Improving school readiness with the Before School Check: early experience in Hawke’s Bay

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Abstract

Aim The New Zealand Ministry of Health’s Before-School Check (B4SC) aims to identify those 4-year-old children with health, developmental or behavioural problems likely to impact on their education so these can be remediated before school entry. This evaluation aims to demonstrate the outcomes of the first 10 months of the B4SC programme in Hawke’s Bay and the lessons learnt.

Methods The B4SC was implemented in Hawke’s Bay using an intersectoral, collaborative approach including all major stakeholders, led by the Hawke’s Bay Primary Health Organisation (HBPHO). Local clinical practice and referral processes were established by a Clinical Advisory Group. Eighty-four practice nurses, Well Child/Tamariki Ora nurses and independent practitioners have been trained in group and individual settings. All referrals come through a clinical nurse leader to an intersectoral triage group.

Results In the 10 months since the first training the nurses have assessed 1848 out of 2180 or 84% of the cohort, including 75% of children in quintile 5. Referrals average 55% and have been of high quality with 74% accepted, 14% already known, and only 8% declined at triage.

Conclusion The intersectoral Clinical Advisory Group has been critical to the success of the programme, as it has achieved engagement and commitment from all stakeholders to the clinical processes and referral pathways. Training nurses with existing community health skills, relationships with families and strong community networks has led to high rates of children seen from the most deprived quintile. The training and the referral pathway, via the Clinical Nurse Leader to an intersectoral triage group, have led to high quality referrals and a low rate of referrals declined.

School readiness is a complex construct including cognitive, social and emotional skills, a family’s willingness and ability to support a child’s pre-school education and a school’s readiness for the children. There are wide ethnic and socioeconomic gaps in achievement apparent at school entry in the US, Canada, Australia and New Zealand. These differences matter because they predict later achievement. Interventions in later childhood or adulthood produce mixed results and are labour and resource intensive. In contrast, there is a growing evidence base of effective interventions for younger children with developmental and behavioural difficulties, including in New Zealand. The Minister of Health launched the Before-School Check (B4SC) in February 2008. Its purpose is to “identify and address any health, behavioural, social, or...
developmental concerns which could affect a child's ability to get the most benefit from school…". 19

The B4SC includes a child health questionnaire, 20 vision and hearing screening (sweep audiometry, tympanometry and distance visual acuity), height and weight, assessment of behaviour with the Strengths and Difficulties Questionnaire 21 (SDQ) and development with the Parent Evaluation of Developmental Status 22 (PEDS), oral health screen, health promotion and education and referrals as indicated. 23 In Hawke’s Bay the Ages and Stages Questionnaire 24 is used as a second-stage screen for development if there is one significant concern on the PEDS or parental communication difficulties. On time immunisation is promoted and opportunistic immunisations provided where indicated.

The B4SC was piloted in Counties Manukau and Whanganui District Health Boards between August and November 2007 and then evaluated. 25 Parents reported high levels of confidence and satisfaction in the programme and said they would recommend it to others. A number of recommendations were made, which were noted in the design of the B4SC programme in Hawke’s Bay.

The Hawke’s Bay District Health Board (HBDHB) services a largely rural population on the East Coast of New Zealand. In 2006 there were 34,101 children and 18,210 young people residing in the region 26 and there are approximately 2,200 deliveries a year. The preschool population of Hawke’s Bay is more deprived than that of New Zealand (NZ), with 56% of babies born in NZ Deprivation Index deciles (NZDep) 8–10 in 2006, compared to 39% in NZ. In 2006, the proportion of young people 15 years and over with little or no formal attainment on leaving school was 40% compared with a national average of 31%. 27

Methods

The Hawke’s Bay District Health Board (HBDHB) used a formal tender process to choose a provider for the B4SC. The tender was won by the Hawke’s Bay Primary Health Organisation (HBPHO), whose proposal emphasized collaboration between providers, registered nurses with well child experience and maximising the potential of established relationships with families.

In December a Clinical Advisory Group (CAG) was formed, chaired by a Clinical Director of Paediatrics at HBDHB. The CAG meets quarterly and includes clinical leaders or managers from HBPHO; HBDHB Paediatrics, Child Development Unit (CDU), Child, Adolescent and Family Service (CAFS), Oral Health Service, Planning, Funding and Performance and Healthy Populations Team; non-governmental (NGO) social services; Eastern Institute of Technology (EIT) educationalists and Ministry of Education Regional Office and Group Special Education (MOE:SE). The decision was taken to defer implementation until the CAG was satisfied that all the necessary systems and processes were in place. Ten workstreams were formed reporting to the CAG to recommend processes suitable to the local environment. These were agreed to by the CAG in January 2009.

All referrals come through the B4SC Clinical Nurse Leader to a triage group of senior clinicians from Paediatrics, CDU, CAFS, NGO social services and MOE:SE. This group meets fortnightly and agrees which service referrals will be sent to or whether further information is required. As MOE:SE and CAFS have long waiting lists, referrals for behaviour are sent to NGOs for support until appointments at the secondary services are available.

A 3-day workforce development programme was designed and delivered by an intersectoral group including paediatrician, nurses, public health, Plunket and education academics. The training was based on a train-the-trainer programme designed by Plunket and modified for use in Hawke’s Bay. Content included the epidemiology of preschool childhood illness, long-term consequences of the conditions screened for in the B4SC, introduction to health promotion and the Well Child/ Tamariki Ora Schedule, the content of the check, referral processes and the evaluation.
Training was promoted to all three PHOs in Hawke’s Bay. Māori and independent providers, Plunket and General Practice nurses were encouraged to attend. The first cohort of 41 nurses completed training in February and the programme began in March 2009. Of the 41, 23 were general practice nurses, 11 were Well Child/Tamariki Ora nurses and 7 were independent practitioners from Public Health, general practice and Tamariki Ora nursing backgrounds. A second group training was provided in August in response to demand. In total, 84 B4SC nurses have been trained to date.

Personal approaches were made to Kohanga Reo, kindergartens and other early childhood education services and organisations. Evening and afternoon information meetings for early childhood teachers were held. Nationally and locally-written information was distributed through mailouts. Public health nurses and vision and hearing technicians actively promoted the programme during regular visits to early childhood education centres and Kohanga Reo.

Data collection was initially on paper and has become increasingly electronic over time as resources and time allowed, e.g., using a MedTech32 advance form. The data is manually re-entered from the HBPHO database into the Ministry of Health B4SC database on the MOH website. Data was exported from the website into an Excel spreadsheet designed specifically for B4SC by HBPHO staff. Data cleaning was required on the data retrieved into the Excel spreadsheet. Analysis was performed in Excel.

Feedback on training was graded on a 5-point Likert scale from very poor to very good and narrative responses were also sought. Demographic data, volumes of checks completed, referrals and referrals declined were collected. New Zealand Deprivation Index quintile was recorded for all children from the HBPHO database.

Results

The first two trainings went over three and 2 days in February and August 2009 respectively. Each day of training was evaluated by 6-11 questions depending on content, and each question answered by 14–29 respondents. From the two nurse trainings 776 survey questions were answered, of which 673 (88%) responses were 4 or 5/5 (good or very good). Narrative responses were overwhelmingly positive and the few constructive criticisms informed the second session, e.g., shortening the programme and specific feedback to individual presenters.

Following training in February, volumes of checks rapidly increased to peak at 333 in May and have steadily fallen since (Figure 1).
A total of 1848 checks (84% of the cohort) had been completed in the 10 months between March 2009 and 7 January 2010 (Table 1). After a settling-in period, the referral rate has remained constant at around 50%.

Table 1. Children seen by quintile to 7 January 2010

<table>
<thead>
<tr>
<th>Quintile</th>
<th>Births</th>
<th>B4SC done</th>
<th>% of cohort</th>
<th>% of all checks</th>
<th>% of quintile checked</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q5/Q0</td>
<td>790</td>
<td>593</td>
<td>36%</td>
<td>32%</td>
<td>75%</td>
</tr>
<tr>
<td>Q4</td>
<td>449</td>
<td>358</td>
<td>21%</td>
<td>19%</td>
<td>80%</td>
</tr>
<tr>
<td>Q3</td>
<td>411</td>
<td>368</td>
<td>19%</td>
<td>20%</td>
<td>90%</td>
</tr>
<tr>
<td>Q2</td>
<td>269</td>
<td>241</td>
<td>12%</td>
<td>13%</td>
<td>90%</td>
</tr>
<tr>
<td>Q1</td>
<td>261</td>
<td>288</td>
<td>12%</td>
<td>16%</td>
<td>110%</td>
</tr>
<tr>
<td>Total</td>
<td>2180</td>
<td>1848</td>
<td></td>
<td></td>
<td>84%</td>
</tr>
</tbody>
</table>

Each year the number of children who receive checks may exceed the number in the MOH database because of immigration into the area and children just turned 5 whose parents request a check or who are finally found and receive a check. Children in Quintile 1 are more likely to not require a referral so checks are registered as “completed” earlier than children in other quintiles. The number of children in Quintile 1 whose checks are completed is therefore more likely to exceed the number in the database than other quintiles. No child received the B4SC more than once.

The proportion of children assessed in each quintile over time was examined in consecutive groups of 100 (Figure 2). The proportion in Quintile 5 has varied between 25–40%.
Overall, despite considerable effort to recruit children in Quintile 5, there remains a clear gradient of recruitment between Quintiles 1–5 (Figure 3).

Referrals were examined by issue (Figures 4 and 5). Dental (24% of referrals, 14% of children), hearing (21%, 12%) and vision (20%, 11%) were the most common issues requiring referral. Most dental referrals were for non-enrolment, but significant numbers of children with severe caries were identified and referred. Integration of the Oral Health Service and B4SC databases greatly reduced unnecessary referrals.

Most referrals for hearing were for glue ear. Referrals for developmental concerns (PEDS 13% of referrals, 7% of children) were greater than for behaviour (SDQ 5%, 3%). Narrative feedback from nurses and the triage group however suggests that the SDQ referrals under-represent actual numbers with behaviour concerns, because many children with behaviour concerns are identified via the PEDS.

The breakdown of referrals by type and deprivation quintile is shown in Figure 6. There was a clear gradient of increasing referrals by quintile, with children in Quintile 5 having the highest referral rate. The gradient effect was seen for all referrals.

Overall, 74% of referrals were accepted (Figure 7). Referrals were declined at triage for 8% and only 2% of parents declined referral, giving a yield of (1024×0.74)/1848=41%.
Fig 4. Referrals by issue as % of all referrals

- Dental: 21%
- Hearing: 13%
- Vision: 20%
- Immunisation: 13%
- PED: 5%
- SDQ: 3%
- Gen Health: 13%
- Growth: 1%

Fig 5. Referrals by issue as % of children referred for that issue

- Dental: 16%
- Hearing: 15%
- Vision: 10%
- Immunisation: 8%
- PED: 6%
- SDQ: 4%
- Gen Health: 2%
- Growth: 1%
Fig 6. B4SC referrals by type and quintile to 7 Jan 2010

Fig 7. Outcome of referrals 16/3/09-22/01/2010
The three NGOs receiving the majority of the B4SC referrals for social work, counselling or parenting programmes reported accelerated demand that exceeded the resources available. Some have had to reduce service to client groups who have previously received service. Even so, NGOs prioritised B4SC referrals and all reported 60–70% attendance rates upon referral.28

The impact of referrals to Ministry of Education: Special Education has meant that waiting lists for children to be seen by Special Education have increased from 2 to 3 months.29 The Child Development Unit (CDU) also reported a significant workload increase where, as a result of texting parents to remind them of appointment times and locations, they achieved 100% attendance rate to date.30 Senior staff from the non-governmental organisations, Special Education and CDU who are also members of the B4SC Triage Team reported that the preparation required for Triage plus its regular meeting times added another 6–8 hours to their respective fortnightly workloads.31

The volumes of referrals to Vision Hearing Testers (VHTs) from the B4SC have placed an additional administrative load on this service, particularly given the data entry requirements. The number of referrals has resulted in waiting lists of 3 to 8 weeks. TXT2Remind has ensured low non-attendance rates in this service.

The referrals to Dental Therapists from the B4SC have placed the service under pressure due to large numbers of children referred from the B4SC with severe caries and an increased administrative workload.

In Hawke’s Bay, immunisation levels at 2 years are among the highest nationally at 91%. Nurses report many opportunistic vaccinations of 4-year-olds and other family members by general practitioners and independent nurse practitioners in homes.32 Nurses also report a greater understanding of child development and behaviour, family issues and services in the community for families in need.

**Box**

Sandy* was home visited by an independent practitioner after failing to attend B4SC clinic appointments. Her children were 4 years 11 months, 2 years and 8 weeks. She had separated from her husband recently. She reported that he continued to visit when he wished with no warning, undermined her parenting and failed to keep promises to the children. She reported symptoms of moderate depression. She was breastfeeding the 2 year-old and the baby, as she lacked the energy to wean the toddler. The 4-year-old had severe behavior disturbance, scoring 15 on the SDQ and 6/6 for conduct, and repeatedly stated that, “Dad moved out because he doesn’t love me any more”. Referrals were made to Plunket to wean the baby, the general practitioner for treatment of depression and to an NGO for social support and including placing boundaries on the ex-husband’s behaviour. Referral to counselling for him was offered but declined. A public health nurse supported transition to school. The mother’s depression lifted, the son’s behaviour improved, transition to school went well and while the ex-husband continues to be unsupportive, the mother reports feeling well-supported by the school and NGO.

*Details changed to protect identities.
Discussion

Ten months after the first nurse training, the B4SC in Hawke’s Bay is beginning to demonstrate some of the outcomes we had hoped for. Seventy-five percent of children in Quintile 5 and 84% of the total cohort have been assessed. There remains a gradient of recruitment from Quintile 1 to 5 despite considerable effort to recruit from the poorest quintiles. This is consistent with the experience of the pilots,\(^{25}\) where considerable extra effort was required to recruit low-decile families.

Referrals are stable at 55%, higher than the 31% referral rate of the pilots,\(^{25}\) but this includes high numbers of children referred simply for enrolment in the oral health service. It is pleasing to see the clear gradient of increasing referrals with deprivation and the low decline rate. Narrative feedback from the triage group suggests referrals are appropriate and of a high standard.

The very low rate of parents declining assessment is encouraging. The referral rate of 7% of children for development appears reasonable. The apparently low referral rate for behaviour of 3% is approximately half of that expected, but could be explained by some referrals for behaviour from the PEDS, which is administered first in Hawke’s Bay. Narrative feedback from nurses suggests some resistance to the SDQ from parents and nurses, however it appears to be gaining acceptance as nurses become more confident in its use.

The referrals have increased the workload for referral services, none of which have had increased resources to cope with the additional workload, but they have prioritised B4SC referrals. Over time this may mean that some services change their skill mix to manage the higher-complexity families referred from the B4SC programme. Managing expectations will also become increasingly important to services and funders as families with more straightforward problems used to receiving a service can no longer receive it.

We have also identified a need for services in remote settings, such as the Chatham Islands, Central Hawke’s Bay and Wairoa, where there are currently limited or no NGO social services or secondary behaviour services. Discussions to meet the identified need are underway.

While considerable work has been done to engage early childhood education and Te Kohanga Reo, there remains skepticism about the SDQ in particular and engagement remains patchy. The CAG’s view is that this skepticism will be addressed most effectively by parents’ and teachers’ successful experiences and ongoing feedback of programme outcomes.

Clinical governance from the CAG worked well. The CAG agreed local clinical and referral processes quickly and proved an effective forum to address issues as they arose. The triage process, with referrals funneled through the clinical nurse leader to an intersectoral group of senior clinical leaders, is time consuming but has led to very few inappropriate referrals or referrals declined and has contributed to the impact on services being manageable.
In our view this has been an appropriate use of these clinicians’ time. Narrative feedback from nurses suggests that long waits for secondary services and poor coordination when multiple appointments are needed continue to act as a barrier to access to services for poor families. Long waits also mean interventions may not be completed by school entry.

Practice nurses and Well Child/Tamariki Ora nurses self-selected for training and have gained the necessary skills quickly. Their existing relationships with families proved helpful, though many said they learnt new things about families they had thought they knew well. Hard-to-reach families were often engaged by independent practitioners, who proved very effective at finding mobile families using their extensive community networks.

On their home visits they have identified a wide variety of previously unmet needs including food poverty, lack of heating, crowding, parental mental illness, family violence, unimmunized children and dental caries, for which referrals were made. These disparate outcomes, while tangible and important to families, are difficult to capture in quantitative reporting and cost-benefit analysis (see Box).

Early referrals were variable in quality and under-referral was noted for Quintile 5 families and for behaviour and developmental concerns. The multiagency triage process and a trusted, senior nurse leader to discuss the referrals with were time-consuming, but proved effective strategies to increase nurse confidence, the quality of assessments and referrals, and referral numbers. In our view these were key to the success of the programme.

Few parents when phoned by the referral services have declined support. Those that did were referred back to the practice nurse, who has often been able to persuade families to engage.

A mixed-method research programme evaluating the B4SC in Hawke’s Bay is underway with a first report due in July 2010. Funded by the Hawke’s Bay Children’s Holdings Trust it will include an analysis of the outcomes of the programme as it develops and the experiences of nurses and parents. A longitudinal study of up to 100 children referred with high scores on the SDQ will report in June 2011.

**Competing interests:** None.

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