Innovation to prevent sudden infant death: the wahakura as an Indigenous vision for a safe sleep environment

David Tipene-Leach\textsuperscript{A,C} and Sally Abel\textsuperscript{B}

\textsuperscript{A}Faculty of Education, Humanities and Health Sciences, Eastern Institute of Technology, Taradale, Napier 4122, New Zealand.  
\textsuperscript{B}Kaupapa Consulting Ltd, Napier 4110, New Zealand.  
\textsuperscript{C}Corresponding author. Email: dtipene-leach@eit.ac.nz

Abstract. The bassinet-like wahakura is an Indigenous initiative for the prevention of Sudden Unexpected Death in Infancy (SUDI). It was developed by New Zealand M\textsuperscript{a}ori in 2005 when M\textsuperscript{a}ori were rejecting the ‘stop bedsharing’ SUDI prevention message and the SUDI disparity between M\textsuperscript{a}ori and non-M\textsuperscript{a}ori had become entrenched. Made of native flax, the wahakura was promoted as a culturally resonant, in-bed safe sleep device that would disrupt the SUDI risk associated with ‘bedsharing where there was smoking in pregnancy’ without relying on smoking cessation. A significant movement of weavers and health professionals grew around the wahakura program. A body of research, including infant care surveys, retrospective case review, qualitative enquiry and a randomised controlled trial comparing wahakura and bassinet safety demonstrated the device’s public health plausibility, acceptability to M\textsuperscript{a}ori women and its essential safety. This facilitated the distribution, by District Health Boards, of safe sleep devices, including a related device called the Pépi-Pod, and safe sleep education to high-risk, mainly M\textsuperscript{a}ori, mothers. Infant mortality in New Zealand fell by 29%, primarily among M\textsuperscript{a}ori infants, over the period 2009–15, suggesting that M\textsuperscript{a}ori cultural concepts, traditional activities and community engagement can have a significant effect on ethnic inequities in infant mortality.

Additional keywords: bassinet, bedsharing, M\textsuperscript{a}ori, Sudden Unexpected Death in Infancy (SUDI), Sudden Infant Death Syndrome (SIDS), traditional.

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Introduction

The wahakura, an Indigenous infant sleep device for the prevention of sudden infant death, was developed within New Zealand’s M\textsuperscript{a}ori community in 2005. Acknowledging the value placed by M\textsuperscript{a}ori women on infant–parent bedsharing, the wahakura and its controversial ‘use in-bed’ design was developed in response to a plateau in mortality and a persistent disparity in M\textsuperscript{a}ori Sudden Infant Death Syndrome (SIDS) and later, Sudden Unexpected Death in Infancy (SUDI) (Child and Youth Mortality Review Committee 2009). SIDS is defined as an infant death occurring during sleep and remaining unexplained after review of clinical history, post-mortem findings and the circumstances of death (Krous et al. 2004). A significant 1990s decrease in SIDS saw the term SUDI became more commonly used in the 2000s when factors around bedsharing, such as suffocation, asphyxia and entrapment, came to play a more prominent role despite their contribution to the death being unclear (American Academy of Pediatrics 2011). This paper describes the context and development of the wahakura initiative, the subsequent research undertaken to provide a body of evidence to support its acceptability to health service bureaucracies, and the decline in infant mortality over that period associated with its widespread implementation. We argue that an innovative approach incorporating Indigenous values is needed to properly target Indigenous health issues.

Context

Sudden Infant Death Syndrome has been particularly prevalent in New Zealand. The National Cot Death Prevention campaign of the early 1990s, which promoted modifying the SIDS risks factors – prone sleeping, maternal smoking, a lack of breastfeeding and bedsharing – effected a 60% decrease in SIDS mortality that did not occur commensurately in the M\textsuperscript{a}ori community (Mitchell et al. 1994). The subsequent disparity prompted the development in 1994 of the M\textsuperscript{a}ori SIDS Prevention Program (MSPP), which advocated a different approach to SIDS prevention that took account of pervasive M\textsuperscript{a}ori deprivation, the value placed on bedsharing, difficulties around smoking cessation and problematic encounters with the Coronial system (Tipene-Leach et al. 2000).

The decrease in non-M\textsuperscript{a}ori SIDS deaths, associated with widespread adoption of the prone sleeping position (Mitchell 2009), was observed internationally and, in order to further reduce mortality, attention turned to messages advising against
What is known about the topic?

- Sudden Unexpected Death in Infancy (SUDI) is most prevalent in Indigenous and other deprived communities, among vulnerable infants, especially those who bedshare where there was maternal smoking in pregnancy.

What does this paper add?

- An innovative Indigenous approach to safe infant sleeping was found to be acceptable to Indigenous mothers and its promotion to be associated with a decline in infant mortality.

bedsharing. This occurred despite strong advocacy by the MSPP who maintained that a campaign against bedsharing would isolate at-risk communities from all SIDS-prevention strategies (Tipene-Leach et al. 2001), alongside evidence that the risk associated with bedsharing was primarily where smoking had occurred in pregnancy, and epidemiological advice that such a course was unlikely to be useful (Scragg et al. 1995). Over time, support for the anti-bedsharing message became even more widespread (American Academy of Pediatrics 2005), notwithstanding further evidence that without smoking in pregnancy, bedsharing was relatively safe (Carpenter et al. 2004) and that such a message might disrupt the complex relationship between bedsharing and breastfeeding (McKenna and McDade 2005). SIDS mortality in New Zealand became increasingly concentrated among Māori where both bedsharing and smoking in pregnancy were common. Possibly for the same reasons, SIDS mortality was also disproportionately high in Indigenous communities within Australia and Canada (Freemantle et al. 2006; Collins et al. 2012) and in minoritised communities in the United States (Hauck et al. 2011).

Although Māori SIDS deaths decreased alongside non-Māori deaths over the first 5 years of MSPP activity, a significant ethnic disparity became increasingly apparent. In the 2000s, the decline in mortality abated and an ongoing plateau developed with a persistent five-fold disparity between Māori and non-Māori rates (Child and Youth Mortality Review Committee 2009). Māori remained resistant to the anti-bedsharing message, and because smoking cessation programs among pregnant Māori women were not proving successful (Glover and Kira 2011), a new and innovative approach was required.

The practice innovation

In 2005, Māori health advocates, including the authors, convinced by the evidence that ‘bedsharing where there was smoking in pregnancy’ was responsible for the plateau and the persistent disparity, decided that an innovative approach that appealed to Māori women was needed — one that would acknowledge valued bedsharing practice and not rely on the cessation of cigarette smoking. At the time, the American Academy of Paediatrics were stressing the ‘separate sleeping surface’ for SIDS prevention (American Academy of Pediatrics 2005) and, although they were recommending cribs and bassinets, Māori health advocates proposed, somewhat controversially, a small ‘Māori bassinet’ be used within the shared sleeping environment.

Enlisting expert weavers and the Ngā Maia Māori midwives’ collective in Gisborne, on the East Coast of New Zealand, a 72 × 34 cm bassinet-like structure, with a flat bottom and a thin foam mattress, was developed alongside a set of ‘safe sleep’ rules. Made of native flax and crafted by traditional Māori weavers, the bassinet-like structure was promoted as a traditional and culturally resonant bedsharing environment and was named the wahakura (waha, to carry; kura, precious little object). With funding from Te Puni Kokiri, a government Māori development organisation, 88 of these items were made and distributed. Evaluation revealed that parents were comfortable with its use and confident in its safety, saying that it created a ‘demarcated no-go zone’, was easily transported and made night breastfeeding much easier (Abel and Tipene-Leach 2013).

Several challenges were also identified for the wahakura program. Adequate supply was an issue. The wahakura was not simple to make; the population concerned were unlikely to be able to easily procure the services of highly skilled craftspeople; and the demand was likely to be high given the high rates of smoking among Māori pregnant women (Tipene-Leach et al. 2010). Second, there was a distribution problem with national infant health services being unlikely to resource or fund a grass roots initiative. And finally, there was no scientific evidence of its safety.

Over the 5 years following the introduction of the wahakura, supply issues were addressed in several ways. The MSPP began a series of nationwide workshops for weavers to learn how to make wahakura, and another wahakura design was developed that was much quicker and easier to make. After the conceptual proposal of a Pepi-Pod (pepi, baby) as ‘anything that served a wahakura-like purpose but was not made of flax’, a Christchurch colleague working for an allied organisation, Change for our Children, identified a cheap commercially available plastic box that, with an attractive cover, was very much ‘fit for purpose’. Following the severe 2011 Christchurch earthquake, many families were left without safe ways to sleep their infants and Change for our Children developed an efficient and streamlined mass production of the Pepi-Pod (Cowen et al. 2013). Over 1000 were eventually distributed to earthquake-affected families. This reliable ongoing supply opened the way for the Hawke’s Bay District Health Board (DHB), with prompting from local Māori health advocates, to implement a program which, in 2011, identified infants at risk of SUDI and provided education about safe sleep and the Pepi-Pod safe sleep device. An evaluation found that it was feasible to assess risk, educate mothers and supply Pepi-Pods, and that this intervention was welcomed by participants (Abel and Tipene-Leach 2013). Over the following years, other DHBs commenced programs of their own. These became known as Safe Sleep programs and in 2016, most of the 20 DHBs were offering them. Without any central policy, standards or funding, each DHB developed its own project working with MSPP (then called Whakawhetu), Change for Our Children and local weavers for the supply of safe sleep devices (Abel and Tipene-Leach 2013).

Although the wahakura was promoted as a ‘safer’ sleep device for SUDI prevention, research evidence was needed to indicate that bedsharing, where there was smoking in pregnancy, was
Indeed the problem, that the device was in fact acceptable to Māori women and that the wahakura did not introduce anything potentially unsafe to the sleeping environment. A survey of SIDS-related infant care practices in Auckland revealed that 21% of Māori women both bedshared and smoked in pregnancy, while only 1% of non-Māori did so (Tipene-Leach et al. 2010). Furthermore, a retrospective case review of the recent decade of SIDS deaths in Auckland showed that two-thirds of the infants were found in a shared bed and that over 80% were Māori or Pacific babies (Hutchison et al. 2011).

A qualitative study of Māori women who had used a wahakura affirmed the acceptability of the wahakura as a culturally resonant item that meaningfully engaged Māori mothers and families in SUDI risk mitigation and, in particular, supported breastfeeding (Abel et al. 2015). In addition, a two-armed randomised controlled trial (RCT) compared the safety and other features of the wahakura with a standard bassinet. Utilising questionnaires, and overnight video recording and monitoring of infant temperature and oxygen saturation at 1 month of age, the research investigated prone sleep, head covering, thermal comfort zone, hypoxia, breastfeeding and non-feed-related parental infant-touching events. The demonstration of no essential difference between the two sleep environments (Baddock et al. 2017; Baddock et al. 2018) confirmed the essential safety of the wahakura. A third arm was then created that examined the safety of the Pepi-Pod using the controls from the wahakura RCT study and this demonstrated that the Pepi-Pod was also a safe device to use as an infant sleep environment (Tipene-Leach et al. 2018).

Over time, a groundswell of Māori weavers, health professional support and DHB funding ensured that the Safe Sleep program distributed wahakura, Pepi-Pods and safe sleep education to those most vulnerable (Abel and Tipene-Leach 2013). Over the 2009–15 period, there was a significant reduction (29%) in national post-perinatal mortality, mostly among Māori infants in places where Safe Sleep programs were active (Mitchell et al. 2016). Safe sleep devices had been delivered to 27% of the at-risk population and the Ministry of Health moved to fund a national roll out of the Safe Sleep program. This program is presently being implemented.

Of concern is yet unpublished data that point to another plateau in SUDI deaths. This suggests that the capacity for SUDI reduction due to the modification of ‘bedsharing’ among approximately a quarter of those at risk may have been reached, and that an extension of that distribution and/or an innovative culturally resonant strategy to deal with smoking in pregnancy is now required.

What can be learnt from the wahakura case
The Safe Sleep program belongs in the wider primary healthcare sector, alongside the promotion of breastfeeding and accessing of adequate antenatal care. Recommendations and referrals between front-line primary care clinicians, general practitioners and midwives, and the health promoters, health educators and community health workers who staff such interventions, is vital. The Safe Sleep program was so effective because it was designed for a specific target population, by members of that population, using cultural maxims derived directly from that population group. It thereby avoided a common outcome of many new health interventions that improve outcomes for dominant groups but produce, or increase, disparity for disadvantaged groups. The use of such traditional models in the development of safe sleep devices has potential parallels in other Indigenous communities; for example, with the Aboriginal Australian coolamon and the cradleboard of First Nations North Americans. Indeed, the Indigenous Apunipima Cape York Health Council of Queensland, Australia, is presently deploying the Pepi-Pod in its communities, partnering with the University of the Sunshine Coast and Children’s Health, Queensland, to do so (Young et al. 2013).

It is also important to note that the growth of the wahakura movement relied on community control and proceeded at a rate determined by Māori women, weavers and health workers. While this article has discussed the contributions of health advocates and researchers, in truth, without the fundamental buy-in of Māori women and the drive of community-based participants, this initiative could not have proceeded. In such culturally aligned health promotion practice, Māori input, in this case with the wahakura, and Māori community engagement have been pivotal to the success. In the immediate future, with an apparent plateau in post-perinatal mortality and the Ministry of Health having ‘taken over’ the Safe Sleep program, a potentially new role has emerged for the original advocates and their community movement to bring about a wave of ‘culturally resonant’ change that addresses cigarette smoking in pregnancy.

Conclusion
Utilising Indigenous tradition alongside the evidence around SUDI risk was the basis of the development of this intervention. Wide community participation cemented the program in the Māori community. We also sought robust evidence that the intervention was appropriate, safe and effective. While this is a model for interventions to address Indigenous health, wider attention also needs to be given to the cultural competence of the workforce, strategic action around institutional racism and political change that addresses the social determinants of health.

Conflicts of interest
The authors declare a potential conflict of interest in that they have been involved with the development and promotion of the wahakura from its inception and, in collaboration with others, have undertaken much of the research relating to the device.

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