A Better Start
E Tipu e Rea

Brief Evidence Reviews for the Well Child Tamariki Ora Programme

Report submitted to MoH on 11 December 2019
Whakapūputia mai ē mānuka,
kia kore ai e whati

Cluster the branches of the manuka,
so they will not break
Foreword

The Ministry of Health is responsible for the development of policy advice on children’s health and the future direction of the Well Child Tamariki Ora (WCTO) programme. The WCTO programme is the universal health service in New Zealand, which is responsible for protecting and improving the health and wellbeing of children from birth to 5 years of age. This is achieved through health and development screening and surveillance, whānau care and support, and health education.

The current programme is based on the evidence available at the time of the last programme update in 2007. Therefore, the Ministry of Health is reviewing the current WCTO Framework and associated Schedule (developed in 2002) to ensure that WCTO services meet the current needs of children and their whānau, and address the issues they face. The present review was initiated in 2019 and is the second review of the programme, as the first was carried out in 2006. In preparation for this review, the Ministry of Health has commissioned an evaluation of the recent literature on some of the new and emerging issues for preschool children, as well as possible ways to address them.

The purpose of this review includes ensuring that the programme is underpinned by the latest research and evidence. This is particularly pertinent to the current Schedule of Universal Contacts delivered, and one of the workstreams of the review is to consider the timing, content, and intensity of the Schedule, and associated additional contacts. This work stream will support the development of an integrated framework of universal wellbeing contacts for the pregnancy to 24 years of age life course.

The Ministry of Health require the brief evidence reviews (BERs) to synthesise relevant evidence about what works in key areas for children, including development, vision, hearing, emotional and mental health, and growth. The BERs adopted the He Awa Whiria – Braided Rivers approach and include consideration of what will work for Māori tamariki and whānau, and Pacific children and families within each domain. The BERs have helped to identify any knowledge gaps where further work and research may be needed, to inform further development of the WCTO programme.

The WCTO review is a key health contribution to the Government’s Child and Youth Well-being Strategy. It forms part of the Ministry of Health’s work programme to transform its approach to supporting maternal, child, and youth well-being.

The Ministry of Health have commissioned A Better Start: E Tipu E Rea National Science Challenge to undertake 11 health related BERs that will inform the WCTO review and decision making on the future core service schedule, and additional health and social services for children in New Zealand. The aim of the BERs is to ensure that decisions are grounded in, and informed by, up-to-date evidence. BERs are intended to synthesise available evidence and meet time constraints of health care decision makers. Internationally health technology agencies have embraced rapid reviews, with most agencies internationally offering these alongside standard reviews. These 11 BERs that we have conducted have been performed in a very short time which was a very challenging task.

A Better Start is a national research programme funded by the Ministry of Business Innovation and Employment (MBIE). The objective of A Better Start is to improve the potential for all young New Zealanders to lead a healthy and successful life. To achieve this, A Better Start is researching methods and tools to predict, prevent, and intervene so children have a healthy weight, are successful learners, and are emotionally and socially well-adjusted. A Better Start consists of more than 120 researchers across 8 institutions.
The BERs cover 11 domains critical to the WCTO programme, which are: neurodevelopment (#1); parent-child relationships (#2); social, emotional, and behavioural screening (#3); parental mental health problems during pregnancy and the postnatal period (#4); parental alcohol and drug use (#5); excessive weight gain and poor growth (#6); vision (#7); oral health (#8); adverse childhood experiences (#9); hearing (#10); and family violence (#11). The BERs have synthesised relevant evidence about what works in key areas for children across these domains, which were assessed with careful consideration of what will work for Māori tamariki and whānau and Pacific children and families. They have also identified knowledge gaps where further work and research may be needed to inform further development of the WCTO programme.

Within each domain, a series of 6–14 specific questions were drafted by the Ministry of Health, and subsequently refined with input from the large team of researchers assembled by A Better Start. A Better Start established discrete writing teams to undertake each BER. These teams largely consisted of a post-doctoral research fellow and specialty expert, often in consultation with other experts in the field. Subsequently, each BER was peer reviewed by at least two independent experts in the field, as well as two Māori and a Pacific senior researcher. In addition, senior clinical staff from the Ministry of Health have reviewed each BER. These were then revised to address all the feedback received, checked by the editors, and finalised for inclusion in this report.

Whilst each of these domains are reviewed as discrete entities, there is considerably inter-relatedness between them. In particular, neurodevelopmental problems can be impacted by parent-child relationships, parental mental health, and pre- and postnatal drug exposure. Similarly, children who have problems with growth, vision, or oral health may also have neurodevelopmental disorders.

Most of the evidence available for these BERs comes from international studies with limited data from New Zealand, in particular there is limited information about Māori, Pacific, and disadvantaged families. These are the tamariki and whānau in whom the WCTO Programme services are more scarce, yet could potentially offer the greatest benefit.

The criteria for screening include the requirement for an effective and accessible intervention; the corollary is that screening should not be offered if there is no benefit to the individual being screened. The essential issue is therefore to identify those infants and preschool children and their whānau who would have better outcomes following intervention; this includes better outcomes for the whānau.

The current WCTO programme has had a greater emphasis on surveillance rather than screening. Many of the questions in the BERs address screening. A change in the WCTO programme that further extends into screening will require substantial upskilling of many WCTO providers, as well as redirection of resources. Importantly, Māori and Pacific iwi and community views must be considered before any new screening programmes are to be included.

It should be noted that a shift towards screening rather than surveillance may prevent health and behavioural problems. The economic benefits of prevention and early intervention are well documented, with early interventions showing that for every dollar spent there are substantial savings to health, social services, police, and special education resources.

Professor Wayne Cutfield  
Director of A Better Start National Science Challenge  
On behalf of the editors, authors and reviewers of the brief evidence reviews
9 Adverse childhood experiences

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Disclaimer

This brief evidence review was commissioned by A Better Start National Science Challenge (the Challenge) on behalf of the New Zealand Ministry of Health. It was prepared over a relatively short time based on the evidence available to the authors at the time of its preparation. The authors have made considerable efforts to perform a comprehensive and balanced evaluation of the existing evidence. However, this brief evidence review cannot be considered an exhaustive analysis of the existing peer-reviewed and grey literature on the topic, and it may not reflect the potentially conflicting views of all experts in the field. There could have been important omissions, and additional evidence might have also come to light since completion of this final draft. Thus, this brief evidence review should be considered with the appropriate caution. A previous version of this document was peer-reviewed by Māori and Pacific researchers and by independent experts in the field. Peer reviewers were anonymous, unless they have otherwise been identified by name. Please note that this brief evidence review does not represent the views of the Challenge or the Ministry of Health; rather, it reports the independent conclusions of the listed authors.

Conflicts of interest: Louise Thorn reports no conflict of interest. Dr Denise Guy coordinates Training in Watch, Wait and Wonder in Australasia and is currently President of IMHAANZ, the organisation providing training to implement FAN in New Zealand. Trecia Wouldes reports no conflict of interest.

Abbreviations

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
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<tr>
<td>ACEs</td>
<td>Adverse Childhood Experiences</td>
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<td>ACE-Q</td>
<td>Adverse Childhood Experiences Questionnaire</td>
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<td>BARC</td>
<td>Bay Area Research Consortium</td>
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<td>BCEs</td>
<td>Benevolent Childhood Experiences Scale</td>
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<tr>
<td>Counter-ACEs</td>
<td>Advantageous Childhood Experiences</td>
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<tr>
<td>CYW</td>
<td>Child Youth and Wellbeing</td>
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<td>DHB</td>
<td>District Health Boards</td>
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<td>FAN</td>
<td>Facilitating Attuned Interaction</td>
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<td>IECMH</td>
<td>Infant and Early Childhood Mental Health</td>
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<tr>
<td>GUINZ</td>
<td>Growing Up in New Zealand study</td>
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<tr>
<td>NGO</td>
<td>Non-Government Organisation</td>
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<tr>
<td>NZ</td>
<td>New Zealand</td>
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<tr>
<td>PEARLS</td>
<td>Paediatric ACEs Screening and Resiliency Screener</td>
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<td>PIF</td>
<td>Pacific Island Families study</td>
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<td>RCT</td>
<td>Randomised Controlled Trial</td>
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<tr>
<td>US</td>
<td>United States of America</td>
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<tr>
<td>WHO</td>
<td>World Health Organisation</td>
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Literature search

Electronic databases searched in order to identify relevant studies included: PubMed, Scopus, Cochrane Database of Systematic Reviews, and Google Scholar. Searches were conducted using key words or free text words depending on the database. Each search was limited to studies published between 1990 and 2019, and in the English language. In addition to databases, reference lists of relevant articles were manually searched. Furthermore, experts in the field were consulted, and government and other organisation websites were searched for relevant journal articles and grey literature. Additional information is found in Appendix I.

Summary

Current research shows approximately half to two-thirds of adults have experienced at least one and 12-14% four or more ACEs\(^1\)\(^-\)\(^4\). The long-term effect of these early experiences is linked to a range of chronic illnesses, poor mental health, and poor health behaviour outcomes in a dose-dependent manner\(^1\)\(^,\)\(^4\)\(^-\)\(^6\), which amounts to a significant cost (Appendix II).

In a NZ study of over 5000 children, half had been exposed to one ACE and 2.6% to four or more prior to 4.5 years according to parental report\(^4\). This may be an underestimate as only 8 rather than 10 of the ACEs were recorded. Children exposed to ≥4 ACEs compared to children with no ACEs, irrespective of which ACES, have been shown to have poorer health, mental health and developmental outcomes\(^7\).

Many screening tools have been developed to collect ACEs among children, but as yet none have been validated. Most screeners include the following, along with a second section that asks about social determinants that have been related to child outcomes.

Abuse:
- Emotional: recurrent threats, humiliation
- Physical: beating, not spanking
- Sexual: contact sexual

Neglect:
- Physical
- Emotional

Household Dysfunction:
- Mother treated violently
- Household member was drug or alcohol abuser
- Household member was imprisoned
- Household member with chronic mental illness
- Not raised by both biological parents
Before universal screening for ACES is established for NZ children aged 0-5 we need the following:

- A screener that reflects the adversity specific to the NZ population and is acceptable to Māori and Pacific.
- A health care system with clear pathways for referral and more interventions that target children aged 0-5 and their families and are available throughout NZ.
- A health care work force that is skilled in screening, and recognising the effects of, adversity in children aged 0-5.
- A national health literacy programme that focusses on improving the understanding of the links between ACES in children and poor outcomes across the life course with a focus on research, education, practice, and policy.

In the interim, screening during pregnancy for those risk factors that have been shown to impact health and development across the life course, and where there are adequate services, such as perinatal mental health, should be instituted. This may require further research and development of antenatal screening protocols, targeted interventions and more integrated services specific to this age group.
9.1 What are the long term impacts of Adverse Childhood Experiences without intervention?

Adverse childhood experiences (ACEs) are stressful or traumatic experiences that occur during early childhood or adolescence. In the seminal ACE Study, Felitti et al. (1998) developed a questionnaire to investigate the effect of ACEs on the health of adult members of a large health maintenance organisation in Southern California. The questionnaire asked about childhood exposure to ten ACEs grouped into three categories including: abuse—physical, emotional, and sexual; neglect—physical and emotional; and household dysfunction—substance abuse by parent/partner, mental illness of parent/partner, intimate violence of parent/partner, incarceration of parent/partner, and separation/divorce of parent. The number of responses were then compared to participants health records and self-reported health risks. The results showed that as the number of childhood ACEs increased there was a corresponding increase in leading health risk factors including: smoking, severe obesity, physical inactivity, injecting drug use, depressed mood, and suicide attempts. There was also a dose response relationship between number of ACEs and disease conditions including, ischemic heart disease, cancer, chronic bronchitis or emphysema, history of hepatitis or jaundice and skeletal fractures.

Subsequent studies using these 10 ACEs, or broader definitions, have found that between half to two thirds of people have experienced at least one ACE, around 25% have experienced two or more ACEs, and 12-14% have experienced four or more ACEs. In New Zealand (NZ), several longitudinal studies have collected data on adversity and the effects of cumulative risk on child development, however, none have collected data on exposure to all 10 ACEs and linked them to health risk or disease conditions in adulthood. Walsh et al. (2019) found that among 5,500 children aged 2-4.5 years in the Growing Up in New Zealand (GUiNZ) study, more than half experienced at least one ACE, and 2.6% experienced four or more ACEs by 4.5 years old. The ACEs were obtained from parent-report of isolated questions and the Patient Health Questionnaire Depression Screener. Walsh et al. collected exposure to 8 ACEs, including: parental depression, problem drinking, drug abuse, criminal history, intimate partner violence, separation; and child physical or emotional abuse. As data on sexual abuse, and physical or emotional neglect was not obtained and parental mental illness was limited to a measure of depression, prevalence may be underestimated.

Research exploring the mechanisms of adversity and poor physical and mental health outcomes have shown that when children experience substantial, stressful, and frequent adversity without predictable nurturing adult care, the endocrine, nervous, and immune systems become chronically activated and overloaded. This includes the persistent elevation of immune markers, which cause chronic inflammation and affects the developing architecture and function of the brain and other organs. These changes to the physiology of the child have been termed “toxic stress”. ACEs, with toxic stress, is associated with a range of poor outcomes in the long term, including mental health problems, physical health problems, and behavioural problems such as violence and substance abuse. ACEs are associated with specific outcomes such as infections, cognitive and developmental delays, asthma, sleep disturbance, school absences, social withdrawal, obesity, and suicide related behaviours.

Poor outcomes from ACEs can affect the individual, their family, and the community. Furthermore, outcomes from ACEs can impact justice, education, welfare, and health systems. Some long-term outcomes have intergenerational consequences for the individual’s family and their children. For example, adults who experienced one or more ACE during childhood were at higher risk of intimate partner violence, which is an ACE for their children. Another study found that children aged 0-17 years...
with parents who reported 4 or more ACEs were more likely to have social, emotional and behavioural problems, than children whose parents reported no ACEs\textsuperscript{30}. ACEs also incur significant financial costs (Appendix II). For example, the cost of depression attributed to ACEs costs approximately $46 Billion US per year\textsuperscript{31}.

Some ACES, such as sexual abuse and physical abuse, have stronger evidence of negative effects than others\textsuperscript{32}. However, there is substantial evidence that ACEs and poor outcomes have a graded relationship, with each additional ACE increasing the risk of poor outcomes\textsuperscript{1,4-6}. Children exposed to four or more ACES, irrespective of which ACES, have an increased risk of poor health outcomes\textsuperscript{7}. In a 2012 study of 125,123 12-17 year olds enrolled in Medicaid in Washington, children with ≥5 ACEs were at increased risk of mental health problems in adolescence, compared to those with no ACEs\textsuperscript{33}.

A number of New Zealand longitudinal studies have measured adversity and the associated outcomes in a range of populations. The Christchurch Health and Development Study found that self-reported childhood sexual abuse was associated with a higher risk for a psychiatric disorder and initiation of sexual intercourse earlier in females\textsuperscript{34}. The Dunedin Multidisciplinary Health and Development Study found that children who had experienced social deprivation, maltreatment and social isolation were more likely to have poor adult health including depression and inflammation\textsuperscript{8}. The longitudinal Pacific Island Families (PIF) study found that poor maternal mental health was associated with internalising problems for children at age 2 years\textsuperscript{35}. Data from the PIF study also found that mothers who were physically abused by their fathers during childhood were more likely be in a relationship that involved intimate partner violence, which is an example of the intergenerational impact of ACEs\textsuperscript{36}.

9.1 Summary

- **Adverse childhood experiences are stressful or traumatic experiences that occur during early childhood or adolescence.**
- **The ACE Study, created a 10-item questionnaire to retrospectively measure ACEs and health outcomes.**
- **Subsequent research suggests between half to two thirds of people have experienced at least one ACE.**
- **Severe and frequent adversity without adult support can lead to toxic stress.**
- **ACEs are associated with poor outcomes in the short and long term including mental health problems, physical health problems, and behavioural problems.**
- **The impacts of ACEs are intergenerational.**

Longitudinal studies in NZ, such as the Dunedin Study, the Christchurch Health and Development Study, and the PIF Study, have also found that adversity is associated with poor health, mental health and behavioural outcomes.

### 9.2 What suitable test(s) are available to screen for Adverse Childhood Experiences during pregnancy and during early childhood?

To our knowledge no standardised screening tool is currently being used to screen for ACEs among children of any age. Worldwide, there are a number of questionnaires in use for screening ACEs but few
that include 0-5 year olds in the target population, take less than 10-15 minutes to complete, and require only minimal training to administer. The Child Youth and Wellness (CYW) Centre in the United States (US) developed two ACE-Questionnaires (ACE-Q) to use in primary health care37, including the ACE-Q Child (0-12 years) and the ACE-Q Teen (13-19 years) versions37. The ACE-Q includes the ten ACE study items (section 1.3.1) and a separate list of seven ACEs relevant to the community. In addition, a stress related symptom checklist is completed by the primary health provider37. The ACE-Q has been in use since 201538. Oh et al (2018) reviewed 32 ACE measurement tools and recommended tools such as the Childhood Trust Events Survey39, the Loma Linda University Whole Child Assessment40, and the Yale-Vermont Adversity in Childhood Scale41 (Table 1). All of these tools include the original 10 ACEs, however they also record other health information and none have been validated42.

Table 9.1. Tools for screening for adverse childhood experiences.

<table>
<thead>
<tr>
<th>Tool</th>
<th>Target population</th>
<th>Who completes it</th>
<th>Types of items assessed</th>
<th>Number of items</th>
</tr>
</thead>
<tbody>
<tr>
<td>CYW ACE-Q Child37</td>
<td>0-12 years</td>
<td>Parent</td>
<td>ACEs, Other adversity</td>
<td>17</td>
</tr>
<tr>
<td>Childhood Trust Events Survey39</td>
<td>0-18 years</td>
<td>Parent</td>
<td>ACEs, Resilience</td>
<td>26-30</td>
</tr>
<tr>
<td>Loma Linda University Whole Child Assessment40</td>
<td>0-17 years</td>
<td>Parent, Self</td>
<td>ACEs, Other adversity, Resilience</td>
<td>41-52</td>
</tr>
<tr>
<td>PEARLS Child43</td>
<td>0-12 years</td>
<td>Parent, Self</td>
<td>ACEs, Other adversity</td>
<td>17</td>
</tr>
<tr>
<td>Yale-Vermont Adversity in Childhood Scale41</td>
<td>0-20 years</td>
<td>Parent, Self, Clinician</td>
<td>ACEs, Other adversity</td>
<td>20</td>
</tr>
</tbody>
</table>

A further questionnaire was developed in 2018 by the Bay Area Research Consortium (BARC), a team that includes representatives from the CYW, the University of California San Francisco, and UCSF Benioff Children’s Hospital Oakland38. Together, the BARC group reviewed five relevant ACE screening tools to create a 17-item screening tool for use in primary care settings38, called the Paediatric ACEs Screening and Resiliency Screener (PEARLS). An evaluation of the PEARLS tool was found to be acceptable and to have face validity among 28 participants. Although it is currently not in use for screening38, it is being trialled in the first randomised controlled trial (RCT) of ACEs in a paediatric clinic setting43. As the ACE-Q and PEARLS tools are similar, and the ACE-Q has been in use since 2015 and more information about its administration is available we have chosen to focus on the ACE-Q.

The CYW ACE-Q is administered with a paper copy (Appendix III) for children aged 0-5 years37. The parent is asked to indicate the total number of ACEs their child has experienced in each section, but not to identify specific ACEs37. A total ACE score is the combined number of ACEs from the first and second sections37. The parent is then interviewed briefly by the health care provider to identify the presence or absence of their child’s stress related symptoms (Appendix IV)37. Other services may choose different approaches to collecting the ACE score, which is an area requiring further research. For example, the PEARLS study looked at preference for the administration of the screening tool, and found that paper, tablet, and face-to-face interview were all acceptable38. However, as some participants had a clear preference for one of the options38, it was suggested, parents be given the option to choose which they prefer.

In the CYW screening model, the ACE-Q score and the presence of any stress related symptoms identified during the interview determines the need for referral to intervention services. If a child has 1-3 ACEs with no symptoms, they are not referred for specialty intervention, however their parents are asked to monitor symptoms37. If the child has 1-3 ACEs with symptoms, or 4 or more ACEs, they are referred for assessment and intervention37. CYW ACE-Q screening begins at nine months of age, followed up at 24 months, then each year until the child is 19 years old37.
9.2 Summary

Tools

- The ACE-Q Child (0-12 years) is a 17-item questionnaire with two sections (Appendix III), has been in use since 2015, but is not validated.
- Section 1 - 10 included items from the Felliti (1998) ACE Study
- Section 2 - 7 included items relevant to the community
- The PEARLS is very similar to the ACE-Q and is part of a current randomised controlled trial of ACEs in a paediatric clinic setting.

Administration

- Parents list the total number of ACEs for their child in each section, rather than identifying the individual ACEs.
- The total ACE score is the combined number from the two sections.
- The health care provider interviews the parents to determine if the child has any symptoms (Appendix IV).

Referral

- 1-3 ACEs with no symptoms – parents monitor child for symptoms
- 1-3 ACEs with symptoms – referred for interventions
- 4 or more ACEs – referred for interventions

Screening

- CYW ACE-Q screening begins at nine months of age, followed up at 24 months, then each year until the child is 19 years old.

9.3 Are there any other evidence based Adverse Childhood Experiences that should be included in a screen?

As discussed in section 1.2, many ACE screening tools include a section with adversities that were not included in the 10-item ACE Study questionnaire. The second section of the ACE-Q includes experience of foster care, bullying, death of a parent/guardian, separation due to deportation/immigration, serious medical procedure/illness, violence in the neighbourhood, and discrimination. The second section of the PEARLS is similar except questions on housing insecurity and food insecurity were added, foster care was merged into housing insecurity, and the serious medical procedure/illness was removed.

A number of longitudinal studies in NZ, such as GUiNZ and The Dunedin Study, as well as studies worldwide, investigate adversity specific to children including exposure to perinatal insults such as low birthweight. One study by Vervoort-Schel et al. (2018) investigated intellectual disability and its association with adversity and therefore the poor outcomes associated with ACEs. Additionally, a review on childhood poverty in NZ by Gibson et al (2017) found that low socioeconomic deprivation is associated with poor child outcomes in NZ. This finding is consistent with other research that shows that socioeconomic status is a key indicator of adversity across childhood. If an ACE tool was to be adopted for the NZ setting, a systematic review of the NZ longitudinal research should be completed, and adversities specific to the NZ population should be considered. However, it is important that...
included adversities have been associated with a severe stress response, as it is the hypothesised physiological pathway from ACEs to poor mental and physical health outcomes11.

9.3.1 Prevention of outcomes associated with adversity

Studies have shown that there are children who, despite exposure to significant adversity, manage to meet age salient tasks or milestones. This is known as resilience, a psychological construct that has been studied for over 4 decades. Current research suggests that resilience is not a personal trait such as “hardiness”, but a process that is informed by multiple biological and psychological systems that interact with family, peer relationships, school environments, and the community46,47. Positive experiences during childhood are associated with improved mental and physical health outcomes in adulthood including positive, supportive relationships, lower stress, lower rates of depression, less sleep difficulties, and better cardiovascular health48-51. However, at present there is limited research that promoting protective or resilience factors will ameliorate the effects of ACEs.

Counter-ACEs or resilience assets could be included in an ACE screening tool in NZ, if there is support from future research. An evaluation of the screening tools used to measure social, emotional, and behavioural difficulties in children showed that parents favoured a tool that measured prosocial behaviours as well as negative behaviours52. Parents may be more accepting of a screening tool that addresses adverse as well as positive childhood experiences. Narayan et al. (2017) created the Benevolent Childhood Experiences Scale (BCEs), a 10-item questionnaire to measure advantageous childhood experiences (counter-ACEs) and their effect on physical and mental health49. The 10 BCEs include: having at least one caregiver with whom you feel safe, at least one good friend, beliefs that give you comfort, enjoying school, at least one teacher who cared about you, good neighbours, an adult other than primary caregiver who could provide support or advice, opportunities to have a good time, liking yourself or being comfortable with yourself, and having a predictable home routine e.g. regular mealtimes and bedtimes49. Crandall et al. (2019) used the BCEs and the Centre for Disease Control and Prevention’s Behavioural Risk Factor Surveillance System Survey to retrospectively measure counter-ACEs and ACEs among 246 adults and found that when ACE scores are moderate, counter-ACEs can neutralise poor health outcomes48. However, the BCEs includes questions that would not be appropriate for children aged 0-5 years e.g. do you like school?49 Therefore, if counter-ACEs or other resilience factors, were to be included in a screening tool, the questions would need to be adapted depending on the age of the children being screened, and if it is parent or self-report.

Bellis et al. (2018) retrospectively looked at data that included ACES, childhood health, school attendance, and childhood community resilience assets53. They developed a 7-item tool for use in adults, based on the Child and Youth Resilience Measure that included: access to a trusted adult, being treated fairly, supportive childhood friends, being given opportunities to use your abilities, cultural engagement, knowing where to get help and having someone to look up to53. Bellis et al. found that these were independently linked to better outcomes53. Different resilience assets influenced different difficulties and also contributed to better outcomes for those with and without ACEs53. For example, 59.8% of the individuals with $\geq$ 4 ACEs were identified as having poor childhood health. This fell to 21.3% when the resilience assets had been present53.
9.3 Summary

- The ACE-Q, and similar ACE screening tools, contain a second section of ACEs that were not included in the original 10 ACEs.
- Longitudinal studies in NZ collect data on adversities that are specific to NZ and not collected in the ACE-Q, such as low birthweight.
- Advantageous childhood experiences (counter-ACEs) and other resilience measures, may be able to reduce the effect of ACEs on children.

9.4 Are there any known harms from screening for Adverse Childhood Experiences?

The possible harms of a screening programme need to be carefully considered. Although negative physical and mental health outcomes for an individual, their family, and future generations have been documented (section 9.1), this does not mean that screening will be successful. We need to ensure that the positives of screening outweigh the negatives. To determine if screening for ACEs is appropriate in the NZ population at this time, we have used ideas from the health screening criteria developed by Dobrow et al (2018)54,55. The 12 Dobrow et al. criteria are split into 3 domains: the disease/condition, the test/intervention principles, and the programme/system principles55. As we have already argued in previous sections that ACEs are an important health problem, and have identified the target population as early childhood, the disease/condition principles do not require further discussion.

The test/intervention principles state that the test should be appropriate, accurate, and acceptable; the results should be easily interpretable so that those who should or should not receive interventions can be identified; and post-test options should be available e.g. follow-up care that will modify the natural history and improve outcomes. The program/system principles include: the screening infrastructure, coordination and integration, acceptability and ethics, benefits and harms, economic evaluation, and quality and performance management.

9.4.1 Test/interventions

As mentioned in section 9.2, many of the screening tools we discuss have not been thoroughly tested for their psychometric properties. While the PEARLS tool was found to have face validity and acceptability, it was a small study with only 28 participants38. Some parents have a problem with the sexual abuse and violence questions in the ACE-Q, even though parents do not need to state which ACEs their child has experienced, just the total number of ACEs38. The PEARLS asked parents to state the actual ACEs, rather than just the number, and about half of the parents felt uncomfortable but all completed the questionnaire38. However, if parents do not find the questions acceptable, it may prevent some parents from completing the screening, or may lead to an underestimate of ACEs for their children. An underestimate of ACEs could lead to false negatives, which is when the child is at risk for poor outcomes but is not found positive by the screen. Alternatively, some children may have ACEs and may not develop poor health outcomes due to, for example, having a reliable positive relationship with a grandparent. Attention to symptoms is important. If these ‘false positive’ children are screened as positive it may put undue pressure on the child, the family, and on the health care system.

For children that have a positive screen, there needs to be an agreed upon type of follow-up care that will modify the course of the condition to ensure positive outcomes55. While there is evidence for
interventions or programmes that help with symptoms or conditions (e.g. Post-Traumatic Stress Disorder), or for prevention (e.g. perinatal mental health services), there is no evidence for interventions for an ACE score. The World Health Organisation (WHO) do not recommend universal screening for child maltreatment as no research has been completed that shows evidence of positive outcomes\(^{56}\). Instead they recommend that health care providers should be alert to the features of child maltreatment\(^{56}\).

9.4.2 Programme/system principles.

A screening programme needs an adequate infrastructure to allow for timely access to follow-up care. Currently, access to interventions for children 0-5 years in NZ is restricted due to availability. Infant and Early Childhood Mental Health (IECMH) services are scarce, with only 4 District Health Board (DHB) based IECMH programmes/services currently established\(^{57}\). Implementing ACE screening would require services that can provide timely assessment and effective interventions. At present, children identified with ACEs would likely be referred to Home Visiting programmes or a Non-Government Organisation (NGO) programme such as Triple-P or Incredible Years. These programmes have limited capacity. Additionally, these programmes have limited evidence as to their effectiveness and whether they are more or less effective in specific populations throughout NZ, particularly in rural areas. Selvaraj et al (2018) found that in one public health centre referral rates increased from 2% to 13% after screening\(^{58}\). Therefore, when planning for increased services in NZ we need to plan for more numbers than are currently referred from screening programmes such as social, emotional, and behavioural difficulties.

A first step in building a more integrated health care system may be expanding the use of the Facilitating Attuned Interaction (FAN) approach developed for Fussy Baby Network practitioners\(^{59}\). The purpose of FBN training is to infuse infant mental health principles and practices into programs and systems of care for infants and toddlers through FAN training: a practical model for practitioners to build relationships and develop reflective practice\(^{60,61}\). Providers in NZ, including Plunket, Well Child Tamariki Ora, and home visiting programmes (Pakeha, Māori and Pacific Teams) are positive about the FAN approach being implemented by the Infant Mental Health Association Aotearoa New Zealand. FAN has had good uptake, and is successful in reducing parental stress, increasing parent satisfaction and provider confidence and reducing provider burnout\(^{60}\). To address needs of higher risk families the High-Risk FAN has been integrated into Level I Practitioner training\(^{60}\). The FAN is now a ‘Promising Practice’ through the Association of Maternal and Child Health Programs.

Currently, there is not enough evidence that universal screening for ACEs will have positive outcomes. In addition, there are limited interventions available for children aged 0-5 years, a limited workforce skilled in treating infants and young children aged 0-5 years, and limited rigorously evaluated interventions that have identified whether they are effective in all populations at risk. Therefore, at this stage we would not recommend the implementation of a universal screening tool. However, given the importance of identifying significant adversity (Domain 3), we would recommend targeted screening for parental mental health, domestic violence and parental alcohol and substance abuse in NZ. Additionally, we need workforce development in identifying children at risk, and the development and evaluation of interventions for the 0-5 age group.
9.4 Summary

Ideas from health screening criteria were used to help consider the risks to universal screening with a measure such as the ACE-Q.

Test/interventions

- Few tools for screening ACEs are validated.
- If parents are uncomfortable answering the abuse questions it could lead to false negatives.
- At present, there is limited evidence for an association between the use of a universal ACE screening tool and positive outcomes.
- WHO does not recommend screening for child maltreatment as they cannot identify evidence of positive outcomes.

Programme/system principles

- Access to interventions for 0-5 year olds in NZ is restricted due to availability.
- IECMH are especially limited, with only 4 DHB based IECMH programmes/services currently established.
- Referral rates to follow-up care may increase, so there is a need to plan for increased services.
- Interventions are limited depending on location, therefore access for some families will be poor.

Overall

- Currently, there is not enough evidence that screening for ACEs will lead to positive outcomes for children.
- Research on ACEs is ongoing and screening may be plausible in the future.

9.5 What interventions or additional supports are effective following early detection for adverse childhood experiences?

There are no comprehensive programmes that screen for ACEs in the early years, have implemented an intervention programme and formally evaluated the results. There are some programmes in the process of evaluation and that includes the CYW model which intervenes with a focus on reducing toxic stress and building resilience. After screening, paediatricians assess children with ACEs, and their families, before referral to integrated paediatric care. Children are provided with a care coordinator who educates the family on ACEs, toxic stress, and the importance of good nutrition, good sleep, physical activity, mental health, mindfulness practices, and supportive parent-child relationships. The care coordinator also refers the child and family to the appropriate medical, mental health, and wellness interventions including: bio-psycho-social assessment, home visiting, child-parent psychotherapy, health education, wellness nursing, psychiatry, biofeedback, and acupuncture.

The antenatal and early years constitute a critical developmental junction where integrating interventions, especially for families with multiple adversities, has the potential to improve infant and young children's outcomes. There is a need for combined approaches rather than disjointed efforts focused on one adversity or that don’t take account of emotional and relational wellbeing. Currently in NZ, we do not have an integrated care model for children 0-5 years with accumulating ACEs. Also, as discussed in section 1.4, there is not enough evidence to support universal ACE screening at this stage.
There are programmes that offer supports or interventions, which focus on improving protective factors that have the possibility of reducing toxic stress from ACEs, and/or address specific adversities. Toxic stress is worsened by the lack of supportive adult relationships and infants are especially vulnerable, and for that reason improving these relationships may build resilience and reduce toxic stress. Counter-ACEs (section 9.3) highlight the fact that supportive parent relationships are key to reducing the poor outcomes associated with having multiple ACEs. Other studies have also shown that positive experiences and supportive relationships are associated with resilience. Di Lemma et al. (2019) in their evidence review of interventions to prevent and address adversity across the life course, identified four common approaches; supporting parenting, building relationships and resilience, early identification of adversity and responding to trauma and specific ACEs.

The Purewal Boparai et al. (2018) review of biological outcomes with interventions developed for children exposed to adversity (institutionalised, in foster care and in community settings) found three key elements underpinned interventions that were effective. Improved parenting skills, earlier intervention placement and greater intervention engagement. Supportive and responsive parenting that promotes secure attachment was advocated.

Parents exposure to trauma and ACEs increases caregiving behaviours that are significantly associated with infant disorganisation which is a risk factor for later emotional, social and externalising problems. Attachment informed interventions are available and show positive effects for mothers and infants. Watch, Wait, and Wonder, Circle of Security-20-week group Intervention, and Video-feedback Interventions including Video Interaction Guidance and Video-feedback to promote Positive Parenting directly focus on the parent-child relationship, are effective at reducing disorganisation and are available in some areas of NZ. Domain 2 has more detail about attachment informed approaches which are more likely to be available in specialty IECMH and Perinatal Mental Health services. These services are extremely limited in NZ. Other supports for children and families with adversities include home visiting programmes and parenting programmes. Interventions that directly address parenting capacity and are available in NZ include: Mellow Bumps, Mellow Parenting, Parent Child Interaction Therapy, Incredible Years and Triple P. These programmes are also discussed in detail in Domain 2.

In NZ, we have invested in intensive home visiting with the Family Start programme which has shown reduced infant mortality, increased utilisation of health services and early education, and increased utilisation of addiction services for mothers. The NZ Early Start home visiting service based on NFP has shown reduced behaviour problems at age 3 years. There are plans to invest in a ‘prototype Nurse-led Family Partnership model’ in NZ. Corbacho et al. (2017) found the NFP intervention lacked evidence of better outcomes and was not cost effective in the UK setting. They proposed that the differences in universal health care and support services across the different countries may be the factor in different findings. The evidence from these Home Visiting programmes for efficacy in improving the parent-infant relationship is lacking.

Slade et al.’s Minding the Baby, and Guedeney’s Compétences parentales et Attacheement dans la Petite Enfance (Parental Skills and Attachment in Early Childhood), are two home visiting programmes that have targeted high to medium risk mothers utilising programmes that integrated Infant Mental Health with a focus on increasing maternal sensitivity, and maternal reflective function and reducing disrupted maternal communication.

We need to identify problems like domestic violence, substance abuse, and mental health difficulties in parents antenatally. Currently, questions on family violence, caregiver mental health (e.g. depression) and substance abuse, are recommended but they should be made part of routine antenatal screening for all parents at the earliest antenatal visit. A response to parents that need follow-up care may be to
refer to services including Perinatal Mental Health Services, drug and alcohol addiction programmes including Pregnancy and Parenting Services, and family violence programmes. However, across a number of these services there is a lack of two-generational approaches and workforce capacity to implement interventions addressing the infants’ relationship with the parent in these specific adverse environments. Furthermore, reducing parental difficulties does not ensure the developmental outcomes for infants are better.

Lastly, it is important to note that to prevent ACEs the Centre for Disease Control and Prevention in the US and the WHO INSPIRE framework suggest strengthening economic supports, changing social norms and positive parenting, quality care and education, enhancing parenting skills, and intervening to lessen harms and prevent future risk. To improve these areas, there needs to be political and social changes, alongside improvements to the provision of skilled interventions to infants, young children and their families. For example, factors like racism, colonialism, and poverty are key structural factors of adversity that may not be improved by intervention programmes.

9.5 Summary

- There are comprehensive follow-up programmes that are currently being evaluated including CYW that provide integrated care that includes education, medical health, mental health, and wellness services.
- At present, NZ does not have the resources and workforce for an integrated care system.
- Improved awareness of ACES, and the development and testing of interventions targeting children aged 0-5 years should be a priority to prevent the effects or intervene early. These should include: supporting parenting, building relationships and resilience, early identification of adversity and responding to trauma and specific ACEs.
- Early and ongoing attention to the parent-child relationship, especially parental sensitivity during infancy, and reducing factors associated with disorganised attachment is advocated.
- Effective interventions engage families, improve parent-child relationships and parenting skills, and are culturally appropriate.
- Interventions available in NZ include: for attachment – Watch, Wait Wonder, Circle of Security, and Video feedback Interventions; for parenting capacity - Mellow Bumps, Mellow Parenting, Parent Child Interaction Therapy, Incredible Years and Triple P; home visiting – Family Start, Early Start, Nurse-led Family Partnership.
- These interventions are discussed in detail in Domains 2 and 3.
- Services such as maternal mental health, drug and alcohol addiction programmes, and family violence programmes are accessible across NZ and incorporate 2-generational approaches to care, and are available to parents.

9.6 Does early intervention lead to significant improvements later in childhood/adolescence?

There is substantial evidence that inequalities in cognitive development, health and social and emotional competence emerge prior to three years of age and can often be traced to a range of adverse circumstances. In addition, research shows that by investing early in development, the benefits are
larger and are enjoyed for longer than for later remediation. Purewal Boparai et al. (2018) conducted a review of studies that looked at biomarkers for toxic stress before and after intervention programmes for children with adversity; children in institutions, foster care, or a community setting. Overall, Purewal Boparai et al. found that interventions reduced or normalised the levels of biomarkers for toxic stress. Some interventions only showed improvements among children aged 24 months and under. This may be due to the brain development that occurs in the first couple of years, during which the child is susceptible to the effects of chronic and severe stress, especially when there is no supportive adult relationship. Patterns of stress biomarkers normalise around age two, and if untreated early life stress is associated with altered brain development. However, most of the studies reviewed looked at general adversities e.g. living in institutional care, rather than at cumulative ACEs. Further research is needed into the effects of intervention on children with multiple ACEs, and their long term effect. Additionally, these studies looked at intervention on stress biomarkers but not at the effect on disease.

Bellis et. al. (2017) found access to a trusted adult in early childhood substantively contributed to reductions in adult mental health difficulties and health harming behaviours in a retrospective study addressing ACEs and life-course resilience. Fergusson et al. (2019) found that children who were a part of the NZ Early Start home visiting programme had reduced hospital admissions, lower risks of physical punishment, higher parental competence, and positive child behaviour, compared to children not included in the programme. These results were sustained over a 9 year follow up. No significant differences were found on a range of measures including maternal depression, parental substance use, intimate partner violence, adverse economic outcomes, and life stress. The authors recommended closer integration of home-visiting services with health and education especially for families with multiple challenges.

Intervening prior to age 3 when children are in their most receptive stage of development has the potential to permanently alter their developmental trajectories and protect them against risk factors present in their early environment. For instance, a recent follow-up of the Abecedarian Project, a comprehensive early education programme for children at high risk for developmental delay found that at age 35 individuals had lower rates of hypertension than those in the comparison group. Additionally, they were at a significantly lower risk of experiencing coronary heart disease within the next 10 years. Finally, prevention as well as early intervention should be considered. There is now substantial evidence that exposure to maternal depression, and substance use and other perinatal events such as being born preterm can have life-long consequences. Therefore, intervening during pregnancy by screening for parental mental health and alcohol and substance use and family violence as well as support systems has the potential to improve outcomes for NZ children (Domains 4 and 5).

### 9.6 Summary

- **Interventions for children with adversity can reduce the levels of stress biomarkers.**
- **There is a growing evidence that the presence of a supportive responsive adult ameliorates the impact of early adversity.**
- **Some interventions have a bigger impact on children under 2 years, possibly due to changes in brain development that occur during this time.**
9.7 What do we know from a Māori and Pacific knowledge basis about screening in this domain?

Colonialism, and economic changes of the 80s and 90s, have brought about intergenerational socioeconomic pressures and whānau/family problems in NZ that have had significant consequences for Māori families. Although Pacific peoples living in NZ have a history of acculturation rather than colonialism both Māori and Pacific tend to have lower paying jobs, and are more likely to be living in crowded or substandard housing and their children are more likely to be attending lower decile schools. ACEs are generally more prevalent in low socioeconomic populations than high socioeconomic populations and as Māori and Pacific families are disproportionately represented among the low socioeconomic groups, it is likely that Māori and Pacific children may have a higher proportion of ACEs than other ethnic groups. Currently there is no data on the prevalence or number of accumulated ACES by ethnicity among children in NZ. However, a feature that permeates the statistics on children at risk in NZ are the poorer outcomes experienced by young Māori and Pacific children. Māori and Pacific children are more likely to be abused or neglected than the average NZ child, they are 5 or 6 times more likely to die from child abuse or neglect, respectively; and they have greater exposure to household dysfunction including parental alcohol and drug abuse, parental incarceration, parental mental illness, and loose or unstable family structure including sole parenting or serial changes of adults responsible for performing a care-giving role to children. Māori adults are more likely to be victims of intimate partner violence than the NZ average, while Pacific adults are around the same as the NZ average.

As Māori and Pacific children are likely to have higher exposure to ACEs than non-Māori children, ACE screening and interventions need to be designed, implemented and evaluated in consultation with Māori and Pacific. For Māori, any discussion needs to consider the evidence and applications that are consistent with the Treaty of Waitangi. Therefore, a Māori screening and intervention model needs to use a Kaupapa Māori framework to ensure that cultural approaches are underpinned by evidence. For example, Hoki te Rito Mellow Parenting and Mellow Bumps use a Kaupapa Māori approach to intervention for parenting capacity. Additionally, Look at You - Aroha Atu, Aroha Mai, films addressing the social and emotional communication of babies in the first 3-4 months aiming to improve parental sensitivity, has Te Reo, Samoan, Tongan, Cook Island, and Nuie versions available. One approach to reconciling western science and kaupapa Māori perspectives is the Awa whiria (Braided Rivers model). Other conceptual frameworks should also be considered, such as Nga Vaka o Kāiga Tapu for addressing family violence in Pacific communities, as it includes education for building and restoring positive family relationships.

One example of challenges to screening for child behavioural difficulties has been the utility of using standardized questionnaires such as the Strengths and Difficulties Questionnaire (SDQ). One review showed a portion of the Māori and Pacific parents did not like questionnaires such as the Strengths and Difficulties Questionnaire (SDQ) which requires parents to rate their child’s social, emotional, and behavioural problems. The parents commented that they would prefer a discussion about their child. In this respect, some Māori and Pacific parents may prefer a screening tool like the ACE-Q, as the health care provider discusses the child’s behaviour with the parents to determine the symptomology. Nevertheless, whether parents should be given the option of a face-to-face discussion or a paper and pencil screener or how the topic of adversity is discussed in general should be developed in consultation with Māori and Pacific stakeholders.
9.7 Summary

- ACEs are more prevalent among low socioeconomic populations and as Māori and Pacific families are disproportionately represented in low socioeconomic populations, it is possible that they will have multiple ACEs.

- Māori and Pacific children have higher rates of abuse, neglect, and household dysfunction than non-Māori and non-Pacific children.

- Māori and Pacific parents may like the ACE-Q as the provider discusses the child’s symptoms and behaviour with the parents.

9.8 Recommendations for further action

Policy and practice

- Early intervention programmes should consider screening throughout pregnancy and at birth to identify adverse circumstances or perinatal outcomes that have been shown to have life-long consequences.

- Ensuring that the development and implementation of any programmes for infants, toddlers and pre-school children includes a focus on early primary caregiver relationships and awareness of ACEs.

- Ensuring that the planning of approaches to prevention and intervention is done in partnership with Māori, Pacific and other ethnic communities.

- In the early years’ attention to early relationships, is key for prevention, protection and intervention. Policy and practice in New Zealand needs to focus on infant and early childhood mental health to significantly improve outcomes.

- A national health literacy programme could be developed to raise public awareness about what can be done to support children’s healthy development, encourage positive relationships, and support responsive parenting. An example of a promotion intervention includes Look at You – Aroha Atu, Aroha Mai.

- Train workforce to ensure all professionals working with infants, young children and their families are engaging, have an understanding of ACEs and are equipped to identify early warning signs in infants and young children. The FAN approach is a promising practice for building relationships and developing reflective practice.

- Prevention services with mental health consultation should be available during pregnancy.

- IECMH services need to be available across NZ. Significant investment is needed in these services.

- Caregiver relationships in the first three years of life are important, we need to work with at least two generations during this time.

- Parents with young children and who have chronic mental illness and addiction problems need priority access to services with 2-generational approaches to ameliorate the effects on the development of the young child.

- Within the Ministry of Health there needs to be better integration of health and mental health in addressing policy and practice for the antenatal and first years. Much of the work including WCTO...
is held within Child Health which is typically minus mental health. In this area perinatal and IECMH must be integrated.

- There needs to be a clear pathway from screening to interventions so that all healthcare providers are sure which services are available and effective for children who receive a positive screen for adversity.

**Further research**

**Before universal screening for ACEs:**

- When developing interventions or screening in NZ, we need to use Māori and Pacific healthcare frameworks, consult with Māori and Pacific leaders, and consider strengths-based approaches to ensure positive outcomes for Māori and Pacific children.
- There needs to be evaluations of interventions and comprehensive services to ensure they are effective for young children with ACEs and have a positive outcome in the short, medium, and long-term. We need services to be available, but also effective.
- Research is needed that shows screening for ACEs is linked to positive outcomes after intervention.

**If we establish universal screening for ACEs:**

- ACE screening tools currently in use need to be evaluated, and an evidence-based ACE screening tool that incorporates those adverse experiences unique to NZ adopted and piloted to determine its reliability, validity and its acceptability.
- A systematic review is needed of the longitudinal research in NZ to identify other adversities that could be included in the above screening tool.
- More research is needed into protective factors, which if appropriate, could be included in an ACE screening tool.
- An evaluation of the administration systems used in other screening programmes, including timeline of administration and pathways to interventions. This evaluation will help to determine a screening model for the NZ population.
- Screeners should be available in te reo Māori and Pacific Island languages.
9.9 Graded Evaluations

- While there are many tools available for screening for adverse childhood experiences, only the ACE-Q and PEARLS, were discussed in this review.

- Screening with the ACE-Q and PEARLS tools is promising, but neither have been validated [grade C]. The ACE-Q has been in use in the US since 2015. PEARLS is currently being validated in a Randomised Controlled Trial, also in the US.

- There has been no research completed that shows positive outcomes after screening for ACEs. While there are interventions established in NZ that promote resilience, and improved primary caregiving relationships for children, there is limited availability for these interventions, especially in rural areas.

- In the review we discuss many interventions that children and families could be referred to, but they have not been specifically evaluated for their efficacy for children with ACEs.

- Given the lack of research into interventions for ACEs, we chose to look at interventions that improve the parent-child relationship and parent capacity. The grades given in Table 9.3 are for the effectiveness of the interventions, but not specifically their ability to improve outcomes for children with ACEs.

- Home visiting programmes such as Family Start [grade C], and Early Start [grade B] have shown reduced infant mortality and increased use of health services, and improved behaviour problems, respectively.

- Group-based programmes, such as Incredible Years (3-6 years) [grade A] and Mellow Parenting [grade C] improve SEB difficulties and parent wellbeing and behaviour. Hoki te Rito, the kaupapa Māori Mellow Parenting programme, has been found to be culturally acceptable, although like Incredible Years Toddler [grade C], needs evidence from more high quality studies.

- PCIT for children aged 2-12 years [grade A]. PCIT has empirical evidence that it improves behavioural difficulties.

- Programmes that address the attachment relationship focusing on improving parenting sensitivity and/or reducing parenting frightening behaviour, include Watch Wait and Wonder [grade C], VIPP [grade C], and ABC [grade A].

- Integrated health care may be the most effective treatment for children that have experienced ACEs, and their families.

- Attention to parental mental health, addictions, and family violence is an important part of integrated health care, but needs a two generational approach.
### Table 9.2. Graded evaluation of screening tools and associated recommendations for policy and practice.

<table>
<thead>
<tr>
<th>Screening tool</th>
<th>Grade</th>
<th>Estimated net benefit</th>
<th>Level of certainty</th>
<th>Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACE-Q</td>
<td>C</td>
<td>Small</td>
<td>Moderate</td>
<td>Has not yet been validated, but captures childhood adversity. Has been in use as a screening tool since 2015 in the US.</td>
</tr>
<tr>
<td>PEARLS</td>
<td>C</td>
<td>Small</td>
<td>Moderate</td>
<td>Currently being validated in a Randomised Controlled Trial, but captures childhood adversity. One small study found that the tool has face validity and acceptability.</td>
</tr>
</tbody>
</table>

**Grade:** A, B, C, D, or I.<br>
**Estimated net benefit:** substantial, moderate, small, nil or harmful, or insufficient (evidence).<br>
**Level of certainty:** high, moderate, or low<br>
For more detailed explanation see Supplementary Information - Grade definitions and levels of certainty.

### Table 9.3. Graded evaluation of interventions and associated recommendations for policy and practice.

<table>
<thead>
<tr>
<th>Intervention</th>
<th>Grade</th>
<th>Estimated net benefit</th>
<th>Level of certainty</th>
<th>Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Home visiting: Family Start</td>
<td>C</td>
<td>Moderate</td>
<td>Low</td>
<td>Could be provided to families of all children who need it.</td>
</tr>
<tr>
<td>Home visiting: Early Start</td>
<td>B</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Could be provided to families of all children who need it. Only available in Christchurch.</td>
</tr>
<tr>
<td>Group-based: Incredible Years (3-6)</td>
<td>A</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Could be provided for families of all children 3-6 years and above who need it.</td>
</tr>
<tr>
<td>Group-based: Incredible Years - Toddler</td>
<td>C</td>
<td>Small</td>
<td>Low-Moderate</td>
<td>Could be provided to families of all children aged 1-3 years who need it. Needs more research for social and emotional problems.</td>
</tr>
<tr>
<td>Group-based: Mellow Parenting</td>
<td>C</td>
<td>Moderate</td>
<td>Low-Moderate</td>
<td>Could be provided to families of all children who need it. Hoki te Rito, the kaupapa Māori Mellow Toddler programme, has been found to be culturally acceptable.</td>
</tr>
<tr>
<td>Dyadic: Parent Child Interaction Therapy</td>
<td>A</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Could be provided for families of all children 2-3 years and above with behavioural difficulties.</td>
</tr>
<tr>
<td>Dyadic: Watch, Wait, Wonder</td>
<td>C</td>
<td>Moderate</td>
<td>Low-Moderate</td>
<td>Could be provided for children aged 0-4 years where presentation indicates parent-child relationship problems Improves social, emotional, and cognitive problems and reduces disorganised attachment. Needs more research.</td>
</tr>
<tr>
<td>FAN</td>
<td>C</td>
<td>Moderate</td>
<td>Low</td>
<td>Could be provided to all practitioners involved with families with children under 5 years (health, education, child protection). Home visitors were more attentive to parents’ cues, better able to focus on parenting, and better able to explore the concerns of parents after training. Reduced burnout in practitioners. Positive uptake in NZ. Needs more research.</td>
</tr>
<tr>
<td>Intervention</td>
<td>Grade</td>
<td>Estimated net benefit</td>
<td>Level of certainty</td>
<td>Recommendation</td>
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<td>--------------------------------------</td>
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<tr>
<td>VIPP (includes VIG within programme)</td>
<td>C</td>
<td>Moderate</td>
<td>Low-Moderate</td>
<td>Could be provided to families of all children who need it. Evidence shows improved maternal sensitivity and a reduction in the rate of disorganised attachment in at-risk populations. The use of video to promote positive parent-child interaction is widely used in infant and early childhood mental health.</td>
</tr>
<tr>
<td>ABC</td>
<td>A</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Could be provided to families of all children who need it. Findings have included reduced disorganised attachment and normalised cortisol patterns in children and improved parental sensitivity.</td>
</tr>
</tbody>
</table>

Grade: A, B, C, D, or I.
Estimated net benefit: substantial, moderate, small, nil or harmful, or insufficient (evidence).
Level of certainty: high, moderate, or low.
For more detailed explanation see Supplementary Information - Grade definitions and levels of certainty.
References


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Appendix I Search strategy

Scopus

ACEs: 486

( TITLE-ABS-KEY ("adverse childhood experiences") 
AND  
( TITLE-ABS-KEY ("child" OR "children" OR "infant" OR "preschool" OR "pre school" OR "paediatric") ) 
AND  
( TITLE-ABS-KEY (screening OR questionnaires ) ) 
AND PUBYEAR > 1989 ( LIMIT-TO ( LANGUAGE , "English" ) )

Cochrane reviews

- 72 Trials matching "adverse childhood experience" in Title Abstract Keyword

NCBI – PubMed

- Adverse Childhood Experiences, child abuse (filters 1990-2019, humans, English, child: birth to 18, infant) - 815
- Adverse Childhood Experiences, child abuse, health (filters 1990-2019, humans, English, child: birth to 18, infant) – 577
- Adverse Childhood Experiences, health status child abuse (filters 1990-2019, humans, English) – 172
- adverse childhood experiences questionnaire (filters 1990-2019, humans, English, child: birth to 18, infant) – 604

Medline/Ovid

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<td>More</td>
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<td>7</td>
<td>limit 6 to (english language and humans and y=1980-Current)</td>
<td>155</td>
<td>Advanced</td>
<td>Display Results</td>
<td>More</td>
</tr>
</tbody>
</table>

Grey literature sources

- Centre for Youth and Wellness, website.
- Dr Denise Guy, personal communication and a presentation on infant mental health interventions.
- Early Intervention Foundation, UK, website.
- Early Start Project, NZ, website.
- Google Scholar, search engine.
- Ministry of Health, New Zealand, website.
• Ministry of Social Development, New Zealand, website.
• New Zealand Family Violence Clearinghouse, NZ, website.
• Oranga Tamariki, NZ, website.
• Public Health Wales, Wales, website.
• The Families Commission, New Zealand, website.
• Well Child Tamariki Ora Programme, New Zealand, website.
• World Health Organisation, UK, website.
Appendix II Estimated costs of health risk factors

Estimated costs of health risk factors attributable to ACEs and costs of illnesses attributable to ACEs per year.

<table>
<thead>
<tr>
<th>Health risk factor</th>
<th>Total Estimated Cost of Condition, Billion US$</th>
<th>Total attributable costs by ACE count, Billion US$</th>
<th>Total attributable costs, %GDP</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 ACE</td>
<td>≥2 ACEs</td>
<td>All ACEs</td>
</tr>
<tr>
<td><strong>Harmful Alcohol Use</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Europe</td>
<td>577</td>
<td>52</td>
<td>90</td>
</tr>
<tr>
<td>North America</td>
<td>260</td>
<td>19</td>
<td>53</td>
</tr>
<tr>
<td><strong>Illicit Drug Use</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Europe</td>
<td>135</td>
<td>14</td>
<td>31</td>
</tr>
<tr>
<td>North America</td>
<td>410</td>
<td>30</td>
<td>138</td>
</tr>
<tr>
<td><strong>Smoking</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Europe</td>
<td>909</td>
<td>51</td>
<td>115</td>
</tr>
<tr>
<td>North America</td>
<td>673</td>
<td>28</td>
<td>132</td>
</tr>
<tr>
<td><strong>Obesity</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Europe</td>
<td>709</td>
<td>10</td>
<td>30</td>
</tr>
<tr>
<td>North America</td>
<td>728</td>
<td>12</td>
<td>53</td>
</tr>
<tr>
<td><strong>Causes of Ill Health</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Anxiety</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Europe</td>
<td>80</td>
<td>6</td>
<td>17</td>
</tr>
<tr>
<td>North America</td>
<td>115</td>
<td>1</td>
<td>35</td>
</tr>
<tr>
<td><strong>Depression</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Europe</td>
<td>104</td>
<td>10</td>
<td>19</td>
</tr>
<tr>
<td>North America</td>
<td>116</td>
<td>6</td>
<td>41</td>
</tr>
<tr>
<td><strong>Cancer</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Europe</td>
<td>1034</td>
<td>17</td>
<td>100</td>
</tr>
<tr>
<td>North America</td>
<td>945</td>
<td>20</td>
<td>75</td>
</tr>
<tr>
<td><strong>Cardiovascular Disease</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Europe</td>
<td>1583</td>
<td>35</td>
<td>150</td>
</tr>
<tr>
<td>North America</td>
<td>978</td>
<td>29</td>
<td>164</td>
</tr>
<tr>
<td><strong>Diabetes</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Europe</td>
<td>203</td>
<td>1</td>
<td>15</td>
</tr>
<tr>
<td>North America</td>
<td>244</td>
<td>6</td>
<td>12</td>
</tr>
<tr>
<td><strong>Respiratory Disease</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Europe</td>
<td>251</td>
<td>9</td>
<td>38</td>
</tr>
<tr>
<td>North America</td>
<td>359</td>
<td>17</td>
<td>82</td>
</tr>
</tbody>
</table>

ACE = Adverse Childhood Experience, GDP = Gross Domestic Product

Appendix III CYW ACE Questionnaire

Questionnaire downloaded from: http://centerforyouthwellness.org/cyw-aceq/

CYW/Adverse Childhood Experiences Questionnaire (ACE-Q) Child

To be completed by Parent/ Caregiver

Today's Date: ____________________________
Child's Name: ___________________________ Date of birth: ___________________________
Your Name: _____________________________ Relationship to Child: ____________________

Many children experience stressful life events that can affect their health and wellbeing. The results from this questionnaire will assist your child's doctor in assessing their health and determining guidance. Please read the statements below. Count the number of statements that apply to your child and write the total number in the box provided.

Please DO NOT mark or indicate which specific statements apply to your child.

1) Of the statements in Section 1, HOW MANY apply to your child? Write the total number in the box.

Section 1. At any point since your child was born...
- Your child's parents or guardians were separated or divorced
- Your child lived with a household member who served time in jail or prison
- Your child lived with a household member who was depressed, mentally ill or attempted suicide
- Your child saw or heard household members hurt or threaten to hurt each other
- A household member swore at, insulted, humiliated, or put down your child in a way that scared your child OR a household member acted in a way that made your child afraid that s/he might be physically hurt
- Someone touched your child's private parts or asked your child to touch their private parts in a sexual way
- More than once, your child went without food, clothing, a place to live, or had no one to protect her/ him
- Someone pushed, grabbed, slapped or threw something at your child OR your child was hit so hard that your child was injured or had marks
- Your child lived with someone who had a problem with drinking or using drugs
- Your child often felt unsupported, unloved and/ or unprotected

2) Of the statements in Section 2, HOW MANY apply to your child? Write the total number in the box.

Section 2. At any point since your child was born...
- Your child was in foster care
- Your child experienced harassment or bullying at school
- Your child lived with a parent or guardian who died
- Your child was separated from her/ his primary caregiver through deportation or immigration
- Your child had a serious medical procedure or life threatening illness
- Your child often saw or heard violence in the neighborhood or in her/ his school neighborhood
- Your child was often treated badly because of race, sexual orientation, place of birth, disability or religion

CYWACE-Q Child (0-12 yrs) © Center for Youth Wellness 2015
# Appendix IV Symptomatology Checklist


<table>
<thead>
<tr>
<th>Tick if Present</th>
<th>Symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sleep disturbance</td>
</tr>
<tr>
<td></td>
<td>Weight gain or loss</td>
</tr>
<tr>
<td></td>
<td>Failure to Thrive</td>
</tr>
<tr>
<td></td>
<td>Enuresis, encopresis</td>
</tr>
<tr>
<td></td>
<td>Constipation</td>
</tr>
<tr>
<td></td>
<td>Hair loss</td>
</tr>
<tr>
<td></td>
<td>Poor control of chronic disease [e.g. asthma, diabetes]</td>
</tr>
<tr>
<td></td>
<td>Developmental regression</td>
</tr>
<tr>
<td></td>
<td>School failure or absenteeism</td>
</tr>
<tr>
<td></td>
<td>Aggression</td>
</tr>
<tr>
<td></td>
<td>Poor impulse control</td>
</tr>
<tr>
<td></td>
<td>Frequent crying</td>
</tr>
<tr>
<td></td>
<td>Restricted affect or numbing</td>
</tr>
<tr>
<td></td>
<td>Unexplained somatic complaints [e.g. headache or abdominal pain]</td>
</tr>
<tr>
<td></td>
<td>Depression</td>
</tr>
<tr>
<td></td>
<td>Anxiety</td>
</tr>
<tr>
<td></td>
<td>Interpersonal conflict</td>
</tr>
<tr>
<td></td>
<td>Total Score</td>
</tr>
</tbody>
</table>
Supplementary Information - Grade definitions and levels of certainty

Table S1. Grade definitions for screening tools and interventions
Adapted with permission from the U.S. Preventive Services Task Force 2012.1

<table>
<thead>
<tr>
<th>Grade</th>
<th>Definition</th>
<th>Recommendation for policy and practice</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>• The authors recommend this screening tool/intervention.</td>
<td>• This screening tool/intervention should be offered or provided.</td>
</tr>
<tr>
<td></td>
<td>• There is high certainty that the net benefit is substantial.</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>• The authors recommend the screening tool/intervention.</td>
<td>• This screening tool/intervention should be offered or provided.</td>
</tr>
<tr>
<td></td>
<td>• There is high certainty that the net benefit is moderate, or there is moderate certainty that the net benefit is moderate to substantial.</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>• The authors recommend selectively offering or providing this screening tool/intervention to patients based on professional judgment and patient preferences.</td>
<td>• This screening tool/intervention should be provided for selected patients depending on individual circumstances.</td>
</tr>
<tr>
<td></td>
<td>• There is at least moderate certainty that the net benefit is small.</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>• The authors recommend against this screening tool/intervention.</td>
<td>• The authors discourage the use of this screening tool/intervention.</td>
</tr>
<tr>
<td></td>
<td>• There is moderate or high certainty that the screening tool/intervention has no net benefit or that the harms outweigh the benefits.</td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>• The authors conclude that the current evidence is insufficient to assess the balance of benefits and harms of the screening tool/intervention.</td>
<td>• If the screening tool/intervention is offered, patients should understand the uncertainty about the balance of benefits and harms.</td>
</tr>
<tr>
<td></td>
<td>• Evidence is lacking, of poor quality, or conflicting, and the balance of benefits and harms cannot be determined.</td>
<td></td>
</tr>
</tbody>
</table>

Table S2. Levels of certainty regarding net benefit
Adapted with permission from the U.S. Preventive Services Task Force 2012 1.

<table>
<thead>
<tr>
<th>Level Of Certainty</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>• The available evidence usually includes consistent results from well-designed, well-conducted studies in representative populations.</td>
</tr>
<tr>
<td></td>
<td>• These studies assess the effects of the preventive service on health outcomes.</td>
</tr>
<tr>
<td></td>
<td>• This conclusion is therefore unlikely to be strongly affected by the results of future studies.</td>
</tr>
<tr>
<td>Moderate</td>
<td>• The available evidence is sufficient to determine the effects of the preventive service on health outcomes, but confidence in the estimate is constrained by such factors as:</td>
</tr>
<tr>
<td></td>
<td>– the number, size, or quality of individual studies;</td>
</tr>
<tr>
<td></td>
<td>– inconsistency of findings across studies;</td>
</tr>
<tr>
<td></td>
<td>– limited generalizability of findings to routine practice;</td>
</tr>
<tr>
<td></td>
<td>– lack of coherence in the chain of evidence.</td>
</tr>
<tr>
<td></td>
<td>• As more information becomes available, the magnitude or direction of the observed effect could change, and this change may be large enough to alter the conclusion(s).</td>
</tr>
<tr>
<td>Low</td>
<td>• The available evidence is insufficient to assess effects on health outcomes, because of:</td>
</tr>
<tr>
<td></td>
<td>– the limited number and/or size of studies;</td>
</tr>
<tr>
<td></td>
<td>– important flaws in study design and/or methods;</td>
</tr>
<tr>
<td></td>
<td>– inconsistency of findings across individual studies;</td>
</tr>
<tr>
<td></td>
<td>– gaps in the chain of evidence;</td>
</tr>
<tr>
<td></td>
<td>– findings not generalizable to routine practice;</td>
</tr>
<tr>
<td></td>
<td>– lack of information on important health outcomes.</td>
</tr>
<tr>
<td></td>
<td>• More information may allow estimation of effects on health outcomes.</td>
</tr>
</tbody>
</table>

1 https://www.uspreventiveservicestaskforce.org/Page/Name/grade-definitions