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Magic mouthguards and primary oral health care–evidence for policy makers

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Abstract
The World Health Organization (WHO) advocates for diverse evidence in effective health policy development and practice. This paper describes the 'Magic Mouthguard' initiative, an innovative oral health collaboration between a university, a corporate sponsor, and a public high school rugby team. Primarily aimed at injury prevention, the team's international triumph created unforeseen association between the mouthguards and their athletic achievement. The 'magic' of these mouthguards lead to communal uplift derived from feeling cared for and invested in, potentially contributing to the rugby team's victory. The initiative also advanced equitable access to custom-fitted mouthguards while confronting a systemic inequity by providing oral health treatment to young athletes who often face barriers to accessing oral healthcare, especially within a Māori and Pasifika communities in Aotearoa New Zealand. The story illustrates healthcare innovation by demonstrating that settings are integral to healthcare delivery and trust is foundational for engagement. This highlights how leveraging embedded knowledge and diverse evidence can integrate into oral health practice and promote population-level health.

Introduction
Storytelling is increasingly recognised as a valuable method for supporting knowledge translation within policy-making, particularly for addressing gaps in understanding on-the-ground realities and the local applicability of programmes (World Health Organization [WHO], 2020). When based on lived experience, stories can be used to illustrate policy problems, their consequences, and the conditions that shape them, offering insights that formal data alone may not capture. As a research approach, storytelling has long been used across the social sciences (Loyola, 2023) and holds significance in Indigenous contexts, such as Yarning in Australia (Kennedy, 2022) and Wananga-Purakau (sacred storytelling) in Aotearoa New Zealand (Siverstsen, 2025).

Across Te Moana-nui-a-Kiwa (the Pacific Ocean), Pacific scholars emphasise that Pacific research methodologies are anchored in Indigenous knowledge systems and relational practices, with storytelling a central mode of inquiry and meaning-making (Leenen-Young & Uperesa, 2023; Naepi, 2019). Approaches such as Talanoa, described by Vaioleti (2013) as an open, dialogic and relational form of storytelling, demonstrate how narrative methods generate rich and culturally aligned knowledge that honours Pacific worldviews.

Position Statement
The story presented in this paper is generated from the lived experience of first author Chanae Nomotu Ihimaera (CNI) a senior lecturer in oral health for Auckland University of Technology (AUT), and from her sustained engagement with predominantly Māori and Pasifika communities over many years. CNI of Ngāti Kuri, Ngāpuhi and Niuean villages of Toi and Mutalau. Her worldview and research pursuits are shaped by her whakapapa and commitment to equity. Her positionality is further enriched by her clinical background as a dental therapist (distinct from dentistry) and her lived experiences as a mother, grandmother and active member of her community. During the COVID-19 pandemic, CNI worked in equity and community engagement advisory roles, where she undertook equity analysis to identify how service disruption, fragmented communication and structural barriers to care disproportionately affected Māori, Pasifika and other underserved communities. This work sharpened her capacity to notice gaps between service availability and community uptake. The blend of professional expertise, equity focused analysis and local knowledge provides an insight into the lived realities of those most affected by health inequities.

Authors Dr Jeremy Tuohy (JT) and Dr Mary Silcock (MS) work in the Office of the Chief Science Advisor at the Ministry of Health (MoH). JT brings forty years of clinical practice in Women's Health in multiple settings within health systems in New Zealand and overseas combined with experience in research and government agencies. MS as a Pākehā New Zealander, occupational therapist and sociologist brings an integration of community health care and knowledge of society into the synthesis. MS grew up in the South Waikato and is the descendent of fifth generation and recent settler-colonists from northern England. The views expressed in this article are those of the authors and are not official MoH or AUT Policy.

The story
The story follows a group of young athletes from Kelston Boys High School (KBHS) who competed at the World School's Rugby Festival and their magic mouthguards. If the idea of magic seems unlikely, the story that follows may offer a different perspective.

In the suburbs of Auckland, KBHS challenges assumptions about sports powerhouses. It's a compelling story from the world's largest Pasifika city, proving that champions aren't forged with vast resources. KBHS's consistent success, often against wealthier schools, stems directly from several factors: effective coaching and management, deep connection to faith, purpose, family and community, nurtured raw talent, and perhaps one secret.

If this sounds like the beginning of a film that Taika Waititi wrote and directed and that made you smile, then maybe, of all the articles you read in this journal, you will remember this one. You might already know how the story ends. But did you know about the magic mouthguards? Anyone who has ever winced at a stray elbow during a game knows that safeguarding your pearly whites is vital. It is also expensive since it usually involves a trip to someone who knows their canines from their coccyx. Here is where the story gets interesting. The first author, CNI proud mum of one of the athletes, while cheering from the sidelines and cringing at some of those tackles, noticed a few issues with the mouthguard situation – dodgy fits, swapping mouthguards and the occasional bare-mouthed rebel. Over several years of sideline observation, several sons and their team-mates reliably turned up for sport, while boys of the same age were inconsistently reached by dental services. These patterns pointed to systemic gaps in service delivery rather than lack of engagement and became a key driver for the mouthguard initiative. This wasn't just about keeping teeth where they belong; as you will soon discover, the positive outcomes tackled more than just sports related dental disasters.

CNI leaned on AUT's relationship with Colgate-Palmolive to fund an initiative preventing sports-related dental injuries while supporting the education of oral health students. With this sponsorship, students from AUT's oral health programme made custom-fitted mouthguards for the KBHS First XV rugby team. The initiative was particularly timely as the First XV had just qualified to represent Aotearoa New Zealand at the World School's Rugby Festival in Dubai, United Arab Emirates.

The mouthguard initiative was carried out at Niho Ora ki Manukau, Oral Health Manukau AUT's oral health teaching clinic.[1] In undergoing comprehensive dental examination, all 26 student athletes were assessed and treated for any pre-existing oral health issues. For some, this was the first dental assessment they had since starting secondary school. Athletes who required treatment that was beyond the scope of oral health students were referred on for additional care.

The initiative also provided oral health care to players families, who were invited to access services at the teaching clinic. Following a comprehensive examination, family members were offered affordable treatment options, including up to five periodontal appointments.

Conducted over two months in October and November 2024, the initiative ensured the oral health of the team was well protected for the World School's Rugby Festival in December 2024. Yet, it's impact extended beyond that. By delivering accessible oral health care to the team members and their families, it enhanced wider community oral health. Concurrently, engaging oral health students in this important work, it also strengthened the trainees practical skills and experience in community-based oral health care. These were truly magic mouthguards!

Using embedded knowledge as evidence

The challenge for researchers, policy makers and health practitioners lies in recognising and valuing the knowledge embedded within stories and lived experience as legitimate forms of evidence for improving health services. Cammock et al. (2022) argue for a rethinking how knowledge is approached in order address health inequities, emphasising that within Aotearoa New Zealand's diverse ethnic landscape, frameworks and models must meaningfully reflect this intricate reality. The success of the mouthguard initiative was contingent on cultural knowledge and the long-standing practitioner experience of CNI, demonstrating how relational, contextually grounded knowledge can be mobilised in practice. This work can be understood through the lens offered by Stewart et al. (2004), who describe how Indigenous Māori and Pasifika early career academics navigate dual roles as disciplinary experts and Indigenous scholars, undertaking additional cultural and relational labour to translate knowledge in ways that are meaningful and accessible to communities.

Culturally-led innovation in health, as this initiative demonstrates, necessitates managerial courage, relationships based on trust and an equal sharing of power (Curtis et al., 2024). The mouthguard initiative involved all three of these ingredients through the trusted relationships amoung AUT, KBHS, a corporate sponsor, and the rugby players and their families. It also provided oral health students with a critical opportunity to learn about the value of trusted relationships, engagement with community leaders and the impact of culturally-tailored care, shaping their future professional practice.

In 2021, the World Health Organization launched a call to action for governments to institutionalise structures and processes to utilise evidence in ways that are "agile, demand-driven, ethical, multisectoral and multidisciplinary, adapted to the local context, coordinated effectively and rapid in responding to decision-makers' needs" (World Health Organization, 2023, p. 21). The World Health Organization's Evidence-informed Policy Network (EVIPNet) provides validated tools designed to facilitate evidence informed policy.[2] Accessing and synthesising diverse types of knowledge for the Aotearoa New Zealand context requires multiple perspectives, including the delivery of the service involved. The diverse and culturally-specific knowledge CNI has is a source of evidence for the Ministry of Health at the policy level, one we have rapid access to, and high trust of, because of our relationship.

The knowledge we have drawn from the 'magic mouthguards' story is described below, although as any novelist might say, every reader takes away a different story, so you do not need to agree or disagree with our interpretation. Indeed, we would be delighted if you see messages in this story which we have not considered.

1 Niho Ora ki Manukau, Oral Health Manukau. https://adc.aut.ac.nz

2 https://www.who.int/publications/i/item/WHO-SCI-RFH-2022.02

Key Insights from this Story

The embedded knowledge or evidence that we have taken away from the 'magic mouthguards' story falls into the following broad insights.

Health care innovation presents in many different ways

The provision of custom-fitted mouthguards necessitated comprehensive dental examinations, facilitating the early detection and management of pre-existing oral health conditions that may have otherwise remained undiagnosed and untreated. Unmet oral health needs result in increased need for hospital-level dental services and is a risk factor for other health issues (McKenzie et al., 2024). Older teenagers, particularly those who identify as Māori or Pacific ethnicities or live in areas of high deprivation are more likely to go on to require costly dental treatment or even tooth removal in their twenties (Pledger, Buckley, et al., 2024). This trend is also likely to continue into the older age group, especially when there are other comorbidities present, with males and those who identified as Māori being over-represented in dental tertiary level care clinics (Ananth et al., 2024).

The athletes motivation to access a mouthguard through a trusted clinician also provided an opportunity to offer care to whānau. The high uptake of dental care among athletes whānau amplified the impact of the initiative, underscoring the potential reach of community-based oral health initiatives. The offer of accessible oral health services to players whānau aligns with whānau and collective centred models of care that are particularly important for reaching Māori and Pacific communities (Teariki & Leau., 2024). By setting aside individual-focused paradigms of service delivery the initiative recognised the inherent interconnectedness of the collective (Enari et al., 2024), incorporating these connections to address broader oral health inequities in priority communities. Pacific peoples in particular face significant systemic barriers to dental care access, reflected in lower utilisation rates and poorer oral health among Pacific children and adolescents in Aotearoa New Zealand (Hanif et al., 2025). Recommendations to address these barriers include increasing Pacific representation in the oral health workforce and use of community-tailored interventions (Harper et al., 2022).

School-based and community oral health services are part of primary and community health care but are generally not integrated into other primary health services. Primary health care reform is a current priority for many countries around the world, including Aotearoa New Zealand (Ministry of Health, 2024). Recent recommendations for primary care reforms in the United Kingdom and Australia identified the allied health workforce as an important asset to leverage strengthening the impact of primary health care (Australian Government, 2024; Baird et al., 2024).

Allied health professions and a multi-disciplinary team approach has been found to have a positive impact on inequities in primary healthcare and increased responsiveness to community needs (Abimbola et al., 2019). The perception of which professions are considered part of the core primary care multi-disciplinary team can often be limited to practice nursing, physiotherapy, occupational therapy and pharmacy professions. Actively including oral health practitioners, (and other overlooked health workers who also may be best placed to address un-met need) is a way to leverage much greater reach and community impact (O'Reilly et al., 2017). The AUT community oral health training clinic, combined with CNI as a Māori and Pacific health leader were necessary requirements to realise the benefits from the mouthguard initiative. CNI not only had the mandate and opportunity to provide oral healthcare which was flexible and responsive to the needs of the community but was also able to incorporate her cultural knowledge and lived experience as a practitioner into her teaching.

Integrating primary health care services has been a challenge for delivery of primary health care in Aotearoa New Zealand (Middleton et.al, 2024). Primary health care that can integrate the voluntary and non-government organisations (NGOs) (Baird et al., 2024), with publicly funded health workers (Harvey, 2020) including local traditional health leaders (Leslie et al., 2020) creates greater opportunities for innovative prevention. Recent Aotearoa New Zealand research with six primary care practices found that GP's and nurses are open to a more deliberate integration of oral health into primary health care (Smith et al., 2025). As evidenced in the mouthguard initiative, including a broader primary health workforce into this integration may open up opportunities for similar initiatives.

The setting is part of the care

The athletes had their dental examinations and mouthguard fittings at AUT's South Campus at its onsite community oral health teaching clinic, Niho Ora ki Manukau. This resulted in another unintended benefit of the initiative. Given the examination process required several hours, CNI capitalised on this opportunity to extend the visit beyond a purely clinical interaction, offering a positive introduction to a university environment. Beyond the tangible experience of the oral health clinic, the team were welcomed into the university's whānau space, fostering a sense of belonging and providing an informal setting to have kai (food) and connect. The positive engagement was further enhanced by participation in the student association's free lunch, integrating a taste of the social fabric of campus life. CNI had organised for the team to access various recreational facilities on campus including videogaming, table tennis tables, and basketball courts, contributing to a relaxed and enjoyable experience.

These activities made the most of the opportunity presented by the location of the clinic but were dependent on the experience and cultural knowledge of CNI to tailor them in a way which would resonate with young men. It encompassed academic, social, cultural, and recreational aspects of university life, demystifying higher education and cultivating a perception of the university as a welcoming and accessible place where they could see themselves belonging. Consequently, some of the team followed up on options for tertiary study in 2025.

Widening the view of community health care to encompass socially and physical appropriate environments that have a pro-active societal intent, is an important policy lever waiting to be fully realised. By broadening the multi-disciplinary team perspective to incorporate the university site as part of the intervention, a connection between oral health care,

socio-cultural levers and public health interventions was made. These connections already often naturally occur in strengths based and holistic community care models such as Whānau Ora (Te Puni Kōkiri, 2023) but, typically are not drawn on in traditional health settings.

The experience the players had engaging with the University environment reflects findings from research with youth and positive access to healthcare. Young people have identified that traditional health clinics can be an unwelcoming or intimidating environment and that the staff and a youth-friendly physical environment help them feel welcome and safe (McKinlay et al., 2021). The success of the seemingly unrelated provision of oral health care at a university campus in addressing much wider social stereotypes in a strengths-based way, is evidence that supports policy decision-making. Policies that are designed to enable flexibility in location and physical environments of clinical services may have a far greater prevention and aspirational potential. The mouthguard initiative underscores a key insight from critical health practice. As Silcock (2020) explains, in Aotearoa New Zealand economic models often dictate healthcare delivery. The practical application and materiality involved with healthcare is a way to contest limitations set by these funding arrangements. The success of the mouthguard initiative was shaped by its material engagement—utilising facilities, Niho Ora ki Manukau and the AUT South Campus, and the mouthguards themselves, to capitalise on the opportunities materiality provides for local agency and collaboration of resources to drive change.

Trust is the foundation of effective care

The overarching determinant for health-enhancing behaviours is trusted relationships. Individuals seek information from those around them such as friends, family and community health leaders–because these are trusted individuals. The important role of these trusted sources was reinforced during the COVID-19 pandemic for many Pasifika (Lau et al., 2024; Tukuitonga et al., 2024) and Māori (Te Atawhai o Te Ao, 2024; Te Hauora o Tūranganui a Kiwa, 2024) where culturally specific services led the most successful campaigns for immunisation, testing and community prevention. As with mouthguard initiative, where CNI was a trusted health leader within the KBHS, AUT and by Colgate-Palmolive communities these examples illustrate the importance of involving trusted community leaders in the design and delivery of health interventions.

The Pae Ora (Healthy Futures) Act 2022, requires health entities to actively engage with individuals and communities with lived experience in the planning, design, delivery, and evaluation of health services, ensuring their voices are heard and inform decision-making (Ministry of Health, 2022). The story of the mouthguard initiative was a way for community voice and leadership to be seen and heard, providing an opportunity for trust to be built between decision-makers and the people impacted by this decision-making. Being a trusted health service is more likely to result in collaboration and combining of resources to meet the needs of differing communities. These collaborations can then turn into a cycle of trust-building activity, strengthening social norms within the health system and health care practice (Kuipers, 2022).

Trust is foundational for social acceptance and requires positive experiences and social relationships between individuals and the institutions or organisations they interact with (Hardin, 2002). Indeed, trust is an outcome realised when individuals and institutions have acted in ways that are deemed trustworthy (Edwards et al., 2019). Within a public health system, social licence implies that the health system will act in the best interest of those who trust it (Buchanan, 2000). Consequently, when population groups perceive the health system as failing to serve their best interests, this perception risks becoming an ingrained narrative of systemic unreliability and distrust. Hence, trust as a concept cannot be separated from trustworthiness and the social relations involved with being perceived as trustworthy (Hardin, 2002).

Therefore, the health system's trustworthiness stems from its human interactions. Recognising how sports actively engage young athletes, the mouthguard initiative provides tangible evidence of effective collaborative engagement. This future-focused success is rooted in strong relationships, whanaungatanga (building relationships and kinship) and consistently acting in a trustworthy manner.

Teaching is part of the learning health system

Finally, the mouthguard initiative also generated significant benefits for the clinical training of AUT university's oral health students. The current lack of healthcare workers in many areas, including oral health (Health New Zealand Te Whatu Ora, 2024), requires considerable learning opportunities for home-grown healthcare professionals, to ensure both adequate numbers of professionals and their competency. The hands-on experience with advanced digital scanning technology, comprehensive oral health examinations and dental treatment enabled students to actively participate in identifying and contributing to the management of oral health needs of the First XV team.

A learning health system (LHS) is one which aims to continually generate and integrate new knowledge into care through a cycle of innovation and learning (Greene et al., 2012). Having educational staff and researchers working in partnership with business sponsors and practicing clinicians is a key pre-requisite to success of the LHS approach in the United States (Gould et al., 2020). The LHS will then enable this knowledge to lead to system-level change (Matheson et al., 2024). Implementation such a system requires teaching and training of health professionals in an ongoing process throughout an individual's career and therefore, strong relationships between academia and clinical practice, beyond delivering a curriculum, are necessary. A key premise of a LHS approach is to engage with real-time evidence drawn from real-world practice, data insights and research (Greene et al., 2012). A LHS also has technical requirements including modern health information technologies and data sharing so that policy can be evidence-informed, practice accurately audited and future research planned. The ability to identify, understand and address gaps in real-world clinical practice is an essential educational message for both students and educators. The mouthguard initiative also gave the oral health students direct insight into a potential systemic deficiency in access to government-funded dental services.

Several athletes presented with untreated decay in their permanent dentition, but since they had recently turned eighteen, they were no longer eligible for government-funded dental care. This highlights significant concerns regarding the effectiveness of school-based oral health services in some regions, directly contributing to these players lack of access to treatment.

According to Harper et al (2022) large numbers of children have missed critical oral health examinations and interventions while they were twelve years and under. For instance, data from Counties Manukau in 2021 indicated that 45 percent of children were overdue for their dental examination having a recall date prior to 2019; for Māori and Pacific children, the situation is more severe, with 70% Māori and 73% Pacific children overdue for their dental examination by more than 30 days (p.6). National level reporting also illustrates the limitations of current surveillance: in Auckland, 54.7% of five-year-olds and 80.2% of twelve-year-olds seen by school-based services were caries-free in 2022, but these figures capture only those enrolled in oral health services for children aged 5–12, rather than all school-aged children (Environmental Health Intelligence, 2024). These patterns suggest the need for approaches that support both access and contextually grounded understanding of children's oral health.

Data for individuals aged 12 and over is limited, making it difficult to ascertain how many young people might not be accessing services to which they are entitled. Addressing these data limitations could be essential for revealing unmet oral health needs, and this situation reflects similar gaps in other primary health data. Notably, young people aged 15-24 years are least likely demographic to be enrolled with a primary health service (Irurzun-Lopez et al., 2021). Young men, in particular are often underrepresented in health service caseloads or enrolments and do not readily access primary health care (Palmer et al., 2024; Pledger, Irurzun-Lopez, et al., 2024). Seeing the real-life impact of this inadequate data collection allowed the oral health students to understand why service providers need to proactively engage with their communities as they age out of eligibility for free dental care. Rather than relying on individuals to seek treatment, providers could take a whānau-centred community approach to reach their target populations. This might take the form of culturally tailored outreach where sporting, religious and community events can be used to engage individuals and families who might otherwise lack access to oral health services. There is also a systemic responsibility for providers and policy makers to address foundational health data to adequately establish where the most need in a population is.

The Victory

The First XV went to Dubai in December 2024 in top form. After a series of impressive wins through the opening rounds of the tournament, KBHS proved too strong for South Africa's Paul Roos Gymnasium winning the match by 20 – 12 to continue an impressive run in the tournament by Aotearoa New Zealand Schools (see supplementary material S1)[3]. No dental injuries or health related issues were sustained during the trip.

The team's international victory unexpectedly elevated oral health's profile within the community, with impacts sustained more than 12 months following the initial intervention. Ongoing health seeking behaviours from continued requests for advice and support received by CNI, including enquiries to adapt the initiative for an international basketball league and other school sports teams.

Conclusion

The paper speaks to the breadth of interrelated benefits that emerged from a single intervention. It is not an evaluation of mouthguard efficacy, community engagement strategies, funding for dental injuries, whānau-centred approaches to community dentistry, or early exposure of to academic environments for young people who would not consider this to be an option. Rather, it considers how all these potential outcomes flowed from a single initiative, illustrating what can be achieved through a modest but well-designed example. The evidence offered is not to claim of universal effectiveness, but the demonstration that an approach like this holds promise and may work for others across similar contexts.

Ethics Statement

The achievements of the Kelson Boy's High School Rugby First XV are in the public domain and they have agreed to the use of this story.

CNI's dual insider–outsider positionality as clinician, early career academic and team mum created trust, access, and cultural understanding needed for storytelling to function as a meaningful method of knowledge translation. This proximity also required ongoing reflexive practice to navigate its ethical risks. Within talanoa and talanoa vā, researchers explicitly attend to relational ethics and the vā (the spaces between), enabling knowledge to be generated with participants rather than about them (Vaioleti, 2006; Fa'avae et al., 2022). This relational accountability aligns with kaupapa Māori research principles, which emphasise respect, reciprocity, and ethical responsibility to people, relationships, and knowledge (Smith, 2021).

Authors Contribution

CNI, ES and JT contributed to drafting and approving this article.

Investigation, Resources, Writing (original draft) – CNI, ES, JT

Supervision, Methodology, Validation, Writing (review and editing) – CNI, ES, JT

Supervision, Validation, Writing (review and editing) – CNI, ES, JT

Conceptualization, Project administration, Funding acquisition, Writing (review and editing) – CNI, ES, JT

Final approval of the version to be published – CNI, ES, JT

Conflicts of interest

The authors declare no conflicting interests.

3 https://www.aut.ac.nz/news/stories/aut-mouthguards-bring-home-the-win

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