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Person-centered maternity services in New Zealand: a practice development initiative to improve the health of pregnant women and infants.

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Abstract

Rationale, aims and objectives: Primary health care and maternity services in New Zealand are delivered via independent self-employed practitioners and separate organisations with no requirement to co-ordinate care. There are disparate immunisation timeliness and rates between ethnic groups. The aim of this practice development initiative is to improve the health of pregnant women and infants. The objectives are to link the general practice enrolled pregnant women with a midwife on confirmation of their pregnancy, record the date of delivery in the general practice notes, enrol the infant with the general practice shortly after birth and so increase the timeliness and rates of immunisations.

Methods: Following an initial audit, information is now recorded on the engagement of pregnant women with a midwife in early pregnancy. Contact is made with the midwife and recorded in the general practice notes around the expected delivery date. An invitation to enrol the infant with the general practice is sent to the family four weeks postnatal. Immunisation timeliness and rates of infants are audited monthly.

Results: Details of the midwife were recorded in the notes of 59 out of a total of 63 pregnant women during 2010, illustrating that the new model of care had been adhered to for the majority of pregnant women. Monthly immunisation timeliness and rates of infants of 94–100% were achieved January 2010–December 2010 in infants six weeks–6 months old.

Conclusion: Primary care can be re-shaped in South Auckland by following international models to facilitate engagement of pregnant women with a midwife and increase immunisation timeliness and rates of infants.

Keywords

Clinical audit, general practice, health visitor, immunisations, New Zealand, nurse practitioner, person-centered maternity services, practice development.

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Introduction

This paper discusses the policy context of primary healthcare in New Zealand for pregnant women and infants. An audit of one general practice in South Auckland (SAGP) illustrated that the immunisation and timeliness rates of infants was sub-optimal. A practice development initiative introduced into the SAGP following the audit, coordinated care of pregnant women between general practice staff and midwives. This practice emulated that of the United Kingdom’s health visiting profession (Table 1). Additionally a stepped approach to inviting parents/carers to the general practice for their infant’s immunisation, based on a model developed in the
USA resulted in an enduring marked increase in immunisation timeliness and rates [1].

**Policy contexts**

**Policy context of primary health care for pregnant women and infants in New Zealand.**

Healthcare systems are social constructions, formulated by the dominant ethnic group in society. These constructions therefore may not address the needs of ethnic minority groups, thus leading to an inequality in access to health care. Primary health care services in New Zealand are delivered by numerous organisations and independent practitioners with no requirement by the public health funding authority to co-ordinate care of patients. This arrangement potentially disadvantages some groups in society. Pregnant girls and women are expected to arrange maternity care themselves, which is free, from a midwife or obstetrician once their pregnancy is confirmed.

Poverty in New Zealand is associated with ethnicity, which results in disparity of access to health care, evidenced by the poor health statistics of Māori and Pacific Peoples [2]. Ethnic minority groups, may have no access to a functioning telephone, poor health literacy and with English as a second language, may find it difficult to engage with the various professional groups to navigate the complex maternity care arrangements. Once registered with a lead maternity carer (LMC) (midwife or obstetrician), these professionals are not obliged to communicate with the woman’s general practice (if she has one) during her pregnancy.

The LMC remains responsible for the care of the woman and infant for the first six postnatal weeks, after which time an expectation is that the infant will be registered by the mother or main carer, with a general practice and ‘well child’ (for example the Plunket organisation) provider. Although the LMC informs the general practice of the birth of an infant, this information may not reach the practice until the infant is older than six weeks, resulting in late administration of their first immunisation. Additionally ‘well child providers’ who provide free development checks for the infant from four – six weeks old and health information for families, but generally not immunisations, are not connected to the general practice. A mother with a new infant does not have to engage with a ‘well child’ provider. This uncoordinated arrangement often results in late registration of the infant with a general practice and subsequent poor timeliness of immunisation.

Timeliness of immunisation is one of the strongest predictors of incomplete immunisation [3,4]. Timeliness is defined by the New Zealand Ministry of Health’s immunisation register [5] as delayed if not received within four weeks of the first due date for the six week immunisations and within six weeks for the three month and five month immunisations. Studies have illustrated that the consequence to the infant of delayed and incomplete immunisation in New Zealand is a four – six fold increased risk of hospitalisation with pertussis, a vaccine preventable illness [6-8].

**General practice in New Zealand**

Features of general practice in New Zealand are that of a small business model with the ability to charge patients’ fees for a consultation. The fee supplements income provided by the District Health Board (DHB) via a primary health organisation (PHO). Since 2003, general practitioners have been encouraged to join a PHO. PHOs bring together doctors, nurses and other health professionals (such as Māori health workers, health promotion workers, dietitians, pharmacists, physiotherapists, psychologists and midwives) [9]. The intention of the PHOs is to improve access to primary health care and so improve health and reduce inequalities in health between ethnic groups.

Funding of general practice is a very complex mixture of annual capitation payments for patients who are enrolled with the PHO, via the general practice and ‘fee for service’ for a range of care episodes, for example, the general practitioner is paid $18.80 for administering an infant’s immunisation [10]. Because of the wide disparities in health between ethnic groups in New Zealand, Māori and Pacific Peoples and people living in the most deprived areas, attract more funding for the general practice if enrolled with a PHO. Furthermore children under six years old are entitled to free general practice visits as the Ministry of Health subsidises this age group.

**Manurewa, South Auckland**

Manurewa, a suburb of South Auckland and the location of SAGP is an area of high socio-economic deprivation as measured by the NZDep06 instrument [11]. This instrument is based on eight factors of deprivation and measures meshblocks, the smallest geographical unit defined by Statistics New Zealand [12]. These meshblocks are separated into deciles and ranked from one – ten, with deciles nine and ten being the most deprived areas. Manurewa has one of the highest NZDep06 scores with 69% of residents living in deciles nine and ten [13]. Māori and Pacific Island Peoples are over represented in Manurewa compared to Auckland (Table 2). Children aged 0 – 14 years comprise 31% of the population [14], the highest proportion of children in any area of New Zealand. In Manurewa, children are likely to live in families headed by a solo parent (Table 1) with the attendant poverty that solo parenthood implies [15]. Household income, post school qualification levels and employment rates are low (Table 3) and all of these factors
### Table 1. The principles and practice of health visiting [4,28]

<table>
<thead>
<tr>
<th>Principles of health visiting</th>
<th>Practice of health visiting</th>
</tr>
</thead>
</table>
| **Principle 1.**  
The search for health needs | Collect and structure data and information on the health and wellbeing and related needs of a defined population.  
Analyse, interpret and communicate data and information on the health and wellbeing and related needs of a defined population.  
Develop and sustain relationships with groups and individuals with the aim of improving health and social wellbeing.  
Identify individuals, families and groups who are at risk and in need of further support.  
Undertake screening of individuals and respond appropriately to findings. |
| **Principle 2.**  
The stimulation of an awareness of health needs | Raise awareness about health and social wellbeing and related factors, services and resources.  
Develop, sustain and evaluate collaborative work.  
Communicate with individuals, groups and communities about promoting their health and wellbeing.  
Raise awareness about the actions that groups and individuals can take to improve their health and social wellbeing.  
Develop capacity and confidence of individuals and groups, including families and communities, to influence and use available services, information and skills, acting as advocate where appropriate.  
Work with others to protect the public’s health and wellbeing from specific risks. |
| **Principle 3.**  
The influence on policies affecting health | Work with others to plan, implement and evaluate programmes and projects to improve health and wellbeing.  
Identify and evaluate service provision and support networks for individuals, families and groups in the local area or setting.  
Appraise policies and recommend changes to improve health and wellbeing.  
Interpret and apply health and safety legislation and approved codes of practice with regard for the environment, wellbeing and protection of those who work and the wider community.  
Contribute to policy development.  
Influence policies affecting health.  
Develop, implement, evaluate and improve practice on the basis of research, evidence and evaluation. |
| **Principle 4.**  
The facilitation of health enhancing activities | Work in partnership with others to prevent the occurrence of needs and risks related to health and wellbeing.  
Work in partnership with others to protect the public’s health and wellbeing from specific risks.  
Prevent, identify and minimise risk of interpersonal abuse or violence, safeguarding children and other vulnerable people, initiating the management of cases involving actual or potential abuse or violence where needed.  
Apply leadership skills and manage projects to improve health and wellbeing.  
Plan, deliver and evaluate programmes to improve the health and wellbeing of individuals and groups.  
Manage teams, individuals and resources effectively. |

### Table 2. Ethnicity and family types of Manurewa residents compared with the Auckland Region, (Statistics New Zealand, 2009).

<table>
<thead>
<tr>
<th>Ethnic groups</th>
<th>Manurewa East %</th>
<th>Manurewa Central %</th>
<th>Auckland region %</th>
</tr>
</thead>
<tbody>
<tr>
<td>European</td>
<td>38.3</td>
<td>43.8</td>
<td>56.5</td>
</tr>
<tr>
<td>Māori</td>
<td>30.6</td>
<td>24.6</td>
<td>11.1</td>
</tr>
<tr>
<td>Pacific peoples</td>
<td>23.9</td>
<td>20.7</td>
<td>14.4</td>
</tr>
<tr>
<td>Asian</td>
<td>16.4</td>
<td>17.6</td>
<td>18.9</td>
</tr>
<tr>
<td>Middle Eastern/Latin American/African</td>
<td>4.2</td>
<td>4.3</td>
<td>1.5</td>
</tr>
<tr>
<td>Other</td>
<td>4.5</td>
<td>5.4</td>
<td>8.1</td>
</tr>
<tr>
<td><strong>Family type</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Couple without child(ren)</td>
<td>26.8</td>
<td>26.7</td>
<td>34.8</td>
</tr>
<tr>
<td>Couple with child(ren)</td>
<td>40.5</td>
<td>43.2</td>
<td>46.3</td>
</tr>
<tr>
<td>One parent with child(ren)</td>
<td>32.1</td>
<td>29.7</td>
<td>18.9</td>
</tr>
</tbody>
</table>
Table 3. Annual income, unemployment rate and post-school qualification for people aged 15 years and over in Manurewa compared to the Auckland region [12].

<table>
<thead>
<tr>
<th>Annual Income</th>
<th>Manurewa East %</th>
<th>Manurewa Central %</th>
<th>Auckland region %</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; $ 20,000</td>
<td>51.6</td>
<td>50.1</td>
<td>40.9</td>
</tr>
<tr>
<td>&gt; $ 50,000</td>
<td>7.2</td>
<td>8.5</td>
<td>21.6</td>
</tr>
<tr>
<td>Median Income</td>
<td>$19,100</td>
<td>$19,900</td>
<td>$26,800</td>
</tr>
<tr>
<td>Unemployment rate</td>
<td>9.7</td>
<td>8</td>
<td>5.6</td>
</tr>
<tr>
<td>Post school qualification</td>
<td>26.5</td>
<td>27.8</td>
<td>42.5</td>
</tr>
</tbody>
</table>

point to Manurewa being an area of high needs with associated health problems.

Children who are not immunised on time are likely to be from socio-economically disadvantaged, urban areas [16]. In March 2010, nationally only 67% of six month old infants had completed their primary course of immunisations. Of these, only 53% of Māori and 64% of Pacific Infants compared to 72% of European infants had completed their age appropriate immunisations [6]. In April 2009, an audit illustrated that the SAGP’s timeliness and coverage of vaccines for the primary course was in keeping with national statistics, at 52%. Figure 1 illustrates the ethnicity of the SAGP’s enrolled infant population over a one year period, which shows that Māori and Pacific Island infants are over represented at this practice and therefore less likely to receive their immunisations on time, compared to the rest of New Zealand.

The role of the health visitor in public health

The practice development initiative introduced into SAGP is based on the principles and practice of the United Kingdom’s (UK) health visiting profession (Table 1). Every infant born in the UK has a specialist community public health nurse [SCPHN] (commonly known as a health visitor) to provide care and advice for its parents. SCPHNs are usually attached to a general practice. Attachment infers that the SCPHN works autonomously alongside the general practitioner sharing notes and case managing the pregnant and 0 – 5 year old patients and their families registered with the practice. The GP does not employ the SCPHN, the local primary care trust or commissioning body is their employer. SCPHNs in the UK are widely recognised as the key public health practitioners providing community public health for young children and families.

The definition of public health coined by Acheson and adopted by the WHO is: ‘The science and art of promoting health, preventing disease and prolonging life through the organised efforts of society” [17]. Successful public health practice involves working with individuals as well as the population [18]. Central to public health are specific diseases and their prevention, of which pertussis is an example. New Zealand continues to experience an infant hospitalisation rate for pertussis which is three – six times higher than rates for England or Australia and the USA (8). The aim of community public health is to operate at a micro-level with families and communities to try and change the context of persistent public health issues [4].

One such issue in New Zealand is the poor uptake of timely immunisation in indigenous (Maori) and Pacific children. New Zealand like the UK provides childhood vaccines free of charge. Parents in the UK are usually advised about the immunisation schedule at the first visit by the SCPHN to the family when their infant is 10 – 14 days old [4]. The SCPHN will then liaise with the practice nurse at the infant’s general practice regarding the delivery of the immunisation schedule. Having one person in the general practice responsible for immunisation issues, patient reminders and recall systems is important in ensuring high coverage rates [19].

Implementing the practice development initiative in SAGP

The SAGP has a no charge policy for any child under eighteen years old and for those in full time study. In common with most general practices throughout New Zealand, general practitioners at SAGP employ practice nurses and administration staff. The general practice was in agreement that improved immunisation compliance was desirable and supported the lead author’s endeavours to achieve this goal.

Following the audit, implementation of the new model was led by the lead author, a UK educated nurse and health visitor who transitioned to a nurse practitioner (NP) role in the SAGP. To operate as a health visitor/SCPHN in New Zealand and be able to prescribe medications, registration as a NP with the Nursing Council of New Zealand (NCNZ) is required [20]. NPs are ‘expert’ nurses possessing leadership, teaching and advanced clinical practice skills.

Methods

The new initiative comprised:
• Recording the details of pregnant women in the ‘birth book’ (see below) at time of confirmation of the pregnancy.
• Liaising with the woman to ensure she had a midwife soon after confirmation of pregnancy.
• Including an independent midwife in the SAGP.
• Contacting the pregnant woman at 36 weeks pregnant to renew the relationship with the general practice.
• Sending a congratulations letter and reminder when the infant is four weeks old inviting the infant for its six week check and first immunisation.
• Contacting the woman when the infant is five weeks old to book them for a six week check appointment if they have not already arranged one.
• Establishing weekly clinics at the three local high schools to work with the school nurses to identify the pregnant teenage girls and offer co-ordinated primary healthcare services.

A ‘birth book’ was established in May 2008. This book contained demographic details of the pregnant woman, including her age, telephone number and address along with the name of the midwife who was caring for her and her expected date of delivery. The birth book is universally a common tool for health visitors in the UK. At SAGP general practitioners and practice nurses on confirming a pregnancy were requested to send a task via the computerised practice system to both the practice manager and the NP to record the woman’s name in the birth book. Her name was recorded beside the month of her estimated delivery date (EDD). The NP contacted the woman early in pregnancy to ensure she had accessed a midwife or obstetrician and when requested by the woman, the NP facilitated access to care for her.

One month prior to the EDD, the NP contacted the woman’s midwife to enquire how the pregnancy was progressing and if all was well, she then contacted the woman to remind her of the services available at the general practice following delivery. One month after the delivery date, contact was made with the family to offer; congratulations, an appointment for a six week check and first immunisations for the infant. This action was in line with principle one of health visiting; the search for health needs (Table 1). Actions associated with this principle are to collect and structure data and information on the health and wellbeing and related needs of a defined population and develop and sustain relationships with groups and individuals with the aim of improving health and social wellbeing (Table 1). The intention of the above actions was to improve antenatal care and immunisation rates and so reduce the numbers of infants hospitalised with vaccine avoidable infections such as pertussis. In April 2009 an independent midwife (who maintained her self-employed status) joined the practice.

Baseline audit

The baseline audit for this practice development initiative was conducted by a GP registrar over a one month period, April 2009, who identified all babies enrolled with the practice aged between 0 years and six months, their immunisation status and if they had been immunised on time. To gain accurate information, because data was not recorded correctly in the practice management system, hand searching of the infants’ notes was necessary. Definition of timeliness was that the first immunisation was given to the baby by the age of ten weeks, the second by four months old and the third by six months old. These data were then anonymised and sent to the National Immunisation Register.

Subsequent monthly audits

Monthly audits have been conducted since December 2009 to collect the dates of each infant’s immunisation using the search engine within the practice management system to ensure that they have been immunised on time. If a delay is noted the family are contacted by telephone and an appointment arranged for them or if they cannot be contacted by telephone, they are visited at home and offered an appointment. These actions constitute evidence-based best practice [1]. The NP and practice nurse co-ordinate information from the midwife regarding the date of the infant’s delivery and integrate it with information recorded in the birth book so that the actual date of birth is recorded next to the EDD.

Ethical approval

This model of care was implemented using the evidence of ‘what works’ to increase immunisation rates from international models [1,4]. The new model forms part of the audit cycle and therefore ethical approval was unnecessary. Ethical approval was not required for the data collected on immunisation timeliness and rates as these anonymised statistics are freely available and published by the Ministry of Health [5,21]. Parents and carers are requested to consent to the recording of their infant’s immunisation status at their first immunisation visit. Consent and subsequent data are sent to the National Immunisation Register (NIR) [5]. The general practice’s name has been changed and is not identifiable nor are the midwives or obstetricians or the enrolled pregnant population.

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Figure 1. Ethnicity of 66 infants aged 6 weeks – 6 months enrolled at SAGP October 2009 – September 2010 compared to national statistics recorded at 2006 census (Statistics New Zealand 2006).

Figure 2. The number of pregnant women enrolled with the SAGP who had an identified LMC recorded in their notes during 2010.
Figure 3. Monthly percentage rates of completion and timeliness of immunisations in 6 week – 6 month old infants, January 2010 – December 2010 (n= 73).

Results

The ‘birth book’ has become a shared document between the midwife, NP, practice nurses, GPs and administration staff. Over a one year period (2009 – 2010), SAGP’s enrolled infant population majority, 22 (33%), were indigenous (Māori). The next main group, 19 (28%) were Pacific Island infants and the third main group were New Zealand European (Figure 1). Of the 62 women whose infants were aged six weeks – six months during 2010 and who were registered with SAGP during their pregnancy, 59 (95%) had a documented LMC in their notes (Figure 2). Eleven infants moved to SAGP after their birth and so no record of their mother’s ante-natal care was available. The audit conducted in April 2009 illustrated that only 52% of infants received their immunisations on time at SAGP. Following the introduction of the new model of care, Figure 3 illustrates that in January, April, May, June, and July 2010, 100% of eligible infants had received their immunisations on time. During the remaining months in 2010, the percentage of infants receiving their immunisations on time was never lower than 94% (Figure 3).

Discussion

Summary of main findings

Standard practice prior to the new model of care was, once pregnancy was confirmed, the woman was given a list of midwives to choose one to make contact with. Having searched for health needs of the Manurewa population, in line with principle one of health visiting (Table 1), it was apparent that the impoverished population of Manurewa may not have the financial means to make numerous telephone calls from cell phones to arrange ante-natal care. Consequently, anecdotally, many pregnant women did not arrange ante-natal care for their first and second trimesters. Personnel operating from the general practice were not privy to information about the pregnancy and subsequent birth and although a system operates whereby the LMC informs the general practice of the birth outcome, receipt of information is often delayed resulting in late appointments offered for the infant’s six week immunisation. Women were expected to make contact with the general practice to arrange their infant’s six week check and immunisations.
Since implementation of the new model of care, 59\% (95\%) of pregnant women enrolled with the practice have a LMC documented in the notes and the majority 28 \% (43\%) enrolled with the SAGP midwife (Figure 2). Additionally immunisation timeliness and rates have increased to 94 – 100\% consistently every month since December 2009 (eight months after the new model was implemented). These results indicate that SAGP has reduced inequality of access to immunisations between ethnic groups for at least five months during 2010, as all infants were immunised (Figure 3). Factors associated with the SAGP’s success at increasing immunisation rates have been: an ethos of bringing pregnant women into the general practice ‘family’, by creating a primary care medical home [22], engaging one midwife to be part of the general practice team, one ‘child champion’ in the team who case manages the pregnant women and infant population and a whole team approach to childhood immunisations.

**Strengths and limitations**

The strength of this audit is the completeness of data from one general practice over a one year period. The limitations of this study are the small numbers of infants enrolled at SAGP and the transferability of this model of care to larger populations. There has as yet been no evaluation from the pregnant woman or new mother’s perspective on this new model of care. Plans are in place to gain this consumer perspective.

**Comparison with existing literature**

The new model of care was underpinned by social construction theory [23,24] which suggests that how we perceive the world depends on our relationships within it. Health care systems are historically time bound and culturally specific, for example in the UK people expect to visit their general practitioner and not pay for this service. This UK tradition was built on Aneurin Bevan’s premise at the inception of the National Health Service (NHS) in 1948 [25], that health care should be free at the point of delivery. New Zealand’s health care system differs in that only certain groups within society may access services from a general practitioner if they have the means to pay. However all maternity care and hospital services are provided at no cost. These social creations are difficult to deconstruct and explain. Some groups in New Zealand society may not understand the intricacies of primary health and maternity care and so feel intimidated at having to initiate a relationship by contacting a midwife when they discover a pregnancy. They may also be concerned that the service costs money.

The idea of the ‘medical home’ was first mooted by the American Academy of Pediatrics in 1967 [26]. The success of the medical home depends on its ability to focus on the needs of the patient on a case by case basis [27]. Responsibility for care and co-ordination in the medical home resides with the person’s primary care provider, working with a health and social care team, which forms and re-forms depending on the patient’s needs [22]. The new model of care at SAGP emulates the concept of the medical home, as pregnant women are contacted to ensure they have accessed ante-natal care and all infants receive surveillance to ensure timely immunisation. These actions constitute case management of a specific population of enrolled patients within the practice.

Hambidge et al’s (2009) randomised controlled trial of 811 infants conducted in the USA, illustrated that a stepped approach to reminders for immunisation, starting with a letter and escalating to a home visit if the family did not respond to the initial invitations, resulted in infants in the intervention arm having significantly fewer days without immunisation coverage in their first 15 months, than those in the control arm. Furthermore those in the intervention group were more likely to be up to date with their immunisation at 12 months old than those in the control arm [1]. The new model of care at SAGP mirrors this American intervention.

**Relevance to clinical practice**

The strengths of this model of care are the improved immunisation rates of infants and their subsequent health outcomes. Grant et al’s [7,8] studies illustrated that infants in New Zealand who were not immunised on time, had a four to six fold increased risk of being hospitalised with pertussis. We can therefore expect that the majority of infants registered with SAGP will have a four – six fold reduced risk of hospitalisation for pertussis because they will have been immunised on time.

**Further evaluation**

Research into barriers to access immunisations is needed in New Zealand, particularly for Māori and Pacific infants who suffer the highest burden of disease from vaccine preventable illnesses. Disseminating the SAGP’s new model of care nationally, may result in widespread improved immunisation rates.

**References**


