CHILDHOOD RESPIRATORY INFECTIONS

In the Lakes and Bay of Plenty Regions

Health Needs Assessment: Literature Review, Stakeholder Consultation, and Recommendations

Report for Toi Te Ora Public Health Service

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EXECUTIVE SUMMARY

Childhood respiratory infections cause a disproportionate burden of disease, and sometimes life-long health consequences, for the most vulnerable children in the Lakes and Bay of Plenty regions.

As with the other childhood infections identified as a priority by Toi Te Ora Public Health Service, there are large inequities in childhood respiratory infections by ethnicity and deprivation that signal a need to focus very strongly on Māori communities and families, and high deprivation communities with any interventions to address childhood respiratory infections in the Lakes/Bay of Plenty region.

There also needs to be a continued strong focus on addressing the determinants of health and poverty for Māori and high deprivation groups, alongside any additional interventions or activities to specifically address childhood respiratory infections.

There is no single intervention that will resolve the high rates of respiratory infection hospitalisations amongst children in the Lakes and Bay of Plenty regions; however a synthesis of the evidence and feedback from stakeholders suggests that the interventions with the most potential to reduce childhood respiratory infection hospitalisations include:

- Evidenced based smoking cessation interventions for pregnant women and mothers.
- Delivery of special pregnancy and child immunisations (pertussis and influenza).
- Focussing on children who have had multiple hospital admissions or presentations to primary care with serious respiratory infections.
- Comprehensive, health-managed healthy housing interventions.

Additionally this report outlines seven streams of recommendations to address the many determinants, risk and protective factors for serious childhood respiratory infections. The recommendations include both activities that Toi Te Ora Public Health Service (Toi Te Ora) could undertake itself, and activities that are beyond the scope of Toi Te Ora, but for which Toi Te Ora can bring to attention, and advocate for locally and nationally.

Stream One: Addressing the Social Determinants of Childhood Respiratory Infections
Stream Two: Reducing Smoking in Pregnant Women and Mothers
Stream Three: Promoting Healthy Pregnancy and Early Childhood
Stream Four: Early Recognition and Management, and Accessible Healthcare
Stream Five: Additional Support for High Risk and Readmissions Group
Stream Six: Better Collaboration to Address Childhood Respiratory Infections
Stream Seven: Keeping Track of and Applying Research
ACKNOWLEDGEMENTS

Thank you to all the stakeholders around the Lakes and Bay of Plenty regions who so willingly made themselves available, and who gave valuable insights and advice on the issue of childhood respiratory infections.
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<th>Definition</th>
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<tbody>
<tr>
<td>AKP</td>
<td>Aukati Kai Paipa</td>
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<tr>
<td>DHB</td>
<td>District Health Board</td>
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<td>CPO</td>
<td>Controlled Purchase Operation</td>
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<td>ECE</td>
<td>Early Childhood Education</td>
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<td>ED</td>
<td>Emergency Department</td>
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<td>ETS</td>
<td>Environmental Tobacco Smoke</td>
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<tr>
<td>GP</td>
<td>General Practitioner</td>
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<td>NIR</td>
<td>National Immunisation Register</td>
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<tr>
<td>NRT</td>
<td>Nicotine Replacement Therapy</td>
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<td>PHN</td>
<td>Public Health Nurse</td>
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<td>PHO</td>
<td>Primary Health Organisation</td>
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<tr>
<td>URTI</td>
<td>Upper Respiratory Tract Infection</td>
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<tr>
<td>LRTI</td>
<td>Lower Respiratory Tract Infection</td>
</tr>
<tr>
<td>RCT</td>
<td>Randomised Controlled Trial</td>
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<tr>
<td>WCTO</td>
<td>Wellchild/Tamariki Ora Provider</td>
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<table>
<thead>
<tr>
<th>Te Reo Maori Word</th>
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<tr>
<td>Whanau</td>
<td>Family</td>
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<td>Tamariki</td>
<td>Child</td>
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<tr>
<td>Ora</td>
<td>Well</td>
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<td>Hapu</td>
<td>Pregnant</td>
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<td>Mama</td>
<td>Mother</td>
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<tr>
<td>Kaupapa Māori</td>
<td>An approach based on the Māori world view</td>
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<tr>
<td>Kohanga</td>
<td>Māori language early childhood education</td>
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<tr>
<td>Whare</td>
<td>House</td>
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<tr>
<td>Tupeka Kore</td>
<td>Tobacco free</td>
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<td>Wananga</td>
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1.0 BACKGROUND

1.1 Toi Te Ora Strategic Plan Goals

Toi Te Ora Public Health Service (Toi Te Ora) has set five long-term strategic goals for the organisation commencing 2013. One of these goals is to reduce childhood admissions to hospital from acute rheumatic fever, respiratory infections and skin infections, each by two thirds in five years from 2013. This project focusses on what could be done to achieve this reduction for childhood respiratory infections amongst children in the Toi Te Ora population (Lakes and Bay of Plenty regions).

1.2 The National Context

Childhood respiratory infections cause a large burden of illness in New Zealand, with very high rates of admission to hospital when compared with other developed countries (1–4). Furthermore there are large, persistent, and widening inequities in the burden of childhood respiratory infections with Māori and Pacific children, and children from high deprivation areas suffering much higher rates of hospitalisation and mortality (3,4).

Rates of bronchiolitis hospitalisation for children increased by almost a third between 2000 and 2013. The combined effect of ethnicity and deprivation meant that Māori and Pacific children in the highest deprivation were more than eight times as likely to be hospitalised for bronchiolitis as New Zealand European/Other children in the lowest deprivation (3).

Whilst childhood pneumonia hospitalisations decreased slightly during the 2000-2013 period, there were large inequities in the distribution of childhood pneumonia mortality by ethnicity, with rates five to six times higher for Māori and Pacific children (3).

For some children, severe or repeated respiratory infections lead to permanent lung damage (bronchiectasis) resulting in a lifetime of ill health and disability, and likely a premature death. Longitudinal studies have also shown that having pneumonia as a young child is associated with poorer lung function in adult life (1).

Thus childhood respiratory infections cause an unacceptable acute and a long-term burden to the health and wellbeing of New Zealand’s children, particularly those that are the most vulnerable.

1.3 The Local Context

Childhood respiratory infections are also a significant issue locally in the Lakes and Bay of Plenty regions. Hospital admission rates for respiratory tract infections (upper respiratory tract infection, bronchiolitis, pneumonia) for Lakes children are all significantly higher than the national rate. For Bay of Plenty children, admissions for upper respiratory tract infection (URTI) and bronchiolitis are also significantly higher than nationally, whilst pneumonia admission rates are about the same as nationally (5).

A more fine-grained analysis of respiratory infection hospitalisation data during the period 2008-2012 for Lakes and Bay of Plenty children aged 0-14 years (6) showed:
On average over 1700 respiratory infection hospital admissions for Toi Te Ora children each year (approximately 1100 per year for the Bay of Plenty District Health Board (DHB), 600 per year for the Lakes DHB).

Four main conditions account for over 80% of respiratory infection hospital admissions for children: bronchiolitis, upper respiratory tract infection, pneumonia and lower respiratory tract infection.

The majority of the children hospitalised for these four conditions were under the age of five years.

The inequities seen in the national data by ethnicity and deprivation are also seen for children in the Lakes and Bay of Plenty regions. Māori children, and children from high deprivation areas were significantly over-represented in the respiratory infection hospitalisation data. There are also some specific areas in the Lakes and Bay of Plenty regions that are over-represented in the childhood respiratory infection hospitalisation data:

- The Eastern Bay of Plenty has a higher rate of admission than the Western Bay of Plenty, and Rotorua has a higher rate than Taupo.
- The highest rates of admissions for respiratory infections in children are in the Kawerau District and in Rotorua (6).

1.4 Specific Aims and Objectives of this Project

**Aim:** To provide recommendations to Toi Te Ora Public Health Service Childhood Infections Goal Group regarding interventions to reduce admissions to hospital for respiratory infections for children (0-14 years) in the Lakes and Bay of Plenty regions.

**Objectives:**

- Complete a review of local, regional, national and international literature to ascertain evidence-based approaches to reducing childhood respiratory infections and hospitalisations.
- Engage and consult with key stakeholders to obtain local information about current services that prevent and treat respiratory infections in children, gaps/barriers, and possible opportunities.
- Investigate services that are available in other regions to address serious childhood respiratory infections.
- Give recommendations as to what the best and most realistic actions are for Toi Te Ora, to progress towards its goal for reducing childhood respiratory infection hospitalisations.
- Give a broad estimate of the resource implications of recommended intervention(s).
There is very little literature on comprehensive interventions to reduce serious childhood respiratory infections in developed countries. New Zealand is quite unique among developed countries for its high rates of serious childhood respiratory infections (1–4), which has led to an intervention being trialled and studied in Auckland – The Healthy Lungs Study.

The Healthy Lungs Study involved children less than two years old admitted to hospital with a serious lower respiratory tract infection being randomised to either an intensive follow-up programme, or usual care. The intensive programme involves follow up to ensure complete treatment and resolution of the respiratory illness; along with linking to community programmes (immunisation, breastfeeding, good nutrition, smokefree, housing), transport to hospital clinics, and continuity with the same health worker supporting at home and in hospital clinics. Data from the Healthy Lungs Study (2010-2013) are currently being analysed and will be published within the next year.

The remainder of this literature review looks at effective interventions for the most significant risk factors for serious childhood respiratory infections.

**2.1 Risk Factors for Serious Respiratory Infections in Children**

The most significant risk factors for serious respiratory infections in children include exposure to tobacco smoke, lack of exclusive breastfeeding, housing (including crowding and housing condition), poor nutrition, and incomplete immunisation (7–13).

Several of these factors are linked to poverty through the impact of ‘enforced lacks’ – families having to cut back on essentials because of money, such as children having to share beds and rooms, less fresh fruit and vegetables, inability to heat the house in winter, exposure to damp/mouldy housing, and postponing doctors’ visits and not collecting prescriptions because of costs. New Zealand rates of child poverty are very high, as are the proportion of children in significant poverty for long periods of time (4).

**2.2 Effective Interventions for Smoking Cessation in Pregnant women and Mothers**

There is a large body of literature that links both prenatal maternal smoking and children’s environmental tobacco smoke (ETS) exposure post-natally to increased rates of respiratory infections, with a stronger effect with increased exposure. Studies suggest independent effects of both pre- and post-natal exposure, with the risks highest during the first few years of life (14). The ‘Growing Up in New Zealand’ study of over 7000 women (pregnant during 2009-2010) reported that 11% of mothers smoked at some stage during pregnancy, with a higher figure for Māori women (34%) and women from lower socioeconomic areas (17%)(15). Thus maternal smoking is a very important driver of the inequities in childhood respiratory infections in New Zealand and locally.

Women who smoke are more likely to stop smoking during pregnancy than at any other time in their lives. First time mothers are particularly receptive to cessation advice (16). Evidence shows that behavioural support (in-person and telephone counselling) for smoking cessation on its own is
marginally effective during pregnancy, and nicotine replacement therapy (NRT) shows mixed results. Interventions that use incentives are the most effective at achieving smoking cessation during pregnancy (17).

With all of these interventions a majority of women relapse to smoking in the longer-term post-natal period (17–20), but the more times smoking cessation advice is offered and the more quit attempts made, the greater the likelihood of stopping permanently (21).

Research suggests that interventions that are delivered in pregnancy and extended into the post-natal period, with a focus on relapse prevention, have the most potential to achieve long-term cessation. One of the highest reported cessation and maintenance rates achieved was seen with a mixed intervention (counselling and nappy voucher incentives) which achieved 97% cessation by the end of pregnancy and 44% abstinence by one year post-natal (18).

Systematic review shows that mobile-phone technology (text messaging to provide motivation, support and tips for quitting) is effective at helping people to quit smoking (22), and this is relevant to pregnant smokers and mothers, who are in the younger demographic. The Quit Group offer a Txt2Quit service, and this is well utilised by smokers in their twenties, and by Māori smokers (21).

It is important to note that the wider context surrounding a woman is critically important. Low socio-economic status, and having other smokers in the home are strong predictors of pregnancy and post-natal smoking – including for Māori pregnant women (18,23). Women who are pregnant and living with a person who smokes are four times more likely to resume smoking after giving birth (16). Social support is also important, regular and positive input from a supporter has been shown to improve eight-month post-natal quit rates (16).

Motivational interviewing is recommended by the American College of Obstetricians and Gynecologists for prompting behaviour change in women who are pregnant and smoke but are resistant to stopping (16).

There is little specific evidence on effective smoking cessation interventions for indigenous pregnant women (24,25), but a reasonable amount of research on possible ‘enablers’ for Māori women who are pregnant to stop smoking. These include: messages that focus on the health of the baby, mass media support for quitting aimed at pregnant women, comfort/familiarity with a smoking cessation service, face-to-face and group support, partner and family support to quit, and messages that link smoking in pregnancy to the risk of Sudden Infant Death Syndrome (25–29).

There is evidence that social marketing with a focus on the negative health impacts of smoking are effective with high deprivation smokers. The only other approaches known to address inequities in smoking include increasing price, and increasing access to cessation services in high deprivation areas (24).
2.3 Effective Interventions for Preventing Child Exposure to Environmental Tobacco Smoke

Large meta-analyses on parental and family interventions to reduce exposure of children to ETS have shown that, at best, there is a small positive effect when measured by the outcome of parentally-reported exposure (but not with biochemical measures of exposure) (30,31). Types of interventions included self-help materials, face-to-face and telephone counselling, free nicotine replacement therapy (NRT) and biofeedback.

Walker et al noted that for indigenous Australians and New Zealanders, the health of children was a strong motivator for changing smoking behaviour. They undertook a randomised, single-blinded trial to determine the impact of a culturally appropriate, family-centred ETS intervention on the respiratory health of indigenous Australian and New Zealand infants (32).

Intervention mothers (and family) received three home visits involving ‘coaching’ from mostly indigenous community workers about the risk of ETS to children, smokefree homes/cars, and strategies to make smoke-free changes. Smokers were also given brief advice, counselling, offered free NRT and/or a Quitline referral. After the intervention there was >95% reported smoke-free homes and cars. However most parents continued to smoke, and biochemical measures of ETS exposure were higher in infants if one or both parents were smokers. There was no effect on acute respiratory illness in the infants. The results highlighted that even with high reported smoke-free homes/cars, children still have exposure to ETS (perhaps unreported/underestimated exposure or third-hand exposure on clothes and other items) – and the authors concluded that the emphasis needs to be on supporting parents/family to quit smoking (32).

Legislative bans are associated with increased smoke-free vehicles and homes, though the effect is lesser for lower socio-economic groups (33,34). Mass media and local campaigns around smoke-free homes and vehicles, within a wider tobacco control programme, may also be effective at reducing ETS exposure in homes and vehicles (35,36).

2.4 Effective Interventions for Promoting Breastfeeding

Breastfeeding strongly protects against lower respiratory tract infection. A substantial body of evidence with large numbers of babies in both in developing and developed countries has shown the protective effect of any breastfeeding. There is a more than tripling of hospitalisations for serious respiratory infections for babies not breastfed compared to those breastfed for four months (1).

The evidence shows that the provision of post-natal support by both professionals and peers improves breastfeeding duration and exclusivity. Face-to-face interventions have a larger positive effect that telephone, and it is important that the professional or peer is the one to initiate contact (rather than relying on the mother to make contact) (37,38).

There is also encouraging evidence around the use of technology to improve breastfeeding outcomes. This includes web-based, and more recently a mobile-phone intervention. One intervention in Australia used two-way text message exchanges once per week (backed up by messages to solve common problems and a visit from a

Best Practice Example: Canterbury Breastfeeding Support

- Breastfeeding Helpline
- Mother to Mother Peer Support Volunteers
- Free breastfeeding information sessions for pregnant women
- Breastfeeding advocacy service
- Drop-in breastfeeding clinic
- Canterbury Breastfeeding Network
trained breastfeeding professional within 24 hours for those mothers that gave a worried/confused text response) was effective at reducing the attrition of women from exclusive breastfeeding. Women were positive about getting help on their own terms, and the intervention also has potential to be more universal and lower cost than peer/professional support (37).

2.5 Effective Interventions for Improving Housing and Overcrowding

New Zealand has good studies that show the effectiveness of housing interventions in improving child respiratory outcomes.

An intervention in the Counties-Manukau district that combined a housing assessment and modification (to reduce crowding/improve insulation) with a Public Health Nurse assessment and linking to other health/social services, resulted in a significant reduction in the risk of acute hospitalisation (from housing-related conditions) for children (39).

A randomised controlled trial (RCT) that looked at the effect of retrofitting insulation to houses in a community sample (Māori and Pacific people were deliberately over-sampled), showed people in the insulated houses had approximately half the odds of self-reported ‘colds and flu’ and hospital records showed a trend toward lower risk of admission for respiratory conditions (40). A further RCT showed that non-polluting and more effective home heating resulted in significantly reduced respiratory symptoms for children (asthma), fewer days off school, and lower healthcare utilisation (41).

2.6 Effective Immunisation Interventions

Immunisation has been shown to be a highly effective and pro-equity intervention in New Zealand. Since the introduction of the pneumococcal vaccine to the childhood schedule in New Zealand certain strains of pneumococcal disease have been almost eliminated in children under five, and the number of hospitalisations for invasive pneumococcal disease has drastically reduced. The greatest reductions in disease have been seen in Māori and Pacific children and children from high deprivation areas (42).

There are two immunisations, which if implemented more widely, could potentially make a large difference to the burden of childhood respiratory infections – influenza immunisation for pregnant women and young children, and pertussis immunisation for pregnant women (in addition to the timely receipt of infant immunisations – any delay in the receipt of the primary immunisation series increases the risk of hospital admission with vaccine preventable disease, e.g. pertussis, during infancy) (43).

Best Practice Example: Waikato DHB Maori Health Unit Warm Whare and Whare Ora Projects

The Māori Health Unit at the Waikato DHB have led a project giving free home insulation to tenants and home owners, reaching close to 1000 high needs families and whanau. More recently they have launched the Whare Ora Project. This involves PHNs doing healthy home assessments for children who have been admitted for rheumatic fever or respiratory illness, and providing additional interventions to create a warmer drier home, such as thermal-lined curtains, heating devices, dehumidifiers, blankets, warm clothes. Also addresses structural and functional overcrowding, and smoking in the home.

Best Practice Example: Hawkes Bay Specialist Teenage Mother Well Child Service

A Plunket nurse was funded to provide an additional two ante-natal visits and one early post-natal visit, and additional needs-based visits for teenage mothers. Aimed to increase immunisation rates, smoking cessation, breastfeeding, family planning and to reduce family violence. Evaluation showed higher rates of referrals to other health services, higher breastfeeding rates and higher completed immunisations.
Influenza

New Zealand data (from the SHIVERS trial) has shown that infants have a high burden of influenza and are over-represented in hospitalisations (44). Recent research has provided much needed information about the effectiveness of influenza immunisation in healthy young children aged six months and over (effectiveness was 64.7% overall and 85.8% in children less than two years) which adds weight to the argument that influenza vaccine should be used more widely amongst children (45,46). Currently it is funded for children aged four years and under who have been hospitalised for a respiratory illness, or have a history of significant respiratory illness (47).

Influenza immunisation is recommended and funded for pregnant women in New Zealand, but underutilised. Immunisation of pregnant women has been found to be safe and highly effective in preventing influenza and its complications in women, and for the infant for a short time after birth (45,46).

Pertussis

New Zealand has made great gains in getting infants immunised on time for pertussis. However, even with immunising on time, infants are not well protected prior to six months of age (49). Pertussis immunisation in pregnancy allows the mother to pass on passive protection to the infant. Recent research showed over 90% vaccine effectiveness for the infants of women immunised with pertussis in the third trimester of pregnancy (50). Recent research also supports the safety of the vaccine in pregnancy (51), and the results of the New Zealand Pertussis Immunisation in Pregnancy Study (PIPS) will soon be available to add to the evidence base on safety. The vaccine is funded for pregnant women in New Zealand but the uptake is low (52).

2.7 Effective Interventions in the Area of Nutrition

Vitamin D supplementation during pregnancy and early infancy has recently been shown to decrease the proportion of children that make primary care visits for acute respiratory infections up to age 18 months. Vitamin D supplementation was started during the pregnancy and stopped at age six months. The beneficial effect continued to be seen to age 18 months (53).

2.8 Effective Interventions for Improving Respiratory Hygiene

A Cochrane review has shown that hand-washing interventions are effective at reducing the spread of respiratory viruses, particularly when directed at younger children (54). Another meta-analysis showed that the use of soap, along with hand hygiene education, showed the greatest benefit in reducing respiratory infection in the community setting (55).

In recent years, some interventions have used computer games to teach the basic principles of handwashing and respiratory hygiene to junior school children. They show some promise in changing knowledge, but the effect on respiratory infection outcomes has not yet been investigated (56).
**2.9 Effective Interventions for Vulnerable Pregnant Women**

Often, the major risk factors for childhood respiratory infection discussed above (smoking, poor housing, lack of breastfeeding, lack of immunisation) cluster together in a group of mothers who face multiple adversities, and who present late in pregnancy and receive limited antenatal care (4). Integrated approaches that engage women early in the antenatal period and address complex needs may be more effective than targeting specific risk factors for childhood respiratory infection in isolation.

In 2012, The Child and Youth Epidemiology Service conducted a review of the issue of pregnant women with multiple adversities. Key points emerging from the literature included the importance of: early and sustained access to services; multi-agency approaches with clear referral pathways; prevention of repeat unplanned conception; and addressing mental health problems and social issues (57).

Beneficial interventions to support these women include: group antenatal care for disadvantaged women and young women; education/career development interventions (e.g. schools for teen parents) and accessible child care; and parenting programmes (57).

**2.10 Access to and Effectiveness of Primary Care for Children**

The accessibility and effectiveness of primary care for children is important to the early management of respiratory infections in children, and may avert the need for hospitalisation in some cases.

Recent analysis has shown an encouraging trend for New Zealand children in one of the measures of primary care access (Ambulatory Sensitive Hospitalisations, or ASH). Over the period 2002-2014 there was a steady reduction in ASH rates for 0-4 year old children, including for Māori and Pacific children, and children in the highest deprivation group. The same trend was seen in 0-14 year old children, but the reduction in ASH rates was less steep (58). Some of this trend may be related to primary care policy changes stemming back to the Primary Health Care Strategy (2001), and more recently, free primary care consultations for under six year olds (including after hours) (58).

Despite the improvement, however, inequities remain. ASH rates are still higher for Māori and Pacific children, and children in the highest deprivation group (58). More work yet needs to be done to ensure there is easy access for all children to primary care; and to ensure that the other strands of community care to children (Wellchild/Tamariki Ora Programme, the B4 School Check Programme, care of the pregnant women and newborn, and social care) are well connected to primary care.

The following important recommendations for improving primary care delivery to New Zealand children are very relevant (5,59):

- DHBs and Primary Health Organisations (PHOs) develop and implement a ‘District After Hours Service Plan’.
- Ensuring culturally responsive Primary Health Care.
- Increasing hours open, after-hours services, and free services for children where there is high need.
- Greater utilisation of nurse-led initiatives.
• Measurement and monitoring (including by ethnicity and deprivation) of:
  o The percentage of babies enrolled with a PHO, General Practitioner (GP), the National Immunisation Register (NIR), and a WellChild/Tamariki Ora provider by four weeks.
  o The percentage of children <6 years of age, and children <18 years of age with access to free primary care in-hours and after-hours.
• Improved health information exchange within primary care services, and between the primary and secondary sector.

Additionally, factors that are likely to support improved access to primary care for Māori children include (60):
• A multidisciplinary approach with collaboration between agencies and/or between lay and professional groups.
• Delivering services away from traditional settings.
• Improving health practitioner cultural awareness and sensitivity.
• Access to Māori health professionals and Māori community health workers.
• Tailored support materials, and recognition that information alone is insufficient.
• Use of prompts or personal reminders to encourage people to use services or keep appointments.
3.0 INITIATIVES TO ADDRESS CHILDHOOD RESPIRATORY INFECTIONS IN THE NORTH ISLAND

Although childhood respiratory infections are acknowledged as a significant issue in New Zealand, and some District Health Boards (DHBs) have it on their work programme, there are very few comprehensive programmes to address the issue. Of note, some of the plans and interventions that have been put in place for rheumatic fever and serious skin infections overlap with the determinants and risk factors for childhood respiratory infection.

The following table outlines initiatives and interventions that are occurring around other parts of the North Island that have relevance to childhood respiratory infections. Information was obtained by contacting Community Paediatricians and Public Health Physicians in other regions of the North Island.

Appendix 2 outlines services in the Bay of Plenty and Lakes regions that are involved with children and/or address child respiratory infection risk and protective factors.

<table>
<thead>
<tr>
<th>Region/DHB</th>
<th>Initiatives and Interventions</th>
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| Waikato District Health Board | • The recently launched Whare Ora Programme (led by the Māori Health Unit of the DHB) will supplement the Warm Whare Insulation Programme. It is targeting children under the age of 16 who have presented with rheumatic fever and/or respiratory illnesses multiple times to Waikato Hospital. It is a collaboration between the DHB, Housing New Zealand, Habitat for Humanity, Hamilton City Council, Te Puni Kokiri, and the Ministry of Social Development. Public Health Nurses will be conducting healthy homes assessments, and families will receive free home insulation and other interventions to create a warmer, drier home such as thermal-lined curtains, heating devices, dehumidifiers, blankets, warm clothes for children. It will also address structural and functional overcrowding, and smoking in the home.  
• A Hapu Mama Smokefree Pregnancies Tupeka Kore Framework is being piloted in Waikato Hospital Maternity Services, along with a Hapu Mama Wananga series led by a Māori midwife. Both initiatives are led by the Māori Health Unit of the Waikato DHB. |
| Counties-Manukau District Health Board | • The Healthy Lungs Study (2010-2013). Children <2 years old admitted to hospital with a serious lower respiratory tract infection randomised to either an intensive follow-up programme, or usual care. The intensive programme involves follow up (with the same consistent health worker) to ensure complete treatment/resolution of the respiratory illness; along with linking to community programmes (immunisation, breastfeeding, good nutrition, smoking cessation, housing); and transport to/support in hospital clinics.  
• Plans to improve uptake of special immunisations by developing a |
- Pilot of financial incentives for women to stop smoking during pregnancy.

**Northern Region Alliance** (Counties-Manukau DHB, Waitemata DHB, Auckland DHB and Northland DHB)  
- Childhood respiratory infection was one of five identified priority areas for children in the Northern Region Health Plan (2013-16). However the only thing done specifically in this priority area to date is the publication of Child Health Pathways for respiratory illnesses [http://www.healthpointpathways.co.nz/northern/](http://www.healthpointpathways.co.nz/northern/)

**Northland District Health Board**  
- Children with frequent respiratory admissions get automatically referred to healthy housing, and get social worker review and appropriate advice/support for family smoking cessation. Opportunistic immunisations are also given.

**Hawkes Bay District Health Board**  
- This is an issue many have struggled with, no specific interventions to date to address childhood respiratory infections.

**Tairawhiti District Health Board**  
- Respiratory infections and asthma are on the work program and will be tackled in the next financial year.

**Taranaki District Health Board**  
- No comprehensive programme to address childhood respiratory infections.
- There is a mail out reminder about influenza immunisation for all children on the paediatric services books with at-risk conditions that would qualify for free vaccination.

<table>
<thead>
<tr>
<th>Table 3.1 Initiatives to address childhood respiratory infections in the North Island</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Northern Region Alliance</strong> (Counties-Manukau DHB, Waitemata DHB, Auckland DHB and Northland DHB)</td>
<td></td>
</tr>
<tr>
<td>Childhood respiratory infection was one of five identified priority areas for children in the Northern Region Health Plan (2013-16). However the only thing done specifically in this priority area to date is the publication of Child Health Pathways for respiratory illnesses <a href="http://www.healthpointpathways.co.nz/northern/">http://www.healthpointpathways.co.nz/northern/</a></td>
<td></td>
</tr>
<tr>
<td><strong>Northland District Health Board</strong></td>
<td></td>
</tr>
<tr>
<td>Children with frequent respiratory admissions get automatically referred to healthy housing, and get social worker review and appropriate advice/support for family smoking cessation. Opportunistic immunisations are also given.</td>
<td></td>
</tr>
<tr>
<td><strong>Hawkes Bay District Health Board</strong></td>
<td></td>
</tr>
<tr>
<td>This is an issue many have struggled with, no specific interventions to date to address childhood respiratory infections.</td>
<td></td>
</tr>
<tr>
<td><strong>Tairawhiti District Health Board</strong></td>
<td></td>
</tr>
<tr>
<td>Respiratory infections and asthma are on the work program and will be tackled in the next financial year.</td>
<td></td>
</tr>
<tr>
<td><strong>Taranaki District Health Board</strong></td>
<td></td>
</tr>
</tbody>
</table>
| No comprehensive programme to address childhood respiratory infections.  
- There is a mail out reminder about influenza immunisation for all children on the paediatric services books with at-risk conditions that would qualify for free vaccination. |
4.0 STAKEHOLDER CONSULTATION

4.1 Methods of Consultation and Stakeholders Consulted

Consultation with stakeholders involved a combination of face-to-face, telephone and email communication around issues contributing to childhood respiratory infections in the Lakes and Bay of Plenty regions; and a set of questions (see appendix 1) about current services, service gaps, and possible interventions to address serious childhood respiratory infections. Stakeholders in regions with high childhood respiratory infections admissions within Lakes/Bay of Plenty (identified in the quantitative health needs assessment) were prioritised.

Stakeholders consulted included:
- General Practitioners
- Practice nurse
- Drop in and after-hours clinic nurse
- Paediatricians and Community Paediatricians
- Public Health Physicians involved in child health
- Paediatric Outreach Nurse
- Public Health Nurses (PHN)
- Paediatric Respiratory Specialists
- Wellchild/Tamariki Ora Providers
- Emergency Department (ED) doctor and nurse
- Māori Providers (health and social services)
- Portfolio Managers, Population and Child health

4.2 Common Themes about Childhood Respiratory Infections Across All Stakeholders

<table>
<thead>
<tr>
<th>Issues contributing to serious childhood respiratory infections</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poverty</td>
</tr>
<tr>
<td>Poor housing (cold, damp, mouldy), and failure of home insulation programmes for rental households.</td>
</tr>
<tr>
<td>Inability to afford to heat home and/or all family sleeping in one heated room to stay warm.</td>
</tr>
<tr>
<td>Tobacco smoking in pregnancy and around children.</td>
</tr>
<tr>
<td>A group of disengaged parents, with complex social issues, who lack parenting and child health skills, and that have poor trust in health and social services.</td>
</tr>
<tr>
<td>Cohort of young mothers, with little whanau/parenting support.</td>
</tr>
<tr>
<td>Poor nutrition making children susceptible to infection.</td>
</tr>
<tr>
<td>Delays in seeking medical attention</td>
</tr>
<tr>
<td>o Parents/care-givers not recognising signs of respiratory distress.</td>
</tr>
<tr>
<td>o Difficulty finding transport in acute situations and/or with the cost of ambulance services.</td>
</tr>
<tr>
<td>o In areas without access to after-hours medical services (e.g. Kawerau).</td>
</tr>
<tr>
<td>Incomplete medical treatment</td>
</tr>
<tr>
<td>o Delay or failure to pick up antibiotics.</td>
</tr>
<tr>
<td>o Not completing course of antibiotics.</td>
</tr>
<tr>
<td>o Sharing antibiotics around family.</td>
</tr>
</tbody>
</table>
| Gaps and barriers in services relevant to childhood respiratory infections | • Specific smoking cessation services for pregnant women in Lakes and Bay of Plenty are lacking. Also of note, there are no specific cessation services specifically targeting youth.  
• The importance of home-visiting and persistent follow-up was highlighted – but that there is not enough outreach positions and/or funding to doing this as much as is needed.  
• Asthma and respiratory nurses are focussed on asthma and chronic respiratory disease in adults. There is a gap around childhood acute respiratory infection education and follow up.  
• There are still many barriers to accessing General Practices  
  o Cost and family debts with practices (despite <6yrs free).  
  o Transience (families moving often).  
  o Delays of 1-3 days in being able to get an appointment to see GP (less of an issue in Practices that have a daily rostered drop-in GP).  
  o Relies on parent coming with the child to the Practice.  
• GPs not seeing pregnant women, or newborn, until 6 week check or later, therefore difficult to deliver preventative care that would decrease risks of childhood respiratory infection.  
• Lack of communication between GP – Wellchild providers – midwives – hospital services.  
• Lack of information sharing between health and social services.  
• Timely breastfeeding support at home is lacking, and there is a lack of understanding of the child health benefits (including less risk of serious infection) of breastfeeding amongst parents.  
• ED/Drop-In and after hours services and GPs often unaware of what services and supports there are in the community (e.g. respiratory nurse, curtain banks, social support services).  
• Less PHN time for health education in schools and Early Childhood Education Centres (ECEs) around hand and respiratory hygiene.  
• Wellchild/Tamariki Ora providers very contract focussed, have little flexibility to address other whanau health/social issues or to go beyond scheduled visits. |
| Successful initiatives, with relevance to childhood respiratory infections | • Immunisation – particularly the addition of Haemophilus influenza and Pneumococcal vaccines has been seen to make a notable difference to serious respiratory infections.  
• Also the intensive outreach and follow up services for immunisation have worked for coverage and equity.  
• GP relationships with Whanau Ora providers allowing wrap around social care in some areas.  
• Local and trusted health workers, known in the community, with outreach capacity, are successful at reaching vulnerable families and children – especially nurses.  
• Multi-disciplinary models that bring together providers: Wellchild/Tamariki Ora, Family Start, midwife, Paeds, PHN etc).  
• Healthline and Plunketline appear to be well utilised if parents
are aware of service and phone number.

**Possible interventions and opportunities**

- Potential for greater use of vaccines - pertussis and influenza for pregnant women; influenza for children.
- Greater engagement and education in ECE sector around risk and protective factors for childhood respiratory infections.
- Relevance of marae and kohanga settings for education and awareness raising around childhood respiratory infections.
- More use of nursing ‘advanced care’ scope of practice to increase access to primary care.
- Greater effectiveness of text messaging and email versus traditional forms of communication to contact parents.

<table>
<thead>
<tr>
<th>Table 4.1 Common themes about childhood respiratory infections across all stakeholders</th>
</tr>
</thead>
</table>

### 4.3 Themes About Childhood Respiratory Infections by Professional Group

#### Public Health Nurses

All professional groups highlighted the role of the social determinants of health, and smoking, in underpinning childhood respiratory infections

- **Poverty**
- **Cold homes (can’t afford to heat)**
- **Damp, mouldy homes**
- **Structural and/or functional overcrowding**
- **Poor nutrition**
- **Complex social issues**

Importance of capacity to home-visit and intensively follow up to ensure the health of children in the most ‘hard to reach’ households. Must go to them.

Community nurses tend to be trusted and able to engage with families, even when all other health/social services are rejected.

Only families with the most complex social issues are being addressed, but this is the tip of the iceberg and there are large unmet social needs contributing to respiratory infections in children.

PHN role in health education (e.g. hand and respiratory hygiene) in schools and early childhood centres has reduced.

Greater effectiveness of text messaging and email versus traditional forms of communication to contact parents.

Barriers in accessing GP still exist through costs for older children and adults (meaning family debts with Practice); transience of families and enrolment; inability to get a same-day appointment with GP.
Wellchild/Tamariki Ora Nurses

All professional groups highlighted the role of the social determinants of health, and smoking, in underpinning childhood respiratory infections

- Poverty
- Cold homes (can’t afford to heat)

Lack of communication between GP – Wellchild/Tamariki Ora providers – midwives – hospital services – community services.

See the potential for greater use of Healthline and Plunketline.

Difficult to provide additional help (e.g. breastfeeding) above and beyond what they are contracted to do in the Wellchild checks.

Being paid for telephone calls to families has allowed more telephone follow-up.

Inadequate breastfeeding support, especially after six weeks.

Māori Providers

- Damp, mouldy homes
- Structural and/or functional overcrowding
- Poor nutrition
- Complex social issues

Highlighted the issue of young (often transient) mothers, without the support of older women, therefore lack of parenting and basic health skills (e.g. recognising signs of respiratory distress).

Highlighted that health services (rather than patients/families) can be hard to engage with:
- unwelcoming/judgemental reception staff.
- complex language used by doctors.
- inconsistent health messages/instructions from different health professionals.

Highlighted the effectiveness of multi-disciplinary (health and social) care for whanau, and the need to attend to social issues before whanau willing and able to address health issues relevant to childhood respiratory infections (e.g. smoking).

See that home-visiting and intensive support (like picking up a child for a health appointment) are sometimes needed.

Paediatricians

Highlighted success of immunisation (e.g. pneumococcal vaccine), and see potential to use influenza and pertussis vaccines more widely.

Suggested focussing on children with recurrent admissions for respiratory infections.
All professional groups highlighted the role of the social determinants of health, and smoking, in underpinning childhood respiratory infections

- Poverty
- Cold homes (can’t afford to heat)
- Damp, mouldy homes
- Structural and/or functional overcrowding
- Poor nutrition
- Complex social issues (e.g. addiction)

General Practitioners

- Note lack of capacity of Wellchild/Tamariki Ora providers to follow up specific issues of concern from the hospital perspective.
- Unsure of the role of Whanau Ora Collectives in supporting child health. Need to build child health skills of navigators.
- Need for better links between hospital and community services.
- Felt there was a lack of child health funding.
- Noted role of poor nutrition in contributing to children’s susceptibility to infection.
- Need for identification and follow up of children at risk of progressing to bronchiectasis.
- The contribution of day-care to respiratory infectious disease burden in children.
- Note that having a drop-in GP allocated each day in General Practices means that children can be seen on same day, and reviewed; prevents delay in getting an appointment to see GP.
- Highlighted the fact that GPs don’t have much engagement with pregnant women or the newborn, until the 6 week check or later.
- Noted some deficiencies in midwife preventative care (smoking cessation, immunisation) and child health knowledge and education of parents post-natally.
- See potential to use influenza and pertussis vaccines more widely.
- See the cost of transport (when families have to travel to seek acute care for respiratory infection) as an issue contributing to delays in getting medical attention.
- Noted housing insulation programmes have not worked for families that rent, and unlikely to succeed if they rely on doctor/nurse referral system.
<table>
<thead>
<tr>
<th>Other nurses</th>
<th>See good after-hours primary care for children as important in preventing trips to hospital for respiratory infection.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>See gap around children presenting to ED with bronchiolitis in terms of follow up and education with family.</td>
</tr>
<tr>
<td></td>
<td>See that nurse practitioners and nurse specialists (that link hospital and primary care) are under-utilised.</td>
</tr>
</tbody>
</table>

### 4.2 Themes about childhood respiratory infections by professional group

**Further Information**

The Midland Child and Youth Health Service Level Alliance Team also identified the fragmentation and lack of connections between Lead Maternity Care (LMC), Primary Care, Wellchild/Tamariki Ora Services and the National Immunisation Register as a key issue in the quality of primary care delivery to children (61). This is part of the rationale for piloting a Child Health Information Platform (CHIP) supported by a Child Health Coordination Service, initially in Hamilton.
5.0 SYNTHESIS, RECOMMENDATIONS, AND RESOURCE IMPLICATIONS

5.1 Key findings

- Despite New Zealand’s high rate of serious childhood respiratory infections, comprehensive programmes to address the issue are currently lacking.

- Poverty, the socio-economic determinants of health, and health behaviours (e.g. smoking) are the key underlying drivers for childhood respiratory infections, and for the inequities in the burden of disease by ethnicity and deprivation.

- Effective and coordinated smoking cessation support for pregnant women and mothers needs to be strengthened in the Lakes and Bay of Plenty regions, along with a continued focus on preventing smoking uptake and effective smoking cessation for young people.

- Breastfeeding strongly protects against serious childhood respiratory infection. Accessible, practical breastfeeding support in the Lakes/Bay of Plenty regions needs to be strengthened once women have left hospital, and especially after infants are >6 weeks of age. The health benefits of breastfeeding in preventing/mitigating serious infections needs to be promoted.

- Housing insulation programmes in the Lakes/Bay of Plenty have not adequately reached the high needs families that are renting, and do not take a comprehensive approach to healthy homes (i.e. do not address heating, dampness, indoor pollution, and other health risk factors).

- There are evidence-based immunisation interventions (pertussis and influenza) that are currently being underutilised in pregnancy and early childhood that could make a significant difference to the incidence of serious childhood respiratory infections, particularly if targeted to the most at-risk groups.

- Wrapping extra early support around young vulnerable pregnant women may be a way of addressing several childhood respiratory infection risk factors at once.

- Home-visiting, and intensive follow-up (especially by nurses) has been identified as key in reaching vulnerable families with children at risk of respiratory infection, but nurse capacity does not currently meet the level of need:
  - Plunket, WellChild/Tamariki Ora and B4 School Check nurses are very focussed on contracted visits/checks and do not have much flexiblity to go beyond that.
  - Public Health Nurses are also lacking capacity.

- Asthma and respiratory nurses are not addressing childhood respiratory infections (tend to focus on asthma, and chronic respiratory conditions in adults).

- There is a high tolerance of, and a degree of ‘normalisation’ of respiratory symptoms in children (e.g. runny nose, cough, wheeze) amongst some communities.
• General Practices are not seeing many pregnant women, or infants, until the six week check or later. Thus, measures that could lower risk of serious childhood respiratory infections (e.g. immunisations, smoking cessation) rely on the Lead Maternity Carers who are often not adequately educated, trained, and supported to deliver.

• There are still many barriers to accessing General Practices for some families as a result of:
  o Debts with practices (from older family members, despite children under 6 being free).
  o Not being able to see the GP on the same day.
  o Lack of after-hours services in some areas (e.g. Kawerau).
  o Transiency and frequent shifting meaning non-enrolment with PHO and GP.
  o Sense of discomfort, or of being judged, from behaviour of staff.

• There are important recommendations for improving primary care delivery to children that could, if regularly monitored and reported against, mean that children with respiratory infection are seen and managed earlier in the community.

• There are multiple services involved in primary health care of pregnant women, infants, and children. These services are not necessarily well connected or communicating, meaning that opportunities for primary and secondary prevention of childhood respiratory infections can be missed.

• There is a cohort of young, unsupported mothers with poor health literacy, and disengagement from health and social services. These women need different and innovative approaches to improve their engagement and empowerment.

• Multidisciplinary models of care are important, as families often can’t address health issues relevant to childhood respiratory infections (e.g. smoking) until social issues are addressed.

5.2 Recommendations and Resource Implications

For the recommendations that follow, there is focus on the determinants of health, and new approaches to addressing the risk factors for serious childhood respiratory infections. These risk factors overlap with the risk factors for serious skin infections and rheumatic fever. Therefore the recommendations should add to the work done previously at Toi Te Ora on childhood infections.

There are seven streams of recommendations, followed by a table that identifies what activities a Public Health Unit such as Toi Te Ora could realistically undertake or fund itself; and what activities are beyond the scope of Toi Te Ora service delivery, but for which Toi Te Ora can bring to attention, and advocate for.

STREAM ONE – ADDRESSING THE SOCIAL DETERMINANTS OF CHILDHOOD RESPIRATORY INFECTIONS

• Continue to advocate for national and local policies that enable a fair distribution of wealth across all of society, and a reduction in child poverty in New Zealand. Child Poverty Action Group publications and background papers are key resource to support this.
• Continue to advocate for equitable access to the determinants of health nationally and locally such as healthy housing, successful education, meaningful employment, and sufficient income.

• Advocate that the Lakes and Bay of Plenty DHBs fund more comprehensive and health managed housing interventions, such as the Whare Ora programme at the Waikato DHB.

STREAM TWO – REDUCING SMOKING IN PREGNANT WOMEN AND MOTHERS

• Consider specific smoking cessation services for pregnant women, youth, and high deprivation groups. Learn from DHBs where this has been piloted or implemented e.g.
  o Tairawhiti DHB fund Te Aka Ora Charitable Trust to provide services to teenagers, teenage parents and pregnant teenagers.
  o Counties-Manukau DHB (CMDHB) funds additional Māori services above those provided by Aukati Kai Paipa (AKP).
  o CMDHB pilot project giving financial incentives to pregnant women.
  o CMDHB, Auckland, Waitemata, Taranaki and Hawkes Bay DHBs fund pregnancy specific cessation services.
  o Whanganui DHB has set up a youth quit clinic for 12-19 year olds.

• Regular smoking cessation education and training for midwives and other health providers that work with children and families.

• Increased number of Controlled Purchase Operations (CPOs) in high risk areas (e.g. Rotorua, Kawerau, Eastern Bay of Plenty) to assist efforts to reduce access to underage smokers.

• Keep abreast of the outcomes of new and innovative research and trials, and consider how these can be applied to the Toi Te Ora Population:
  • The AWHI-Incentives trial for Māori pregnant women (University of Auckland).
  • Motivational Interviewing for Smoking Cessation among Pregnant Youth and Young Mothers (University of Auckland).
  • Waitemata PHO (together with CMDHB) mobile Quit Bus smoking cessation support, advice, and NRT.
  • Southern DHB Little Lungs – Pokahukahu Iti project (Smokefree trainings/workshops to 16 Early Childhood Centres).
  • CMDHB’s Supporting Smokefree Intersectorally Project - to provide a total package of smokefree support for agencies across a range of sectors outside of health.
  • Tairawhiti gap analysis to look at key messages and information to encourage young Māori women (13-19yrs) to quit smoking.
  • WERO team smoking cessation challenge applied to specific populations, e.g. young women.

• Consider a hospital follow up cessation service for priority groups - pregnant women, youth, whanau of children admitted to hospital.

• Design messaging to increase uptake of Quitline and Txt2Quit by Māori, youth and pregnant women in the Lakes and Bay of Plenty regions.

• Continue to work to prevent uptake of smoking in young people, with an emphasis on Māori.

STREAM THREE: PROMOTING HEALTHY PREGNANCY AND EARLY CHILDHOOD

• Continue to build on Midwives’ ability to promote and deliver evidence-based preventative care (e.g. immunisation, nutritional and breastfeeding education), possibly through the Toi Te Ora Healthy Pregnancy Project.

• Use the evidence base to put in place greater breastfeeding support post-natally (and especially after six weeks), targeting high needs areas.
• Ensure Toi Te Ora Health Pregnancy Project links with the ‘Healthy Start for Mothers and Babies initiative in Rotorua’, and the Bay of Plenty DHB Maternity Project; and ensure that smoking cessation, breastfeeding and special pregnancy immunisations are promoted.

• Request that the DHB consider funding extra pre- and post-natal home visits for teenage mothers by Wellchild/Tamaraki Ora nurse(s) with a focus on smoking cessation, breastfeeding, special pregnancy immunisations, and attendance to social issues (e.g. the Hawkes Bay model).

• Ensure that Toi Te Ora delivers effective hand and respiratory hygiene education to ECEs and primary schools, and identifies substandard hand hygiene facilities for remediation.

STREAM FOUR: EARLY RECOGNITION AND MANAGEMENT AND ACCESSIBLE HEALTHCARE

• Suggest the District Health Boards review the recommendations for improving primary health care delivery to children (see 2.10), and institute regular monitoring and reporting against them.

• Raise the issue of transport cost barriers for rural families with children who need to travel for acute care (e.g. the high cost of an ambulance trip) – and advocate for financial assistance to reduce such costs (Ministry of Health, or DHB).

• Raise awareness amongst parents of the signs of acute respiratory distress in children that indicate a child needs quick medical attention.

• Promote the use of Healthline and Plunketline, especially through Māori providers and networks.

• Advocate that paediatricians deliver education to General Practitioners and child health providers on how to identifying and manage children at risk of progressing to bronchiectasis.

• Ensure there are clinical pathways for the prevention and management of childhood respiratory tract infections on Bay Navigator and Map of Medicine.

• Undertake a stocktake, and review adequacy of printed educational resources (available to parents/caregivers) for respiratory infections, bronchiolitis and pneumonia.

STREAM FIVE: ADDITIONAL SUPPORT FOR HIGH RISK AND READMISSIONS GROUP

• Advocate that the DHB put measures in place to ensure that children for whom the influenza vaccine is free (children aged 4 years and under who have been hospitalised for a respiratory illness, or have a history of significant respiratory illness) are identified and offered the vaccine, particularly in high needs areas.

• Consider establishing or advocating for an outreach follow-up service for children with recurrent respiratory infection presentations to primary and secondary care in a high needs area. May include:
  o Healthy housing assessment and intervention
  o Smoking cessation and ETS intervention
  o Influenza vaccination
  o Respiratory hygiene and respiratory signs/symptoms education
  o Nutritional assessment and education
  o Assistance in optimising social circumstances (e.g. WINZ assessment, budgeting support)
STREAM SIX: BETTER COLLABORATION TO ADDRESS CHILDHOOD RESPIRATORY INFECTIONS

- Consider establishing a Child Respiratory Infections Alliance Group consisting of primary care, paediatricians, public health, Māori health, midwife(s), and Wellchild/Tamariki Ora providers to increase the collaboration between different groups on the prevention and early management of childhood respiratory infections.

STREAM SEVEN: KEEPING TRACK OF, AND APPLYING RESEARCH

- Keep up to date with respiratory research published from the child cohort study ‘Growing Up in New Zealand’ (www.growingup.co.nz).
- Take note of the outcomes of the Auckland Healthy Lungs Study (due to be published in 2015).
- Consider collecting and analysing primary care childhood respiratory infection data.
- Consider analysing childhood respiratory hospitalisation data by Census Area Unit to further identify high needs areas for targeting the interventions recommended above.

<table>
<thead>
<tr>
<th>Recommended activities that Toi Te Ora Public Health Service could undertake:</th>
<th>Recommended activities that are beyond scope, but that Toi Te Ora could advocate for:</th>
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<tbody>
<tr>
<td>STREAM ONE AND TWO</td>
<td></td>
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<tr>
<td>- Smoking cessation education and training for midwives and providers working with children/whanau. <em>Resource implication: Delivery of workshops, or funding to allow delivery by an outside provider.</em></td>
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<tr>
<td>- Increased number of CPOs in high risk areas (e.g. Rotorua, Kawerau, Eastern BOP) to assist efforts to reduce access to underage smokers. <em>Resource implication: Possibly increased FTE for public health practitioner undertaking CPOs.</em></td>
<td></td>
</tr>
<tr>
<td>- Keep abreast of the outcomes of new and innovative research and trials around smoking cessation for priority populations, and consider how these can be applied to the Toi Te Ora population. <em>Resource implication: Monitoring by Toi Te Ora tobacco control team.</em></td>
<td></td>
</tr>
<tr>
<td>- Design messaging to increase uptake of Quitline and Text2Quit by Māori, youth and pregnant women in the Lakes and Bay of Plenty regions. <em>Resource implication: extra funding for printed resources and/or media campaign.</em></td>
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</tr>
<tr>
<td>- Continue to work to prevent uptake of smoking in young people, with an emphasis on Māori. <em>Resource implication: within existing work of Toi Te Ora staff, but ensure focus on Māori settings.</em></td>
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<tr>
<td>STREAM THREE</td>
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<tr>
<td>- Continue to advocate for national and local policies that enable a fair distribution of wealth across all of society and a reduction in child poverty in New Zealand.</td>
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<td>- Continue to advocate for equitable access to the determinants of health nationally and locally, such as healthy housing, successful education, meaningful employment, sufficient income.</td>
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<td>- Advocate that the Lakes and Bay of Plenty DHBs fund more comprehensive and health managed housing interventions, such as the Whare Ora programme at the Waikato DHB.</td>
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<td>- Consider specific smoking cessation services for pregnant women, youth, and high deprivation groups. Learn from DHBs where this has been piloted or implemented.</td>
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<tr>
<td>- Consider a hospital follow up cessation service for priority groups: pregnant women, youth, families of children admitted to hospital.</td>
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</tbody>
</table>
- Continue to build on midwives’ ability to promote and deliver evidence based preventative interventions (e.g. immunisation, nutrition), possibly through Toi Te Ora Healthy Pregnancy Project.  
  *Resource implication: regular education sessions with midwives and ongoing support.*
- Ensure Toi Te Ora Healthy Pregnancy Project links with ‘Healthy Start for Mothers and Babies’ initiative in Rotorua, and the BOP DHB Maternity Project; and ensure that smoking cessation, breastfeeding and special pregnancy immunisations are promoted.
- Ensure that Toi Te Ora delivers effective hand and respiratory hygiene education in ECEs and primary schools, with identification of substandard hand hygiene facilities for remediation.  
  *Resource implication: already part of rheumatic fever plan.*

**STREAM FOUR**

- Raise awareness amongst parents of the signs of acute respiratory distress in children that indicate a child needs quick medical attention.  
  *Resource implication: extra funding for printed resources and/or media campaign.*
- Promote use of Healthline and Plunketline, especially through Māori providers and networks.  
  *Resource implication: extra funding for resources and/or media campaign in partnership with Māori providers.*
- Undertake a stocktake, and review adequacy of printed educational resources (available to parents/caregivers) for respiratory infections, bronchiolitis and pneumonia.  
  *Resource implication: time commitment for communicable disease nurses.*

**STREAM FIVE**

- Consider establishing or advocating for an outreach follow up service for children with recurrent respiratory infection presentations to primary and secondary care in high needs area. May include:
  - Healthy housing assessment and intervention
  - Smoking cessation and ETS intervention
  - Influenza vaccination
  - Respiratory hygiene and respiratory signs/symptoms education
  - Nutritional assessment and education
  - Assistance in optimising social circumstances (e.g. WINZ assessment, budgeting support)
  - Linking and enrolling in child health services
  *Resource implication – Salary for 1 additional FTE nurse (e.g. a Public Health Nurse).*

**STREAM SIX**

- Consider establishing a Child Respiratory Infections Alliance Group consisting of primary care, paediatricians, public health, Māori health, midwife(s), and Wellchild/Tamariki Ora providers to increase the collaboration between different groups on the prevention and early management of childhood
- Use the evidence base to put in place greater breastfeeding support post-natally (and especially after 6 weeks), targeting high needs areas.
- Request that the DHB consider funding extra pre- and post-natal home visits for teenage mothers by Wellchild/Tamaraki nurse(s) with a focus on smoking cessation, breastfeeding, special pregnancy immunisations, and attendance to social issues (e.g. the Hawkes Bay model).

**STREAM FOUR**

- Suggest the DHBs review the recommendations for improving primary health care delivery to children, and institute regular monitoring and reporting against them.
- Raise the issue of transport cost barriers for rural children who need to travel for acute care (e.g. cost of an ambulance trip) – and advocate for financial assistance (Ministry of Health, or DHB).
- Advocate that paediatricians deliver education to GPs and child health providers on how to identifying and manage children at risk of progressing to bronchiectasis.
- Ensure that there are clinical pathways for the prevention and management of childhood respiratory infections on Bay Navigator and Map of Medicine.

**STREAM FIVE**

- Advocate that the DHB put measures in place to ensure that children for whom the influenza vaccine is free (children aged four years and under who have been hospitalised for a respiratory illness, or have a history of significant respiratory illness) are identified and offered the vaccine, particularly in high needs areas.

**STREAM SIX**
respiratory infections.  
*Resource implication: additional time by Medical Officer of Health.*

**STREAM SEVEN**

- Keep up to date with respiratory infection research published from the child cohort study ‘Growing Up in New Zealand’ ([www.growingup.co.nz](http://www.growingup.co.nz)).
- Take note of the outcomes of the Auckland Healthy Lung Study (due to be published later in 2015).
- Consider collecting and analysing primary care childhood respiratory infection data.
- Consider analysing childhood respiratory hospitalisation data by CAU to further identify high needs groups for targeting the interventions recommended above.  
*Resource implication: analyst and communicable disease nurse time.*

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**Table 5.1** Recommended activities inside and outside the scope of Toi Te Ora Public Health Service activities.
APPENDIX 1

**Stakeholder Questions and Responses**

**Questions about existing services**

What services or programmes are you aware of, in this region, that contribute to preventing childhood respiratory infections?
*(e.g. housing, smoking/ETS, breastfeeding, nutrition, imms, respiratory hygiene)*

What services or programmes are you aware of that are helping with the early management of childhood respiratory infections?
*(e.g. primary care/community outreach/after-hours or drop in/access to paeds advice or review)*?

What factors contribute to the decision to refer/admit a child with a respiratory infection to hospital? *(Paediatricians and GPs)*.

**Questions about gaps in services**

Do you think there are any gaps in the current services/programmes that are delivered to children in this region in relation to the prevention and early treatment of childhood respiratory infections?

**Questions about possible interventions**

What do you think would help to reduce admissions to hospital from childhood respiratory infections? *(prompts if necessary around prevention and early management)*

What do you think would have the greatest impact?

Do you know of any initiatives in other regions that are doing well in the prevention and early management of childhood respiratory tract infections?

Are there any particular opportunities you see in this region for building on current services/adding new services that would help in the prevention and early management of child respiratory infections?
APPENDIX 2

Services and Interventions Relevant to Childhood Respiratory Infections in Lakes and Bay of Plenty Region

Information obtained from DHB Annual Plans and Reports, Quality Accounts, Māori Health Plans, and through stakeholder discussions.

<table>
<thead>
<tr>
<th>LAKES</th>
<th>BAY OF PLENTY</th>
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</thead>
<tbody>
<tr>
<td><strong>PREVENTION</strong></td>
<td></td>
</tr>
<tr>
<td>Smoking</td>
<td></td>
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<tr>
<td>• ABC in primary and secondary care</td>
<td>• ABC in primary &amp; secondary care.</td>
</tr>
<tr>
<td>• Cessation services – Quitline, Aukati Kai Paipa, some primary care</td>
<td>• Smokefree champions in PHOs.</td>
</tr>
<tr>
<td>services.</td>
<td>• 2x Maternity service smokefree (plus SUDI and Peipipod) coordinators.</td>
</tr>
<tr>
<td>• Cessation referral pathways</td>
<td>• Cessation services – Quitline, AKP, some primary care services.</td>
</tr>
<tr>
<td>Welchild/Tamariki Ora/B4 School Check/maternity/ paediatrics.</td>
<td>• DHB employees counselling and NRT through employee health &amp; safety.</td>
</tr>
<tr>
<td>• Smokefree info in pregnancy kits in antenatal clinic.</td>
<td>• Smokefree health promotion. Controlled purchase operations.</td>
</tr>
<tr>
<td>• Pamper day smoking cessation for pregnant women, Turangi.</td>
<td>• Smokefree coalitions.</td>
</tr>
<tr>
<td>• Smokefree health promotion.</td>
<td>• 2014-15 BOPDHB Annual Plan committing $110,000 to improving the maternity</td>
</tr>
<tr>
<td>• Smokefree coalition.</td>
<td>care component of the Better Help For Smokers To Quit target.</td>
</tr>
<tr>
<td>• Pharmacological support to all staff who smoke and cessation clinic</td>
<td></td>
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<tr>
<td>based in the Ambulatory/outpatients department.</td>
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<tr>
<td>Housing</td>
<td></td>
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<tr>
<td>• New Ministry of Health crowded housing service (includes child</td>
<td>• New Ministry of Health crowded housing service (includes child respiratory</td>
</tr>
<tr>
<td>respiratory tract infection) – Western Heights.</td>
<td>tract infection).</td>
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<tr>
<td>• Warm up NZ insulation programme homeowners and landlords.</td>
<td>• Warm up NZ insulation programme homeowners and landlords.</td>
</tr>
<tr>
<td>NB scheme has been underutilised, and under 200 rentals retrofitted</td>
<td>• BOP DHB insulation funding (~36 homes).</td>
</tr>
<tr>
<td>versus 400 owner-occupied houses.</td>
<td>• Maketu Healthy Whare Project.</td>
</tr>
<tr>
<td>• Subsidised clean heating for home owners if Community Services Card</td>
<td>• Community Trust &amp; Energy Trust Housing initiatives.</td>
</tr>
<tr>
<td>holders, with children or people with health issues.</td>
<td>• Western BOP Māori housing forum.</td>
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<tr>
<td>• Hot swap loans to upgrade open fire or pre-2005 wood burner.</td>
<td></td>
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<tr>
<td>Breastfeeding</td>
<td></td>
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<tr>
<td>• Breastfeeding friendly spaces (Toi Te Ora).</td>
<td>• Breastfeeding friendly spaces (Toi Te Ora).</td>
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<tr>
<td>• Breastfeeding Friendly Hospitals Initiative.</td>
<td>• Breastfeeding Friendly Hospitals Initiative.</td>
</tr>
<tr>
<td>• Lactation consultant (hospital).</td>
<td>• Lactation consultants x2 (hospital)</td>
</tr>
<tr>
<td></td>
<td>• Eastern Bay of Plenty breastfeeding coalition.</td>
</tr>
<tr>
<td></td>
<td>• Te Umakainga Nohonga Pai, a steering group bringing together key stakeholders to support breastfeeding, safe sleeping and a smokefree environment for babies (pepi), with a particular focus on Māori.</td>
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<tr>
<td>Nutrition</td>
<td></td>
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<td>---</td>
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<tr>
<td>• Healthy food/Food security team (Toi Te Ora)</td>
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<tr>
<th>Immunisations</th>
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<tbody>
<tr>
<td>• Immunisation Alliance Steering Group with primary care leadership.</td>
<td></td>
<td>Immunisations advocate and outreach at PHOs.</td>
</tr>
<tr>
<td>• Immunisation facilitator and outreach team.</td>
<td></td>
<td>Immunisations advocate visits maternity ward.</td>
</tr>
<tr>
<td>• Monthly multidisciplinary team meeting to follow up late or missed children.</td>
<td></td>
<td>Lay advocate service.</td>
</tr>
<tr>
<td>• 10 minutes information from newborn hearing screeners.</td>
<td></td>
<td>Immunisations Alliance Steering Group.</td>
</tr>
<tr>
<td>• Pertussis and influenza vaccination in antenatal clinic.</td>
<td></td>
<td>Immunisations Operational Working Group.</td>
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<thead>
<tr>
<th>Respiratory hygiene</th>
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<tr>
<td>In rheumatic fever plan that Toi Te Ora will deliver hand hygiene education to schools/ECEs and identify schools with substandard hand hygiene facilities.</td>
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<tr>
<th>ACCESS/EFFECTIVENESS PRIMARY CARE</th>
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<tbody>
<tr>
<td>Outreach/community</td>
<td></td>
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<tr>
<td>• Public Health Nurses.</td>
<td>Public Health Nurses.</td>
<td></td>
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<tr>
<td>• Wellchild/Tamariki Ora Programme</td>
<td>Wellchild/Tamariki Ora Programme</td>
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<tr>
<td>• School based throat swabbing – Western Heights (plus drop in sore throat clinic).</td>
<td>School based throat swabbing – Ototiki, Kawerau, Murupara, Taneatua, Tauranga.</td>
<td></td>
</tr>
<tr>
<td>• Asthma and respiratory nurse (limited FTE).</td>
<td>Asthma and respiratory nurse.</td>
<td></td>
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<tr>
<td>• Nurse-led child health assessments, referrals and education at Children’s Camp.</td>
<td>Pepipod programme.</td>
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<tr>
<td>• 5-6 year children who miss B4 school check followed up at school.</td>
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<tr>
<th>After hours</th>
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<tr>
<td>Free for under 6’s.</td>
<td>Free for under 6’s, but Kawerau has no after hours service, and Opotiki after hours service is at risk.</td>
<td></td>
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</tbody>
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<thead>
<tr>
<th>Enrolment/early engagement/access to care for mother and child</th>
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<tbody>
<tr>
<td>• Automatic enrolment of newborns at hospital to PHO and GP, follow up of missed babies.</td>
<td>As Soon As You Are Pregnant promotion.</td>
<td></td>
</tr>
<tr>
<td>• Automated text message reminders for children’s outpatients, and follow up of DNAs with assistance of community services.</td>
<td>Plans for multiple enrolment on maternity ward (NIR, PHO, GP, dental, Wellchild/Tamariki Ora, hearing screening)</td>
<td></td>
</tr>
<tr>
<td>• Nurse-family partnerships for pregnant women at 3 Māori providers (DHB funded).</td>
<td>Bay Navigator information.</td>
<td></td>
</tr>
<tr>
<td>• Child Health Service Level Alliance Team (SLAT) plans ‘Health Start for Mothers and Babies’:</td>
<td></td>
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</tr>
<tr>
<td>• Establish a maternal health hub to receive referrals from GP/ LMC from time of positive pregnancy test.</td>
<td>Plans for acute demand intervention trial whereby quintile 5 demographic in Largest Bay of Plenty PHO will be offered free first appointment for any of the 25 ASH conditions. All subsequent appointments related to management will be free of charge (including prescriptions).</td>
<td></td>
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<tr>
<td>• Free first GP visit for pregnant women with Community Services Card.</td>
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<tr>
<th>Primary-Secondary links</th>
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<tr>
<td>• Map of medicine clinical pathways.</td>
<td>Bay Navigator.</td>
<td></td>
</tr>
<tr>
<td>• Service Level Alliance Teams (primary-secondary care).</td>
<td>Alliance Leadership Team and Service Level Alliance teams.</td>
<td></td>
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<tr>
<td>Health-Social links</td>
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<td>---------------------------------------------------------</td>
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<td>-----------------------------------------------------------------</td>
</tr>
<tr>
<td>• Vulnerable unborns and under 5’s programmes – Rotorua, Taupo, Turangi.</td>
<td>• Vulnerable unborns programme.</td>
<td>• Links between GP Practices and Whanau Ora providers in some areas (e.g. Opotiki); and Bay Navigator Whanau Ora Access Pathways.</td>
</tr>
<tr>
<td>• Awhi House maternal and child health integrated service, Turangi.</td>
<td>• Social sector trial.</td>
<td>• Social sector trial.</td>
</tr>
<tr>
<td>• Rotorua PHO alliance with local Whanau Ora Collective.</td>
<td>• Plans for Interagency Child and Youth Strategic Alliance.</td>
<td>• Plans for Interagency Child and Youth Strategic Alliance.</td>
</tr>
<tr>
<td>• Tipu Ora Integrated Contract – Ministry of Health, Ministry of Social Development, Lakes DHB.</td>
<td>• Collaboration Bay of Plenty (COBOP):</td>
<td>• Collaboration Bay of Plenty (COBOP):</td>
</tr>
<tr>
<td>• Children’s Team.</td>
<td>This is a network of senior managers from local and central Government agencies serving the Bay of Plenty – BOPDHB participates in this.</td>
<td>This is a network of senior managers from local and central Government agencies serving the Bay of Plenty – BOPDHB participates in this.</td>
</tr>
</tbody>
</table>
REFERENCES


5. The NZ Child and Youth Epidemiology Service. The Health Status of Children and Young People in the Midland Region. Dunedin: University of Otago; 2011.


