

Prevention and early intervention update – trends in recent research

Literature review



NSW Department of
Community Services



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Executive summary

This paper provides a brief update of the Department of Community Services' Prevention and Early Intervention Literature Review written in 2005 (Watson, White, Taplin & Huntsman, 2005). It builds on the previous review and provides an overview of the current research trends. There has been a substantial increase in the volume of research and the provision of early intervention services in the past two to three years.

The earlier review focused on four main strategies of early intervention and prevention: home visiting, high quality child care, parenting education and multi-component programs. For each of these strategies the benchmark programs were examined. As well some smaller studies investigating specific aspects of programs or strategies were reviewed.

At the time of the earlier review most of the evidence was based on methodologically rigorous university-administered studies. Analyses were usually undertaken on relatively small sample sizes and results generalised to larger populations. These studies showed often dramatic changes to the life chances of vulnerable children as a function of the intervention they received in early childhood.

As a result, policy makers in several jurisdictions have been quick to adopt the most effective programs identified in the university research and to roll them out as part of public policy. They have also been keen to ensure that there is a strong evidence base to inform both the policy and practice of early intervention. Consequently, the roll-outs have often been accompanied by rigorous evaluation. There has also been an increase in consortia-based research, large government-funded longitudinal studies and larger scale replications. Meta-analyses of the findings of several studies have also helped increase the sample size. Research literature reflects this marked trend towards evidence that is based on larger sample sizes.

In response to the increasing use of meta-analyses, and in order to make direct comparisons of different programs, researchers have adopted a more standardised method of reporting results in which they use effect sizes (or change expressed in terms of a percent of standard deviation). In human service delivery an effect size of 0.2 is considered small, 0.5 is considered moderate and 0.8 is considered large. Public policy roll-out, and the use of longitudinal data to examine the effect of 'routinely experienced' services (that is, standard services available in the community rather than the often higher quality services designed as an intervention), tended to reduce the effect sizes found in university studies by about 0.2 of an effect size.

The shift away from university-driven research towards applied research to inform policy and practice has also increased the emphasis on cost effectiveness and the cost-benefit ratio of the interventions. Policy makers in the area of child welfare have a broader societal interest in supporting services that improve the lives of families and, in particular, enhance the life chances of vulnerable children. However the need to use limited resources effectively has added the question of cost-effectiveness and cost-benefit to the standard research questions of effectiveness. It is no longer a question of 'what works and for whom?' but 'what works, for whom, at what cost and relative benefit compared with other options?'

To date only a few programs have followed children into adulthood and these have enabled long term cost-benefit analyses to be undertaken. This has led to an over-reliance on a limited number of studies, often with small sample sizes. It will take another five to ten years to reap benefit from the knowledge gained by studies started in the past few years.

In addition to the shift to larger population level studies, there has been a simultaneous narrowing of the focus of research, evident in the detailed analysis of individual programs to isolate the common elements that are critical to change. The crucial components examined in research have included the importance of practitioner-family relationships, training of staff providing the service, content and 'dosage' (for instance, duration and intensity) of the programs delivered, age of the child and characteristics of specific target populations.

This paper examines the four main early intervention strategies – home visiting, child care, parenting programs and multi-component programs – in light of these major shifts in research trends. In general, the broad conclusions are similar to those found in the previous review. Improvements due to programs are, not surprisingly, most noticeable in those at whom the service is directed. There is greater change in children where programs target children directly, rather than indirectly through their parents. Similarly, change in parents is recorded when programs target parents. Benefits are aligned with the aims of the program. Children benefit from high quality child care and these gains are mostly shown in cognitive development; maternal welfare is improved through home visiting; and parental discipline style is altered through teaching behavioural management techniques in a parent education program.

The results for home visiting as a strategy for delivering services continue to be mixed, while child care appears to be the most effective single strategy intervention for enhancing developmental outcomes. Parent education based on a behaviour management approach generally has a positive impact. However, most impacts on child and family outcomes are small to moderate. No single strategy is as effective as a combined approach which targets both child and parent.

It is still concerning that there is so much reliance on the early benchmark university studies, particularly the results of the Nurse Family Partnership study in Elmira and the High/Scope Perry Preschool. There has been some difficulty in replicating the positive findings of early home visiting interventions, not only in public policy roll-outs but also in replications of studies. Home visiting is most effective where home visitors are well-trained and families have greatest initial need, or where families perceive their children to need services because of underlying biological reasons, such as low birth weight, prematurity or special needs. Child safety is improved when home visitors provide case management services and parent-child activities to teenage parents with children under three years.

This updated review has provided the opportunity to examine the differing methodologies used in different research studies to help improve our understanding of the variations in the findings. A more detailed examination of this issue has been included in the Appendices.

The results from early childhood education studies are more consistent in showing positive effects. This may be because child care is often publicly funded and is more transparent in nature. The search for ‘what does and does not work?’ and what comprises ‘high quality’ in child care is more rigorously examined than it is in home visiting. It is also less affected by the confidential content, copyright and commercial issues that impact on the transparency and clarity of the results of some of the home visiting and parent education programs.

The conclusions from this review are that early intervention can and does change children’s developmental pathways towards more positive outcomes, with the more disadvantaged children benefiting most. This is particularly the case where high quality child care is involved and accompanied by a strategy that simultaneously targets parents and which is easily accessible within a community. The shift towards a public policy approach has broadened the outcomes examined with the emphasis more on promoting positive parenting practices and child well-being within routinely experienced services than specifically protecting children from maltreatment or ameliorating its effects.

1. Introduction

1.1 Rationale

This paper provides a brief update of the Department of Community Services' Prevention and Early Intervention Literature Review written in 2005 (Watson, White, Taplin & Huntsman, 2005). There has been a substantial increase in the volume of research and the provision of early intervention services in the past two to three years. This paper builds on the previous review and provides an overview of the current research trends.

1.2 Brief summary of findings from the previous review

The earlier review focused on research examining the effectiveness of early intervention in families with children up to eight years of age. It was structured in terms of the most common types of service delivery and examined the effectiveness of home visiting, high quality childcare, parent education and multi-component programs.

At that time the findings in relation to home visiting were equivocal. This may reflect the fact that a range of program quality and often undocumented content is delivered under the term 'home visiting'. The most effective program reported was the Nurse Family Partnership evaluated using random control trials in three sites in the United States: Elmira [NY], Memphis and Denver (Olds, 2006; Olds, Sadler & Kitzman, 2007). The Elmira families were followed up over 15 years and showed the greatest gains. The strength of the findings was difficult to replicate in the later evaluations of this program in Memphis and Denver (Olds, Kitzman, et al., 2004).

Childcare or preschool is now part of the everyday experience of most children in developed countries. The developmental benefits and disadvantages depend, to a great extent, on the quality of the care provided. However as an *intervention* to combat the effects of disadvantage, high quality child care has been shown to be the most effective and cost beneficial single strategy intervention available to enhance developmental outcomes.

The earlier review identified only a small number of parenting programs that had been evaluated empirically, despite the large number of parenting programs that are available in Australia and internationally. Most evaluations have been conducted in clinical settings with those based on behaviour management principles being regarded as the most effective.

Although research at the time of the last review generally focused on single strategy interventions, greater gains were made where multi-component strategies were implemented. When high quality child care was provided in conjunction with another strategy, such as a parent education or supportive home visiting program, there was evidence of enduring positive effects well into middle adulthood.

1.3 Method

A library search of the literature covered the period from June 2004 (the cut-off date of the previous review) until January 2007, however the editorial process has seen the inclusion of selected more recent publications. Trends in research have been highlighted rather than a comprehensive review of all literature undertaken.

The review is primarily based on a library search of *EBSCO*, *Gale*, *OVID*, *CSA* and *Informit* for access to peer-reviewed scientific journal articles. This included the following databases: *Psychology and Behavioural Science Collection*, *PsycINFO*, *Academic Search Premier*, *Family and Society Plus*, *CSA Sociological Abstracts*, *CSA Social Services Abstracts* and *Expanded Academic ASAP*. Government reports from organisations such as the National Centre for Child Abuse and Neglect in Washington and the Australian

Institute of Family Studies were accessed directly through their websites or through a more general internet search. The main keywords used for searching were 'home visiting', 'home visitation', 'child care' and 'parenting programs', as well as 'early intervention' and 'prevention' in combination with 'child maltreatment' and child abuse'. The better known researchers in each area were also searched by author name.

A complementary review of early intervention strategies for the older group of children aged between eight and 14 years has been published recently (Tully, 2007). The more recent literature on prevention and early intervention in Indigenous communities is the subject of a more detailed separate paper (see Munro, 2007, in preparation).

To avoid confusion, the terminology most frequently used in the literature has been adopted. 'Initiative' refers to an early intervention approach, usually at a policy level, which may involve a number of strategies. 'Strategy' refers to a broad type of early intervention approach, such as child care or home visiting. 'Program' is used to refer to a specifically named program, such as High/Scope Perry Preschool or Nurse Family Partnership Program.

1.4 Structure of the paper

This paper first outlines the general changes in the area of early intervention. Five major inter-related trends can be distinguished.

1. The shift towards larger sample sizes
2. The standardised reporting of results
3. An interest in critical elements common to effective programs
4. The shift towards community-based multi-component strategies
5. The incorporation of cost-benefit analyses.

Following this, the recent research pertaining to the main early intervention strategies (that is, home visiting, child care and parent education) is examined. Each strategy is considered in relation to the first three of these major trends: larger sample size, standardised reporting and identifying effective elements.

The next section examines the degree to which the effectiveness of these individual approaches may be enhanced through adopting multi-component strategies. The cost-benefit of the different strategies is then compared.

The final section of the review examines the increasing interest in how a combination of early intervention services might increase the life chances for all children in a community and, when spread over multiple communities, can improve health and well being of a nation's children.

2. Summary of current research trends

2.1 Overview

While this review considers only research published over a relatively short period of time, it is evident that several changes in focus have occurred. First, the focus has become broader with a move towards adopting early intervention as a policy and examining how this might best be implemented in terms of a system of service delivery. This mirrors a shift in our understanding of models of change. Although *explanations* of developmental health and well-being have been based on a socio-ecological framework for at least two decades (Bronfenbrenner, 1979), *in practice* preventative and treatment models have been slow to follow, often still adhering to a model of individual or family dysfunction. This has been accompanied by a stronger voice advocating integrated systems of early intervention strategies and programs and a greater interest in the availability of services at a community level.

As policy makers look for a stronger evidence base to inform both the policy and practice of early intervention, there has been a marked trend towards research that is based on larger sample sizes. This has been obtained through public policy roll-out of programs, consortia-based research and government-funded longitudinal studies. Accompanying this has been a call for rigorous evaluation. Improvement in technology and communication has led to data sharing across these large, often national, studies. As a result, enhanced databases are able to provide a ‘bigger picture’ of the developmental pathways of children as a function of differing governmental policies, service provision systems, demographic factors and how these may interact with child and family strengths and vulnerability. Researchers have adopted a standardised method of reporting the effects of human service delivery, which allows more direct comparability of results of different programs. Meta-analyses of the findings of several studies have also helped increase the size of the populations used to inform policy decisions.

Within government, budget considerations have also added the question of cost-effectiveness and cost-benefit to the standard questions of effectiveness. It is no longer a question of ‘what works and for whom?’ but ‘what works, for whom, at what cost and relative benefit compared with other options?’

There has also been a simultaneous narrowing of focus, evident in the interest in the detailed analysis of individual programs. This involves an in-depth examination of individual programs in order to isolate the common elements that are critical to initiating and sustaining change. As part of this narrowing of focus there has also been an interest in comparing target groups to examine whether some families may benefit from one strategy or program more than others.

These trends are outlined in more detail below.

2.2 Trend toward larger sample sizes

The first striking change is that smaller, rigorous, university-run studies of programs have given way to evaluations of larger, *public policy roll-outs* of the most effective evidence-based programs. These may be delivered on a universal basis or targeted to disadvantaged families. Some have been accompanied by government-funded evaluations, often carried out in conjunction with universities and reflecting the move towards collaboration between policy makers and researchers to identify the programs most likely to improve developmental outcomes. A simultaneous growth industry in copyrighted, commercially-based early intervention programs, particularly parenting education programs, appears to have accompanied the increased government interest in investing in these areas.

The broadening of emphasis is also reflected in the increasing interest in tracking children’s development through a number of *large national longitudinal studies*, often run by consortia of government and university research bodies. High-risk sub-samples of these studies are being analysed to investigate risk and protective factors and the degree to which use of the standard services available, such as child care, may alter children’s developmental pathways.

Another development related to larger sample sizes has been an increase in the number of *meta-analytic reviews*. At best these combine the results of rigorous studies that measure the effect of the same, or very similar, interventions on the same outcome measures in comparable populations. By increasing the sample size in this way, conclusions can be drawn with greater confidence. This is especially useful where the outcomes measured include such rarely occurring events as child abuse and neglect. At worst, the results of rigorously evaluated effective programs are masked by the inclusion of ineffective programs, interventions and samples that are not comparable or studies that are based on poor methodology, all of which have the capacity to either artificially inflate or reduce intervention effects.

2.3 Standardised reporting of results

The shift towards larger sample sizes has precipitated a change in how results are reported. Results are now less often reported in terms of alpha values (such as, $p < 0.05$) and more commonly reported in terms of effect sizes (measured in standard deviation units). Alternatively, when events are relatively common, they are reported in terms of the probability of changing a developmental outcome (odds-ratios). This is apparent whether the larger samples are obtained through public policy roll-out, government-sponsored national longitudinal studies, consortia collaborating to carry out larger studies or meta-analytic reviews. As the links between research and policy strengthen, it is important to make findings transparent with regard to the actual effect on the lives of children and their families. Rules of thumb used in evaluations of social service programs define effect sizes of up to 0.2 as small, 0.5 as moderate and 0.8 as large (Cohen, 1983; McCartney & Rosenthal, 2000)¹.

In this regard the trend towards larger sample sizes also holds some dangers. It means that very slight differences between groups become reportable effect sizes or show statistical significance. It is important to look closely at the degree of change, and the calibration and accuracy of the measures used, in order to gauge the relative importance of the real-life change for the children involved. For example, how meaningful in terms of change to their lives is a one point improvement on a cognitive developmental scale devised for two year olds with a range 50 to 150 points, even if it is statistically significant?

It is also important to avoid reporting results of rare events in terms of comparative percentages as sometimes happens in child maltreatment research. The intent may not be disingenuous but it can be misleading. This is the case when, for instance, researchers argue that a control group had a 50% higher rate of abuse without stating that the figures used involved two cases of child maltreatment in an intervention group compared with three cases in the non-intervention sample.

2.4 Drilling down – ‘what works and for whom?’

There has also been a strengthened research effort to identify the components critical to effecting change. These studies, usually smaller and more tightly controlled, examine the detail of ‘what works’ in the content of the program or in its implementation. It includes a closer look at who might benefit. Predominant among the areas of current interest are: active engagement strategies for hard-to-reach families; the importance of the practitioner-family relationship; the quality and duration of the intervention; as well as the importance of family-specific factors, such as ethnicity, substance abuse or mental illness.

At the same time there have been some attempts to replicate the findings in relation to specific programs (such as the Nurse Family Partnership) or specific outcomes (such as readiness to start school or child maltreatment) often using larger samples. In some cases replication of results has been difficult to attain. Where this has occurred the original methodology has been examined in more detail to try and find an explanation.

¹ For example, an effect size of 0.2 signifies that there is one-fifth of a standard deviation difference between the intervention and the control group.

2.5 Shift towards multi-component and community strategies

The fourth major change is the increased integration in the area of prevention and early intervention. The competitive zeal of different approaches vying to be recognised as the ‘best’ intervention has increasingly been replaced by investigating the ways in which these components can be combined to increase effectiveness. Often both parents and children are targeted with linked, simultaneous and/or consecutive services.

As part of this shift there is increasing interest in ensuring that communities have adequate services and investigating the impact these services have on families in that community. There has been a trend for the developmental well-being of a generational cohort to become a focus of social policy, with an examination of the mix of services needed to optimise developmental outcomes.

2.6 Greater use of cost-benefit analysis

The move towards government-funded public policy roll-out and large research initiatives has driven a fifth change in the focus of research. There is now more concentrated focus on cost-benefit analysis² as governments aim to ensure that they are maximising the outcomes from the funding allocated to these services in terms of the degree of change and the number of families assisted.

Whether small effect sizes are meaningful or not depends on the value of the outcome measured and whether it can be replicated across an entire population, as well as whether the intervention is cheap or expensive to deliver. Using a medical analogy, Gomby (2005) noted that a worthwhile small effect is to give adults a cheap aspirin every day if it reduces death by heart attack. If, on the other hand, a relatively expensive program produces only a small effect size on a paper and pencil test, then the program may not be worth replicating. She makes the point that it is more important that early interventions produce changes in parent behaviour, rates of child abuse or grade repetition at school than the more dubious benefits of better scores on paper and pencil tests (McCartney & Dearing, 2002).

The benchmark is no longer just the research standard of ‘significant change’ but weighing up the alternatives in terms of meaningful change to life chances on a per capita cost basis. In 2007 an entire issue of the journal, *Economics of Education Review*, was devoted to the cost-benefit analysis of early intervention (Belfield, 2007).

² Whereas cost-effectiveness will just show that one program is more effective than another for a similar cost, a cost-benefit analysis looks at whether it is worth implementing either program based on the longer term economic benefits weighed up against the cost outlay for the program.

3. Home visiting

3.1 Summary of previous findings

The most convincing home visiting results reported were from the first study site of the Nurse Family Partnership³ in Elmira, New York. This study was a randomised control trial aimed at disadvantaged first-time mothers who were followed up for 15 years after the birth of their child (Olds, Eckenrode, Henderson, Kitzman, et al., 1997; Olds, 2006; Olds, 2007). The greatest positive effects pertained to the group of poor, unmarried mothers ($n = 38$ in the intervention group, $n = 62$ in the control group). Gains were not confined to children, for instance in terms of lower crime rates and less substantiated abuse and neglect; their mothers also benefited. Mothers had less closely spaced pregnancies and spent less time on welfare.

The strength of the Nurse Family Partnership findings in Elmira has been difficult to replicate when the same program was implemented in Memphis and Denver. There were, however, still some gains made by mothers and modest, positive effects on children's development. The Community Mothers Program was also seen as having potential although it was less well evaluated (Barker, 2004; personal communication; Johnson, Molloy, Scallan, Rooney, Keegan & Byrne, 2000).

Reviews of other home visiting programs were less conclusive. This was considered, in part, to be a function of the amalgamation of a number of different programs under the umbrella concept of home visiting. This may mask the positive effects of some programs by the counterbalancing negative effects of others.

Even when the program being tested was quite structured (such as Healthy Families America, Hawaii Healthy Start, Parents as Teachers or Home Interaction Program for Parents and Youngsters), there were often large differences in effectiveness between sites. It has been suggested that personal and relationship factors may play a larger role than had been previously suspected.

Many of the other evaluations lacked rigour and were based on 'satisfaction' type rating scales, along with a few open-ended questions. This approach only provided clues as to what might or might not work, rather than the harder evidence base that more rigorous research would deliver. It was suggested that home visiting programs needed to have clear and measurable goals and work within a theoretical framework that explicitly focused on behaviours linked to negative outcomes. Additionally it was concluded that more data was needed on the practicalities of how to enrol and engage families and the reasons behind high attrition rates. It was also suggested that closer examination was required to see which families were helped, how many visits were needed and to which qualities of the home visitor the parents responded.

It was argued that home visitors needed particular personal qualities, to be well-trained and offered supportive supervision, especially if they are dealing with vulnerable families with many inter-connected and complex issues.

3.2 Results of recent reviews and public policy roll-outs

Home visiting is now the most commonly used approach in serving families with young children in the United States. At least 37 states have adopted home visiting strategies and reach around 400,000 children and families each year across the United States. It has also been rolled out in several states in Australia as a targeted intervention for high risk families.

In 2005, Gomby reviewed the effects of home visiting on outcomes for children and parents who had been part of large public policy home visiting roll-outs in the United States. Her review focussed on programs for mothers with children from birth to five years that:

- aimed to promote child health and development and/or prevent child abuse and neglect
- were part of enhanced paediatric practice
- were used in combination with early childhood education (this group was considered separately, as has been done in this review, see Section 6).

Gomby also considered the results of several meta-analytic reviews (including Sweet & Applebaum, 2004; Sikorski, Renfrew, Pindoria & Wade, 2004; Hodnett & Fredericks, 2004; Geerart, Van den Noorgate, Grietens, & Onghena, 2004) and a literature review from Bull, McCormick, Swan & Mulvihill (2004). Concentrating on those programs that offered home visiting only, or had home visiting as one of their program options, she took into account the evaluations of the following programs:⁴

- Parents as Teachers
- Healthy Families America
- Early Head Start
- Parent Child Home Program
- Home Instruction for Parents of Preschool Youngsters (HIPPPY)
- Nurse Family Partnership (NFP).

The results presented here in relation to the evaluations of public policy roll-outs have been informed by Gomby's (2005) review. Large sample analyses in relation to specific outcomes, replications and longitudinal study data add to the picture of current research findings.

3.2.1 Benefits for children

Home visiting is a parent-directed intervention. Benefits to children are expected to flow indirectly from the changes brought about in maternal behaviour. It has now widely accepted that home visiting produces the greatest gains for mothers, with less direct benefit for children (Marshall & Watt, 1999; Shonkoff & Phillips, 2000; Mustard, 2007). Most studies and meta-analyses show few direct or enduring benefits for children. Geerart et al. (2004) identified more positive findings in their meta-analysis but their review criteria were less stringent and they included studies that relied on pre-to-post changes in the absence of a control group. Lower quality research tends to inflate effect sizes (MacDonald, 2004; Neill, 2006).

⁴ *Parents as Teachers*. In 2002, a national program, 3000 sites in all 50 states, the District of Columbia and six other counties with a reach of 330,000 children prenatally to five years.
Healthy Families America. In 2002, 450 communities in 39 states reaching 66,000 families.
Early Head Start. In 2004, 650 programs serving 62,000 children under age three years.
Parent Child Home Program. In 2005, in 12 states with 140 program sites serving 4,000 families.
HIPPPY. In 2002, 160 programs in 27 states and Columbia and Guam reached 16,000 families.
NFP. In 2002, in 22 states and 24,000 women tested scientifically on three communities.

Infant and baby health

Most home visiting programs have not been found to increase the utilisation of health care or to lead to benefits in children's health care status. There is some evidence that home visiting encourages breastfeeding (Sikorska et al., 2004; Kemp, 2006) but it seems home-visited mothers do not breastfeed any longer than those who were not home-visited (Sikorska, 2004; Higgins, Bromfield, Richardson & Higgins, 2006). Children of home-visited mothers had high levels of immunisation and 'medical homes' (an established relationship with a local medical practitioner) but so too did children of mothers who were not home-visited.

For low birth weight babies, the picture is unclear. The young teenage mothers in the Elmira Nurse Family Partnership Program (NFP) had fewer low birth weight babies than the comparison mothers but, linked to this, they also had initial high levels of smoking which were reduced during antenatal home visits. The findings regarding smoking and low birth weight babies were not replicated in the evaluation of the same program (NFP) in Memphis, where initial levels of smoking were low. The same program delivered by paraprofessionals in Denver showed a reduction in the number of low birth weight babies but this was not the case when nurses visited (Olds et al., 2004).

Cognitive achievement

Large cognitive benefits have not been demonstrated reliably in high quality randomised control trials of home visiting programs such as Parent as Teachers, Parent Child Home Program, HIPPPY or Early Head Start (Gomby, 2005). For children who were socially at risk, the positive effect size of home visiting was very slight at 0.09 (Sweet & Applebaum, 2004). This accords with previous reports of no significant differences except for a gain of around two IQ points in the home-visited groups. The benefits were smaller than those associated with attendance at a centre-based child care program, either as the sole intervention or in combination with home visiting (Gomby, 2005).

There were no differences in language development or early identification of language problems in a randomised control trial of 513 at risk three-year-olds who were home visited (King, Rosenberg, Fuddy, McFarlane, Sia & Duggan, 2005).

If seeking to identify changes in cognitive development, it may be more meaningful to use other measures that reflect the practical impact of cognitive gains on children's lives, rather than measuring change in IQ. This might include outcomes such as differences in rates of grade repetition, placement in special education, school achievement and high school graduation.

Social and emotional development

Because home visiting can produce small but positive changes in parenting attitudes and perhaps behaviour, it was thought this may lead to stronger parent-child attachments and protect children from delinquent behaviour in adolescence. Most commentators and researchers still rely on the Elmira NFP study when arguing the case for the benefits of home visiting in relation to social and emotional development. Earlier reports of significantly fewer 'instances of running away' and 'number of days that alcohol was consumed' have been shown to be incorrect on re-analysis (Olds et al., 2007). However, at the 15-year follow-up, nurse-visited children had significantly fewer arrests and, parole violations/convictions; and amongst the unmarried, poor families there were fewer sexual partners (2.5 as opposed to one) compared with children in the randomly allocated control group.

Many of the remaining measures showed no significant differences between the home-visited and the groups who were not home-visited.⁵

In sum, effect sizes for home visiting delivered as a single strategy intervention are very small but positive in relation to the benefit to children. Aos et al. (2004) conclude that the effect size is around 0.1 on the cognitive and social-emotional development of children (Gomby, 2005).

Child abuse and neglect

As child maltreatment is a relatively rare event in the general population, it is difficult to show statistically significant differences between groups. Nevertheless the results were initially promising. Hawaii Healthy Start found one per cent of child maltreatment reports in the home-visited group compared with 18 per cent in the control group (see Watson et al., 2005). In the roll-out of Healthy Families America in Oregon there was a 1.2 per cent rate of maltreatment in home-visited families compared with 2.2 per cent in the comparison families (Greene, Mackin, Tarte, Cole & Brekhus, 2005).

In an attempt to replicate the early Hawaii Healthy Start findings in a state-wide trial of the program, Duggan et al. (2004) tested this specific hypothesis on 643 families in a randomised control trial. They concluded that this program did not prevent abuse or promote the use of non-violent discipline, although it had a modest impact on neglect.

Reliance for the positive effect of home visiting on child maltreatment has mostly been placed on the Elmira study. Here the number of verified reports was lower amongst mothers who had been home visited, although this was not apparent until the 15-year follow-up, when all reports were examined.

In a more recent trial of nurse home visiting, Macmillan, Thomas, Jamieson, Walsh Boyle, Shannon et al. (2005) randomly allocated a comparatively large sample of maltreating families ($n = 163$). They found that home visitation by nurses⁶ did not affect the three year follow-up incidence of maltreatment according to child protection services reports. Surprisingly, hospital records showed significantly more abuse and neglect in the intervention group than in the control group. When families reported by public health nurses were excluded, there were no differences between the groups (five mothers continued to maltreat in the intervention group and three in the control group) suggesting this initial difference was due to a surveillance effect (MacMillan et al., 2005).

Duggan, Caldera, Rodriguez, Burrell, Rohde & Crowne (2007)⁷ also examined the effects of paraprofessional home visiting on child abuse and neglect in a randomised control high-risk sample. There was no overall program effect on maltreatment reports and most measures of potential maltreatment. Home-visited mothers reported using mild forms of physical discipline less often than control mothers. The groups were similar in their use of more severe forms of physical discipline. There was no program impact on parental risks. There was no impact on outcomes for families with a 'high dose' of home visiting. Home visitors often failed to address parental risks and seldom linked families with community resources.

⁵ The large sample consisted of 400 mothers randomly allocated to one of four groups. There were 100 in the intervention group who received pre- and post-natal home visits. The 100 who received pre-natal visits only were dropped from the analysis. In the small sub-sample of 100 unmarried, poor mothers there were 38 in the intervention group and 62 in the comparison group. In the large sample there were significantly lower rates of child arrest measured by mother report. There were fewer convictions/parole violations and arrests when six co-variables were entered. However there were no differences in arrest rates, need for supervision or sent to a correctional centre without the co-variables entered. In the large sample there were no differences in 'ever in need of supervision' or sent to correctional centre, minor antisocial acts, major delinquent acts, number of externalising, internalising or acting out problems, ever had sexual intercourse, ever been pregnant or made someone pregnant, incidence of sexual partners, incidence of short-term or long-term suspensions, incidence of cigarettes smoked in a day, incidence of days drank alcohol, incidence of used drugs, alcohol impairment self-report, alcohol impairment parents report. A problem with incident-based reporting is that a few children can contribute disproportionately.

⁶ One and a half hour visits every week for six months, then every two weeks for six months and then monthly for 12 months.

⁷ This more recent research was included as part of the editorial process after the cut-off date for the general literature search.

The recent evaluation of Healthy Families Alaska (Gessner, 2008)⁸ followed up the families of 985 children enrolled in the program. Although rates of abuse and neglect decreased significantly in the home visited group, the decrease was only seen in the group that received 20 or more home visits and the decrease was matched in size in the families who had not been home-visited. Gessner (2008) concluded that there ‘was little evidence that Alaska’s home visiting program had a measurable impact on child maltreatment outcomes (p. 317).

Chaffin (2004; 2006) and Gomby (2005) suggest greater caution as the results are ‘decidedly mixed’. Given the rarity of maltreatment, they suggest that the use of more indirect or proxy measures may give greater understanding.⁹

Proxy measures of child maltreatment

The picture is more positive in relation to the outcomes of home visiting on child abuse and neglect when proxy measures are used (Bilukha, Hahn, Crosby, Fullilove, Liberman, Moscicki et al., 2005). Healthy Families America show decreased rates of hospitalisation for injuries and ingestions and lower maternal self-reported harsh discipline (Gomby, 2005). However, studies often rely on maternal self reports which are not always reliable. Mothers have been shown to significantly under-report injuries in their babies aged from birth to three years compared with the primary care medical record. In a sample of 443 mothers, 48 per cent recorded child injuries according to the primary medical health record compared with 22 per cent by maternal report (Stone et al., 2004).

The Nurse Family Partnership studies indicated that control mothers were more likely to punish their children at the two year follow up. However, at the four year follow up, punishment is more common among the nurse-visited mothers (Olds, Henderson, Chamberlain & Tattlebaum, 1986). Similar inconsistent results were found in relation to emergency visits.

It is concluded that home visiting programs may have a small effect (0.24) on reducing the potential for abuse or risk factors involved in maltreatment, but they have no effect on decreasing actual abuse and neglect rates (Sweet & Applebaum, 2004; Higgins, Bromfield & Richardson, 2006). In concordance with these findings, Gomby (2005) concludes:

*In sum, the strongest evidence for the benefits of home visiting programs in the **prevention of child abuse and neglect comes primarily from one study (the NFP)** or from multiple studies employing measures other than CPS reports. Program effects are dependent on characteristics of the families served and the ability of the program to address the underlying risk factors associated with abuse and neglect. (p.23, emphasis added).*

3.2.2 Why might child maltreatment results be difficult to replicate?

In general, other home visiting programs have not been shown to be as effective in promoting positive outcomes for children as the Nurse Family Partnership Program. Even the Nurse Family Partnership replications of the Elmira study in Memphis and Denver were less convincing. Attempts to replicate the positive results of, for instance, the early Hawaii Healthy Start program in child maltreatment reduction have been not been able to retain the strength of their earlier findings. The reasons why the program delivered in Elmira is able to report more positive results warrants closer examination (see Appendix A for detail). The example used in this review relates to child maltreatment but the issues raised are likely to be valid for other outcome measures.

⁸ This more recent research was included as part of the editorial process.

10 ⁹ This more recent research was included as part of the editorial process.

- *Fidelity of roll-out.* The reduction in the significance of findings may be related to lack of program fidelity as it is rolled out as part of a large public policy initiative rather than the more tightly controlled university experimental paradigm.
- *Length of time of follow-up.* Elmira families have been followed up for 15 years. Other programs have either not yet had enough time since inception for changes to be significant or follow up for this length of time was not carried out.
- *Different units of analysis.* In relation to child maltreatment, most replications compare the numbers of abusive mothers in each group and find that these did not significantly differ. This is also the case with the Elmira data (Olds et al., 1997; Eckenrode et al., 2001). The unit of analysis in the Elmira study where significant differences were found was based on the number of state-verified reports. This means that one or two mothers can contribute disproportionately to the numbers of verified reports.¹⁰
- *Persistence of abuse.* Drilling down further into the Elmira data, Eckenrode et al., (2001, p. 885) found that for the 39 children who had at least one verified report before age 10 there was no difference in the *proportion of children* who had been abused between the nurse-visited and the comparison group (child-limited abuse, mean number of reports was 1.6). For those with at least one verified report at age 10 or over (adolescent-limited abuse) there was no difference in the *proportion of children* abused in the adolescent limited group between the nurse-visited and the comparison group ($n = 19$, mean number of reports = 1.2). A third category of children were considered persistently abused. These children had at least two reports, one under the age of 10 and one when the child was 10 or older (mean number of reports 4.3). There was a slight difference in the *proportion of children* who were abused as a function of home visiting in this group ($n = 12$), with fewer being in the nurse-visited group ($p = 0.08$). Given the serious sequelae of child abuse and neglect, the acceptance of a higher probability of this being a chance finding than would usually be the case in research may be justified.
- *Small sample size.* In most outcomes measured in Elmira, stronger effects of nurse home visiting were found in the most disadvantaged group, that is, low socio-economic status (SES), unmarried and young mothers¹¹ (Olds et al., 1997). The intervention group at Elmira with all three risk characteristics comprised only 23 mothers. The small sample size makes the inability to replicate findings less surprising. Even in later analyses when the risk factor of 'young' parent was dropped there were only 38 mothers in the high risk home-visited group (unmarried and low SES).

Gomby (2005) points out that despite the limited evidence and the difficulty there has been in replicating findings, home visiting is widely upheld as an effective preventative measure for child abuse and neglect. The US General Accounting Office, the US Advisory Board on Child Abuse and Neglect, the American Academy of Pediatrics, the Association of Maternal and Child Health Programs, the Centers for Disease Control and Prevention, the Office of Juvenile Justice and Delinquency Prevention, the National Academy of Sciences and the National Governors Association have all endorsed home visiting as a method of preventing child abuse and neglect. The Task Force on Community and Preventative Services even concluded that 40 per cent of all maltreatment would be prevented if home visiting were widely available.

¹⁰ The original articles (Olds et al. 1997; Eckenrode et al. 2001) refer to the numbers of verified reports. Based on the same data analysis in 2007, Olds et al. argue that 'in contrast to women in the comparison group, those visited by nurses were 48% less likely to be identified as perpetrators of child abuse and neglect' (p. 378). The 48% cited tallies more closely with the decrease in verified reports than the proportion of women suggesting the a 'verified report' is also the unit of analysis referred to here.

¹¹ Classification of risk levels was made at registration. 'Low SES' was defined by occupation and included semi-skilled and unskilled workers; 'unmarried' was defined by legal status (although 20 percent of unmarried mothers were living in de facto marriages) and 'young' was defined as less than 19 years.

3.2.3 Benefits for maternal life course

The benefits seem to be greater for mothers, again with most positive gains coming from the Elmira study (Olds et al., 1997). The disadvantaged group of 38 unmarried, poor, nurse-visited mothers who were followed up 15 years later reported fewer arrests or convictions of their child than the comparison group (also reinforced by Criminal Justice Services records for crime against property).

These mothers also differed significantly in the delays between their first and second born child (65 vs 37 months) and, in a related finding, their own estimations of their use of welfare over the past 15 years. The home visited group spent an estimated 60 months on welfare compared with 90 months for the non-home-visited. They had 1.3 compared with 1.6 subsequent births and reported a lesser impact of drug and/or alcohol abuse on their lives.

At the same 15-year follow-up, Izzo, Eckenrode, Smith, Henderson, Cole, Kitzman and Olds (2005) interviewed the mothers in the Elmira families, around 85% of whom had at least *one* risk factor (that is, they were unmarried *or* poor *or* young at the time of the birth). They found that the number of uncontrolled, stressful life events resulted in fewer negative outcomes for mothers if they had been nurse home-visited (after locus of control, marital status, age and socio-economic status were taken into account).

The replications of the Nurse Family Partnership in Memphis and Denver were less marked, with differences between first and second births of about 27 months compared with 30 months (that is, an extra delay of three to four months). There were similar three to four month reductions in the receipt of welfare and food stamps, probably related to this delay in subsequent pregnancy.

Even where there was evidence that mothers took up an educational course there were no differences in achievement, vocational credentials, employment or welfare receipt between those who were home-visited and controls (see Early Head Start, Hawaii Healthy Start or Teenage Parent Home Visitor Services) (Gomby, 2005).

These results are reinforced by a randomised control trial undertaken by Fergusson, Grant, Horwood & Ridder (2006) in New Zealand. They examined the extent to which the Early Start Nurse Home Visiting program had beneficial effects in maternal health, family functioning, family economic circumstances, exposure to stress and adversity ($n = 220$ Early Start, $n = 223$ control.) They also found a consistent lack of benefits for mothers although there were a few child-related benefits. There were small effects related to parent behaviour in the areas of child health, preschool education and non-punitive parenting. There was no evidence that mothers became more self-sufficient.

In sum, the meta-analytic reviews undertaken since 2004 revealed that home visiting does not generally improve mother's economic self-sufficiency although there was a small effect (0.13) on educational outcomes (Sweet & Applebaum, 2004). Gomby (2005) concluded that studies have not yet shown benefits in terms of increasing mothers' social support, decreasing stress or increasing their use of community resources and, at best, they accrue very small benefits in relation to their mental health.

3.2.4 Why might findings on maternal self-sufficiency be difficult to replicate?

Although there were very significant reductions in rapid repeat births in Elmira NFP amongst the 38 poor, unmarried mothers, this has not been replicated with the same strength elsewhere. There were much smaller reductions in the Denver and Memphis NFP. No differences have been recorded in rapid repeat pregnancy in either Hawaii Healthy Start or Teenage Parent Home Visitor Service to demonstrate that home visiting addresses contraception issues effectively (El-Kamary, Higman, Fuddy, McFarlane, et al., 2004). The inability to replicate findings is usually considered to be due to different program content or different characteristics of the home visitors.

In order to examine what nurses actually did or said to reduce the rate of rapid repeat pregnancies, Gray, Sheeder, O'Brien & Stevens-Simon (2006) examined the nurses' log books in the Denver Nurse Family Partnership sample. These books recorded what had happened in the meetings with the mothers. There were a total of 111 mothers aged 13 to 19 years who had both antenatal and postnatal home visiting. The content of the recorded discussions was unrelated to whether these teenage mothers conceived or not.¹² Gray et al. (2006) concluded that 'the magnitude of the benefit attributed to many programs is so disproportionate to their intensity that the reports are difficult to take seriously' (p. 390).

Even when reducing rapid repeat pregnancies was a planned goal of home visiting, Jacobs, Esterbrooks, Brady and Mistry (2005) also report that 90 percent of parents state their home visitor's opinion on family planning did not affect their own decisions.

Some of the difficulty in replicating findings with regard to maternal self-sufficiency, particularly rapid repeat birth, may be related to social change. This applies particularly in relation to women's educational and employment opportunities and reproductive control that have occurred since the early 1970s. At the time when Elmira started in 1978, the contraceptive pill had been in circulation for only a few years, with substantial negative social stigma attached when used by women, especially young women, who were unmarried.¹³ Doctors often refused to prescribe the pill unless the woman was married. Abortions were more commonly illegal, much more difficult to obtain and seen in a very negative light. By the time the later studies started, there was less social stigma attached to taking a contraceptive pill and abortions were more easily available and more common.¹⁴ These changes increased control over rapid repeat birth for all mothers, perhaps reducing the likelihood of showing differences between groups. Social change may also affect the results for female educational status and workforce participation.

3.3 Drilling down – 'what works and for whom?'

In order to explain the mixed results of home visiting as an intervention, researchers have attempted to 'drill-down' to see why some programs seem to work while others do not. This includes examining engagement and retention strategies, as well as identifying the effective elements common to different programs.

The 'drill-down' research is still quite fragmented, often with only one aspect of program roll-out being examined in each study. However, it is clear that program effectiveness will relate to the ability to engage the families. Many of the same factors that predict engagement are also predictors of the ability of the program to bring about change. The relationship that the practitioner can forge with the family is critical, although program factors such as content and duration are also important.

Many studies count families as being 'home-visited' when they have been randomly allocated to a 'home visit' group but not received any home visits at all (analysis undertaken by 'intention to treat'). If outcomes for these families improve, can this really be counted as a positive effect of home visiting? If their situation deteriorates, can this be counted as a program failure? The most distressed families are likely to be the most difficult to recruit and engage. Is a program that makes minor positive differences to a group of very complex families less effective than one which helps a group of highly motivated middle-class families but fails to engage families most in need of help?

¹² Almost everyone received the recommended number of visits. Proactive discussions of contraception were not mentioned in the reported content so the visits could not explain the findings. Discussions and active interventions related to lapses in contraceptive use were only documented in 30% of the visits and the incidence of these discussions was unrelated to whether the teenage mothers conceived or not. The only difference between those who became pregnant and those who do not was that they were less likely to have used contraceptives in the previous six months.

¹³ 'Initially, use of the pill was largely restricted to married women. Some doctors were reluctant to prescribe for unmarried women unless they could justify a medical indication... advice to prevent pregnancy was considered immoral' (ABS, 1996, p.5). This applied especially to unmarried minors (under 21 years) (ABS, 1996).

¹⁴ In 2003 an estimated one in four pregnancies was terminated by abortion in Australia (Chan & Sage, 2005) and two thirds of women between 18 and 49 were taking some form of contraceptive (ABS, 2001 Year Book, A Century of Population Change).

3.3.1 Reasons for lack of engagement and change

Family factors

Retention in home visiting programs has been a major issue. As reported previously, retention rates vary between 20 per cent and 40 per cent (Gomby, 1999). The drop-out rate for Parents as Teachers with teenage parents was 57.5 per cent and for the Comprehensive Child Development Program was more than two thirds by the end of the five year program (Wagner, Spiker, Linn, Gerlach-Downie & Hernandez, 2003).

There seem to be two groups of parents who do not engage. Firstly, there are those who have an accurate belief that they are already coping well, have adequate parenting support and do not need further services (McCurdy, Daro, Anisfeld, Katzev, Keim, LeCroy et al., 2006). These families have higher educational levels and healthier, higher birth weight babies than those who do accept services (Barlow et al., 2005; Barnes et al., 2006; Duggan et al., 2000; McCurdy et al., 2006).

At the same time, the findings of several studies suggest that the most vulnerable families are most likely to refuse to engage from the outset and also drop out early. These vulnerabilities included stress, poverty, personal health and motivation (Brookes, Summers, Thornburg, Ipsa & Lane, 2006; Barlow, Kirkpatrick, Stewart-Brown & Davis, 2005), teenage parenthood (Barlow et al., 2005), lack of social support from family and friendship circles (Brookes et al., 2006; McGuigan, Katzev & Pratt, 2003) and poor community health (McGuigan et al., 2003). This reinforces the findings of Barnes, McPherson and Senior (2006) that families who need help the most – that is, the most socially, educationally and economically disadvantaged families – were less likely to take up the offer of home visiting.¹⁵

Some vulnerable families did, however, accept support. These families were more likely to have larger families, family members with health or mental health problems and no local support network (Barnes et al., 2006). Perhaps in these families difficulties can be seen as ‘outside their personal control’, either biological or physical, or the lack of support being geographically related rather than personally defined. These families may be more likely to accept help than those where the offer of assistance only serves to further their sense of personal failure.

In line with this concern about attrition, there is now increased interest in strategies which may be useful in recruiting and engaging vulnerable families into services (see Watson, 2005). This might involve door-knocking rather than phoning, describing the service as ‘support’ rather than ‘intervention’, offering financial incentives, providing concrete services, bringing toys for children and, fundamental to both engagement and bringing about change, building up a strong positive relationship between caseworkers and families.

Home visitor factors

Relationships: There is mounting recognition of the critical importance of the relationship between the home visitor and the family. This person is attempting to bring about change in 20 to 30 visits (that is, in 20 to 30 hours) to a parent whose experiences throughout their life have made them wary of relationships (Barlow, Kirkpatrick, Stewart-Brown & Davis, 2005). Some outcomes are easier to attain than others. For instance, it is probably easier to encourage health outcomes that can be ‘ticked off’ within a shorter time frame, such as breast feeding, immunisation or finding a medical base. It is much harder to change life-time patterns of trust and distrust, alter automatic but dysfunctional parenting styles, reduce domestic violence or help very stressed parents keep control of their tempers and refrain from lashing out at children (Herrenkohl & Herrenkohl, 2007).

¹⁵ This dichotomous nature of ‘refusers’ reflects the difficulties of research in the area, where averaging eg size of social support networks or education levels rather than looking at clustering, may mask differences between groups.

As Gomby (2005) points out, the home visitors are the program for families. To break ingrained emotional patterns of parental response, home visitors need to have well-honed personal skills because it is the rapport that they establish which makes it likely that parents will follow their advice. They also need the organisational skills to deliver the program, the problem solving skills to address current issues and the cognitive skills to do the written work required, although the more prescribed programs may not require such high levels of training (Gomby, 2005).

Besides good interpersonal skills, researchers have tried to establish whether there are strategies that could help form positive and trusting enough relationships to act as a springboard for change. This area is not yet rigorously researched (see Watson, 2005) but there is some evidence that it is important for home visitors to:

- engage the mother before the birth of the child. This may more clearly give the message that the home visitor is there to support the mother in her efforts to look after the baby, rather than being seen as a post-birth judgement that the baby may need protecting from the mother (Higgins, Bromfield & Richardson, 2006).
- signal positive intent by helping the parent achieve change in something they see as their most immediate problem. This is often a concrete need and may be something as simple as fixing a washing machine. By doing this quickly, it also indicates that the home visitor has the capacity to bring about change. Also bringing toys or food, playing with the children, helping with tasks around the house are all practical ways that home visitors signal positive intent.
- have personal qualities that give the parents the message that the home visitor is working with them rather than monitoring and judging them (Dunst, Boyd, Trivett & Hamby, 2002), including demonstrating conscientiousness and respect (Brookes, Summers, Thornburg, Ispa & Lane, 2006).

Prochanska and DiClemente (1992) have suggested a model to help bring about change. They argue that social workers should work at the pace of the parents in following a series of steps. These consist of helping parents to recognise that there is a problem, thinking about the problem and creating an intention to change, working out how to go about change and acting on it, and then maintaining it. However, in examining social worker influence on this process, problem recognition and intention to change were related more strongly to external events and did not change as a function of social worker intervention, its frequency or duration (Littell & Girvin, 2006). These findings do not necessarily negate Prochanska and DiClemente's approach but they do highlight the complexity and multiplicity of factors that can impact on families' lives and the difficulty one person has in bringing about change.

The Family Partnership model (Barlow, et al., 2006) is based on Prochanska and DiClemente's framework. Barlow et al. (2006) suggest that this model may improve infant cooperativeness and maternal sensitivity but the difference in rating was minimal.¹⁶

Relationships take time to build and energy to sustain. Stability of staff is critically important. Turnover can have a devastating effect on success rates. Gomby (2005) argues that the 50 per cent turnover rate amongst the nurses in the Nurse Family Partnership program in Memphis may help explain the more limited results than the same program in Elmira. She suggests high turnover may be related to low pay levels. This is especially relevant to paraprofessionals where drop out rates can be even higher. In the Early Head Start evaluation, low wages (averaging US\$9.77 per hour) was given as a reason for staff unhappiness (Gomby, 2005).

¹⁶ The difference was based on the observation of a three-minute video. There was only a one point difference when their own reliability criteria for the scale are set such that a two point difference is considered equivalent. They point out themselves that the significant differences they did find could be just a chance finding that occurs when multiple comparisons are made.

Trained staff: Hawaii Healthy Start did not affect child abuse and neglect rates; it neither reduced risk factors nor increased service usage rates. One of the explanations was that staff needed to be better trained to recognise parental risk factors and actively link families with community services (Duggan et al., 2004b).

Most home visitors are paraprofessionals and their efforts showed only modest gains. Similarly the volunteer nature of many home visiting programs has been seen as a reason for lack of success. The Nurse Family Partnership in the Denver study directly compared paraprofessional visitors with nurse visitors and claimed significant differences favouring the nurses (Old et al., 2001; Olds et al., 2007), although others have been unable to replicate these findings (MacMillan et al., 2005). Meta-analyses suggest that the results are mixed.

In the Denver study, it was found that by the time children were four years of age there were three significant differences favouring nurse-visited mothers: they delayed a subsequent birth by 4.1 months, the children were less likely to attend pre-school/licensed child care and there were reduced rates of domestic violence. It is not difficult to argue that the most important of these findings was the lower rates of domestic violence. Closer examination indicates, however, that the paraprofessional visited group not only had a higher proportion of vulnerable (low 'psychologic resources') mothers in their initial sample but also higher rates of domestic violence. As well, more mothers who had been subjected to domestic violence at the time of recruitment dropped out of the nurse-visited group compared with mothers in the paraprofessional group. It is not so surprising then that fewer mothers in the nurse-visited sample were subjected to domestic violence in the six months prior to follow up. They had fewer to start with and more of them dropped out (see Appendix B for details).

Even bearing in mind that there were pre-intervention differences favouring the control group over the visited groups, and only post-intervention comparisons were used, there were also some differences in favour of the paraprofessional-visited mothers when the child was four years of age. Paraprofessional-visited mothers had been in paid work for longer, had a greater sense of mastery, had better mental health, had fewer low birth weight babies and were more sensitive and responsive to their children than control group mothers. Except for the low birth weight babies, these differences were very small although statistically significant (see Appendix C).

When the analysis focused on the most vulnerable families ('low psychologic resources') the children of nurse-visited mothers compared with controls had better post-intervention 'language development', 'executive functioning' and better 'behavioural adaptation while testing'. The differences between the changes brought about by nurses and paraprofessionals were very small, ranging from 0.49 to 1.12 points (see Appendix C for details) but large enough to report a difference for nurse-visited compared with controls but not paraprofessional-visited compared with controls.

Aside from the dubious reliance on only post-intervention comparisons, the practical significance of these results is still not clear. The question needs to be asked whether the test is so well calibrated and exact that this difference is distinguishable in terms of behaviour or well-being. What does a two point difference in terms of mental health mean for the mothers concerned? What does the cognitive difference of 0.49 of a point superiority in child language of nurse-visited families over paraprofessional-visited families mean for the child? For those funding home visiting, is it worth spending the extra money?

Although the debate for the main part still centres on paraprofessionals compared with nurses, it may be that non-professionals and volunteers do not have the necessary skills to lead the change. Nurses are not the only alternative. There is also a recognisable trend for home visitors to be child development specialists (with a Bachelor or Masters degree in Child Development or in Social Sciences or Social Work) (Culp, Hetchner-Galvin, Howell, Saathoff-Wells & Marr, 2004). Gomby (2005) points out that for some of the paraprofessional home visitors in the research studies, this may be their first job.

Child factors

Biological risk: Some programs are more effective when they target specific populations. An enhanced parenting program was associated with reductions in physical abuse rates in a very small group ($n=63$) of randomly allocated socially (and very mildly biologically) at risk children when compared with standard Healthy Start America children or a control group. Rates of maltreatment were four per cent in the enhanced group, 23 per cent with traditional home visiting and 26 per cent in the control group. Fathers in the enhanced group also showed lower rates of family violence (Bugental & Happaney, 2004).

The Infant Health and Development Program was also effective with the heavier sample of 985 premature babies in terms of cognitive gains made (Gomby, 2005), although by the second and third year of the program these children also attended centre-based care, known for its positive impact on cognitive development.

Combinations of factors that may improve outcomes

The Abt Associates meta-analysis (2004, cited in Gomby, 2005) suggests that, although programs had almost no effect on child safety outcomes, there were greater child safety benefits linked with those programs that:

- served children under three years
- provided case management services
- provided parent-child activities
- worked with teenage parents.

If strategies had all of these elements, the effect was large (1.4 of a standard deviation) compared with about 0.2 where there were none of the service elements. Although targeting very vulnerable families may show the greatest changes, it is important that the services are well-equipped to serve them (Guterman, 1999).

Program content, duration and intensity

It is important that the content of the program has stated goals so that it is clear when things improve. These goals also need to align with the stated goals of families (Duggan et al., 2007). Most families initially have concrete goals which require material assistance. Families find addressing these goals of greatest assistance. Furthermore, a positive result related to a simple concrete goal can assist in establishing a trusting relationship, allowing more complex issues to be addressed more readily.

To impact on child maltreatment, it is important that the programs be of long enough duration to address the factors that contribute to child maltreatment (Higgins, Bromfield & Richardson, 2006). Most are offered for about two years and start off with greater intensity, such as weekly visits, and then reduce to fortnightly and monthly visits after about six months. Starting antenatally seems to increase effectiveness (Higgins, Bromfield & Richardson, 2006). In practice, however, families receive about half as many visits as intended. Also with drop out rates averaging around 50% after the first year and 60% after two years, the duration of home visiting is often less than intended. Half the visits over half the time, and varying half of the intended content makes, it less likely that behaviour will change (Duggan et al., 2007).

3.4 Summary

It seems that home visiting can produce benefits but most effects are very modest, with effect sizes of around 0.1 to 0.2. It is more effective when rolled out as a methodologically rigorous pilot study, such as the Nurse Family Partnership program in Elmira, than when it is a broad ranging public policy roll-out such as Healthy Start America.

Gray and McCormick (2005) concluded there were ‘mixed results for home visiting programs’ (p.261). It works best where families have greatest initial need or when families perceive their children to need the services because of underlying biological reasons, such as low birth weight, premature birth or special needs. Results may improve if the characteristics that produce quality home visiting are better understood, bolstered and monitored (intensity, skills of the home visitor and content). Home visiting is most effective and the effects are longer lasting if it is used in conjunction with high quality child care. This will be examined in Section 6.

4. High quality child care or pre-school

4.1 Summary of previous findings

The 2005 review found that of all single strategy interventions, high quality child care was the most effective in improving child outcomes and providing children with a chance to start school on a more equal footing with their more advantaged peers (Watson et al., 2005). Subsequent reviews of early intervention programs, mostly related to research in the United States, have found similar results (Gomby, 2005; Gray & McCormick, 2005; Karoly, Kilburn & Cannon, 2005). The transparent nature of child care also means that what is involved in the program and what constitutes quality is better understood than, for instance, what happens in a home visiting program.

As was made clear in the previous review, the quality of care must be high. High quality is reflected in the day-to-day experiences of children, such as having warm, positive and stimulating staff-child interactions, age appropriate activities and a safe and healthy environment. The corollary was also shown to be true; where the quality of care is low, child care can be detrimental to children. While vulnerable children are particularly susceptible to the negative effects of poor quality care, they also benefit the most from high quality care.

The more recent research reinforces the conclusions of the previous review that, in general, ‘small, centre-based programs prove to be the most effective [early intervention strategy]’ (Gray & McCormick, 2005, p.261). In addition, the positive effect of child care can be increased by the introduction of a simultaneous parent-directed intervention.

When introduced as an intervention, child care does not usually target reducing child maltreatment directly but hopes to ameliorate its effects. It aims to improve disadvantaged children’s life chances by promoting their social and emotional well-being and enhancing cognitive outcomes. As an evaluated strategy to counteract the effects of disadvantage, it is now rarely introduced as a single strategy intervention for families at risk because the positive effects have been shown to be augmented by a home visiting or parent education program. Nevertheless, some studies are interested in isolating the degree to which change can be attributed to the child care/preschool component of an intervention.

As with the home visiting studies, the more recent literature encompasses both a broadening and a narrowing of focus. This includes a move towards:

- larger sample sizes involving large public policy roll-out
- examination of national longitudinal study data (large sample sizes)
- the long term follow-up of the earlier bench mark programs
- replication/extensions of earlier benchmark programs
- attempts to isolate common effective elements of programs
- cost-benefit analyses (see Section 6).

4.2 Large public policy roll-outs

The positive results of small university pilot programs (such as the High/Scope Perry preschool program) have precipitated a shift towards larger scale, public policy roll-out of early childhood education. This most commonly entails preschool aimed at children aged four years, however, the effects of centre-based child care, which typically starts much earlier than pre-school, have also been examined. While pre-school may be offered as a single strategy intervention, centre-based care more often includes a program aimed at parents.

Around 40 states in the United States now have state-funded preschools (Lamy, Barnett & Jung, 2005). Most target disadvantaged families and communities (Gormley, Gayer, Phillips & Dawson, 2004) and many also offer programs to the parents (Karoly et al., 2005). Six of the states in the United States have adopted a universal approach to preschool, referred to as ‘pre-Kindergarten’ or more simply, ‘pre-K’. Attendance is free but not compulsory.¹⁷ The evaluations of the effects of child care are mostly more rigorous than evaluations of ‘for-profit’ programs.

Preliminary evaluations of these programs have shown promising results. While evaluators in most states failed to correct for selection bias (see Gormley et al., 2004 for details), in Oklahoma selection bias was mostly overcome because of that state’s strict age eligibility criteria: children one day younger attended the pre-K program, while children born the next day went straight into Kindergarten. This meant that the effects of preschool attendance could be more accurately assessed. For this reason Karoly et al. (2005) included Oklahoma as their only example of single-strategy pre-school, with 91 per cent of the state’s school districts participating in the program. Also the teachers in Oklahoma are required to have a degree with early childhood qualifications, are paid the same rates as primary and secondary school teachers, the staff to child ratio is 1:10 and the maximum group size is 20. These are all structural factors associated with high quality early education and care. They found children who attended pre-K had improved English scores (effect size, 0.24), Maths scores (effect size, 0.29) print awareness scores (effect size, 0.62), with no difference in phonological development compared with those who did not attend. The effectiveness of the program on print awareness was greater for children who were initially more disadvantaged.

Some countries, in particular Nordic countries, have had heavily subsidised, universally available, high quality early childhood education as an accepted part of public policy for decades. In the United Kingdom there has been a move towards ‘educare’ in the preschool years (Melhuish, 2004; Sylva & Pugh, 2005) with all four-year-olds having a right to a preschool place. In Australia, Labor offered universal availability of preschool for four-year-old children as part of its policy platform in the run up to the 2007 election (Labor Preschool Education Policy, 2007).

4.3 Large longitudinal studies – routinely experienced care

Data from the National Institute of Child Health & Human Development (NICHD) longitudinal study has also been used to examine the effects of *routinely experienced* child care and pre-kindergarten (Early Child Care Research Network, ECCRE, 2006).

In the United States only 39% of child care centres achieve a rating of at least ‘fair’ in terms of caregiving, suggesting a significant proportion are not high quality. Unlike Australia, there is no national accreditation system tied to subsidy eligibility which helps maintain higher quality levels of care (Harrison, Watson & Skouteris, 2004).

Nevertheless, the NICHD longitudinal study indicated that both *routinely experienced* ‘centre-based care’ and ‘pre-K’ have positive impacts on academic outcomes and negative impacts on behaviour, but the impacts are small with effect sizes around 0.18 (Bainbridge, Meyers, Tanako & Waldfogel, 2005; Belsky, Burchinal, McCartney, Vandell, Clarke-Stewart & Owen, 2007; Magnuson, Ruhm & Waldfogel, 2007).¹⁸ This equates to a shift from the 50th to the 54th percentile for academic achievement and 50th to the 55th percentile for behavioural problems. The positive effects on academic achievement had largely dissipated by first grade but the behavioural problems persisted (Magnuson, Meyers, Ruhm & Waldfogel, 2005).

¹⁷ New York, Georgia, Oklahoma, Florida, Massachusetts and West Virginia. Most are aimed at four-year-olds. Los Angeles county has a program that includes three-year-olds as well.

¹⁸ Mean aggression scores were 0.07 of a standard deviation higher on Gresham & Elliott’s five item seven-point Likert-type scale. Self-control was 0.11 of a standard deviation lower in the in the ‘pre-K’ group. Maths and reading effect sizes are 0.1 and 0.12.

There has been some concern about the slightly elevated levels of aggression and defiance, especially in children who had experienced more hours of child care (Belsky et al., 2007). However, as most children learned to self-regulate over time, this did not translate into problematic trajectories of disruptive behaviour in middle childhood (see Magnuson et al., 2007). With a sample size of 10,224 children, small differences may be significant but how this translates into differences in actual behaviour and achievement still needs to be considered.

The positive effects of a pre-school year are larger and longer lasting for children from disadvantaged backgrounds. In the Miami School Readiness project, Winsler, Tran, Hartman, Madigan, Manfra & Bleiker, (2008) followed up 3,838 ethnically diverse, four-year-old children living in poverty, most of whom attended subsidised or free preschool programs. They found moderate positive size effects for most areas of development. Compared to national norms these children started their pre-kindergarten year at significant risk in the areas of language, cognition, and fine motor skills (32nd to 43rd percentile ranking). By the end of the year, they were performing close to the national average (47th to 52nd percentile ranking). Their socio-emotional development was initially around the national average but made significant improvements over the year according to both teacher and parent reports (around seven national percentile points). 'Behaviour problems were relatively stable according to both parents and teachers, with teachers reporting that children's behaviour is typical of that seen in other 4-year-olds nationally' (Winsler et al., 2008).

These findings also reiterate the earlier emphasis on the importance of quality. When measuring quality, 'a distinction has been made between *structural quality*, which looks at aspects of the child care setting, and *process quality* – what actually happens in a child care setting, especially child-adult and child-child interactions and children's engagement with activities and materials made available for them' (Huntsman, 2007, p. 4). The higher the *process quality* of child care (that is, the more attentive, responsive and stimulating the care and the closer the child-caregiver relationship) the better the cognitive-linguistic function of children and the fewer parent-reported externalising problems (Magnuson et al., 2007; Howes, Burchinal, Pianta, Bryant, Early, Clifford & Barbarin, 2008). Process quality was, in turn, clearly related to structural quality variables (such as teacher qualifications and staff to child ratios) for children from disadvantaged backgrounds (Magnuson et al., 2007; Winsler et al., 2008). This structural quality was of less importance when a general population was examined (Howes et al., 2008).

There may also be other explanations for the effects of care. Children whose mothers did not complete high school are half as likely to be in centre-based arrangements as those whose mothers who are college educated. Maternal education is also strongly associated with their children's developmental outcomes and could account for some of the results. This possibility was addressed in a study of 3,000 children who attended preschool in the United Kingdom (Sammons, Smees, Taggart, Sylva, Melhuish & Siraj-Blatshford, 2003). Similar findings indicated that the results are not confined to the United States and remained even after taking into account the socio-economic status of the parents (Belsky, et al., 2007). Poor quality care when combined with low maternal sensitivity predicted poor developmental outcomes (Magnuson et al., 2007).

In Australia, Homel et al., (2006) introduced a high quality preschool, supplemented by specialist programs, as one of the preventative strategies to combat the effects of disadvantage in a low socio-economic status community in Queensland. This was available on an aggregated universal basis. Attendance ($n = 510$) resulted in small positive gains in language (effect size = 0.21) and moderate positive teacher-rated behavioural and school readiness benefits for boys (effect sizes of 0.44 and 0.46 respectively). There was no significant change for girls on behaviour or school readiness.

4.4 Long term follow-up of earlier benchmark studies

One of the striking aspects of early intervention is the extent to which we rely on benchmark programs often instigated in the 1970s to promote the benefits of preschool programs. For long term follow-up, the most often cited are the High/Scope Perry Pre-school Program and the Abecedarian program. The most recent follow up of the High/Scope Perry Program was reported when program participants were 40 years old (Schweinhart, 2007). As reported in the earlier review (Watson et al., 2005), program participants were less likely to repeat grades and more likely to graduate from high school, to be employed, have higher earnings and own their own home than non-participants. They were less likely to be on welfare or to be arrested for any crime, including violent, drug and property crimes (Welsh & Farrington, 2007). The less rigorously evaluated Syracuse and Houston programs show similar results, adding weight to these conclusions. It needs to be remembered that these programs also had a component aimed at the parents and although they are often cited as supporting evidence that preschool is an effective intervention to combat disadvantage, these programs are, strictly speaking, ‘two-generation’ interventions.

Similar results have been reported for the Abecedarian study whose participant children started at a younger age than the High/Scope Perry Preschool. The benefits were very similar, with greater individual gains by participants. Although both studies relied on random allocation, sample sizes were still relatively small, with 123 children in the Perry Program ($n = 58$ in the program group) and 111 in the Abecedarian Program ($n = 57$ in the program group). The Abecedarian study also compared a ‘child care only’ group with one where families were also home-visited once children attended school to see if this enhanced the effect of the program. Although this was the case, the main contributor to the enhanced life chances was the child care aspect of the program.

The more recent studies generally look at the effects of providing multi-component early intervention and prevention strategies, as this has been shown to be of greater benefit than single-strategy approaches. Most interventions now are at least two-generational. The other focus of the long term follow-up analyses has been to examine the cost-benefit ratio of child care. However, economic analysis has not been confined to child care and is of interest across all types of early intervention and prevention strategies. For this reason it is considered in a separate section here (see Section 6).

4.5 Drilling down – ‘what works and for whom?’

When analysing programs or strategies to identify the factors that contribute most to change, more traditional randomised controlled studies with smaller sample sizes are usually adopted. The transparent nature of centre-based care means the day-to-day caregiver-child interactions and activities are more visible and open to scrutiny and analysis than home-based programs.

The minutiae of interactions have been analysed in an attempt to drill down and isolate the elements of a program that result in positive effects. Scales of quality of interaction are very specific. They include items such as teacher ‘makes a conscious effort to have an informal conversation with each child every day’ and ‘verbally expands on ideas presented by children (example, adds information, asks questions to encourage children to talk more)’ (Harms, Clifford & Cryer, 1998). As a result, knowledge about structural and process factors that contribute towards high quality child care is more detailed (see Vandell & Wolfe, 2000; Huntsman, 2007 submitted for publication) than our knowledge about the detail of what happens in home visiting, or the often commercial-in-confidence content of various for-profit parenting education programs.

Besides the structural and process variables already isolated that are associated with high quality care, researchers are starting to look at the extent to whether factors such as number of days in care, number of hours in care, age of starting care, race and income have a differential impact on developmental outcomes. Some of this is driven by economic imperatives especially, where governments are providing free or heavily subsidised early childhood education and care. Their goal is to maximise the positive effects for as many children as possible within a budget.

4.5.1 Quality of care

It had been commonly accepted that structural variables are so closely associated with process variables that they can be used interchangeably (Scarr, Eisenberg & Deater-Deckard, 1994). However, Cassidy, Hestenes, Hegde, Hestenes and Mims (2005) concluded from their examination of 1,313 classrooms that structural quality cannot be used as a proxy measure for process quality. The process variables are the more important contributors to positive developmental outcomes, however, process quality is more likely to be present if structural quality is also in place (for example, early childhood educators have a university degree relating to child development, they receive higher wages, there are favourable staff to child ratios, small group sizes and fees) (Cassidy et al., 2005).

The recognition of the importance of high process quality has also led to a shift in definition of early childhood curriculum (eg Stonehouse, 2001) and helped ensure that children of preschool age are no longer subjected to teacher-led question and answer lessons with the content prescribed by the teacher. This latter approach is associated with significantly poorer social-emotional development than children who experienced high process quality care (Marshall & Watt, 1999).

4.5.2 Income and race

The quality of care also interacts with race and income. Loeb et al. (2007) point out that centre programs appear to offer the most benefits to poor children attending carefully controlled and expensive 'boutique' preschools. This generates immediate and long term benefits. However, high SES children are more likely to attend preschools (70% of upper middle compared with 45% of children from low income families). High quality child care also has more positive effects on the developmental outcomes of Hispanic children compared with other children (Loeb, 2007).

The many 'near poor' working families in the United States often have the least access to child care. They cannot afford high fees but are just above income eligibility cut-offs for subsidies. Very poor families have access to Head Start programs (Fuller, Loeb, Strath & Carroll, 2004). Evidence of the effect of Head Start is mixed due to less rigorous evaluation (Garces, Thomas & Currie, 2002, cited in Loeb, 2007).

4.5.3 Age of entry

In the United States the greatest academic benefit, usually measured by maths and reading, was derived if children started centre-based care at two to three years rather than older or younger ages. However, negative behavioural effects, even though slight, were greater the younger the starting age regardless of family background (Belsky, 2006; Bridges, 2004; Loeb, 2007).

Two years of preschool is considered to provide more benefits for children than just one year of preschool (Clements, Reynolds & Hickey, 2004). The number of months in care in the United Kingdom predicted cognitive development and these academic gains were greater for disadvantaged children (Sylva, Melhuish, Sammons, Siraj, Blatchford & Taggart, 2004 cited in Barnett & Masse, 2007).

4.5.4 Hours per day

Increased hours per day lead to greater academic benefits but increased negative behavioural consequences (Loeb et al., 2007).

The evidence suggests that at least a half day in a centre yields cognitive gains and there is little extra to gain from a full day program. Belsky (2006) concluded that limited doses of good quality care may carry the same developmental benefits as larger doses, although it has been suggested that a full day high quality program may serve children from lower income families better by allowing them to gain pre-reading and maths skill without detriment to social behaviour.

4.6 Summary

As an intervention, child care has not generally been used as a direct strategy to reduce abusive and neglectful behaviour of the parent but rather to promote developmental health and well-being. If only a single strategy is possible, the more recent research has reinforced its greater effectiveness in promoting well-being than other strategies, such as home visiting or parent education programs. Although effect sizes are modest, even with a population level roll-out child care and preschool still have a positive impact. The effect size of a strategy seems to reduce by about 0.2 of a standard deviation with the shift from rigorous university pilot studies to public policy roll-out. For home visiting, which had small effect sizes in the university studies, many of the significant findings were washed out altogether when delivered on a larger scale. For child care, the effect sizes that had been around 0.58 were reduced to smaller, but still significant, effect sizes (around 0.26-0.29) (Abt Associates, 2004; Gomby, 2005). Nelson et al. (2003) suggest that the preschool education component accounted for 63% of the variance in cognitive outcomes in their meta-analysis.

Gains from *routinely experienced* child care are predominantly cognitive. The greatest gains are made by the more disadvantaged group of children and this group also derive social-emotional benefits. If there is any effect at all on behavioural problems in the early years of school it tends to be somewhat negative. Children who have been in child care appear to be slightly less compliant than those who did not attend child care. However, much of the research comes from the United States where the quality of routinely experienced care is adequate rather than high.

It may be that an indirect effect of high quality child care is to reduce child abuse and neglect. Not only is there less opportunity for parents to maltreat their child, but they gain some respite from the challenge of parenting. In high quality centres parents are also likely to be offered informal parenting support by staff and other parents.

In addition, the care offered during the day may work towards counteracting the effects of maltreatment. This may be particularly the case for neglected children who are able to obtain nutritious food, emotional warmth, cognitive stimulation and appropriate physical activities in a safe environment that promotes their health and well-being. This proposition is still to be directly examined.

5. Parenting programs

Like home visiting and child care, parent education is an umbrella term for a wide range of programs of varying effectiveness and quality. Parenting programs are not necessarily distinct from home visiting programs since their mode of delivery may be through home visiting. However, unlike most home visiting and child care strategies, which are generally long-term interventions, parenting programs are generally short-term interventions. They are aimed at improving the quality of the parent-child relationship by changing parenting practices, aspects of parental functioning or family functioning and the child's emotional or behavioural adjustment (Barlow, Johnston, Kendrick, Polnay, & Stewart-Brown, 2006).

5.1 Summary of previous findings

The earlier literature review identified only a small number of parenting programs that have been evaluated empirically, despite the large number of parenting programs that are available in Australian and internationally (Watson et al., 2005). In addition, the review found that while there is considerable evidence regarding the outcome of parenting programs in controlled clinical settings, there is relatively little knowledge about the utility of these interventions in community settings. At the time of the last review, there were already a number of meta-analytic reviews conducted to examine the effectiveness of parenting programs, but, given the methodological problems with much of the research, only a small number of studies were included in these reviews.

5.2 Trends from recent research

In the last few years, research on parenting programs as an early intervention strategy for young children and their families has generally focused on four key areas. First, there have been several studies of parenting programs in larger community populations in an effort to determine the effectiveness of these programs in 'real-life' settings. There have also been large public policy roll-outs of parenting programs, particularly Triple P. Second, there have been a number of meta-analytical reviews that have examined the effectiveness of parenting programs for a range of child, parent and family outcomes. Third, research has examined the effectiveness of evidence-based parenting programs that have been adapted for specific populations in order to extend the reach and applicability of the programs. Finally, research has attempted to identify the factors which determine the effectiveness of parenting programs and parental engagement in these programs.

This section of the paper will review these research trends across three areas: parenting programs for parents of children with behavioural problems; parenting programs for parents at risk of child abuse or neglect; and parenting programs for families with other risk factors.

5.2.1 Parenting programs targeting child behavioural problems

There is large body of research to show that behaviourally-based parenting programs can prevent and reduce child behavioural problems. Parenting programs that have been evaluated empirically are generally based on either behavioural approaches or 'relationship' approaches. Relationship approaches involve humanistic, Adlerian, attachment or family systems theories (Barlow & Stewart-Brown, 2000). However, most of the research emerging from the literature in the last few years relates to behavioural programs. Behavioural parent training is based on social learning theory and the focus is on teaching parents strategies to help them modify their child's behaviours through rewards and punishments.

The focus on child behavioural problems as an outcome variable results from research demonstrating that behavioural problems emerge very early in a child's life (Alink et al., 2006), are stable over time and are associated with significant psychosocial problems in early adulthood, such as involvement in crime, mental illness and substance use (Fergusson, Horwood, & Ridder, 2005; Rutter, Kim-Cohen, & Maughan, 2006). Thus, the presence of early conduct problems is one of the most important indicators of long-term psycho-social outcomes and is therefore an important target for early intervention. As there is

evidence that parenting practices such as harsh punishment play a significant role in contributing to child behavioural problems (Lynch et al., 2006), parenting programs focus on changing dysfunctional parenting practices in order to effect change in a child's behaviour.

In recent years, there have been three meta-analytic reviews which have further demonstrated that behavioural parent training can improve child behavioural problems. First, Barlow, Parsons and Stewart-Brown (2005) examined the effectiveness of group-based parenting programs for the prevention of emotional and behavioural problems with children under three years. Their review found that parenting programs were associated with significantly greater improvements in children's adjustment compared to the control group using independent observations of child behaviour. However, there was a lack of studies that examined long-term effectiveness and, for those that did, outcomes appeared to deteriorate over time.

Second, Maughan, Christiansen, Jenson, Olympia, and Clark (2005) found a moderate effect of behavioural parent training on child disruptive behaviours. Similarly, Lundahl, Risser and Lovejoy (2006) also found that behavioural programs resulted in moderate improvements in child behaviour immediately following intervention and while these improvements were maintained at one-year follow-up, the effects were small in magnitude. This review also found positive effects for non-behavioural programs, although there was a lack of long-term follow-up to assess the durability of intervention effects.

The effectiveness of 'media-based' behavioural interventions for behavioural problems in children has also been explored in a recent review (Montgomery, Bjornstad, & Dennis, 2006). Media-based interventions refer to self-help materials such as parenting books, DVDs and computer programs. These programs have a number of advantages when compared with traditional therapist-led programs, including greater convenience for families, fewer barriers to participation, less stigma and fewer costs. Research into brief or self-directed programs also reflects an emerging focus on the principle of 'program sufficiency', which emphasises that families may differ in the strength of intervention they require to manage a problem and that, for some families, the provision of information alone may be sufficient to effect change (Sanders, 2003).

This review found that media-based programs had a moderate effect on child behavioural problems (Montgomery et al., 2006). Thus, for some families, media-based programs alone may be sufficient, while for others they may be an appropriate initial intervention which can be followed by a more intensive intervention (as part of a 'stepped-care' approach) if improvements are not achieved (Morawska, Stallman, Sanders, & Ralph, 2005). However, it is presently not known which families are likely to benefit from these interventions, as factors such as parental education, motivation to change and self-regulation skills are likely to be important.

A fourth more recent meta-analytic review (Kaminski, Valle, Filene & Boyle, 2008) looked at the active components of different parent education programs which aimed to reduce externalising behaviour in children. Program components that were consistently associated with larger effects included increasing positive parent-child interactions and emotional communication skills and teaching parents to use time out; and to be consistent. It also helped when parents were required to practice new skills with their children during parent training sessions. Teaching parents problem solving skills and demonstrating how they can promote their child's cognitive, academic, or social skills were associated with smaller effect sizes.

There are three key empirically-supported behavioural parenting programs that have continued to develop an evidence base in the last few years: Triple P (Positive Parenting Program), *Incredible Years and Parent Child Interaction Therapy* (PCIT). In general, the focus of recent research on these programs has been on determining the 'effectiveness' of the program in studies conducted within community settings and adapting the program so that it is more accessible for families or appropriate for different populations.

The Positive Parenting Program (Triple P)

A large effectiveness study of universal group Triple P was recently conducted in Western Australia. Using a quasi-experimental design, 804 families of preschool age children received Triple P and 806 families were included in a comparison group (Zubrick et al., 2005). Despite the comparison group, effect size results are reported in terms of pre-to-post scores for the intervention group. Triple P was associated with moderate reductions in parent-reported dysfunctional parenting and child behaviour problems at one year and two year follow-ups (effect size = 0.41 and 0.47 respectively). The effects were much greater for children with behavioural problems in the clinical range, although it should be noted that even those in the comparison group showed moderate to large effect size improvement at the one and two year follow-ups, which suggested that much of the change reported in the intervention group was a function of time or maturation. Within the intervention group, small significant improvements pre-to-post intervention were also found in parental mental health, marital adjustment and levels of child rearing conflict. A randomised control trial of universal group Triple P in Germany with families of preschool age children ($n = 219$) demonstrated its effectiveness for improving mothers' ratings of parenting, child behaviour, psychological distress and relationship satisfaction and fathers' reports of parenting at one year follow-up when compared with a control group (Heinrichs et al., 2006).

A version of the Triple P Program for Australian Indigenous families has been developed and examined in a preliminary randomly controlled trial (RCT) with 51 families (Turner, Richards & Sanders, in press). The group-based program was modified to be suitable for Indigenous families and comprised six group sessions and two individual home-based sessions. The study, conducted in South-East Queensland, found there were significant reductions in parents' reports of child behaviour problems and some dysfunctional parenting practices when compared with the control group. The changes in the intervention group appeared to be maintained at the six month follow-up. There is a second, larger study of this program underway in 12 sites across four Australian states (K.M.T. Turner, personal communication with second author, 2007).

The Incredible Years Program

There have been a number of recent studies that have demonstrated the effectiveness of the Incredible Years Program. For example, Gardner, Burton and Klimes (2006) conducted the first independent study of the group-based program in a community-based service for parents ($n = 79$) of children aged two to nine years with conduct problems. Compared with a waitlist control group, significant differences emerged for the intervention group on child behaviour, parenting behaviours and skills, but not maternal depression. These improvements in the intervention group were maintained at an 18 month follow-up. This study also found a positive effect of the intervention on siblings of the target child in the study, suggesting that more than one child per family may benefit from the program.

Brotman and colleagues (2005) conducted a study of an enhanced version of the Incredible Years program for preschool-age siblings of antisocial youth. In a randomly controlled trial with 96 children, those who were assigned to the intervention participated in 22 centre-based groups and received 10 individual home-based sessions. At post-intervention, parents in the intervention group were significantly less negative in their parenting and provided greater stimulation for learning at home and children displayed greater social competence than controls, although there was no change in positive parenting or problem child behaviours.

Parent Child Interaction Therapy (PCIT)

Recent research has continued to expand the evidence-base for PCIT. In an Australian study, families of preschoolers ($n = 54$) with behavioural problems were randomly assigned to standard PCIT (15 hours), a brief PCIT (9 hours) or waitlist control. The brief PCIT included videotape and phone consultations, as well as face-to-face sessions. In both intervention groups there were significant

improvements in child disruptive behaviour, parental stress and dysfunctional discipline compared with the waitlist group (Nixon, Sweeney, Erickson, & Touyz, 2003). The improvements for families in both intervention groups were maintained at one year and two year follow-ups.

Overall, there is a lack of evidence regarding the cost-effectiveness of parenting programs. However, in a review of the costs and benefits for early intervention programs, Aos, Lieb, Mayfield, Miller and Pennucci (2004) reported that PCIT was associated with significant cost-benefit ratios and overall net benefit of US\$3,427 per child.

Relationship-based parenting programs

In general, there is a lack of research on parenting programs that are based on relationship approaches, including attachment-based programs. While these programs appear to be commonly delivered in practice, the published evidence supporting their effectiveness is minimal. However, two recent studies examined the effectiveness of an intervention based predominantly on attachment theory. The first study compared two versions of Video-feedback Intervention to promote Positive Parenting (VIPP) with a control group of first time mothers ($n = 81$) who themselves had insecure attachment (Klein, Velderman, Bakermans-Kranenburg, Juffer, & van Ijzendoorn, 2006). One intervention consisted of four sessions of home-based video-feedback and brochures to enhance sensitive parenting and the second intervention involved additional discussions of mothers' childhood attachment experiences in relation to current parenting. Both interventions were more effective than the control group at enhancing mothers' sensitivity; however, neither intervention affected infant attachment security.

The second study aimed to integrate attachment theory with social learning theory (the basis of a behavioural approach) into an intervention which targeted parents ($n = 237$) of children aged one to three years with behavioural problems. In a RCT, parents were assigned to the Video-feedback Intervention to promote Positive Parenting and Sensitive Discipline (VIPPSD: Van Zeijl et al., 2006) which involved six sessions delivered in the home or a control group that involved telephone calls. The intervention was found to be effective in improving positive maternal attitudes to sensitive child rearing and enhancing the use of positive discipline strategies. However, there was no effect on negative discipline strategies or child behaviour.

5.2.2 Parenting programs targeting child abuse and neglect

Parenting programs are often relied on in instances where a parent has abused or neglected their child or is considered to be at risk of maltreatment. They operate on the assumption that parents will be less likely to maltreat their child if they improve their parenting skills, reduce their coercive child management strategies and modify attitudes linked to harsh parenting (Dore & Lee, 1999; Lundahl, Nimer, & Parsons, 2006).

There have been a number of recent reviews of the evidence supporting parent programs for preventing child abuse and neglect. Lundahl, Nimer et al. (2006) observed with the studies, such as the majority of studies were pre-to-post design rather than randomly controlled trials; only a minority of studies included substantiated cases of abuse; 'conducted a meta-analytic review of 23 studies of parent training programs to reduce parents' risk of abusing their child. This study found that parent training resulted in significant changes in parental attitudes, emotions and behaviours that may be linked to abuse. Parents who completed parent training were more likely to rely on non-coercive strategies, such as expression of warmth, and were less likely to rely on coercive strategies, such as physical force or threats. Long term follow-up showed that improvements in parenting behaviours were not always maintained over time (Lundahl, Nimer et al., 2006). However, there were a number of methodological problems abuse' was ill-defined; and many studies did not include long term follow-ups.

Barlow, Johnston et al. (2006) examined the evidence for parenting programs as an intervention for child physical abuse and neglect. Only seven randomly controlled trials were identified for inclusion in the review and, of these, only two studies assessed the impact of the program using objective measures of child abuse (the incidence of child abuse or number of injuries). The remaining studies assessed only proxy measures of abusive parenting, such as parental anger, stress and child abuse potential, which prevented the possibility of undertaking a meta-analysis of study findings.

The findings of this review indicated that there is insufficient evidence to support the use of parenting programs as an intervention for parents who physically abuse or neglect their child. However, there is some limited evidence to show that parenting programs may be effective in improving outcomes that are associated with abusive parenting. These authors also noted that there is a lack of parenting programs developed for parents at risk of neglect. Thus, there is an urgent need for rigorous evaluation of the effectiveness of parenting programs for preventing child abuse and neglect.

Barlow and colleagues (Barlow, Simkiss, & Stewart-Brown, 2006) conducted a systematic review of previous reviews on interventions to prevent and reduce child abuse and neglect. This review also concluded that there is inadequate evidence about the impact of parenting programs on objective measures of abuse and neglect but concluded that there is sufficient evidence from existing reviews that parents who have abused their child, or who are 'at risk' of abuse, should be offered parenting programs to help them regulate negative emotional states.

In a narrative review of parent training programs in child welfare services, Barth et al. (2005) has argued that the programs with the greatest promise to improve the delivery of child welfare services are the programs that have been shown to be effective for child behavioural problems. Programs such as Triple P, PCIT and Incredible Years are examples of parenting programs that were originally developed to reduce child behavioural problems that have subsequently been adapted as interventions for the child protection context. These three programs have all been rated '1' for scientific merit (well-supported, effective practice) and '2' for relevance to child welfare (reflecting medium relevance to child welfare populations) by The California Evidence-Based Clearinghouse (CEBC) for Child Welfare.¹⁹

Chaffin et al. (2004) investigated whether PCIT was more effective than a standard group-based psychoeducation program in preventing physical abuse recurrence among physically abusive parents in the child welfare system. Families ($n = 112$) were randomly assigned to three interventions: PCIT, Enhanced PCIT or community psychoeducation group. The Enhanced PCIT involved individualised services targeting parental depression, substance abuse and domestic violence, in addition to the 12-14 session program. At follow-up, 19 per cent of parents assigned to the PCIT had a re-report of physical abuse compared with 49 per cent of parents assigned to the standard community group. The Enhanced PCIT did not show any additional benefits over the PCIT.

5.2.3 Parenting programs targeting other risk factors

Parenting programs have targeted a range of other vulnerabilities, such as parental psycho-social health, parental substance use and parent intellectual disability. Barlow, Coren and Stewart-Brown (2003) conducted a meta-analytic review of group-based parenting programs for improving maternal psycho-social health. The review included 26 studies, of which 20 provided sufficient information to combine the data in a meta-analysis. There were small to medium improvements in the intervention group for depression, anxiety or stress and relationship with partner and self-esteem, although there was no evidence of effectiveness for social support. There was a lack of studies with long term follow-up so it is not known whether effects were maintained over time.

¹⁹ The CEBC helps to identify and disseminate information regarding evidence-based practices relevant to child welfare (www.cachildwelfareclearinghouse.org).

Suchman et al. (2006) conducted a narrative review of parenting programs for drug-dependent mothers and their young children. Overall, the parenting programs appeared to reduce maternal drug use and improve adjustment but did not appear to be effective in improving mother-child interaction or promoting child development. There also appeared to be considerable difficulty in engaging mothers in the interventions.

Dawe and Harnett (in press) conducted a RCT of Parents Under Pressure (PUP) Program, an Australian home-based program for families with a parent on methadone maintenance. Families ($n = 64$) were randomly assigned to the program, which included a brief two-session parenting program or a standard care control group. At three month and six month follow-ups, families who received PUP showed significant reductions in child abuse potential, rigid parenting attitudes, child behavioural problems and parental methadone use. Some improvements were seen in child abuse potential in the brief intervention group but no improvements were found in the standard care group.

An Australian study examined the efficacy of the Home Learning Program, a home-based intervention targeted to parents with intellectual disability to promote child health and home safety in the preschool years (Llewellyn, McConnell, Honey, Mayes, & Russo, 2003). In a RCT with a multiple baseline design, the intervention improved parents' ability to recognise home dangers and implement safety precautions in the home. Positive effects were also found for parents' knowledge and skills related to child health, such as understanding of symptoms of illness and knowledge of about visiting the doctors. All positive outcomes were maintained at a three month follow-up.

5.2.4 Factors that influence effectiveness of parenting programs

The effectiveness of parenting programs is thought to be influenced by participant characteristics and features of the parent training programs (Lundahl, Risser et al., 2006). Two reviews have examined the impact of participant characteristics on program effectiveness. First, Reyno and McGrath (2006) conducted a meta-analytic review of the child, parent and family factors that influence the outcomes of parent training for child behavioural problems. This review found that three factors were moderate predictors of outcome: low parental education, more severe child behavioural problems and maternal psychopathology. The only strong predictor of outcome was low family income. Second, in a similar review, Lundahl Risser and Lovejoy (2006) also found family income to be an important predictor variable and that parent training was less effective overall for economically disadvantaged families.

There are also a number of program factors that have been found to be related to the effectiveness of the program. Lundahl, Risser et al. (2006) found that individual parent training was more effective than group parent training for economically disadvantaged families; self-directed parenting programs appear to be as effective as other delivery modes, such as group and individual programs; and that including additional intervention components, such as separate child interventions, did not enhance the effects of parent training.

Lundahl, Nimer et al. (2006) conducted a meta-analysis of parent training programs for the prevention of child abuse and found that the following factors resulted in improved effects on parenting attitudes and/or behaviour: inclusion of a home visitor; programs that offered a combination of centre-based and home-based settings when compared with centre-based only; programs with a greater number of sessions; and programs that involved both individual and group components rather than individual-only or group-only delivery. In addition, programs that involved either a non-behavioural or a mixture of behavioural and non-behavioural components changed parental attitudes more than those that relied on behavioural programs. However, behavioural program resulted in greater changes in parenting practices than non-behavioural programs.

There has been emerging interest in the relevance of children's characteristics to the outcomes of parenting programs. For example, one study examined the impact of a program to enhance responsive parenting of infants with differing birth weights (Landry, Smith, & Swank, 2006). Parents of six month old infants ($n = 275$) who were born at term and born at very low birth weight (VLBW) were randomly assigned to the intervention, which included 10 home visits using video-feedback or a developmental feedback comparison group. Mothers' responsive behaviours changed more in the intervention group than the comparison group and changes in supportive behaviours were strongest for mothers of VLBW infants.

The impact of children's 'callous-unemotional' traits on the outcomes of parent training has also been examined. Children with 'callous-emotional' traits have temperaments that are characterised by limited empathy, guilt and emotional responding and they tend to show more severe behavioural problems (Hawes & Dadds, 2005). A preliminary study conducted in Australia examined the effectiveness of behavioural parent training for boys aged two to nine years with and without CU traits and found poorer outcomes for boys with 'callous-emotional' traits at six month follow-up (Hawes & Dadds, 2005). This study found that discipline strategies appeared to be much less effective for boys with high CU traits.

The importance of the relationship between parents and the program facilitator has largely been overlooked in recent research on parenting programs. However, Kazdin and Whitley (2006) examined the parent-facilitator alliance in parent training for children with disruptive behaviours and found that the better the quality of the relationship, the greater the improvements in parenting practices by the end of intervention.

5.3 Factors that influence engagement in parenting programs

Engagement in parenting programs can be seen to encompass three parent behaviours: initial enrolment in the program, participation in sessions and completion of the program. It is well established that high risk families are less likely to enrol in parenting programs and more likely to drop out prior to completion. The same factors that tend to be associated with the effectiveness of an intervention also appear to be associated with engagement (Reyno & McGrath, 2006). For example, recent studies have found that initial enrolment and drop-out are related to factors such as low socio-economic status of the family or neighbourhood, step- or sole-parent families and high levels of depression, anxiety and stress (Heinrichs, Bertram, Kuschel, & Hahlweg, 2005; Zubrick et al., 2005). As high risk families have the potential to gain the most from participation in parenting programs, ensuring high rates of attendance of these families is important.

In a narrative review of parental engagement in parenting programs, Morawska and Sanders (2006) concluded that much research has focused on demographic variables that predict engagement and there is a lack of research on potentially modifiable factors that influence engagement, such as parental cognitive, affective and motivational factors. In recognising the importance of motivational factors, Nock and Kazdin (2005) conducted a RCT to examine the effects of a motivational intervention designed to increase participation and attendance in a parent training program for child behavioural problems.

The motivational enhancement intervention in the study was brief (five to 45 minutes) and involved provision of information about the importance of attendance and adherence to the program, eliciting motivational statements from parents and helping parents to identify and develop plans for overcoming barriers to attendance. Families with children aged two to 12 years with conduct problems were randomly assigned to this brief intervention prior to participation in the parent training. Participation in the intervention was associated with greater parent motivation and parents attended significantly more sessions. Given the brief nature of this intervention and the positive findings for motivation and attendance, this may represent a potential useful strategy for use in clinical practice.

Heinrichs (2006) examined the effects of payment and program format (individual vs group) on enrolment rates in a universal parenting program. Offering families a payment significantly increased overall recruitment by 20%, which represented a 76% increase in attendance compared with the unpaid condition. However, offering families an individual program did not significantly increase recruitment when compared with the group condition.

5.4 Summary

The predominant focus of research on parenting programs in the last few years has been on conducting reviews of the evidence supporting behaviourally-based parenting programs as an intervention for child behavioural problems and for child abuse and neglect. There is evidence that parenting programs have a moderate effect on child behaviour problems, at least in the short term, as well as parenting outcomes that may be associated with child abuse and neglect. However, there is not yet evidence about whether parenting programs actually reduce the incidence of child abuse and neglect and further research is urgently needed. There is also a lack of evidence about whether positive outcomes are maintained in the longer term and about the cost-effectiveness of parenting programs.

In recent years there has been further research to support the effectiveness of three behavioural parenting programs: Triple P, PCIT and Incredible Years. There is some evidence that parenting programs are effective in improving adjustment for parents with substance use, as well as increasing knowledge and skills related to child health for parents with intellectual disabilities. Parenting programs also appear to have short term effects on parental mood, relationship with partner and self esteem. In general, there is a lack of evidence regarding programs based on relationship approaches, such as attachment-based parenting programs.

There are a number of family risk factors that have been found to be associated with parents' engagement in parenting programs and the effectiveness of these programs. There is evidence parenting programs are less effective for economically disadvantaged families and these families are less likely to engage in parenting programs. There is also some evidence that these families may benefit from individual parenting programs over group programs. There is also some preliminary research to suggest that motivational enhancement strategies may be effective for engaging families in parenting programs.

While there is some evidence that parenting programs are potentially cost-effective (Aos, Lieb, Mayfield, Miller & Pennucci, 2004; Dretze et al., 2005), there is an overall lack of research that provides sufficient information about the cost-effectiveness and cost benefits of parenting programs.

6. Multi-component approaches

6.1 Summary of previous findings

Multi-component approaches usually combine two or more strategies. Often these are two-generational strategies (targeting both parent and child). However, they can also incorporate a third tier by including a community strategy, such as increasing the number and accessibility of non-stigmatised services in a community (for instance, through provision of co-located and integrated early childhood services).

As reported in the previous review, the best known examples are probably the High/Scope Perry Program and the Abecedarian program, which included early childhood education and a parenting program. Rather than aiming for modest improvements for all families, they targeted socially disadvantaged families in an attempt to close the developmental gap associated with this disadvantage. The results of the High/Scope Perry Preschool and the Abecedarian Programs indicated that preschool programs could produce sizeable results that change children's life pathways and set them on a more solid foundation for their adult life (Marshall & Watt, 1999, Schweinhart, 2005; Watson et al., 2005). The Abecedarian study showed that the effect was augmented if the intervention also targeted parents. However, in both cases, the sample sizes were small and the educational intervention was research-initiated. It was not clear whether these results might generalise to other 'non-model' programs.

It is now widely accepted that the most effective approach to early intervention is to combine a strategy aimed at the parents, such as a structured parent education program or home visiting, while providing high quality care for children (Gomby, 2005). This requires the services to be available and accessible within the community and has resulted in a call for available and accessible 'joined-up' services in a geographic area, as well as finding ways to increase the informal social capital of a community.

The recent literature again reflects a shift to:

- larger sample sizes including public policy roll-out evaluations
- long term follow up of benchmark programs
- drill down to effective components
- economic cost-benefit analysis.

6.2 Large public policy roll-out

From the promise of these early results, evaluated larger scale roll-outs of multi-component services have been adopted as part of public policy. The best known of these are the Chicago Child-Parent Centres, Early Head Start and the Comprehensive Child Development Program in the United States, and the Sure Start initiative in the United Kingdom. This evaluated early intervention strategy is also being adopted as public policy in Australia (for example, the NSW *Brighter Futures* program).

6.2.1 Chicago Child-Parent Centres

The establishment of the Chicago Child-Parent Centres is a public policy intervention initially set up in 1967. Grants were provided to public schools serving high concentrations of children from low income families. The second oldest federally-funded preschool program after Head Start, in 2006 it provided about 15 hours per week of early care and education to children in 24 centres in Chicago, along with parent education to their parents. The Chicago Longitudinal Study, administered by the University of Wisconsin, is still following the progress of children who have attended these Child-Parent Centres. The evaluators claim that this longitudinal study represents 'the most extensive investigation of the long term effects of a publicly funded preschool program' (Temple & Reynolds, 2007: p.134).

Currently the Chicago Longitudinal Study is monitoring the program effects for the entire cohort of 989 children who were born between 1979 and 1980 and attended the program from age three to six years. The comparison group was not randomly selected but consisted of a group, matched for age and income, who attended all day kindergarten for children at risk at five randomly selected schools. The Chicago Child-Parent Centres targeted children from the highest poverty neighbourhoods so estimates of the impact of the program are likely to be conservative.

Study participants have now been followed up to age 22 years ($n = 1281$), with an 87% recovery rate for both groups. Compared with the control group, program children were more likely to be 'ready for school', be at national norms for reading ability and have greater parental involvement. They were half as likely to have child maltreatment court reports (five compared with 10) or Indicated Child Protection reports (seven compared with 14). At school they were less likely to have repeated a grade or required special education and more likely to have completed high school. They were less likely to have been arrested, including 41% less likely to have been arrested for violent crime (Mann & Reynolds, 2006).

Even within the constraints of a public budget and with each program under different auspices, the findings were consistent across centres and had very similar positive effects to the smaller and more tightly run university pilot studies.

6.2.2 Early Head Start

The other major public policy roll-out showing promise is Early Head Start (Karoly et al., 2006). This grew out of the Head Start program, with the age group extended downwards to include infants and toddlers. This federally-funded 'two-generation' initiative targeted low income families. In the 2004 financial year the budget was US\$677 million, which supported 650 programs serving nearly 62,000 children under three years of age (Gomby, 2005).

The evaluation of the program was based on 3,001 low income families. These families were highly diverse in age, ethnicity and rural and urban mix and selected regardless of birth order. Children were enrolled in the first year of life and the average time in the program was 22 months. There was random allocation across 17 sites to the program ($n = 1513$ to intervention and $n = 1488$ to control). Services in the program consisted of early childhood education, parent education, comprehensive health and mental health services, nutrition education and family support services. These services were delivered through a centre-based program (four sites), a home-based program (seven sites) or a mix of centre- and home-based (six sites). Control group families did not receive Early Head Start services but were able to access other services in the community.

Children were followed up at three years of age. Results have been reported as statistically significant and positive, with cognitive and language gains, lower levels of aggression, higher engagement and levels of support from their parent. They have more positive home environments and are less likely to be smacked when compared with the control group (Raikes, Green, Atwater, Kisker, Constantine & Chazan-Cohen, 2006).

The effects, however, are very small, with most around 0.1 to 0.15 of a standard deviation above the control group. They are encouragingly all in a positive direction and, as the children are still very young, may reflect the beginning of a more positive trajectory with differences increasing over time. However, perhaps Gomby's (2005) point should also be borne in mind. She states that 'sometimes very small differences between groups (such as one or two points on a standardised test) can be statistically significant even though such differences may not have any practical or functional importance for families.' (p.14). The differences in the analyses of Early Head Start are so small it could be argued that they are virtually meaningless in terms of the discriminatory power of the tests administered.²⁰

²⁰ There was a 1.5 point difference on the Bayley's Development Scale (91.4 cf 89.9 mean =100, SD of 16); a 2.2 difference on the Peabody Picture Vocabulary Test (83.3 to 81.1 points), a 0.7 of a point difference on an aggression scale, which ranges from 0 to 38. There was 0.2 of a point higher on parental engagement and 0.1 of a point higher on parent support, both as measured on a 7 point Likert-type scale. Detachment, reading to child and spanking were all similarly very small effect sizes.

The pertinent question to ask here is the degree to which change must occur in order to be worth the monetary investment. There is no hard and fast rule that can be applied. A very small percentage change may be worth the investment if the outcome being measured is serious, such as child deaths or child maltreatment. If the outcome measured is, for instance, the number of words in the child's vocabulary then funding bodies may be keen to see larger changes than 0.1 of a standard deviation.

Early Head Start results are encouraging but small. It will not be until the children start school that any stronger conclusions can be drawn.

6.2.3 Sure Start

Sure Start was an early intervention program for children under four and their families in the United Kingdom that aimed to reduce child poverty and social exclusion by enhancing family functioning and promoting the physical, intellectual and social development of babies and young children, particularly those who were disadvantaged (NESS Research Team, 2004). Sure Start Local Programmes (SSLP) aimed to improve existing services and create new services in deprived areas with average populations under 13,000 (Belsky et al., 2006). Services provided within SSLPs were universally available and, unlike most early interventions, did not have a prescribed 'curriculum'. Instead, each SSLP had local autonomy to create and improve 'evidence-based' services as needed. Services provided within SSLPs included the provision of outreach or home visiting; family support; support for good quality play, learning and childcare experiences; primary and community health care; advice about child and family health and development; and support for people with special needs (Belsky et al., 2004).

Belsky et al. (2006) reported the initial impact evaluation of SSLPs by examining differences between children and families in 150 randomly selected communities with SSLPs and 50 comparison communities to have SSLPs at a later date. Using a quasi-experimental cross-sectional design, randomly selected mothers were interviewed in the SSLP areas and children aged 36 months were assessed for cognitive and linguistic functioning. The findings of the study showed that mothers of children aged nine months living in SSLP areas reported less household chaos and mothers of children aged 36 months showed greater parental acceptance of their communities than those in comparison areas (although 14 other variables were non-significant at both time-points). While children of non-teenage mothers had fewer behavioural problems and greater social competences when living in SSLP areas, the reverse was true for children of teenage mothers. It appeared that children of teenage mothers were adversely affected by living in SSLP areas with lower verbal ability and social competence and greater behavioural problems when compared with those in the comparison areas. Additionally, children of other socially deprived families (such as lone parents and workless households) living in SSLPs showed poorer verbal ability relative to the comparison sample. There were no differences in reports of service utilisation or perceived service utility.

From the findings, Belsky et al. (2006) concluded that SSLPs appeared to benefit less socially deprived parents and their children but seem to have an adverse effect on the most disadvantaged children. The authors suggested that this finding may be attributable to socially deprived parents being less able to take advantage of SSLP services and may have found the extra attention of service providers stressful and intrusive. However, the authors note that, because of the quasi-experimental nature of the study, the findings should be treated with caution and that further follow-up of the nine-month old children at age five may enhance understanding of these initial findings.

Rutter (2006) has reviewed and critiqued the initial findings of the Sure Start program. He notes a number of important limitations with the methodology of the program that may have prevented a clear understanding of program outcomes, including the failure to use a RCT and the fact that SSLPs did not use a prescribed curriculum, which led to services and program implementation being highly varied across the SSLP sites.²¹

6.2.4 Pathways to prevention

An understanding that child and family well-being is related to the community within which they live provides the theoretical underpinning in the Australian Pathways to Prevention program. It has the specific aim to build a sense of community in the most disadvantaged geographic area in urban Queensland. The first phase of the project focused on the transition to school and involved the integration of family support programs with preschool and school-based programs in seven schools, delivered within a community development framework (Hemel et al., 2006). Qualitative data collected through interviews indicated that relationships did improve between schools and families. Also, families reported greater access to services and greater participation in church and community groups, more attachment to community, an increased sense of belonging, inclusion in and strengthening of community networks and greater connection with traditions and values. There was a consequent reduction in social isolation. The service was used by some of the most difficult-to-reach and vulnerable families.

Hemel et al. (2006) argue that the quantitative outcomes for children after one year of involvement in the project provide some of the strongest evidence that multi-layered interventions in school and community setting can influence developmental pathways. The extent to which any single program is responsible cannot be disentangled, although the positive outcomes are in line with the effect sizes found in delivering high quality child care (see Gomby, 2005).

6.2.5 Comprehensive Child Development Program

The underlying principle of this United States-based program was that it would link families up with existing services through a case manager 'single-entry point', although families still had to find their way to the various services. A case manager visited families at home and linked families to a range of services by brokering services according to the family's needs. The progress of 4,140 families randomly allocated to the program or standard services across 21 sites, at the cost of US\$25 million per year, was monitored for five years. There was 'no statistically significant impact of CCDP in program families when they were compared with control families in any of the assessed domains: early childhood education, child and family health, parenting education, family economic self-sufficiency or maternal life course' (St. Pierre & Layzer, 1999, p.134).

6.2.6 Assessing the impact at population level

Multi-component approaches often require a high degree of interagency collaboration to ensure that policies and services are aligned especially if they are delivered by multiple service agencies as part of a large public policy roll-out. Introduced at a population level this approach might be expected to produce population level change.

²¹ At the time of publication of this paper, Sure Start evaluators published a study showing more positive benefits of Sure Start. Programs delivered were based on research evidence of effectiveness rather than community ideas. Where SSLPs had a Children's Centre offering a range of services (including immunisations, parent education, occasional care, health checks and a high quality preschool program based on High/Scope Perry principles) children made significant developmental gains and parents benefited. These gains remained after taking into account numerous child and family and demographic variables (Melhuish et al., 2008).

To strengthen inter-agency planning and provision of services some jurisdictions have adopted a common inter-agency language and assessment framework (Little, 2007; Bentovim & Bingley-Miller, 2007). In the United Kingdom agencies such as 'social services, education departments, housing authorities and independent organisations ...are no longer merely exhorted to co-operate but they are legally required to do so' (Aldgate & Statham, 2001; p.96). Under this legislation, the social service department has a key co-ordinating role. Other agencies are mandated to assist if requested (Aldgate & Statham, 2001).

Over the last decade, researchers have begun to intensify their interest in examining the impact of social and economic policy on child developmental health, well-being and academic achievement at a national level eg Sweden (Durrant, 2000), Norway, Canada, and the United States (Phipps, 1999), and Canada (Keating & Hertzman, 2000). This has been followed by a series of descriptive government reports and research papers detailing a shift towards a more preventative system with the aim of creating population level change (such as in Finland and New Zealand; Harrikari & Satka 2006; New Zealand Ministry of Social Development, 2003).

In the main it is too soon to examine the effect of the implementation of these broad ranging policy shifts beyond assessing the progress of the implementation itself and gathering base line data.

An exception is the Durrant and Janson's (2005) examination of population level records over three decades to investigate possible links between policy change and child maltreatment. In 1979, Sweden was the first of 17 countries to explicitly abolish corporal punishment. The law was very simple and in a public campaign to increase public awareness it was both written on the side of milk cartons and taught as part of the school curriculum. It was expected that over time there would be less support for corporal punishment and that ultimately this would result in lower levels of parental violence towards children. Evidence from a variety of population data bases was examined to assess trends in child physical abuse in Sweden over time. The authors conclude that acts of violence against children have declined dramatically in Sweden since the law was introduced; corporal punishment is infrequent, serious assaults are uncommon, and child abuse fatalities are extremely rare compared with population norms of other countries (Durrant & Janson, 2005).

The links are clearly correlational not causal, however at a time when most other developed countries have not experienced downwards trend *over the same period*, in fact most often the reverse trend is apparent, it adds weight to the argument that the Swedish policy may be successful.

Horwarth and Morrison (2007) suggest that there are common challenges in relation to improving services for maltreated children irrespective of jurisdiction. The challenges faced are firstly integrating services delivery systems previously run by separate organisations, and secondly moving from a service-led to an outcome-focused service. They outline key features that are required in order to create a more integrated approach to service delivery with the aim of reducing child maltreatment (Howarth & Morrison, 2007).

Other evaluations of policy change are often limited by their recency of introduction and concentrate on early or baseline data (eg Willms, 2005, in Canada looking at *The Early Years*); report process variables relating to the success of roll-out (Halfon, 2005, in California looking at *First Five*); or they are qualitative in nature (Spice, 2002, in Australia, looking at *Strengthening Families*). As Homel notes, 'it is important to focus on outcomes and avoid the usual drift to outputs' (Homel et al. 2006).

6.2.7 Aligning policies

An advantage of integrating service delivery system is that it helps ensure that government policies targeting low-income families do not conflict. This has happened in the United States, where welfare and employment polices, designed to increase workforce participation (Welfare-to-Work policies) conflicted with early childhood intervention policies, designed to increase the life chances of children living in poverty (eg Head Start). Welfare-to-Work policies often include legislation regarding for instance, mandatory participation on the work force, time limits of welfare receipt and 'disregarded' earnings.

Many of those affected are poor, single mothers who are also eligible for programs such as Head Start. The differing and unpredictable hours of work of low income workers often means their children cannot access the part-time high quality early childhood programs designed to give their children a better start in life. Where families participated in any one of ten Welfare-to-Work programs, their rate of involvement on Head Start declined and their children accessed other forms of child care. These were more likely to be lower quality care than Head Start would have provided (Chang, Huston, Crosby & Gennetian, 2007).

6.3 Drilling down – ‘what works and for whom?’

6.3.1 Programs for specific families

Some of these two-generational programs have limited the entry of families to the service through eligibility criteria to particular groups, such as social or biological disadvantage.

Biological disadvantage

The Infant Development Program targeted 985 low birth weight babies (2,500 grams or 5.2 lbs or less). Babies were born on average seven weeks before their due date but some as little as three weeks before their due date. The program was taken up by 377 families who were offered three years of home visiting and two years of centre-based care of at least four hours a day on weekdays. Initial gains for the participant group over the control group at three years of age had dissipated by five years of age except for cognitive gains by the heavier birth weight babies, that is, those babies whose birth weight was at least 2,000 grams or 4.4 pounds (Gomby, 2005).

About two-thirds of the sample was followed up at 18 years of age (McCormick, Brooks-Gunn, Buka, Goldman et al., 2006). Again the lower birth weight babies did not benefit from the program but the higher birth weight program babies ($n = 91$) retained their gains in maths and vocabulary. There was no difference between the groups in reading, risk taking or behaviour problems scores. As maternal educational level is perhaps the best predictor of cognitive achievement in children it is perhaps worth noting that the intervention mothers were more highly educated. Nearly two thirds of the mothers (63.4%) of the intervention mothers had completed high school compared with less than half (43.9%) of the control group.

Social disadvantage

The most successful programs have been aimed at social disadvantage and have combined high quality early childhood education with a linked home visiting program of parent education program. Notably effective programs have been the High/Scope Perry Preschool program, the Abecedarian Program and the Chicago Child-Parent Centres, all of which have been rigorously evaluated well into adulthood (see Section 2).

6.4 Conclusions

The most effective way of promoting children’s life chances has been to adopt a multi-component approach so that services target both parents and children. In the United States and the United Kingdom this has been the basis of public service provision, especially in disadvantaged areas. Evaluations of benchmark university-based studies have shown enduring positive effects well into adulthood. With the exception of the Chicago Child-Parent Centres, which have shown positive results similar to those found in university based studies, the translation of this type of service into public policy is still in its infancy but its adoption is becoming increasingly widespread.

7. Cost-benefit analysis

With the shift from university research to public policy roll-out of early intervention strategies and programs, there has been a strong interest in not only what is most effective but also what constitutes the most beneficial allocation of funds.

This can be seen in the number of publications which focus on this issue. Much of one issue of the journal *Economics of Education Review* is devoted to the cost-benefit analysis of early childhood prevention and early intervention programs and strategies (Belfield, 2007; Barnett & Masse, 2007; Temple & Reynolds, 2007). Gomby's (2005) analysis of effectiveness of home visiting includes a comparative cost-benefit analysis of the most well known programs. Aos, Lieb, Mayfield, Miller and Pennucci (2004) examine the benefits and costs of early intervention programs for youth. Extending the analysis and adopting a broader perspective, Wolfe and Tefft (2006) suggest that by improving children's life chances and subsequent adult productivity, early childhood interventions may lead to the increased economic growth of a country. In their commentary, Corso and Lutzker (2006) call for all evaluations of early intervention programs in relation to child maltreatment to include an economic analysis rather than just statistical significance levels.

7.1 Aligning policy interests with research and program design

While there is general concern that the best programs are selected to roll-out, there are other factors which influence the reporting of findings in the literature.

Researchers and program designers naturally hope that their program may be adopted, not only for altruistic reasons. There are often also considerable academic and financial advantages involved. This could make it tempting to highlight positive findings and overlook negative or insignificant ones when reporting.

Policy makers want to ensure that they spend limited funds not only on programs that work (have a significant positive effect) but they are also concerned that these funds are spent wisely, that is, they are cost effective, and that there are economic benefits in the longer term. 'Budget constrained policy makers and practitioners typically seek the most cost-effective programs that serve the largest possible number of needy children. How significant an impact must an intervention have to be worthwhile? Is a cheaper-by-half, scaled back version of a proven program likely to provide half the benefits?' (Shonkoff & Phillips, 2000, p.374).

Policy makers are also interested in what does not work. Insignificant results also need to be reported. To make informed decisions it was as important to find that the Comprehensive Child Development Program did not make any difference as it was to find out that High/Scope Perry Preschool did.

As sample sizes have grown larger, the power to detect minor changes has increased but the question still needs to be asked: is this degree of change worth the investment? Gomby (2005) points out that minor differences between groups on a pencil and paper test may not be worth the investment of large amounts of money (such as one point on a test with a score range from 50 to 150). Smaller percentage differences in group outcomes which are serious, such as child abuse or child deaths, are worth a greater investment than larger differences in outcomes, such as numeracy skills at age four.

Policy makers consider the answers to the following questions when making decisions

- What has changed?
- Is this a valuable change for society?
- Is the degree of change enough to warrant investment?
- Is this the most cost-effective way to produce the desired degree of change?

The most recent and perhaps the most comprehensive cost-benefit analysis was put out by the RAND Corporation in an update of their 1998 cost-benefit analysis of early intervention strategies (Karoly, Kilburn & Cannon, 2005). It included abuse and neglect as an outcome but the more the more general aim was to see how best to improve school readiness in children aged birth to five years. They looked at eight home visiting programs, 11 programs that combined home visiting with early childhood education and one early childhood education program. In a note of caution, Karoly et al. (2005) also warn that their findings are estimates and not an exact science as different areas estimate costs in different ways (for instance, Parents As Teachers is estimated to cost \$5,295 for a 2.5 year intervention by Montgomery (2000) which is \$1,795 more than Aos et al. (2006) used in their calculations).

The benefits of each strategy, and the programs within the strategy, have already been discussed. These analyses now put a dollar value on these changes. Included in the Table below (see Table 1) are only programs whose effectiveness has been tested using random allocation to control group or an untreated control group matched to the intervention group. Most need to have had at least 50 in the intervention group, unless otherwise stated, for the purposes of statistical analysis.

The costs have been taken from Karoly et al. (2006) Aos et al. (2004) and Gomby (2005).

There are some qualifications to be noted with regard to the reporting in Table 1. The participant numbers cited are **not** the numbers who have gone through the programs but the numbers in each of the intervention and control groups that contributed to the statistical analysis at the age of last follow-up.²² The main cost saving was made through reduction of crime. Where program evaluations did not collect crime data at a later age, these data were not able to be entered into the analysis, thereby reducing their apparent benefits. Similarly where programs have been implemented too recently to see if they have any impact on juvenile, adult crime or welfare costs, effectiveness will appear less, even though this may be a later benefit.

7.2 Summary

The figures suggest that providing services that target disadvantaged families is a more cost-beneficial strategy than universal service delivery. However, identifying those families who might benefit the most from more intensive early intervention may require screening or monitoring on a universal basis. This could occur most easily at transition points in family life, for instance ‘well-baby’ checks through home visiting after the birth of a child. Stigmatisation also needs to be avoided. An approach that targets vulnerable subgroups on a universal basis, such as by disadvantaged locations and/or first time mothers, avoids this problem.

The tightly controlled studies with analyses on small samples were the most cost beneficial (High/Scope Perry and NFP in Elmira). Nevertheless, there was also evidence from the Chicago Child-Parent Centres that a targeted public policy roll-out, administered within tight government budget constraints, can also produce large cost beneficial positive developmental outcomes. The consistent results of the Chicago Child-Parent Centres, across different sites and auspices, suggest that the staff training and program content are of critical importance to the success of the program.

²² This can fluctuate slightly due to missing data. However, when analyses are performed on sub-samples, the actual sample size is important. This is because findings based on small sample sizes provide generally less reliable data and are therefore harder to replicate. On the other hand, the differences need to be quite large in order to be significant.

Table 1: Cost benefit ratio

Program	Type	Age at last follow up	Method	Program costs per child	n(program) n(control)	Savings to gov't	Rest of Society	Total benefit to society per child	Net benefit to society per child	Return per dollar cost per child
Follow up in pre-school years²³										
Nurse Family Partnership	Home visit/ Parent ed.	4 Denver	RCT	\$8,661	206 (nurse) 224 (control)			\$2,477	-\$6,184	\$0.29
Nurse Family Partnership	Home visit/ Parent ed.	4 Memphis	RCT	\$9,775	211 (para) 204 (prog.)			\$247	-\$5,591	\$0.04
Early Head Start	Childcare/ Parent ed.	3	RCT	\$20,972	1,513 (prog.) 1,448 (cont.)			\$4,768	-\$16,203	\$0.23
Parents as Teachers	Home visit	3	RCT	\$3,500	75 (prog.) 69 (control)			\$4,300	+\$800	\$1.23
Follow up during elementary school years										
Comprehensive Child Development Program	Case manager brokers services	5	RCT	\$37,388	1,507 (prog.) 1,544 (cont.)	-\$101	0	-\$9	-\$37,397	0
HIPPY USA	HV/PE/ home child activities	6	RCT	\$1,681	514 (prog.) 514 (control)	\$485	\$607	\$3,032	\$1,351	\$1.80
Infant Health Development Program	Childcare/ HV/Group Parent ed.	8	Matched	\$49,021	377 (prog.) 608 (control)	0	0	0	-\$49,021	0

²³ It should be noted that these programs are unlikely to produce significant cost benefits as the children are too young to have accumulated benefits.

Table 1 (cont.): Cost benefit ratio

Program	Type	Age at last follow up	Method	Program costs per child	n(program) n(control)	Savings to gov't	Rest of Society	Total benefit to society per child	Net benefit to society per child	Return per dollar cost per child
Follow up to early adulthood										
Abecedarian	Childcare/home visit	21	RCT	\$42,871 (Karoly) \$63,476 (Barnett) \$35,864 (Temple)	57 (program) 54 (control)			\$138,635 \$158,278 \$135,546	\$95,764 \$94,802 \$99,682	\$3.23 \$2.50 \$2.69
Chicago Child Parent Centres	Childcare/home visit	21	Matched	\$6,913 \$4,856 (1yr)	837 (prog.) 444 (pre-K program)			\$74,981	\$67,595	\$6.87
High Scope Perry Preschool	Childcare/home visit	27 40 21	RCT	\$9,759 (1yr) \$14,830 \$15,386 (Barnett)	58 (program) 65 (control)	\$61,866	\$191,288	\$138,486 \$253,154 \$262,642	\$122,642 \$238,342 \$247,256	\$7.16 \$17.07 \$9.00
Standard	Grade retention Class size (K-3) 22-15	Post school age		\$7,959 \$8,454					-\$26,434 \$23,913	-\$3.32 \$2.83
Parent-child Home program	Home visit	17-22	RCT	\$3,890	209 altogether				-\$3,890	0
Healthy Families America	Home visit			\$3,314				\$2,052	-\$1,263	\$0.62
Family preservation	Home visit – crisis			\$2,531					-\$2,531	0
Even start	Parent ed./literacy			\$4,863				0	0	0
ECE 3-4 yr low income meta-analysis	Varies			\$6,681				\$15,752	\$9,061	\$2.36

Table 1 (cont.): Cost benefit ratio

Program	Type	Age at last follow up	Method	Program costs per child	n(program) n(control)	Savings to gov't	Rest of Society	Total benefit to society per child	Net benefit to society per child	Return per dollar cost per child
Follow up during secondary school years										
Nurse Family Partnership – high risk	Home visit/ Parent ed.	15 Elmira	RCT	\$7,271	38 (program) 62 (control)	\$32,447	\$7,695	\$41,419	\$34,148	\$5.70
Nurse Family Partnership – low risk	Home visit/ Parent ed.	15 Elmira	RCT	\$7,271	61 (program) 103 (control)	\$5,095	\$2,005	\$9,151	\$1,880	\$1.26
Nurse Family Partnership – Full sample	Home visit/ Parent ed.	15 Elmira	RCT	\$9,118	99 (program) 165 (control)	\$9,548	\$14,075	\$26,298	\$17,180	\$2.88
Meta-analysis Home visit high risk mothers (13 studies)	Home visit/ Parent ed.	Varies	RCT	\$4,982				\$10,969	\$6,077	\$2.24

8. Implications and conclusions

8.1 Implications for policy, practice and research

There are several implications for policy, practice and research.

- **Multi-component strategies are more effective than single strategy interventions.** Where interventions target both parents and children in a family, the effect is greater than that of a single strategy. For preschool children, early childhood education is the most effective and cost beneficial strategy. Its effects can be enhanced by a home visiting strategy or an evidence-based parent education program.
- **Evidence should be based on more than one study.** There appears to be an over-reliance on earlier benchmark studies, such as the Elmira study from Olds et al. and the High/Scope Perry Preschool Program. Whereas the child care/preschool studies are methodologically quite rigorous and results have generally been replicated elsewhere, there has been greater difficulty in replicating the home visiting results. The evidence, especially for the effectiveness of home visiting is mixed, particularly as a stand-alone strategy to improve outcomes for children from vulnerable families. Additionally, the evidence for the effectiveness of home visiting in terms of preventing child maltreatment is even more inconsistent, however, this may be a result of the low base rate of this phenomenon on the general community. Nevertheless, home visiting may be an excellent platform in identifying those families which need extra support.
- **Identify high quality – the active ingredients of effective programs.** One reason why child care seems to be more effective than home visiting is that we know the factors that contribute to high quality child care. Child care is, by its nature, observable and in Australia the quality is monitored through a policy-driven, government-funded, national accreditation system. The same level of detailed knowledge about what makes for a high quality home visiting program is not yet available. This might explain the rather ‘washed out’ results reported for home visiting. If the factors that constituted a high quality home visiting program were better understood, the results may be more positive. It is known that practitioners need to be well-trained, supported, provided with a structured content and have excellent interpersonal skills. However, further research is called for, particularly a detailed examination of what actually happens during the visits so that what is high quality home visiting, and what is not, can be more accurately identified in the same way as it has been for child care. Once this is better established then large public policy roll-outs might be more effective. The DoCS-funded Miller home visiting trial in NSW and the evaluation of the DoCS Brighter Futures Program provide important opportunities to contribute to this evidence base.
- **The importance of relationships.** Regardless of strategy, the relationship that is built between the practitioner and the parent, or the child and child care educator, is of critical importance. Again the nature of adult-child relationships that promote positive developmental outcomes is best understood in centre-based care, where detailed observation has resulted in measurable indicators of the quality of the relationship. Relationships are also known to be crucial to the success of all early intervention programs however the statements describing its nature are often more general such as ‘trusting’ and ‘respectful’, without stating what constitutes ‘respect’.
- **Programs need to target specific problems and families to maximise effectiveness.** Parenting programs that are behaviourally-based, such as Triple P, the Incredible Years and Parent Child Interaction Therapy, have the potential to improve parenting skills and to reduce behaviour problems in children. These programs should be targeted at parents who need to learn specific behaviour management skills. There is also a lack of evidence regarding the effectiveness of parenting programs for parents at risk of abuse and neglect. While some reviews have found positive results, further research is needed. There is also a lack of evidence on relationship-based parenting programs, such as those based on attachment theory.

- **Take the socio-ecological context seriously.** Change is not created solely by a competent practitioner delivering an effective program to a family with a specific problem. The broader picture needs to be considered. Change is not up to practitioners alone. Policy makers improve the life chances of innumerable children by implementing initiatives and strategies that ensure that families, especially those in disadvantaged areas, have access to a range of accessible and effective support services, including material support. It is important that these services are accessible to children who can derive the most benefit, are delivered by staff who are well-trained and who have adequate supervision.
- **Allow funds for evaluation.** By allowing funding for evaluation, policy makers can constantly refine strategies and programs by providing on-going funding for effective programs and discarding ineffective ones. What works and what does not work are of equal interest. Evaluation as a part of policy is less likely to be influenced by potential conflicts of interest, which may occur when occupational promotion or status depend on significant, positive results.

8.2 Conclusions

The trend towards looking at the impact of policy or systems level change on a population or very large sample was already noticeable before 2004. There has, however, been a greater interest in a more rigorous evaluation of the effects of policy, and a stronger voice advocating integrated systems of strategies and programs, as part of this broader focus. At the same time, there has been a trend towards funding consortia represented by government and university departments undertaking large-scale longitudinal studies. Improvement in technology and communication has led to data sharing across these large, often national, studies. The resulting large data bases are able to provide a ‘bigger picture’ of the developmental pathways of children as a function of differing governmental policies, service provision systems, demographic factors and how these may interact with child and family strengths and vulnerability. Analysis of these data bases, as well as ongoing evaluation of current strategies and programs, will add to the knowledge base and contribute to improving the life chances of vulnerable children and their families through early intervention.

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Appendix A

Why is it difficult to for recent home visiting evaluations to replicate the findings of the Elmira study in relation to child maltreatment?

Despite multiple measures on the small disadvantaged sample there was no statistical correction made for this, increasing the probability of chance significant findings.

An alternative explanation may be that because most studies have yet to be followed up for an equivalent period of time, the impact of early home visiting on teenage behaviour still remains to be seen.

Lack of fidelity of roll-out. Attempts to replicate the positive results of the early Hawaii Healthy Start have been not been able to retain the strength of these earlier findings. This may be because of lack of fidelity of roll-out as sample sizes increase. Particularly in large public policy roll-outs there may be less commitment to a specific program and the intensity and duration of program delivery may be diluted as the demands on the time of those delivering it increase.

Length of time of follow-up. The theoretical underpinning of early intervention is that children start off on a more positive developmental pathway. Over time the apparently small differences in positive parenting, cognitive gains, school readiness lead to large differences long-term outcomes, such as reduction in arrests and crime or drug and alcohol abuse. The length of follow up would therefore make it more likely that positive effects are apparent and the broader impact (eg involvement in criminal activity) can be taken into account.

Small sample size. Olds et al. (2007) report that their most dramatic findings generally were noted amongst the most disadvantaged groups. The strength of these findings is reinforced by the random allocation and its prospective nature. However even though Olds et al. targeted young, unmarried, poor mothers in Elmira, of the 400 who participated in the research only 74 were poor, unmarried and single. In the analyses, those visited only antenatally were very often not included in statistical analyses as this group showed 'few and inconsistent results' (Eckenrode, 2001). This means that most of the early statistical analyses that show significant findings related to a disadvantaged group of 23 unmarried, single, young mothers who were visited post-natally compared with 32 similarly disadvantaged mothers who were not visited. Fifteen years later the criterion of young was dropped. The disadvantaged intervention group used for comparative purposes remained nevertheless quite small with 38 home-visited unmarried, poor mothers being compared with 62 similar mothers in the control group.

Different units of analysis. In relation to child maltreatment, most replications compare the numbers of abusive mothers in each group and find that these did not significantly differ. The unit of analysis in the Elmira study fifteen years later where significant differences were found was based on the number of state-verified reports. Although there was ceiling set at 20 reports per mother, Olds makes it clear that 'Individual cases may have values greater than one' (p. 642. 2001). This means that one or two mothers can contribute disproportionately to the numbers of verified reports (and there must have been at least one mother with 20 reports for the ceiling to be set). The average number of reports in the visited group was 0.29 and in the non-visited group was 0.54.²⁴

The earlier data from Elmira suggests that the proportion of mothers in each group who maltreat is not dissimilar. In childhood at 34 months and 46 months comparisons were made between the 24 maltreating families in the control group and 11-12 maltreating families in the intervention group suggesting that there were about the same proportion of maltreating families in each group (as the control group was close to twice the size of the intervention group).

²⁴ Although the original article refers to the number of reports (Olds et al. Eckenrode et al, 2001), in 2007 Olds et al argue that 'in contrast to woman in the comparison group, those visited by nurses were 48% less likely to be identified as perpetrators of child abuse and neglect' (p. 378) suggesting that his refers to numbers of women. In the 1997 article he cites it is stated that mothers were identified as perpetrators **in fewer verified reports** and is clear that if the same mother is cited in a verified report 20 times this is counted as 20 identifications of a mother in that group as a perpetrator.

Persistence of abuse. Most children who were abused in the Elmira sample were abused by the mother with the most commonly reported type of abuse mostly being neglect (63%). Olds (1997) reports there were more verified reports of abuse over the fifteen year period in the comparison group than the nurse visited group. Eckenrode (2001) has also examined the maltreated children in the Elmira group.

Olds (1997) looked maltreatment in the Elmira group, including 'all reports involving either the mother or the focal child' (p. 64). Eckenrode used the maltreated sub-sample where 'reports that did not involve mother as a perpetrator or the study child as the victim were excluded' (p. 879). It can be assumed that the samples examined were broadly overlapping although Eckenrode had 13 children in the sample who were subject of sexual abuse allegations which may mean that the mother was unlikely to be the perpetrator in these cases (i.e. Eckenrode may have included reports where the subject child was the target but the mother not the perpetrator). Physical and sexual abuse were counted as one category. Olds (1997) truncated the number of reports at 20 'to reduce the likelihood that the differenced observed were the result of a few extreme values' (1997, p. 640) and Eckenrode truncated the numbers of reports at 5 'because there were few cases with more than 5 reports' (p. 880).

Drilling down further into the Elmira data, Eckenrode et al. (2001, p. 885) reports that for the 39 children who had at least one verified report before age 10 there was no difference in the *proportion of children* who had been abused between the nurse visited and the comparison group (child-limited abuse, mean number of reports was 1.6). For those with at least one verified report at age 10 or over ($n = 19$, adolescent-limited abuse) there was no difference in the *proportion of children* abused in the adolescent limited group between the nurse visited and the comparison group (mean number of reports was 1.2). A third category of children were considered persistently abused. These children had at least two reports, one under the age of ten and one when the child was ten or older (mean number of reports 4.3). There was a slight difference in the *proportion of children* who were persistently abused right through childhood ($n = 12$) with fewer being in the nurse visited group ($p = 0.08$). Given the serious sequelae of child abuse and neglect, the acceptance of a higher probability of this being a chance finding, than would usually be the case in research, may be justified.

Amongst these 12 'persistently abusive' mothers, the comparison mothers had more verified reports of abuse or neglect ($p = 0.03$ – Eckenrode, et al., 2001).

This level of detail may seem unnecessary, the point being made, however, is that the evidence for the effectiveness of home-visiting as a single strategy to prevent child maltreatment is based on limited evidence.

Appendix B

Why are findings of the superiority of nurses in relation to domestic violence difficult to find in other studies?

The finding related to domestic violence is of greatest interest to child protection agencies and is worth looking at in more detail.

The data were analysed by making direct comparisons between nurse-visited mothers and the control mothers and also between with paraprofessional visited and control mothers. There were no direct comparisons made between the outcomes of families who were nurse visited and families visited by paraprofessionals. After the intervention the paraprofessional group compared with the control is almost equivalent with only 0.6% difference. It would seem that the nurses brought about change and the paraprofessionals did not. When change is examined the difference between the two is not so marked with the paraprofessionals bringing about 4.8% change compared with the nurses 6.7% change. The nurses still brought about 1.9% more change.

Despite the randomisation to control, nurse or paraprofessional groups, the initial background characteristics of the 'aged four' sample indicate that 46.5% of the paraprofessional group being in the 'low psychologic resources' group compared with 32.7% of the controls and 39.7% of the nurse home visited. There were also a larger proportion in the initial paraprofessional group who were subjected to domestic violence in the preceding 6 months (19%) than either the nurse visited mothers (16.4%) or the controls (13.4%).

Compounding this initial inequality, nurses lost disproportionately more mothers who were subjected to domestic violence through attrition. In the whole sample the controls lost four out of 36 mothers to attrition (11%) who were initially subjected to domestic violence and so were not included in the follow up. The paraprofessionals lost 3 out of 40 mothers who were subjected to domestic violence (9%) to attrition. The nurses lost ten mothers out of an initial 37 to attrition (31%).

It is then not so surprising that fewer mothers in the nurse visited sample ended up being subjected to domestic violence in the past six months. They had fewer to start with and more of them dropped out.

For a more detailed breakdown of the numbers and percentages see Table 2.

Table 2: Breakdown of initial sample and attrition by vulnerability and domestic violence as a function of status of visitor (nurse or paraprofessional) and control

	Whole sample			Low Psychological Resource		
	Control	Para	Nurse	Control	Para	Nurse
Intake characteristics						
N	255	245	235	82	115	97
DV – %	16%	18%	16%	18%	30%	27%
DV – n	40.8	44.1	37.6	14.76	34.5	26.19
Intake characteristics of clients who completed 4-year maternal assessments						
N	220	211	204	72	98	81
Dropout – n	35	34	31	10	17	16
Dropout – %	13.73%	13.88%	13.19%	12.2%	14.78%	16.49%
DV – %	16.4%	19%	13.7%	18%	31.9%	22.8%
DV – n	36.08	40.09	27.95	12.96	31.26	18.47
DV – % change	+0.4%	+1.0%	-2.3%	0	+1.9%	-4.2%
DV – among dropout (n)	4	3.2	9.65	1.8	3.24	7.72
DV – among dropout (%)	11.43%	9.41%	31.13%	18%	19.06%	48.3%
Post intervention						
DV – %	13.6%	14.2%	6.9%	-	-	-
DV – n	29.92	29.96	14.08			
DV – % change	-2.8%	-4.8%	-6.8%			

Table from Kate Furst (2007) extracted from data from Eckenrode et al. (2004).

Appendix C

Why are the results of nurses better than those of paraprofessionals?

In the Denver study, it was found that by the time children were four years of age there were three significant differences favouring nurse visited mothers. Nurse visited mothers delayed a subsequent birth by 4.1 months, the children were less likely to attend pre-school/licensed child care and there were reduced rates of domestic violence

Even bearing in mind there were some quite large pre-intervention differences favouring the control group and using post-intervention comparisons of rates only, there were significant effects looking at paraprofessionals results compared with controls which were not apparent for nurses.

Mothers visited by paraprofessionals:

- worked more between the child's age of two and four years (15 compared with 13 months)
- had a greater sense of mastery (101 compared with 99)
- better mental health (101 compared with 99)
- less low birth weight (2.8 compared with 7.7)
- were more sensitive and responsive 100.92 compared with 98.66.

There were no other differences for mothers in educational achievement, use of welfare, marijuana, alcohol, substance abuse, children's emotional regulation, or mothers reports of externalising problems as a function of whether they were home visited by nurses or paraprofessionals.

If nurse-visited are compared with controls post-intervention rates, children in the **low psychologically resourced** group who were visited by nurses had better:

- language development (91.39 for nurse visited compared with 86.73 for controls. The paraprofessional visited score was 90.90) The 0.49 difference between the achievement of nurse-visited children and paraprofessional-visited children results is a significant difference for nurses but not for paraprofessionals when compared with controls.
- executive functioning (100.16 for nurse visited compared with 95.48 for controls. The paraprofessional visited score was 99.51). The 0.65 difference between the achievement of nurse-visited children and paraprofessional-visited children results in a significant difference for nurses but not for paraprofessionals.
- behavioural adaptation while testing (100.41 for nurse visited compared with 96.66). The paraprofessional visited were 99.29. The 1.12 difference between the achievement of nurse visited children and paraprofessional visited children results in a significant difference for nurses but not for paraprofessionals.

Aside from the use of post-intervention comparisons only, the practical significance of these results is still not clear. What does a two point difference in terms of better mental health mean for the mothers concerned? What is the cognitive difference of 0.49 of a point superiority of nurses in language mean for the child? For those funding home visiting, is it worth spending the extra money? The question needs to be asked whether the test is so well calibrated and exact that this difference is distinguishable in terms of behaviour or well-being.

