THE KINDNESS OF STRANGERS: FAMILY-BASED EARLY INTERVENTION AND IMPROVED OUTCOMES FOR CHILDREN

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Abstract

This paper presents the findings of a study examining the relationship between family-based early intervention services provided through home visitation and improved outcomes for children, in order to determine the effectiveness of these programmes. This pre-test/post-test design study examined a sample of families (n = 297) across three California-based early intervention home visitation programmes. The findings of the study provides lessons for New Zealand on how early intervention programmes for families can be successful at protecting children from negative outcomes such as abuse and neglect. Programme effectiveness was studied by analysing individual family data to determine the relationship between programme involvement (duration and intensity) and changes in outcome indicators for children pre-intervention and post-intervention. Of the six child outcome indicators examined across three programmes, early intervention services had a significant positive relationship with only one outcome – healthy child birth weight. The key finding of this study was that greater programme involvement, measured by longer and more intense home visitation early interventions, did not result in improved child outcomes. The lessons for New Zealand from this California-based study are that effectively intervening early in a family to enhance a child's wellbeing is complex and seems to require interventions that are part of an integrated model providing quality services that are based on some flexibility in the intensity and duration of services provided.

1 **Acknowledgements**
The views expressed in this paper are those of the author and do not necessarily reflect the views of any organisation with which the author is affiliated. The author's intention is to stimulate wider debate on the most effective ways to improve outcomes for children, considering the various components of early intervention.
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INTRODUCTION

> Society has a solemn responsibility to protect its young. When children are failed by their families then the onus clearly rests with the state and wider society to ensure that children do not suffer or die from violence, abuse or neglect (McClay 2000:25).

A significant number of New Zealand children die as a result of deliberate acts of violence against them by family members. A 2001 report by the United Nations Children's Fund, which compared the rate of child death from injuries among OECD countries, ranked New Zealand as having the fifth highest rate of child death out of the 26 countries studied, with 13.7 child deaths per 100,000 children aged 1–14 years old during 1991–1995 (based on unintentional or intentional injuries, since intention and definitions of neglect are not always clear). Comparably, this was just behind the United States, which ranked fourth among OECD countries at 14.1 per 100,000 children (UNICEF 2001). When we consider that only a relatively small percentage of child abuse and neglect cases end in death and how difficult it has been to correctly identify even these most severe cases, it is sobering to contemplate how many less obvious cases of abuse go unheeded and unchecked.

The trend among all OECD countries in recent decades has been a steep decline in child death rates from injury, with New Zealand's rate of 13.7 children per 100,000 during 1991–1995 down from a rate of 23.7 during 1971–1975. However, New Zealand's child abuse and neglect rate since 1995 has changed very little and the fact remains that New Zealand children continue to die as a result of abuse, often at the hands of family members (Doolan 2004).

The child abuse and neglect figures for New Zealand are also disproportionate across ethnicities. In the year to June 2003, 7,361 children aged 0–16 were assessed by Child, Youth and Family as abused or neglected following a notification, which equates to an overall rate of 7.4 children for every 1,000 under 17 years of age. However, when broken down by ethnicity, the rate per 1,000 was 11.9 children for Māori and 5.9 for non-Māori.[2] Māori families also have much higher rates of the family vulnerability factors discussed in this study, including low socio-economic status, teenage childbearing, low educational attainment and health problems in children (Ministry of Social Development 2004).

It is important that further research continues to be carried out to identify the most effective ways to intervene in families to break the cycle of abuse and neglect. The study presented in this paper focused on the effectiveness of family-based early

2 Corresponding rates are not available for Pacific children.

interventions in achieving positive child outcomes by using empirical evidence from three case studies of family-based early intervention programmes using home visitation. Family-based early intervention is defined as any social service intervention in the life of a child from pre-birth to school-aged, consisting of family-centred services (including care, support or education services) that target parents and children. Home visitation is one form of early intervention where a public nurse, home visitor or behavioural specialist enters the home of a family on a regular basis and works with the family to help improve their situation. In these programmes, home visitors provide support and information to mothers in areas such as child health and development, mother–child attachment and parental strategies. By "intervention" we do not mean involvement by child protective services, although this may happen at times.

It is hoped that this paper sheds some light on the impact of early intervention approaches on the functioning of the family and adds to our knowledge on effective approaches in a way that will strengthen the use of early intervention, and improve the wellbeing of all children.

FAMILY-BASED EARLY INTERVENTION IN NEW ZEALAND

The family plays a crucial role in shaping the wellbeing and development of a child. In recent years there has been a growing interest in New Zealand in family-based early intervention and prevention programmes to address the needs of vulnerable children aged zero to five years. This has been fuelled in part by recent tragic child deaths and the increased awareness by practitioners of the strong relationship between the family situation and child outcomes.

In New Zealand, current early interventions in families with vulnerable children have had varying levels of effectiveness, or their effectiveness is unknown because programme evaluations have not been carried out. It has been recognised that there is a need to continue developing a continuum of effective interventions that provide the right support at the right time to families. Policy around early intervention has identified that initiatives, both at the national level and local level, need to build on the research and evidence of effective interventions and has identified four key areas that need to be addressed together:

- improving effectiveness of services for families raising children
- achieving service co-ordination by promoting local co-ordination, governance and funding
- improving the identification, referral and assessment of families with children with additional needs
- ensuring that families and children have access to support services and remain engaged when these services are used (Ministry of Social Development 2005).

The key lesson learnt from work in New Zealand is that to improve outcomes for young children we need to consider all of these issues of quality, coordination, identification, access and engagement in services together. This is to ensure that all families who need additional support are identified, are able to access services, and are provided with the support services they need while raising their young children.

Research in the area of early intervention has focused on identifying risk factors that contribute to negative outcomes for children, as well as arriving at a consensus on the positive results of early intervention programmes such as home visitation. However, many questions remain about which forms of early intervention are the most effective in achieving these improved outcomes and what focus these interventions in the family unit should take. Since there is little empirical evidence available in New Zealand on the effectiveness of early interventions in the family, this study largely draws on the literature and findings of research carried out in the United States, where more longitudinal data are available. This study also focuses specifically on three case studies of established family-based early intervention home visitation programmes in Sacramento County, California, to provide empirical evidence from the United States on the effectiveness of these interventions. The high-level findings of this study are likely to have relevance to New Zealand and will contribute to our knowledge base about how best to intervene early in the family to improve outcomes for New Zealand children.

THE CASE FOR FAMILY-BASED EARLY INTERVENTION

There is a significant body of research on the different early intervention approaches used by social support services to help improve outcomes for children, particularly in the areas of home visitation and family-based interventions. The family has been identified in the literature as the primary setting for the development of the child and the primary entity through which the community influences this development. Numerous studies in developmental psychology have identified family-level protective factors to be closely linked to improved outcomes for vulnerable children (Cunningham and Zayas 2002, Ethier et al. 2000). There is also increasing evidence to show that a child's experiences in the early years from pre-birth to six years critically shape outcomes across health, education and welfare throughout that individual's life span. This evidence creates a case to provide social service investment in families with children from pre-birth to school age (Duncan and Brooks-Gunn 1997, Karoly et al. 1998, Brooks-Gunn et al. 2003, MacLeod and Nelson 2000).

Recent emphasis in the research on effective early interventions has focused on family-centred programmes that target parents and children, their interactions with each other, as well as their interactions with other social variables. A great deal of this research centres on the concept of family resilience, described as a combination of vulnerability factors and protective factors (Kalil 2003, Rutter 1987, McCubbin et al. 1997). These

vulnerability and protective factors are used as proxy measures when trying to identify causes for negative outcomes for children due to the significant difficulty in determining actual causes. As Kalil (2003) has explained, it is generally agreed in the field of family-based intervention that vulnerability factors are defined as early predictors of later, unfavourable outcomes for a child or family. It has also been accepted that protective factors are "buffering" variables that interact with risk to change or moderate the predictive relationship between risk factors and outcomes (Kalil 2003). In addition to a number of key demographic characteristics known to be vulnerability factors for families, this study also took into account three particular family-level vulnerabilities that have been predominantly found to negatively affect the course of family functioning and child development: low family income (Davies et al. 2002, Duncan and Brooks-Gunn 1997, Stephens and Waldegrave 2001); single parenthood (Kalil 2003, Pool et al. 1998); and teenage childbearing (Kalil 2003, Moore et al. 1995, Fergusson et al. 2001).

This study found, from a review of the theoretical work and empirical studies available, that the literature appears to converge on several key themes with respect to the most effective early interventions for vulnerable families. It was found that effective home visitation intervention programmes can be considered to:

- have a strong theoretical underpinning (Olds 1999)
- begin early in the development of the child (Duncan and Brooks-Gunn 1997, New Zealand Treasury 2002, Karoly 1998, Olds 1999)
- continue longer in intervening (MacLeod and Nelson 2000, Werkele and Wolfe 1993)
- be more intense and comprehensive (MacLeod and Nelson 2000)
- recognise that some children benefit more than others and target vulnerable children with particular identifiable needs (Cunningham and Zayas 2002, MacLeod and Nelson 2000)
- be delivered in a way that uses a bundle of interventions, including home visitation (Behrman 1999, MacLeod and Nelson 2000)
- recognise that the initial positive effects of more reactive early interventions are likely to fade over time (Brooks-Gunn 2003)
- be sensitive to families' cultural beliefs, practices and traditions, by designing and delivering services in a way that helps all vulnerable families access those services and remain in services for as long as they need the support (New Zealand Treasury 2002).

There is evidence to show that all of these policy considerations can contribute to effective early intervention home visitation programmes. The key challenge for policy makers is to identify when an effective early intervention programme has been achieved. The true measure of success of a family-based early intervention programme needs to be determined by looking at the improved outcomes for children over time,

both in their childhood and also into adolescence and adulthood across the range of health, safety, economic security and education domains.

Recent research on the effectiveness of individual home visitation early intervention programmes has highlighted that not all early intervention services lead to improved outcomes for children, and a number of programmes have in fact shown very modest or inconsistent effects on child outcomes (Behrman, 1999). While home visitation has been demonstrated to be one of the most effective types of family-based early intervention (Olds 1999, Breen 1999, Fraser 2000), the results of evaluation research has been mixed.

The results summarised in a special issue of the *Future of Children* journal (1999) illustrate these mixed results, and the particular difficulties in changing lives of children and parents who live in disadvantaged conditions. Evaluations of a number of early intervention home visitation programmes were presented in this special issue and the results varied widely across different programme models, programme sites and families, and across the domains of human experience that the programmes were designed to address (Behrman 1999). Several home visitation models produced some benefits in parenting or in the prevention of child abuse and neglect on at least some measures. Only a small number of models in the sample examined produced consistent improvements in child development or rates of health-related behaviours such as immunisations or well-baby check-ups. Two of the programmes evaluated in this sample explicitly sought to alter mother's lives, and while one of those programmes produced significant positive results when assessed with rigorous evaluation studies, the other did not (Behrman 1999). These mixed results in the evaluations of home visitation programmes emphasise the need to continue carrying out research to identify the most effective ways to intervene in families to improve child outcomes and break the cycle of abuse and neglect.

METHOD

A pre-test/post-test research design was used in this study and a sample of families across three California-based early intervention home visitation programmes was examined. This method of analysis was chosen based on availability of data, barriers to using a control group, cost considerations and time frame. Under a pre-test/post-test research design, one sample group is compared with itself, before and after exposure to some form of treatment – in this case, early intervention home visitation services. Unlike a true experimental design approach, families are not randomly selected in this research design and no control group is present. As a consequence, this design does present some risks to the internal validity of the results because it may be difficult to establish whether early intervention services alone were responsible for any changes occurring in child outcomes between pre-testing and post-testing.

The key risks within this research design are history and maturation factors. The historical factor relates to all of the events that occur within a family between pre-testing and post-testing that are in addition to their exposure to early intervention services. The maturational factor refers to those processes within the families resulting in changes in attitude or behaviour simply as a function of the passage of time (Cole 1996). However, the research design used by this study does have the ability to illustrate the effect on a child of exposure to the early intervention programmes examined, and efforts were made to use the best available data to control for some of the risks in using this design. While it was difficult to isolate specific programme influences on children from all the broader social and economic influences, it was possible to provide validity to this research design by identifying a number of family vulnerability factors that were likely to affect the observed relationship between programme involvement and child outcomes, and then control for these factors using regression analysis.

Qualitative data were also collected on each programme's goals, implementation and intended outcomes, and this information was used to compile working theories of change on how intervention services related to expected programme outcomes. A working theory of change is an implicit or explicit description of the programme's goals and assumptions, and how the goals will be achieved. This theory of change shapes the programme at multiple levels, from theoretical programme design through to interactions between home visitors and parents. These theories of change were then scrutinised and tested using quantitative data on each individual family to see if the hypothesised child outcomes were obtained.

Hypotheses

Based on the overall goals of these three programmes and the findings in the literature reviewed, the research hypotheses for this quantitative study were as follows:

- A greater duration of services provided to a family leads to improvements in a number of child outcomes, controlling for initial family vulnerability factors.
- A greater intensity (i.e. intervention "dose") of services provided to a family leads to improvements in a number of child outcomes, controlling for initial family vulnerability factors.

This study focused on the duration (length of time receiving services) and intensity of services (number of face-to-face contacts) a family received as the best measure of the family's level of involvement in the programme. These two measures of programme involvement were then analysed to see if they had any relationship with improved outcomes for the child in order to determine the effectiveness of the programme. This study also focused on which specific positive child outcomes were associated with

greater duration and intensity of service in order to identify particular aspects of the family that may have been more effectively influenced by intervention services.

Sample

A sample of 297 families from the three California-based early intervention home visitation programmes was examined. Individual family data were analysed to determine the relationship between programme involvement (duration and intensity) and pre-intervention and post-intervention outcome indicators for a child.

The three intervention programmes chosen for this study were selected based on the criteria that they were all family-based early intervention programmes targeting children pre-birth to school-aged, and all shared similar eligibility requirements for the families they serve. The three Sacramento County programmes were the Birth and Beyond Program, Birthing Project Sister Friend Program and Adolescent Family Life Program. These programmes were chosen from Sacramento County because of accessibility of data and the high level of neighbourhood diversity in the communities that these programmes provide services to.

A key question to ask of any study examining effective intervention programmes is the extent to which findings can be applied to other programmes serving different communities, different populations, or employing different models, and in this case, whether the results can be applied to programmes in New Zealand. While this study has found a number of consistent findings in the literature about effective intervention programmes, the study also sought to determine the strength and transferability of these findings through the examination of the case studies in Sacramento.

The Public Policy Institute of California (2002) has found that the City of Sacramento has the highest levels of neighbourhood diversity of any large city in the state of California in terms of ethnic, racial and cultural differences, and it was considered at one time the most diverse city in the United States. If the findings of these case studies are consistent with the findings in the literature on family-based early intervention, then an argument can certainly be made that this study has some ability to predict the results of other programmes serving different communities or different populations, such as those in New Zealand.

In order to find patterns across case studies and to extrapolate the findings of one programme model to another, it is also necessary to examine each programme's underlying philosophy, goals, processes and theory of change. When the goals, expected outcomes and theories of change of different programmes are similar, the processes and implementation will often be similar also, and therefore generalisation across programmes is more plausible. The three case studies chosen for this study, as

well as the programmes examined in the literature, have been selected based on their similar goals and expected outcomes so that generalisations may be possible from the findings of this study. All three of the case study programmes chosen for quantitative analysis are voluntary rather than mandatory programmes (i.e. there was no degree of coercion for families to participate). The only real incentive for families to participate in the programmes was to receive free support in raising their children. These similarities add further to the ability to draw conclusions across programmes.

It is also important to note that while the interventions studied here were operating within the United States welfare system, which is considerably different from New Zealand's system, lessons can still be drawn for New Zealand in terms of the effectiveness of the programmes themselves. This is due to the fact that, first, these early intervention programmes are non-governmental organisations whose operations are not as easily affected by changes in the United States welfare system; and second, whereas child, family or community circumstances may be different due to the welfare system supporting them, these differences are primarily accounted for in the regression analysis since family vulnerability factors such as socio-economic status and education level are controlled for.

The literature consistently expresses concerns about the practice of including programme dropouts in the analysis of early intervention programmes. These concerns are in relation to evaluating the effect of an intervention in families that did not receive most or any of the services being provided due to dropping out early (Goodson et al. 2000). Therefore, this study included data only on those families that had been in the selected programme for at least 90 days and had either: 1) achieved their goals and completed the programme; 2) become no longer eligible for the programme due to age restrictions; or 3) moved away from the area. Only those families that had sufficient data recorded for them were included in the sample groups, and this included data on ethnicity, income level, marital status, age of mother, and selected pre-intervention and post-intervention assessments taken of children in those families.

Procedures

Data collection was carried out at each programme site after securing written informed consent from programme managers in accordance with the California State University's Human Subjects Committee. Data were collected by extracting individual family case records, including pre-intervention and post-intervention assessment records, service activity records and quarterly family assessments. A total of 517 family case records were examined but only 297 families (57.4%) had complete data with pre-intervention and post-intervention assessment records. No significant patterns were found among those families that were removed from the sample due to incomplete data, ensuring no selection bias in the sample group.

Measures

Data were collected, where available, on the following topics:

- socio-demographic characteristics
- child health
- environment and safety of child
- planned parenting
- programme involvement – duration of time the family was in the programme (in days) and total number of individualised face-to-face contacts with the family.

This study was fortunate enough to obtain specific data on the duration and intensity of services, allowing statistical analysis to separate out the effects of these on child outcomes. An interaction variable of "duration of services x intensity of services" was calculated for this analysis to determine if there was any strong interaction between duration and intensity itself, but this was not statistically significant and therefore not included in the analysis.

Statistical Analysis

Statistical software (SPSS) was used to perform chi-squared analysis and regression analysis that examined the relationships between the level of programme involvement by a family and child outcomes. Regression analysis was used to control for other family vulnerability factors likely to be affecting the observed relationship between programme involvement and child outcomes. Odds ratios were calculated to provide further interpretative analysis for these regression results. The odds ratios show the percentage change in the odds of a child outcome based on a one-unit change in the variables of duration or intensity.

RESULTS

Descriptive Statistics

The key characteristics of the programmes studied and of all families in the sample are detailed in Tables 1 and 2. Table 1 presents an analysis of the key characteristics of the interventions examined. The analysis shows that all the studied programmes were family-based early intervention home visitation programmes of a voluntary nature, as outlined in the criteria for these case studies. All programmes have goals that centre on improved outcomes for children by improving the family environment. Each programme requires a different level of formal qualifications of home visitors. Lastly, each programme has a strong theoretical foundation, with a clear working theory of change as to how it seeks to achieve particular child outcomes through the programme's advice, services and support. These theories of change all support the outcome indicators identified by this study.

Table 1 Key Characteristics of Programmes Examined

	Sister Friend Program	Birth and Beyond Program	Adolescent Family Life Program
Primary programme type:	Home visitation (voluntary; preventive; family-based)	Home visitation (voluntary; preventive; family-based)	Home visitation (voluntary; preventive; family-based)
Strengths-based?	Yes	Yes	Yes
Programme goals:	1. Reduce the incidence of low birth weight babies 2. Improve health outcomes of mothers and infants 3. Improve unplanned repeat pregnancy 4. Maximise education and employment potential of mothers.	1. Reduce child abuse 2. Improve child health 3. Improve child development 4. Improve child school readiness 5. Improve parenting skills 6. Improve employment readiness of parents.	1. Reduce the incidence of low birth weight babies 2. Improve health outcomes of mothers and infants 3. Maximise education potential of adolescent parents 4. Decrease unplanned repeat pregnancy 5. Improve parenting skills 6. Involve fathers when possible 7. Assist youth to access needed services.
Eligibility for entry in programme:	• Mother is pregnant.	• Mother is pregnant or baby 0–3 months • Sacramento county zip code • No child protection case.	• Pregnant or parenting adolescent • Sacramento county • Under age 19.
Qualification levels of staff:	Lay volunteers	Lay volunteers and some trained staff	Trained social workers
Programme components:	Home visitation, case management, centre-based health support services.	Home visitation, case management, multi-disciplinary teams, family resource centres.	Home visitation, case management, support services.
Working theories of change:	To reduce the incidence of infant mortality, low birth weight babies and negative outcomes of children by providing practical support, direction and advocacy to women during pregnancy and for one year after the birth of their child.	To prevent child abuse and neglect by providing a variety of services intended to mitigate the stressors of being a parent.	To prevent early pregnancy and ameliorate untoward effects when early pregnancy does occur by using case management and support services to develop nurturing relationships between case management counsellors and families.

As shown in Table 2, 55.2% of mothers in the total sample of families were teenage mothers and the mean age of all mothers was 21.03 (SD = 6.21). There was a very diverse spread of ethnicities in the total sample with 35.0% of all families defined as Latino, 25.9% African American, 20.2% White, 7.4% from more than one race, and 11.4% from other races including Asian, South-East Asian, Ukrainian/Russian and Hmong. Of all mothers in the sample a significant proportion (68%) had less than a high school education. Over half of the families (62.4%) were English speaking. The characteristics of this sample group were similar to all families receiving services in the three programmes.

Table 2 Socio-demographic Characteristics of Families Pre-intervention

Characteristic	TOTAL (N = 297)	
	M	(SD)
Age of mother (years)	21.03	(6.21)
	n	(%)
Teenage mother		
Yes	164	(55.2)
No	133	(44.8)
Race/ethnicity		
Latino	104	(35.0)
African American	77	(25.9)
White	60	(20.2)
More than one race	22	(7.4)
Other	34	(11.4)
Marital status		
Married or living with partner	140	(47.1)
Single (inc. separated; divorced)	148	(49.8)
Other	9	(3.0)
Family income		
Adequate income[a]	186	(62.6)
Using government assistance	111	(37.4)
Education of mother		
Less than high school	202	(68.0)
High school graduate	70	(23.6)
Tertiary education	18	(6.1)
Unknown	7	(2.4)
English proficiency[b]		
English proficient	98	(62.4)
Non-English speaking	59	(37.6)

a Adequate income was defined by the three case study programmes as those families not eligible for any government income assistance due to income level.

b As a percentage of families where English proficiency data were available.

The child outcome indicators (dependent variables) used by this research model are listed below (and a description of each is provided in Appendix 1):

- reduced maternal smoking or drug use
- healthy child birth weight
- breastfeeding by mother
- reduced unplanned pregnancies
- child health improvements
- reduced child abuse and neglect.

The child outcome indicators chosen are the most appropriate indicator measures available for determining the outcomes for zero to school-aged children based on measures used in similar studies and on the goals of each of the programmes. Some outcome indicators were not available for all three programmes, so only the findings of two case studies could be used in those instances.

The broad categories for programme involvement (explanatory variables) and family vulnerability factors (control variables) expected to impact on the child outcome indicators described above are: duration of services, intensity of services, ethnicity/race, education, socio-economic status and family disruption. The specific variables used in this study to represent these broad categories are listed in Appendix 2.

Table 3 presents actual figures on the families that showed evidence of positive child outcomes post-intervention. In order to see what relationship programme involvement had with these child outcome results, regression analysis was used to compare child outcome indicators pre-intervention and post-intervention, controlling for the level of programme involvement and other family vulnerability factors. The results of this analysis are presented in the next section.

Table 3 Positive Child Outcomes in Families Post-intervention

Positive Child Outcome Indicator	TOTAL (N = 297)		
	n (% of known)		Unknown[a]
Healthy child birth weight	174	(91.1)	106
Reduced maternal smoking or drug use	–1[b]	(–0.5)	108
Breastfeeding by mother[c]	73	(54.1)	162
Contraceptive use by mother	151	(84.4)	118
Healthy child	195	(94.2)	90
Reduced child abuse and neglect			
No emergency room visits or hospitalisation	85	(80.2)	191
No child protection case opened	93	(90.3)	194
Reduced abuse risk factors present post-intervention	–15[d]	(–11.0)	161

a Unknown figures are primarily made up of those families in one of the three programmes where data was not collected on outcome measure

b Maternal smoking or drug use actually increased by one mother overall. Three mothers stopped smoking or drug use, but four mothers started smoking or drug use during the programme

c Breastfed for a period of six weeks for the Sister Friend Program, and a period of eight weeks for the Birth and Beyond Program. Breastfeeding data were unavailable for the Adolescent Family Life Program

d The number of families with abuse risk factors present post-intervention increased by 15 families compared to the pre-intervention number

Comparing Child Outcomes Pre-intervention and Post-intervention

Of the six child outcomes examined across the three case study early intervention programmes, only the outcome category of healthy child birth weight had a significant positive relationship with programme involvement ($p = 0.10$).[3] The effect of the three early intervention programmes on all six child outcome indicators are presented in the regression analysis results in Appendix 3 and 4 based on both the duration of services (Appendix 3) and the intensity of services received (Appendix 4).

3 This birth weight outcome was only measured where the mother was enrolled in the programme prior to the birth of the child.

For the Sister Friend Program, the findings of this study show that a one-unit increase in the intensity of services provided was associated with an increase in a child's birth weight by 49.36 grams ($p = 0.057$), controlling for duration and other family vulnerability factors. There was no significant association between duration and birth weight for this programme. For the Adolescent Family Life Program, the increase in child's birth weight was 10.37 grams ($p = 0.063$) for each unit increase in intensity. This result was slightly marred by a very small, but significant, negative relationship between duration and child's birth weight, with a 0.50 gram decrease in birth weight for each extra day in the programme ($p = 0.004$). These findings show that the child outcome of healthy birth weight is influenced to a greater extent by intensity of intervention services rather than intervention over a longer period.

It should be noted that this study found no significant and consistent relationships ($p < 0.10$) between programme involvement and improvements in the remaining five outcome indicators examined across the programmes: maternal smoking or drug use; breastfeeding by mother; child health; unplanned pregnancies; and child abuse and neglect. While some significant effects were found when examining the outcome of child health improvements, these were very small in magnitude and the results were mixed when comparisons were made between the programmes. The consistent findings across these three programmes do show that when the underpinning theories of two or more programmes are similar, this study has found that there is potential for generalisations and transferability of approaches. By controlling for family vulnerability factors that may have made these interventions less comparable, we were able to isolate the effect of programme involvement on child outcomes and find a similar pattern of findings across programmes.

DISCUSSION

The findings of this study show that almost all of the early interventions carried out in the family by these three home visitation programmes could not demonstrate effectiveness at improving outcomes for children. Greater programme involvement, measured by longer and more intense home visitation, did not result in improved outcomes for children. The only exceptions were the interventions intended to assist an increase in the chance of a healthy birth weight child, such as nutrition advice and ensuring the regular use of prenatal vitamins, and to a lesser extent, some interventions to improve child health. This study found that for two of the programmes, where child birth weight was recorded and where the mother was enrolled in the programme prior to the birth of the child, an increased intensity of service was closely associated with an increase in a child's birth weight. For one programme, this result was diluted slightly,

since a one-unit increase in duration was found to reduce child birth weight by 0.50 grams. For all other child outcomes indicators across the three programmes, there were no consistent, significant positive relationships between programme involvement and these child outcomes.

With regard to the original research hypotheses, the findings of this quantitative study lead us to conclude that, after controlling for the level of vulnerability families faced, longer duration of family intervention and greater intensity of services by these intervention programmes does not have a significant association with improved outcomes for children. We can, however, accept the second hypothesis for one particular outcome across all programmes, and that is healthy birth weight babies. Based on this study's findings, greater intensity of services provided to a family has a strong association with babies born with a healthy birth weight, controlling for family vulnerability factors and length of time in the programme. This finding is consistent with the results of other family-based early intervention programmes and represents a known relationship between support and nutritional advice provided to mothers during pregnancy and healthy birth weight babies (Armstrong and Hill 2001).

Some may argue that this finding on child birth weight may be due to the fact that this outcome requires the least amount of behavioural change by parents compared to those identified by other outcome indicators, and is also the outcome where parents ultimately have the least control. In this context it is important to recognise that the four outcome indicators exhibiting no significant relationship to programme involvement in this study were all variables that directly reflect on the behaviour of parents: maternal smoking or drug use, breastfeeding by mother, unplanned pregnancy, and child abuse and neglect. This is consistent with the findings outlined by Behrman (1999) and Goodson et al. (2000) that there is no relationship, or only a modest relationship, between family-based early intervention home visitation programmes of this type and specific changes in the behaviour of parents that can directly lead to improved outcomes for children. The findings of other studies suggest that when a programme's goals target parent behaviour, these initiatives need to consider whether the family-based interventions offered to parents are appropriate to result in the intended outcomes for the child.

It should also be noted that the outcome category of child abuse and neglect, which was measured using three indicators (emergency room visits or hospitalisation, child protection cases opened, and whether abuse risk factors were present), although not statistically significant, actually demonstrated a negative relationship with the intensity of service received by a family; that is, families that received more intensive services may have had a higher chance of child abuse or neglect. While these negative results are not statistically significant, they do warrant further examination. These negative effect results are consistent with conclusions of similar programmes in current

literature (MacLeod and Nelson 2000) and highlight the limitations of this form of statistical research to address causality between variables. One possible interpretation for these results is that the more intense the intervention, the greater the likelihood that child abuse and neglect increases or remains the same, but this is unlikely to be the most accurate interpretation. A plausible explanation of these findings, and the rationale found in other studies, is that those families presenting child abuse and neglect risk factors are likely to be in greater need of intervention services and are therefore more likely to remain in the programme for a longer period of time and receive a greater intensity of services. It is also important to consider the "surveillance effects" that are likely to be evident in these findings. Families with greater involvement in early intervention home visitation programmes are more likely to have child abuse and neglect reported by programme staff since staff have more opportunities to discover risk factors in the home during visitation.

There is evidence in the literature that for the most "at-risk" families and children, longer and more intensive interventions will have a greater impact on child outcomes than shorter, less intensive ones (MacLeod and Nelson 2000, Werkele and Wolfe 1993). However, the findings of this study have not supported this evidence and it is important to consider why this may be. First, it is likely that those families in the study that required greater levels of programme involvement were families with higher risk factors, several of which have been controlled for in this regression analysis. While the findings of this study show that longer and more intensive intervention services did not have a significant association with improved outcomes for children, it is possible that these findings may mask some positive improvements among the most "at-risk" families, or may have represented an equalising effect. These higher risk families, needing longer and more intensive services, may have been able to reduce some of those risk factors, but they may not actually have gone as far as achieving positive results for their children. While it is argued that more effective interventions may have achieved positive outcomes for children in these families, there is still a case that these findings and others may hide positive improvements and reductions in risk factors for children.

Second, it is possible that programme duration and intensity have been over-emphasised both in the literature and by staff in these three programmes, perhaps to the detriment of considering the quality of intervention services. While each case study intervention was found to meticulously record the number of home visits a family received, the number of minutes of service either in home visitation or at resource centres, and the total length of time in the programme, insufficient attention was often given to the quality of the advice offered during visits or the strength of the relationship between the home visitor and the family. All three programmes did have strong theoretical foundations on which they operated – one important element of a high-quality programme. However, other elements of high-quality interventions were

overlooked by these programmes, including programme content, well-educated staff and responsiveness and cultural sensitivity to the needs of families. These early intervention programmes viewed intervention services as medicine, where "dosage" and "frequency," or "booster shots", were almost as important (perhaps more important) as the choice between one of several recognised therapies or interventions.

To follow this analogy further, it appeared that since many staff tended to assume that any one of several standard medicines would suffice, they focused on the dosage and frequency of treatment rather than stepping back to look at the therapy being offered as a whole, or the relationship between the therapist (programme) and patient (family). This raises an important issue for policy makers to consider, and it demonstrates that early interventions in any aspect of the family seem to require interventions that are part of an integrated model providing *high-quality* services based on some flexibility in the intensity and length of services rather than on regimented treatment dosages.

When interpreting the results of this research, consideration must be given to specific limitations in the method of analysis used, including the limited sample sizes, lack of control group, the limited number of outcome indicators, and limitations in the regression analysis approach. Control groups were not possible as a method of analysis for this study due to the fact that if a programme had assigned a child or family considered "at-risk" to a no-treatment group, this would have been considered unethical in most instances in California. There is general agreement in California that home visitation services have been found to provide essential services to many "at-risk" families and therefore it is ethically difficult to withhold these services from anyone. While many of these "at-risk" families are not in need of immediate child protective services, many are under such pressure financially, emotionally and psychologically that to identify and monitor risk factors yet deny services to these families is not possible. Therefore this research followed a more limited pre-test / post-test design based on the changes between pre-intervention and post-intervention outcome indicators for a child.

More in-depth evaluations of these multi-dimensional family-based interventions would have been possible if a greater range of outcome indicators were available. Other outcome measures that would have been of significant benefit, had they been available, include: follow-up measures on whether gains in child outcomes were maintained or enhanced, or whether they faded over time; measures that determine the quality of service provided by staff; and more specific data on each child outcome variable. This study's findings on the effectiveness of programmes used only the amount of services received by families (duration and intensity) as the measure of service provision. Future analysis should also look more specifically at the quality of those services provided.

Any studies that examine the effectiveness of intervention programmes are constructive to the extent that they encourage researchers to carefully evaluate claims of effectiveness. It is anticipated that further studies in this area will probe deeper into early intervention programme design to determine what features of these programmes are key to successful early intervention. Since most early intervention programmes have multiple components, it is difficult to isolate the independent effects of these different intervention components. While this study has been able to focus on the effects of duration and intensity of services, further empirical research is needed to disentangle the effects of other elements of successful programmes.

Specifically, future research should examine in more depth the nature of a family's vulnerabilities and also look more closely at the targeting and delivery of interventions provided and how these relate to child outcomes. Home visitation as a form of intervention should be further examined not only in terms of frequency and length of contacts, but also in terms of the content of visits and the qualification levels of home visitors. In New Zealand, further research is certainly needed into new and continuing family-based early intervention programmes if policy makers are to determine how best to improve outcomes for New Zealand children through these interventions.

The findings of this study indicate that programme involvement, measured by longer and more intense interventions, does not necessarily result in improved outcomes for children. The lessons for New Zealand policy makers from this California-based study include a need to recognise that improving a child's wellbeing is complex and requires interventions grounded in a thorough analysis of the empirical research. Interventions in any aspect of the family need to be a part of an integrated model with a focus on the provision of quality services, and based on some flexibility in the intensity and length of services provided. There are no easy solutions.

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APPENDIX 1: DESCRIPTION OF CHILD OUTCOME VARIABLES (DEPENDENT VARIABLES)

Child Outcome Variable	Outcome Indicator	Description
Reduced maternal smoking or drug use	Maternal smoking or drug use during pregnancy	Whether maternal smoking or drug use during pregnancy was reduced or stopped during a family's time in the programme. NB: If mother did not smoke or use drugs pre-intervention, recorded as no reduction to show more conservative results.
Healthy child birth weight	Child's birth weight	The birth weight of a child born during a family's time in the programme.
Breastfeeding by mother	Evidence of breastfeeding	Whether the mother breastfed for a specified length of time during a family's time in the programme (a period of six weeks for the Sister Friend Program, and a period of eight weeks for the Birth and Beyond Program. Breastfeeding data were unavailable for the Adolescent Family Life Program).
Reduced unplanned pregnancies	Contraception use by mother	Whether the mother took up contraception use if repeat pregnancies were unwanted by the mother.
Child health improvements	Child health	Whether there was an improvement in the health of the child during a family's time in the programme based on the difference between pre-intervention child health assessment results and health assessment results post-intervention.
Reduced child abuse and neglect	Physical, emotional or sexual abuse risk factors	Whether there was a reduction in physical, emotional or sexual abuse risk factors in a family during a family's time in the programme based on the difference between pre-intervention abuse assessments and an assessment post-intervention.
	Emergency room visits or hospitalisation	Number of child visits to emergency rooms or hospitalisations during a family's time in the programme.
	Child protective services case opened	Whether a child protective services case was opened for a child during a family's time in the programme.

APPENDIX 2: DESCRIPTION OF EXPLANATORY AND CONTROL VARIABLES (INDEPENDENT VARIABLES)*

Explanatory Variable	Indicator Measure
Duration of time in programme	Number of days in the programme
Intensity of services	Number of face-to-face contacts between home visitor or field visitor and family
Control Variable	**Indicator Measure**
Ethnicity/race	Whether White, African American, or other ethnicity/race
Education	Whether mother is a high school graduate
Socioeconomic status	Whether receiving government assistance
Family disruption	Whether single-parent household
	Whether teenage childbearing

* Measures of the strength and direction of linear relationships between each pair of explanatory variables (bivariate correlation coefficients) were examined and no significant multicollinearity was found at a 0.05 significance level (two-tailed).

APPENDIX 3: RELATIONSHIP BETWEEN DURATION[a] AND CHILD OUTCOME PRE-INTERVENTION AND POST-INTERVENTION EFFECT SIZES

Child Outcome Indicator	Sister Friend Program (n = 51)		Birth and Beyond (n = 106)		Adolescent Family Life Program (n = 140)	
	ß(sig.)[b] *90% Confidence*	Elast	ß(sig.) *90% Confidence*	Elast	ß(sig.) *90% Confidence*	Elast
Healthy child birth weight	–1.215 (0.318) *±2.042*	–0.07			–0.504 (0.004)*** *±0.286*	–0.10
	ß(sig.)	*Odds ratio (%)*	ß(sig.)	*Odds ratio (%)*	ß(sig.)	*Odds ratio (%)*
Reduce maternal smoking or drug	0.009 (0.231)	*0.9*			0.000 (0.862)	*0.0*
Breastfeeding by mother	0.004 (0.576)	*0.4*	0.000 (0.708)	*0.0*		
Reduce unplanned pregnancies	0.015 (0.211)	*1.5*			0.000 (0.835)	*0.0*
Child health improvements			–0.008 (0.092)*	*–0.8*	0.002 (0.131)	*0.2*
Reduced child abuse and neglect:						
Emergency room visits or hospitalisation			0.000 (0.807)	*0.0*		
Child protection case opened			0.000 (0.793)	*0.0*		
Abuse risk factors present					0.001 (0.386)	*0.1*

a Where "duration" equals the number of days a family was enrolled in the programme.

b Significance levels indicated as follows:

* = $p < 0.10$

** = $p < 0.05$

*** = $p < 0.01$

NB: Odds ratio = (Exp(ß) –1)*100 = % change in odds of outcome for one-unit change in variable

APPENDIX 4: RELATIONSHIP BETWEEN INTENSITY[a] AND CHILD OUTCOME PRE-INTERVENTION AND POST-INTERVENTION EFFECT SIZES

Child Outcome Indicator	Sister Friend Program (n = 51)		Birth and Beyond (n = 106)		Adolescent Family Life Program (n = 140)	
	ß(sig.)[b] *90% Confidence*	Elast	ß(sig.) *90% Confidence*	Elast	ß(sig.) *90% Confidence*	Elast
Healthy child birth weight	49.359 (0.057)* *±42.082*	0.16			10.367 (0.063)* *±9.145*	0.05
	ß(sig.)	*Odds ratio (%)*	ß(sig.)	*Odds ratio (%)*	ß(sig.)	*Odds ratio (%)*
Reduce maternal smoking or drug	–0.119 (0.458)	*–11.3*			–0.027 (0.619)	*–2.6*
Breastfeeding by mother	–0.224 (0.158)	*–20.1*	0.009 (0.618)	*0.9*		
Reduce unplanned pregnancies	–0.179 (0.395)	*–16.4*			–0.020 (0.370)	*–2.0*
Child health improvements			0.086 (0.055)*	*9.0*	–0.080 (0.044)**	*–7.7*
Reduced child abuse and neglect:						
Emergency room visits or hospitalisation			–0.030 (0.171)	*–3.0*		
Child protection case opened			–0.017 (0.532)	*–1.6*		
Abuse risk factors present					–0.045 (0.276)	*–4.4*

a Where "intensity" equals the number of face-to-face contacts between home visitor or field visitor and family.

b Significance levels indicated as follows:
* = $p < 0.10$
** = $p < 0.05$
*** = $p < 0.01$

NB: Odds ratio = (Exp(ß) –1)*100 = % change in odds of outcome for one-unit change in variable