility of disabled people in health data, research, and evidence as part of an active learning system is identified as a priority area for improvement in the recently released Provisional Health of Disabled People Strategy.<sup>41</sup>

Intersectionality describes the phenomenon whereby some people experience even greater inequity in health outcomes, because they belong to a number of marginalised groups. For example, Māori with bipolar disorder have worse physical health than non-Māori with the same diagnosis.<sup>42</sup> This compounding of marginalisation is not evenly distributed, for example, non-Māori are more likely to live in areas with low socio-economic deprivation.<sup>43</sup>

Figure 2: Māori (left) and NZ European (right) population distributions by NZDep decile, 1991–2013<sup>43</sup>



Yet health inequities experienced by Māori cannot be solely explained by unequal socio-economic distribution.<sup>44–46</sup> Research has shown that unequal access to health services<sup>47</sup>, lower quality of care<sup>26</sup>, and experiences of racism<sup>48,49</sup> within the health system are associated with poorer health outcomes for Māori, independent of socio-economic status.

## 4. Understanding why achieving equity is a key priority for our health system

In publicly funded health systems offering universal access, decisions around how to best allocate finite resources are necessary and unavoidable.

Equity is an important principle to determine how health services should be distributed. Fundamentally, equity is underpinned by societal values, including rights-based and ethical considerations.

### 4.1. Rights to health and freedom from discrimination

Aotearoa New Zealand has committed to several international declarations and agreements that create a framework for the right to health. The Universal Declaration of Human Rights (1948) sets out in Article 25(1) that “Everyone has the right to a standard of living adequate for health and well-being” and specifically includes “medical care” as important to attain this. The International Covenant on Economic, Social and Cultural Rights (1966) provides that State Parties recognise the “right of everyone to the enjoyment of the highest attainable standard of physical and mental health” (Article 12(1)). It then describes steps to be taken to achieve the full realisation of the right, which include those matters necessary for “the creation of conditions which would assure to all medical service and medical attention in the event of sickness” (Article 12(2) (d)). Perhaps most well-known is the right enshrined in the constitution of the World Health Organisation, which provides for the

“enjoyment of the highest determinable standard of health” as one of the fundamental rights of every human being.<sup>50</sup>

In Aotearoa New Zealand, section 3(a) of the Pae Ora (Healthy Futures) Act 2022 describes the Act’s purpose as being “to provide for the public funding and provision of services in order to—

- a. protect, promote, and improve the health of all New Zealanders; and
- b. achieve equity in health outcomes among New Zealand’s population groups, including by striving to eliminate health disparities, in particular for Māori; and
- c. build towards pae ora (healthy futures) for all New Zealanders.”

However, it is recognised that the right to access healthcare may be impacted in the context of a public health system by resource constraints, justifying prioritisation.<sup>51,52</sup> This is reflected in section 7(2)(a) of the Pae Ora Act which expressly recognises the impact of resource constraints on Health NZ’s decision-making. In addition, clause 3 of the Code of Health and Disability Services Consumers’ Rights recognises that quality of care can be reasonably impacted by resource constraints. The Code does not give a right for consumers to access healthcare.



However, healthcare providers must ensure the care they do provide is of an appropriate standard (Right 4), minimises potential harm to them and optimises their quality of life (Right 4(4)). This includes minimising delays for people on waitlists and providing care within acceptable timeframes where possible. Providers should assess and prioritise people on a waitlist appropriately, ensuring prioritisation systems are reasonably fair, effective and free from discrimination (Right 2).<sup>53,54</sup>

Beyond rights to health per se, New Zealanders have a right to be free from discrimination. Article Two of the Universal Declaration of Human Rights provides that everyone is entitled to the rights “without distinction of any kind, such as race colour, sex...national or social origin.” The International Convention on the Elimination of All Forms of Racial Discrimination (1965) provides that State Parties undertake to prohibit and eliminate racial discrimination and “guarantee the right of everyone, without distinction as to race colour or national or ethnic origin, to equality before the law” including in relation to the right to public health and medical care (Article 5).<sup>50</sup>

The rights of disabled people, children and Indigenous groups are specifically recognised in United Nations’ Declaration on the Rights of Disabled Persons, the Convention on the Rights of the Child, and the Declaration on the Rights of Indigenous Peoples (UNDRIP) respectively. In relation to children, Article 24 of the Convention of the Rights of the Child provides “State Parties recognize the right of the child to the enjoyment of the highest attainable standard of health and to facilities for the treatment of illness and rehabilitation of health.”

The Convention goes on to additionally impose on State Parties the obligation to ensure that “no child is deprived of his or her right of access” to healthcare services (Article 24(1)). The United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP) provides in Article 21 that Indigenous peoples have the right to “the improvement of their economic and social conditions, including ... health...”. A right to access “without any discrimination” all health services is set out in Article 24, which also states: “Indigenous individuals have an equal right to the enjoyment of the highest attainable standard of physical and mental health. States shall take the necessary steps with a view to achieving progressively the full realisation of this right”.<sup>50</sup>

The right to be free from discrimination is also present in Aotearoa New Zealand law, including section 19 of the New Zealand Bill of Rights Act 1990; sections 21(1) and 44 of the Human Rights Act 1993; and Right 2 of the Code of Health and Disability Services Consumers’ Rights.

## 4.2. Legal considerations including pro-equity provisions in Aotearoa New Zealand law

Health NZ is required by law to aim for a health sector that is equitable for all population groups.

The Pae Ora (Healthy Futures) Act 2022 (Pae Ora Act) was enacted on 1 July 2022. Prior to the enactment of the Pae Ora Act, a number of reports found significant deficiencies in how the health system served Māori, in particular the Waitangi Tribunal’s Stage one report of the Wai 2575 Health Services and Outcomes Kaupapa Inquiry (Wai 2575).<sup>55</sup>

Section 6 of the Pae Ora Act gives express legal effect to Te Tiriti o Waitangi. It includes a descriptive Te Tiriti o Waitangi clause which outlines specific mechanisms by which Te Tiriti is recognised in the legislation. One of those specific mechanisms is the health sector principles, set out in section 7, which are decision-making principles aimed at “improving the health sector for Māori and improving hauora Māori outcomes”.

One of the three purposes of the Pae Ora Act in section 3 is “to provide for the public funding and provision of services in order to achieve equity in health outcomes among Aotearoa New Zealand’s population groups, including by striving to eliminate health disparities, in particular for Māori.” This purpose covers a range of equity parameters and groups experiencing inequity.

The health sector principles outlined in section 7 of the Pae Ora Act reiterate that mandate, requiring Health NZ to ensure the health sector is equitable. In particular, under section 7(1)(a), Māori and other population groups must “(i) have access to services in proportion to their health needs; and (ii) receive equitable levels of service; and (iii) and achieve equitable health outcomes.”

As outlined in the Ministry of Health 2019 definition of equity, achieving equitable health outcomes may require treating population groups differently. If certain population groups have disparate outcomes when compared to others, there is a legitimate basis for developing and applying measures to remove those disadvantages and ensure equitable outcomes.<sup>30</sup>

It is well established in international and domestic law that special measures designed to attain equity between groups, by assisting groups disadvantaged by unlawful discrimination, do not themselves constitute unlawful discrimination.

Section 19(2) of the New Zealand Bill of Rights Act 1990 (NZBORA) states that “measures taken in good faith for the purpose of assisting or advancing persons or groups of persons disadvantaged because of discrimination do not constitute discrimination.” That provision is also reflected in section 73(1) of the Human Rights Act 1993.

However, that position is not unqualified. Both NZBORA and the Human Rights Act require that any measures adopted to attain equity must be rational and proportionate to the identified disadvantage. It is therefore important that any measures implemented by Health NZ are appropriately designed and underpinned by research and evidence. It will also be necessary to regularly evaluate the measures to ensure they remain appropriate.

### 4.3. Māori rights

For Māori, rights to health are guaranteed by Te Tiriti o Waitangi, and as a public service, Health NZ has a responsibility to support the Crown in meeting its Tiriti obligations.<sup>56</sup> Māori rights to equitable health outcomes have been affirmed by the Waitangi Tribunal. In its Wai2575 Hauora report, the principles of active protection, equity, options, partnership, and the guarantee of tino rangatiratanga were identified as being of particular relevance to health.<sup>55</sup> The Pae Ora Act was intended to give effect to the findings and principles of Te Tiriti identified by the Waitangi Tribunal in the Stage one report of Wai2575, which are reflected in the health sector principles in section 7.

Specifically, Te Tiriti principle of active protection requires the state to act “to the fullest extent practicable” to achieve equitable outcomes for Māori.<sup>55</sup> This is reflected in section 7(1)(e) of the Pae Ora Act, which requires the health sector to “*protect and promote people’s health and wellbeing, including by*

- (i) *adopting population health approaches that prevent, reduce, or delay the onset of health needs; and*
- (ii) *undertaking promotional and preventative measures to protect and improve Māori health and wellbeing; and*
- (iii) *working to improve Mental and physical health and diagnose and treat Mental and physical health problems equitably; and*
- (iv) *collaborating with agencies and organisations to address the wider determinants of health; and*
- (v) *undertaking promotional and preventative measures to address the wider determinants of health, including climate change, that adversely affect people’s health.”*

In addition, Te Tiriti principle of equity requires the Crown to be committed to achieving equitable health outcomes for Māori.<sup>55,51</sup> This is also reflected in the Pae Ora Act, section 7(1)(a):

*“the health sector should be equitable, which includes ensuring Māori and other population groups –*

- (i) *have access to services in proportion to their health needs; and*
- (ii) *receive equitable levels of services; and*
- (iii) *achieve equitable health outcomes.”*

Furthermore, the Tribunal has made observations in previous reports regarding Māori rights to health equity. “The Tribunal in the *Napier Hospital and Health Services Report* stated that, while the principle of active protection does not automatically ‘privilege Māori as a group,’ the existence of significant health disparities requires the Crown to implement positive steps to provide for the pursuit of Māori health equity. The Crown’s obligation of active protection is heightened where ‘adverse disparities in health status between Maori [sic] and non-Maori are persistent and marked’. Thus, in such circumstances, active protection may compel the Crown to target more resources according to need ‘in order to reduce structural or historical disadvantage’. In its inquiry into Tauranga Moana post-raupatu claims, the Tribunal...considered the Crown’s Te Tiriti obligation of active protection with regard to Māori health, and it concluded that the persistent Māori health disparities evident in that inquiry should have compelled the Crown to ‘do all it could’ to achieve Māori health equity. The Tribunal also observed that, given the Crown’s knowledge of the persistence of Māori health disparities since the mid-twentieth century, it would be reasonable in Te Tiriti terms to expect the Crown to implement positive steps to reduce those disparities.<sup>55</sup> This has been Parliament’s intention and expectation of Health NZ, in the purpose of the Pae Ora Act and health sector principles as outlined above.

#### 4.4. Ethical principles related to health equity

Considerations of justice or fairness are invoked when goods or services are distributed between individuals (distributive justice). Equity is a widely recognised ethical value, but efforts to equitably distribute public goods (such as access to healthcare) can be contentious, especially when we can see the effects of the process upon individuals. Where health inequities exist based on where someone lives, their health or socio-economic status, or their ethnic background, fairness requires that resources are allocated to mitigate the effects of an unjust distribution. It is because everyone's health matters equally that it would be wrong to ignore the fact

that some groups have better prospects for enjoying health than others. While any health system must provide for individual needs in a just way – scarcity of resources means that some form of prioritisation is necessary. Prioritisation is important because it determines how long a person must wait to receive treatment, and sometimes it can also determine whether a person receives a given treatment at all. Attempts to correct for existing inequities express a commitment to the equal moral status of all.<sup>50</sup>

Ethical issues relevant to prioritisation, and the equity adjustor tools, which the Review Panel considered in detail, are outlined fully in an expert commissioned report in Appendix 2.

## 5. The robust evidence base demonstrating inequities throughout the care pathway

Good health, and good access to healthcare, are not enjoyed equally in Aotearoa New Zealand.

Health inequities are experienced across a range of domains, and there are marked inequities between ethnicities and across socio-economic status, with inequities, particularly in health service access, also experienced by people living rurally. Therefore, the status quo is not neutral. As illustrated in Figure 3, a person and their whānau must engage with many elements of the health system in order to access, and benefit from, planned care. The planned care pathway is thus a microcosm of the broader system, with the potential for inequities in access, quality of care and outcomes at each step.

### 5.1. Symptom identification, help-seeking behaviour and primary care access

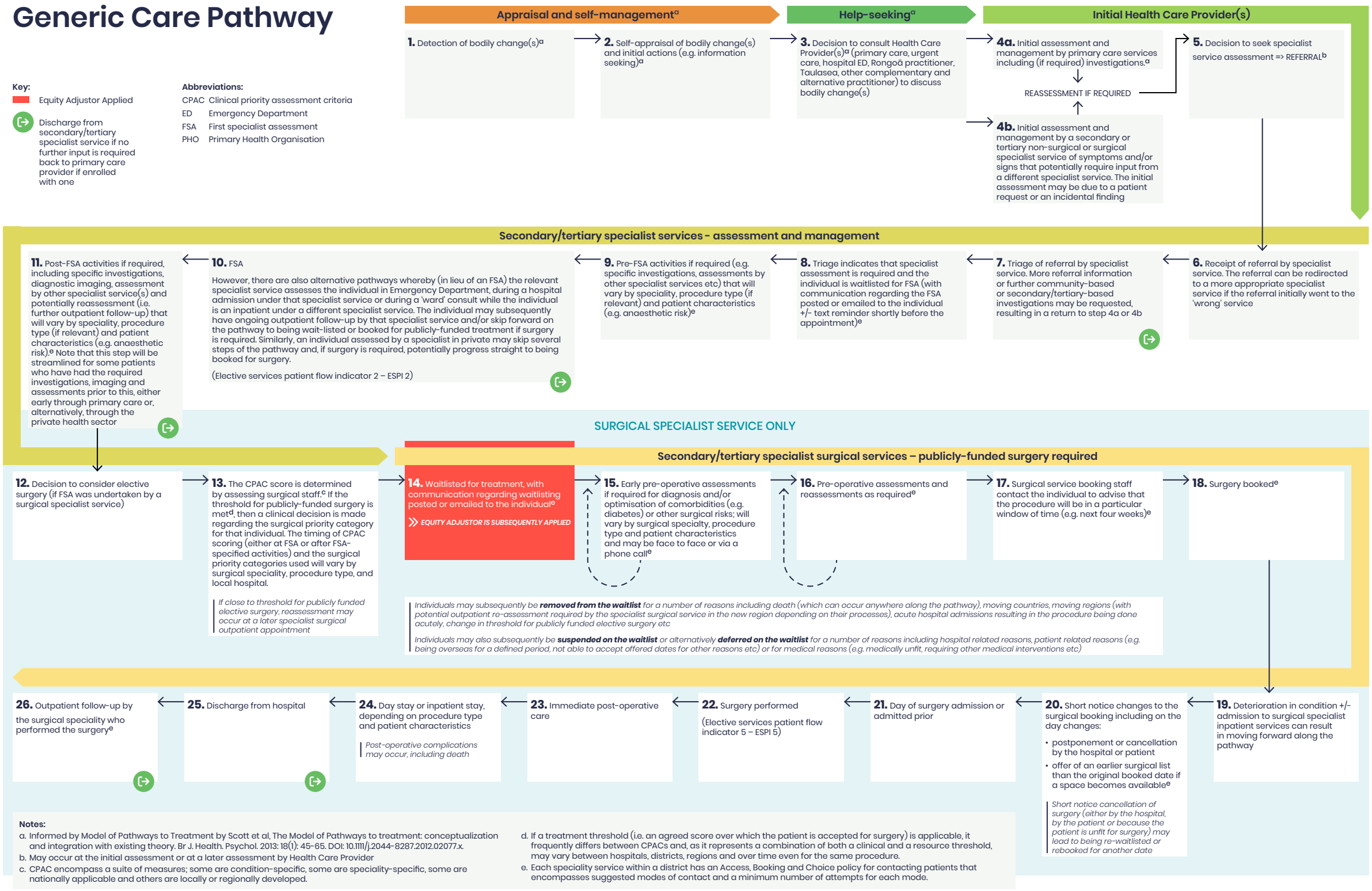
The planned care journey begins when a person who has been experiencing symptoms of concern seeks advice from a healthcare professional. Evidence shows that different societal groups have varied experiences of this initial part of the pathway.

In a study of people with colorectal cancer, concern about symptoms was the most common prompt for healthcare-seeking behaviour, although most participants reported not knowing what their symptoms could represent. Most patients first sought the opinion of a non-healthcare professional (usually a partner or friend) before turning to their general practitioner (GP).<sup>58</sup> The most common barrier to seeking help was patients determining alternative explanations for symptoms experienced.<sup>58</sup> Patients who were younger and those with less formal education were more likely to have a delay between symptom onset and diagnosis, with an indication of greater delay for Māori (although the study was underpowered to determine the strength of this association).<sup>58</sup>

Figure 3: A model for health service engagement along the planned care pathway, and location of the equity adjustor tools on the pathway (red box)

### Generic Care Pathway

- Key:**  
█ Equity Adjustor Applied  
↔ Discharge from secondary/tertiary specialist service if no further input is required back to primary care provider if enrolled with one
- Abbreviations:**  
 CPAC Clinical priority assessment criteria  
 ED Emergency Department  
 FSA First specialist assessment  
 PHO Primary Health Organisation



Graphic created by the Technical Working Group, supported by the Hospital and Specialist Service directorate to ensure that the representation accurately reflects the key care pathway steps. Note that this may not include all pathways to care. Model adapted from<sup>57</sup>

Help-seeking behaviour may be shaped by both individual and system-related factors, including the acceptability and accessibility of care. In the past, delays in help-seeking behaviour have erroneously been blamed on a “cultural reluctance to present for care”.<sup>59</sup> Instead, factors such as patient confidence in health settings and provider behaviours can impact help-seeking behaviour. A lack of confidence in navigating the system can influence a person’s decision to seek help.<sup>60</sup> Experiences of discrimination can also be a barrier to future help-seeking. For Māori women, for example, experience of racial discrimination from a healthcare professional was significantly associated with lower participation in cervical and breast cancer screening.<sup>61</sup> Findings from this study suggest reported experience of racial discrimination both by a healthcare professional and in other settings may influence healthcare use and may be a pathway through which poor health and inequalities result.<sup>61</sup>

As general practice is considered the gateway to diagnosis and treatment, access to primary care is a critical step in the planned care pathway. There is clear evidence of inequities in primary care access in Aotearoa New Zealand. Ambulatory sensitive hospitalisations (ASH) are hospital admissions that are considered potentially avoidable if the person had received disease-preventing or therapeutic interventions in a primary healthcare setting and as such are a proxy measure of primary care access.<sup>31</sup> Among those aged 45–64 years, Māori and Pacific people had the highest ASH rates.<sup>31</sup> For Pacific children, the data indicates that there have been no significant improvements in ASH rates over the last 10 years, while Pacific adult ASH rates have worsened, increasing the gap between Pacific and the total population.<sup>62</sup>

Primary health organisation enrolment is another measure of access. In 2019, approximately 6% of the population was not enrolled with a primary health organisation, with lower rates of enrolment for Māori than NZ European/Other groups.<sup>13,14</sup> Low rates of enrolment with primary care may be associated with poorer health outcomes.<sup>15,63,64</sup> Primary care is not serving all populations equitably, with those of Māori, Pacific, or Asian ethnicity, and those living in the highest deprivation least likely to be satisfied with primary care services received.<sup>65</sup>

The barriers to primary care access are potentially numerous. They may include affordability, availability, acceptability (including service cultural competency) and quality of care. Importantly, these barriers to access do not occur separately but often simultaneously in patients’ and whānau primary healthcare journeys, with effects that may be compounding. It has been noted that the primary healthcare framework does not recognise and properly provide for tino rangatiratanga and mana motuhake of hauora Māori.<sup>47</sup>

Recent evidence examining unmet need due to cost found that approximately one in 10 adults reported not seeing a GP due to cost in the previous 12 months.<sup>66</sup> In 2021/22, those living in the areas of highest deprivation were two-thirds more likely to have unmet need for a GP due to cost than those in the lowest deprivation areas.<sup>66</sup> Māori were almost three times as likely as non-Māori, and those in the most deprived areas almost five times as likely as those in the least, to have not visited a GP because they owed money at the medical practice.<sup>66</sup> In an analysis of eight years of pooled New Zealand Health Survey data, Māori were significantly more likely to report cost as a barrier to primary care than non-Māori.<sup>14</sup>



Other practical barriers to primary care access are experienced inequitably. In the 2021/22 New Zealand Health Survey, Māori were two-and-a-half times as likely as non-Māori to report a lack of transport as a driver of unmet need for GP care, and Pacific people three-and-a-half times more likely than non-Pacific people. Māori were significantly more likely than non-Māori to report unmet need for GP care because they were not able to arrange childcare or care for a dependent adult.<sup>66</sup> For those in waged employment in particular, primary care opening hours present a barrier to access.<sup>67</sup>

Rurality may be a barrier to adequate primary care access, with additional distances travelled presenting time and cost barriers. Assessment of rural primary care accessibility is made more challenging by the fact that people do not necessarily attend their nearest practice, with rural residents demonstrating high rates of closest-GP bypass (that is, not attending their nearest GP).<sup>68</sup>

Cultural bias, racism and lack of cultural competency in primary care are barriers to access, particularly for Māori and Pacific patients.<sup>60,67,69,70</sup> The biomedical Western model of care, which focuses on the individual, may not adequately serve collective, familial health needs. For example, the practical decision-making side of health, illness and healing is a 'family affair' for many Pacific families and patients' family members needed to be involved in their healthcare planning.<sup>56</sup>

Experiences of discrimination affect access. Social assignment as Māori is associated with risk of exposure to differential and discriminatory healthcare.<sup>67</sup> Patients who reported experience of racial discrimination by a healthcare professional were significantly more likely to report that they were not always listened to carefully, that they did not always have information

fully discussed with them, and that they were not always treated with dignity and respect.<sup>72</sup> Discrimination experienced from any member of the primary care team may be important. For example, as receptionists act as gate-keepers to appointments, their unconscious bias in interpersonal communications may act as a potential barrier to access.<sup>73</sup>

There are also inequities in the quality of care received. A study looking at the general practice electronic alert system data in Aotearoa New Zealand found that clinicians appear to take less action on patient management system-generated alerts for Māori and Pacific patients.<sup>74</sup> Further, Māori experience shorter consultation times and are less likely to be referred for specialist review compared with other ethnic groups.<sup>75</sup>

## 5.2. Referral and access to specialist services

In order to access planned care, a decision must be made for a patient to be referred, this referral then accepted and prioritised, and then a first specialist appointment (FSA) booked and attended at which point treatment is determined. There are potentially inequities at each point in this pathway.

Severity of disease at diagnosis or at prioritisation is an indicator of barriers to timely referral, which may represent inequities in access to primary care, but also in referral practices. At prioritisation for cataract surgery, Māori and Pacific patients were younger than NZ European patients, with worse visual acuity.<sup>10</sup> Māori present younger and have worse preoperative functional scores than non-Māori prior to surgery for knee/hip arthroplasty.<sup>76</sup>

Among people with cancer, there are clear inequities in stage at diagnosis. This is important because there is often a relationship between stage at diagnosis and survival outcomes.<sup>77</sup> Late stage at diagnosis accounts for a component of the survival inequities for a number of cancers.<sup>78–80</sup> For some forms of cancer, in particular breast, bowel, cervical and prostate, this is likely to in part reflect differential access to screening.<sup>81,82</sup> Māori are more likely to be diagnosed with later stage disease than NZ European/ Other patients across many cancers, including those that we currently have screening programmes for.<sup>83</sup> In a study of women with invasive breast cancer, even when other factors were controlled for, Māori women were almost twice as likely to have metastatic cancer at breast cancer diagnosis (rather than early stage) compared with NZ European women, and Pacific women almost three times as likely. Patients living in areas of higher deprivation were also more likely to have advanced disease at diagnosis.<sup>84</sup> In a study of men who had a prostate-specific antigen (PSA) test over a 10-year period, Māori men were half as likely to receive PSA testing as non-Māori men, and 73% more likely to have high grade cancer if detected.<sup>85</sup> For breast cancer, there are worse outcomes for rural Māori than urban, with lower rates of screen-detected cancer and greater rates of metastatic disease. However, while stage at cancer diagnosis may contribute to survival inequities for some cancers, the fact that there are not inequities in stage at diagnosis for all cancers, and that survival inequities persist even when stage at diagnosis is controlled for, indicates other factors at play.<sup>83</sup>

Place of diagnosis may also reflect inadequacies earlier in the care pathway. Māori and those living in areas of highest

deprivation are more likely to present with colorectal cancer with more advanced disease and through an emergency department presentation.<sup>86</sup> In a national study of lung cancer registrations over a 12 year period, Māori were 21% more likely than NZ Europeans to have an acute hospitalisation prior to a lung cancer diagnosis, even when controlling for a range of factors including age, rurality, comorbidity and deprivation. Pacific people had 50% higher odds than NZ Europeans of emergency hospitalisation.<sup>87</sup>

There is compelling evidence of inequities in access to specialist services. Māori are more than twice as likely and Pacific patients 40% more likely than NZ European patients to never receive diabetes eye care, even when other factors such as age and area deprivation were controlled for. Those living in the areas of highest deprivation were 50% more likely to have never received diabetes eye care compared to those in the least deprived areas.<sup>88</sup> The proportion of Māori referred late to specialist nephrology services (FSA with nephrologist occurring within 90 days of starting renal replacement therapy) is consistently high and (as at 2018) was not decreasing. Late referral inhibits timely preparation for renal replacement therapy and time to prepare for transplantation. In 2018, 14% of Māori were referred late, compared with 9% Pacific (an improvement for this group), Asian 8% and NZ European 12%.<sup>16</sup>

Discrepancies between expected population need and the proportion of people referred to and seen by a service may be a reflection of both primary care access and referral practices. For cataract surgery, Māori are under-represented in referrals as compared with population prevalence.<sup>10</sup>

When compared with expected numbers based on population statistics and chronic pain prevalence, people of NZ European ethnicity were over-represented in chronic pain clinics, while Pacific people were under-represented by 58%, and Asian by 49%, even though Māori and Pacific patients had significantly more pain, with greater psychosocial impact, than NZ Europeans.<sup>89</sup>

Once referred, Māori wait longer for specialist appointments than non-Māori. More non-Māori are seen within one and four weeks, and more Māori wait for more than three months for an appointment.<sup>17</sup> In the context of lung cancer care, Māori describe delays in referrals for diagnostic procedures and specialist appointments.<sup>90</sup> Māori and Pacific women with breast cancer reported longer delays to seeing a specialist after seeing a primary care provider than non-Māori, non-Pacific women (more likely to wait more than seven days to see a specialist).<sup>18</sup> These delays not only impact the receipt of timely care, but also create a barrier to appointment attendance.<sup>91</sup>

The FSA is a critical step along the planned care pathway, at which key diagnostic and treatment decisions are made. Non-attendance at an FSA may mark the end point of the planned care pathway, or the start of a re-referral loop. Non-attendance reflects failures in appointment accessibility, which are multifaceted. There are examples of inequities in appointment attendance across specialties.<sup>92,93</sup> Almost five percent of those patients referred for endoscopy in the former Auckland and Canterbury District Health Boards between 2012 and 2017 did not attend their appointment. Ethnicity and socio-economic deprivation were both independently associated with non-attendance. Māori and Pacific patients were more than three times as likely to not attend than NZ Europeans, and those living

in the areas of highest deprivation had double the rates of non-attendance than those in the least deprived.<sup>94</sup>

Māori and Pacific patients and those in highest deprivation areas were also less likely to attend ophthalmology appointments.<sup>93</sup> Between 2011 and 2014, 16% of Māori did not attend their specialist appointment, compared with 6% of non-Māori.<sup>17</sup> In a study of Pacific women booked for colposcopy, those living in the areas of highest deprivation were more likely to not attend an appointment than those in the least deprived.<sup>95</sup> In a rheumatology context, Māori and Pacific patients were almost twice as likely to not attend an FSA.<sup>91</sup> Māori are more likely than non-Māori to not attend specialist eye clinic appointments; and nearly twice as likely to never access ophthalmology once referred in one study.<sup>88,96</sup> Those living in the most deprived areas were also almost twice as likely to never access ophthalmology when referred than those in the least, even when other demographic factors were controlled for.<sup>88</sup>

The barriers to accessing a specialist appointment are potentially numerous and are not experienced equally. For example, Pacific (14%) and Māori women (7%) with breast cancer were more likely than non-Māori, non-Pacific women (3%) to report three or more barriers to accessing a specialist appointment. The most reported barriers were cost and the appointment time.<sup>18</sup> While the appointment itself is free, there is potentially considerable cost in attending an outpatient appointment, both in terms of direct costs associated with transport, parking and childcare, as well as the indirect costs to the patient and any whānau members accompanying them in terms of lost wages. For those living rurally, the distance to specialist services means that more substantial costs, both financial and time, are incurred.<sup>97-99</sup>

Māori and Pacific people are more likely to experience deprivation<sup>43</sup>, and in many instances a higher proportion of Māori live rurally than NZ Europeans<sup>37,100</sup>, meaning that the economic impacts are unevenly experienced. In an analysis of those referred who met the threshold for cataract surgery in Waikato, Māori were more likely to have remote access from their referring optometrist, with the driving time and distance 27% longer than for NZ Europeans.<sup>101</sup> Social pressures, including care of whānau members, mean that releasing time to attend appointments may also be difficult.<sup>102</sup>

Access barriers go beyond cost. Inflexibility of appointment times and the scheduling of appointments during working hours are a barrier, particularly if whānau members are also attending in support of the patient.<sup>60,67</sup> There are several system-related factors that may present barriers to Māori and Pacific engagement. A review examining barriers and facilitators for Māori accessing hospital services identified four themes capturing the barriers to access, in addition to the practical barriers described above. These included poor communication from healthcare providers, a hostile healthcare environment, barriers to primary care access and experiences of interpersonal racism.<sup>49</sup> A Eurocentric health system design is potentially alienating, with a focus on a biomedical model and the individual, and where practice and communication may not be culturally appropriate and traditional medicine is typically disparaged.<sup>60,103,104</sup> Under-representation of Māori and Pacific healthcare staff adds to the disconnect.<sup>60,67,105</sup> Distrust of health professionals because of previous negative experiences is a further disincentive to engagement.<sup>102,106</sup> Language barriers, encompassing both verbal and written communication, can be a particular challenge and barrier to health service access for patients with limited English

proficiency or for whom English is not their primary language, affecting the ability to describe health concerns and advocate for further treatment.<sup>107</sup> Pacific people, a population with significant linguistic diversity with more than 16 distinct ethnic groups and languages, may be particularly impacted.<sup>62</sup>

There are, at times substantial, inter-district differences between referral pathways, thresholds and surgical intervention rates for elective surgery.<sup>108</sup> The differences between demographic characteristics of the districts may mean that already-disadvantaged populations are further under-served. For example, patients who received knee and hip joint replacement surgery in Whangārei, a rural hospital in a district with a higher Māori population and more deprivation, were, on average, more functionally impaired and had more severe arthritis on imaging than those at Auckland and North Shore Hospitals.<sup>9</sup> Until recently, districts had set their own CPAC thresholds for cataract surgery. In the metro Auckland region, the threshold to qualify for surgery in Counties Manukau was more than 20% higher than in the neighbouring Auckland Te Toka Tumai Auckland district.<sup>109</sup> Counties Manukau has a larger population of Māori and Pacific people, as well as more areas of socio-economic deprivation.<sup>110</sup>

The tools used to prioritise people for receipt of surgery may themselves disadvantage particular groups. Despite Māori and Pacific patients being younger, having worse visual acuity and more advanced cataracts at prioritisation than NZ Europeans, there was not a significant difference in the scores on the Impact on Life questionnaire, which accounts for 13% of the CPAC score, between Māori and non-Māori patients.<sup>19</sup> This finding is at odds with the inequities in health status at presentation.

There is evidence from other studies that the questionnaire poorly assesses vision-related quality of life. This discrepancy suggests Māori and Pacific may be disproportionately disadvantaged.<sup>19</sup>

There is evidence of inequities in receipt of treatment across specialties. Māori and Pacific patients are less likely to receive live donor and pre-emptive kidney transplantation than non-Māori, non-Pacific patients.<sup>16</sup> Māori were approximately 66% less likely than NZ Europeans to access liver transplant even after adjusting for confounding or mediating factors such as comorbidity.<sup>111</sup> Among patients with newly diagnosed epilepsy, Māori were significantly less likely than patients of other ethnicities to be started on anti-seizure medications immediately, and more likely to remain untreated.<sup>112</sup> In patients with end-stage renal disease, non-Māori patients less frequently receive non-tunnelled (temporary) vascular access when starting dialysis and have lower mortality at three and five years after commencing treatment than Māori, even when comorbidity and demographic characteristics are controlled for. Temporary vascular access is associated with more complications, including lower survival.<sup>89</sup>

Comorbidity and multi-morbidity are inequitably distributed (particularly by ethnicity and socio-economic status) and may lead to inequities in access to treatment.<sup>113</sup> Although there are inequities that persist even when comorbidity is controlled for, disparity in comorbidity is an important mediator of treatment inequities. Among people with stomach and liver cancer, the greater the degree of comorbidity, the lower the likelihood of receiving curative surgery (even after adjusting for factors like ethnicity, deprivation and rurality). Receipt of curative surgery was in turn strongly associated with survival.<sup>114</sup>

The use of an upper limit of BMI for some interventions, diabetic control as measured by HbA1c and treatment qualification decisions based on smoking status can compound inequities in access, particularly where these are not consistently applied across interventions and districts.<sup>29</sup>

Once on the treatment pathway, there are inequities in the timeliness and quality of treatment provided. Māori with rectal cancer waited longer for referral to medical oncologists than non-Māori patients.<sup>115</sup> Māori and Pacific women with breast cancer were more likely to experience a delay in commencement of adjuvant chemotherapy, as were women living rurally. The higher risk for Māori persisted even where deprivation and rurality was controlled for.<sup>116</sup> In another study of women with newly diagnosed invasive breast cancer, while there were not significant differences in the use of chemotherapy between Māori and non-Māori (although the timeliness, appropriateness and completion of treatment were not explored), Māori women were less than two-thirds as likely as NZ European women to receive radiotherapy, and women living more than 100km from the radiotherapy facility were less than half as likely to receive treatment.<sup>117</sup> Even when other factors were controlled for, Māori with colon cancer were less likely to be offered adjuvant chemotherapy and more likely to experience a delay of eight or more weeks until chemotherapy was commenced than non-Māori. There were no differences in the rate at which chemotherapy was declined by the patient.<sup>118</sup> In another study of people with colorectal cancer, Pacific patients were least likely to receive chemotherapy, with Māori and Asian patients also less likely to receive chemotherapy than NZ Europeans, even when other demographic, cancer stage and geographic variables were controlled for. NZ Europeans were also most likely to receive timely chemotherapy.<sup>23</sup>

### 5.3. Surgery and postoperative outcomes

Once accepted for surgery, there is evidence of inequities in the time to receipt of surgery, the nature of the surgery performed, the place of surgery and peri- and postoperative outcomes.

The Planned Care Taskforce Reset and Restore Plan outlined the national waiting list position as at June 2022 – within an overall growth in the number of patients waiting more than 12 months for elective surgery, there was evidence of inequities, with a 53% increase in the number of Māori waiting more than 12 months, compared with a 49% increase overall, and a 20% increase in Pacific patients.<sup>29</sup> This has potential knock-on effects, including deterioration of quality of life, and potentially a deterioration in condition or comorbid conditions impacting on surgery type and outcomes.

The response to the elective surgery backlog that resulted from the suspension of a significant volume of planned care in the early COVID-19 response demonstrates sustained inequities, with care being delivered at a greater volume to those already more advantaged by the system. While the elective surgery shortfall decreased for all ethnicities, Māori and Pacific patients were still experiencing a reduction in the amount of elective surgery volumes compared with before the pandemic.<sup>119</sup> The impact of planned care deferral resulting from the Omicron outbreak has also disproportionately fallen upon Māori and Pacific patients, with the services first to be cancelled (including community dental, ear nose and throat surgery and paediatrics) those with higher numbers of Māori and Pacific patients. Those with comorbidities are more likely to require access to diagnostic services as part of a pre-surgery workup, and so are particularly impacted by delays in access to these services.<sup>120</sup>

There may be variation in the nature of the surgery performed. Māori and Pacific breast cancer patients were less likely to receive breast-conserving surgery compared to other ethnic groups<sup>78</sup> and Māori patients undergoing primary surgery for colon cancer were less likely to undergo extensive lymph node clearance compared to non-Māori patients.<sup>118</sup> Māori men with localised prostate disease were also less likely to be treated with radical prostatectomy compared with NZ European men.<sup>121</sup> Patients being treated for aortic stenosis were less likely to receive minimally invasive Transcatheter Aortic Valve Implantation if they were of Māori or Pacific ethnicity compared to NZ European.<sup>122</sup>

Differences in where surgery is performed, and by whom, both reveal and introduce inequities. There is tension between providing the option of convenient care and that of high-quality care in specialised centres. Receiving surgery closer to home is generally regarded as better for patients (assuming comparable quality) and patient feedback supports this as preferable.<sup>123</sup> However, Māori patients often live farther from main treatment sites<sup>21,114,124,125</sup> and in areas of higher deprivation.<sup>20,21,121</sup> Māori liver cancer patients had to travel farther to primary surgical treatment, spending more time travelling than NZ European patients, enhancing direct and indirect costs to the patient and providing further barriers to care access.<sup>126</sup> Māori cancer patients were more likely to be treated in secondary healthcare facilities<sup>115,118,124</sup> and in some cases less likely to be treated by a specialist surgeon. In the context of stomach cancer, Māori patients (compared to non-Māori) were less likely to have their resection in a main treatment hub and were less likely to have an upper-gastrointestinal surgeon perform the resection, even when the surgery was at a major urban centre.<sup>124</sup>

A proportion of planned care occurs in the private sector, outside the public system. There are inequities in access to private care, some of which is related to differences in access to health insurance. Māori and Pacific adults were less likely to report having health insurance coverage than non-Māori, non-Pacific adults. People with higher income were more likely to have private health insurance than those on low incomes.<sup>127</sup> In general, the private sector provides quicker access to elective surgery, and this introduces additional inequity.<sup>128</sup> There are, for example, inequities in survival between those receiving breast cancer care in private and public. Patients receiving breast cancer treatment (mainly surgical) in public were more likely to be of Māori, Pacific or Asian ethnicity, be older, live in more deprived and rural areas, and less likely to have early stage cancer. This group had almost twice the mortality risk. Much was explained by differences in baseline characteristics, but even when these factors were controlled for, there was still a 14% higher mortality in public. The public group also had a longer time to first treatment after diagnosis.<sup>128</sup> Women receiving breast cancer treatment in private are likely to have more timely surgical treatment than those in public care. The differential access to private treatment between NZ European and Māori women was the primary driver of inequities in treatment delays between these groups.<sup>21</sup>

There is evidence of inequities in perioperative and postoperative outcomes. Māori patients undergoing coronary artery bypass grafting (CABG) at Auckland City Hospital had longer durations of cardiopulmonary bypass and cross-clamp time during their procedure.<sup>20</sup> Operating times for Māori and Pacific patients undergoing thyroid surgery were significantly longer than for non-Māori, non-Pacific patients, even when controlling for other factors.<sup>129</sup>

Of women who require a caesarean section, Māori and Pacific women were a third more likely to receive a general anaesthetic than NZ European/other women and were more likely to subsequently receive a blood transfusion.<sup>130</sup> Further, both Māori and Pacific patients undergoing renal transplantation in Aotearoa New Zealand during 2018 had a higher risk of graft failure.<sup>131</sup> The incidence of postoperative delirium has also been shown to be higher in Māori patients compared to NZ European patients following a surgical intervention under sedation.<sup>132</sup>

There are inequities in postoperative mortality by ethnicity and deprivation. Among those undergoing acute and elective surgical procedures between 2009 and 2013, Māori patients were 60% more likely than NZ Europeans to die within 30 days following an acute or elective procedure with a general anaesthetic. The 30-day mortality after an elective/waiting list hospital admission was also significantly higher for Māori (compared to NZ European) and those living in the most deprived areas compared with the least (NZDep deciles 5–10 compared with 1 and 2). These differences were evident after other socio-demographic and clinical factors (age, gender, ethnicity, NZDep decile and ASA score) were adjusted for.<sup>24</sup> Poorer survival rates for Māori surgical patients have been documented across a broad range of procedures including CABG, cardiac valve repair, bowel resection, lower limb amputation,<sup>25,133–135</sup> abdominal aortic aneurysm (AAA),<sup>136</sup> colon cancer<sup>118</sup> and heart transplantation.<sup>137</sup> Overall inequities in mortality were largely mirrored for Pacific people and MELAA/Other patients compared with NZ European people.<sup>25</sup> For Māori and NZ European patients, comorbidities were shown to have the strongest impact on the inequities in mortality.<sup>138</sup>



Acute surgery is associated with a higher mortality rate than elective surgery. Patients who identified as Māori and patients who lived in areas of high deprivation had higher rates of acute admissions for surgery than elective admissions, compared with non-Māori and those in low deprivation.<sup>139</sup> Of patients undergoing AAA repair, those who identified as Māori had a greater percentage of admissions that were acute compared with NZ Europeans.<sup>136,139</sup> Emergency presentations for colorectal cancer are more common for Māori.<sup>118,140</sup> In a review of the Perioperative Mortality Review Committee examining emergency laparotomies, Māori patients had 21% more emergency laparotomy operations and were more likely to have visited the emergency department in the 90 days prior, suggesting less timely access to elective abdominal surgery.<sup>132</sup> The acute presentation of diseases such as AAA and associated increased mortality rates are likely driven by a combination of risk factor distribution and poorer access to primary and hospital care.<sup>141</sup>

While in hospital the needs of patients are not equitably met.<sup>26</sup> In a recent Health Quality and Safety Commission inpatient experience survey, hospital experience was rated lower by Māori patients compared to NZ European/Other patients with respect to feeling informed about care, trust in and treatment from staff. Cultural and spiritual needs were met more frequently for NZ European/Other patients than Māori patients (92% vs 80% and 82% vs 79% respectively). Furthermore, fewer Māori patients than those of NZ European/Other ethnicity reported not being treated fairly (83% vs 91%).<sup>142</sup>

In summary, inequities are present at each stage of the planned care pathway. The most well-described and marked inequities are those seen by ethnicity, with Māori and Pacific people particularly disadvantaged. There are also many examples of inequities between socio-economic groups, with those living in the areas of greatest deprivation frequently experiencing poorer outcomes than those in the least. Finally, there is evidence of inequities between those living in rural areas and those living in urban settings, particularly with respect to health services access.

The inequities identified across the pathway are sited within the context of broader health system inequities, and inequities in the determinants of health. These have impacts at each stage of the planned care pathway, from the differential risk of developing disease, to the impact of comorbidity on access to treatment and outcomes, in addition to differences in access to care, the quality of care received and the outcomes of this care. That is, these factors not only increase the risk of developing disease but play out along the pathway, leading to cumulative disadvantage, compounded by intersectional effects.

## 6. Prioritisation in healthcare

The Review Panel received an expert report, and expert commentary, on the history of priority-setting in Aotearoa New Zealand, which can be found in Appendix 3.

Publicly funded health systems and services are inevitably subject to resource constraints. The prioritisation of health spending is therefore a central function of any health system. Section 7(2)(a) of the Pae Ora Act permits Health NZ to take into account resource constraints when performing its functions, powers or duties and being guided by the health sector principles. Priority-setting occurs when there is more demand for a service than can be supplied within available resources (funding and workforce).

In any health system funded by 'third-party' payers (governments and/or insurance organisations), there is therefore a pattern of resource allocation and service provision that is the consequence of decisions made across all levels, ranging from budget allocations at the macro level, to, at the micro level, individual clinical decisions about who to provide services to, and how much service to provide.

The term 'priority-setting' or prioritisation refers to the processes by which patterns of resource allocation are established. All approaches to explicit priority-setting require the identification of criteria or principles that are to be used to guide decision-making. The nature of criteria that are used vary across these different types of priority-setting. The particular arguments that are used to justify the criteria used in prioritisation processes also differ. However, in all approaches to developing priority-setting criteria, notions of 'need' and 'equity' are central. There has been a plethora of explicit priority-setting approaches in Aotearoa New Zealand, and a plethora of criteria and rationales that have been adopted, even within the same category of priority-setting. Generally, when criteria of need and equity have been incorporated into explicit priority-setting, they have not been well defined.

## 6.1. Implicit and explicit priority-setting

Historically, most priority-setting processes in health systems have been implicit<sup>143</sup>, resulting in a particular pattern of health funding allocations. How this pattern evolves is shaped by health system characteristics. In health systems in which users are not required to pay directly, services are often implicitly rationed through waiting times and waiting lists. Criteria and values that underlie implicit decision-making are often hidden or unclear. Implicit processes may therefore be more vulnerable to generating inequities. Implicit priority-setting processes result in historical, path-dependent funding patterns which are often difficult to change, particularly if allocating additional funds to a particular area or service requires funding to be taken away from other areas or services. More explicit priority-setting requires the identification of criteria or principles that are to be used to guide decision-making.

## 6.2. Brief overview and history of explicit priority-setting in Aotearoa New Zealand

In Aotearoa New Zealand, which has a health system predominantly funded through taxation, most priorities were historically set implicitly for publicly funded health services. That is, once an overall allocation to Vote: Health was determined, the government allocated funding to major categories of services (such as public health, primary care, and hospital care), and left it largely up to local organisations (e.g., hospital boards, general practitioners) to allocate resources themselves.

As new forms of data on health resource allocation gradually emerged in the post-war period, patterns of inequitable resource distribution, particularly between

geographic areas, became more apparent to policymakers. The first Aotearoa New Zealand attempts to develop more explicit approaches to priority-setting developed in the 1980s when the first geographic-based funding formula was developed.

This was later accompanied by the first central government goals and targets, which were introduced in 1989 in a 'A New Relationship' document, including more explicit contracts for the newly established Area Health Boards (AHBs). Since that time, central governments in Aotearoa New Zealand have used a range of planning processes and documents to set out the goals and objectives that it wants to see achieved.

During the early 1990s, there were considerable developments in explicit priority-setting in Aotearoa New Zealand, and these were part of a broader international trend in which governments in jurisdictions such as the Netherlands, Sweden and the US state of Oregon sought to establish clear principles to guide health-care resource allocation.<sup>144</sup> In 1992, the New Zealand government established the Core Services Committee, which was given the task of developing overarching principles for prioritisation between services at the national level and establishing an explicit 'core' of services to which all those living in Aotearoa New Zealand would have access.<sup>145</sup> This attempt at developing an explicit core was largely unsuccessful.<sup>3</sup> However, a year later, PHARMAC was established to make priority-setting decisions regarding the funding of new pharmaceutical products. Currently, PHARMAC remains the most well-developed system of explicit priority-setting between goods/sub-services in Aotearoa New Zealand. Its priority criteria have evolved over its 30-year existence.

At around this time the Core Services Committee (which had been renamed as National Health Committee) shifted its focus from 'between-service' priority-setting to 'within-service' priority-setting, with a particular focus on waiting lists for elective surgery. This work resulted in the development of Clinical Priority Assessment Criteria (CPAC) tools that were developed to prioritise patients' access to surgery. At the time, these CPAC processes were considered to be highly innovative internationally and were the subject of widespread interest from researchers and policymakers from other high-income countries.<sup>146</sup> Later in the 1990s, the Health Funding Authority also set out a proposed approach for 'between-service' priority-setting, building on the technical approach used by PHARMAC.<sup>147</sup>

By the early 2000s, there was a growing realisation in Aotearoa New Zealand and internationally that explicit priority-setting processes, particularly between health-care services, were very difficult and complex to establish and run. Specifically, there were considerable political and practical challenges in the identification and weighting of ethical criteria, and regarding the availability of credible information necessary to support decision-making based on set criteria.<sup>148</sup>

During the early 2000s, the Aotearoa New Zealand government's approach to priority-setting switched to a two-pronged approach. At a central government level, a range of strategies were developed to guide resource allocations and to support the direction of policy and service delivery. Thus, an overarching New Zealand Health Strategy<sup>149</sup> and New Zealand Disability Strategy<sup>150</sup> were established, alongside later strategies for Māori health (He Korowai Oranga),<sup>151</sup> primary care (the Primary Health Care Strategy)<sup>152</sup> and a Pacific health action plan (as well as many other strategies, such as for older people, etc).

Beneath that, was a geographic/population-based focus. The newly established District Health Boards (DHBs) were funded according to an explicit population-based formula comprised of basic demographic criteria.<sup>153,154</sup> The funding of the newly established Primary Health Organisations (PHOs) was also designed according to a population-based formula but linked to the individual characteristics of enrolled patients.<sup>155</sup> Typically, the formula used for PHOs has also been used to fund individual general medical practices.<sup>156</sup> Although the population criteria used to define these formulae have long been<sup>157</sup> criticised for inadequately reflecting differential patterns of need (particularly for Māori, Pacific, and people living in areas of high socio-economic deprivation), only minor incremental changes were made between 2003 and 2022.<sup>155</sup>

For DHBs, PHOs and general practices, even though funding was allocated according to population-based formulae, there was no requirement for these organisations to prioritise their own resource allocation in terms of these characteristics.

While DHBs were required to engage in strategic planning to support their geographic allocations of resources, the main information necessary to support resource allocation decision-making was to be gathered from district Health Needs Assessments (HNAs). A joint Ministry of Health (MoH)/DHB resource again focused on the general criteria that might be used to allocate resources between services.<sup>158</sup> However, by the late 2000s it had become apparent that the information requirements to support between-service priority-setting within DHBs were considerable, while a combination of central government directives and difficulties in shifting resources meant that HNAs had little impact on decision-making and resource allocation in DHBs.<sup>153</sup>

As such, most ‘between-service’ priority-setting within DHBs continued to develop implicitly, dominated by historical funding patterns.

The structural changes of 2022 in which DHBs were merged into a single organisation (Health NZ) have further changed the priority-setting landscape. One of the main justifications of these reforms was to reduce or eliminate ‘postcode rationing’ (i.e., the effects of implicit geographic priority-setting).<sup>2</sup> Geographic priority-setting is now a core responsibility of Health NZ. Priority-setting between services and within services is also part of the ambit of Health NZ in partnership with Te Aka Whai Ora (Māori Health Authority).

The *Pae Ora* legislation, like its NZPHDA predecessor, also places great emphasis on health service planning as the predominant vehicle for converting overall policy priorities into actual resource allocations.<sup>2</sup> Formally, overall goals are set out in a Government Policy Statement on Health and six key Strategies, which Health NZ and Te Aka Whai Ora must turn into a New Zealand Health Plan.<sup>2</sup> However, it is early days for these new organisations and how they approach their priority-setting role remains to be seen.

In summary, each approach has challenges associated with it. Policy instruments to support explicit priority-setting are enormously challenging to operationalise, because the information requirements to support such systems are considerable, and the processes required to produce priority-setting tools that have legitimacy with the public and clinicians are also challenging.

For the most part, the processes by which health services, population groups and service users are prioritised are based, as they are in all health systems, on predominantly implicit processes. It is well-established that the results of these predominantly implicit processes are inequitable, in terms of access to health services and in terms of health outcomes.<sup>159,160</sup>

Based on 30 years of experience, policy instruments to support explicit priority-setting have been found to be enormously challenging to operationalise, because the information requirements to support such systems are large, and the processes required to produce priority-setting tools that have legitimacy with the public and clinicians are also challenging. For this reason, they have ended up being confined to a few specific domains, such as choices regarding the funding of pharmaceutical products and prioritising access to surgery. Many of the other practices (e.g., subsidising primary care fees) could be considered as examples of semi-explicit prioritisation, as priority is given to specific categories of the population, but not in a systematic way based on first principles.

Generally, concepts of ‘need’ and ‘equity’ have become integral to the overarching policy goals and objectives that the country is trying to achieve; as such, these concepts are also included as key criteria or principles when explicitly setting priorities, less so or (or less obviously) for implicit approaches. However, more often than not, neither concept has been well defined, making it difficult to know whether the operationalisation of each concept in priority-setting is indeed supporting the achievement of key policy goals.

There has been a plethora of approaches taken to set priorities in Aotearoa New Zealand, and a plethora of different criteria and rationales that have been adopted, even within the same category of priority-setting. For example, there have been different population-based criteria used for funding DHBs as distinct from PHOs, even though the funding formulae for each were developed at the same time, and we currently see different criteria being used to support equity within screening programmes. Neither do key strategy documents nor explicit priority-setting processes set out a theory of how equity is to be achieved; and in particular, most documents and processes are silent when it comes to considering how inequities are to be *reduced*.

### 6.3. Planned care and Clinical Priority Assessment Criteria (CPAC)

In the context of a broader shift from implicit to explicit prioritisation, the now-disestablished National Health Committee (then the Core Services Committee) introduced a booking system to replace waiting lists, and at this time the Clinical Priority Assessment Criteria (CPACs) were developed.<sup>161</sup> Aotearoa New Zealand was among the first in the world to adopt an explicit prioritisation approach for planned care waiting lists, with others including Canada<sup>162</sup>, Sweden<sup>163</sup> and Spain<sup>164</sup>.

The underlying objectives of the booking system were to make prioritisation transparent, to ensure that those patients with the greatest need and ability to benefit were assigned the greatest priority, and to give some certainty to patients as to when (and if) they would receive treatment.<sup>165</sup> The intended benefit of explicit prioritisation over implicit approaches to decision-making was the provision of clear and non-conflicting criteria, in theory

increasing the quality of decision-making and accountability.<sup>166</sup>

Clinical Priority Assessment Criteria include a suite of measures that capture clinical, patient-experienced and social elements, and differ between tools. Each of the criteria is weighted, and the attributed points summed. Patient prioritisation is a complex task, as many of these factors are difficult to determine.<sup>167</sup> The criteria are typically developed by professional advisory groups, through a range of methods.<sup>168</sup> There are some national CPACs, and others that are locally or regionally developed. Some CPACs are condition-specific (eg for cataracts), while others are applied more broadly across a specialty (eg general surgery).

Clinical Priority Assessment Criteria are used differently between specialties and across regions. In most services, there is one or both of a CPAC threshold for acceptance onto a waitlist or the use of the CPAC score to determine urgency. This allows care to be scheduled in priority order, with patients with higher scores receiving care more quickly.<sup>169</sup> Where a treatment threshold is assigned (an agreed score over which the patient is accepted for surgery) it frequently differs between CPACs and, as it represents a combination of both a clinical and resource threshold, may vary between districts even for the same procedure. Differences in capacity, as well as differences in referral patterns and CPAC thresholds are some of the drivers of known inter-district variation in waiting list management and timeliness.

While the CPAC tools have iterated and their use expanded, much of the evaluation and research on the prioritisation process occurred in the first years after their institution, and there has been a relative dearth of examination of the process subsequently.<sup>170</sup>

### 6.3.1. CPAC performance and relevance to equity

The implications of the CPAC performance for equity include the validity and reliability of the measures, in particular cross-cultural validity; the scope for subjective decision making and implicit prioritisation; the potential impact of a utilitarian approach; and their uptake and application.

The validity and reliability of clinical prioritisation tools, including the CPAC, are variable and often not well examined. Reliability, including both inter-rater agreement and intra-rater stability, has been noted to vary considerably, and validity measurement is typically hindered by the absence of an accepted gold standard.<sup>167</sup> Many CPACs currently in use have not been formally evaluated or validated, although the published evidence suggests some improvement in the available tools, at least for general surgery.<sup>171,172</sup>

It has been acknowledged that different ethical perspectives may result in different criteria, or criteria that are differently weighted.<sup>173</sup> There has been limited exploration of the cross-cultural validity or acceptability of the criteria. For example, while the Impact on Life questionnaire, a patient-reported health measure used as part of the orthopaedic CPAC, was identified as a valid and reliable method of establishing patient quality of life for prioritisation of orthopaedic procedures, the assessment did not include analysis about the relative performance across different ethnicities.<sup>174</sup> Without this analysis the relative acceptability or performance of these criteria, and the consequent impact on equity, is not clear. Further, many CPACs were developed by health professionals without robust consumer participation.<sup>175</sup>

Advances in the methodology for scoring system development are likely to improve the validity and reliability of the measures, and where patients are engaged in the development of the criteria, this can also increase acceptability.<sup>176</sup>

### 6.3.2. Ability to benefit and patient-experienced health status

Prioritisation for planned care is generally predicated on a combination of assessment of both need and ability to benefit, noting that 'need' is variously considered as the severity of the condition or urgency, or in its broader sense as its 'capacity, ability or propensity to benefit' (in this consideration, need is a subset of ability to benefit). The 'ability to benefit' component is also variously defined, can be subjective and open to bias, and can be encompassing either or both of the magnitude or duration of anticipated benefit. Early ethical analysis of the CPAC prioritisation process cautioned against emphasis on prioritisation on the basis of maximising ability to benefit as this was considered to potentially disadvantage those with comorbidities or advanced age, favouring concentration on urgency of need instead.<sup>177,178</sup> This is consistent with broader tensions between utility and equity in clinical prioritisation decisions.<sup>179</sup>

Need and ability to benefit are frequently aligned where the measure of pre-intervention health need (especially where this is a patient experience-based measure of health status) is a predictor of change in health status following the intervention.<sup>180</sup> A study evaluating the use of CPAC to prioritise access to elective surgery demonstrated that CPAC scores were only weakly correlated with the ability to benefit (defined in this instance by a change in disease-specific health status). This was instead strongly correlated with pre-surgery functional severity.

Prioritising according to patient-experienced condition-related status may improve the likelihood of outcomes benefiting the patient.<sup>181</sup>

Other Aotearoa New Zealand studies have also demonstrated limited correlation between CPAC scores and patient-experienced health status measures, including a relatively recent pilot of a General Surgery Prioritisation Tool, which demonstrated no correlation between the Impact on Life assessment and overall priority score.<sup>172,174,182</sup> Poor correlation between clinical priority scoring and quality of life measures (potentially due to clinical priority-setting processes being open to bias, or quality of life measures not being valid in some sub-populations) means that those with the greatest impairment may not necessarily be receiving highest priority.<sup>183</sup>

### 6.3.3. Consistency of application

The potential pro-equity impacts of the CPAC scoring process, offering increased consistency and transparency over and above clinical judgement, are undermined where uptake is poor or clinicians are influenced by other factors in their prioritisation decisions instead, including the potential for both conscious and subconscious biases.<sup>184</sup> Analysis in the decade after the institution of the CPAC process suggested that there was variation in the ways in which the scores were assigned (including who they were assigned by) and then used for prioritisation. In a 2004 study of the application of the CPAC by surgeons of different specialties, approximately half reported that accuracy in score calculation was a major influence in the way they determined the score, while 13.5% reported that the financial threshold was a major influence on the score construction. Only a fifth felt that the current CPACs were effective in prioritising patients, with close to three quarters favouring their clinical judgement instead. The CPAC score

was not, at that time, being consistently used to determine the prioritisation for surgery, with other factors (including patient or family pressure) being identified as having major influence.<sup>185</sup>

### 6.3.4. Impact on equity

Inequities may be exacerbated where there is not a formal prioritisation process, with inequities observed on the basis of both geographic and socio-demographic characteristics.<sup>186</sup> Equity of access was one of the principles underpinning the institution of the prioritisation process in Aotearoa New Zealand. An explicit prioritisation system may contribute to equitable waiting list management.<sup>187,188</sup> However, there was no substantive audit of the policies and processes around waiting list management prior to the introduction of the 'booking system' approach and the CPAC, making it difficult to directly determine the instituted system's impact on equity.<sup>166,189</sup>

Inequity in waiting list times has been explored more broadly. In systematic review of socio-economic status and waiting times in countries with universal health coverage, 21 of the 28 examined studies found a socio-economic gradient in waiting times, with an inverse relationship.<sup>190</sup> The review noted that there were examples of this observed in countries with clinical priority criteria, although the groups were not compared. In a Swedish study that included institution of clinical prioritisation part way through the study period, younger people and males were found to be more likely to have shorter waiting times for cataract surgery, although no comparison was made before and after its introduction.<sup>191</sup> These inequities are likely to have multifactorial origins, ranging from proximity to services to the impact of differential resources on the ability to navigate the system, and it is difficult to determine the influence of explicit prioritisation criteria on access equity.



While the structure, validity and application of the CPAC have been discussed, consideration of the evidence for the potential influence of explicit prioritisation tools on equity, in particular bias and gaming, is discussed below.

### 6.3.5. Bias

Health professionals' explicit and implicit biases, across a range of factors including ethnicity, age and gender, impact the quality of health service delivered. Internationally, unconscious (implicit) bias has been observed to impact the interventions offered (or not) in both experimental and observational studies.<sup>192</sup> In Aotearoa New Zealand, there is evidence for inequities in the in-hospital care (including access to interventions) received by Māori.<sup>193</sup> An explicit prioritisation process is likely to mitigate some opportunity for the introduction of bias.<sup>194</sup> There remains, however, some requirement for clinicians to score on subjective criteria which are also vulnerable to clinicians' explicit and implicit biases.<sup>195</sup>

A 2006 study of prioritisation scores for elective coronary artery bypass grafting prioritisation examined CPAC scores by demographic characteristics, finding that they were not affected by gender, but did vary by ethnicity (slightly higher for Māori and Pacific) and degree of deprivation (greater in those resident in areas of highest deprivation). However, the authors considered it unlikely that the difference sufficiently reflected the true difference in need in the population (that is, that the extent of higher scores for Māori and Pacific people did not reflect 'real need') and, of greater concern, these differences did not translate to the ultimate priority assigned.<sup>196</sup>

Where there is scope for subjectivity and implicit prioritisation within the application of these tools, there is greater vulnerability to bias. A Dunedin-based study examined primary and secondary care clinician views on the equity of access to elective surgery, and identified the potential impact of perceived socio-demographic factors on subjective decision-making. Both general practitioners and secondary care clinicians described instances where they had advocated for those they considered 'socio-economically disadvantaged', and the authors identified impacts of stereotypes on the assessment of need and ability to benefit.<sup>197</sup>

### 6.3.6. Gaming

Most systems offer the potential for 'gaming', in this case artificially inflating a patient's CPAC score to either meet the treatment threshold or to increase their urgency, thus reducing their waiting time. A small number of studies have explored gaming in the CPAC system. The social criteria are in general more subjective and are thus more vulnerable to manipulation. The available literature suggests that, while present, this practice is not universal. In an earlier-mentioned study of CPAC scoring for coronary artery bypass grafting, there was no evidence of artificial inflation of the social component of the CPAC score.<sup>196</sup> Other studies have found otherwise. A study of more than 5,000 priority scores from 16 general surgeons identified the presence of gaming for some surgeons, which the authors commented contributed to inter-practitioner variation in the prioritisation process.<sup>198</sup> Two other studies identified instances of surgeons making a decision about whether or not to provide surgery, and then scoring the CPAC post hoc to align with this decision.<sup>197,199</sup> There were a number of reasons cited, including distrust of the tool, which others have recognised as increasing the likelihood of gaming behaviour.<sup>200</sup>

### 6.3.7. Geographic equity

National inconsistency in the design and application of clinical prioritisation tools, such as the CPAC, may contribute to geographic inequity in access to planned care.<sup>173</sup> This includes differences in the thresholds for treatment, the tools themselves and the way in which they are applied. A report from the Office of the Auditor-General noted that this means that priority scores may not reflect similar levels of need and ability to benefit for similar patients across regions.<sup>169</sup> This may have consequences for equity more broadly where there are inter-district population differences, particularly in ethnicity and deprivation.

### 6.3.8. Other factors influencing equity

The CPAC is only one component in a much broader system in access to planned care. The booking system, for example, relies on adequate access to primary care, referral to a specialist and that each part of the pathway is both accessible and acceptable. In Aotearoa New Zealand, Māori experience poorer access to primary care, and are more likely to experience longer waits for a first specialist appointment, in addition to specialist appointments being more likely to be inaccessible.<sup>17</sup> Socio-economic inequities in access may also be introduced through access to the first specialist appointment (and completion of CPAC) through the private sector allowing more rapid entry to the treatment waiting list.

## 7. Implementation context for prioritisation tools

The Northern and Southern tools were implemented as part of a range of initiatives to improve delivery of planned care during and following the COVID-19 pandemic.

This makes assessment of the effectiveness of and potential harm caused by these waiting list prioritisation tools challenging. It is also difficult to quantify other relevant issues that influence the referral and waitlisting process, such as surgical need and systemic barriers to accessing healthcare. Meaningful interpretation of any trends in elective planned care procedure and waiting list data before and after introduction of the tools is therefore not possible. As a result, simple descriptive analyses have been undertaken to provide context regarding the numbers of people on FSA and elective planned care procedure waiting lists in the Northern region (prior to implementation of the Equity Adjustor tool). The volumes of elective planned care procedures that were undertaken in Aotearoa New Zealand and in regions in recent years, including the 2022/23 financial year (when the Northern and Southern tools were implemented) have also been examined. These analyses are summarised below with a detailed overview and tables provided in Appendix 4.

- There were 55,679 people on the **FSA waiting lists in the Northern Region on 1 July 2022**, with 2,625 people waitlisted in the P1 category, 23,208 in the P2 category, 22,182 in the P3 category and 7,664 in the P4 category. Across all four priority categories, 41,258 (74%) had waited  $\leq 120$  days and 1,957 (4%) had already waited  $> 365$  days.
- There were 23,954 people on the **elective planned care procedure waiting lists in the Northern region on 1 July 2022**, with 2,412 people waitlisted in the P1 category, 7,205 in the P2 category and 14,337 people in the P3 and P4 categories combined (including only 543 people in the P4 category). Across all the priority categories, 62% of people ( $n = 14,933$ ) had waited  $\leq 120$  days and 7% ( $n = 1,770$ ) had waited more than a year.

- Across Aotearoa New Zealand, there were 162,648 **inpatient elective planned care procedures** undertaken in the 2018/19 financial year and 153,939 procedures in the 2022/23 financial year, with variation noted in the intervening financial years that encompassed the COVID-19 pandemic.
- The proportion of elective planned care procedures undertaken nationally across ethnic groups and by deprivation, rural/urban status, age and sex was similar in the financial years immediately pre- and post the COVID-19 pandemic (i.e. the 2018/19 and 2022/23 financial years).
- In the four regions during the 2022/23 financial year, there were 58,053 elective planned care procedures performed in the Northern region, 31,864 in Te Manawa Taki, 31,785 in Central Region and 32,237 in South Island Te Waipounamu.
- In terms of elective planned care procedures performed in each region by specialty, the largest proportion of procedures were performed by general surgery and ophthalmology in each of the four regions, ranging from 22,427 (39%) of procedures by both specialties combined in the Northern region to 10,464 (32%) of procedures in South Island Te Waipounamu.

## 8. Description of planned care equity adjustor tools

### 8.1. Tool development and deployment within the Northern region

The Equity Adjustor developed by Auckland Te Toka Tumai is a score-based algorithm that is applied at the individual level to planned care procedure waiting lists in Auckland Te Toka Tumai and, subsequently, two services at Northland Te Tai Tokerau. The Equity Adjustor assigns a score that increases with each day on the waiting list based upon multiple factors including clinical severity (P=Priority; P1-P4), the specialist service in question, time already spent on the waiting list, ethnicity, deprivation and residence in a metro Auckland/non-metro Auckland location. The individual scores are then used to order individuals on the waiting list from highest to lowest scores. The Equity Adjustor has been applied to all patients on the waiting lists for elective planned care procedures at Auckland Te Toka Tumai since 31 October 2022 and is still in use.

#### 8.1.1. Governance

An Auckland Te Toka Tumai Working Group ('Pro-Equity Prioritisation Meeting') was convened on 25 August 2022, reporting into the Planned Care Weekly Meeting put in place on 15 July 2022 with additional oversight of the Equity Adjustor work provided by the Regional Provider Group (RPG). RPG oversees the regional programme of work in place to monitor and improve planned care performance and delivery. The group meets weekly, and membership includes the Regional Director,

Interim District Leads, Chief Medical Officers, District Planned Care leads, District Equity leads and Northern Region Support Services Planned Care Programme Management representatives. Subsequently, the Northern Region Steering Group entitled 'Regional Equity Adjustor – Waitlist Oversight Group' was convened in February 2023. An Auckland Te Toka Tumai Equity Adjustor Governance Committee was also established in August 2023 to provide oversight of Equity Adjustor adaptations. Membership for these groups is listed in Appendix 5.

#### 8.1.2. Rationale

The rationale for development of the Equity Adjustor by Auckland Te Toka Tumai was twofold: to address inequities in the status quo processes in elective planned care waiting lists that were exacerbated by the COVID-19 pandemic, and to fulfil obligations under Te Tiriti o Waitangi. Auckland Te Toka Tumai senior leaders noted systemic inequities resulting from colonisation, including of specific relevance for Te Tiriti, the inequitable distribution of the determinants of health. Similar rationales were considered for other groups including Pacific people (Pacific planned care navigation service initiated in COVID-19) and the other tool variables including rurality and deprivation. Various initiatives had been introduced over the COVID-19 pandemic to improve equity of planned care delivery in the district. However, it was considered that this 'ecosystem' of initiatives was not succeeding systematically.

The Toka Tumai team reported to the Review Panel that ‘continuing to do the same’ would result in perpetuation of inequities in planned care delivery. Pro-equity prioritisation that incorporated consideration of obligations under Te Tiriti was regarded as a way to compensate for some of these system elements that contribute to inequities, although it was acknowledged from the outset that such a prioritisation process would not solve all equity-related waiting list issues.

The algorithm-based Equity Adjustor was intended to provide a more nuanced approach than two previously considered initiatives that were both considered to be ‘blunt’. One of these older approaches was the ‘one-up’ prioritisation initiative that moved Māori and Pacific patients in category P4 on the elective planned care procedure waiting list to P3 and was incompletely implemented in mid-2020. The second disregarded approach involved adding 30 days waiting time on to Māori and Pacific patients across all priority groups, and was implemented in the Auckland Te Toka Tumai Adult Cardiovascular service in June 2020.

### 8.1.3. Aim and objective

Northern region staff representatives have indicated that the aim of the Equity Adjustor is to improve equity of planned care delivery. The objective of the Equity Adjustor is to calculate a score for each individual based on the incorporated variables that can be used to order the planned care procedure waiting list. The ordered list is then used by booking staff to determine the order to contact individuals for booking in procedures and appointments. Therefore, it is important to note that the score influenced the timeliness of *being contacted for booking*, but did not explicitly address the timeliness of the procedure or appointment itself.

### 8.1.4. Point of application in the care pathway

The Equity Adjustor is applied to individuals who attend their FSA with an Auckland Te Toka Tumai service where a subsequent decision is made that the individual is eligible for a publicly-funded elective procedure (see Figure 3). Generally, such a decision is based on an assessment according to the appropriate CPAC score by a clinician, and results in an indication of clinical priority (P1-P4, or urgent/non-urgent). It has been noted that inconsistency in assignment of clinical priority categories, particularly for semi-urgent and non-urgent procedures, is a national issue and work is ongoing to set national standards for clinicians and booking administrators to follow. Following assignment of a clinical priority category, the individual is added to the elective planned care procedure waiting list for that service. The Equity Adjustor is then applied to order the waiting list for that specific service or procedure.

### 8.1.5. Method used to develop and adapt the tool

#### Determination of tool components

The initial tool was developed in the Auckland Te Toka Tumai Urology service by an analyst and a surgeon, with support from others in the Urology service and an individual working with the Auckland Te Toka Tumai Performance Improvement team. Supplied to the Review Panel were various analyses of service and hospital level planned care waiting list data undertaken at Auckland Te Toka Tumai in the 2019–2020 period focused on equity.

Initial tool components were decided upon by the development team listed above based on consideration of trends from this service and hospital level data and first principles knowledge of socio-demographic factors that could be associated with delays in the booking and eventual receipt of elective planned care procedures. Multiple regression analyses (either overall at Auckland Te Toka Tumai or per service/per procedure) were not undertaken to identify the specific factors or quantify the impact of those factors on waiting times to receipt of planned care procedures.

The initial tool components were priority category, ethnicity and days already waited. Other variables were added over time, based on feedback and discussion with a range of stakeholders relevant to planned care including clinical staff, services managers, and Māori and Pacific health teams. Appendix 5 lists the membership of the Auckland Te Toka Tumai Working Group ('Pro-Equity Prioritisation Meeting') that was convened in August 2022 and, subsequently, the Northern Region Steering Group ('Regional Equity Adjustor – Waitlist Oversight Group') that was convened in February 2023.

### **Determination of initial tool component points**

A set of initial tool component points (starting scores, points for initial and extended days waited) and a threshold for commencement of the extended days waited points allocation were chosen by the development team. These initial tool parameter settings were based on a general impression of useful component weightings informed by first principles, discussion with stakeholders and trends in historical performance parameters. The set of tool parameter settings was intended as a starting point for use of the tool in the Urology service.

An 'iterative tuning' approach was utilised to subsequently adjust these tool parameter settings through experimentation, discussion with relevant clinical and non-clinical staff, and visual inspection of longitudinal waiting time patterns. The intention was to provide the best achievable balance between clinical need and long waiting times within the various patient cohorts considered (i.e. P1-P4 priority groups and ethnic groups). Time-to event analysis ('survival' analyses) was not undertaken to determine tool parameter settings based on available data regarding waiting times from referral to receipt of elective planned care procedures.

### **Adaptation of the tool applied to elective planned care procedure waiting lists undertaken up to August 2023**

When the Equity Adjustor developed in the Urology service was implemented across elective planned care procedure waiting lists at Auckland Te Toka Tumai on 31 October 2022, the set of initial tool parameter settings was used as a starting point in each service. If deemed necessary, these tool parameter settings have been modified by services based upon their current waiting list size and service capacity, thereby creating service-specific tools.

As required between October 2022 and August 2023, Service Clinical Directors (in conjunction with an analyst) adjusted the service-specific tool parameter settings and the booking threshold score based on service-specific capacity. Booking staff generally contact all patients with a score at or higher than the current booking threshold score to schedule procedures, but Service Clinical Directors can 'over-ride' this process and instruct booking staff to schedule in other patients below the threshold score, if indicated.



The tool parameter settings and booking threshold score are generally re-evaluated fortnightly by the Service Clinical Directors with frequent modifications made to the booking threshold score; by contrast, readjustment of the service-specific points allocations or the threshold for commencement of the extended days waited scoring is only occasionally undertaken.

After the initial development period, the use of the Equity Adjustor does not enable explicit movement from one priority category (i.e. P1 –P4) to another but a very long waiting individual in a lower clinical priority category (e.g. P3) could potentially reach the top of the waiting list before an individual in a higher clinical priority category (e.g. P2) who has waited for a shorter period. Tool parameter settings were established and altered over time with the intention that an individual in a lower clinical priority category will not score higher than an individual in a higher clinical priority category who has waited the same number of days. Some specific adjustment has been required when patient cohorts crossed, or came close to, clinical priority category thresholds as the potential harm of this was considered. Examples of crossing priority categories were noted in the discussion with the clinical team, and manual mechanisms were reportedly put in place to identify, review and avoid these. An analyst who is also a Production Planning Manager (the administrator) administers the 'master list' of current service-specific points allocations and thresholds for commencement of extended days waited scoring and applies these parameter settings to the elective planned care procedure waiting lists to order them using the scores. Any changes to the service-specific parameter settings are communicated to this administrator who updates the master list.

Prior to August 2023, changes to the service-specific tool parameter settings decided upon by the Service Clinical Directors were then updated in the master list by the administrator and immediately applied to the waiting lists.

### **Process for adaptation from August 2023 onwards**

In August 2023, the Auckland Te Toka Tumai Equity Adjustor Governance Committee was established to oversee modifications to tool parameter settings (and potentially to the tool components themselves) in all services where the Equity Adjustor has been implemented. Since August 2023, once alterations to the tool parameter settings have been decided upon by the Service Clinical Directors, the suggested changes are considered by the Governance Committee and subsequently approved or declined. If approved, these new service-specific tool parameter settings are communicated to the administrator who updates the master list that is applied to the waiting list for that service.

#### **8.1.6. How the tool is used for elective planned care procedure waiting lists**

The Equity Adjustor consists of multiple components for calculating an individual-level score with consideration of:

- clinical specialty
- clinical priority group
- days already waited since being added to the waiting list
- ethnic group (Māori, Pacific or non-Māori/non-Pacific; individuals with missing ethnicity data are categorised as non-Māori/non-Pacific)
- socio-economic deprivation (NZDep decile)<sup>28</sup>
- residence in a metro Auckland or non-metro Auckland location

Points are assigned as follows:

- Starting score:** a one-off number of points is assigned to the individual added to the waiting list (i.e. a day 0 allocation of points). The number of points assigned varies according to the specialty, clinical priority category (i.e. P1–P4) and ethnic group. In general across specialties, all ethnic groups in the P1 priority group are assigned the same starting score values. In the P2–P4 groups, Māori patients generally have higher starting scores, followed by Pacific and then non-Māori/non-Pacific people. The points allocations for Māori are based on a Te Tiriti o Waitangi justification to ensure that Māori do not have poorer health outcomes. Across Auckland Te Toka Tumai services, the starting scores are generally the same or close to the generic set of starting scores.
- Waiting list duration:** points are added to the starting score for each day (including day 1) that an individual is on the waiting list, with a higher score (i.e. increased magnitude of points) assigned each day once an individual has waited for a pre-determined extended number of days. The clinical team have indicated that the start day for higher accrual of points should be around 90% of the maximum acceptable clinical waiting time, but that this will be impacted by the waiting list size in many services. In reality, commencement of the extended days waiting scoring in the generic tool settings ranges from 70–90% of the most common target waiting times in P1–P3 categories, with even greater variability in the services that have modified the tool parameters. (In P4, commencement of the extended days waited scoring ranges from 80% (Māori) to 125% (Pacific and non-Māori/non-Pacific people) of the target time if 120 days is used, noting that there are very few people categorised as P4 in the Northern region). The points accrued for initial and extended days waited and the threshold for increased points accrual are more variable across specialties, priority categories and ethnic groups than the starting scores.
- Deprivation:** additional points are added for each day on the waiting list based upon New Zealand Index of Deprivation 2018 deciles 1 (least deprived) to decile 10 (most deprived); as the deprivation decile increases, the weighting incrementally increases by 0.02 points. For instance, deprivation decile 1 is allocated no points per day, deprivation decile 2 is allocated 0.02 points per day and deprivation decile 10 is allocated 0.18 points per day. This daily points allocation for the deprivation deciles does not vary by specialty, priority category, ethnicity or number of days waited. An individual with missing deprivation data is not allocated any points for this component.
- Non-metro Auckland location:** Individuals residing in a location outside of metro-Auckland (i.e. all patients living in Northland Te Tai Tokerau or those on a Northern region waiting list but living in districts outside of the Northern region) are assigned 20 points as a one-off allocation on day one of being added to the waiting list (i.e. no further points are added while on the waiting list). Residence in non-metro Auckland locations was used as a proxy for rurality. The intention was ultimately to use the Geographic Classification for Health to classify rural/urban status for each individual, but this has not yet been implemented.

Each service also sets a ‘booking threshold’ score; booking staff contact individuals on the waiting list with a score at or higher than the current booking threshold score to schedule procedures.

A final score and waitlist order may undergo an ‘over-ride’ process by service management, clinicians or schedulers for specific reasons. The developers of the tool reported regular examination of the number of ‘over-ride’ occurrences and whether these were for clinical or other reasons (with potential concerns of bias as well as the importance of responsiveness to changing clinical circumstances).

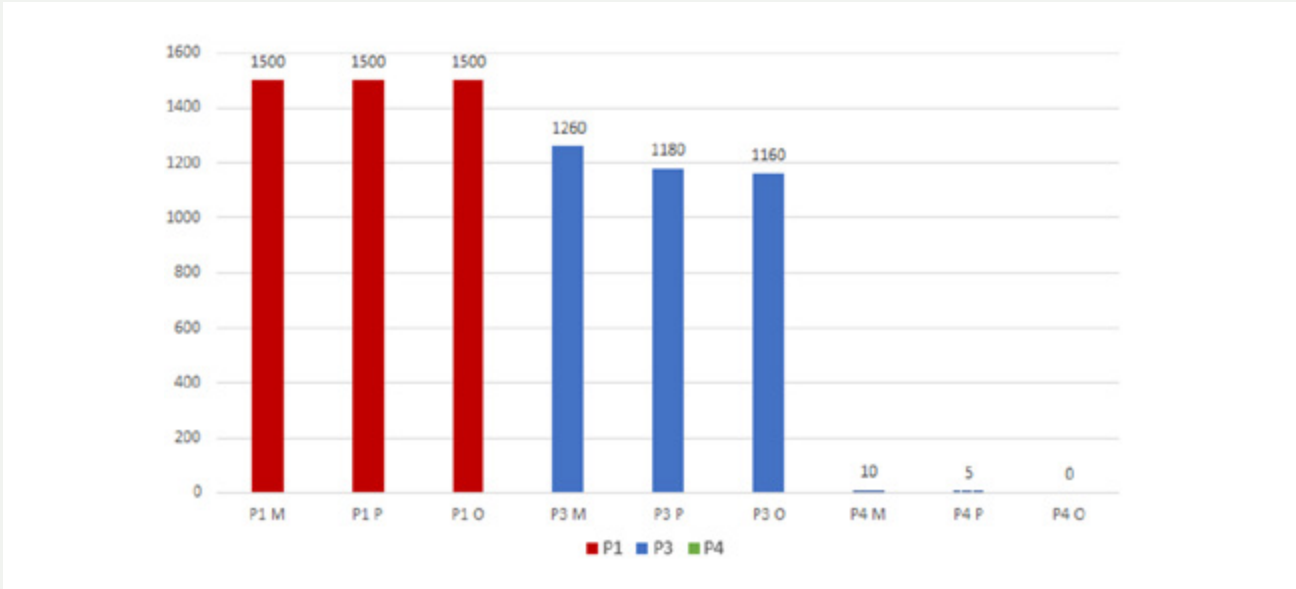
#### **8.1.7. Examples of tool scoring using Auckland Te Toka Tumai Urology and General Surgery-specific versions**

At Te Toka Tumai, there are around 25 services where the tool was implemented for elective planned care procedure waiting lists. The Auckland

Te Toka Tumai Urology and General Surgery tool parameters as at 5 December 2023 are used below to demonstrate how points are accrued for individuals waitlisted with these two services.

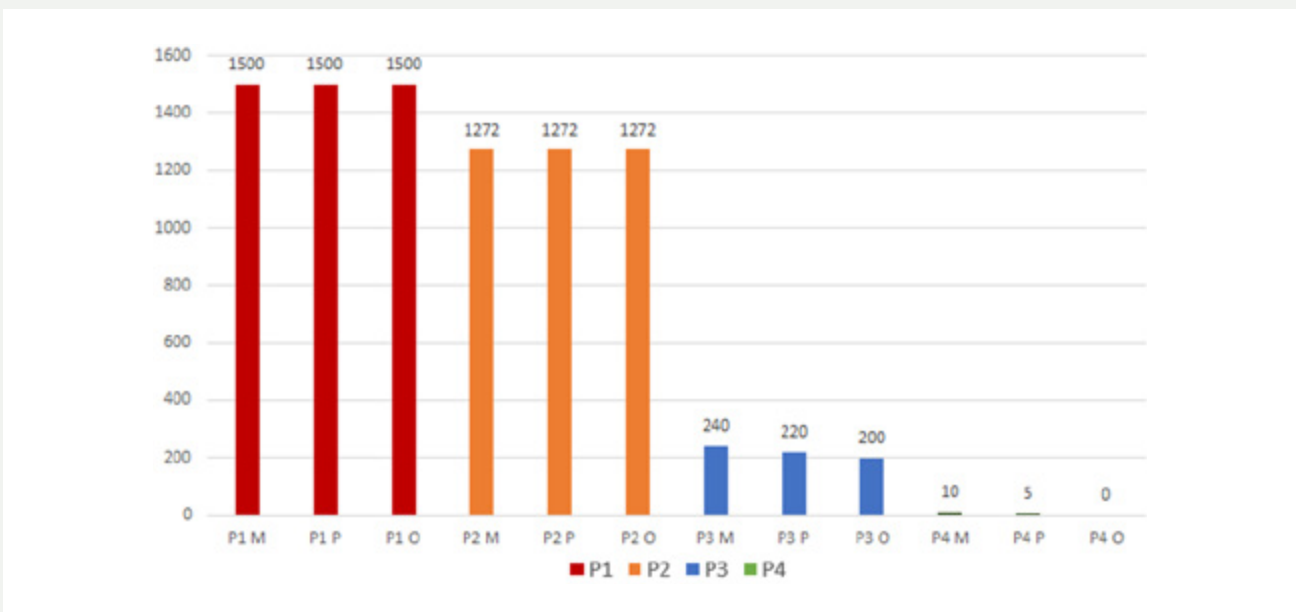
The starting scores by priority category and ethnic group that are assigned on day one of being added to the elective planned care procedure waiting list are shown in Figure 4a (Urology) and Figure 4b (General Surgery). Please note that the Urology service at Auckland Te Toka Tumai does not use priority category 2 (P2) so it has been excluded from the graph (i.e. only P1, P3 and P4 categories are used). Please also note that, while P4 category scoring has been shown in the figures below for both Urology and General Surgery, there are very few people who are assigned to this priority category; data from 1 July 2022 indicates that only 35 people across all specialties in Auckland Te Toka Tumai were assigned to the P4 category.

Figure 4a: Starting scores (as at 5 December 2023) allocated on day 1 by priority category and ethnic group – Auckland Te Toka Tumai Auckland Urology version



M = Māori; P = Pacific; O = Other (non-Māori/non-Pacific)  
 Please note that P2 is not shown as this is not a priority category used by the Health New Zealand – Te Whatu Ora Auckland Te Toka Tumai Urology service

Figure 4b: Starting scores (as at 5 December 2023) allocated on day 1 by priority category and ethnic group – Auckland Te Toka Tumai Auckland Adult General Surgery version

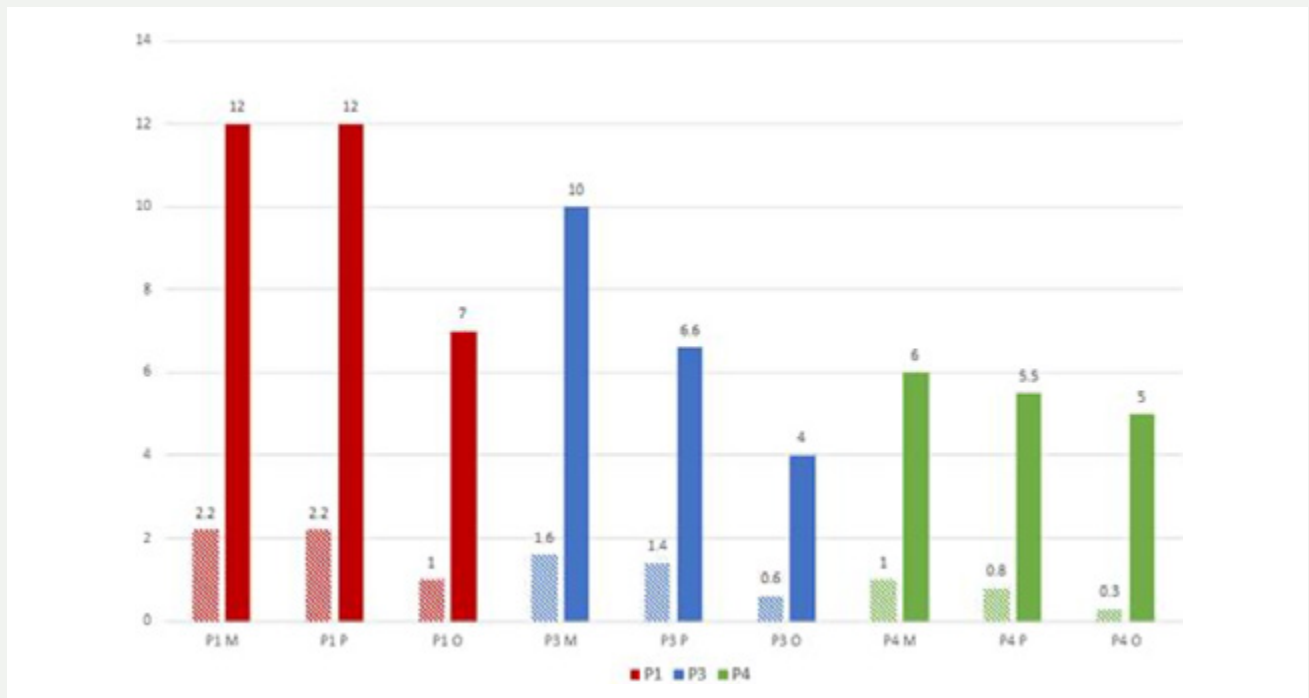


M = Māori; P = Pacific; O = Other (non-Māori/non-Pacific)

The additional points allocated on day one based on deprivation decile (ranging between 0 for deprivation decile 1 and 0.18 for deprivation decile 10) have negligible impact on the total starting score for either specialty. For individuals who reside outside of metro-Auckland, the additional one-off allocation of 20 points on day one also has minimal impact on the total starting scores for Urology P1 and P3 patients or General Surgery P1 and P2 patients, and a small impact on the total starting score for P3 General Surgery patients.

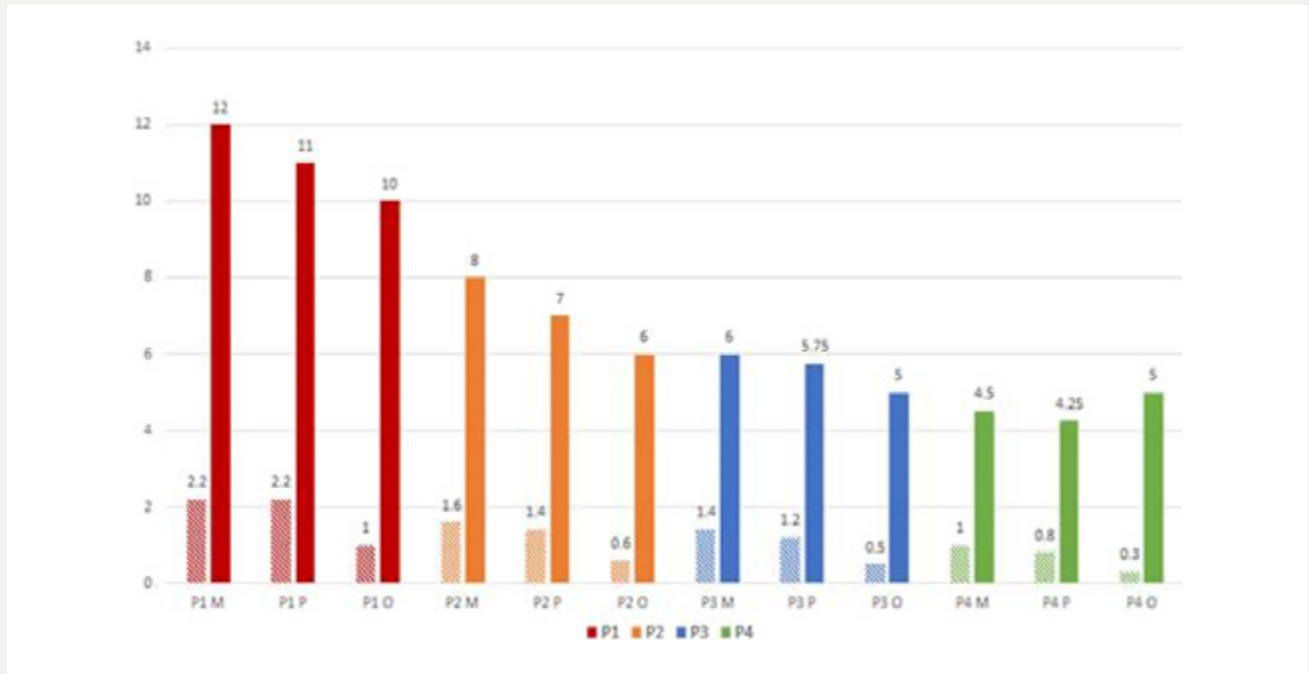
As mentioned previously, points are added to the starting score for each day that an individual is on the waiting list, with an increased magnitude of points assigned each day once an individual has waited for a pre-determined extended number of days (i.e 'extended' days waited). Figures 5a and 5b below show, for the two specialties by priority categories and ethnic groups, the points accrued for 'initial' day (i.e day 1 until extended score start day) and extended day that an individual remains on the waiting list. As noted previously, there is also a daily small allocation of points for individuals residing in deprivation deciles 2 to 10, but no further allocation of points for those residing in non-metro Auckland locations.

**Figure 5a: Points added for initial and extended days waited by priority category and ethnic group as at 5 December 2023 – Auckland Te Toka Tumai Auckland Adult Urology version**



Diagonal pattern bars = initial days waited; solid bars = extended days waited;  
 M = Māori; P = Pacific; O = Other (non-Māori/non-Pacific)  
 Please note that P2 is not shown as this is not a priority category used by the Health New Zealand – Te Whatu Ora Auckland Te Toka Tumai Urology service

**Figure 5b: Points added for initial and extended days waited by priority category and ethnic group as at 5 December 2023 – Auckland Te Toka Tumai Auckland Adult General Surgery version**



Diagonal pattern bars = initial days waited; solid bars = extended days waited; M = Māori; P= Pacific; O= Other (non-Māori/non-Pacific)

The cumulative points accrued during 365 days on the waiting list for different combinations of priority category, ethnic group, deprivation decile and residence in metro/non-metro Auckland locations are presented in the graphs below for Urology (Figure 6a) and General Surgery (Figure 6b). The figures show the combination of starting characteristics resulting in the highest (solid line) and lowest (dotted line) possible cumulative scores within each priority category over the 365 day period, as well as a third scenario (dashed line) that demonstrates the maximum effect of ethnicity over the 365 day period in each priority category (by showing the cumulative points accrued for a Māori individual residing in deprivation decile 1 (least deprived) in a metro Auckland location (i.e. urban)).

In the figures below, commencement of the extended days waited scoring is indicated by the inflection in each of the lines where the gradient for points accumulation becomes steeper. For Urology and General Surgery P1s this bend occurs at 10 days and for Urology P3s and General Surgery P2s at 36 days in all three ethnic groups. For General Surgery P3s, the increased accumulation of points commences for Māori and Pacific individuals at 90 days and 110 days for non-Māori/non-Pacific individuals. P4 is also shown for completeness, but as mentioned previously, very few individuals are assigned this category in the Northern region.

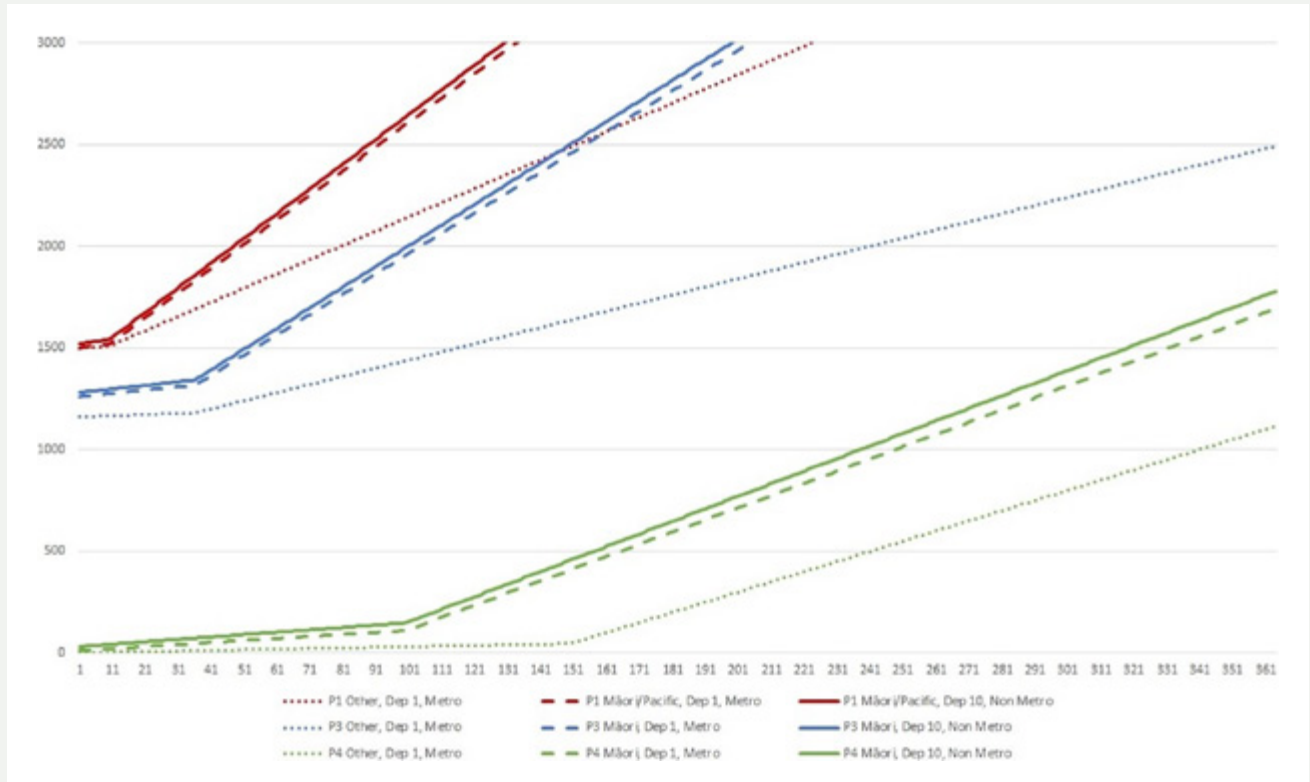
Figures 6a and 6b indicate that the threshold for commencement of the extended days waited scoring (leading to increased magnitude of points accrual) has the biggest impact on scoring over a 365 day period followed by ethnicity. In both Figures 6a and 6b, the case scenarios represented by the dashed lines (Māori, deprivation decile 1 and metro Auckland residence) in each priority group are very close to the solid lines (Māori, deprivation decile 10 and non-metro Auckland residence). The close proximity of these two case scenarios in each priority group indicates that deprivation and residence in a non-metro Auckland location has a minimal impact on scoring over a year.

The clinical team indicated that cumulative points are intended to be accrued such that an individual from a lower priority should not surpass an individual in a higher priority category who has waited the same amount of time. However, there are exceptions.

For the Urology service, Figure 6a indicates that a P3 Māori individual (irrespective of deprivation status or residence a non-metro Auckland location) will currently accrue points at a faster rate than a P1 non-Māori/non-Pacific individual living in a deprivation decile 1, metro-Auckland location. After the lines cross, the P3 Māori individual will have a higher cumulative score than the P1 non-Māori/non-Pacific individual and would be higher up on the reordered waiting list that booking staff use to determine who to contact for booking in procedures. However, at the point that the P3 scoring exceeds the P1 scoring in the figure below (day 145 for the P3 Māori/deprivation decile 10/non-metro Auckland scenario and day 160 for the P3 Māori/deprivation decile 1/metro-Auckland scenario), the majority of patients in the P1 category would already have been booked.

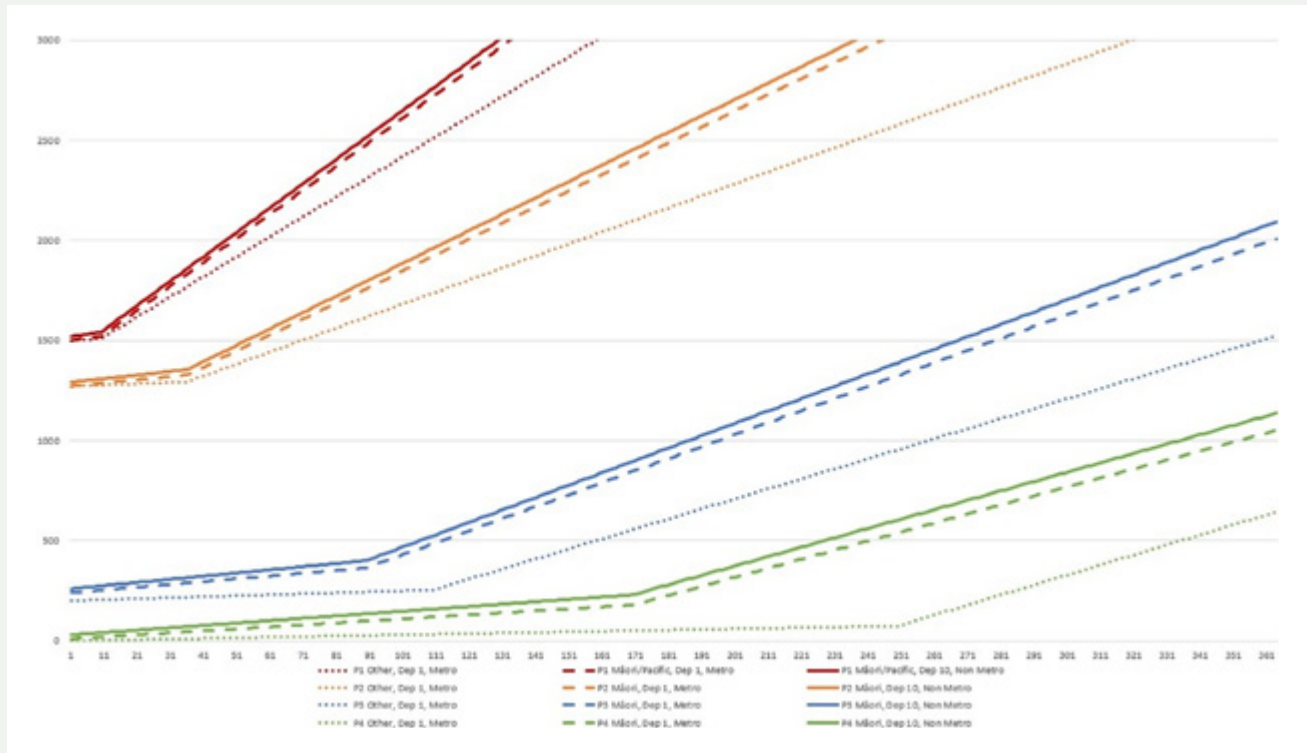


Figure 6a: Cumulative points accrued over 365 days for different case scenarios based on scoring as at 5 December 2023 – Auckland Te Toka Tumai Auckland Urology version



Other = non-Māori/non-Pacific  
 Dep = deprivation decile according to New Zealand Index of Deprivation 2018  
 Metro = residence in metro-Auckland location; Non Metro = residence in a location outside of metro Auckland

Figure 6b: Cumulative points accrued over 365 days for different case scenarios as at 5 December 2023 – Auckland Te Toka Tumai Auckland General Surgery version



Other = non-Māori/non-Pacific

Dep = deprivation decile according to New Zealand Index of Deprivation 2018

Metro = residence in metro-Auckland location; Non Metro = residence in a location outside of metro Auckland

### 8.1.8. Application to non-surgical waiting lists at Auckland Te Toka Tumai

The Equity Adjustor was subsequently applied to waiting lists for FSAs from 9 June 2023, across all surgical and non-surgical specialist services for both paediatric and adult patients. Each relevant specialist service receives referrals from primary care providers, or other secondary or tertiary specialist services with subsequent triage of these referrals into P1-P4 categories; there is variability in target waiting list times

across services but the most common target waiting times are similar to those generally employed for elective planned care procedure clinical priority categories. Individuals who are triaged as requiring specialist assessment are then put on the waiting list for an FSA with the appropriate service. The Equity Adjustor is subsequently applied to reorder the waiting list for FSAs with that service, to inform the order that booking staff contact patients and schedule appointments.

For specialties that offer elective procedures, the generic set of initial tool component parameters identified for the elective planned care procedure waiting lists were used as a starting point for the FSA tool version in each service. The same process for adaptation that has been used for the Equity Adjustor applied to elective planned care procedure waiting lists is also used for the FSA service-specific versions (i.e. potential changes to component points are decided by Service Clinical Directors, with subsequent consideration by the Auckland Te Toka Tumai Equity Adjustor Governance Committee).

### **8.1.9. Application to elective planned care procedure waiting lists at Northland Te Tai Tokerau**

The Equity Adjustor tool was implemented by the Northland Te Tai Tokerau Urology and Orthopaedic services for elective planned care procedure waiting lists on 12 April 2023, and is still in use by these services. The same tool parameter settings as for the corresponding services at Auckland Te Toka Tumai were implemented without adjustment. Of note, the score for non-metro Auckland locations was applied for all Northland Te Tai Tokerau patients; therefore, the 'remote' scoring did not contribute to stratification in Te Tai Tokerau. It was intended that adjustment of tool parameter settings for the Urology and Orthopaedic services would be undertaken through an iterative process that considered service capacity with a team approach involving Service Managers, clinical leadership, data and digital teams and liaison with Auckland Te Toka Tumai colleagues. However, the national request to pause roll out of the equity booking approach occurred before this adjustment process could commence. The Equity Adjustor was not implemented for FSA waiting lists in Te Tai Tokerau.

## **8.2. Tool development and deployment in the Southern district**

### **8.2.1. Description of the Southern tool**

The tool developed by Southern is a score-based algorithm applied at the individual level to waiting lists for planned care procedures. Called the Southern Waitlist Prioritisation Tool, it assigns a score based upon multiple factors including length of time already spent on the waiting list, target time for the clinical priority category, ethnic group, deprivation, prior emergency department visits and rurality. The individual scores are then used to reorder individuals on the waiting list from highest to lowest scores. This reordered waiting list can be utilised by booking staff to determine the order to contact individuals for booking in procedures. The Southern Waitlist Prioritisation Tool went live on 1 May 2023 in all surgical services and is still available to booking staff, clinicians and managers, although use of the tool has been optional since implementation and how much the tool is used (and how use is determined) is unclear. The priority categories used at Southern are urgent, semi-urgent and routine and, in practice, booking staff and clinicians are encouraged to use the tool when they have long-waiting patients in the routine priority category who have waited similar times to assist in the decision-making process regarding the order to contact patients for a procedure booking.

### 8.2.2. Governance

Current governance of the Southern Waitlist Prioritisation Tool is through the Southern Planned Care Steering Group that has Primary Care and community representatives and meets monthly. The purpose, functions and responsibilities and membership of the group are listed in Appendix 6. The tool was also discussed at the South Island Te Waipounamu Clinical Operational Group (COG) meeting in June 2023.

### 8.2.3. Rationale

The rationale for introduction of the Southern Waitlist Prioritisation Tool provided by the Southern development team was multifactorial. Staff reported that the tool was developed in recognition that the impact of the current planned care procedure waiting list processes was inequitable across population groups. A risk stratification score-based algorithm developed by the Cancer Nurse Coordinators had been previously implemented to identify 'high risk' or 'vulnerable' cancer patients and facilitate their navigation through treatment. The Cancer Nurse Coordinator Equity Tool incorporates multiple components including two or more 'did not attend' records for appointments in the previous 12 months, history of mental health service access, in-patient admissions in the preceding 12 months, contact with two or more non-oncological services, ethnicity and deprivation index to identify 'high risk' individuals. This Cancer Nurse Coordinator Equity Tool was considered to have improved service provision, although a formal evaluation of the tool has not been undertaken to date. On that basis, there was a desire to develop an elective planned care procedure waiting list tool that could prioritise at-risk long-waiting

routine patients and potentially improve on booking the longest-waiting patients first (i.e. from the back of the waiting lists). A tool of this nature was considered to potentially be able to promote equitable outcomes for patients from 'vulnerable' population groups by, as a starting point, improving one part of the health journey of these patients. It was also noted that the Waitlist Prioritisation Tool could potentially be used across multiple waiting lists on the patient's healthcare journey, and there was support for the tool concept from clinical and non-clinical teams.

### 8.2.4. Aims and objective

The overall aim of the Southern Waitlist Prioritisation Tool indicated by the Southern development team is to improve the waiting list booking process for long-waiting patients, through consideration of clinical priority, time already on the waiting lists and risk features associated with poorer outcomes if individuals experience a longer surgical waiting time. Specifically, the Southern team aims to:

- provide a more sophisticated equity lens than was previously available for waiting lists,
- quantify risk 'features' for a specialty linked to routinely collected data,
- enable logical risk stratification that is commensurate with available information about outcomes (both population and condition-specific outcomes),
- ensure transparency around the type of risk on given waiting lists,
- allow tracking of a reduction or increase in risk over time, and
- provide information on resources required to clear waiting lists based on risk.

Similar to the Northern tool, the objective of the Southern Waitlist Prioritisation Tool is to calculate a score for each individual based upon the included factors that can be used to reorder the elective planned care procedure waiting list, prior to booking staff contacting patients regarding a booking for their procedure.

### **8.2.5. Point of application in the care pathway**

As summarised previously, if a publicly-funded planned care procedure is an option being considered following an FSA with a relevant service, then an assessment is usually undertaken with an appropriate CPAC score. If the threshold for publicly-funded intervention is met, clinical judgement should determine the clinical priority category assigned (i.e. urgent, semi-urgent or routine at Southern). However, as noted earlier, while there is a consistent process to assign an 'urgent' categorisation, there is inconsistency across services regarding application of the semi-urgent and routine categories and this has been recognised as a national problem, with ongoing work to set national standards for clinicians and booking administrators to follow. After assignment of the clinical priority category, individuals are placed onto the elective planned care procedure waiting list. The tool is currently applied following entry onto the waiting list, similar to the point of application for the Northern Tool. While, in theory, the tool can be applied to all clinical priority categories, the Southern development team has indicated that the focus for application of the Waitlist Prioritisation Tool is long-waiting patients in the routine priority category.

While application of the tool is currently restricted to planned care procedure waiting lists, the Southern development team is considering future application to FSA waiting lists within medical specialties.

### **8.2.6. Method used to develop the tool**

#### **Determination of tool components**

The concept of applying a prioritisation mechanism like the Cancer Nurse Coordinator Equity Tool to elective planned care procedure waiting lists was first considered around March 2022 by the Planned Care District Manager and former General Manager Surgical Services and Radiology. The initial tool components considered were acuity score (days already waited divided by the target number of days that the planned care procedure should have been undertaken in for that clinical priority category), ethnic group and deprivation.

Advice and a review of international articles was provided by an Associate Professor in the Department of Surgical Services at University of Otago Medical School, the Clinical Director of the Southern Ear Nose and Throat (ENT) service in August 2022. In addition to suggesting inclusion of acuity score, ethnic group, socio-economic status and age  $\leq 16$  years as tool components, the Associate Professor also recommended consideration of the specific diagnosis and procedure that was indicated and, separately, CPAC scores. Incorporating a score based on diagnosis across all services was subsequently excluded as it was considered to be covered by the clinical priority category assigned to that individual for their procedure and was also thought to be too difficult to use in practice. CPAC was not considered as an option as Southern representatives considered that the CPAC scoring system is used inconsistently and could be manipulated by 'gaming'. Subsequently, presentations to an Emergency Department within the last 12 months was suggested as a tool component, as this was thought to partially capture socio-economic status and could be quantified using available data.

The provisional concept, incorporating acuity score, ethnicity, deprivation, age and number of ED visits, was presented to the Chief Māori Health Strategy and the Chief Operating Officer in August 2022. It was agreed after this presentation that there should be further discussion with clinical colleagues to determine if there were more sophisticated methods to risk stratify surgical long waiters. A presentation by the former General Manager Surgical Services and Radiology was taken to the Surgical Services Clinical Directors later in August 2022, with subsequent support from the Māori Directorate and the Surgical Clinical Directors to continue tool development. Presentations were then undertaken by the Planned Care District Manager, the former General Manager Surgical Services and Radiology and a Data Analyst to multiple clinical services and clinical leaders to discuss the provisional tool concept. A summary table of these presentations is included in Appendix 6. The clinical teams provided feedback that the tool should include rurality, and that incorporation of 'did not attend' records for use of the tool in an outpatient context as well as mental health service access should both be considered. It was decided by the development team that rurality and ED visits should be considered together as a tool component, since Health New Zealand – Te Whatu Ora Southern is largely rural with three main centres that have ED facilities. Not accounting for residence in a rural location would have 'disadvantaged' people who live rurally as they have reduced ED access. Therefore, it elected to assign points to patients living rurally based on the average ED scores within each specialty.

Following the Associate Professor's earlier recommendations, age ( $\leq 16$  years) was considered as a parameter for specific situations within services, as it was thought that inclusion could improve risk stratification for certain procedures such as grommets and tonsillectomies. However, age was later excluded as the tool was intended to be applied with fixed weightings across all surgical specialties and the age component could not be universally applied to all specialties. In addition, the number of mental health referrals (that was a component of the Cancer Nurse Coordinator Equity Tool) was excluded as a tool component, because this was considered by the development team to be a less relevant factor affecting waiting list position than acuity, deprivation, ED visits, rurality and ethnicity. However, the Southern development team has indicated that comments by the referring GP regarding the mental health of a patient are made available to the triaging clinician, who can subsequently reprioritise the patient after the waitlist tool is applied.

The Planned Care District Manager and former General Manager Surgical Services and Radiology determined the final tool components, incorporating discussion and feedback from clinicians and senior leadership. The decision to implement a tool with these components was confirmed by the Chief Medical Officer and the Lead for Hospital and Specialist Services, with a subsequent memo to clinical staff on 5 May 2023 to inform them of this decision.



### **Determination of initial tool component weightings**

The initial tool concept used acuity, ethnicity and deprivation as components with a weighting of 40%, 40% and 20%, respectively. The Associate Professor suggested weightings of acuity 40%, ethnic group 15%, socio-economic status 20% and age  $\leq 16$  years 10% (along with 10% for diagnosis and 5% for CPAC score, which were components that were subsequently excluded). Prior emergency department visits were also considered for inclusion with a provisional weighting of 25%. In subsequent presentations to clinicians and surgical services, the component weightings in the trial tool were left blank and added in during the presentations to show the effect of different weightings on the waiting list order. After presentations, clinicians and managers were able to access the trial tool and manipulate it themselves. Following blind testing with Paediatric Surgical and Gynaecology clinical staff and service managers involving patient waiting lists reordered using the provisional tool, component weightings were adjusted by the end of 2022/early 2023 to acuity 40%, deprivation 30%, prior ED visits and rurality 20% and ethnicity 10%. These weightings have been used consistently since then.

The weighting for the ethnicity component was reduced from 15% to 10% based on the Associate Professor's observation that there could be 'overlap' with socio-economic status, and observation of this association during the testing process. The development team noted that with the ethnic group tool component set at 10%, there was a 2-3 times increase in the number of Māori and Pacific people in the 700 patients at the top of the waiting list

for booking, but adjusting the ethnic group weighting lower or higher appeared to disproportionately increase or decrease the number of Māori and Pacific people at the top of the waiting list according to subjective appraisal by the Southern Development team. As with the Northern tool, survival analysis (time-to-event analysis) was not undertaken to determine component score point allocations based on available data regarding waiting times from referral to receipt of elective planned care procedures.

### **Adaptation of the Waitlist Prioritisation Tool**

No adaptation of the Southern Waitlist Prioritisation Tool has been undertaken since it was originally implemented. However, a dashboard that monitors average planned care procedure waiting times has recently been developed that enables stratification by specialty, clinical priority category and rural/urban locations. The Southern development team has indicated that output from the dashboard will be discussed with the Planned Care Steering Group initially, followed by clinicians and services to determine if modifications should be undertaken to the Waitlist Prioritisation Tool.

#### **8.2.7. How the tool is used for elective planned care procedure waiting lists**

Southern tool scores for each patient on the waiting list are currently calculated on a weekly basis. An ordered version of the waiting list based on the updated patient scores is then made available to booking staff and clinicians so that they can access it if desired to inform decision-making around the order to contact patients to book them in for procedures.



The Southern tool currently consists of four components to enable calculation of an individual-level score, with the same version used across all services that have elective planned care procedure waiting lists. The tool generally leads to a score between 0 and 10 although, in certain situations that are outlined below, the score can theoretically exceed 10 points with no maximum upper limit.

The tool currently consists of the following components, with the intended component weightings as communicated by the Southern development team:

1. **Acuity** (intended to be 40% of the overall score): an individual's surgical priority category (urgent, semi-urgent and routine) and the length of time since entry on to the waiting list are both considered in the acuity component. A ratio is determined of the days already waited (i.e. the number of days since entry onto the waiting list) divided by the target days for that priority category (i.e. the target number of days within which the individual should receive their procedure for their clinical priority category). The Southern development team has indicated that the target numbers of days in each priority category is 28 days for urgent procedures, 56 days for semi-urgent procedures and 112 days for routine procedures. The 'acuity ratio' is then multiplied by 0.4 to determine the number of acuity-related points that are added to the total score for the individual.

The multiplication of the acuity ratio by 0.4 is the mechanism employed by the Southern development team to achieve a points allocation that was intended to comprise 40% of the maximum total score. Given that there is no fixed end point to the number of days waited and the Southern development team has indicated that the acuity component was not intended to have a maximum possible allocation of points, the acuity component (and the other tool components) in reality contribute a variable proportion of the overall score. Nevertheless, in most situations the acuity component is allocated up to four points. Exceeding an allocation of four points for the acuity component is infrequent; this occurs for an individual waitlisted for a procedure in the 'urgent' category after 281 days, for semi-urgent procedures after 561 days and for routine procedures after 1,121 days.

2. **Deprivation** (intended to be 30% of the maximum overall score): points for deprivation decile are assigned on day one of being added to the waiting list. Deprivation decile is multiplied by 0.3 to obtain a score out of 3; for example, deprivation decile 10 will score 3, deprivation decile 5 will score 1.5 etc. Deprivation decile has been categorised until recently according to New Zealand Deprivation Index 2013 based on a patient's domicile code of residence. Deprivation decile is now categorised using New Zealand Index of Deprivation 2018 (NZDep 2018)<sup>28</sup>, and the Southern Development team has noted that using NZDep 2018 has resulted in minimal changes to the deprivation-related points allocations. If a patient has a missing domicile of residence code or it cannot be mapped to a deprivation decile, then the person receives 0 points for the deprivation tool component.

### 3. **Prior emergency department attendance (ED) or rurality** (intended to be 20% of the maximum overall score):

Prior ED attendance in the last 12 months (up to a maximum of four visits) and rurality are considered together and allocated points on day one of being added to the waiting list. ED visits are categorised by triage category (resuscitation, emergency, urgent, semi-urgent and non-urgent) and departure status (admit, discharge, transfer, other). Based upon the triage category and departure status, a severity score (ranging from 0–2.5) is calculated for each ED attendance. The severity score for the last four admissions over the preceding 12 months is summed to obtain a maximum score of 10 and then multiplied by 0.2 to obtain a maximum allocation of 2 points. The Southern development team has indicated that (as at 6 December 2023) only 28% of patients currently waitlisted had one or more recorded ED visits in the last year; 26% were allocated less than 1 point, only 2% were allocated  $\geq 1$  point for prior ED visits, and the maximum current ED-related points allocation was 1.8. The average points allocation for all patients with at least one ED visit in the year prior was 0.4 points, with little variation across priority categories.

Rurality is assessed based on a patient's domicile code of residence and categorised according to the Geographic Classification for Health (GCH) R1, R2 and R3 rural categories that correspond to increasing levels of rurality.<sup>100</sup> Individuals residing at any rural location who have **not** attended ED within the last year are assigned a score based on their rurality category

and the average ED-related score for their specialty (i.e. the average points allocated among all individuals with an ED-related score in that specialty). People residing in locations corresponding to the GCH classification R1, R2 and R3 categories are assigned 60%, 80% and 100% of the average ED score for their specialty respectively. For example, as at 1 December 2023, the average ED score for General Surgery at Southern was 0.09, so people residing in R1 would be assigned 0.05 points, R2 0.07 points and R3 0.09 points. The average ED scores for each specialty are currently calculated on a weekly basis, at the same time that the Southern Waitlist Prioritisation Tool total scores for each patient on the waiting list are updated.

If an individual resides in a rural location and also has had ED visits in the last 12 months, the prior ED visits contribute to the score assignment; the Southern development team indicate that this convention is employed to prevent 'double-dipping' of points. If the patient has a missing domicile of residence code or it cannot be mapped to a GCH category, then that individual receives 0 points for the ED/rurality component of the score.

### 4. **Ethnic group** (intended to be 10% of the maximum overall score): Māori and Pacific individuals are allocated one point on the first day of being added to the waiting list. Individuals of non-Māori and non-Pacific ethnicities receive no additional points. If a patient has missing ethnicity data, then that individual is categorised as non-Māori and non-Pacific.

In summary, the Southern Waitlist Prioritisation Tool usually results in a score between 0 and 10, although there is no maximum overall score; the deprivation, ED/rurality and ethnicity components have a maximum possible allocation of points, but the acuity component theoretically has no upper limit. In reality, therefore, the tool components do not have a fixed weighting. Points for deprivation, ED/rurality and ethnicity are allocated on day 1 of being added to the waiting list (i.e. upfront allocations of points) and these three tool components do not accrue additional points over further days waited. Acuity has a negligible points allocation on day 1 of being added to the waiting list and is the only component that results in additional points added to the total score from day 2 onwards on the waiting list.

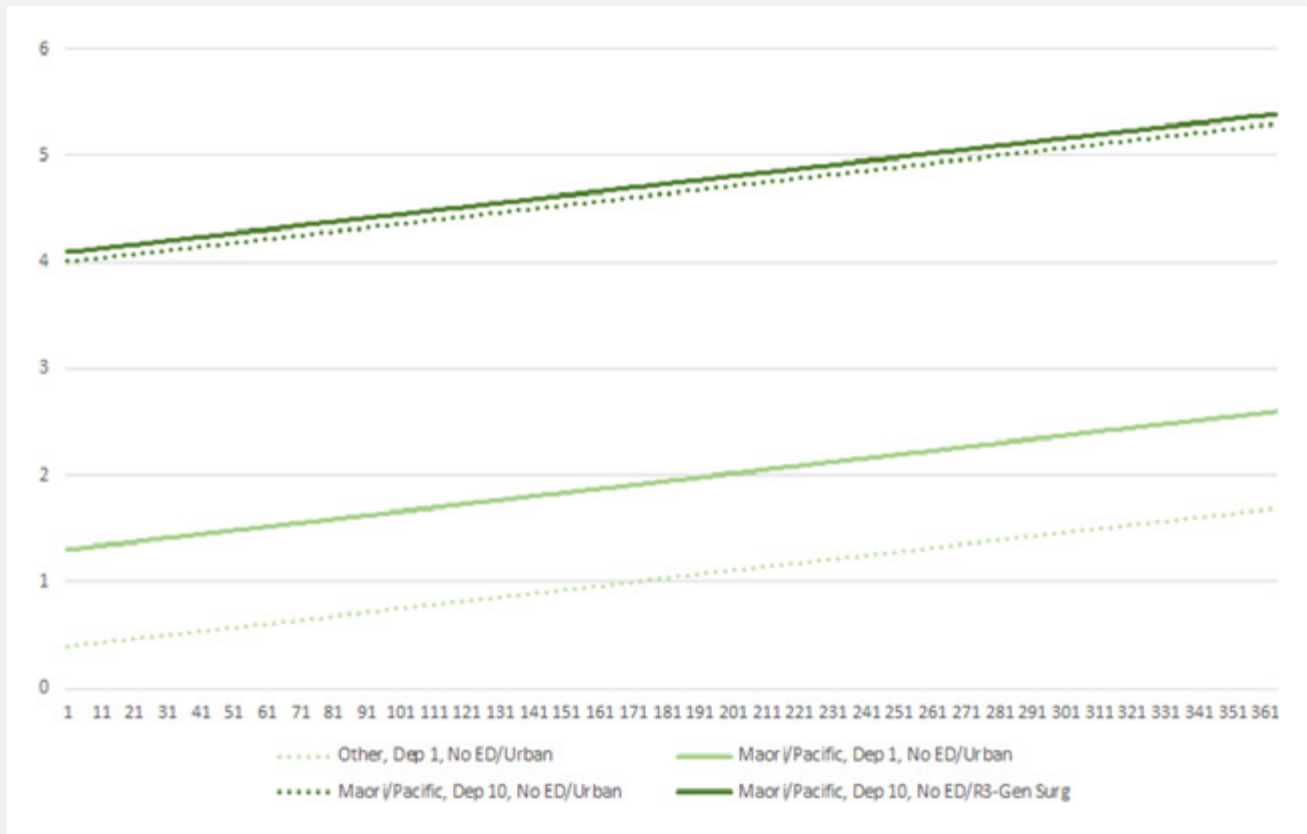
### 8.2.8. Examples of tool scoring

As mentioned previously, although the Southern tool is available across all priority categories, it is primarily used to assist decision-making around booking patients waiting for 'routine' procedures. As such, only examples using the 'routine' category have been provided below.

Figure 7 shows the cumulative points accrued over 365 days for different combinations of starting components. The bottom line shows scoring for 'Other' individuals who all reside in an urban location corresponding to deprivation

decile 1 (i.e. least deprived decile), and represents the minimum scoring possible with the Southern Waitlist Prioritisation Tool for routine patients. The bottom two lines show the effect of the ethnic group points allocation by presenting the points scored by 'Māori or Pacific' individuals (since Māori and Pacific people are both assigned one point on being added to the waiting list) where other tool parameters are the same as for the 'Other' case scenario represented by the bottom line. The difference between the second and third lines in Figure 7 shows the maximum effect of deprivation; those two scenarios present the points allocated to Māori or Pacific individuals without any ED visits in the previous year who reside in an urban location corresponding to deprivation decile 1 (least deprived) and deprivation decile 10 (most deprived) respectively. The average ED score for General Surgery as at 1 December 2023, 0.09 points, has been used for the scenario presented in the top line in Figure 7 encompassing an individual residing in the R3 rural category; as noted above, they are assigned 100% of the average ED score for that specialty. The difference between the top two lines in Figure 7 gives an indication of the effect of rurality on tool scoring (noting, as mentioned above, that the points allocation differs across GCH rural categories for patients within the same service as well as across services, and the rurality points allocations are reviewed and updated weekly).

**Figure 7: Cumulative points accrued over 365 days for different case scenarios including rurality points allocations for General Surgery as at 1 December 2023 – Southern tool**



Dep = deprivation decile according to New Zealand Index of Deprivation 2018; ED = Emergency Department; Gen Surg= General Surgery; Other = non-Māori/non-Pacific  
Rural/Urban status is classified according to the Geographic Classification for Health that has five categories, including R1, R2 and R3 rural categories

As noted previously, points are allocated on day 1 of being added to the waiting list for deprivation, ethnic group and ED visits or rurality if required. Figure 7 indicates that deprivation has the largest upfront (i.e. day 1) potential impact on scoring followed by ethnic group. The impact of residence in a rural location (in the absence of prior ED visits) is minimal. ED visits have a potential

impact of scoring greater than the ethnic group component, but as mentioned previously, points allocations above 1 are very infrequent for the ED/rurality component (around 2% of the total waitlist, which corresponds to around 10 patients for the routine category at Southern district as at 1 December 2023).

As outlined earlier, acuity is the only tool component that leads to accrual of points from day 2 onwards on the waiting list. After one year on the waiting list in the routine category, the acuity component accrues 1.3 points. Therefore, although the intention is for the acuity component to comprise up to 40% of the score for an individual, in reality it has less impact on scoring than deprivation for 'routine' patients residing in deciles 5-10 (who are assigned 1.5-3 points for deprivation) even after one year.

Table 1 below outlines the number of days required for the acuity component alone to reach the maximum points allocations for the other three tool components. As noted previously, the tool is currently mainly used for patients waitlisted in the 'routine' category. If the tool were to be used more widely across urgent and semi-urgent priority categories, the current method of calculating the acuity component can never result in an individual in a lower priority category gaining a total score that surpasses someone in a higher priority category who has waited the same number of days.

**TABLE 1: NUMBER OF DAYS REQUIRED FOR THE ACUITY COMPONENT TO EQUAL THE MAXIMUM POINTS ALLOCATIONS FOR THE OTHER TOOL COMPONENTS OF THE SOUTHERN TOOL**

Priority Category	Days Required to Reach Dep 10 (3 points)	Days Required to Reach Max ED (2 points)	Days Required to Reach Māori/Pacific (1 point)
Urgent	210	140	70
Semi-urgent	420	280	140
Routine	840	560	280

## 9. Evaluation summary

### 9.1. Evaluation framework assessment

There are a range of evaluation frameworks to guide evaluation design, in particular focusing development of relevant evaluation questions. The Technical Working Group and Review Panel considered a range of potential frameworks and selected a pragmatic framework in common use, that included an equity lens known as RE-AIM.<sup>201</sup> The Technical Working Group also noted that data was either not collected or not available to answer key aspects of a usual planned prospective evaluation due to the nature of the tool development and deployment, and that a pragmatic approach consistent with recent rapid 'real-world' health system evaluation would also be applied.<sup>202</sup>

- RE-AIM is a commonly used evaluation framework in health, with iterations since its introduction two decades ago. The framework is concerned with issues related to impact in real-world settings and translation of research into practice.<sup>203</sup>
- RE-AIM was expanded several years ago to include PRISM (Practical Robust Implementation and Sustainability Model). This includes RE-AIM outcomes and explicitly identifies key contextual factors related to these outcomes. PRISM can provide a pragmatic, feasible and robust way to consider contextual factors. RE-AIM was further updated to version 2.0 with additional equity and sustainability lens questions added to the sections.<sup>201</sup>
- Not all RE-AIM dimensions need to be included in every use, but consideration should be given to all dimensions.<sup>204</sup>

**TABLE 2: RE-AIM DOMAINS**

RE-AIM general definitions and equity lens questions	Northern region assessment	Southern assessment																														
<p><b>Reach</b></p> <p>The absolute number, proportion, and representativeness of individuals who participate in a given initiative, intervention, or program.</p> <p>Are all populations equitably reached by the EBI? Who is not reached by the EBI (in terms of a range of social dimensions and social determinants of health) and why? How can we better reach those who are not receiving the EBI and ensure we are reaching those who experience inequities related to social dimensions and social/structural determinants of health?</p>	<p>The Northern region team was asked to provide data on how many people the tool had been applied to since its implementation. The team provided the following data: At 2 October 2023 the Auckland Te Toka Tumai waitlist = approximately 33,500 patients, and the FSA waitlist = approx. 60,000 patients. It is noted that the tool was applied to everyone on the Auckland Te Toka Tumai treatment waiting lists since implementation.</p> <p>In Te Tai Tokerau, the team indicated: Number of people on waitlists as of 25 September 2023) that the equity adjuster is applied to Orthopaedics = 1397 and Urology = 788. This is the number of people on the waiting list at that specific date, not all patients treated since it was launched. It is noted that the tool has been applied to everyone on the Northland Te Tai Tokerau Urology and Orthopaedic waiting lists since implementation.</p> <p>The reach of the tool for different groups is covered by the tool description section above.</p>	<p>The Southern team was asked to provide data on how many people the tool had been applied to since its implementation. The team provided the table below which is calculated based on the number of patients who had waited 6 months or longer for their operation and had their operation between implementation of the tool and 26 September 2023 (data extracted). This was based on the assumption that the tool would be used for all routine patients and that urgent patients would not be waitlisted using the tool. It is noted that the Southern tool use was optional, and it is not clear whether reach differed across population groups or over time.</p> <div data-bbox="1034 1178 1477 1406" style="background-color: #1a3d4d; color: white; padding: 5px;"> <p><b>TABLE 3: THE NUMBER OF PATIENTS FOR WHOM THE WAITLIST PRIORITISATION TOOL MAY HAVE BEEN USED</b></p> </div> <table border="1" data-bbox="1034 1406 1477 2033"> <thead> <tr> <th data-bbox="1034 1406 1329 1487">Services</th> <th data-bbox="1329 1406 1477 1487">Patient numbers</th> </tr> </thead> <tbody> <tr><td>Cardiothoracic</td><td>26</td></tr> <tr><td>Dental Surgery</td><td>21</td></tr> <tr><td>ENT Surgical</td><td>211</td></tr> <tr><td>General Surgery</td><td>121</td></tr> <tr><td>Gynaecology</td><td>75</td></tr> <tr><td>Maxillo-Facial</td><td>10</td></tr> <tr><td>Neurosurgery</td><td>8</td></tr> <tr><td>Ophthalmology</td><td>100</td></tr> <tr><td>Orthopaedics</td><td>354</td></tr> <tr><td>Plastic Surgery</td><td>81</td></tr> <tr><td>Spec Paediatric Surg</td><td>28</td></tr> <tr><td>Urology</td><td>81</td></tr> <tr><td>Vascular Surgery</td><td>28</td></tr> <tr><td><b>Total</b></td><td><b>1,144</b></td></tr> </tbody> </table>	Services	Patient numbers	Cardiothoracic	26	Dental Surgery	21	ENT Surgical	211	General Surgery	121	Gynaecology	75	Maxillo-Facial	10	Neurosurgery	8	Ophthalmology	100	Orthopaedics	354	Plastic Surgery	81	Spec Paediatric Surg	28	Urology	81	Vascular Surgery	28	<b>Total</b>	<b>1,144</b>
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Spec Paediatric Surg	28																															
Urology	81																															
Vascular Surgery	28																															
<b>Total</b>	<b>1,144</b>																															

Note: EBI = Evidence based intervention (in this case the adjuster algorithm)



**TABLE 2: RE-AIM DOMAINS (CONTINUED)**

RE-AIM general definitions and equity lens questions	Northern region assessment	Southern assessment
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**Effectiveness** (and harm also considered here)

The impact of an intervention on important outcomes, including potential negative effects, quality of life, and economic outcomes.

Are the health impacts experienced equitably across all groups on the basis of various social dimensions and social/ structural determinants of health – why or why not? Do certain groups experience higher levels of negative effects or burdens?

**Effectiveness**

Although a range of graphical representations of various indicators (for example median and 90<sup>th</sup> centile wait times) by ethnicity, socio-economic status and geographic location were provided to the Review Panel in meetings with the two sites and in follow-up documentation, the Technical Working Group and Review Panel’s assessment was that this documentation provided a mixed picture of potential benefits in reduced waiting time for the parameters included in the tools. One graphic referred to in a number of reports on the Northern tool (Figure 8 below) shows inequities relating to the longest waiters in the P4 category prior to the tool implementation, and an equalisation by ethnic group in the immediate period post implementation. However other graphics in the same pack demonstrated a much more mixed picture for median wait times, non-sustained and variable response, and similar mixed pictures for socio-economic status and geography. Data presented to the Review Panel indicated improvements were seen prior to tool deployment in several instances.

**Figure 8: 90<sup>th</sup> centile waiting times for P4 category patients in June 2023 at Te Tokai Tumai**



**TABLE 2: RE-AIM DOMAINS (CONTINUED)**

RE-AIM general definitions and equity lens questions	Northern region assessment	Southern assessment
<b>Effectiveness</b> (and harm also considered here)	<p>After review and synthesis of all available information the Technical Working Group and Review Panel were not able to determine whether the tools were effective at reducing inequities within the parameters used in the tools. The reasons the Review Panel could not make this assessment include:</p> <ul style="list-style-type: none"> <li>• The Northern region and Southern District tools were implemented as part of a range of initiatives to improve delivery of planned care during and following the COVID-19 pandemic, based on known inequities and the exacerbation of these inequities due to COVID-19 delays. The range of activities were variably commenced during the COVID-19 pandemic and were continued thereafter. In addition, there were a number of actions undertaken to address the requirements of the July 2022 Planned Care Taskforce Report, which included a number of recommendations to reduce inequities, alongside actions to reduce those waiting longer than 365 days. The range of initiatives implemented prior to, and throughout the tool development and deployment period, makes it impossible to assess the causal effectiveness of the waiting list prioritisation tools as a single intervention. The Review Panel noted that most staff interviewed felt the tools had been effective within the package of other initiatives implemented.</li> <li>• The tools themselves were also developed and implemented in a COVID-19 enabling environment of rapid-test projects and an urgency to address worsening inequities in a number of areas of planned care, rather than a more usual process of planned quality improvement or project approach with pre-determined outcome measurement.</li> <li>• The tools were both developed through primarily stakeholder understanding of known inequities and local analyst and clinical expert opinion. Neither tool was derived from local data, scoring-parameters were not set using service-specific data, and expert biostatistical or epidemiological support was not sought. This feature, the absence of a statistical data-based derivation process for tool development, was noted by the Review Panel in the evaluation to introduce risk where score values do not accurately reflect the association of those factors with waiting list duration. The Review Panel was unable to quantify the effectiveness of the tool as the data was not collected during the tool development or deployment.</li> <li>• It is difficult to quantify other relevant issues that influence the referral and waitlisting process, such as surgical need and systemic barriers to accessing healthcare.</li> </ul>	

**TABLE 2: RE-AIM DOMAINS (CONTINUED)**

RE-AIM general definitions and equity lens questions	Northern region assessment	Southern assessment
<b>Effectiveness</b> (and harm also considered here)	<p>Although meaningful interpretation of any trends in elective planned care procedure and waiting list data before and after introduction of the tools was not possible, other co-benefits were articulated by staff involved with the two tools. Neither the Northern team or the Southern district developed a usual project or quality improvement approach to the development of an intervention (or intervention strategies), including pre-determined outcome measures, a measurement framework or an intervention logic model. To assist in identifying some of the potential co-benefits articulated by district staff through the interview process the Technical Working Group and Review Panel developed a hypothetical intervention logic model for what might have been considered and potentially measured in an evaluation if the data had been collected. This is seen in Appendix 7 and highlights several key themes identified during the site interviews:</p> <ul style="list-style-type: none"> <li>• Having a common vision to address inequities in surgical planned care – including national priorities, district and regional leadership support, key clinician and management alignment (noting that clinician and service support was not universal, and often had to be built over time with project staff working alongside services)</li> <li>• Improving the systematisation of approaches to waitlist management – all members of the team working from one ‘source of the truth’ and applying policies and procedures to reduce variation and improve systematic approaches</li> <li>• Accessible and collective visibility of the waitlist across different staff and services</li> <li>• Equity education opportunities including shared opportunities as leadership or site/service teams, as well as those workforces who may not have accessed opportunities previously e.g. booking and scheduling staff</li> <li>• Engagement of Māori and Pacific staff in leadership of the improvement activities including local Māori and Pacific health teams, navigation support staff, Te Aka Whai Ora and Pacific Health Group representatives</li> <li>• Identification of further resource for navigation or practice support, including explicit consideration of barriers such as transport; support and recognition for existing navigation services in districts where these existed</li> </ul>	

**TABLE 2: RE-AIM DOMAINS (CONTINUED)**

RE-AIM general definitions and equity lens questions	Northern region assessment	Southern assessment
<b>Effectiveness</b> (and harm also considered here)	<p><b>Harm</b></p> <p>The Review Panel found assessment of harm challenging. While there were no data available related to harm (as this is not routinely collected, and was not collected as part of the tool deployment at either site), the Review Panel did not see any evidence suggesting that any patients were denied care or treatment, or provided a lesser standard of care. It is noted that the optional/non-systematic nature of the application of the tool in Southern may have the potential to create bias. All patients have the potential for harm by waiting for a required procedure (even within the generally accepted waiting times associated with CPAC priority scores). Harm could therefore be considered greater for those waiting longer. In the status quo system there are already groups of people who demonstrably wait longer than others, therefore harm within the current system is not neutral but disproportionately impacts some groups (for example, low socio-economic groups, those living remotely and Māori and Pacific people). Deaths and the potential for worsening of the condition for which someone is waiting for a procedure are both harms that already happen on waiting lists. It is the task of clinicians and hospital managers to actively manage the waiting list to mitigate these potential harms and keep waiting times within generally accepted priority category parameters.</p> <p>The Review Panel was not able to determine whether there were any harmful impacts in the period of the tool deployment due to the complex nature of the environment into which the tools were deployed, particularly the multiple other interventions occurring in parallel. The tools are likely to have resulted in some people moving within the waiting lists; however, once the tools were fully implemented, restrictions were placed on explicit movement between clinical priority groups (priority groups one (urgent) to four (least urgent); P1-4) – where all patients within a priority group have set clinically acceptable waiting times.</p> <p>Patient movement was therefore occurring in the context of a pool of patients of similar clinical need and with a similar expected wait time for their procedures. As noted previously, tool parameter settings were established and altered over time with the intention that an individual in a lower clinical category will not score higher than an individual in a higher clinical priority category who has waited the same number of days. Some adjustment has been required in this regard and manual mechanisms were reportedly put in place to identify, review and avoid these occurrences.</p>	

**TABLE 2: RE-AIM DOMAINS (CONTINUED)**

RE-AIM general definitions and equity lens questions	Northern region assessment	Southern assessment																
<b>Adoption</b>																		
<p>The absolute number, proportion, and representativeness of settings and intervention agents (people who deliver the program) who are willing to initiate a program.</p>	<p>After the initial service development in Urology there was uptake of the tool across all surgical services in Auckland Te Toka Tumai and across all services that offer elective planned care procedures. In Northland Te Tai Tokerau adoption of the tool occurred in Urology and Orthopaedics, further roll-out was paused awaiting the outcome of the evaluation.</p>	<p>The tool was deployed in the services listed in Table 3 described in Reach above. The agents accessing the tool were also provided by the Southern team – the Table below indicates those who accessed the tool in the three months prior to 26 September 2023.</p>																
<p>Did all settings equitably adopt the EBI? Which settings and staff adopted and applied the EBI? Which did not and why? Were low-resource settings able to adopt the EBI to the same extent as higher-resource settings? What adaptations might be needed to facilitate adoption?</p>		<table border="1" data-bbox="1034 837 1479 1438"> <thead> <tr> <th colspan="2" data-bbox="1034 837 1479 1025"><b>TABLE 4: VIEWS OF WAITLIST PRIORITISATION TOOL IN LAST 3 MONTHS (JULY TO SEP 23)</b></th> </tr> <tr> <th data-bbox="1034 1025 1295 1111"><b>Row Labels</b></th> <th data-bbox="1295 1025 1479 1111"><b>Sum of totalEntries</b></th> </tr> </thead> <tbody> <tr> <td data-bbox="1034 1111 1295 1189">Booking administrators</td> <td data-bbox="1295 1111 1479 1189">208</td> </tr> <tr> <td data-bbox="1034 1189 1295 1234">Long wait RNs</td> <td data-bbox="1295 1189 1479 1234">35</td> </tr> <tr> <td data-bbox="1034 1234 1295 1312">Planned Care Team</td> <td data-bbox="1295 1234 1479 1312">33</td> </tr> <tr> <td data-bbox="1034 1312 1295 1357">Service Managers</td> <td data-bbox="1295 1312 1479 1357">10</td> </tr> <tr> <td data-bbox="1034 1357 1295 1402">Surgeons</td> <td data-bbox="1295 1357 1479 1402">6</td> </tr> <tr> <td data-bbox="1034 1402 1295 1438"><b>Grand Total</b></td> <td data-bbox="1295 1402 1479 1438"><b>292</b></td> </tr> </tbody> </table>	<b>TABLE 4: VIEWS OF WAITLIST PRIORITISATION TOOL IN LAST 3 MONTHS (JULY TO SEP 23)</b>		<b>Row Labels</b>	<b>Sum of totalEntries</b>	Booking administrators	208	Long wait RNs	35	Planned Care Team	33	Service Managers	10	Surgeons	6	<b>Grand Total</b>	<b>292</b>
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**TABLE 2: RE-AIM DOMAINS (CONTINUED)**

RE-AIM general definitions and equity lens questions	Northern region assessment	Southern assessment
<b>Implementation</b>		
<p>At the setting level, implementation refers to the intervention agents' fidelity to the various elements of an intervention's protocol, including consistency of delivery as intended and the time and cost of the intervention. At the individual level, implementation refers to clients' use of the intervention strategies.</p>	<p>The Northern region tool appears to have been largely implemented as intended – initial single service application, testing and refinement, and then wider application across all surgical services using the same approach.</p> <p>Resources required to implement include time to communicate the tool concept to clinical staff and managers, time to develop the current tools; speciality-specific discussions fortnightly between clinical staff and service managers regarding the need to adjust the threshold for booking and/or the component scores, and manual intervention processes by analyst, clinician and management staff across the services.</p>	<p>The Southern tool does not appear to have been implemented as intended. In particular, the acuity component does not have a maximum upper value so the tool components, in reality, do not have a fixed maximum weighting as was intended.</p> <p>Resources required to implement include time to communicate the tool concept to clinical staff and managers; time to develop the current tools; weekly calculation of patient scores (and average ED scores for each speciality).</p>
<p>Were the EBI and implementation strategies equitably delivered across settings/staff? Which settings/staff successfully delivered the EBI and implementation strategies and which did not and why? Do all settings/staff have the capacity and resources to deliver the EBI on an ongoing basis? What adaptations might be needed to promote equity and address social determinants of health?</p>	<p>Of note, Auckland Te Toka Tumai had an existing patient navigation and support service for Māori and Pacific patients (earlier in the COVID period). Neither Northland Te Tai Tokerau or Southern had this service, although patient supports were noted to be a critical component of the application of the tool and there were requests for further resource by services to address patient need uncovered through the tool application process.</p> <p>Adaptations to the tool by service and over time are covered in detail in the tool description section. In summary, a large number of changes, adaptations, refinements and 'tweaking' occurred to the tool across the Auckland Te Toka Tumai services in which it was deployed. Refinements and manual adjustments occur regularly with the tool's ongoing use. This involves analysts, managers, clinicians and booking and scheduling staff. There have not been changes to the tool to date in Northland Te Tai Tokerau due to less resource to apply manual intervention this district.</p>	<p>Other than the weekly review and update of the rural category scoring for each service, adaptations of the tool did not occur after the initial development period.</p>

**TABLE 2: RE-AIM DOMAINS (CONTINUED)**

RE-AIM general definitions and equity lens questions	Northern region assessment	Southern assessment
<b>Maintenance</b>		
<p>The extent to which a program or policy becomes institutionalised or part of the routine organizational practices and policies. At the individual level, maintenance has been defined as the long-term effects of a program on outcomes after 6 or more months after the most recent intervention contact.</p>	<p>The tool is currently still in use at Auckland Te Toka Tumai (for both FSA waitlists and elective planned care waitlists) and was implemented at Northland Te Tai Tokerau and remains in use in the two initial services. Governance is covered in the tool descriptions above. Of note, that while the Northern tool had substantial senior clinical and management support (particularly for the rationale and need for a tool of this nature), and some Māori and Pacific leadership support, those staff interviewed could not fully describe the nature of the tool, how it operated, what its components were or whether it was effective. The governance groups did not seek an external opinion on these factors, although they considered early in 2023 the need for an evaluation of the tool prior to any national roll-out.</p>	<p>The tool is currently in use at Southern for elective planned care waitlists with some expansion beyond original departments. Its application is primarily for the 'routine' category of patients. Governance is covered in the tool descriptions above. The tool did have senior management support, and the nature of the tool development, parameters and application were able to be described by those interviewed by the Panel.</p>
<p>Is the EBI being equitably sustained? What settings and populations continue to be reached long-term by the EBI and continue to receive benefits over time – why or why not? Do adaptations to EBIs reduce or exacerbate health inequities over time? Do all settings have continued capacity and partnerships to maintain delivery of EBIs? Are the determinants of sustainability the same across low-resource and high-resource settings? How do social determinants of health shape inequitable implementation and sustainability of EBIs over time?</p>		



## 9.2. Intervention logic

The Review Panel noted that an intervention logic (or theory of change) is best practice for large scale projects (and evaluations), assisting in identifying the activities and processes being impacted/changed and the intended short term and longer term outcomes. There was not an intervention logic developed for either tool deployment. The Review Panel identified this as an area of improvement for any further tool development or for other equity projects. The Panel used the themes identified through the staff interview process and observations made over the course of the evaluation to develop a theoretical (retrospective) intervention logic that included some of the tool-specific aspects and some of the co-benefit or unintended consequences. This can be found in Appendix 7 and may be useful as part of future considerations.

## 9.3. Best practice algorithm development

Outside of technical and epidemiological expertise provided by the Technical Working Group and Review Panel members in the evaluation process, there are a range of other mechanisms to consider best practice in algorithm development including Software as a Medical Device (SAMd) risk assessment<sup>205</sup> (often used for clinical algorithms) and the recently adopted public sector *Algorithm Charter for Aotearoa New Zealand*, developed by Statistics New Zealand, launched in July 2020,<sup>206</sup> see Appendix 8. The Technical Working Group presented their assessment that neither tool would be considered best practice algorithm development, in particular the lack of local data-derivation to inform the variable selection, and the lack of a pre-determined outcome improvement and audit or monitoring specifically against that parameter with planned variable adjustment.

The Review Panel received expert advice including how the Algorithm Charter criteria and risk assessment may apply, but noted that the Charter was very broad (not health specific) and the risk categories were also broad and not well defined. In addition, as the evaluation was not able to determine effectiveness or harm, these factors could not be well defined when assessing risk using the Charter. This limited the Charter assessment's utility; however, the process of applying the Charter was helpful in supporting the technical assessment of the tools.

## 9.4. Potential method for developing a robust waitlist prioritisation tool

The Review Panel requested that the Technical Working Group undertake assessment of what best practice algorithm development could look like from a technical perspective. The Review Panel notes that Māori and Pacific specific framing and expertise should inform best practice. The Review Panel also notes that there may also be other methodologies which should be given further consideration.

Development of future waitlist prioritisation tools should be undertaken with careful consideration of both appropriate people to be involved from the outset and use of a robust methodology to determine the tool components and their weightings. Due consideration should be given to the narrow window of application within a much wider care pathway, and wider inequities. Further consideration should also be given to the role of inequity outside the specific time period of referral to booking, and whether any mechanisms for 'accounting for' this may be possible.

A time-to-event ‘survival’ analysis<sup>iii</sup> based on multiple regression as outlined below is one methodology that could be used to both develop a waitlist prioritisation tool and, if repeated at regular pre-determined intervals, to monitor trends in the waiting list data and adjust the tool component weightings accordingly.

#### 9.4.1. Aim

To quantify the relative differences across relevant socio-demographic groups in the time from referral to elective planned care procedures among waitlisted individuals residing in the geographic area of interest.

#### 9.4.2. Development team

A working group should be established including relevant clinical staff, biostatisticians and epidemiologists, service managers and health analytics staff. A range of Māori and Pacific leadership (and representation relative to any equity parameter under consideration) is critical, as is equity-specific technical expertise, to ensure that the tool is developed with appropriate consideration of equity-related issues.

#### 9.4.3. Potential methods

##### Population

For example, every individual waitlisted on an elective planned care procedure waiting list with a Northern region service on a given date (e.g. 1 January 2023).

**Follow-up period:** This follow-up period where receipt of elective planned care procedures is identified could be, for example, one year or 18 months from the date that the cohort is identified.

**Data sources:** National or regional waiting list data would be used to construct a longitudinal cohort dataset with individual-level baseline data (i.e. variables corresponding to potential tool components) and data regarding procedures undertaken during the follow-up period (including date of procedure) as well as loss to follow-up or date of death if relevant.

#### Brief description of potential analyses

- **Time to event analysis:** e.g Fine and Gray subdistribution hazards regression
- **Outcome of interest:** Receipt of elective planned care procedure for each individual
- **Competing risk:** death from any cause
- **Independent variables:** potential tool components include prioritised ethnicity, deprivation decile according to the most recent New Zealand Index of Deprivation (NZDep), rural/urban status according to the Geographic Classification of Health, age, sex and priority category.

For all individuals residing in the geographic area(s) of interest who were identified from routinely collected waiting list data on the baseline date of interest, Fine and Gray models could be constructed to examine time from date of referral to receipt of elective planned care procedure up to the end of the follow-up period, with death during the follow-up period considered as a competing event. The cohort could include all ages, all elective planned care procedures and all surgical priority groups (P1-P4).

iii. Survival analysis is a type of statistical analysis concerned with studying the time between entry to a study and a subsequent event. Originally the analysis was concerned with time from treatment until death, hence the name, but is applicable to many areas besides mortality.<sup>210</sup> In the context of this report, survival analysis does not refer to the death of a person.

Adjusted subhazard ratios (aSHRs) with 95% confidence intervals would be estimated for the variables of interest (e.g. ethnic groups, deprivation quintiles, rural/urban categories, age groups and by sex), with each aSHR adjusted for all other socio-demographic variables in the model. The models could also be adjusted for surgical priority category (P1-P4), or stratified by surgical priority category if the proportional hazards assumption is violated. Follow-up time for individuals would cease if removal from the waiting list for a reason other than death was recorded during the follow-up period.

To consider some of the broader context of inequities while on the waitlist, relevant descriptive analyses could also be undertaken for the cohort by socio-demographic characteristics, including:

- removal from the waiting list during the follow-up period of interest for reasons other than death,
- short notice surgical cancellations and reasons for these, and
- individuals still waiting for a procedure at the end of the follow-up period of interest.

### Limitations of the analysis

- It does not account for surgical need.
- Potential inequities in assignment to surgical priority category across socio-demographic groups of interest can be described but not accounted for.
- There is known misclassification within prioritised ethnicity data.
- Deprivation quintile is based on a small area based metric of socio-economic status rather than an individual measure.

## 9.5. Additional Review Panel comments

### Urgency and equity championship alongside due diligence

The Review Panel noted that the nature of the tools (algorithms applied to waiting lists) was novel, and as such requires due diligence activities such as consideration of legal, ethical, public and technical best practice development (the issues outlined in this Review). However, the Review Panel also noted the context of the post-COVID-19 rapid worsening inequities in planned care, and the urgency and necessity to address these inequities in a comprehensive way. These concerns were reported internationally post-COVID-19, with a variety of interventions implemented in different jurisdictions. The Panel highlighted the importance of action on inequities, across the whole care pathway, and notes the districts that undertook development and implemented the tools were acting as equity champions. This Review offers an opportunity to improve Health NZ's approach to concrete actions to address inequity.

### Equity action at other points in the planned care pathway

In considering actions on inequities, a multilevel set of interventions is usually required. In terms of the planned care pathway, the tool application was only at one narrow point of the care pathway. Interventions to address inequities should be considered across all aspects of the care pathway beyond waiting list adjustment considerations.

### **Inter-district variation**

The panel saw compelling evidence of inter-district variation across the whole country at a high level, and in detail in the Northern region analysis. The greatest inequities were seen in Northland Te Tai Tokerau and Counties Manukau districts. The site interviews also confirmed that CPAC use, priority categorisation and thresholds for waitlisting for specific procedures varied at the district and service levels. The Review Panel considered action to address inter-district variation important in parallel with action to address other equity parameters under consideration in the tools themselves and across the wider planned care pathway.

### **Alternative interventions**

Although outside the scope of the Review, the Panel noted that there are likely to have been other potential interventions that could be considered with the goal of reducing waiting list inequities. Some of these interventions occurred in parallel with the tools and some were considered in the development of the tools. Such interventions may have included:

- amendment to the CPAC tools to better address inequities as part of the clinical priority process,
- standardisation and visibility of waiting lists, including pooled waiting lists to address inter-district variation,
- a singular focus on those waiting over 365 days (noting that this approach may mask inequities in the higher priority categories), and
- earlier offer of navigation support for groups of people with demonstrably longer waiting times.

## 10. Conclusions

The need for prioritisation within publicly funded health systems is well-established, and unavoidable where demand is greater than available resources.

Rebuilding approaches to the provision of planned care services in the wake of COVID-19 related delays has been seen as an opportunity to address longstanding health inequities, both in Aotearoa New Zealand and internationally.

The Review Panel concluded that pro-equity interventions, such as algorithm tools, are legally and ethically justifiable in the context of demonstrable inequities, and further that Health NZ has an obligation to act to achieve equitable health outcomes for all Aotearoa New Zealand populations. The Panel found that the staff and districts undertaking this work did so with strong purpose and rationale to address systemic drivers of inequitable outcomes, undertaking work that was novel in the Aotearoa New Zealand context and that was under conditions of urgency due to the worsening inequities related to COVID-19.

However, the Panel considered that the planned care equity adjustor tools implemented in the Northern region and Southern district were not developed in a manner consistent with algorithm best practice. Neither the Northern or Southern teams developed a usual project or quality improvement approach to the development of an intervention, including pre-determined outcome measures, a measurement framework or an intervention logic model. This is partly explained by the unique context in which they were used, a COVID-19 enabling environment of rapid-test projects and an urgency to address worsening inequities in a number of areas of planned care.

The tools were both developed through primarily stakeholder understanding of known inequities and local analyst and clinical expert opinion. Neither tool was derived from local data, scoring-parameters were not set using service-specific data, and expert biostatistical or epidemiological support was not sought. Opportunities for improvement (and a potential methodological approach) were suggested to ensure that the score values accurately reflect the association of variables with waitlist duration.

After review and synthesis of all available information the Technical Working Group and Review Panel were not able to determine whether the tools were effective at reducing inequities within the parameters used in the tool. The reasons the panel could not make this assessment include:

- The range of initiatives to improve delivery of planned care during and following the COVID-19 pandemic implemented prior to, and concurrently with, the Northern and Southern equity adjustor tools makes it impossible to assess their causal effectiveness as a single intervention.
- The Panel was unable to quantify the effectiveness of the tool as the data was not collected during the tool development or deployment.
- Quantifying other relevant issues that influence the referral and waitlisting process, such as surgical need and systemic barriers to accessing healthcare proved challenging.

Although meaningful interpretation of any trends in elective planned care procedure and waiting list data before and after introduction of the tools was not possible, other co-benefits were articulated by staff involved with the adjustor tools which the Panel considered important to highlight.

The Review Panel found assessment of harm challenging. Safety and harm data is routinely collected in hospital systems across a variety of indicators; however, assessment of harms occurring on waiting lists is not routinely assessed outside of the measurement of waiting times. In terms of harms relevant to the equity adjuster tools, the Review Panel considered the following potential harms: denial of care or treatment; lesser standard of care; and death, worsening of condition, pain or distress due to longer waiting times.

All of the potential harms listed may occur in the status quo. It is the task of clinicians and hospital managers to actively manage the waiting list to mitigate these potential harms and keep waiting times within generally accepted priority category parameters. The Review Panel considered there to be clear evidence that longer wait times disproportionately impacted some groups (Māori and Pacific patients, those from areas of high socio-economic deprivation, and those in rural/remote settings), and that these inequities worsened during COVID-19. There was also clear evidence of inter-district variation in waiting times and related processes resulting in differential harms. The current state is therefore not neutral in the receipt of timely surgery or the harm of longer waiting times.

As noted above, the Review Panel was unable to determine the effectiveness of the tools, particularly related to the parallel implementation of a range of other interventions. While redistribution (ordering) of the waiting lists did occur, likely changing the distribution of waiting times and therefore potential harms, the Panel was unable to make any assessment of the impact of the tool on individuals or groups in terms of potential or actual harms. There was no evidence of denial of care or lesser standard of care occurring.

The conclusion of the Review Panel and Technical Working Group, particularly noting lack of data-derivation, was that neither equity adjustor tool was developed according to best practice algorithm development. This means that the tools have the potential to be ineffective in addressing specific equity parameters, and may alternatively have potential to introduce risk, although the panel did not find evidence of harm.

# 11. Recommendations

Based on this Review, the Review Panel identified several recommendations.

1. **Action on demonstrated health inequities is legally and ethically justifiable.**  
Interventions that are developed must be robust and transparent to demonstrate that measures adopted to attain equity are rational and proportionate to disadvantage. This means that interventions should be designed and underpinned by evidence (including high quality data) and regularly evaluated to ensure they remain appropriate.
2. **A nationally consistent planned care action plan must be developed and mandated.** This coordinated approach will assist regions, districts, and services to address demonstrated inequities experienced by population groups including Māori, Pacific people, those living in the most deprived neighbourhoods, and rural people. Given the independent, intersecting and compounding effects of inequity, actions based solely on socio-economic deprivation will be insufficient.
  - a. Actions must be identified across the entirety of the planned care pathway, along which inequities exist at every step.
  - b. A suite of evidence-based interventions to address planned care inequities must be identified. Consideration should be given to local and international intervention examples.
  - c. Other improvement opportunities should be assessed, including to current mechanisms such as CPAC.
3. **The action plan (Recommendation 2) must specifically address the unacceptable variation in receipt of timely planned care between districts and regions, relative to individual-level sociodemographic and health variables used within district in the waitlist prioritisation tools.**
4. **Intervention development and implementation processes must carefully consider the right team and approach.** Interventions should be undertaken with careful consideration of both appropriate people involved, appropriate governance mechanisms and use of a robust methodology to determine technical tool components. Specific expertise regarding various methods must be included, such as Māori and Pacific epidemiologists, approaches grounded in kaupapa Māori theory, alongside Māori and Pacific clinicians. The approach should be transparent, widely socialised amongst staff and communities, and subject to audit, planned evaluation, and continuous monitoring. Consideration should be given in how to appropriately include consumer/public perspectives.



5. **Subject to the following, and until a nationally planned approach (Recommendation 2) is implemented, the current Northern region and Southern district approaches should continue:**
  - a. Algorithm improvement is undertaken using an appropriate statistical method with inclusion of data-derived variables that impact on timely receipt of procedure/ intervention (for example, see Section 9.4, noting that regional or other variation requires consideration).
  - b. Algorithm improvement is aligned to best practice and is undertaken by an appropriate team (as outlined in Recommendation 4).
  - c. Upon deployment, no further adaptations are made until the impact of the tool deployment is assessed (pre-specified time period and outcomes), and specific adjustments made on the basis of the impact assessment.
  - d. Consider the appropriateness of where such a tool may be deployed (same districts and/or other districts/services).
  - e. Consider appropriate training and support packages as part of deployment.
  - f. Consider an algorithm governance mechanism e.g. the National AI Advisory Group.
  - g. Consider whether the tool should be deployed prior to FSA as well as post CPAC triage for booking.
6. **Co-benefits of equity interventions are recognised and measured in equity-focused interventions including for staff, patients and the system.** The Panel noted the utility in capturing these in a future evaluation of an improved tool, alongside opportunities to improve staff engagement and communication.

## 12. Appendices

### Appendices supplied separately

Appendix 1: Evaluation of equity adjustor tools for surgical prioritisation

Appendix 2. Expert report: Ethics and equity in Priority Setting

Appendix 3. Expert report: Explicit priority-setting in Aotearoa New Zealand: An overview

Appendix 4: Description of analyses

Appendix 5: Northern tool governance

Appendix 6: Southern tool additional information and governance

Appendix 7. Potential intervention logic

Appendix 8. Algorithm charter for Aotearoa New Zealand

## 13. References

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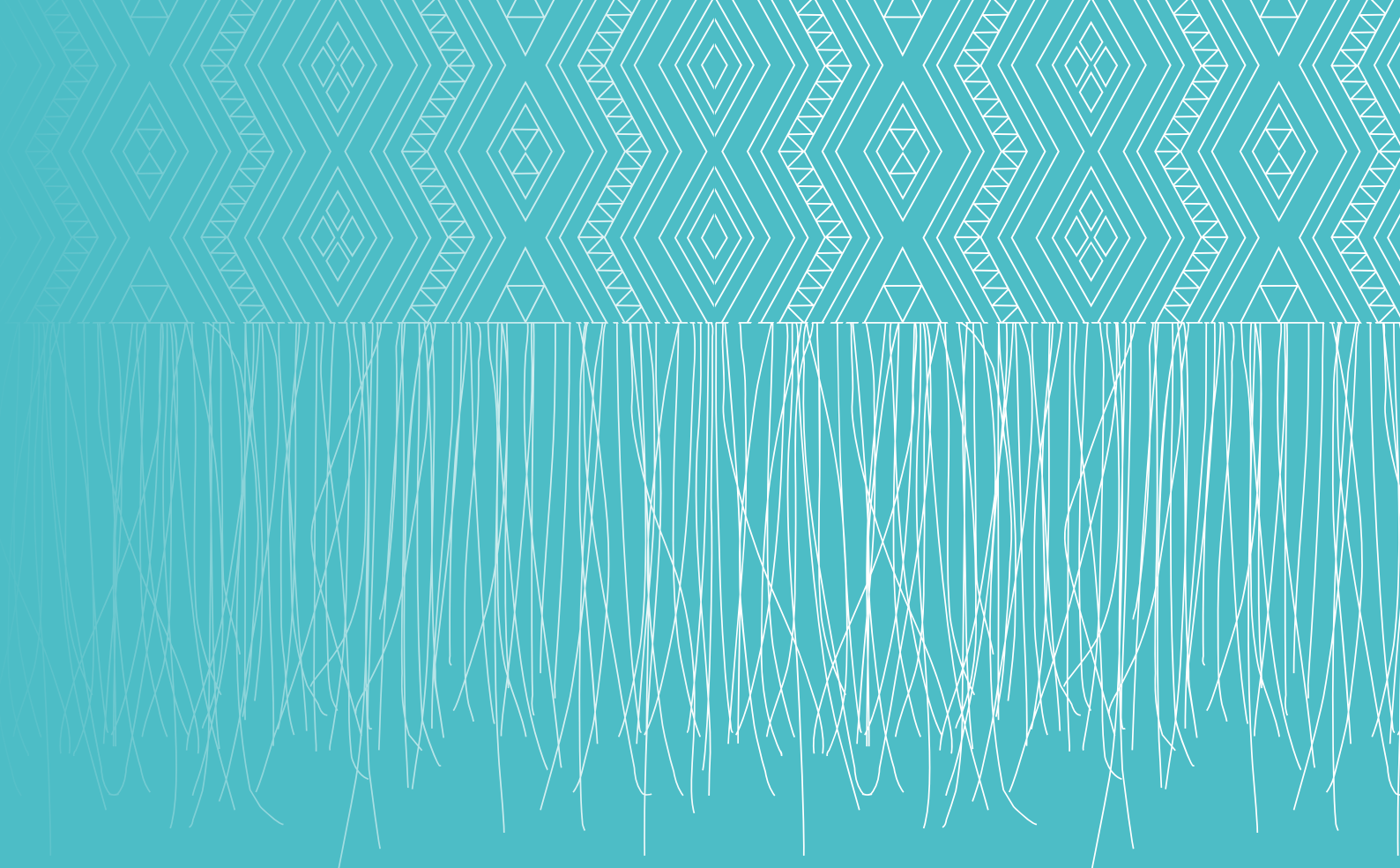


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The logo for Te Whaiti is a stylized, light blue graphic. The upper portion consists of a repeating geometric pattern of interlocking diamonds and zig-zags. The lower portion is a dense, vertical fringe of thin, slightly curved lines, resembling a traditional Māori tuihaka (tassel).

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