Sustainable midwifery

Supporting improved wellbeing and greater equity

NZIER report to New Zealand College of Midwives

March 2020

About NZIER

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NZIER was established in 1958.

Authorship

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Key points

How could sustainability of the midwifery delivery model be improved?

Caseload midwifery is community-based and at the front line of perinatal public health interventions and outcomes. NZIER was commissioned to investigate the contribution of midwifery to improving health outcomes. Pay and conditions were not the main focus of the project, but this emerged as an underlying factor in the sustainability of improving perinatal health outcomes.

The workforce faces challenges from increasing medical and social complexities, which are demanding more time per pregnancy than is allowed under section 88 of the New Zealand Public Health and Disability Act 2000. Pay and conditions is a factor in retention issues. Studies have shown that, for low-risk pregnancies, midwifery can reduce the risk of interventions such as caesarean section, contributing to better health outcomes and health system savings. Adequate training, resources and integration are critical in achieving those outcomes. In this report, the challenges faced by midwifery are investigated and recommendations are made to improve the sustainability of resources for midwifery in New Zealand.

"Midwifery is associated with more efficient use of resources and improved outcomes when provided by midwives who are educated, trained, licensed, and regulated, and midwives are only effective when integrated into the health system in the context of effective teamwork and referral mechanisms and sufficient resources" (Renfrew et al. 2014, 2)

Midwifery strengthens primary and community services

Primary and community care-led health systems produce better outcomes. The interim Health and Disability System Review has signalled that primary and community care needs to be strengthened. The Child and Youth Wellbeing Strategy calls for the best possible health, starting before birth. This means that midwifery services are central to strengthening our health services and improving maternal and child wellbeing.

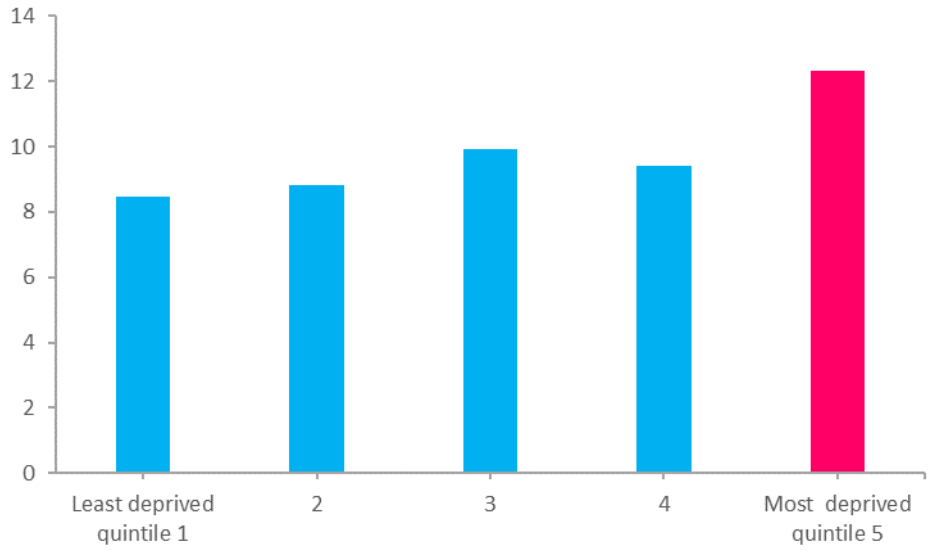
Midwifery is one of the earliest opportunities to invest in a child's wellbeing

International reviews have demonstrated that midwifery contributes to the short, medium and long-term outcomes of mothers and babies. The outcomes include long-term health benefits but also contribute to social and economic wellbeing.

Community-based midwives support the achievement of good outcomes by providing a personalised healthcare service that lowers barriers for parents and relieves pressure on hospital infrastructure.

Midwives face increasing social and medical complexities in their work. The importance and impacts of these can be significant. The rate of perinatal mortality is 34% higher in the most-deprived neighbourhoods (quintile 5). The cost of inequality is 73 lives per year.

Figure 1 Perinatal mortality by deprivation quintile, 2013–2017



Source: Perinatal & Maternal Mortality Review Committee (2018)

Demand for midwifery services will increase for populations at increasing risk

The number of births is forecast to increase in the next decade by 3%. Most women are choosing a midwife as their lead maternity carer (LMC). The cultural diversity of mothers and families is increasing.

Sustaining outcomes by addressing the 3Cs – complexity, caseloads and conditions

Systematic reviews of the evidence support the New Zealand model of midwifery-led care as cost-effective. Therefore, we focus on the sustainability of the current model. NZIER has three key recommendations to support a sustainable midwifery service that continues to meet demand and outcomes.

Table 1 Policy recommendations to improve the sustainability of midwifery

	Issue	Recommendation
Complexity	Perinatal mortality is disproportionately high among the most-deprived neighbourhoods (quintile 5).	Introduce a special fee for additional midwife consultations for women living with high deprivation and/or social complexity.
Caseloads	The needs of mothers mean midwives are working 17–26% more than a full-time equivalent role.	Increase the level of fees for midwifery by at least 20% and recruit additional midwives.
Conditions	A two systems approach – long delays between registration and payment, combined with a procurement model that is not aligned with demand pressures.	Launch a comprehensive review of procurement for the delivery of midwifery services and involve midwives in the design of a new procurement model that is aligned with the demand pressures. The review should include self-employed and hospital-based midwives.

Source: NZIER

Resourcing the 3Cs to sustain the service and the outcomes

Increased services to address the quintile 5 equity gap, addressing the workload issue component and introducing milestone payments to address payment delays are the three areas of cost that need to be funded to retain a sustainable present-day service. Figure 2 below sets out the costs of improving equity and addressing complexity.

Figure 2 Combined cost of the recommendations in 2020

Source: NZIER

There are establishment costs of moving from post-service to milestone payments for changes that must be made to payment systems. The annual costs of foregone interest to the Crown have not been included.

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1 Objectives and scope

The New Zealand College of Midwives commissioned NZIER to examine the cost utility of an expanded midwifery service.

1.1 Research objectives

The objectives of the research were as follows:

- The primary objective was to examine the demand and supply factors for midwifery services.
- The secondary objective was to establish the cost utility of closing any identified gaps to retaining a sustainable service offering.

1.2 Scope of the research

The scope of the research covers the sustainability of the current midwifery model. Impacts on government expenditure beyond the health system were out of scope due to the limitations of the research budget and timeframe.

1.3 Structure of the report

The structure of the report is as follows:

- Our approach
- The long-term health system context
- Defining the problem and the opportunity
- Opportunities to improve the sustainability of midwifery in New Zealand.

1.4 Research funding

The research was funded by the New Zealand College of Midwives and conducted independently by NZIER. NZIER is honoured to be asked to conduct this research.

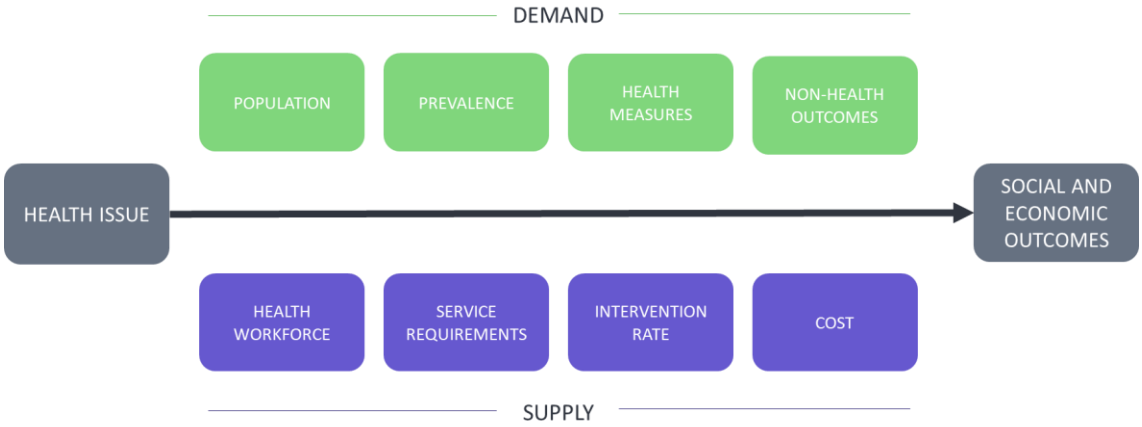
2 Our approach

NZIER used a structured approach to conduct the research. The benefits of this approach were:

- a clear framework for assessing the demand and supply
- establishing the relationships between inputs, outputs and outcomes
- a systems-based approach that considered the demand for services and the corresponding supply-side implications.

Our structured approach was based on the stylised intervention logic shown in Figure 3.

Figure 3 NZIER health intervention logic model



Source: NZIER

3 The setting: the health system

New Zealand's health system performs well when investments are compared to outcomes. Investment in the system is determined by the government, allowing the government to shape what is offered by the system (Ministry of Health 2019e).

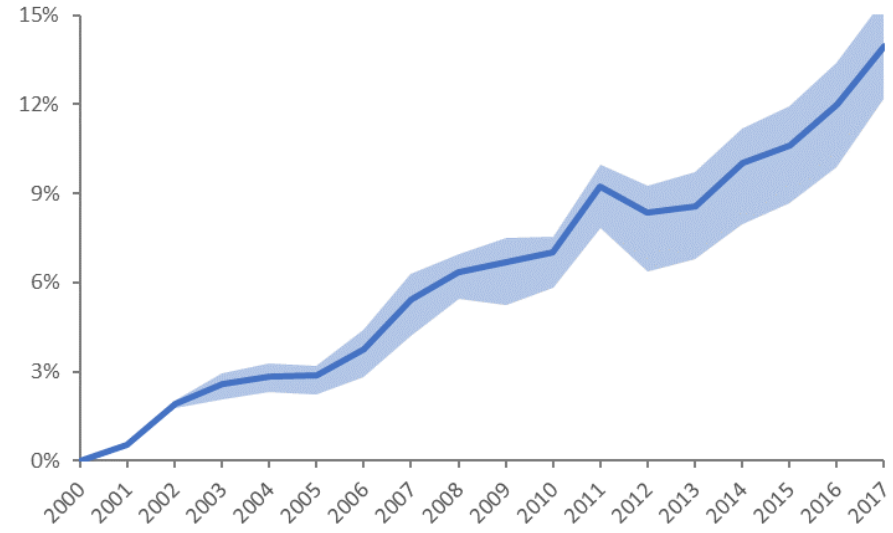
Demand pressures will continue to be a challenge

The demands on the health system have increased and will continue to grow.

Figure 4 shows the growth in disability-adjusted life years (DALYs) since 2000. The unabated upwards trend indicates demand pressures in the health system have increased over the long term.

Figure 4 Growth in the burden of disease since 2000

The growth in disability-adjusted life years since 2000

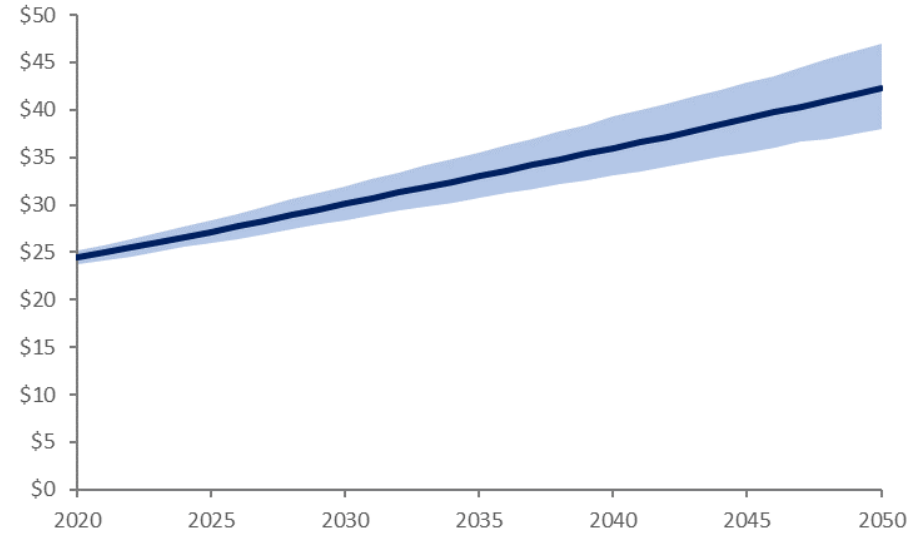


Source: Institute for Health Metrics and Evaluation (IHME) Global Health Data Exchange

The long-term forecasts of government health expenditure also show the upwards pressure on the health budget in New Zealand (see Figure 5).

Figure 5 Government health expenditure forecasts

NZD (billions)



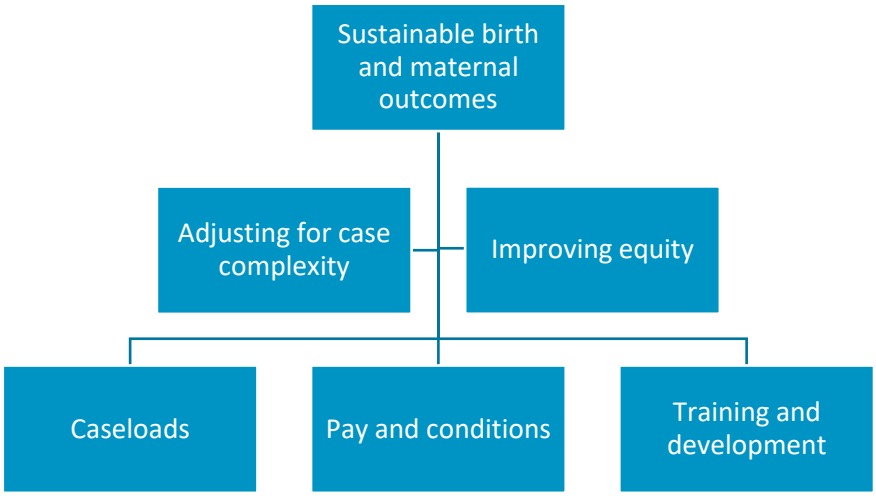
Source: Institute for Health Metrics and Evaluation (2019) and OECD (n.d.)

4 What are the problems and the opportunities?

4.1 The intervention logic

NZIER developed an intervention logic framework for sustaining good outcomes for New Zealand mothers and babies. The framework aims to deliver improved and sustainable maternal and perinatal outcomes. The second layer of the intervention logic deals with the intermediate outcomes of case complexity and improving equity. The foundation of the intervention logic is the fundamental input conditions and practicalities for midwives: caseloads, pay and conditions and training and development.

Figure 6 Intervention logic for sustaining maternal care services in New Zealand



Source: NZIER

4.2 What are the issues?

There is a set of related issues that need to be addressed to sustain New Zealand's model of maternity care and meet government objectives for improved equity:

- Increased complexity of health issues in the cohort of expectant mothers.
- Complexities in the social determinants of health wellbeing that can increase the time midwives spend with their mothers.
- Persistent inequalities.
- Factors affecting labour market participation including:
  - caseloads
  - increasing medical and social complexity is demanding midwives to spend more time on cases than is reflected in section 88
  - irregular and unpredictable hours of work are required due to the nature of labour, birth and acute call-outs
  - some aspects of pay and conditions and training and development.

4.3 Midwives have a multi-faceted role that is at the forefront of public health

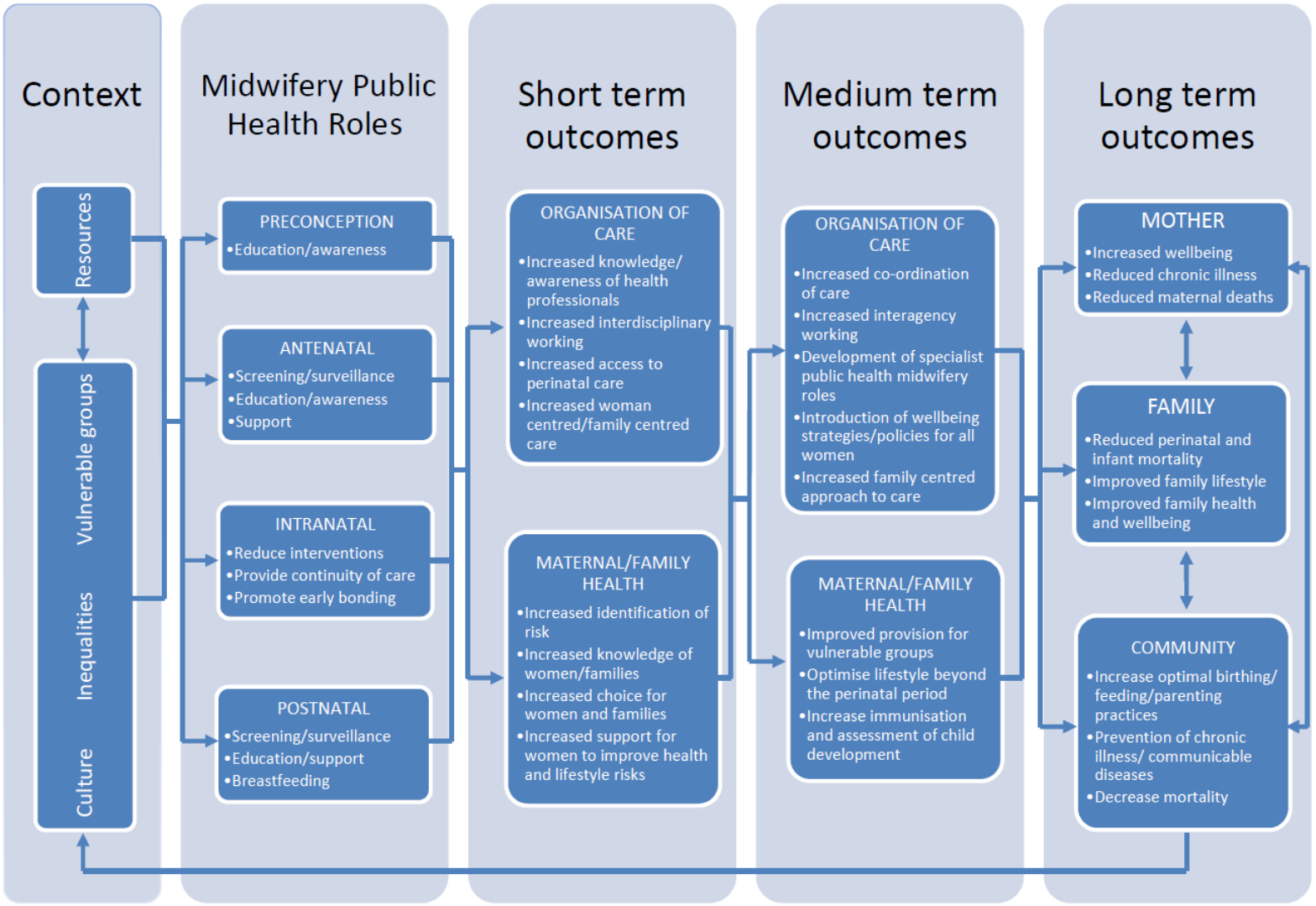
There is a well-established body of research that shows primary and community care-led health systems produce better outcomes (Starfield, Shi and Macinko 2005). New Zealand's midwifery service is community-based. This has been reinforced in the Health and Disability System Review and the Child and Youth Wellbeing Strategy.

McNeill, Lynn and Alderdice (2010) completed a systematic review of the public health role of midwives. They identified three areas:

- Reducing the social gradient through promoting wellbeing and preventing ill-health.
- Enabling children to have the best start in life through parenting education.
- Creating opportunity for midwives to be co-ordinators of care to identify vulnerable groups.

A summary of the overarching outcomes framework is shown in Figure 7 below, which illustrates the significant range of public health issues midwives cover. It also shows the effect of pregnancy support for short, medium and long-term outcomes for the child, the health system and society.

Figure 7 The contribution of midwifery to public health outcomes currently and in the future



Source: McNeill et al. (2010)

4.4 Midwifery can lower the need for intervention, increase satisfaction and assist in lowering the barriers to health due to the impact of deprivation

Reducing the need for intervention

A systematic comparison of models of care found that women who received midwife-led continuity models of care were less likely to require interventions and more likely to be satisfied with their care and experience fewer adverse outcomes compared to other models of care (Sandall et al. 2016).

Donnellan-Fernandez, Creedy and Callander (2018) conducted a systematic review of the cost-effectiveness and clinical effectiveness of continuity of midwifery care for women with complex pregnancies. They found that midwifery care could lead to improved health outcomes and cost savings compared to other models of care, but this was not always the case. Service design and delivery was an important factor in the outcomes achieved.

Callander et al. (2020) investigated the cost-effectiveness of three interventions known to reduce the probability of a caesarean delivery compared to the standard care approach. The interventions considered were caseload midwifery, routine-induction of labour and chart audits. Caseload midwifery represented the best value for reducing the probability of a caesarean delivery.

Increasing satisfaction and supporting better maternal mental health outcomes

Caird et al. (2010) conducted a systematic review of the socioeconomic value of nursing and midwifery. They found:

- additional consultations by midwives appear to have a beneficial effect on postnatal depression when compared with routine care
- midwife-led care for low-risk women compared to doctor-led care appeared to improve maternal outcomes, reduce the number of procedures during labour and increase maternal satisfaction with care.

Addressing deprivation

Inequalities in maternal and newborn care can have an economic impact on communities and frustrate efforts to address intergenerational health inequalities. Action on social determinants throughout life is needed to achieve greater health equity, now and in the future (Marmot et al. 2012).

Community-based midwifery can assist in lowering the barriers to health due to the impact of deprivation through home visits. Generally, the most deprived are 1.4 times more likely to face barriers to healthcare. Lack of transport is an important barrier to access healthcare. For example, the most deprived are 5.4 times likely to have an unmet need to visit a GP due to lack of transport compared to the least deprived (Ministry of Health 2019a). Community-based midwifery offers a solution to lower the transport cost barrier for deprived women.

Caseloads should be adjusted to accommodate the higher needs of communities with socioeconomic deprivation. Homer, Brodie, Sandall and Leap (2019, 64) suggest it is “vital that midwives working in communities with high social deprivation with multiple public health issues have smaller caseloads” and that caseloads in deprived communities could be halved due to the additional needs of women in those communities.

Midwifery can contribute to improving perinatal health outcomes among women with low socioeconomic status, relative to a physician-led model of care. McRae (2018) found that antenatal midwifery reduced prevalence of small-for-gestational-age and preterm birth for women of low socioeconomic position compared to physician-led models of care. There is evidence that midwifery can also improve perinatal outcomes in indigenous communities. Preterm birth gaps can be reduced through targeted interventions that provide continuity of midwifery carer with indigenous governance and indigenous carers (Kildea et al. 2019).

4.5 Is it time to consider strengthening midwifery in New Zealand to ensure its sustainability for the future?

Midwifery has been shown to be associated with more-efficient resource use and better outcomes provided midwifery is resourced and integrated into the health system (Renfrew et al. 2014).

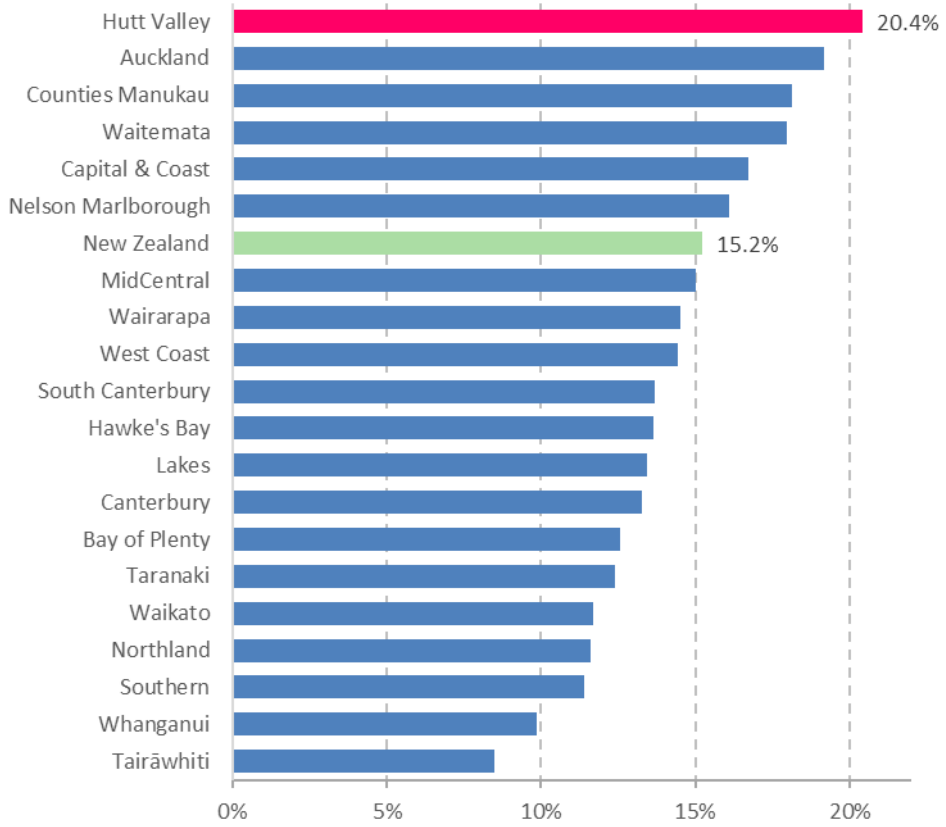
"Midwifery is associated with more efficient use of resources and improved outcomes when provided by midwives who are educated, trained, licensed, and regulated, and midwives are only effective when integrated into the health system in the context of effective teamwork and referral mechanisms and sufficient resources" (Renfrew et al. 2014, 2)

Hospital and community-based midwives are interdependent. Both need to be resourced adequately for maternity services to function well. There is evidence that midwifery in New Zealand is under pressure, which puts at risk the suitability of the model. For example, a survey of 473 midwives found that:

- employed midwives worked fewer hours but had higher levels of burn-out and anxiety than self-employed midwives
- employed midwives reported lower levels of autonomy, empowerment and professional recognition
- aspects of the work environment found to be associated with burn-out were inadequacy of resources, lack of management support and lack of professional recognition and development opportunities (Dixon et al. 2017).

An external review of Women's Health Services at Hutt Valley District Health Board found that midwifery staff shortages were associated with high caesarean section rates compared to other district health boards. Figure 8 shows that Hutt Valley had the highest rate of emergency caesarean sections in 2017. Zbiri et al. (2018) found that maternity unit staffing levels affect the use of caesarean deliveries, whereby high staffing levels for obstetricians and midwives are associated with lower caesarean rates. This suggests that staff shortages need to be addressed as part of improving the outcomes in Hutt Valley. Since this report was written, the number of LMC midwives practising in Hutt Valley has decreased from 44 to 24. The main reasons for leaving are work-related stress and the impact of staff shortages (New Zealand College of Midwives, personal communication).

Figure 8 Emergency caesarean section by district health board, 2017



Source: Ministry of Health (2019b)

Midwifery is the nexus between public health and the social wellbeing approach

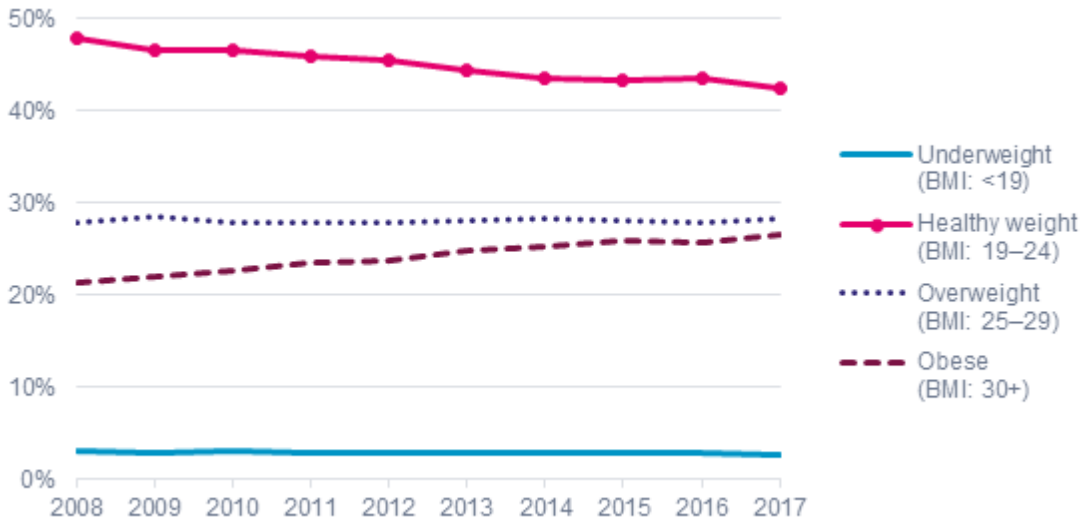
Government funding of midwifery represents one of the earliest opportunities for the government to take a social wellbeing approach. In this report, we outline the complexity of challenges faced by midwives and present some opportunities to improve the sustainability of midwifery's contribution to wellbeing outcomes.

4.6 Complexity arises from the combination of challenging health and social issues

Care needs for mothers and newborns are increasingly complex due to aspects of compound disadvantage represented by deprivation and risk factors such as obesity and smoking. The population in general has increased rates of obesity, and this is reflected in the cohort of expectant mothers. Figure 9 shows the 10-year trends in body mass index (BMI) during pregnancy. Obesity during pregnancy has increased from 21.4% in 2008 to 26.5% in 2017. During the same period, the percentage of mothers in a healthy weight range (BMI 19–24) has decreased from 47.9% to 42.4%.

Figure 9 BMI trends in pregnancy, 2008–2017

Percentage of women giving birth



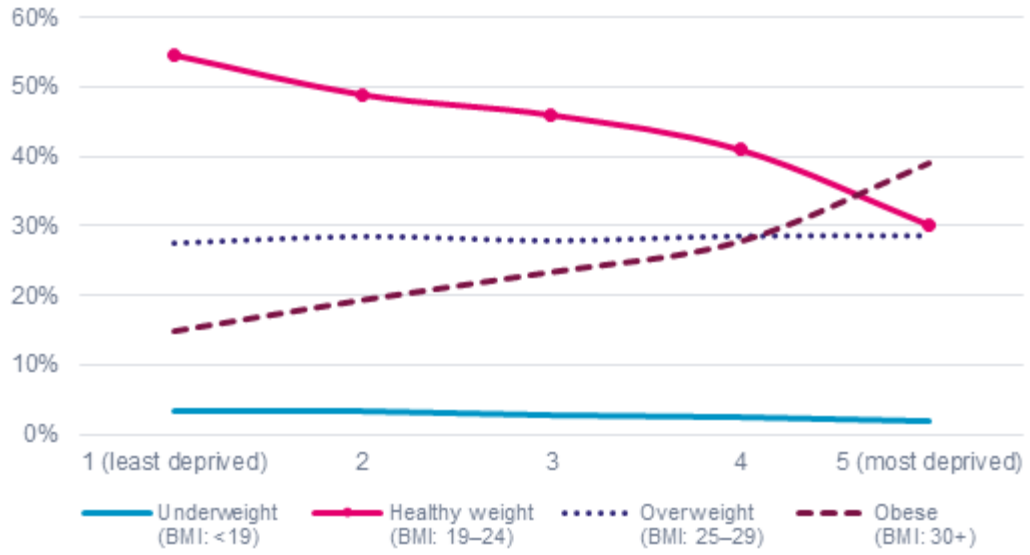
Source: Ministry of Health (2019b)

The risks associated with being very overweight during pregnancy include a higher risk of:

- gestational diabetes
- pregnancy-induced hypertension
- maternal and foetus mortality
- primary caesarean section delivery (Stubert, Reister, Hartmann and Janni 2018; Abrams and Parker 1988).

The share of women giving birth who are obese increases with the degree of neighbourhood deprivation. The share of women giving birth in the healthy weight range decreases as deprivation increases (see Figure 10). This indicates that women from more-deprived neighbourhoods face an increased risk of medical complexities associated with an unhealthy BMI. McNeill et al. (2010) identified support for women to improve health and lifestyle risks as a key public health role for midwives. Body mass is one of those health and lifestyle risks.

Figure 10 BMI trends in pregnancy by deprivation, 2017



Source: Ministry of Health (2019b)

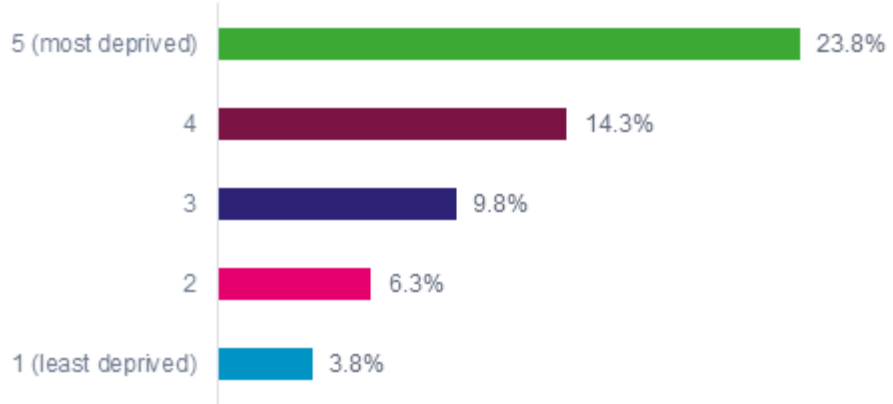
Smoking during pregnancy can affect the health outcomes and mortality risk for the baby. It can cause health problems such as:

- low birth weight that could delay development
- an increased risk of pneumonia, asthma or glue ear
- increased risk of sudden unexplained death
- a risk of miscarriage or stillbirth (Ministry of Health, 2019c).

Figure 11 shows the share of mothers who were smoking during pregnancy in 2017. It shows that smoking rates increase with deprivation.

Figure 11 Smoking mothers who continue to smoke during pregnancy, 2017

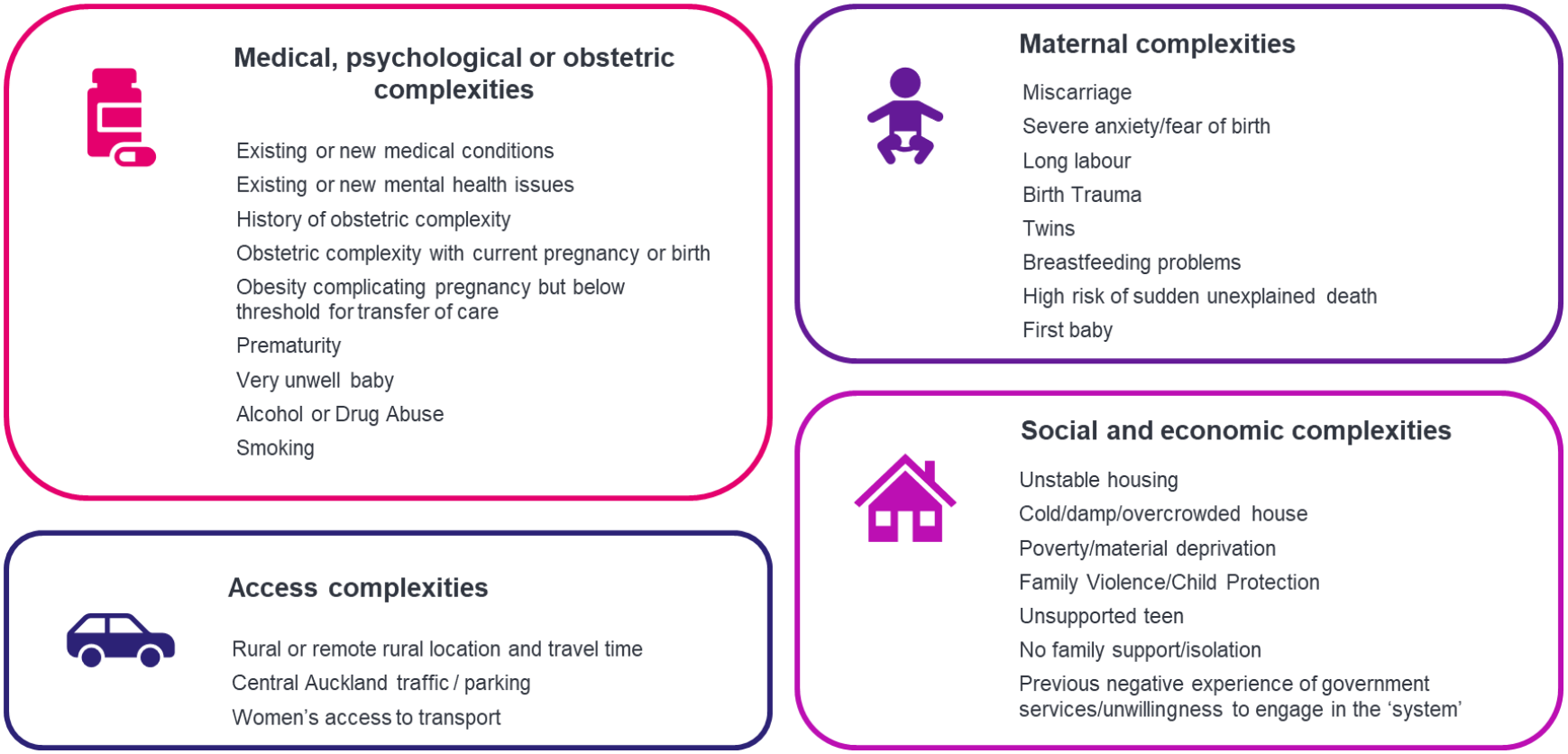
Neighbourhood deprivation



Source: Ministry of Health (2019c)

Figure 12 shows the range of complexities that influence the demands faced by midwives as they seek to support mothers and meet the needs of pregnancy.

Figure 12 Factors affecting case complexity for midwives



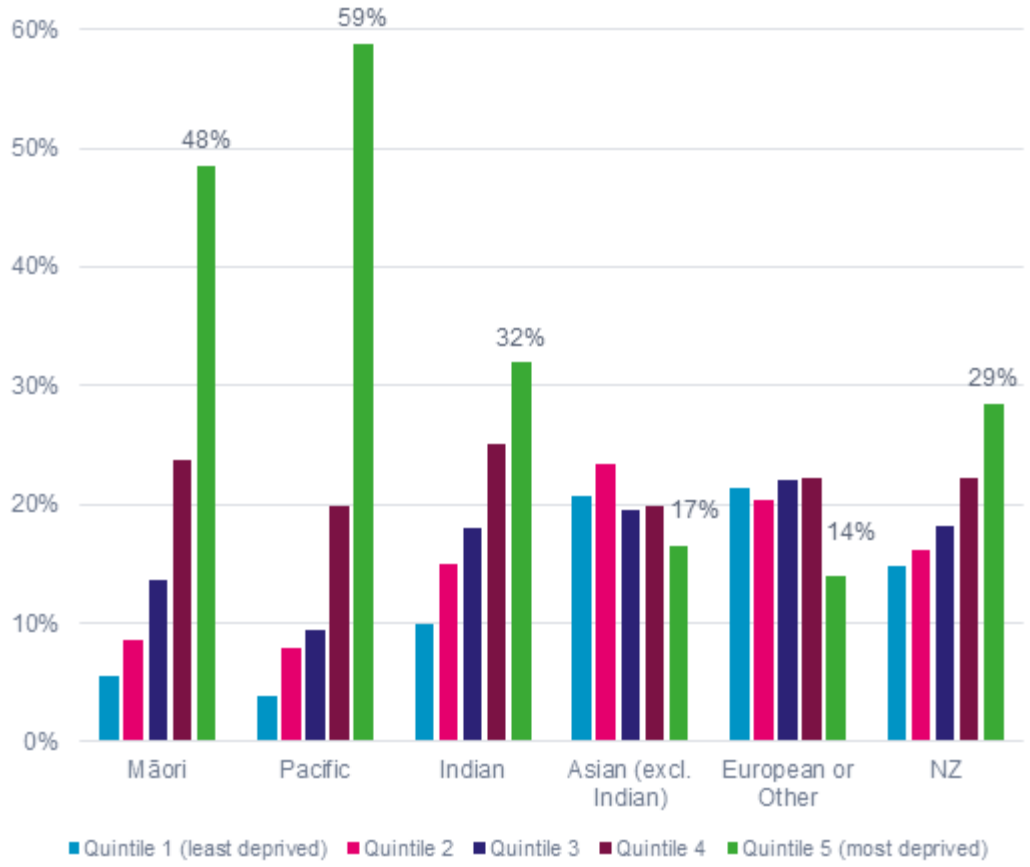
Source: Adapted from Ministry of Health and New Zealand College of Midwives (2017)

4.7 Deprivation is an unavoidable challenge for midwifery

Figure 13 shows the share of births by ethnicity and by degree of deprivation in 2017 and for New Zealand overall. The percentages of Māori, Pacific and Indian babies born in the most-deprived neighbourhoods are 48%, 59% and 32%, respectively, while only 17% of Asian babies, excluding Indian, and 17% of European babies are born in quintile 5 neighbourhoods. The distribution of births is strongly skewed towards deprived neighbourhoods for Māori, Pacific and Indian births.

Figure 13 Share of births in each ethnicity group by deprivation, 2017

Percentage of births



Source: Ministry of Health (2019b)

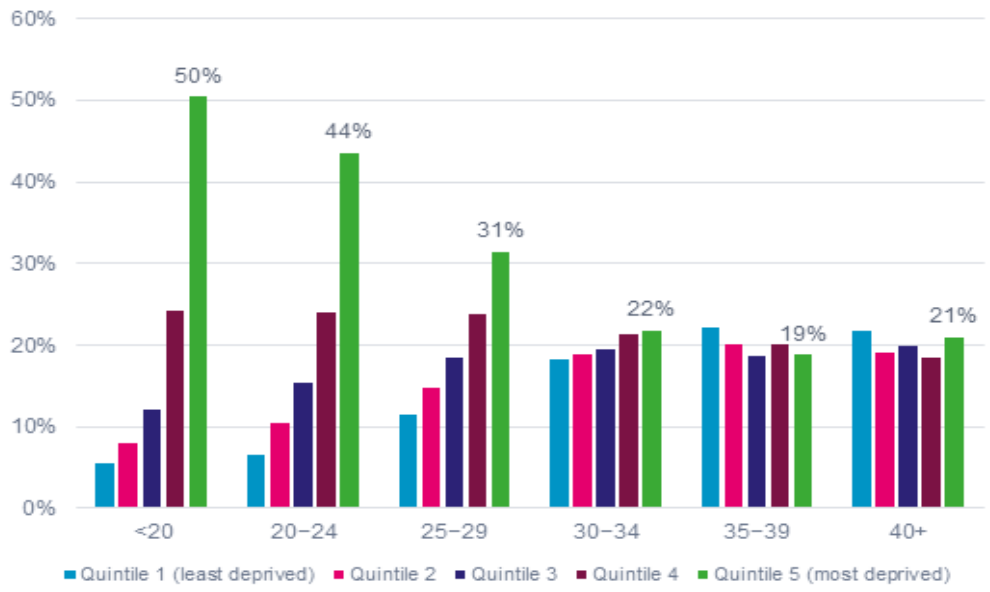
The proportion of Māori babies born in quintile 5 neighbourhoods is more than three times that of European babies born in quintile 5 neighbourhoods. For Pacific babies, the ratio is more than four times higher.

From 2008 to 2017, birth rates were consistently higher for women in more-deprived neighbourhoods than for women in less-deprived neighbourhoods. The birth rate for those in quintile 5 was 1.6–2.1 times the rate for those in quintile 1 (Ministry of Health, 2019b).

The median age of women giving birth in 2017 was 30 years, and more than half of the women giving birth in 2017 were between 25 and 34 years old (Ministry of Health, 2019b). Mothers under 30 years old are more like to reside in more-deprived neighbourhoods.

Figure 14 Age of mothers compared to levels of neighbourhood deprivation

Percentage of mothers



Source: Ministry of Health (2019b)

Surveys and studies that track the actual work time of community-based midwives indicate that their workload is 17–26% beyond a standard full-time equivalent (FTE) in a profession that can require irregular and unpredictable hours of work (Ministry of Health and New Zealand College of Midwives 2017). Midwives have identified social complexities as a significant contributing factor driving this workload issue.

Many other professions would be able to recover some or all the time spent through billing. Community-based midwives work in an environment where the fees are set through regulation and are fixed regardless of the duration of consultations or the number of consultations needed to support individual mothers. Therefore, community-based midwives have no mechanism to recover the cost of above-average needs.

By agreeing to take on socially or medically complex cases, midwives are effectively agreeing to lower hourly rates. This might incentivise community-based midwives to be reluctant to provide services and support to mothers with higher than average social or medical complexities. Such an outcome is contrary to the purpose of the service, which aims to support, assist and guide any and all mothers through the labour and birth stages of a pregnancy.

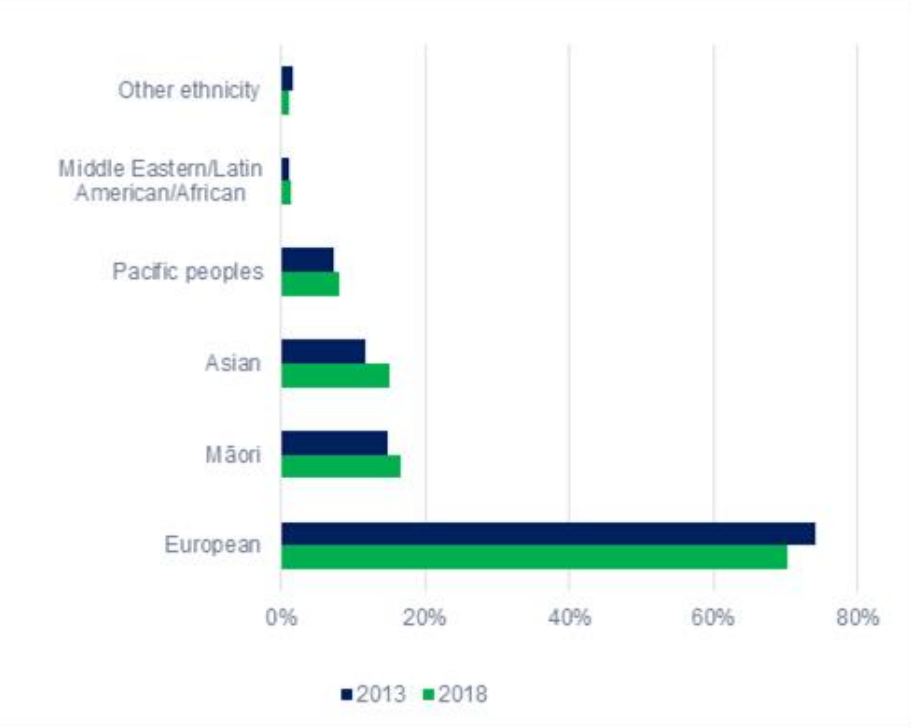
Such system-driven incentives to avoid socially and medically complex cases weaken the sustainability of the service when midwives are working beyond a one-FTE workload. This is a workforce sustainability issue.

This analysis questions whether the current average cost funding model is consistent with the characteristics of the demand profile, which is the underlying need in the community. A more-sophisticated approach would be to use marginal cost pricing that would link payments to community-based midwives to the demand for and length of consultations and regulate the demand through a reporting mechanism that allows the need to be measured and accounted for. Developing such an approach is beyond the scope of this research. It is signalled here as a logical area for further research.

4.8 Equity and diversity

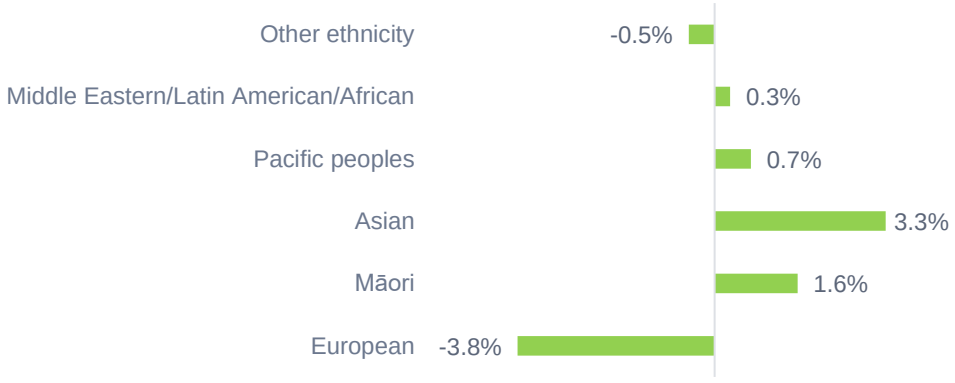
New Zealand's population is becoming more culturally diverse. Figure 15 shows the population composition by ethnicity at the 2013 and 2018 Censuses. Figure 16 shows the change in population share by each aggregate ethnic group between 2013 and 2018. All non-European ethnic groups are growing as a share of the population.

Figure 15 Population composition by ethnicity at the 2013 and 2018 Censuses



Source: https://www.stats.govt.nz/news/new-zealands-population-reflects-growing-diversity

Figure 16 Change in population share by ethnicity, 2013–2018



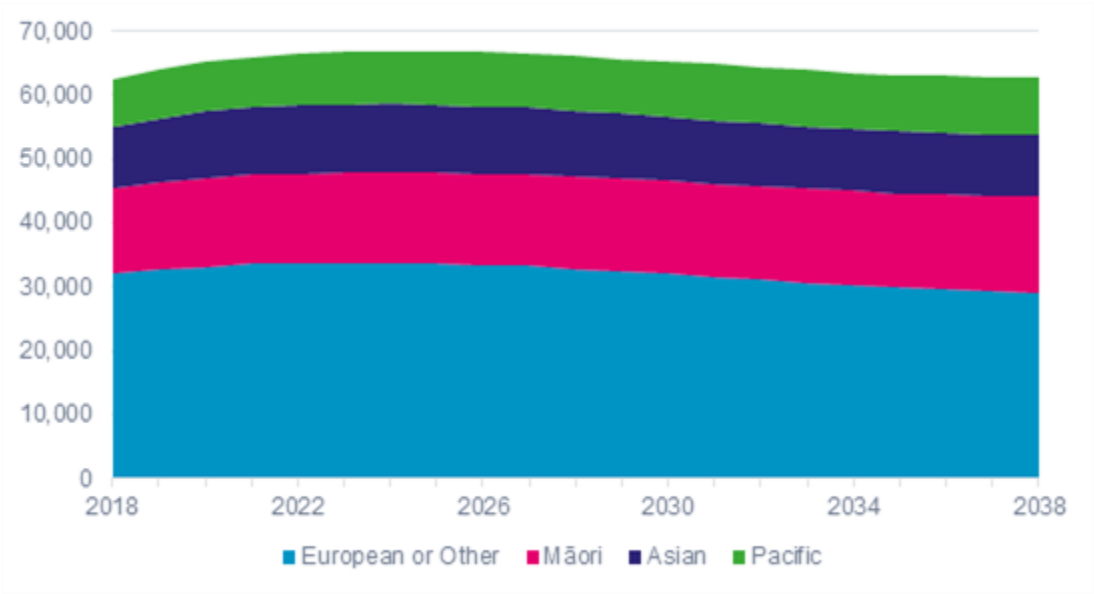
Source: https://www.stats.govt.nz/news/new-zealands-population-reflects-growing-diversity

The implication for midwifery, and indeed the health system, is that it will also need to become more culturally diverse and culturally aware. Midwifery and maternity services will be impacted by this through variations in fertility rates across different ethnic communities.

Figure 17 shows the projected change in ethnicity over time. What isn't shown by the figure below is how many of these births will be to multi-cultural parents. Regardless, it is clear that maternity and midwifery services will need to adapt to increased cultural diversity so that the service can respond to and meet the social and cultural needs of mothers and their communities in the future.

Figure 17 Birth projection by ethnicity

Live births (thousands) per year



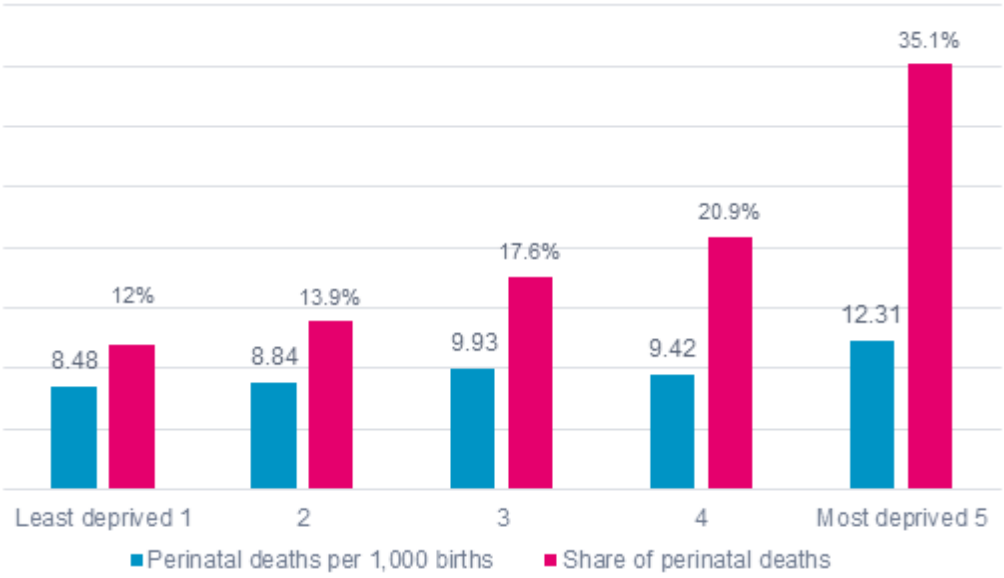
Source: Statistics New Zealand (n.d.)

Perinatal mortality is over-represented in some communities. In its September 2019 annual report, the Perinatal and Maternal Mortality Review Committee states:

> *"the rate of stillbirth has significantly decreased for the period 2007–2017 for babies of both New Zealand European and Māori mothers. Unfortunately, this decrease has not occurred in people of other ethnicities. Rates of perinatal mortality, perinatal related mortality and fetal death have reduced since 2007 for babies of New Zealand European mothers, but there has been no change in these measures for other ethnic groups." (Perinatal & Maternal Mortality Review Committee 2019, 1)*

Figure 18 shows that the quintile 5 neighbourhoods have had higher perinatal mortality rates over the 5 years from 2013 to 2017. The number of perinatal infant deaths over the 5-year period was 1,066. The social cost of the loss of life is estimated to be $4.7 billion, based on the value of statistical life estimated by the Ministry of Transport (2019).

Figure 18 Perinatal mortality rates and share, 2013–2017



Source: Perinatal & Maternal Mortality Review Committee (2019)

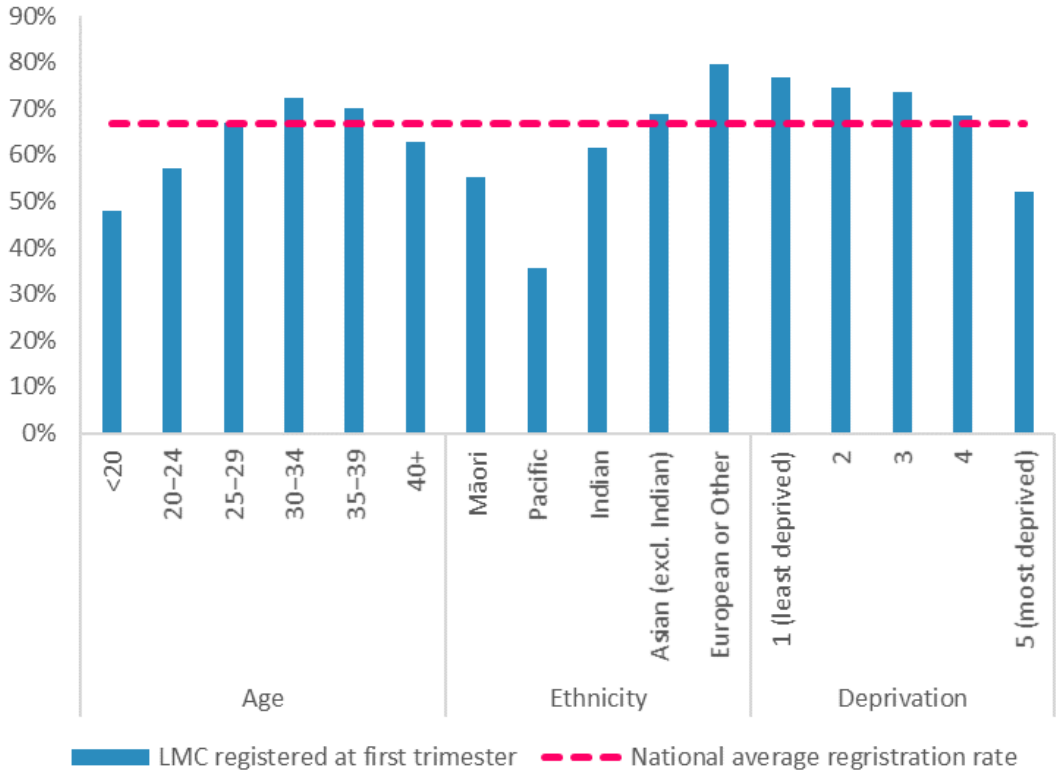
If the rate of perinatal mortality per 1,000 births in the quintile 5 neighbourhoods was reduced to the average of the other four deprivation groups, the rate of perinatal morality in the quintile 5 neighbourhood would reduce by 34%. This represents a saving of 365 lives over 5 years or an average of 73 lives saved per year.

Another way to measure the unmet need for midwives is to consider the variation in registrations with an LMC in the group where challenges have been identified. Figure 19 shows the share of mothers registered with an LMC during the first trimester by age, ethnicity and deprivation. The dotted line shows the national average share of mothers in the different categories registered with an LMC during their first trimester. The vast majority of LMCs are midwives, as shown previously.

Registration with an LMC during the first trimester of pregnancy was less common among:

- young women (47.8% of women aged under 20 years)
- Māori and Pacific women (55.2% and 35.5%, respectively)
- women residing in the quintile 5 neighbourhoods (51.9%) (Ministry of Health 2019b, 34).

Figure 19 Registered with an LMC during the first trimester



Source: Ministry of Health (2019b)

4.9 Why the long wait to get paid?

Community-based midwives have to wait until 28 weeks of pregnancy are completed to receive any payments from government. Community-based midwives are self-employed contractors. Their contract is to provide the services for the Crown, and payment is currently only on completion of services.

In effect, this means that a new community-based midwife can have a caseload of 45 mothers with all the associated expenses of delivering the midwifery service and not receive any payments until the antenatal consultations are completed. That means midwives experience a 7-month delay in receiving payment. This could put pressure on their cash flow as the cost of fuel, vehicle operating costs and other resources are paid for as acquired. Ultimately, this could be a retention issue.

Many other industries such as professional services, residential construction and infrastructure companies use milestone payments at key points to monitor service delivery, which assists suppliers with their cash flow management. The same kind of approach could be adopted by the Ministry of Health.

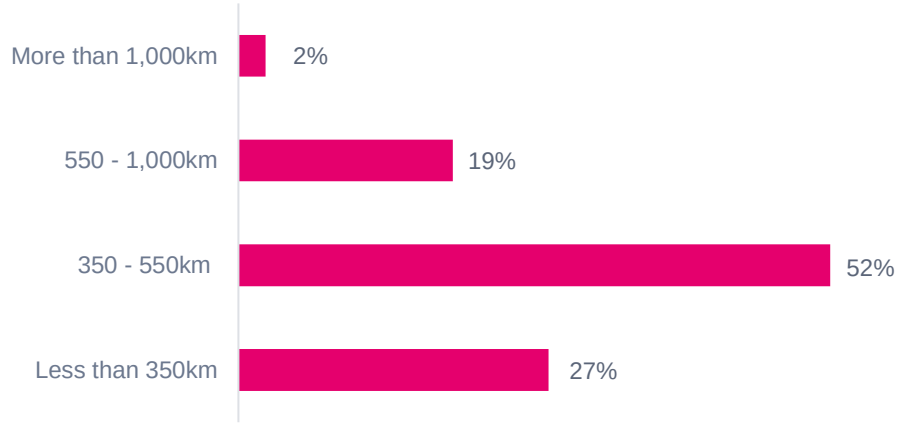
4.10 Travel times costs and rurality issues

LMC travel times and costs are substantial. Figure 20 shows average weekly travel by LMCs who were surveyed. Half of the respondents were travelling 350–550 km per week on average.

Based on an Inland Revenue mileage rate of $0.79 per km, 350– 550 km is equivalent to an average travel cost per case of $277–435. The additional fees midwives can claim under section 88 for postnatal consultations are $194.50, $292.50 and $519.00 for semi-rural, rural and remote rural care for six consultations. Based on six consultations and a rate of $0.79 per km, this would cover a return trip of 41 km, 61 km or 109 km per semi-rural, rural or remote case.

What about the cost of the travel time? At an average rural travel speed of 90 kph, a 61 km return trip would take 41 minutes, which is longer than the average consultation. This cost is not covered by the additional fee for rural consultations

Figure 20 Average weekly travel by LMCs



Source: New Zealand College of Midwives survey of midwives

The analysis of the additional fees for rural travel shows the following:

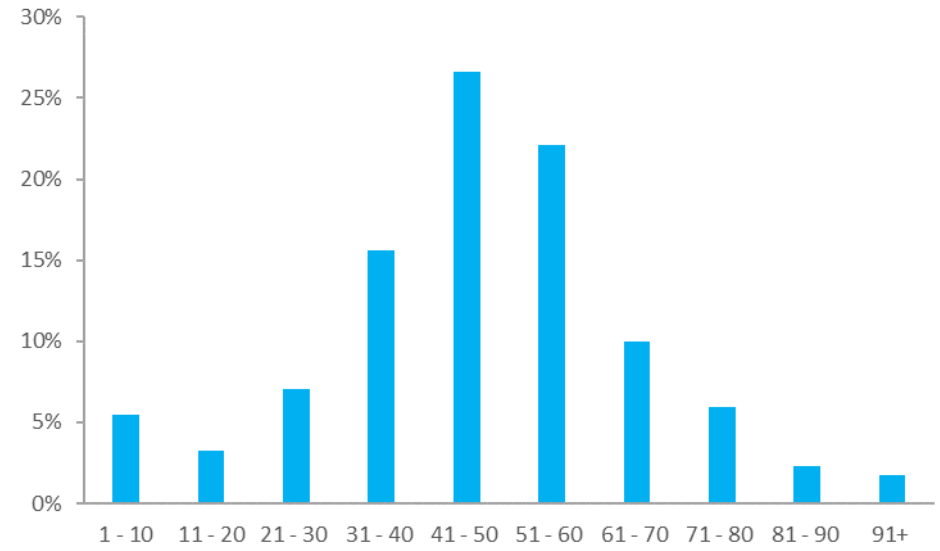
- Travel is a material cost of delivering LMC services in the community.
- The additional fees for semi-rural, rural and remote consultations would only cover the mileage costs and would not cover the cost of travel time, which for rural and remote consultations can easily add up to hours of additional travel time compared to an urban consultation.
- The impact of congestion and parking costs in also missing from the section 88 guidelines on midwifery services.

4.11 Workforce shortages

Many midwives prefer to work on a part time basis, but the majority have caseloads above the recommended level of 40 cases per year. Survey results indicate that on average a midwife had 47 cases per year.

Figure 21 shows the distribution of caseloads based on a survey of midwives. The graph shows that there is wide range of caseloads experienced by midwives working throughout New Zealand. The distribution shows that 31% of survey respondents had caseloads below the recommend level of 40 cases annually. 69% had caseloads above the recommended level.

Figure 21 Caseload distribution



Source: New Zealand College of Midwives (2017) College member survey

Child-care is a key driver behind part-time work, meaning that part-time midwives may not be able to increase their caseloads to meet demand. Lowering the average case load from 47 to 40 case would require an additional 150-200 midwives, without a change in preferences among part-time midwives.

The number of people that are certified to practice has increased by 124 between 2019 and 2017. However, around 5% of all those currently certified are choosing not to practice for the following reasons:

- practising overseas
- taking a break
- health reasons
- unhappy with shift work/caseload
- inadequate remuneration

Responding to shortages will require addressing caseloads, conditions and complexity. Retention and attracting new midwives are both important to the sustainable delivery of perinatal health outcomes for mothers and babies.

5 How could the sustainability of midwifery be improved?

5.1 Policy recommendations

Table 2 outlines the issues we have identified in the preceding sections of this report, and we present three recommendations to help address the issues and improve the sustainability of the midwifery service.

Table 2 Policy recommendations to improve the sustainability of midwifery

	Issue	Recommendation
Complexity	Perinatal mortality is disproportionately high among the most-deprived neighbourhoods (quintile 5).	Introduce a special fee for additional midwife consultations for women living with high deprivation and/or social complexity.
Caseloads	The needs of mothers mean midwives are working 17–26% more than a full-time equivalent role.	Increase the level of fees for midwifery by at least 20% and recruit additional midwives.
Conditions	A two systems approach – long delays between registration and payment combined with a procurement model that is not aligned with demand pressures.	Launch a comprehensive review of procurement for the delivery of midwifery services and involve midwives in the design of a new procurement model that is aligned with the demand pressures. The review should include self-employed and hospital-based midwives.

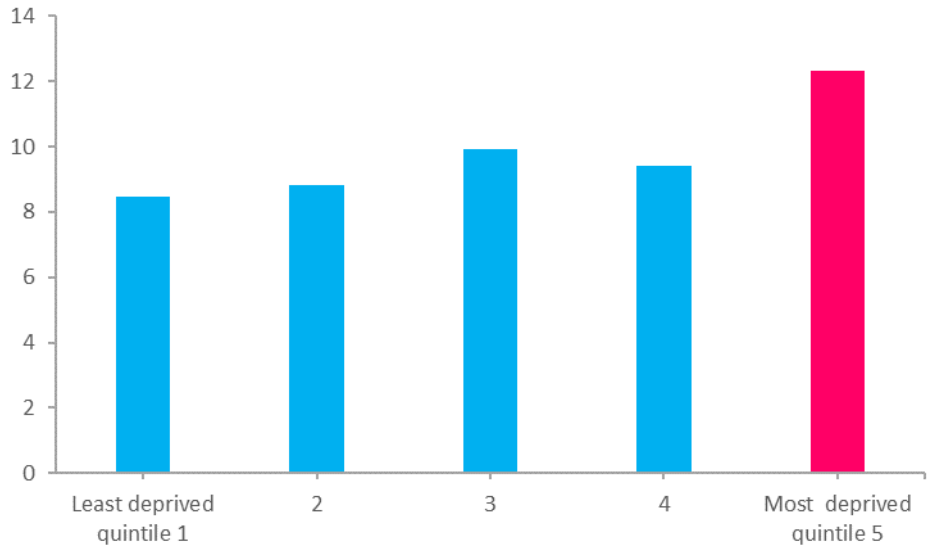
Source: NZIER

5.2 What inputs are needed?

Recommendation 1: Introduce a special fee for additional midwife consultations for women living with high deprivation and/or social complexity

The perinatal mortality rate in quintile 5, the most-deprived neighbourhoods, is one-third higher than the rates in other areas (Figure 22). Compared to the average rate of perinatal mortality in other neighbourhoods, there were on average 73 more perinatal deaths per year from 2013–2017 in the most-deprived areas. The social cost of the higher rate of perinatal deaths is $319 million.

Figure 22 Perinatal mortality by deprivation quintile, 2013–2017



Source: Perinatal & Maternal Mortality Review Committee (2018)

Mothers in quintile 5 are known to register later with LMCs compared to other cohorts. The possible reasons for the delay in registration could include a range of cost, transport and other known barriers to access. Younger mothers are more likely be from more-deprived neighbourhoods. Not all high-needs women are in quintile 5 neighbourhoods so determination of high need should be assessed case by case across all quintiles.

The 12th Perinatal and Maternal Mortality Review Committee recommended investigating evidence-based solutions to ensure equitable access to screening and treatment for priority populations. It also recommended that relevant communities have a voice in the development of health policy process and practice to achieve equitable care.

The introduction of a special fee for additional midwife consultations for women living with high deprivation and/or social complexity is recommended to address the service and outcome gap. The details of the intervention should be co-designed with those familiar with the challenges of delivering better outcomes for the most deprived in the community, case by case. A special payment of additional targeted consultation is recommended based on the compound disadvantage faced by high-needs women.

The exact design of the intervention will happen beyond this report. However, one option could be to effectively expand the consultations. For example, an increase in the number of consultations should be based on a one-third service increase to address the disproportionately higher mortality in quintile 5 neighbourhoods. This would cost $255.33 per birth in 2020. Based on an estimated 18,554 births in the most-deprived neighbourhoods in 2020, the additional cost to the health system would be $18.9 million. Over the 4 years of a Budget forecast, this adds to $76.9 million.[1] Midwifery alone will not be able to eliminate the quintile 5 disparity, but it is a key component.

[1] The share of births in the most-deprived neighbourhoods from 2013–2017 was 28.5%. We have assumed this share will hold true in 2020.

The breakeven point for this recommendation would be achieved when the average number of perinatal deaths in the most-deprived neighbourhoods decreased by four perinatal deaths per year, based on the value of statistical life.

Recommendation 2: Review the fees in section 88 to address the disparity between self-employed midwives and hospital-based midwives

Demand for midwives is such that a survey showed that midwives are working 17–26% more than a standard FTE (Ministry of Health and New Zealand College of Midwives 2017). More-recent information provided by the New Zealand College of Midwives indicates the workloads are 30% above the standard working week, once caseloads, labour duration and increased travel time due to increasing congestion are accounted for.

The New Zealand College of Midwives Survey 2017 indicates that the average caseload is 46.8 cases compared to a best-practice caseload of 40 cases. This indicates that, on average, midwives are facing demand pressures that are 17% above the best-practice number of cases per year. In addition to the demand pressure from extra cases, midwives experience increased demand pressures per case. Results from the survey indicate complexities occur at the following frequencies:

- Medical complexity – 33.7%
- Social determinants of complexity – 20.8%
- Maternal complexity – 30.9%
- Average share of births that have some level of complexity – 28.5%.

It is reasonable to expect that some cases involve more than one type of complexity, which is likely to compound the demand pressures on midwives.

Independent sources also point to increasing pressures for midwives. NZIER analysis based on using Ministry of Health workforce modelling for midwives estimated that the average caseload per FTE LMC was 40.5 cases at the national level, and it forecast that caseload will increase to 44 cases or 9% by 2024.

To ensure the sustainability and the health and safety of the midwifery service, we recommend increasing funding per case by 20% to reflect the current demand pressure. This should be done in conjunction with intentionally recruiting additional midwives. The additional cost of this adjustment is estimated to be $500 per birth or a total of $33 million in 2020. Over the 4 years from 2020–2023, the additional cost to the health system is estimated to be $134 million.

The breakeven point for this recommendation would be achieved when the average number of perinatal deaths in the quintile 5 neighbourhood decreases by seven perinatal deaths per year, based on the value of statistical life.

Recommendation 3: Review the models of midwifery

There is evidence that aspects of the current procurement model for community-based midwives weaken the sustainability of the model of care and could be improved. The main issues are:

- long delays between the delivery of service and payment
- rigid fees for services that allow little variation for higher than average needs

- limited ability to recover extra travel costs
- the absence of call-out fees for unscheduled consultations
- remuneration discourse is often conceptually misframed and slips in to treating the fees for service as comparable to effective hourly rates, when this is not the appropriate comparator given the cost of business, GST and commercial taxes that must be paid for out of the fees.

There are also burn-out issues among hospital-based midwives.

The New Zealand College of Midwives has called for changes to the model several times in the last few years to ensure that payment is fair and reasonable, and there is currently a petition calling for action. The weaknesses outlined above are reason enough for the Ministry of Health to initiate a review of the payment model. In the first instance, there is a prima facie case to investigate a milestone-based payment system.

Currently, self-employed midwives are paid on completion of services. This can lead to long delays between the cost outlays and payment for services. This can create cash flow risk for midwives that could be reversed by restructuring the payment system to close the gap between consultations and payment. We recommend the payment system is reviewed and milestone payments are introduced that closely follow service provision.

This would require changes to the administrative system, but it should not require a bespoke system because milestone payments are common in many industries with projects that last several months, including residential construction, professional services, infrastructure and multi-year research projects.

We would also advise that the language used around the payments to self-employed midwives be carefully reviewed. The aim would be to make sure there is sector-wide understanding that the payment represents the fee for a service with underlying operational costs and taxes rather than an hourly wage. Too often, the discourse around the fees for the community-based midwifery service seems to slip into a comparison of average wages, which is better characterised as a package of care or service. This more accurately frames the remuneration of the model of care.

Community-based midwifery is an essential link in the continuum of care connecting women to the healthcare system and a mechanism to bridge the gap caused by barriers to access including costs and cultural mismatch (Renfrew et al. 2014). Sustainable midwifery in New Zealand demands a robust foundation whereby the procurement model is consistent with the services demanded, including the necessarily flexibility to meet the specific needs of individual mothers.

If the procurement model is misaligned to the demand profile, it will put the community-based midwifery model at risk. The evidence throughout this report points to real risks in the ongoing sustainability of the model in New Zealand. The Ministry of Health can act to mitigate the issues identified.

5.3 What are the alternatives?

New Zealand has committed to a midwifery-based service model in favour of GP or specialist obstetrics care or community nurse-led models of care. The New Zealand model of care is based on the evidence of cost-effectiveness in achieving good outcomes for mothers and newborns addressed earlier in this report.

Midwifery services are part of a wider system with a scope of practice that places them central to positive birth outcomes for mother and child.

5.4 What is the counterfactual?

In the absence of intervention to stabilise and consolidate midwifery services, there is a risk of service gaps widening against forecast demand, with district health boards and the Ministry of Health facing increased transaction costs associated with recruitment and increased hospital-based midwives and obstetricians, all the while eroding the benefits of community-based midwifery in terms of access and increasing the transport costs for mothers. This is contrary to the aims and intention of having a community-based health system. It would increase demand for hospital infrastructure and services.

Paying midwives more to address a range of pay matters, including uncompensated hours and pay equity, is not likely to result in fewer hours worked. The evidence from research with registered nurses' wages suggests that paying more does not result in nurses working less (Condliffe and Link 2016).

A systematic review of burn-out in midwives shows that, for personal burn-out, "the high prevalence is related to a low salary and a lack of professional recognition which could reduce the commitment at work" (Suleiman-Martos et al. 2020). Improved pay is unlikely to be a source of less work when salary is cited as a source of burn-out.

5.5 How well does this align with government strategy?

As part of the Prime Ministerial-led Child and Youth Wellbeing Strategy,[2] the actions to improve maternity and early years support include:

- redesigning maternity services through a 5-year whole-of-system action plan
- reviewing the Well Child/Tamariki Ora programme
- expanding pregnancy and parenting services.

The Minister of Health has five health priorities (Ministry of Health 2019d), with midwifery services central to two:

- Improving child wellbeing
- Better population health outcomes supported by primary healthcare.

There is an overarching goal of achieving equitable outcomes for all people. This goal includes different levels of advantage requiring different approaches and resources to get equitable outcomes.

As the health professional with the highest contact time (~20 hours) in the perinatal period and with a disadvantaged population group, midwives are central to the child wellbeing strategy and goals for improved equity.

5.6 How would this be implemented?

The changes for the first two recommendations should be implemented immediately through section 88 notices under the New Zealand Public Health and Disability Act. Ministry

[2] https://childyouthwellbeing.govt.nz/actions

of Health guidance should also be prepared and published to inform midwives and mothers of the benefits and eligibility for additional funding and support.

The third recommendation will require the development of a more-agile administrative system, but the changes are unlikely to need a new bespoke system because milestone payments are not an original concept.

5.7 What are the risks to manage?

There are multiple risks that will need to be managed alongside any investment aimed at improving the sustainability of the midwifery service. Table 3 sets out the key risks and mitigations to be addressed.

Table 3 Service and outcome risks to be managed

Risk	Nature of the unmitigated risk	Mitigation
Value for money	Additional resources do not improve outcomes.	Additional resources targeted at mothers experiencing high deprivation who are at greatest risk of poor outcomes. Meeting actual demand shortfall to assist retention.
Public expectations	All mothers may expect the same level of service.	Good communication about reasons for targeting those in greatest need.
Implementation	Funding the quintile 5 gap and case-funding shortfall may require more midwives.	Retention schemes and attention to pay and conditions.

Source: NZIER

5.8 How would you know if it is working?

To monitor whether the interventions are working, we suggest the following indicators:

- Caseloads at the DHB level and neighbourhood deprivation level
- Perinatal mortality by neighbourhood deprivation
- Patient-reported outcomes
- Cultural diversity of midwifery compared to the cultural diversity of mothers and families.

6 References

Abrams, B., and J. Parker. 1988. "Overweight and Pregnancy Complications." *International Journal of Obesity* 12 (4): 293–303.

Caird, Jenny, Rebecca Rees, Josephine Kavanagh, Katy Sutcliffe, Kathryn Oliver, Kelly Dickson, Jenny Woodman, Elaine Barnett-Page, and James Thomas. 2010. "The Socioeconomic Value of Nursing and Midwifery: A Rapid Systematic Review of Reviews."

Callander, Emily J., Debra K. Creedy, Jenny Gamble, Haylee Fox, Jocelyn Toohill, Anne Sneddon, and David Ellwood. 2020. "Reducing Caesarean Delivery: An Economic Evaluation of Routine Induction of Labour at 39 Weeks in Low-Risk Nulliparous Women." *Paediatric and Perinatal Epidemiology* 34 (1): 3–11. https://doi.org/10.1111/ppe.12621.

careers.govt.nz. n.d. "Midwife." Accessed February 26, 2020. https://www.careers.govt.nz/jobs-database/health-and-community/health/midwife/.

Condliffe, Simon, and Charles R. Link. 2016. "Registered Nurses: The Impact of Wages on Labour Force Participation and Hours Worked–Are Wages an Effective Mechanism for Addressing RN Shortages with Evidence from 1960 to 2008?" *Applied Economics Letters* 23 (12): 849–852.

Dixon, Lesley, Karen Guilliland, Julie Pallant, Mary Sidebotham, Jennifer Fenwick, Judith McAra-Couper, and Andrea Gilkison. 2017. "The Emotional Wellbeing of New Zealand Midwives: Comparing Responses for Midwives in Caseloading and Shift Work Settings." *New Zealand College of Midwives Journal* 53 (December): 5–14. https://doi.org/10.12784/nzcomjnl53.2017.1.5-14.

Donnellan-Fernandez, Roslyn E., Debra K. Creedy, and Emily J. Callander. 2018. "Cost-Effectiveness of Continuity of Midwifery Care for Women with Complex Pregnancy: A Structured Review of the Literature." *Health Economics Review* 8 (1): 32. https://doi.org/10.1186/s13561-018-0217-3.

Homer, Caroline, Pat Brodie, Jane Sandall, and Nicky Leap. 2019. *Midwifery Continuity of Care: A Practical Guide*. Elsevier Health Sciences.

Institute for Health Metrics and Evaluation. 2019. "Global Expected Health Spending 2017-2050." 2019.

Kildea, Sue, Yu Gao, Sophie Hickey, Sue Kruske, Carmel Nelson, Renee Blackman, Sally Tracy, Cameron Hurst, Daniel Williamson, and Yvette Roe. 2019. "Reducing Preterm Birth amongst Aboriginal and Torres Strait Islander Babies: A Prospective Cohort Study, Brisbane, Australia." *EClinicalMedicine* 12 (July): 43–51. https://doi.org/10.1016/j.eclinm.2019.06.001.

Marmot, Michael, Jessica Allen, Ruth Bell, Ellen Bloomer, and Peter Goldblatt. 2012. "WHO European Review of Social Determinants of Health and the Health Divide." *The Lancet* 380 (9846): 1011–29. https://doi.org/10.1016/S0140-6736(12)61228-8.

McNeill, Jenny, Fiona Lynn, and Fiona Alderdice. n.d. “Systematic Review of Reviews: The Public Health Role of the Midwife.” Belfast: School of Nursing & Midwifery, Queen’s University.

McRae, Daphne N., Patricia A. Janssen, Saraswathi Vedam, Maureen Mayhew, Deborah Mpofu, Ulrich Teucher, and Nazeem Muhajarine. 2018. “Reduced Prevalence of Small-for-Gestational-Age and Preterm Birth for Women of Low Socioeconomic Position: A Population-Based Cohort Study Comparing Antenatal Midwifery and Physician Models of Care.” *BMJ Open* 8 (10). https://doi.org/10.1136/bmjopen-2018-022220.

Ministry of Health. 2019a. “Annual Data Explorer 2018/19: New Zealand Health Survey.” https://minhealthnz.shinyapps.io/nz-health-survey-2018-19-annual-data-explorer/_w_b0577231/#!/home.

———. 2019b. “Report on Maternity 2017.” https://www.health.govt.nz/publication/report-maternity-2017.

———. 2019c. “Stop Smoking, Drinking Alcohol and Using Drugs in Pregnancy.” Ministry of Health NZ. 2019. https://www.health.govt.nz/your-health/pregnancy-and-kids/pregnancy/helpful-advice-during-pregnancy/stop-smoking-drinking-alcohol-and-using-drugs-pregnancy.

———. 2019d. “Work Programme 2019/20.”

———. 2019e. “New Zealand Health Policy: Choices, Settings and Performance.” May.

Ministry of Health, and New Zealand College of Midwives. 2017. “Community Midwifery Pricing Model: Report and Recommendations of the Community Midwifery Funding Co-Design Project.”

Ministry of Transport. 2019. “Social Cost of Road Crashes and Injuries 2018 Update.” Wellington: Ministry of Transport.

New Zealand College of Midwives (2017) College member Survey.

OECD. n.d. “Conversion Rates - Purchasing Power Parities (PPP) - OECD Data.” n.d. https://data.oecd.org/conversion/purchasing-power-parities-ppp.htm.

Perinatal & Maternal Mortality Review Committee. 2018. “Te Pūrongo Ā-Tau Tekau Mā Toru o Te Komiti Arotake Mate Pēpi, Mate Whaea Hoki | Twelfth Annual Report of the Perinatal and Maternal Mortality Review Committee.” Health Quality & Safety Commission. 2018. https://www.hqsc.govt.nz/our-programmes/mrc/pmmrc/publications-and-resources/publication/3391/.

———. 2019. “Te Pūrongo Ā-Tau Tekau Mā Toru o Te Komiti Arotake Mate Pēpi, Mate Whaea Hoki | Thirteenth Annual Report of the Perinatal and Maternal Mortality Review Committee.” Health Quality & Safety Commission. 2019. https://www.hqsc.govt.nz/our-programmes/mrc/pmmrc/publications-and-resources/.

PHARMAC. 2018. “Cost Resource Manual: Version 3.” https://www.pharmac.govt.nz/medicines/how-medicines-are-funded/economic-analysis/cost-resource-manual/.

Renfrew, Mary, Caroline Homer, Soo Downe, Alison Mcfadden, Natalie Kenney Muir, T. Prentice, and Petra ten Hoope-Bender. 2014. “Midwifery: An Executive Summary for the Lancet’s Series.” *The Lancet* 2014 (June).

Sandall, Jane, Hora Soltani, Simon Gates, Andrew Shennan, and Declan Devane. 2016. "Midwife-Led Continuity Models versus Other Models of Care for Childbearing Women." Edited by Cochrane Pregnancy and Childbirth Group. *Cochrane Database of Systematic Reviews*, April. https://doi.org/10.1002/14651858.CD004667.pub5.

Starfield, Barbara, Leiyu Shi, and James Macinko. 2005. "Contribution of Primary Care to Health Systems and Health." *The Milbank Quarterly* 83 (3): 457–502. https://doi.org/10.1111/j.1468-0009.2005.00409.x.

Statistics New Zealand. n.d. "Population Projections 2013 to 2038." http://archive.stats.govt.nz/browse_for_stats/population/estimates_and_projections/NationalEthnicPopulationProjections_HOTP2013-38.aspx.

Stubert, Johannes, Frank Reister, Steffi Hartmann, and Wolfgang Janni. 2018. "The Risks Associated with Obesity in Pregnancy." *Deutsches Ärzteblatt International* 115 (16): 276–83. https://doi.org/10.3238/arztebl.2018.0276.

Suleiman-Martos, Nora, Luis Albendín-García, José L. Gómez-Urquiza, Keyla Vargas-Román, Lucia Ramirez-Baena, Elena Ortega-Campos, De La Fuente-Solana, and I. Emilia. 2020. "Prevalence and Predictors of Burnout in Midwives: A Systematic Review and Meta-Analysis." *International Journal of Environmental Research and Public Health* 17 (2): 641.

Zbiri, Saad, Patrick Rozenberg, François Goffinet, and Carine Milcent. 2018. "Cesarean Delivery Rate and Staffing Levels of the Maternity Unit." *PLOS ONE* 13 (11): e0207379. https://doi.org/10.1371/journal.pone.0207379.