National Health Committee
Hunga Kaititiro i te Hauora o te Tangata

Technology Note

Ventilation tubes: an opportunity for better targeting

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Introduction

This paper provides an overview of the evidence on the safety, effectiveness, and cost-effectiveness of ventilation tubes for the treatment of otitis media. It also benchmarks current NZ practice and derives estimated potential savings from better targeting of the procedure.

Ventilation tubes (grommets or tympanostomy tubes) are small plastic tubes inserted in the eardrum to allow air-flow to equalise pressure on both sides of the eardrum. Trapped fluid can also flow out of the middle ear. The device is intended to treat hearing loss and reduce the risk of ear infections.

Ventilation tubes are most often discussed for the treatment of otitis media with effusion (OME). OME or 'glue ear' is a condition where there is thick or sticky fluid behind the eardrum in the middle ear, but there is no ear infection [1]. OME at some stage in childhood is normal [2] and natural resolution is the most likely outcome [3]. However, for some children OME can be persistent and disabling, so the clinical dilemma becomes how to identify such children and how best to treat them. Ventilation tubes are also used for the treatment of acute otitis media (AOM). AOM is an ear infection involving inflammation of the space behind the eardrum [4].

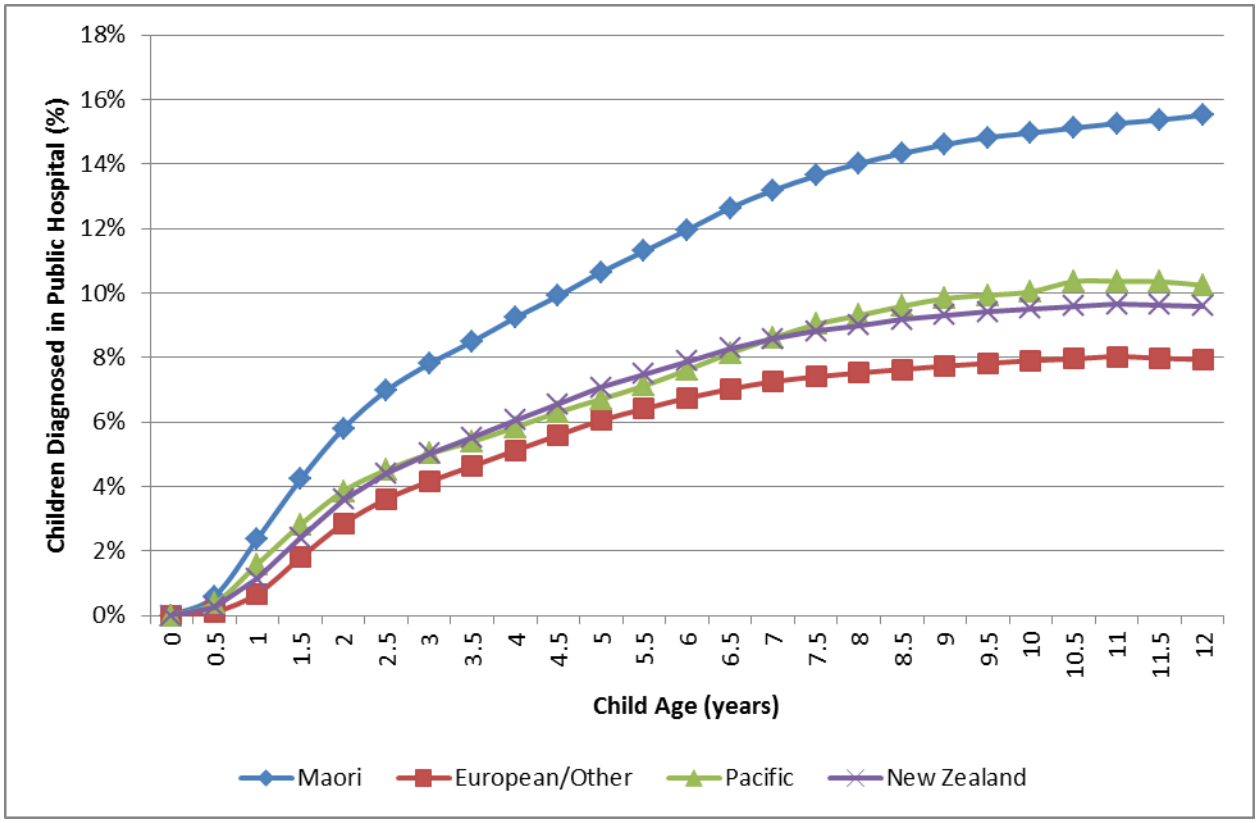
Prevalence and incidence of otitis media

Up to 90% of children are estimated to suffer at least one episode of OME before they reach school age [5]. A more conservative estimate notes prevalence of OME is bimodal with the first and largest peak of 20% at two years of age and a second peak of approximately 16% at around five years of age [6]. A recent retrospective analysis of 3885 children enrolled at 63

general practices in New Zealand found AOM in 27% of under-fives each year, but found no difference in incidence between Maori, Pacific and other ethnicities [7].

The NHC's analysis of public hospitalisations for otitis media shows a cumulative prevalence of 9.6% by age 12. The prevalence among Maori is significantly higher than for other children (cumulative prevalence of 15.6%) (Figure 1). Hospitalisation data is likely to capture only the more severe cases of otitis media and undercount populations with poor access to healthcare. A primary care based study of 1001 two year old Pacific children living in New Zealand found a prevalence of 25.4% for OME, 1.9% for AOM, and 26.9% for OME or AOM. [8].

Figure 1: Cumulative prevalence of public hospital discharges for otitis media in children up to 12 years of age, 2000-2011.



Source: NHC analysis of National Minimum Dataset (NMDS). Public hospital discharges count any diagnosis in hospital with otitis media not purely surgical treatment.

A retrospective analysis of 2901 general practice consultations for otitis media between July 1993 and June 1994 found AOM was the most common diagnosis (84.1% of cases) while OME comprised 10.4% of cases and recurrent AOM 5.4% [9]. A New Zealand non-randomised observational study of 112 children referred for ventilation tubes found 74% were referred with OME and 19.5% were referred with recurrent AOM [10]. As the study was non-randomised and relatively small, substantive conclusions cannot be drawn. However, taken alongside one another, the above studies suggest that while AOM may result in more primary care presentations, OME appears to be the main driver of demand for ventilation tubes. This

conclusion is contrary to clinical advice that suggests AOM is the primary driver of demand for ventilation tubes, suggesting further research is required to address this empirical question.

Safety

The insertion of ventilation tubes is a routine surgical operation. Post-operative otorrhoea (discharge) is the most common complication with a reported incidence ranging from 10% to 50% [11]. Ventilation tubes are associated with higher rates of tympanosclerosis, calcification of tissues in the middle ear. A 2012 randomised control trial of 376 children with bilateral OME reported tympanosclerosis incidence of 27% in ventilation tube ears versus 0% in un-operated ears [12]. The criterion for randomisation was OME in both ears with a hearing impairment of at least 20 decibels in both ears for three months. Randomisation had three arms: no surgery, tubes in both ears, and tubes in both ears with adenoidectomy (Surgical removal of the adenoids). The study's findings are consistent with those of an earlier meta-analysis [13]. A 2007 review of complications associated with ventilation tubes, found that while complications were common, in most cases they are of minor importance and resolve with conservative management [14]. The review found that despite the frequent occurrence of tympanosclerosis its effect in hearing is not significant as it does not usually exceed 0.5 decibels.

A 2001 non-randomised prospective observational study, set in South Auckland, of 112 children found one in four children developed a post-operative complication from ventilation tubes (otorrhoea or non-functioning ventilation tube) [10]. The study found Maori and Pacific Islanders were significantly more likely than other ethnicities to have a non-functioning tube (blocked or extruded) in the early post-operative period. The authors suggest this latter result may be a consequence of greater case complexity.

Effectiveness

Ventilation tube's for otitis media with effusion (OME)

A 2010 Cochrane review found ventilation tubes offer a short-term hearing improvement in children with OME who have no other serious medical problems or disabilities [3]. The magnitude of benefit is modest and diminishes after six months. The result was derived from a meta-analysis of three high quality randomised controlled trials (n=523). Hearing benefit is greatest at three months, being in the region of 12 decibels, but this drops at six to nine months to only four decibels [3]. This latter figure is within the test/retest error for audiometry in an individual child [3]. The review notes the reduction in benefit is consistent with natural resolution of OME.

A major concern with persistent OME is its potential detrimental effect on a child's development. The Dunedin Multidisciplinary Health and Development Study, a longitudinal study of about 1000 children, found (after adjustment for socioeconomic status) OME history in childhood positively associated with parent-reported inattention at 11, 13, and 15 years; with lower IQ associated with OME remaining significant to 13 [15]. Deficit in reading ability was observed until the age of 18. The negative behavioural and educational effects however, appear to have diminished by 18. The study in part defines the severity of OME in children by the presence of ventilation tubes, but does not draw conclusions about the effectiveness of ventilation tubes in mitigating behavioural and learning problems. The aforementioned Cochrane review found no study of grommets in children with established speech, language, learning or developmental problems so did not drawn conclusions regarding treatment of such children.

Ventilation tube's for acute otitis media (AOM)

Recurrent AOM, where ventilation tube insertion may be considered, occurs in only a small proportion of cases. It is defined as either three or more acute infections of the middle ear cleft in a six-month period or at least four episodes in a year [4].

A 2011 Cochrane review found that ventilation tubes may reduce the number of episodes of AOM in the first six months after surgery for children three years and under [4]. Further research is required to investigate the effect beyond six months. Additionally more children treated with ventilation tubes are rendered symptom-free in the six months after surgery compared to controls. However, the reviewers found only two studies, involving 148 children, suitable for analysis and accordingly noted the need for further high-quality research in order to be confident of their conclusions. A systematic review in response to this work challenged the results, finding only 'very limited' evidence of the effectiveness of ventilation tubes for AOM [16]. The authors' search criteria identified the same five randomized studies as the Cochrane review, but instead of excluding trials, it used information from all five trials because, unlike the Cochrane reviewers the authors found no critical difference in the quality of the studies.

Primary care treatment of AOM

A 2002 survey of New Zealand General Practitioners (GPs) [909 replies = 45% response rate] found considerable variation in the management of AOM, leading the authors to call for national guidelines [17]. Approximately half the GPs considered 5-6 episodes of AOM in a year as an appropriate threshold for referral for ventilation tubes [17]. Four percent of GPs did not consider recurrent AOM an appropriate indication for ventilation tubes [17]. Ninety-five percent of GPs reported usually or always using antibiotics for treatment [17]. The vast majority of AOM episodes are triggered by an upper respiratory tract infection, usually of viral origin [18]. A 2010 Cochrane review of antibiotics for reducing the pain of AOM in children found that antibiotics are

not very useful for most children with AOM [19]. In accordance with accepted best practice the use of antibiotics for the treatment of AOM has significantly declined over the past decade in New Zealand. A 2012 study of 3885 children enrolled at 63 general practices found 51% of children with AOM were treated with antibiotics [7].

Ventilation tubes and adjuvant adenoidectomy

Adenoidectomy (surgical removal of the adenoids) may be performed alongside ventilation tube insertion for the treatment of OME and AOM. A 2010 Cochrane review found a small but statistically significant benefit of adenoidectomy for the resolution of middle ear effusion in children with OME [20]. The review found insufficient evidence for the effectiveness of the procedure for AOM. Advice from the National Institute for Health and Clinical Excellence (NICE), developed prior to the Cochrane review, noted a lack of robust scientific evidence for the use of adjuvant adenoidectomy. Accordingly, NICE recommends against adjuvant adenoidectomy in the absence of persistent and/or frequent upper respiratory tract symptoms [21].

Ventilation tubes for cleft palate

A systematic review of ventilation tubes for children with cleft palate found insufficient evidence on which to base the clinical practice of early routine use of ventilation tubes in the treatment of this condition [22].

Cost-effectiveness of ventilation tubes

In 2008 the Swedish Council on Technology Assessment in Health Care published a systematic review of ventilation tubes for otitis media in children. They found insufficient scientific evidence to determine whether or not ventilation tubes were cost-effective for AOM or OME [23]. The National Health Service (NHS) HealthCare Improvement Scotland assessment was similarly cautious. They found 'limited preliminary evidence' that ventilation tubes without adenoidectomy may be cost-effective compared to doing nothing after three months of watchful waiting [24]. No New Zealand cost effectiveness studies have been identified.

Alternative treatments for OME

Currently there is no proven medical management for OME [3]. The most common treatments include decongestants, mucolytics, steroids, antihistamines and antibiotics [2]. The effectiveness of these treatments has not been established [2, 3]. The temporary use of hearing aids for children with OME, common in the UK, has been postulated as a viable alternative to surgical intervention but needs to be trialled [3].

Another alternative is the use of auto-inflation - a technique whereby the eustachian tube, the tube that connects the middle ear and the back of the nose, is reopened by raising pressure in the nose [25]. The technique is achieved by forced exhalation with closed mouth and nose, blowing up a balloon through each nostril or using an anaesthetic mask [25]. The aim is to ventilate the middle ear, via the eustachian tube, equalising the pressures and allowing better drainage of the fluid [25]. A 2006 Cochrane review of the technique found limited evidence for its effectiveness but concluded its low cost and absence of adverse effects warranted its consideration whilst awaiting natural resolution of OME [25]. A later Cochrane review found the evidence for auto-inflation to be equivocal [3]. In the UK, recruitment is currently underway for a randomised controlled trial of an auto-inflation device, essentially a balloon, called Otovent®).[1]

Guidelines for the treatment of otitis media

A recent (non-peer reviewed) study in New Zealand Doctor confirms the NHC's finding that New Zealand has no national guideline regarding otitis media treatment [26]. Three guidelines for the treatment of otitis media are summarised as follows:

The Paediatric Society of New Zealand and Starship Foundation give brief general guidance on the use of ventilation tubes [27]. They note ventilation tubes may be recommended for glue ear that will not clear up or for frequent episodes of acute middle ear infections, including where a child has any one of the following:

- middle ear fluid (glue ear) for more than three months, depending on the degree of hearing loss
- six acute ear infections in one year, especially if the infections have occurred in both ears
- repeat infections through the summer months, when such infections should be less likely to occur
- previous complications because of ear infections

NICE guidance is that children with persistent bilateral OME, documented over a period of 3 months with a hearing level in the better ear of 25–30 dBHL or worse averaged at 0.5, 1, 2 and 4 kHz (or equivalent dBA where dBHL not available), should be considered for ventilation tube insertion [21]. NICE also advises against adjuvant adenoidectomy in the absence of persistent and/or frequent upper respiratory tract symptoms. More specific advice is given for children with Down's syndrome and cleft palate.

[1] http://www.nhs.uk/Conditions/Glue-ear/Pages/clinical-trial-details.aspx?TrialId=ISRCTN55208702&Condition=Glue%20ear&pn=1&Rec=0&CT=0

NICE advises against the following treatments for OME:

- antibiotics
- topical or systemic antihistamines
- topical or systemic decongestants
- topical or systemic steroids
- homeopathy
- cranial osteopathy
- acupuncture
- dietary modification, including probiotics
- immunostimulants
- massage.

In 2004, the joint committee of the American Academy of Family Practitioners, American Academy Otolaryngology-Head and Neck Surgery and the American Academy of Paediatrics, published a clinical practice guideline on the screening, diagnosis, and management of Otitis Media with Effusion [28]. The clinical guideline made a number of recommendations about clinical best practice and has been widely accepted internationally. Among the recommendations were the following:

- Clinicians should document the laterality, duration of effusion, and presence and severity of associated symptoms at each assessment of the child with OME.
- Clinicians should distinguish the child with OME who is at risk for speech, language, or learning problems from other children with OME, and should evaluate hearing speech, language and need for intervention more promptly.
- Clinicians should manage the child with OME who is not at risk with watchful waiting for 3 months from the date of effusion onset (if this is known) or diagnosis (if onset is unknown).
- Hearing testing is recommended when OME persists for 3 months or longer or at any time that language delay, learning problems or a significant hearing loss is suspected in a child with OME; language testing should be conducted for children with hearing loss.
- Children with persistent OME who are not at risk should be re-examined at 3-6 month intervals until the effusion is no longer present, significant hearing loss is identified, or structural abnormalities of the eardrum or middle ear are suspected.
- When children with OME are referred by the primary care clinician for evaluation by an otolaryngologist, audiologist, or speech-language pathologist, the referring clinician should document the effusion duration and specific reason for referral (evaluation, surgery), and

provide additional relevant information such as history of AOM and developmental status of the child.

- When a child becomes a surgical candidate, tympanostomy tube insertion is the preferred initial procedure; adenoidectomy should not be performed unless a distinct indication exists (nasal obstruction, chronic adenoiditis). Repeat surgery consists of adenoidectomy plus myringotomy, with or without tube insertion. Tonsillectomy alone or myringotomy alone should not be used to treat OME.

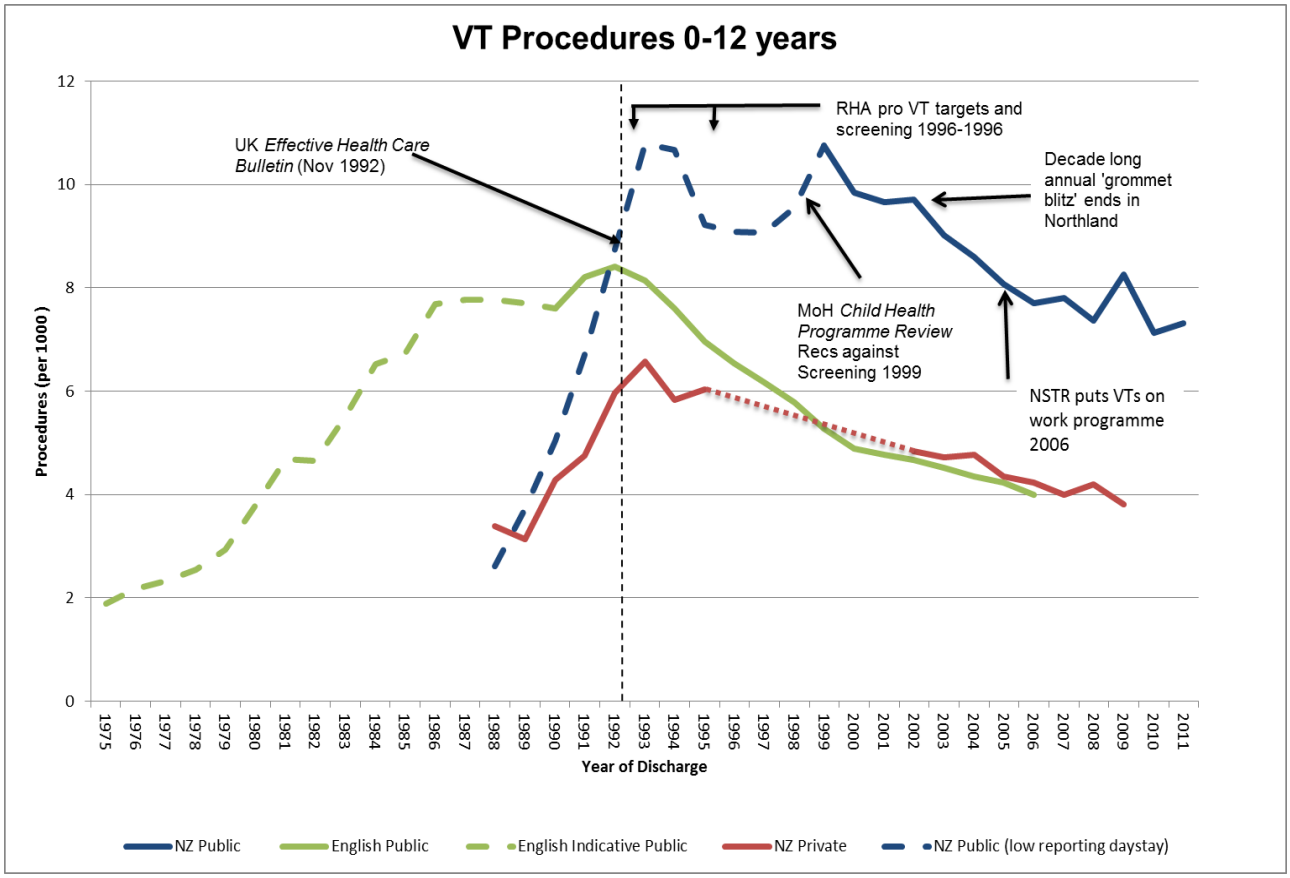
A historical perspective

The first ventilation tube was introduced by Beverley Armstrong in 1954 [29]. By the 1970s ventilation tubes were a widespread intervention for children [30, 31]. The rate of surgery for children suffering from OME, including ventilation tubes insertion, increased considerably in industrialized countries during the 1970s and 1980s. During the 1980s the appropriateness of surgery for OME was increasingly questioned in light of the results from both observational studies and randomised controlled trials [31]. Despite this, surgical rates in England continued to grow before declining in the 1990s.

The following time series maps the English public sector ventilation tube intervention rate against the New Zealand public and (separately) private intervention rates (Figure 2). Relative to England the time series shows persistently high (though declining) intervention rates in New Zealand over the past 20 years. Reliable data for New Zealand's public intervention rate could only be sourced back to 2000. The estimates prior to this period are likely to undercount the intervention rate as there was variable reporting of day-stay operations. New Zealand's private sector data is incomplete and undercounts the intervention rate, particularly post 2004, as many private providers are not reporting volumes to the Ministry of Health.[2] Accordingly the apparent decline in private sector provision over the past decade may simply be illustrative of decreasing reporting rates. The English rate prior to 1990 is an estimate based on ventilation tube insertion rates in the East Anglian and Oxford regions [32]. It is included purely to show growth in the technology's use over time.

[2] The private sector is not obliged to report surgical intervention volumes to the Ministry of Health. Reported data is for privately funded patients.

Figure 2: New Zealand and English VT procedure rates over-time



Source: NHC Executive analysis of National Minimum Dataset (NMDS). English rates prior to 1990 are estimated based on ventilation tube insertion rates in the East Anglian and Oxford regions [31, 32]. The data for intervention rates prior to 1990 was for children aged 0-9; accordingly, indicative English rates have been estimated for the 0-12 population. Post 1990 the English intervention rate is a three-year moving average sourced from NICE analysis [33].

An interesting feature of the graph is the rapid decline in English intervention rates post 1992. The decline has been partly attributed to the release of national guidance on surgery for children suffering from OME in the *Effective HealthCare Bulletin* which advocated the appropriate use of investigations and watchful waiting [31].[3] The experience in New Zealand appears divergent. In December 1993 a consensus conference of clinicians and officials was held by the Ministry of Health and Regional Health Authorities (RHA) to determine the most appropriate way to reduce waiting times for specialist assessment and treatment for children with persistent OME. The resulting report made 17 recommendations including that RHAs establish agreed guidelines for the insertion of ventilation tubes [34]. The report did not make specific recommendations about the desired level of ventilation tube operations. However, it highlighted 'local success stories' including the 'ventilation tube blitzes' undertaken in Northland where two theatres were dedicated for a day of intensive ventilation tube surgery. The report noted persistent hearing loss

[3] Other contributing factors noted included pre-existing professional concern about the value of surgery, the introduction of an internal market into the NHS, and growing apprehension among parents fuelled by scepticism in the mass media.

associated with OME can seriously affect children's development and learning and recommended OME screening.

Targets were set for RHAs to increase ventilation tube operations in the financial year 1993/94 [35]. The performance target persisted through 1995/96 with RHAs receiving clear guidance through the *Policy Guidelines for Regional Health Authorities1995/96* to reduce waiting times for specialist assessment and treatment of OME [36, 37]. During this time RHAs focused on increasing screening for OME alongside increased ventilation tube operations [35]. Increased OME screening in Hutt Valley exceeded its capacity to treat [36, 38]. In response, Central Region RHA proposed funding an additional 80 ventilation tube operations for Capital Coast Health.

By the late 1990s the tide appeared to have turned to a more evidence-based approach. The Ministry of Health's *Child Health Programme Review* found insufficient evidence to demonstrate a causal link between glue ear and significant disability, and accordingly recommended against screening for the disease [39]. Funding was nevertheless increased by $2.25 million in 1999 to further reduce surgical waiting lists for paediatrics with a significant portion going to Ear Nose and Throat services including ventilation tube operations [40].

Further evidence of a shift away from ventilation tube promotion came in 2003 when the Northern Advocate reported funding for Northland's 'ventilation tube blitzes' ceasing as the region already had the highest rate of ventilation tube insertion in the country [41]. In 2006 the National Service & Technology Review Advisory Committee [NSTR] put ventilation tubes on its work programme as a potential area for disinvestment, but was unable to form an opinion before disestablishment in 2010.

Potential for Savings

The NHC Executive benchmarked current DHB ventilation tube insertion rates for children aged 0-12 years. Crude and standardised (by age, gender, deprivation and ethnicity) rates are presented in Figure 3 below. Standardisation controls for potential variation in need associated with age, gender, deprivation and ethnicity.

There is wide variation in practice, with Otago DHB (now amalgamated with Southland to form Southern DHB) having a standardised intervention rate of 15.2 ventilation tubes per 1000 children - nearly four and a half times Hawkes Bay DHB's standardised rate of 3.5 per 1000 children (Figure 3). A similar picture has emerged from an updated analysis conducted for the NHC by the National Health Board (Figure 4). The discharge ratios have been standardised by age, gender, deprivation and ethnicity. A standardised discharge ratio (SDR) of one is equal to the national average. Ninety-nine percent confidence intervals have been plotted to compare

regional SDR's to the national discharge rate. Regions with confidence intervals which do not cross 1 have statistically significant different SDR's to the national rate. The relative ranking of DHBs clustered around the NZ average rate will change from year to year. The notable feature, however, is the validation of the outliers: with large and statistically significant intervention rates in Southland, Otago and South Canterbury, and low intervention rates in Hawkes Bay and Whanganui DHBs. Significant regional variation in intervention rates also exist in England [21]. A review of randomised control data indicated large international differences in surgical intervention for otitis media, varying 10-fold for ventilation tubes [42]. This is consistent with earlier reports on other surgical procedures [43].

Potential savings in the range of $1.0-$4.4 million have been estimated assuming DHBs above the New Zealand national public average reduce provision to the average (6.9 per 1000 children aged 0-12) or the English public average (4.0 per 1000 children aged 0-12) (Figure 5, Table 1). If New Zealand had a similar intervention rate as England between 2002 and 2011, the savings (nominal dollars) would have summed to $58 million.

The English average is seen to be broadly in line with NICE guidance [44]. The English benchmark is purely indicative, where differences between the two health systems may affect the quality and comparability of the data. There may also be a significant differential in underlying need for ventilation tubes between England and New Zealand (driven by a different prevalence of AOM and OME).

High prevalence of otitis media in Maori may explain a small fraction of the difference, but it is unlikely to be a significant factor.[4] Research by the University of Otago on *The Health Status of Children and Young People* has found, for example, relatively low rates of acute hospital admissions in Otago for otitis media (rate ratio = 0.82) but relatively high grommet intervention rates (rate ratio = 1.42) [45]. Hospital admission rates are however, unlikely to be a fair reflection of underlying regional need, as they may not capture individuals with inhibited access to health service and referral practice may vary from region to region. We know that OME presentations closely track upper respiratory infection in the UK but do not know the comparative prevalence of common cold and flu in each country [46]. In the UK for children under five, one child with otitis media presents to a general practitioner for every two with a common cold [46].

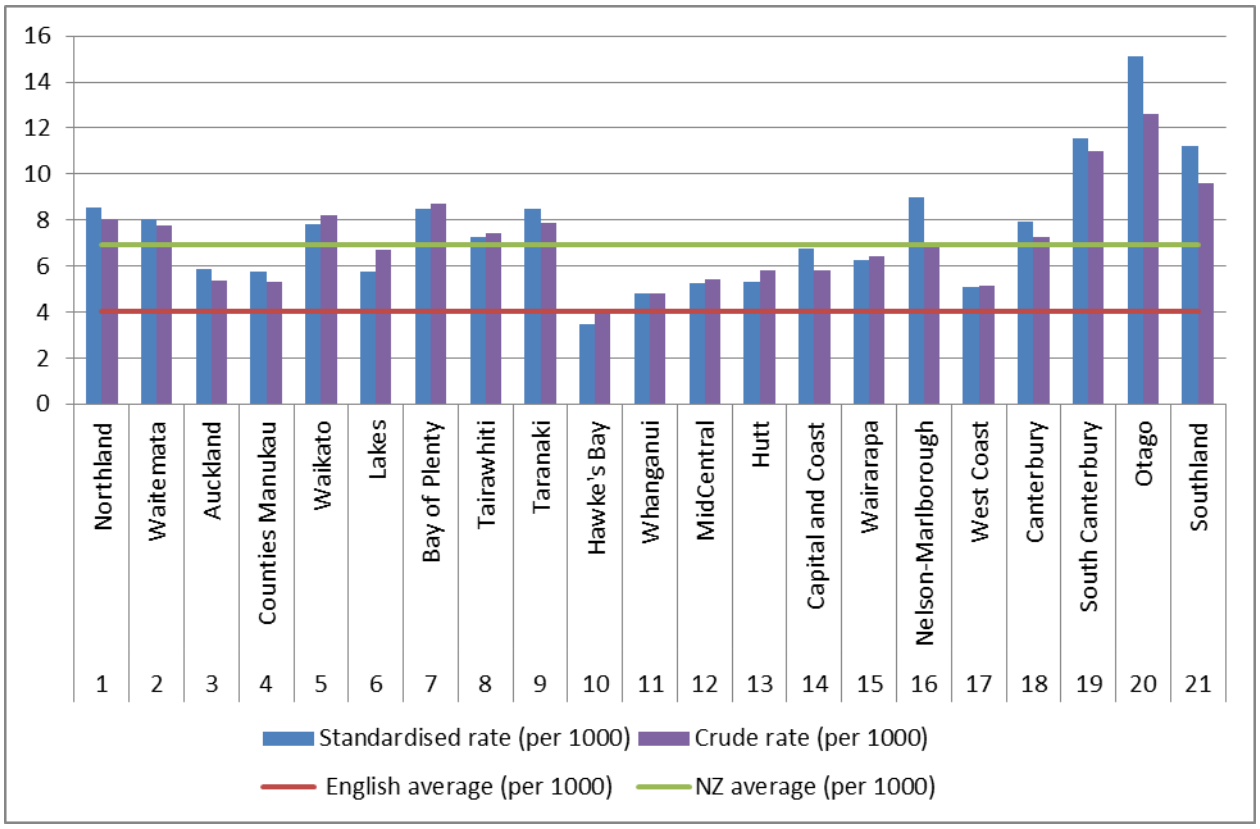
Nevertheless, the magnitude of difference (72.5%) between the English and New Zealand averages suggests that New Zealand's average intervention rate may be too high. Evidence from Norway suggests that taking an evidence-based approach can significantly reduce intervention

[4] The Maori population is too small, and prevalence does not appear great enough (Figure 1) to explain a significant portion of the difference. Furthermore, across most DHBs intervention rates remain relatively stable when ethnicity is standardised (Figure 3).

rates [47]. In the Norwegian East health region a consensus agreement was reached in 1992 that stated children would only receive ventilation tubes for OME if the condition did not naturally resolve in 3-6 months. Consequently, the rate of intervention is now 2 per 1000 children aged 0-16. The consensus process has been credited for the low intervention rate, where other regions in Norway have intervention rates ranging from 4.8 to 5.8 per 1000 children.

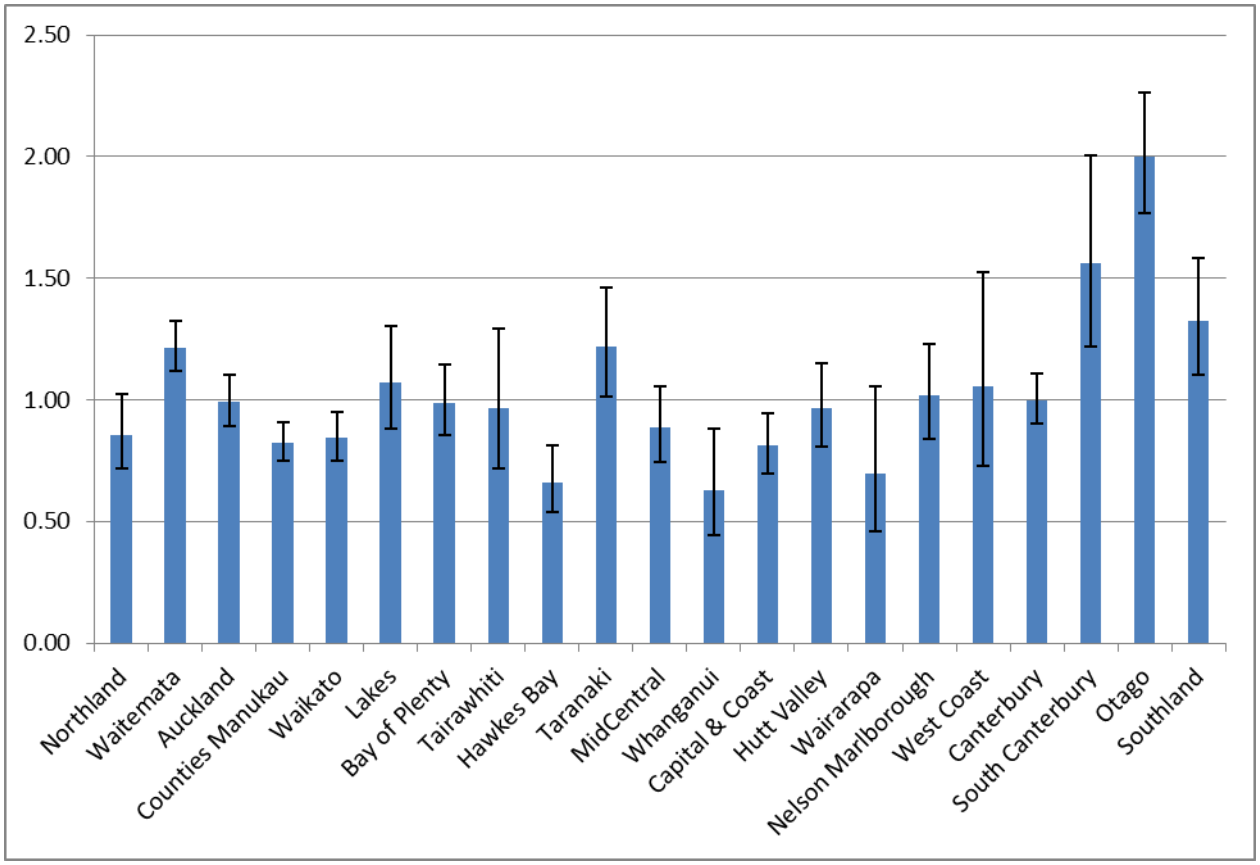
In determining the intervention rate for ventilation tubes, the NHC analysis below counts hospital admissions where a myringotomy with bi-lateral or uni-lateral tube insertion was performed as one procedure (as opposed to two), while counting re-admissions in the same year for the same procedure (rare), as a separate procedure. Overall, this method of counting is likely to underestimate the number of procedures.

Figure 3: Variation in Ventilation tube insertion rates by District Health Board in 2010/11



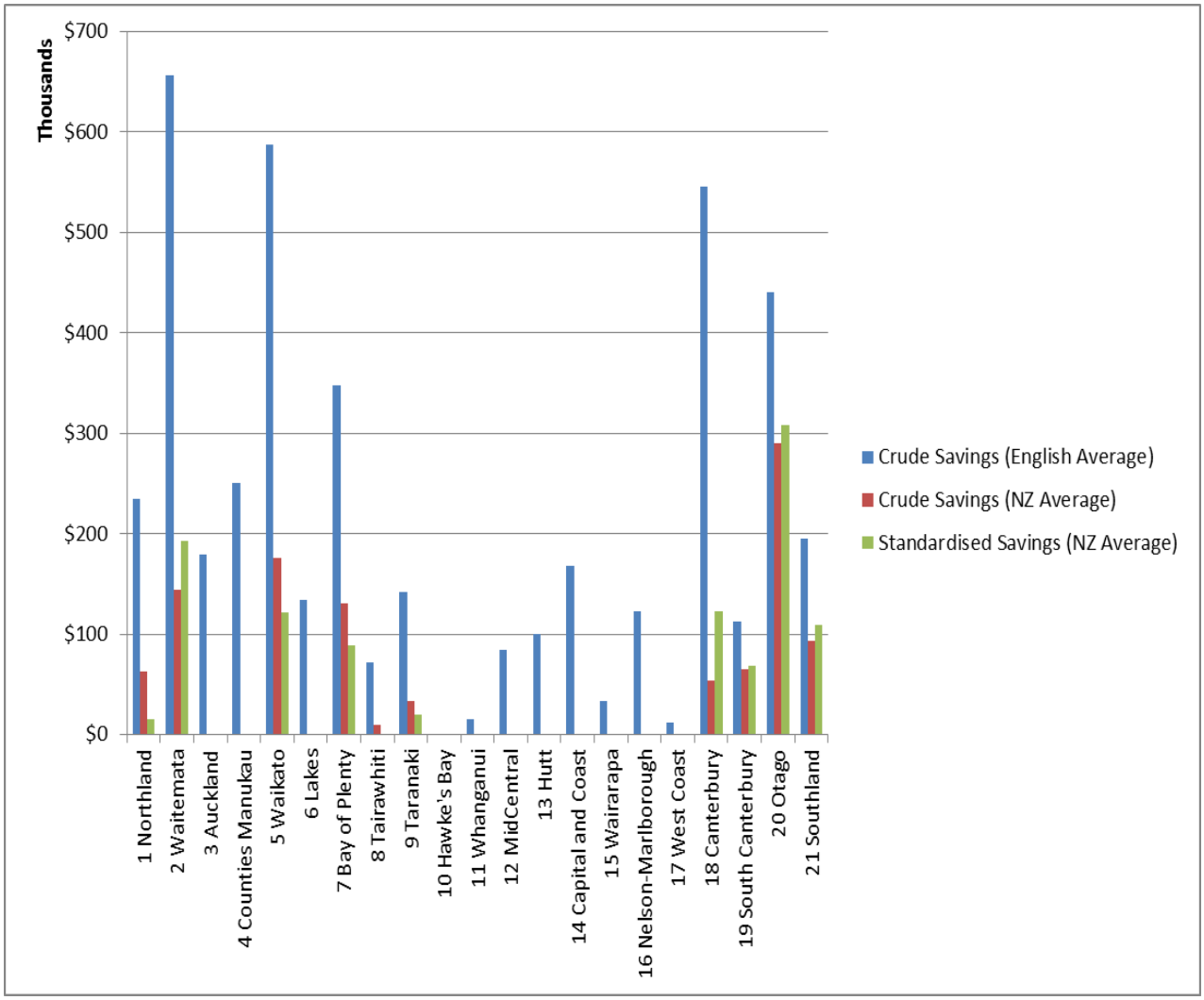
Source: NHC Executive analysis of National Minimum Dataset (NMDS)

Figure 4: Standardised Discharge Ratio for Ventilation tube procedures by District Health Board in 2011/12



Source: NHB analysis of National Minimum Dataset (NMDS)

Figure 5: Potential savings from reducing Ventilation tube insertion rates to the average intervention rate for New Zealand or the United Kingdom (based on 2010/11 data)



Source: NHC Executive analysis of National Minimum Dataset (NMDS)

Table 1: Potential savings from reducing Ventilation tube insertion rates to the average intervention rate for NZ or England

DHB Name	Ventilation tube Procedures 2010/11 (0-12 years)	Expenditure	Population (0-12 years)	Crude Intervention Rate (per 1000)	Standardised* Intervention Rate (per 1000)	Estimated savings if bring crude rate down to at least the English level (4/1000)	Estimated savings if bring crude rate down to at least NZ level (6.95/1000)	Estimated savings if bring standardised rate down to at least NZ level (6.95/1000)
Northland	259	$ 468,078	32,282	8.0	8.6	$ 234,711	$ 62,736	$ 15,135
Waitemata	776	$ 1,351,694	99,764	7.8	8.0	$ 656,589	$ 144,344	$ 193,133
Auckland	416	$ 695,135	77,187	5.4	5.8	$ 179,218	$ -	$ -
Counties Manukau	599	$ 1,027,267	113,227	5.3	5.8	$ 250,543	$ -	$ -
Waikato	587	$ 1,144,975	71,483	8.2	7.8	$ 587,249	$ 176,243	$ 121,867
Lakes	145	$ 333,783	21,657	6.7	5.8	$ 134,370	$ -	$ -
Bay of Plenty	351	$ 641,025	40,206	8.7	8.5	$ 347,315	$ 130,871	$ 89,050
Tairawhiti	76	$ 155,133	10,225	7.4	7.2	$ 71,647	$ 10,123	$ -
Taranaki	164	$ 289,158	20,865	7.9	8.5	$ 142,005	$ 33,563	$ 19,999
Hawke's Bay	123	$ 225,495	30,718	4.0	3.5	$ 235	$ -	$ -
Whanganui	56	$ 94,212	11,715	4.8	4.8	$ 15,377	$ -	$ -
MidCentral	164	$ 320,719	30,237	5.4	5.3	$ 84,193	$ -	$ -
Hutt	160	$ 321,859	27,553	5.8	5.3	$ 100,154	$ -	$ -

Capital and Coast	288	$ 536,078	49,388	5.8	6.8	$ 168,358	$ -	$ -
Wairarapa	47	$ 88,620	7,317	6.4	6.3	$ 33,434	$ -	$ -
Nelson-Marlborough	155	$ 297,397	22,826	6.8	9.0	$ 122,213	$ -	$ 605
West Coast	28	$ 52,015	5,457	5.1	5.1	$ 11,466	$ -	$ -
Canterbury	620	$ 1,212,074	85,277	7.3	7.9	$ 545,222	$ 53,798	$ 122,530
South Canterbury	96	$ 177,302	8,725	11.0	11.5	$ 112,845	$ 65,345	$ 68,108
Otago	352	$ 644,719	27,893	12.6	15.1	$ 440,365	$ 289,770	$ 308,497
Southland	196	$ 333,732	20,365	9.6	11.2	$ 195,029	$ 92,814	$ 108,713
National	5,658	$ 10,410,470	814,367	6.9	6.9	$ 4,416,873	$ 1,059,607	$ 1,047,637

Source: NHC Executive analysis of National Minimum Dataset (NMDS). Assumes a public price for VT procedures in 2011 of $1,940.57

* Standardised by NZ age, NZDep, Gender and Ethnic distribution

Conclusion

There exists large and unexplained variation in intervention rates for ventilation tubes across DHBs. Further work is required to understand this variation. In particular available Ministry of Health data is too unreliable to account for variation in privately funded intervention rates. It is expected that the inclusion of reliable private data would boost the relative (total) intervention rates in the major centres. Intervention rates for ventilation tubes are however, only a process measure (not an outcome measure) along the pathway of care for children with otitis media. Currently no standard pathway of care exists across DHBs for the treatment of otitis media. It is expected that an agreed pathway of care, spanning primary and secondary care, would lead to improved health outcomes for children, more equitable access to services across DHBs, and potentially significant savings.

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National Health Committee (NHC) and Executive

The National Health Committee (NHC) is an independent statutory body which provides advice to the New Zealand Minister of Health. It was reformed in 2011 to establish evaluation systems that would provide the New Zealand people and health sector with greater value for the money invested in health. The NHC Executive are the secretariat that supports the Committee. The NHC Executive's primary objective is to provide the Committee with sufficient information for them to prioritise interventions and make investment and disinvestment decisions. They do this through a variety of products including Prioritising Summaries, Technology Notes, EpiNotes, CostNotes, Rapid Reviews, and Health Technology Assessments which are chosen according to the nature of the decision required and time-frame within which decisions need to be made.

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