THE CHRISTCHURCH HEALTH AND DEVELOPMENT STUDY

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What I want to do today, is to talk about some research that has occupied my life for the last 25 years. This is a description of that last 25 years. The study involved is the Christchurch Health and Development Study. It is a long-term study of 1,265 children, who were born in the Christchurch urban region in mid-1977, and these children have now been studied to the age of 21. In fact, we are currently proposing, with the goodwill of the health research funding, to study them to the page of 25. But it is really the findings of this 25-year-old study that I want to present, at least in some part to you today. To begin with, what I propose to do is probably talk, by the way, for about 40 minutes, perhaps no longer than that, and then give you about 20 minutes to talk to me. I would far rather talk with you than talk at you. But the central foundation for all this has a little bit of history.

The initial impetus for the Christchurch Health and Development Study, as it is now called, came from the initial work by Professor Fred Shannon, who was the foundation Professor of Paediatrics at the Christchurch School of Medicine. In the early 1970s, Fred observed that a disproportionate number of his patients tended to come from single-parent families and that these families had a disproportionate number of problems. Initially, he set up what would now be called a case control study in which he proposed to contrast the health and development of 100 children born into single-parent families with those in two-parent families. For a whole variety of reasons, technical and methodological, that study actually foundered quite quickly. As a result of this, the Medical Research Council of New Zealand provided funding to set up a long-term study of a cohort of approximately 1,000 children. That study funding was actually provided on the recommendations of Dr Mia Kelmer-Pringle, who was the Director of the National Children's Bureau in England.

Now, a regrettable part of the story is that all of the founders of this study are currently dead. Professor Shannon died last year, regrettably; Dr Mia Kelmer-Pringle died some years ago. As a result of the holocaust of restructuring that was visited upon New Zealand in the 1980s—you have probably heard about it—the Health Research Council disappeared and was replaced by an alternative body, the Medical Research Council, which has disappeared and has been replaced by what is called the Health Research Council. I will not make any comparisons. Anyway, as a result of all that work in the 70s, and that is before I came n the scene, the funding had been set up to start a long-term study. For how long no-one really knew. I had been doing some work in the Government, working on cohort data covering 25,000 young offenders, and I was about the only person in the country who knew what longitudinal data was about. I did not know very much. I thought I knew a lot, but I did not, and being young and brash I began that appointment in 1976.

In 1977 the initial data collection for the Christchurch Health and Development Study began. This transparency tells you about the research design. It really tells you all you need to know about this study unless you want to know a great deal about how we conducted it. The individuals who were involved in the study comprised a birth cohort of children, that is, a group of children all born in the Christchurch urban region during the period 15 April 1977 to 5 August. Some 1,310 children were born and the parents of 1,265 children, 97 per cent, agreed to participate in the study. We have now studied children in this cohort at birth, four months, one year, every year to the age of 16, again at the age of 18 and at 21 and we are currently proposing to study them again at 25.

One of the features of data collection with children and families is that information is always subject to fallibility. It is subject to error and uncertainty. In an attempt to deal with some of these sources of uncertainty and error, we have typically attempted to use a multiple informant approach. We have gathered data from the children, their parents, teachers and official records. The data we have gathered over the course of the study comprises some 40 million characters, which describes the 21-year life history of this particular cohort. To give you, I suppose, an overview or some sense of the outputs of this, the study has now produced close to 230 scientific papers and books to describe the 21-year life history of this cohort.

Because of the nature of the study and the wide interest in it, the results were published in a wide range of disciplinary areas. These include social paediatrics and paediatric epidemiology. This emphasis of the study was particularly evident in the first five years of life where much of our work was focussed on child health and risk factors of child health. We have done quite a bit of work in the area of developmental psychology, looking at the development of such things as problem behaviour, depression and other types of behaviour in children.

Psychiatric epidemiology has become a major theme in the research as our cohort moves towards young adulthood and we are starting to count those with psychiatric illnesses and problems. Much of our work is focussed on looking at the development of pathological or difficult types of behaviour in childhood, an area now called developmental psychopathology, looking at the emergence of crime, substance abuse and other things. That, of course, overlaps into criminology. We also focused a lot on educational outcomes, on the family sociology and particularly the dynamics of the family breakdown, such things as teenage pregnancy. We have done some work on family economics, the impact of benefits and benefit wellbeing and, I suppose, interwoven between all these studies quite a few papers on the design and analysis of longitudinal studies.

One of the issues that people are always concerned about with longitudinal studies is the retention of subjects. The first thing one learns in a course of longitudinal data analysis is that people get lots to follow up, and that causes bias. We have actually been very fortunate in this respect. We studied 1,011 young people at the age of 21.
That sample represented 80 per cent of our original cohort and 90 per cent of all cohort members still resident in New Zealand. The difference between those two numbers is that most of our losses or half of our losses, at least, come from cohort members who migrate from New Zealand, and I will say that a large number of those have migrated to Australia. I would like to remind you of Sir Robert Muldoon, a former Prime Minister of New Zealand who commented upon New Zealanders who moved to Australia. He observed that they benefited both cultures by raising their average IQ.

I will not make jokes about underarm bowling. The reason I do this sort of thing, incidentally, is not an apology. It was a very dramatic experience I once had in Canberra. I was at this meeting talking about lead with a lot of learned people from around the world. An Australian Federal Minister came to address the crowd. He spoke nicely about the Russians, the Germans, the French and the Swedish. I was about the only New Zealander in the crowd. Towards the end he seemed obliged to comment upon the unsavoury habits of New Zealanders and sheep. That seemed to be the only comment. I thought there must be some revenge for this, so every time I come to Australia I try to give a little bit back and I am not sure whether I am winning or losing.

To pack down some of this information in a more coherent way, I suppose that we can say that the conduct of this Christchurch study really fell into three boxes in which different themes dominated our research. During the pre-school years, the focus of the study was largely on child health. We examined such issues as breastfeeding, parental smoking and its impact, childhood accidents, respiratory illness, immunisation and related topics. There is a whole rich area of issues that arise around children and their health and the interactions of families with the health services that we were interested in. As our children moved into middle childhood, many of those health-related issues tended to reduce somewhat. In the middle of childhood years we shifted our focus away from child health and more to behavioural development adjustment at school and academic achievement.

The last, and by far the most interesting section of the study, was adolescents and young adult, say, from the period of 12 years to 21 years. Over this period our interests have shifted away from physical health and moved on to the issues of psychosocial adjustment and mental health in the cohort. Over time, the cohort can be used to examine a variety of things and issues. In the two lectures or talks I am giving this morning, I will present examples from all of these areas. In this morning's piece before morning tea I will focus on the pre-school years and middle school years. After morning tea I will look at adolescents and young adulthood-related issues.

I always have great deal of difficulty in deciding exactly what to tell people about the study because there are so many things to talk about in so many different ways. In the past I have found that the best way is to focus upon a number of specific things and present a number of research studies as scenarios, small vignettes of how the research was used, and that is what I propose to do today, present you with four separate research studies. In doing this, I hope they will span areas that interest you, but if there are areas that I do not mention it is not because we probably have not done them, it is simply I do not have the time to discuss all of the things that one can do with a longitudinal study in the time that I have.

My first area of interest is breastfeeding and academic achievement. It has been long known, probably back to the 1930s, that breastfed children appear to have somewhat higher intelligence and perform better at school than bottle-fed children. We became very interested in this topic area and particularly since we had comprehensive data on, firstly, infant feeding practices in the first postnatal year, at least, and intelligence in school achievement from age eight to age 18. Our particular focus was upon the fact that many of the studies that have looked at breastfeeding and school performance had done so in seven-year-old children, eight-year-old children and nine-year-old children and they had shown small differences. Typically, the breastfed children had IQ scores which were three or four points higher than the bottle fed children. The difficulty with that data is that does it really matter in seven-year-old children that we show these small differences.

More generally, this focus upon using cognitive tests and school tests as though they are indicators of something meaningful begs the question, does it matter in the long run. One of the advantages of a longitudinal study like this was that we were able to answer this question by looking at the extent to which infant feeding practices were related to longer-term outcomes up to the age of 18. To present a bit of data, those who do not like numbers it is to the good of your soul. Honestly, it really is. The more you do it you like it and you will get to like it in the end, I promise you. The other day I had a student who said, "I cannot do numbers". I said, "Just divert your eyes." I used to warn her every time that more numbers were coming.

This table is a very simple one. It shows the duration of breastfeeding in months from nought up to seven plus and for each of those four groups it gives you tests on the mean IQ scores at eight years, reading scores at 10 years and mathematics at 11, which is the middle school data. But now we extend it to the percentage of children leaving school without qualifications, which is a much more fundamental measure when you think about it than how well you do in an IQ test. Leaving school without qualifications has real meaning in terms of your life course, your life opportunities and wellbeing and also the mean number of school certificate passes.

The school certificate is something that people in New Zealand take at the age of 16. We acquired a somewhat politically correct qualifications authority that banned the word "pass". I do not know if you have those. We actually got the word "pass" banned but they do have a grade called C, which corresponds to the old pass. I still use passes because I am an older person and that is the way we think. Do not worry about the P. All those Ps tell you that these results are very unlikely to be due to chance. If you look at the data you will see that as the duration of breastfeeding goes up, IQ goes up. Nought to seven is about five points. The reading scores go up. The mathematics scores go up. There is quite a dramatic difference in the percentages of leaving school without qualifications—25 per cent of the bottle fed children versus 9 per cent of the breastfed children—and the school certificate passes go up. It is quite clear, then, that with increasing breastfeeding, academic achievement increases.

The counter-argument to this, of course, is very simple, that this has nothing to do with breastfeeding at all. It has to do with the fact that mothers who breastfeed are brighter, wiser and do much better things. How they feed their child does not matter.

That occurred to us, actually, and so by the magic of some statistics which I will not burden you with, we were able to adjust our associations for a whole mass of variables, ranging from education, family circumstances and related birth weight. These are now estimates. The association between duration of breastfeeding, in a sense, purged or adjusted for these sources that confound you. As you can see, the table shows there are still differences, but they have reduced a bit. We have about a two IQ-point spread and so forth.

Moving to the more important thing, that is, the percentage of children leaving school without qualifications, you still see that the bottle fed children are about one and a half times more likely to leave school than those who have been breastfed, irrespective of social background, maternal education, maternal IQ and all the things we control. These results clearly suggest that breast feeding may, as a practice, have beneficial effects on children's cognitive ability, which is very interesting because it does suggest one relatively simple and positive way in which parents can contribute to the start of the life chances of their children. One of the difficulties with these sorts of results is the question, by what mechanism does breastfeeding lead to this chance if, indeed, it does at all, and that is still contentious. One explanation that has been developed recently and appears to be the most accepted—there are other alternatives but this is the most widely accepted explanation—is that the apparent benefits of breastfeeding is that it is species specific milk and it contains what are known as long-chain polyunsaturated fatty acids or LCPs.

There is some evidence that is not particularly compelling and that is somewhat tenuous, but there is some evidence that LCPs may in fact aid early neurological development and thence lead to better cognitive ability. Now, aside from in a sense showing you the effects of breastfeeding, these results also display some of the power of longitudinal data—the way you are able to look from the age of one to the age of 18 at the ways in which early feeding practices have a potential impact on children. Though breastfeeding was one of the things that paediatricians have always been keen about, in the 70s in particular one of the areas that became of particular interest was that of passive smoking. It is now widely accepted that childhood exposure to parental smoking is associated with increased risks of lower respiratory illness. Indeed, I was contacted by some Sydney lawyers about this where parents were actually fighting a custody battle over the father's smoking habits. The grounds for denying him access to the child were that he was a smoker and therefore was damaging the child, to which I said—well, you will see what I said as the results come out.

The Christchurch Health and Development Study was one of the first studies to show this finding. At least for historical interest, it is probably of interest to revisit this research. What we found was, firstly, that cigarette smoking was only related to respiratory illness if it was done by the mother, which is interesting. You have got to think about this as being a cohort in the 1970s, in which mothers were at home with their children and fathers were not, so the average exposure of mothers to children was about 18 hours per day compared with two hours for fathers. As you can see if you look at the data, with increasing amounts of cigarette smoking, the percentage of illness rises dramatically. Children whose parents smoked 20 cigarettes a day or more had rates of lower respiratory illness which were about three to four times higher than those of non-smokers, and this of course is suggestive of the fact that exposure to cigarette smoke is something that is damaging to children, something that we should discourage people from doing.

The counter-argument again is that it is not the smoking; it is perhaps the people who smoke. And, again, by the magic of statistics, which I will not expose you to, we were actually able to show that even after being adjusted for a massive number of factors, these associations still persisted. It was these findings, which were some of the earliest, which led to what is now the widespread consensus of opinion that passive smoking does have harmful effects on children. These studies have now been replicated in a large number of societies—in Great Britain, Australia, the USA, Scandinavia, Israel and China, to mention a few, and in all of these societies the data very clearly show that the offspring of smokers characteristically have about twice the rate of lower respiratory illness of non-smokers and that the more parents smoke the worse things get. Those results came from, in a sense, two of our earlier and health-based approaches.

Now I move quite away from health to a topic which actually attracted considerable debate, emotion and perhaps continues to do so, and that is the issue of gender and school achievement. It is a topic which I have been sort of wrapped up in for quite a long time and in some quite strong debates. In New Zealand, and I suspect probably around the world, discussions on gender and education achievement were dominated until about the mid - 1990s by a feminist model which asserted that girls were being disadvantaged by a sexist education system. Those claims were by and large underwritten by research published in the 1970s. We were gathering data on our cohort's educational achievement from about eight years onwards, and at no point in time did we ever see this gender evidence. In fact, we all saw the opposite. We saw that boys were doing worse than girls. And I kept on reporting this at various gatherings and meetings and saying, "Well, look, you may be saying that girls are disadvantaged. We cannot see this." And there was always the mandatory angry denial. One was that the data were wrong or, two, that these differences would emerge at some unknown time in the future when the children entered adolescence. However, there was a dramatic interest in the feminist model, which appears to have waned very dramatically in the late 1990s.

There were publications all around the world almost simultaneously showing that, contrary to the claims of the feminist models, boys in the 1990s were doing less well at school than girls, and these are the kinds of data that we actually produced. Firstly, we compared our males and females on a series of measures of standardised tests. These are basically that you give children a pencil and paper and they fill out word recognition, reading comprehension and scholastic ability. Those tests were administered at the ages of eight, 10 and 13. You can see that in all comparisons males fare significantly worse than females, so if you actually test kids you find out that boys are doing worse, and they were doing worse right the way throughout their school career.

Some people object to standardised testing and say that it does not measure the child's capacity, that it is biased and that it is based upon a limited model. We were aware of those critiques and, therefore, we actually got teachers to rate the children. These are ratings taken down to 12 of the percentage of children rated as being very poor in the key skill areas of reading, written expression, spelling and mathematics, and, again, you see the consistent tendency for the greater proportion of males to be rated as performing poorly. It is not just the standardised tests that say it; it is also the teachers. It does not really matter, however, what the standardised tests or the teachers say if things come out okay in the long run, so we began to look at our outcomes at the age of 18, and what we see at the age of 18, which is about the point that most of our cohort had left secondary school, are higher rates of reading delay amongst males, lower rates of school certificate passes and lower rates for leaving school without qualifications.

There is little doubt that in this cohort from the age of eight to 18, and I would suggest beyond, males have been consistently disadvantaged as to education. What was very striking at this time was the way that this disadvantage has continued in the cohort despite a prevailing rhetoric that females would be disadvantaged by a sexist educational school system and also, in a sense, my frustration of sitting there at meeting after meeting being told about this disadvantage and saying, "None of our data say this," and the frustration of also hearing people say, "Your data are wrong. Our opinions are right." Now, one of the important issues, I suppose, this raises is what gives rise to the gender differences. Why is it that these things happen? One of the explanations given is that girls are brighter than boys. That is why. Interestingly, the evidence does not support this view at all. When we did the IQ testing at the ages of eight and nine, quite contrary to any other measures of school achievement, boys and girls came out exactly the same, or so close it did not matter. Actually, boys did slightly better, but it is hardly worth worrying about, suggesting that it is very unlikely that you can actually say that the reasons for these differences are because males and females have different levels of intelligence. The two populations seem to be very similar, a point which has been hammered over and over and over in the literature anyway.

So given that it is probably not cognitive ability, we then began to look around at classroom behaviour, and we found that we were able to explain these gender differences. The explanation is that boys and girls behave differently in the classroom setting. We found that boys tend to have higher rates of inattentive, restless, hyperactive behaviour, and indeed more disruptive classroom behaviour, and we were able to explain—and I will not go through the statistical analysis because it is somewhat complicated—the poor performance of males in terms of this behaviour. What our results suggest is that we actually are dealing with a causal sequence in the following form: that the child's gender determines the classroom behaviour, with males characteristically behaving less attentively, being more difficult, being more disruptive, and that how you behave in class, not surprisingly, has a bearing on your academic performance independently of your intelligence. So the story seems to be that male disadvantage is, in some sense, caused by male behaviour in the classroom. If we are to address and deal with these things, we are going to need to address the issue of disruptive classroom behaviour.

There is also an important second issue about this, and that is that although gender is linked to classroom behaviour, by no means all of those with disruptive classroom behaviour are male. In fact, about 20 per cent to one-quarter of kids with disruptive behaviour turned out to be female. These results clearly suggest that instead of focusing upon gender, which may very well be a red herring in this debate, we need to focus on the minority of children who have disruptive classroom behaviour, irrespective of whether they are males or females. By taking that focus, in fact, we will find that the predominant number we will focus on are male but not all of them are male. If we focus on gender we will disregard the minority of females with difficult classroom behaviour compared with academic performance.

My last topic is some charter epidemiology, which was a very important debate particularly in the 1970s and 1980s, about the effects of lead exposure. Since the early 1980s there were concerns about the extent to which lead at so-called subclinical levels, that is levels not sufficient to cause poisoning, may have small adverse effects on childhood intelligence. To study that, we gathered data during the Christchurch Health and Development Study by collecting shed deciduous or baby teeth in the cohort from the age of eight. The reason for this is that lead accumulates in the bones and teeth and, therefore, these give you an index of how much exposure children have to lead. The problem we there faced was how do you get teeth from children? I will tell you how we did it. We relied on an appeal to two human vices — greed and the belief in mythology — and we instructed the Christchurch Health and Development Study Tooth Fairy to hand out to each of the children 50 cents for every tooth that was sent to us.

The result of this was that large numbers of teeth came flooding into my office. My secretary very gingerly picked these out and put them in plastic bags and sent them off with a 50 cent piece. So that was quite good. But then I started to get phone calls from mothers, irate mothers, who pointed out to me that the proper price for a tooth was 20 cents. A number of them said that the incredibly generous Christchurch Health and Development Study Tooth

Fairy has inflated the cost for all the kids. This was in the 1980s. You may remember that New Zealand was actually running at 18 to 20 per cent inflation. Well, actually, I managed to put 150 per cent inflation into the tooth fairy market with one fell swoop. Anyway, the net effect of this is that we got teeth from nearly all our kids.

Those teeth were analysed at the Department of Chemistry at the University of Canterbury by an individual named Jack Fergusson, who spells his name in the exactly the same way, but he discovered we were not related, and he said he was very profoundly glad of that fact, but he actually had had a life-long addiction or desire to analyse lead in anything. It did not matter what kind of medium it was, Jack would want to know how much lead it contained. Giving him 900 to 1,000 teeth, his eyes lit up, and he disappeared into the laboratory with all this arcane equipment, and delivered us back estimates for each child of how much lead they had been exposed to. That is the background. But our key question was to what extent does exposure to lead in childhood have adverse effects on children? And here we see in the same sort of table I have been showing you the dentine lead levels in parts per million, ranging from nought to two. These are kids with low levels of 12 plus. They were the 8 per cent of the sample with the highest lead levels.
You can see that as lead levels go up reading delay increases. Reading delays are about four times more common amongst those with high lead levels. Again, leaving school without qualifications is about twice as high to three times as high. You will see that the mean number of school certificate passes—subjects passed, that is—you are allowed to use the word "pass" if you are an older person—actually drops quite dramatically. Now, these things do suggest that even if all these lead levels were non-toxic—no child would be admitted to hospital as being poisoned; no-one would even notice them as being harmful— even at these low and subtle levels lead can be harmful, which is actually the centre of a very big and hot international debate by the lead companies.

The argument was that these were all due to other factors—no social caste or the bad habits of parents or something else. Again, the power of the longitudinal study was that we knew about these children from birth so that we could adjust for all of the sorts of things that people said confound them. Even when we did these adjustments, we found that the percentage of subjects with reading delays went up. You still got three times as much reading delays if you have high lead levels. If you left school without qualifications, you are still one and a half more times likely and that the number of school certificate subjects passed decline with lead levels.

There seems to be little doubt that at low levels of exposure there is a strong case to the view that lead may have small but detectable, harmful effects on children. I have heard it argued that the effects are very small and that they could be made up by remedial programs. That is a fallacious position. If these differences are attributable to lead, the only way of removing them is to take away the lead because the disadvantage will still prevail. It was this kind of result that led countries all round the world to reduce their lead burdens and the most marked effects are, clearly, the reduction of lead in petrol, old wooden housing is a second source, and so forth.

Since the 1980s, one of the studies that has been conducted looking at lead burdens has shown that throughout most industrial societies the average level of lead burden quite dramatically drops but the lead burden of contemporary children are about half to a quarter of those of a decade ago. That is really, I suppose, one tangible result that does show that research sometimes does work, that it does produce change and does have benefits. I have done my four examples and I say some sort of fatuous and obvious things on that transparency. You write them down when you are doing it and then you think that is stupid, and so I will stop talking about the study now and allow you to ask me questions about either the specific examples or anything else that you would like to know. I would ask you to confine your questions to the start of and middle school years because after the break I want to talk about teenage years and probably more exciting things than relatively mundane stuff of early childhood.

QUESTION: *I wanted to ask a clarification on the subject are girls brighter than boys, just looking at whether the school type made a difference, if you could comment on that.*

Professor FERGUSSON: We have done a study on that very topic and it does appear that for both males and females, single-sex schools have a small benefit. If you do a raw comparison between single-sex and two-sex, single-sex come out doing quite a lot better. Much of that is due to selection. In New Zealand, single sex schools have a higher status. They tend to attract brighter pupils and more motivated parents. When you take that out, most of the differences go away, but there are small persistent effects suggesting that children of single sex schools may be better off and that applies to both males and females.

QUESTION: *What sort of things have you done over the years to have such a low attrition rate?*

Professor FERGUSSON: I think there are several points about this. Firstly, living in New Zealand is very important. It is a very small society and it is very hard to get lost. To give you an analogy about how it is hard to get lost, you have probably heard the saga of the *Rainbow Warrior* and the DGSE Frenchmen who came to New Zealand to blow up ships. Those people landed in Northland off a yacht and before they got ashore, the locals had commented on these French people. They were caught. They went to the hire car company and the hire car company said, "Yes some French people came in," and they were caught before they even moved. These are apparently skilled, intelligence operators. They came to a small society that they did not understand where anyone stands out. Everybody knows everybody and things can be seen easily.

The same thing happened with our study. We all go into a small town and we do not know where someone is and we ask, "Do you know where Mrs Smith is", "Yes, she comes down for her mail on Tuesday." That is part of it. We have been able to keep contact with it. Secondly, we have done a lot of leg work. One of the ways of how do you find a child, who knows where a child is - granny - and if they have two grannies you do a lot of work talking to them.

We provide our people with newsletters. We ring them up. We have a complaints policy which says that if anyone has a complaint about the study, they do not talk to the interviewer, they talk to me. I will actually ring them at home and ask, "Are you upset? Have we done something wrong? Let's talk about this." There was a time when New Zealand had a much smaller, kinder community-minded people. I think it would be much higher now.

QUESTION: *What studies have you been able to do or draw on to indicate why boys behave differently to girls in an educational environment?*

Professor FERGUSSON: It is not in an educational environment, it is an all environment. In fact, it is not only boys, it is also probably more mammalian than that. Male animals are more aggressive, disruptive and difficult. Why that is so, no-one knows. One can speculate. There have been two debates about this. One is the genetic debate and the other one is the environmental debate. Despite what people claim, there is not yet any resolution of these matters and I do not think there will be until we actually unravel the genetics of behaviour which I would suggest to you is going to be the topic for the twenty - first century longitudinal studies.

QUESTION: *As I understand it, breastfeeding is much more about a practice and a process rather than about a decision, so a parent does not decide that she is going to breastfeed and manage it. If a woman can manage to breastfeed past seven months that says something about temperament and the quality of the relationship with the child. You talked about maternal intelligence and education, but I am wondering whether what you really have is a measure of the quality of the relationship.*

Professor FERGUSSON: We have been at that very directly. Following your line of logic, you would suggest that children whose mother's breastfed them would be better adjusted and would show better attachment. We did a study looking at the association between breastfeeding and social adjustment. There is no association, which is quite remarkable. So you see it for intelligence but you do not see it for social outcomes. This inclines you to the view that if the association is causal, and it is an if still, then it is probably something to do with the breast milk rather than the way it is being delivered. Is it the mothering or the milk is always the debate. It seems that, if it has an effect at all, it is the milk rather than the mothering.

QUESTION: *Some of the brain research that has come out talks about more than being the milk but about the whole gamut of sensory experience in breastfeeding as being very directly related to biological cranial development.*

Professor FERGUSSON: That is a possibility but that possibility would incline to the view that breastfeeding would be associated not just with intelligence but with better social attachments and relationships. That did not turn out to be the case. It does push you back more to the milk rather than the process. I am not going to be dogmatic about this and I do not think anyone should be. I got stuck into a really unpleasant debate in paediatrics about this where people construed me as saying these things very dogmatically when I had not done so. It is a hot topic in the literature.

QUESTION: *Just going back to the gender differences and the behaviour in classroom behaviour, did you look at correlating the disruptive behaviour and child abuse basically, different types of physical punishment, whatever?*

Professor FERGUSSON: The question was did we look at the association between disruptive behaviour in children and child abuse. The answer is in that study, no, but in a more general context we have looked at the association between physical child abuse and disruptive behaviour and, as I will show you later, sexual abuse and disruptive behaviour. We actually get different stories for the two outcomes. We find that for both kinds of abuse, physical and sexual, children who are exposed to abuse are at a higher risk of a whole variety of adverse behaviour—conduct disorder, conduct disorder, substance abuse, suicide ideation and depression, the standard sort of mix of adverse psychosocial conditions I am certain you are all generally aware of. For physical abuse, these associations appeared to be more explained by the context in which the abuse occurs. When you get kids who have been battered, there are often many, many things wrong with the family, in addition to the physical abuse — poor parental relationships, poverty, alcoholism, limited behavioural difficulties and so forth. It appears to be those contextual variables that explain most of the effects of battering or physical abuse. For sexual abuse the story is different and it is different for this reason, most sexual abuse is not committed by family members and, therefore, the nature of the family environment plays far less a role. As I will show you later, exposure to sexual abuse, particularly contact abuse, has quite dramatic effects.

QUESTION: *Did your studies look at the effect of one or both parents working and the use of formal care in outcomes for children and did it show any difference?*

Professor FERGUSSON: It showed no difference whatsoever. By and large, to explain this a bit more, the offspring of children whose parents worked did slightly better on most tests but the parents who worked tended to be better educated women, more professional women and so forth and it was those choices, the characteristics of the mother rather than the child care.

We took into account those selection processes and could not produce any evidence to suggest that a parent working was beneficial for children or any evidence to suggest that it was detrimental.

QUESTION: *Did you conduct any interventions to show whether those might alter your outcome in a subset of your cycle?*
Professor FERGUSSON: I am not sure I pick up entirely.

QUESTION: *For instance, children from low socioeconomic backgrounds, and I am thinking of the David Olds' study where there has been —*

Professor FERGUSSON: You are spoiling my talk. Later on I will describe actually, as a spin-off study, how we developed an intervention which is very much like David Olds' but I will leave that to later.

QUESTION: *Did you look at issues of neglect and the impact on children?*

Professor FERGUSSON: No, we have not done anything on neglect. The reason for that is it is remarkably difficult to assess neglect, particularly through our interviews. When we assessed abuse, how we did this was we took our 18-year-old people and asked them to report back. It is ethically almost impossible to go into families of six-year-old, seven-year-old and eight-year-old children and say, "Have you abused your child". There might be ways of actually getting people to tell you to disclose.

But even if they were to disclose, you are in this terrible ethical dilemma that you are going to have to go to the authorities and ‘dob people in’. And what happens on the day that the teacher tells you? You rush off and you say: "Yes, well, we are doing this. We are obliged to tell you," and it all turns out to be false or malicious or wrong and you are in the middle. You are the agent of this. So we backed off very heavily from talking about any kind of abusive experience with families until the kids were 18. When they are 18 in New Zealand they reach the age of majority, they are allowed to vote. If they are allowed to vote, we thought they were old enough to be asked about their childhood experiences, and that is how we proceeded. But measuring neglect that way would be very, very hard. It is a tricky issue.

QUESTION: *What about conflicting relationships between divorced parents where a child is going backwards and forwards between the two? Have you looked at that?*

Professor FERGUSSON: No, is the short answer. We have done a lot of work on the impact of separation and divorce on kids, and that shows, as has been well known, that the offspring of parents who divorce tend to have high levels of behaviour problems but—and a big but—these appear to reflect events and circumstances that were present before the divorce: the conflict, the alcohol problems, the poverty and all the other contributors. We did not do studies of conflict between parents, largely because the study has an Achilles heel. We do not measure data on fathers. Now, everyone has said, "Why not? It's terrible." There is a very good reason for this: cost. The study is operating in a context where the funding is tight. We currently have to reduce our costs to the bone. We can afford one informant for a child and, under the circumstances, the mother was the natural choice. So we have not gathered data on fathers.

QUESTION: *Looking at the data with IQ and boys' achievement levels, if you controlled for learning difficulty, did you still get the same outcome with behaviour and lower achievement?*

Professor FERGUSSON: Yes.

QUESTION: *And the second question: with the breastfeeding achievement levels, do you control for public and private schools and/or individual school choice? I am thinking in terms of children deciding to leave school early. Did their cohorts have a greater effect on that decision than perhaps breastfeeding?*

Professor FERGUSSON: We did not control for that, and it should not be a confounder. The condition for the confounding is that the type of school has to be correlated with the breastfeeding. It may well be, but it is a long bow. You are drawing a long bow to correlate whether the mother has breastfed with the kind of school you go to in adolescence. It is a possibility.

QUESTION: *I was kind of looking at it if you put that into the mix, did that change the data?*

Professor FERGUSSON: It should not.

QUESTION: *I am saying did breastfeeding not have an effect if you put in a public or private school?*

Professor FERGUSSON: I am certain it will have an effect irrespective of that, but I have not done exactly what you have in mind. I would bet with you a small amount.

QUESTION: *Have you done any work on family size, like, number of other siblings and community impacts and the community health outcomes?*

Professor FERGUSSON: Thanks. We have done some work on family size and birth position, which in this cohort appears to play no role whatsoever. You may recall people saying that birth position determines IQ and all sorts of things. We can find no birth order effects at all. We got bored with doing it. We found nothing. We tried again. Every now and then we had a little go at birth order effects, and nothing happens, so we never do anything about it. The other things, no, because the study is focused on asking the family. It is a strength but it is also a limitation, because the social context within which the family operates tends to get rather grey and vague, and we rely only on the family's account of its perceptions of its social behaviour. One could, if one had enough money, actually measure the community around the subjects as well, and we were going to do one of these studies. We actually in the 1980s wanted to do a study of the classroom impacts on kids, and we went and thought we were doing quite well until we went to see the education department, which declined outright to have our researchers within their schools evaluating their teachers' performance.

QUESTION: *Can you just comment on the sample size and the number of associations you looked at and on the fact that they were not completely independent?*

QUESTION: *What was the question?*

Professor FERGUSSON: A statistical question about the number of statistical tests that we are doing and that they are not independent. When I present you with these data, I present you with a simple variate test—I do that deliberately—when, in fact, the multivariate test such as the one we do in-house is testing of analysis of variance for statistical significance. That is what we actually use when we report data in journals, but when I come round to sort of general audiences, I do not want to burden you with these sorts of tests. I do them one at a time. If you get really worried about them, you could also use a Bonferoni correction. The Bonferoni correction just says that if you have 10 tests and your significance levels are 0.05, you divide 0.05 by 10 and you get a new adjusted significance. We will sometimes do that.

Ms CALVERT: We might give you a break for half an hour for morning tea…

(Morning tea adjournment)

Ms CALVERT: We might start again. I will hand you back over to Professor Fergusson.

Professor FERGUSSON: Thank you. In the next instalment of this we are going to take a sort of leap from early childhood into issues concerning adolescence, and I must say that by far the most interesting period of the study has been adolescence. When we studied children in the middle school years there was a big flat plateau of relatively boring events where kids were going on and developing and nothing was really happening at all. It was very much the same each year. We went back and asked the same questions, and there were a few problems, but not a lot, and there were the troublesome kids. All of this changed quite dramatically in adolescence from about 13 onwards, with a sudden rise and almost explosion of frustrated behavioural variability and difficulties.

I want to talk about some of these issues. I have chosen four issues again to talk about. The first one is the prevalence of psychiatric disorders in the cohort really to set the scene for issues of disorder and problems in young people; the second, the prevalence of sexual abuse and its effects on adjustment; the third, the development of suicidal behaviour in the cohort, because this is a big issue in New Zealand. It has a reputation for having one of the highest

rates of youth suicide in the world. I understand Australia has quite high rates. Finally, I would like to talk about the development of an early intervention service, which was based upon the results of our research. So I am going in a complete loop from adulthood back to the beginnings of how the study was used for policy.

The prevalence of psychiatric disorders. As part of the Christchurch Health and Development Study we gathered data on symptoms of psychiatric illness at the ages of 16 to 18. essentially, when you are talking about teenagers, there are commonly four major diagnostic groupings that are going to be of concern. They are mood disorders, and particularly major depression; anxiety disorders—panic, anxiety and phobias; conduct disorders—conduct disorder, anti-social personality disorder; and the substance use disorders. They essentially exhaust most of the diagnosis of disorder which you will see in young people. There are, of course, much more serious disorders, such as schizophrenia, manic depression, psychotic illness, that you will see in small minorities. For those of you who have a thing about DSM-IV—and some people seem to have a thing about DSM-IV—I would like to draw your attention to the fact that if anyone wants to get anywhere writing about psychiatric disorder these days you have to use DSM-IV. I used to rail against it, and I used to have these long arguments with reviewers, but in the end it is as good as anything and better than some. But I am not going to engage in debate here. I have had that debate before.

Here is the prevalence of these things according to the criteria. Mood disorder—which is from the age of 16 to 18: 30 per cent of females met criteria for mood disorder compared with 13 per cent of males, with an overall prevalence of 22 per cent. Anxiety disorders: we see the male-female ratio again with an overall prevalence of 17 per cent; 1.7 per cent conduct disorder versus 7.9, and you see that this does bear out my point to you that I made earlier on that not all of those with conduct problems are male. About a quarter are females, or actually 1.7—maybe a fifth. 1.7 is about 9. Substance use disorders: we see a gender difference. And any disorder: 45 per cent of females and 43 per cent of males. In fact, those differences are not significantly different. The prevalence of disorder in males and females is about the same. You simply see different patterns of disorder, with males being more prone to substance use disorders and conduct disorders, with females more prone to mood and anxiety disorders.

Now, although 40 per cent of the cohort met criteria for at least one disorder, the majority of those meeting such criteria did not exceed 77 per cent. Only about one in four actually had any form of treatment, and we used a very broad definition of treatment: "Have you discussed this problem with anyone who might help?" Even using that broad criteria, only one in four had actually sought treatment. There are a lot of reasons people give for young people not going to psychiatric services about costs and barriers and all that, but if you could read what the young people told us, it was really because they did not believe that they needed to have any form of treatment. The three common replies to the question "Why didn't you go?" were "I did not need help. I could handle my problem myself. I did not think about seeking treatment. I thought it would get better by itself." So the barriers appear to be simple, largely attitudinal and the belief systems of young people about whether or not they should seek treatment rather than the external treatment services. This is not to say, however, that were young people to suddenly change their mind and start to seek services they would get them.

Certainly in New Zealand if all 40 per cent said they would go, they would go on a 19-year waiting list. The reason that psychiatric services survive is because very few people actually go to them and, therefore, those services can meet the minority clientele they see.

We began to look at what distinguished those who sought treatment, and these were the major criteria. Firstly, and this is quite interesting—not interesting; it is confirmatory—those seeking treatment tended to report far greater impairment, but the young people who really felt that these problems were harming them tended to more often go. This raises issues about the reality and meaningfulness of the DSM-IV criteria: are they, in fact, openly inclusive in classifying people with mild problems as though they have disorders? "Have multiple disorders" is the second criteria. "Be more likely to have mood disorders" is quite important, and that has been documented in other studies. The corollary of that is "not likely to have conduct or substance use disorders".

Substance use and conduct disorders are particularly resistant to simple treatment. Interestingly, very interestingly, in the light of debates about bias in statistics, there are more likely to be of low socioeconomic status, and this suggests that the reason for this may very well be that social workers and police and families are sensitised to the view that these problems are common to youth and are more likely to react to them. Interestingly, despite claims that females seek treatment more often than males, that was not so. There was a gender difference. Females did seek treatment more, but it was because they had more depression. So if you have depression you will seek treatment, but gender by itself was not a determinant in treatment-seeking. That really is the story of the prevalence, and prevalence is a boring thing. One has to do it because everyone wants to know about it, but I will talk about something that tends to excite greater interest, and it is a topic that I think is immensely interesting because of the interface between politics and reality that it always raises, and this is the whole issue of sexual abuse and psychiatric adjustment.

In the last decade there have been growing concerns about the prevalence of childhood sexual abuse or, as I will write, CSA, because it is just a long phrase, and particularly concerns about the long-term effects of CSA on vulnerability to psychiatric disorder. These interested people, particularly in New Zealand in the 1980s, when there was a time that I could not go to a meeting to discuss anything without the mandatory question, "Have you looked at sexual abuse?" There was a pervasive belief amongst many New Zealand workers in the area of childhood and family that the primary causative factor in the mentality of psychiatric disorder, and indeed any disorder, had to be sexual abuse. If you were disturbed, maladjusted, upset, unhappy, well, that was a sign of sexual abuse. I think we have become somewhat wiser but not necessarily everybody has. I think we are losing that absorption with the view that sexual abuse was the primary influencing factor. It was because of that interest that we really put a lot of investment into trying to understand this area, and as part of the study we gathered data on accounts of young people at the age of 18 of their exposure to sexual abuse before the age of 16.

The reason, I explained earlier, why we did not gather data on sexual abuse during childhood was the ethical problems and because of the conflicts that would arise. We saw that young people aged 18 were able to vote, and we argued that they were able, therefore, to provide accounts of their exposure to abuse. This actually took a long and very messy debate with ethical committees, which were obsessed, completely obsessed, with the view that if you talk to people about sexual abuse and you ask them questions about sexual abuse you in some way harm them, seriously. If you ask them anything else, it does not harm them, but if you ask about sexual abuse, it does. I have never understood the origin of this, but they describe it as retraumatising.

There is literature on this which says about 3 per cent to 5 per cent of people interviewed about sexual abuse find it stressful and upsetting. After multiple visits to the ethics committee, we were able to persuade them about that, that we could actually ask 18 year olds about this, and we did. At the same time, we gathered measures of psychiatric symptoms. So we have now the ingredients of a study were we can look at the relationship between exposure to sexual abuse and rates of psychiatric disorder. I will give you some prevalence data. At age 18, about 10 per cent of our cohort said that they had been exposed to some form of sexual abuse during childhood. There were quite marked differences in gender. Some 17 per cent of females reported exposure to CSA compared to 3 per cent of males. I believe that the male figure is probably underestimated, and we certainly found that while males were not upset about these questions in the sense of being distressed, they were hesitant in answering and some of them were not comfortable with this issue. Females appeared to have little difficulty in answering this question.

Secondly, and importantly, sexual abuse has been described as one sort of thing, like measles. It clearly is not. It is an array or continued experiences which range from the virtually mild, such as episodes of non-contact abuse such as indecent exposure to severe incidents involving sexual penetration. When we broke it down, we found that about 2.3 per cent of the 10 per cent reported non-contact abuse, 4.5 per cent reported sexual abuse that did not involve sexual penetration and 3.5 per cent reported CSA involving penetration. These figures, you will notice, are somewhat lower than the wild estimates that were bandied around that one in three, one in four or one in two people will be abused by the age of 16. In fact, they were well within the range of estimates in the field.

I would like to talk about those wild estimates that implied one in four girls were being sexually molested by their fathers. What we did find out was that 6.5 per cent of girls reported sexual abuse involving attempted penetration by the age of 16. That 6.5 per cent means that out of every class of 30 girls, one to two will have experienced sexual abuse of that degree of severity. You do not have to have these absurdly high 25 per cents that people were bandying around to make sexual abuse a serious problem. The prevalence of serious sexual abuse at even 3 per cent to 4 per cent is sufficiently high to make it a serious social problem. I cannot help feeling that a lot of damage was done during the 1970s and 1980s by both the overbidding up of the prevalence of sexual abuse and the consequent disputes about the providence and guarantees of these statistics. We do not need those big prevalence to make this a serious problem.

But about perpetrators. A lot of stereotypes suggest that most cases of child abuse take the form of incest. That is in fact not so, as I am certain most of you are aware. Here we get the break down of the perpetrators in the 10 per cent of children reporting sexual abuse. In 1.5 per cent of cases, the natural parent was the perpetrator. That is actually one case out of 1,000. In 5.3 per cent the stepfather was. That is three cases out of 1,000. Notice that the risk for stepfathers is much higher than the natural parent because there were far fewer stepfathers in our study than natural parents —about three of them versus one. Siblings 6.8 per cent, other relatives 9.8 per cent, and then you see the big market is certainly acquaintances, friends of the family, and strangers being the major abusers.

Sexual abuse is not incest, although there are a minority of cases of incest, say about 10 per cent, which involve some incestual relationship. The big question that everyone wanted to know was does exposure to sexual abuse predispose you to psychiatric disorder. This was the major plank of the debate of the 1980s in which it was argued in the extreme form, that if you were sexually abused you would almost inevitably become psychiatrically disordered. Here are the data showing the extent of sexual abuse ranging from non penetration to those reporting penetration. I have showed you a series of outcomes which, in a sense, are the outcomes of the prevalence study I showed you—depression, anxiety, conduct problems, and I have broken the substance abuse down a wee bit, and I have also added suicide attempts.

As you can see, with increasing severity of sexual abuse there are: increasing rates of depression, 17 versus 48; anxiety, 14 versus 32; conduct disorder, 3 versus 26; alcohol abuse, 7 versus 35; substance abuse, 10 versus 39; and suicide attempt, 4 versus 15. In all cases, those exposed to CSA, particularly CSA involving intercourse, were markedly elevated rates of psychiatric disorder. At the same time, and this is equally important to notice, by no means all of those exposed to sexual abuse developed psychiatric disorder. It is not the case that if you are exposed to sexual abuse you will inevitably develop psychiatric disorder. Some individuals were resilient and appeared to transcend it.

Estimates suggested that about 25 per cent to 40 per cent of those who report being exposed to sexual abuse do not develop psychiatric disorder in response. I think we had a 25 per cent group here. The obvious question that arises about these results is perhaps it was not the sexual abuse, perhaps it was other factors associated with the individual's background, the family circumstances or other factors. The power of the longitudinal study, again, is very clear. We knew a lot about the life history of these people, their early conduct problems, family relationships, parents' marital break down, so we were in a very strong position to adjust these associations for confounding factors, as I did, for example, with breastfeeding and lead and the cognitive tests. I do not have a table of the results adjusted for confounding factors with me because we found that, however we worked, adjustments had no effect on these associations at all. Every variable we threw at these analyses did not change these associations.

You cannot argue that the associations between sexual abuse and psychiatric disorder can be explained away by social class effects, ethnicity, parental break down or any of a mass of things. There are potentially two arguments that one can mount. The first and obvious one is that exposure to sexual abuse via a variety of routes encourages psychiatric disorder, that is, it makes them more vulnerable to psychiatric disorder. But there is a counter-model which says that it is reverse causality, that those who suffer or experience psychiatric disorders may be more prone to report and recall abuse. So there is a bias. There is actually no way of disentangling how much of this abuse leads to increased rates of disorder from increased rates of disorder lead to a higher report of abuse. These are data that need to be approached with a certain degree of subtlety and sophistication as indicative of an association rather than as conclusive and ultimate proof of an association, which I think has often been the case in the past.

The next step is basically suicidal behaviour in young people. We mounted a series of studies looking at both the prevalence of and risk factors for suicidal behaviour. By the age of 21, 29 per cent of the cohort, let us say one in three, reported experiencing suicidal thoughts. About

7.5 per cent had made an actual suicide attempt. Most of these suicide attempts proved to be relatively trivial, often involving attempts at hanging or, as the subjects described it, strangling, and many young people who make attempts will do this, they will put their head in a noose and try to hang themselves. They will find that it is very uncomfortable and they will extricate themselves from this situation rapidly. The problem is, however, if enough people do that, not all of them will extricate themselves from the nooses. The fact is that, of the deaths by suicide in New Zealand, 75 per cent are by hanging, which is remarkably different from the USA where I think about 60 per cent of suicides are by gun shot.

We also had two cohort members, both males, who died from suicide and that reflects the male dominance in rates of youth suicide. Rates of suicide by males in New Zealand are approximately six times higher than those by females. The interesting point is that females make more suicide attempts. Females make twice the rate of suicide attempts, but they do not die at the same rate and the reason appears to be method of choice. Female suicide attempts tend to more frequently involve poisoning and overdose. They certainly have a potential for social embarrassment when you get taken to the hospital to have your stomach pumped out, but actually killing yourself is not as easy as it looks.

We then began to look at the risk factors for suicidal behaviour. I have not presented all the statistics here because I felt they were complicated and I wanted to present to you the over all profile. What we found out was that the risk of suicide behaviour related to a whole series of factors that acted accumulatively to determine individual risk. When I talk about suicidal ideation, I mean suicidal attempts. The rate of this behaviour is higher among people of lower socioeconomic status, reflecting an almost ubiquitous tendency for any adverse outcome in childhood dimension to be higher among those of lower ACS. Those young people who attempted suicide often had higher rates of exposure to childhood and family adversity, family dysfunction, child abuse—we have already seen the role of sexual abuse in suicide attempts—and also parental adjustment problems. Kids who were making attempts often came from family backgrounds that were fraught with problems, difficulties and stresses.

We looked at personality factors. Personality did appear to play a role. We looked at two. The first factor was called neuroticism, which is one's tendency to anxious, depressive behaviour in the face of stress. The second tendency was a personality dimension called novelty seeking, basically a risk- taking measure. Both of those things appear to influence whether you are suicidal. You can see why, if you were responsive to stress, how you might be more prone to be more suicidal and also if you were a risk taker at the same time, which is quite possible, how you may take risks to be come engaged in these things.

However, by far the most strong predictors of suicidal behaviour in the cohort were mental health problems—depression, substance use disorders and conduct disorders in particular. Approximately 90 per cent of those making suicide attempts had a recognisable psychiatric disorder at or around the time of their attempt.

Finally, as has been documented in other studies, there is exposure to adverse life events, and two types of adverse life events seemed to be important: firstly, relationship breakdowns, where the boyfriend told the girlfriend, or vice versa, that it was all over, and, secondly, problems with the law appeared to be a particularly potent precipitator of the behaviour. But what was important was that it was not one of those factors in isolation that determined the children but the combination, the accumulation, of low socioeconomic status, childhood adversity, personality factors, mental health problems and stress, all coming together tend to be characteristic of those making any sort of youth suicide attempt.

There are a number of implications of these for popular debates about suicide and suicide prevention, and views of the causation of and response to youth suicide have really been dominated by two very different models, which make different assumptions about the aetiological factors. They have been called, broadly and crudely I think, the stress model and the mental health model. The stress model, by and large, assumes that everybody is more or less equally liable to make suicide attempts in adolescence and that suicide is a response to normally occurring adolescent stresses. Those espousing the stress model tend to emphasise the role of community action rather than focusing on those with psychiatric disorders. The mental health model actually approaches the topic in quite a different way and assumes that suicide attempt occurs almost exclusively to young people with mental health problems and sees mental health problems as playing a central role in the aetiology of suicide attempts.

If you actually look at our data, you can see that there is an element of truth in both of these models. Certainly, while it is true that suicidal behaviour often follows exposure to stressful life events, frequently, suicidal behaviour only occurs amongst those who are experiencing an existing mental disorder and other life difficulties — that is, stress by and of itself is not sufficient to precipitate suicidal behaviour in most teenagers.

It will only precipitate suicidal behaviour in the vulnerable. But the same thing goes round the other way. Whilst the majority of those making suicide attempts will have had a psychiatric problem, it is by no means the case that all those with such problems make suicide attempts. In fact, the majority of young people with psychiatric problems do not make suicide attempts, and you can see that in the prevalence figures—7.5 per cent of attempts, 40 per cent prevalence of disorder.

These considerations suggest that we need to develop probably a more general life course model of suicidal behaviour which takes into account the cumulative effects, the way in fact life conspires against you to bring you to that destination of suicide, so that you are socially disadvantaged, you have a bad family history, your personality is not helping you, you have got mental problems and the life stresses. It is that sort of cumulative process that we need to be addressing rather than picking out stress in the community or teaching young people to be resilient to marital breakdowns and whatever. To move on to some of the preventive complications, I would suggest that if you accept this kind of cumulative stress model, the likely interventions that may help us will include family support and early intervention programs to mitigate the effects of family and social disadvantage.

Now, I am not suggesting here that the sole justification of these programs is to prevent suicide, but, clearly, they are one strand of an effective policy. Certainly we need early intervention for children and young persons who show significant behavioural difficulties. Recall that 90 per cent of those who make suicide attempts will have at least one psychiatric disorder. We need to improve mental health services to address the needs of young people with mental health problems. You will recall that I said that most people did not go to psychiatric services. I also observed that if they did go, they would never get in. Certainly, our psychiatric services in New Zealand are not such that they could actually cope with or address a marked influx of new clients.

Finally, going back to the prevalence in the treatment data, there needs to be a greater awareness amongst young people and their families of mental health problems and the need to seek treatment for these problems, given the central role that they play. Anyway, I would suggest that those should be the key focus of an effective suicide prevention program, which follows more or less the results that I have shown.

So far I have talked about the Christchurch Health and Development Study, and one of the things that people always say to me is, "Well, you have done all this research. What good was it? What did it do? What policies did you invent? What change to the world did you make?" First, I would like to say to everyone that it is a very heavy pressure to put upon one individual doing a study to change the world. An expectation that research by and of itself will change the world I think is a naive one. It will give you the knowledge and the tools to inform you about ways of changing the world, but changing the world in the end turns out to be a political process and one of power and all sorts of things. Anyway, as a result of those sorts of issues, really, I came to realise that if any useful programs were to come from the study, we would actually have to come and get involved in a very fundamental way with service development, not just simply telling people how to develop services.

You have probably all had the experience where you write to the Government and say, "Oh, now I have found out all these things, here are all the things you need to do." The Government replies, "Thank you for your letter. The Minister will reply in due course," and then it disappears. I went round to meetings like this saying, "Look, there are all these kids having all these problems and someone ought to do something about it," and everyone said, "Yes, yes, yes," and they all went away. And at the next meeting we did this. So I decided that I would actually attempt to get much more actively involved in the translation of the research findings of a community-based early intervention program. I would like to go through this whole process of how we arrived there.

The point of departure of this whole line of thinking was a very simple study we did where we looked at a group of kids whom we described as multiple-problem teenagers. It occurred to me that lots of our kids were smoking dope and breaking the law and doing things, but these were relatively mild and adolescent-limited. We wanted to find out the kids who really had pathological levels of anti-social behaviour. Using a technique known as latent class analysis, and I will not tell you how we did that, we actually cut out from our cohort a small group of teenagers — 27 of them —who were multiple-problem teenagers.

This transparency gives you a profile of the multiple-problem teenager versus the rest. A hundred per cent were sexually active by 15; 100 per cent had conduct disorders; 55 per cent had already been in contact with the police for offending; 90 per cent, near enough, were cannabis users; 40 per cent were alcohol abusers; 55 per cent were other-substance users, essentially cannabis; 22 per cent had mood disorders; one in three had suicidal ideation; one in five had low self-esteem. You can see when you compare this group with other teenagers that they are markedly different. One of the interesting things is that the prevalence of this group is quite low; it is about 2.6 per cent of the population. They represent, however, the extreme 2.6 per cent of the population who probably preoccupy the courts. Most of you will instantly have images in your mind of clients and people you have seen who fit that criteria. These young people look like street kids. In fact, most of them were not, but would have liked to have been, and were very close to being so.

So having cut this extreme group out of our cohort—only a small group—we asked the question: What were the processes that brought them to this destination? We were in a very good position to do this because we had 15 years of data about their childhood, their mothers, their fathers, all sorts of things; we knew a lot about them. The answer to this question is not surprising; it will come as no surprise to you. What we found is that multiple-problem teenagers tended to come from multiple-problem home environments, characterised by social disadvantage, family dysfunction, impaired child rearing and parental psychopathology and difficulties. But what distinguished these kids was not the presence or absence of one factor, and this is a very important point.

Many of our policy debates on kids in New Zealand have been trapped into the view that there is one factor that is the cause of these problems. The New Zealand history was that we started off with single parenthood. We then moved on to childhood physical abuse. The sexual abuse wave hit us. The sexual abuse wave subsided, and it became family violence. Now we are back to single parenthood in a new guise called fatherless families. At each time at the junction there is an argument being mounted: if only this problem—whether it is sexual abuse or fatherless families, or whatever—were cured, then everything would be so good. But what was distinguishing the arguments of kids was not one of these things but, rather, exposure to an accumulation of risk factors.

I want to show you the dramatic ways in which these risk factors accumulate. We had 39 risk factors that we looked at, and I will not even describe them. They were predictable things about how families functioned. We created a score by giving children one point for each adverse things that happened. This is the distribution of the score: 54 per cent of the sample had between nought to six points. These were the kids who were reared in completely unexceptional home environments. They may not have been perfect and ideal but certainly there was nothing untoward about them. Of those 54 per cent, 500 children, one child became a multiple problem teenager. The rate as a percentage for multiple-problem behaviour was 0.2 per cent—two per thousand. But the other extreme had 5.4 per cent of families who got a score of 19 plus. These were families which were essentially in chaos. Eleven of their offspring became multiple-problem teenagers. The rate of multiple-problem teenagers in those families was 21.6.

Now, if you do a little bit of arithmetic, you will suddenly come to the remarkable observation that rates of multiple-problem behaviour were 100 times more high in the 19 plus than in the nought to six. It was remarkable. It was a huge relative risk. So if you get into one of these families, your chance of becoming one of these severely damaged teenagers is 100 times higher than if you get into the usual, run-of-the-mill, unexceptional family environments. That is a massive difference, particularly when you think about cancer epidemiologists and others talking about smoking and they wring their hands. The relative risks for smoking are about 10 for lung cancer, not 100. There is nothing in physical epidemiology approaching that sort of risk. It is dramatic. If you are a cancer epidemiologist and you were shown a table like this you would say, "Well, what is this factor? We must find it. We must do something about it. We must address it. This is the key for that huge relative risk." It was this sort of observation that led us to ask the question: What could be done to ameliorate, to address, the environments of those multiple-problem teenagers?

The issues I have just discussed were discussed in 1993 at a meeting held by the New Zealand Mental Health Foundation. At that meeting there was a sense of broad consensus of one approach that merited consideration, and that was the use of intensive family support programs provided by home visitation. Reviews of the evidence at that time suggested that effective programs in this area, quite a nice review article by Yoshikawa, are, firstly, targeted at high risk families. The programs have to be targeted at high risk families because they are too intensive to be applied across the whole population in a non-expensive way. Services are provided by family support workers who have a small client load, less than 20 families.

Importantly, the programs are designed to address a wide range of social family issues. They do not focus on the single issue of sexual abuse, breastfeeding or whatever. They focus upon the totality of the environment to which the child is exposed and, importantly, program duration length. I think you can see very well a good reason for that. With families with the extent of the pathology that I am describing, the belief that some kind of three- to- six-week parenting program or quick fix will work is naive in the extreme. It took for those families often 30 years to get where they are to really become a fully fledged, difficult, dysfunctional family. We should perhaps expect that the undoing of that process, if it is reversible, may take a substantial period of time.

As a result of interest following that meeting, a group of providers gathered together in Christchurch essentially following a number of meetings to pilot test, develop and evaluate an approach to family support that has become known as the Early Start. The providers included the Family Help Trust, an organisation that had been working with prisoner families and had an interest in home visitation, the CHDS to provide a research basis, and the Plunket Society. The Plunket Society is a remarkably New Zealand thing where we have these nurses called Plunket nurses who visit families and give them advice about good, healthy child rearing. They actually see 95 per cent of the kids in Christchurch, so they are a very important point of contact. We also became involved with the local GPs who wanted to buy in and we also had Maori representation to ensure that the programs were not only culturally appropriate, as they were, but seen to be culturally appropriate. I would make the point that of the directors of the Early Start consortium, three are Maori women and two are white males, so we certainly are politically correct in all effects.

The first aim of the consortium was to conduct a pilot study of providing intensive home visitation to at risk families. There is a very interesting process that goes on when you moot these arguments. When you first go to the meetings and say, "Look, these families are in trouble. They need some help. People should go and assist them", everyone says, "Yes, tremendous." Then when you move to the point of getting some money and getting together, they say, "I don't know about that. It is unethical. You are labelling them, aren't you". There are a whole series of barriers that you have to overcome to address this. We were aware of these barriers and we decided that the best way of addressing the barriers was simply to say, "We will conduct a limited scale pilot study of 50 to see whether all the systems work, whether we can screen the families, whether they like it, whether they find themselves stigmatised and then we can address these concerns that you have on an empirical basis. We can actually say this is what happened in the pilot study."

As I say, when you actually get to this point, there are a whole mass of gatekeepers in the community who are prepared to prevent things from happening not because they have ever done it or seen it, but because they think it might. The only way you can really attack that sort of, it might stigmatise, it might damage, it might harm, is to do something and do it on a small scale. That is what we did. The key features of the Early Start service that we developed is that service provision is provided by trained family support workers who have qualifications in nursing or social work. Earlier it proved to be quite a contentious issue about whether we should use lay workers or qualified workers.

This was really decided by the Plunket Society who said that they would not have anything to do with people who did not have qualifications, and that was the end of it. They probably proved to be right because when I talked to David Olds about this, in a US study he has done a comparison of lay workers versus qualified workers and he argues that there are definite advantages of qualified workers in the sense that they have an understanding of boundaries, will accept supervision, will have case note takings skills and also have an understanding of what to be alert to and what not to be alert to. Also, they are less likely to be captured and become, in a sense, an agent of the family, which is a major risk in this area. Each family support worker has a client load of approximately 15 families and initially all families are visited regularly, at least once a week. The program aims to provide family support and assistance in the key areas of child health, maternal wellbeing, parenting skills, family economic functioning, crisis management and anything else that might come up in the day-to-day business of the family support worker.

One of the critical issues about any family support service is getting systematic referral, how do you get your clients. There has been a major debate in literature about, in a sense, ad hoc referral versus screening methods. We got trapped right in the middle of this with people arguing that population screening was unacceptable because it was stigmatising and others arguing that ad hoc referral was unreasonable because you would not get a representative sample. We actually struck a system that tried to steer through a middle course between a screening system and a referral system. The clients at the Early Start are referred to us by the Plunket nurse who we have taught to use a simple 11-item screening—has the parent considered adoption, was the pregnancy unplanned, those kinds of item. This instrument is not administered formally. They are told about the 11 criteria and are advised to refer anyone with two of the criteria or if they have any other concerns. There is no heavy formal screening going on.

The Plunket nurses then seek the mother's signed informed consent to be referred. This is the second sticking block—you cannot refer without the signed consent. The next critical piece, and this is what worked with the ethics committee and which is what solved the problem, following the client referral we enrolled our families into the Early Start program for a one-month probationary period. This is a free introductory offer. It is a trial. It has two functions. First, it allows the Early Start Service to learn about the client and determine whether the Plunket nurse's referral is a valid one and the false positives will drop out of at that point and, secondly, it gives the client a no obligation key to the service of one month. They do not sign up for anything except for a month and at the end of the month we assess them and then approach families with high levels of need to be enrolled in the service.

We are steering a middle course between an in-depth needs assessment, which is this stage of the thing, and population screening. It was that process that got us past several ethical committees who said that it seemed to be a reasonable way of meeting the need that the client should be properly assessed but at the same time the client population should be covered. We had 55 families referred to us in our first pilot study. They were characterised, and this is not surprising because it is the profile we were searching for: high levels of socioeconomic disadvantaged, including single parenthood; limited parental education and low income; very high rates of adversity in the childhood of the mothers, including family conflict, parental substance use, child neglect and poverty; high rates of parental adjustment problems, that is the mothers and their parents, including crime, substance abuse and mental problems; and very high rates of relationship problems and unsatisfactory relationships.

Interestingly, marital violence was not a major problem. Most of the relationships were very unsatisfactory. They were conflictual and stressful but relatively few involved violence, which was quite surprising, although it involved a lot of threats, counter-threats and verbal hostility. We then follow those families up for 18 months to see what happens, what benefits the service produced. I do not have time to go through all of the tables so I am going to cut to the chase and tell you what our conclusion was. We found that the program was very successful in encouraging new learning. Any area of new learning, like immunisation, going to the doctor, how to resolve problems or using services, the service was very good at, but in changing old behaviour and habits the service was virtually ineffective. It did not reduce rates of substance abuse, crime, unemployment or those kinds of difficulties. In other words, you can teach people new parenting behaviour but changing old predispositions seems to be much harder.

To accentuate the positive, I will show you some of the positive outcomes. I will not forget the negative ones. This is where we scored well. One of the big issues with these families has always been immunisation. In New Zealand we have a characteristic 60 per cent immunisation population. These are our subjects that are up to date with immunisation in the program. In fact you can see that we have 100 per cent immunisation and the same with well child checks. This bears interestingly on the debate I had once with officials from the Ministry of Health who were agonising over low rates of immunisation in the child population—how can we do it. Someone said, "I know what we will do, we will get a register and record who gets immunisation and who does not." They all said, "And we will get a computer database." I said, "Listen, I want to tell you something. How do you get children immunised? You get the mother, you put the mother and the child in the car, you drive the car to the doctor, you take the child out of the car and say to the doctor, 'Nigel needs immunising.' The doctor immunises Nigel and they drive back home. That is the causal process as I understand it. Please explain to me what the register is going to do? Is the register going to drive the car, or is it going to do the immunisation?"

The family support workers actually do this very causal process and they are told, "You have to do it otherwise we will grumble at you." We get 100 per cent. We get the occasional conscientious objector about immunisation. The same thing about the child abuse and neglect concerns. We asked for ratings of these abuses and 45 per cent of the kids who were seen at risk of abuse and neglect dropped to 27 per cent after 18 months. It is easy to argue that, over the passage of time, that could have happened, anyway. Relatively few of these families were referred to children and young persons for abuse and neglect, three in the first six months, four and zero. Interestingly, almost all of those cases were cases of neglect rather than abuse.
It is remarkable how everybody has got hooked on to the issue that physical abuse is the problem when certainly our experience of these things is that it is the neglect. It is the sins of omission rather than the acts of commission that are threatening the children more. One area which we did really well in dramatically was maternal depression. It was very apparent at the beginning of the program that mothers had clear symptoms of depression. To address this, we taught to the workers a simple screening test based on how to identify mothers with possible depression. We said, "If they have got this many symptoms, tell them that they need to go to the doctor. Do not tell them they are depressed. You are not allowed to tell them they are

depressed but you can say, 'You know, you have enough symptoms to justify going to the doctor.'" We had 73 per cent of mums in six months who met those criteria—that is, 33 of them. We got 32 to the doctor in various ways, and some of them took this up within six months. Eighteen months out, the prevalence of depression in the sample had dropped to below 6 per cent, which is actually lower than the random sample that the population were producing.

Depression is one of these eminently treatable conditions if you actually can get people to go. It is not just getting them to go; the second problem is compliance with anti-depressants. Everyone thinks anti-depressants are happy pills: you take one if you are unhappy. It is not so. They take about three weeks to work. So the family support workers have got to work on compliance. They say, "You have got to keep taking these. You cannot expect one to work." We actually worked on that and got this very dramatic effect.

Some more conclusions from the pilot: the places where we did not work, and I should tell you, because I have not got a transparency, were certain types of domestic violence that we had no cure for, alcohol problems, anything to do with money, poverty. We just did not reduce debt. I think about 40 per cent of these families had debts in excess of $5,000. We never touched the debt; we never touched the money; we never actually successfully addressed work force participation. So the new learning about how to use the services and how to address the services, that is fine, but at changing our life they seemed to be very resilient, much more so than I think many people would like to believe. A lot of people have the idea that if the services and the motivation and the context is provided, all will be well. Well, we entered the study with that belief but I think we realise that it is more than that. You really do have to do a lot of work to change people's lives.

The major conclusion of the study: our client identification methods produced 79 per cent of those who were eligible participating. We did find it was possible to deliver family support to at-risk families. There is no doubt about it: you can do it. There were clear benefits in the new learning. With the old learning we were less successful. We also conducted a consumer survey to check for stigmatisation. Actually, we got very high enthusiasm. The great majority of the program participants—it was an anonymous survey—described it as worthwhile, helpful and culturally appropriate, with only about two or three malcontents who said they did not like it. So, by and large, from the standpoint of the consumer rather than the consumer advocate, these programs are seen as being positive and beneficial and useful. And why should they not be when you have got people who are going round doing their best to genuinely and sincerely help them?

There were also interesting issues of power that arose in the family support situation. Family support workers have no power whatsoever. They go into the family and the only way they are going to stay in that family is by their own skills and interpersonal ability. They have got no Act, they have got no writs, they have got no laws, and the only way they can succeed is by helping people and persuading the parents to like them, to participate and to work with the parents. It is that lack of power which I think by and large avoids the program being stigmatising or labelling you to a large extent. So that is what we did in the pilot study.

Now, given the success of the pilot study, the Early Start consortium is currently conducting a randomised field trial, and this is to try to get some hard data on whether the program is more effective than doing nothing or doing the existing alternative. Two hundred and twenty families will receive the Early Start program, with a control group of 220 families who do not receive the program but who receive whatever society offers in family support, which is actually quite a lot. Both series will be assessed at baseline, six months, 12 months, 24 months and 36 months, and there is a whole mass of measures, which I will not go through because they are obvious. So far, this is how much program we have done. We got funding for both the service provision and research evaluation components of the trial, and this proved to be a massive job of fighting the politics.

The service costs of the trial are $3 million, so you have actually got to work very hard lobbying and working with politicians to get your $3 million. They do not hand out $3 million easily, which is probably fair enough, but we have actually got that funding. After we went through two ethics committees, who finally agreed that we had done everything perfectly, or as perfectly as they believe, we set up a field trial organisation with staff to deliver the services to the experimental series. We have actually now recruited 347 families—172 in the experiment series and 175 or thereabouts into the control series—and I am hoping that the trial recruitment will be completed by June this year. So we have actually got the trial together, and that is where we are at the present time.

I would like to talk just a little bit about the factors which contributed to the relative success of this program and how we managed to get it off the ground. I think one of the key things about this was an active researcher involvement in the planning of the program. Researchers can come along to audiences and tell them to do this and do that and these are great ideas, but in the end the implementation of research knowledge to a program is actually quite subtle. It requires a lot of subtle translation which you do not realise until you have actually got to do it.

The second thing was that the development of the thing was done by the formation of strategic linkages with key community groups and providers. The Plunket Society, the GPs and the Maori community were keen. Lots of people talk about the role of the community. Actually the community is a very dangerous place for a young program if you are wandering around. There are thugs everywhere. You want to pick your friends very carefully because if you go naively into the community and say, "Please participate", we did this in the beginning and everyone said, yes, tremendous, until we got some money. We learned very quickly to withdraw, not to communicate with the people who were dangerous, and you learn who is dangerous.

The third thing is engaging politicians in the process. We were successful in engaging the former Minister for Social Policy, Roger Sowery, in the program. He became quite committed to it. I am not so sure with the change of government to a Labor Government that we are going to be as successful. The Labor Government has a greater emphasis on generic community ownership than is compatible with the program's objectives. There is going to be some strain and we are going to have to do some re-marketing to sell it. The most important thing, again, is timing, I suspect. The reason that this program got off the ground was that we had all these statistics about youth suicide, sexual abuse and childhood drug using. People were looking for a solution and Early Start was one such solution.

What were the drawbacks? Let us finish off with the negatives. The big problem is limitations on everyone's time. Everyone is a volunteer in this program. It is all very well grabbing volunteers, but there is a lot of work to be done in running these things. Essentially, I am now spending about two days of my week running a community service, solving staff problems, going to court and arguing about employment contracts rather than doing research. The second thing was resistance to the program because of interagency concerns about funding.

As I say, it is not a nice place out there. The ethically sensitive and the politically correct will also kneecap you if they can. We are a small society. There are only 300,000 people in Christchurch. It was quite hard to recruit staff who have had experience on the streets to deal with families and who want to do this work. They are my four scenarios. I will finish there and again allow you to discuss the matters. I would like Gillian to moderate.

QUESTION: *In New South Wales we are looking at universal screening for all pregnant women when they do to an antenatal clinic and hopefully we will do that soon in some centres. By doing that, we actually start identifying families that you talk about on their first visit. We also now have notification before the infant is born. Looking at these two sectors, which may be seen as an advantage or a disadvantage, if you had this privilege, would you actually start your program before the infant is born?*

Professor FERGUSSON: Yes, we certainly would. Let me tell you the story about why we did not start the program before the infant was born. It is quite an interesting story. We started out going to see Christchurch Women's Hospital, the largest maternity hospital in New Zealand. We were aware that the maternity services in New Zealand had become very much fragmented with a big private midwife thing, but this was one hospital. We organised a meeting and the person who organised the meeting made the mistake of organising it with middle level nursing staff. We went along with bright, shiny faces and said that we would like to talk to their patients about these things and we were going to screen them. What we got was a whole series of gate-keeping responses instantly and the ultimate gate-keeping response was that the nurse would have to get the patient to sign a letter to say that the patient agreed to us seeing the person and then we would have to go to the patient. There were about five levels. We walked out of the room and said, "Forget it." So we were actually left with our antenatal screening in tatters.

We then went to the Plunket Society that was looking at 95 per cent of the population about six weeks postnatally, and they were quite keen. When we went to the Plunket Society we talked to the boss, not the nurses. Once you have made that mistake it is over because they have all the objections listed on a piece of paper. Remember, it is good to have an organisation where you have one person in charge because if you get a democracy it is finished. Some 10 per cent will say no to anything. If you offered them $100 they would say no.

QUESTION: *You spoke about how you were able to increase new learning even if you were not able to change family situations. Do you have any data yet to demonstrate whether or not that improvement in parenting practice and increasing depression actually mitigate children and young people against those adverse circumstances?*

Professor FERGUSSON: No, there is a big study by David Olds which has suggested that—up to 15 years. There is also the Elmira study which has suggested it. Having said that, there was a big review recently in the journal, *The Future of the Children,* which paints a bleak picture of the efficacy of these early intervention services. I think that the answer to this is that the only ones that will work are ones that are designed meticulously and run rigorously. If you merely send people round to people's houses to do their best, it does not work. You have to be programmatic. You have to have goals, supervision and you have to be checking all the time on how your work is going.

QUESTION: *Will you be following up those families to see what the effects of the program are over time?*
Professor FERGUSSON: Up to three years we will but, then again, we have to get more funding to follow them up, and I cannot guarantee that founding. Besides, I am getting old. I would like to go fishing one day.

QUESTION: *You mentioned the issue of recruitment of staff, which is also an issue in Australia. Are you doing any work at colleges or universities about this sort of training? It seems to me that is where we are missing.*

Professor FERGUSSON: We cannot do any work like that. We are a demonstration project, so we are not part of a market and it would be quite wrong for us to say train people to do this. We have three years funding of $3 million to hold this together, but at the end of that three years I have to think about getting another $3 million for the next three years. That is very heavy funding to call on, as you would be aware.

QUESTION: *What was the frequency of visits to the family? With the population I work with, for mothers a lot of it is loneliness. Just having a visitor once a week would alleviate maternal depression where I work.*

Professor FERGUSSON: On average, we saw those families 53 times in the year for direct contact, and there were another 40 indirect contacts—that is telephone contacts—and probably another indirect 20. These are just guesses, so do not write them down because I might be making this up. A lot of work is being done on behalf of the client: ringing up estate agents, ringing up the Plunket, ringing up the children and young persons services overall to negotiate things, so at least once a week. We have got a graded system, though. Clients start at level one, which is once a week; they work to level two, which is once a fortnight; level three, once a month; and level four, once every three months.

QUESTION: *So the impact on maternal depression from having constant buffer zones and visits and so on?*

Professor FERGUSSON: There could be but, then again, we also did good practice by making sure that they went to the place where they ought to have gone if they were depressed. We do get into disputes with some of our family support workers about whether people should be taking anti-depressants. We are very, very clear. We say that we provide a mainstream service and you do what is best practice for parents, not what you think. It may be that someone says that you send the person to the doctor. He will make the decision about anti-depressants; it is not your decision. So if you have got depression, this is what you do, and what you are really doing, in a remarkable way, is exposing disadvantages to a middle-class skill base. This is the key to it. You remember those 55 per cent of families? What were they doing? Well, nothing magic, but they have got a whole world view and a whole series of things that they know what to do, how to navigate the world, and the family support worker brings with them that whole class of skills and tries to transplant them into the family.

QUESTION: *I gather in talking about the intervention study that there were a number of families in that study that are Maori.*

Professor FERGUSSON: Yes.

QUESTION: *Can you talk about that as an issue but also in terms of the first longitudinal study and the numbers of Maori families in the first study?*

Professor FERGUSSON: In the pilot study we had 14 per cent of families of Maori ethnicity, which was actually lower. In the randomised trial it started at 25 per cent. We have got as part of our consortium Maori representatives. We have two Maori workers, and we have negotiated a very, very clear position: everybody gets delivered the same program. So it is not the case that it is a Maori program and a Pakeha program; it is the same program but it is delivered in a culturally relevant way. The Maori workers work with Maori clients, and they deliver the program and the components but they do it in a way that they deem to be culturally relevant. So those are the ethnicity issues in the trial.

In the Christchurch Health and Development Study, 15 per cent of the cohort were of Maori descent, and this has been a very tetchy subject in New Zealand during debates about ethnicity. We have not specifically analysed our data by ethnicity because of the sensitivities about this, but we have now reached a negotiation with the Ngai Tahu Research Unit down in Dunedin, which is a local tribal Iwi unit, and we have said, "You can take our data on these 150 Maori for 21 years, and you can, in conjunction with us of course, analyse this to produce a report for your purposes. The first one we did was based on ethnic identity, looking at the spectrum of identity in people who declared themselves Maori. It is very clear that this is not a homogenous population with a common set of beliefs and views, any more than white people are or any other people, and there are people with strong identity and weak identity and so forth.

QUESTION: *Given the resistance of families to changing long-term behaviour, have you considered that it may be worthwhile rather than targeting families for therapeutic intervention acting before that step and working with families that have some of that collection of risk factors but not actually in the higher risk end of the spectrum?*

Professor FERGUSSON: Well, when we screen out we are actually screening out the most disadvantaged 15 per cent, so there is quite a spectrum in there.

QUESTION: *So there is no high risk as in ill-health or bias?*

Professor FERGUSSON: No. So what we are doing is, in a sense, taking a much bigger lump because of ethnicity. We are not down to three or four points, and this has been done explicitly. There is a balance to be made. It is one of these interesting things about the analogy with battlefield triage. It may very well be, and there is some data in my research that suggests, that the families that are going to win are the middle-risk families, not the families that are so bad that nothing is ever going to change, nor the families that are so good, if that is the right word, that it does not really matter what you do, but the families who unless something is done for them may sink. My gut feeling is that about the 8 per cent or 9 per cent are 15 or 20, and that is where you probably can do your best.

QUESTION: *If you delineate the proportional contribution of, say, impulsive novelty-seeking temperament between those families at risk, was there any big difference between the groups of, say, families that you are saying are the ones that can be reached most easily that will most benefit from the program than those who will not?*

Professor FERGUSSON: We do not have any measure on the temperament and personality in the intervention. If I were to be really honest about this, and I will be, and probably stigmatised because of it, I suspect that in the end it is actually the intelligence of the mother that is critical.

QUESTION: *The temperament of the mother?*

Professor FERGUSSON: The intelligence. We have mothers who pick up and work and will take jobs and have quite a bit about them and there are others who just will not. It may be partly temperament, but I think it is how bright they are. One of the things that this screening always picks up and everyone has ignored is that there are a substantial number of quite dull people in the community. However hard you work, you are not going to make them less dull than they are. You can patch them up, give them resources, but essentially that is where they are.

QUESTION: *Is there a correlation between low IQ and impulsive temperament?*

Professor FERGUSSON: Yes, there is. Why I say IQ is that when we looked at factors that protected young people—remember those 21 per cent that I showed you—the one that came out as the most protective is IQ. If you are reared in a bad family, what is going to save you is being bright, first and foremost above anything else, which is not unreasonable. IQ is just another word for adaptability in the end.

QUESTION: *Was there very much study done on criminology?*

Professor FERGUSSON: Yes. We recently published two on criminology. There has been a whole lot of debate about trajectories of offending, and particularly in the work of Terri Moffitt, the distinction between life-course persistent offender, the hard core 4 to 5 per cent of the population, who start offending at eight and go on to 80 and the so-called adolescent limited ones. We published some papers on victimisation, looking at what were the characteristics of victims of violence and victims of crime. The answer is this: those who are the victims of crimes are the same people who commit the crimes. The victims and perpetrators are very hard to distinguish from each other. They look like each other because they are in the same ecology, the same battlefield. Our world is sectored up. It is not the case that we are mixed at random. If you live in a battlefield with perpetrators, you are going to get called one and you may very well be one yourself. As I observed one time, the only thing that distinguishes between the victim and the perpetrator is who lost the fight.

QUESTION: *Your description of the sorts of families is familiar to any of us who work in family support areas and targeting family support in particular, but there is an increasing scepticism about how much you can really change some of the outcomes demonstrated in your research, which is leading numbers of us to see more direct work directly with the children as being more reasonable for some for their future outcomes.*

Professor FERGUSSON: I see now that if I were to start again, I would add to this a centre-based program. When you have a family support worker now, you only have two hours a week and even if she is working hard it is four hours a week. If you can get children into a centre-based program you can give them 10, 15 or 20 hours substitute parenting. We are

actually moving this way by saying to all our family support workers, "We want these kids into pre-school institutions by 18 months, no arguments and not just enrolled, we want them there every day. That is your job" and that is the best we can do, but I think a better design would be to have the family support program to facilitate this. There is no point in having a pre-school Head Start system if you cannot get the mothers there. You need the family support system to be the feeder and you need the centres to provide the substitute parenting. That is when you start to win, but you are spending very, very big money on these families.

QUESTION: *There is a range of programs like tutoring through the middle years of childhood and respite care, for example, to continue that substitute care for parenting.*

Professor FERGUSSON: It is becoming very expensive.

QUESTION: *I know.*

QUESTION: *Have you done any studies at age 18 to 21 of physical health outcomes, for example, respiratory problems, overweight and obesity?*

Professor FERGUSSON: Very little on those, largely because the problems seem to be ho-hum and not particularly interesting. But I think that the obesity issue is an interesting one.

The respiratory illness one: we did a lot of work on respiratory illness earlier, and it just becomes more of the same, particularly asthma and recurrent bronchitis. So the answer is "very little". The thing is that the psychiatric and personal adjustment data are so rich and so interesting that I am always attracted towards doing that rather than looking at physical health problems.

Ms CALVERT: Well, we might leave it there if you would like to join with me in thanking David. We are now going to break for lunch, but when we come back we have two more fabulous presenters. Sven Silburn will be talking about the Western Australian Child Health Research Study. I was going to say we were having people who were a bit closer, but when I did the figures we are getting someone from further away in Sven. Sven will be talking about the Western Australian Child Health Research Study, which is a fabulous piece of research. He will also be talking about his work with Aboriginal children and families and also how that research has been translated into policy and practice development. Then we will have Victor Nossar, who is very close to our shores, talking about how we can use this research information, or not use it, and some of the challenges of using this research information to actually change some of the policies, programs and practices that we are currently offering in New South Wales. So I think it is going to be an afternoon equally as stimulating as the morning. We have got an hour for lunch, and it will be served out in the foyer area. For those of you who like to go for a walk during lunch, there is the fabulous Hyde Park just to your left.

THE CHRISTCHURCH HEALTH AND DEVELOPMENT STUDY

Overview:

The Christchurch Health and Development Study is a long term study of a group of 1,265 children who were born in the Christchurch (New Zealand) urban region in mid 1977. These children have been studied from birth to age 21.

Brief History:

The initial impetus for the CHDS came from the efforts of the Foundation Professor of Pediatrics (Professor F T Shannon) at the Christchurch School of Medicine. As a result of his efforts in the early 1970's, the Medical Research Council of New Zealand provided funding to set up a long term study of a birth cohort of 1,000 (approx.) infants.

The study began in 1976 with the appointment of D M Fergusson and data collection began in 1977.

RESEARCH DESIGN

Study Group: The individuals enrolled in the study comprised a birth cohort of children born in the Christchurch urban region over the period 15 April 1977 - 5 August 1977. Over this time 1,310 children were born and the parents of 1,265 (97%) agreed to participate in the research.

Study Times: Children in the cohort have been studied at birth, 4 months, 1 year, annually to age 16, 18 years and again at 21 years.

Sources of Information: Information has come from the children, their parents, teachers and official records (hospital records, police records). The data gathered comprises 40 million characters of data describing the 21 year life history of the birth cohort.

RESEARCH OUTPUTS

The CHDS has produced over 200 scientific papers and books that describe the 21 year life history of the cohort. These publications address a wide range of disciplinary areas including:

Social Pediatrics and Pediatric Epidemiology.
Developmental Psychology.
Psychiatric Epidemiology.
Developmental Psychopathology.
Criminology.
Educational Psychology.
Family Sociology.
Family Economics.
Research Methodology.

SAMPLE RETENTION

At age 21, a total of 1,011 young people were studied. This group represented 80% of the original cohort and 90% of all cohort members still resident in New Zealand.

RESEARCH THEMES AND EMPHASIS

The conduct of the CHDS can be classified into three research epochs during which there have been different research emphases.

The Preschool Years (0-5 Years): During this time the focus of the study was largely on child health and examined such issues as: breastfeeding; parental smoking; childhood accidents; respiratory illness; immunisation and related topics.

The Middle Childhood Years (5-12 Years): During this time the focus of the study shifted to issues relating to behavioural adjustment at school and academic achievement.

RESEARCH THEMES AND EMPHASIS (Cont)

Adolescence and Young Adulthood (12-21 Years): During this phase of the study, the emphasis of the research was on issues of psychosocial adjustment and mental health.

BREASTFEEDING AND ACADEMIC ACHIEVEMENT

There has been a long standing interest in the extent to which breastfeeding may lead to improved intelligence and school performance in children. The CHDS provides an ideal opportunity to examine this topic since comprehensive information was gather on:

Infant feeding practices in first (post natal) year.

Intelligence and school achievement from 8 years to 18 years.

BREASTFEEDING AND EDUCATIONAL ACHIEVEMENT

	Duration of Breastfeeding (Months)				
	0	<4	4-7	>7	p
IQ score 8 years	97.46	98.89	102.16	102.83	<.0001
Reading 10 years	97.86	98.94	101.77	103.06	<.001
Maths 11 years	98.16	98.81	101.19	102.90	<.001
% Leaving school without qualifications	25.3	25.5	10.8	9.7	<.001
Mean number of SC passes	2.66	3.04	3.75	3.99	<.001

With increasing duration of breastfeeding there was evidence of increasing IQ, increasing school performance and increased achievement of the point of school leaving.

BREASTFEEDING AND EDUCATIONAL ACHIEVEMENT

In part, the superior performance of breast fed children was due to the fact they tended to come from socially advantaged homes. Statistical corrections for perinatal factors (birth weight, smoking during pregnancy, birth order) and family factors (maternal age, maternal education, socio-economic status, family living standards, family income) reduced these associations. Nonetheless, even after such control, clear relationships between duration of breastfeeding and achievement remained.

Adjusted Results

	Duration of Breastfeeding (Months)				
	0	<4	4-7	>7	p
IQ score 8 years	98.70	99.65	100.59	101.54	<.005
Reading 10 years	98.86	99.76	100.66	101.56	<.005
Maths 11 years	99.06	99.77	100.49	101.21	<.05
% Leaving school without qualifcat.	22.2	19.2	16.4	14.0	<.05
Mean number of SC passes	3.05	3.22	3.40	3.57	<.005

MECHANISMS THAT MAY EXPLAIN THE BENEFITS OF BREASTFEEDING

One possible explanation of the apparent benefits of breastfeeding is that breast milk contains what are known as “long chain polyunsaturated fatty acids” (LCP’s). There is some evidence that LCP’s may aid early neurological development and thence lead to better cognitive ability.

PASSIVE SMOKING

It is now widely accepted that childhood exposure to cigarette smoking is associated with increased risks of lower respiratory illness. The CHDS was one of the first studies to show this association. It is of, at least, historical interest to revisit this research.

RISKS OF LOWER RESPIRATORY ILLNESS IN INFANCY BY MATERNAL SMOKING

Amount Smoked (Cigs per Day)	% With Illness
Non Smoker	6
<5	7
5-10	14
10-15	12
15-20	11
20+	21

Children whose mothers smoked 20 or more cigarettes per day had rates of lower respiratory illness that were over 3 times higher than the rate of non smokers.

STATISTICAL ADJUSTMENT

It could be suggested that the poorer health of the offspring of smokers was due to factors other than their parents' smoking. For example, parents who smoked tended to be less well educated and had poorer living standards. It could be proposed that the higher rates of lower respiratory illness amongst their children reflected these factors rather than the effects of smoking. This does not seem to be the case since even after statistical adjustments for a wide range of factors, children whose mothers smoked remained at increased risk of lower respiratory illness.

ADJUSTED RESULTS

Amount Smoked By Mother	% of Children With Illness
Non Smoker	6
<5	7
5-10	10
10-15	13
15-20	15
20+	19

Even following statistical adjustment, children whose mothers smoked had rates of lower respiratory illness that were over 3 times higher than children whose mothers did not smoke.

REPLICATIONS OF CHDS FINDINGS

Since the initial work on this issue there have been a large number of studies of the linkages between parental smoking and lower respiratory illness. Findings have been reported from:

Great Britain
Australia
USA
Scandinavia
Israel
China

All studies in this area show a clear tendency for the offspring of parents who smoke to be at increased risks of lower respiratory illness.

GENDER AND SCHOOL ACHIEVEMENT

A topic which has attracted considerable interest and debate has concerned the linkages between gender and educational achievement.

Up until the mid 1990's, the field was dominated by a feminist model which asserted that girls were being disadvantaged by a sexist education system. However, interest in this model appears to have waned in the late 1990's as a result of reports from all around the world showing that, contrary to the claims of the feminist model, boys were doing less well at school than girls.

FINDINGS FROM CHDS

Standardised Tests

Test	Age	Female	Male	p
Word recognition	8	47.8	42.4	<.001
Reading comprehension	10	11.3	9.5	<.001
Scholastic ability	13	36.4	32.9	<.005

Girls performed consistently better than boys on standardised tests.

FINDINGS FROM CHDS

Teacher Ratings (% poor/very poor) at Age 12

Skill	Female	Male	p
Reading	8.3	18.8	<.001
Written expression	10.5	25.0	<.001
Spelling	12.7	28.0	<.001
Mathematics	14.3	20.0	<.05

Teachers rated males as performing more poorly than females in all skill areas.

FINDINGS FROM CHDS

d) Outcomes at age 18

Skill	Female	Male	p
% With reading delay	6.4	11.4	<.005
Mean number of SC passes	3.5	3.0	<.005
% Left school with no qualifications	16.4	22.2	<.05

At the point of school leaving, males were more prone to reading delay, were less successful in School Certificate examinations and more often had left school without qualifications.

CONCLUSIONS

The preceding findings suggest that girls are performing better than boys at school. This association is likely to hold for cohorts of children entering the school system from the early 1980's onwards. This raises the interesting issue of why male disadvantage was not recognised until the mid 1990's.

EXPLANATIONS OF GENDER DIFFERENCES

There are two likely explanations of gender differences in educational achievement.

Girls are brighter than boys!
The evidence does not support this view. IQ tests administered at ages 8 and 9 show girls and boys to have similar IQ.

IQ Scores at 8 and 9

Age	Female	Male	p
8	101.5	102.2	>.40
9	103.4	104.8	>.20

At ages 8 and 9 boys scored slightly higher on IQ tests than girls.

EXPLANATIONS OF GENDER DIFFERENCES

Girls and boys behave differently in the classroom.

The evidence favours this explanation. Our results showed that boys were far more prone to inattentive, restless and hyperactive classroom behaviours. In turn, these higher rates of disruptive classroom behaviour were found to explain the poorer performance of males. Our findings suggest a causal chain sequence of the form.

Gender Classroom Behaviour Academic Performance

CHILDHOOD LEAD EXPOSURE AND LONGER TERM ACHIEVEMENT

Since the early 1980s, there have been concerns about the extent to which exposure to lead at subclinical levels may have small adverse effects on childhood intelligence. As part of the CHDS, we gathered shed deciduous (baby) teeth from the cohort at around age 8. From these teeth, it was possible to secure estimates of dentine lead levels and further, to examine the relationships between lead levels at around age 8 and subsequent academic achievement.

LEAD LEVELS AT AGE 8 AND ACADEMIC ACHIEVEMENT AT AGE 18

	Dentine Lead Level (ppm)					
	0-2	3-5	6-8	9-11	12+	p
% Reading Delayed	4.6	5.3	10.1	14.1	14.0	<.005
% Leaving school without quals	13.2	12.2	20.8	24.1	36.4	<.0001
Mean number of SC subjects	3.87	3.77	2.91	3.01	2.3	<.0001

With increasing dentine lead levels, there are clear increases in reading delays and school dropout and a corresponding decline in levels of success in School Certificate.

LEAD LEVELS AND ACADEMIC ACHIEVEMENT

Adjusted Relationships

	Dentine Lead Levels (ppm)					
	0-2	3-5	6-8	9-1	12+	p
% Reading Delayed	5.3	6.3	7.8	9.7	16.5	<.001
% Leaving school without quals	15.6	16.7	18.1	19.7	24.	<.02
Mean number of SC subjects	3.52	3.45	3.3	3.2	3.	<.05

Even after control for confounding factors, increasing lead levels were associated with small but detectable increases in rates of reading delay and school dropout and lower pass rates in School Certificate.

CONCLUDING COMMENTS

The four examples I have discussed illustrate the power of the longitudinal design to address a diverse series of topics within the framework of a common data collection process. Each area also clearly bears on issues that are relevant to public policy. There has been ongoing debate and discussion about such issues as:

Breastfeeding

Parental smoking

Childhood level exposure

Gender differences in education.

One of the many advantages of the longitudinal design is that this design makes it possible to examine a large number of issues within the framework of a common research methodology.

ISSUES IN ADOLESCENCE AND YOUNG ADULTHOOD

In the previous session, I provided an overview of some CHDS findings in early and middle childhood. However, by far the most interesting phase of this study has been the outcomes of the cohort during the period of adolescence as the cohort members make their transition from childhood to adulthood.

In this session, I illustrate this process by examining a number of issues relating to adolescent health and adjustment. Key issues to be examined include:

The prevalence of psychiatric disorder in the cohort.

The prevalence of sexual abuse and its effects on adjustment.

The development of suicidal behaviours.

The development of an Early Intervention Service.

PREVALENCE OF DISORDER 16-18 YEARS

As part of the CHDS, we gathered data on symptoms of psychiatric illness at ages 16 and 18 years. This information made it possible to assess the prevalence of disorder within the cohort using standardised (DSM-IV) diagnostic classification. DSM-IV is a method of classifying disorder that has been designed by the American Psychiatric Association. The common disorders of adolescence are:

Mood disorders: Major depression.
Anxiety disorders: Anxiety, panic, phobias.
Conduct disorders: Conduct disorder, antisocial personality disorder.
Substance use disorders: Alcohol/illicit drug abuse and dependence.

PREVALENCE OF DISORDER 16-18 YEARS

Diagnosis	Females	Males	Total
Mood disorder	30.2	13.7	22.1
0Anxiety disorder	22.3	11.7	17.1
Conduct disorder	1.7	7.9	4.8
Substance use disorder (abuse/dependence)	19.6	28.5	24.0
Any disorder	45.6	40.1	43.2

Overall there was a high rate of disorder with 43% of the cohort meeting criteria for disorder by age 18.

There are clear gender differences with females being more prone to mood and anxiety disorders, whereas males are more prone to conduct disorder and substance use disorders. Overall, males and females have very similar rates of disorders.

TREATMENT SEEKING

Although over 40% of the cohort met criteria for at least one disorder, the majority (77%) of those meeting criteria for disorder had not sought treatment.

Three reasons were commonly given for failure to seek treatment.

Did not need help - could handle problem by self	**91%**
Did not think to seek treatment	**81%**
Thought the problem would get better by itself	**60%**

CHARACTERISTICS OF THOSE SEEKING TREATMENT

Those seeking treatment tended to:

Report greater levels of impairment than those not seeking treatment.

Have multiple disorders.

Be more likely to have mood disorders.

Come from families of low socio-economic status.

SEXUAL ABUSE AND PSYCHIATRIC ADJUSTMENT

In the last decade there have been growing concerns about the prevalence of child sexual abuse (CSA) and the long term effects of CSA on later vulnerability to psychiatric disorder. As part of the CHDS, we have gathered:

Accounts of young people at age 18 of their exposure to CSA before 16.

Measures of psychiatric symptoms.

THE PREVALENCE OF CSA

At age 18, just over 10% of the CHDS cohort reported that they had been exposed to some form of CSA during childhood:

17% of females reported exposure to CSA compared to 3% of males.

There was a continuum of abusive experiences ranging from episodes of non contact abuse (eg indecent exposure) to incidents involving sexual penetration:

2.3% reported non contact abuse.

4.5% reported CSA that involved contact but did not involve sexual penetration.

3.5% reported CSA involving sexual penetration.

PERPETRATORS OF SEXUAL ABUSE

It is often believed that most cases of child abuse involve various forms of incest. In fact, this is not so. Most cases involve individuals who are not relatives but who are known to the family.

Relationship of Perpetrator to Child	% of Perpetrators
Natural parent	1.5
Step parent	5.3
Sibling	6.8
Other relative	9.8
Acquaintance	47.7
Stranger	28.8

RELATIONSHIP BETWEEN EXTENT OF CSA AND PSYCHIATRIC ADJUSTMENT AT AGE 16-18 YEARS

	Extent of CSA				
Outcome	None	Non Contact	Contact	Penetration	p
% Depression	17.1	39.5	35.5	48.6	<.001
% Anxiety	14.5	30.6	32.0	32.9	<.001
% Conduct disorder	3.9	3.9	14.7	26.0	<.001
% Alcohol abuse	17.9	28.1	39.2	35.7	<.01
% Substance abuse	10.6	8.2	17.0	39.0	<.001
% Suicide attempt	4.1	3.3	8.3	15.2	<.01

Those exposed to CSA involving intercourse have rates of disorder that were 2-6.6 times higher than those not exposed to CSA.

SUICIDAL BEHAVIOURS IN YOUNG PEOPLE: PREVALENCE AND RISK FACTORS

Prevalence of suicidal behaviours.

By age 21:

29% of the CHDS cohort had reported experiencing suicidal thoughts.

7.5% reported making a suicide attempt.

Two cohort members (both males) had died by suicide.

RISK FACTORS FOR SUICIDAL BEHAVIOURS

Risks of suicidal thoughts and suicide attempts were related to a series of factors that included:
Low socio-economic status.
Exposure to childhood and family adversity (family dysfunction, child abuse, parental adjustment problems).
Personality factors including neuroticism and novelty seeking.
Mental health problems (depression, substance use disorders, conduct disorders).
Exposure to adverse life events.

These factors acted accumulatively to influence the risk of suicidal behaviours.

PREVENTIVE IMPLICATIONS

Views of the causation and response to the issue of youth suicide have tended to polarise into two different models.

The Stress Model: This assumes that all young people are at risk of suicidal behaviours and that these behaviours are a response to the stresses and difficulties associated with adolescence.

The Mental Health Model: This model assumes that suicide almost exclusively occurs to young people with mental health problems.

PREVENTIVE IMPLICATIONS (Cont)

The results of the CHDS suggest that:

There is an element of truth in both these models.

While it is true that suicidal behaviours often follow exposure to stressful life events, frequently this only occurs for those with an existing mental disorder and other life difficulties.

Whilst the majority of those making suicide attempts will have a psychiatric problem when they make the attempt, by no means do all of those with such problems make suicide attempts.

These considerations suggest the need to develop a more general life course model of suicidal behaviour which takes into account the accumulative effects of: social background; family history; personality; mental health and life stresses.

PREVENTIVE IMPLICATIONS (Cont)

Likely interventive approaches include:

Family support and early intervention programmes to mitigate the effects of family and social disadvantages.

Early intervention programmes for children and young people with significant behavioural difficulties.

Improved mental health services to address the needs of young people with mental health problems.

Greater awareness amongst young people and families of mental health problems and the need to seek treatment for these problems.

THE DEVELOPMENT OF EARLY START

One “spin-off” from the CHDS has been the development of an intensive family support programme for at risk families. This programme developed from some initial research on multiple problem children. To conclude the talk, I would like to look at this research and describe the process by which research findings were translated into a community based early intervention programme.

Comparisons of rates (%) of problem behaviours in multiple problem and other teenagers

Measure	Multiple Problem Teenagers	Other Teenagers	p
Early sexual activity	100.0	5.9	<.00
Conduct/oppositional disorder	100.0	8.3	<.00
Police contact for offending	55.0	8.3	<.00
Cannabis use	88.9	7.5	<.00
Alcohol abuse	40.7	4.0	<.00
Substance abuse (other than alcohol)	55.6	3.1	<.00
Mood disorder	22.2	6.1	<.00
Suicidal ideation	29.6	6.9	<.00
Low self esteem (bottom decile of SEI score)	22.2	10.3	<.05

N = 27 N = 915

THE CHILDHOODS OF MULTIPLE PROBLEM ADOLESCENTS

Multiple problem teenagers tended to come from:

Socially disadvantaged homes characterised by limited parental education, low socio-economic status and depressed living standards.

Family environments characterised by parental conflict, marital violence and parental separation/divorce.

Family environments characterised by impaired child rearing practices, limited early educational opportunities and child abuse.

Family environments in which one or both parents had significant substance abuse problems or a history of criminal offending.

However, what distinguished the multiple problem group from other teenagers was not the presence of a single risk factor (such as poverty; family violence or child abuse) but rather exposure to an accumulation of risk factors spanning: social disadvantage; family dysfunction; impaired child rearing environment and parental maladjustment.

THE ACCUMULATIVE RISK MODEL

To examine the impact of multiple risk factors on risks of multiple problem behaviour, a simple point score method was used. This method assigned one point for each disadvantage factor recorded and the extent of disadvantage was given by the sum of the points for each individual. The Table below shows the relationship between the points score and rate of multiple problem behaviours.

Distribution of disadvantage score and rate (%) of multiple problem behaviours

Score	% of Sample	Number of Multiple Problem Teenagers	Rate (%) of Multiple Problem Behaviour
0-6	54.5	1	0.2
7-12	29.8	7	2.5
13-18	10.3	8	8.3
19+	5.4	11	21.6
TOTAL	100.0	27	2.9

THE BEGINNINGS OF EARLY START

The findings from the Christchurch Health and Development Study clearly highlight the importance of the nature and quality of childhood environments in determining risks of later adjustment difficulties.

In the early 1990's there was rising concern about a series of issues relating to the psycho-social wellbeing of children. These issues involved: child abuse and family violence; truancy; problem behaviour at school; juvenile crime; youth suicide. In all cases these outcomes are related to a similar pattern of home and childhood circumstances found for multiple problem teenagers.

HOME VISITATION

These issues were discussed at a meeting convened by the Mental Health Foundation in 1993. At that meeting, there was a broad consensus that one approach that merited consideration was the use of intensive family support provided by home visitation.

Effective programmes in this area are characterised by the following factors:

The programmes are targeted at high risk families.

Services are provided by home visitors who have a small (<20 families) client load.

The programmes are designed to address a wide range of social and family issues.

Programme duration is lengthy (> 2 years).

THE DEVELOPMENT OF THE EARLY START CONSORTIUM

As a result of local interest in the role of early intervention programmes in mitigating childhood disadvantage, a group of providers have gathered together in Christchurch to pilot test, develop and evaluate an approach to family support that has become known as Early Start. These providers include:

The Family Help Trust.

The Christchurch Health and Development Study.

The Southern Regional office of the Plunket Society.

The Pegasus GP group.

Maori representation.

THE DEVELOPMENT OF EARLY START

The first aim of this Consortium has been to conduct a pilot study of the feasibility of providing intensive home visitation to at risk families with the aims of assisting and empowering these families to address problems in the areas of: child health; childrearing and parenting; family functioning; family economic circumstances and related issues.

KEY FEATURES OF THE EARLY START SERVICES

Service provision is provided by trained family support workers who have qualifications in social work or nursing. Each family support worker has a client case load of approximately 15 families. All families are visited regularly (at least once per week) and the programme aims to provide family support and assistance in the areas of:

Child health.

Maternal wellbeing.

Parenting skills.

Family economic functioning.

Crisis management.

CLIENT REFERRAL

Clients enter Early Start on the basis of referrals from Plunket Nurses who have been trained in the application of a simple 11 item screening inventory.

Before referring families to Early Start, Plunket Nurses seek the mother's signed consent for this referral.

Following client referral, Early Start workers contact the family and enrol the family into the programme for a one month probationary period.

At the end of the probationary period, an assessment is made of the family's needs and families with high levels of need are enrolled into the programme.

CLIENT PROFILES

The 55 families referred to Early Start were characterised by:

Socio-economic disadvantage: single parenthood; limited parental education; low income.

High rates of adversity in the childhoods of mothers: family conflict; parental substance use; child abuse; child neglect; poverty.

High rates of parental adjustment problems including: crime; substance abuse, and mental health problems.

High rates of relationship problems and unsatisfactory relationships.

OUTCOMES OF PILOT STUDY

Study of this group of families over a period of 18 months in the service suggests two generalisations about the impact of the Early Start programme on client families:

The programme was highly successful in encouraging “new learning” in the areas of child health care and parenting.

It was far less successful in providing change in well established behaviours and habits such as substance abuse.

SUCCESSFUL OUTCOMES

CHILD HEALTH

	TIME IN PROGRAMME		
Measure	6 months	12 months	18 months
% Up to date with immunisation	100	97.7	100.0
% Up to date with well child checks	100	95.5	97.2

CHILD ABUSE/NEGLECT CONCERNS

	Time in Programme		
Measure	6 months	12 months	18 months
% for whom concern existed about possible abuse/neglect	45.8	38.6	27.7
No. of families notified to Children and Young Persons Service because of concern about abuse/neglect	3	4	0
No. of children admitted to hospital because of abuse/neglect	2	0	0

MATERNAL DEPRESSION

One area in which spectacular success was achieved was in the management of maternal depression. It was apparent at the beginning of the pilot programme that a large number of mothers had clear symptoms of depression. In response to these concerns, family support workers were taught to use a simple screening questionnaire to identify depression and to encourage mothers with depression to seek help from the family doctor. The result of this approach was to produce a very large decrease in the rate of depression in the client group.

	TIME IN PROGRAMME		
	6 months	12 months	18 months
% Depressed	73%	30%	6%

MAJOR CONCLUSIONS FROM PILOT STUDY

Client identification methods produced an acceptable level (79%) of programme participation.

It was possible to deliver a programme of family support to at risk families.

There were clear programme benefits in areas involving "new learning" including: child health care; parenting; the management of maternal depression.

The programme was less successful in addressing such issues as parental substance use, family conflict, and depressed family living standards.

The great majority (over 90%) of programme participants felt the programme was worthwhile, helpful and culturally appropriate.

FURTHER EVALUATION

Given the general success of the pilot study, the Early Start Consortium is currently conducting a randomised field trial. The overall design of the trial is:

A series of 220 families receiving the Early Start programme will be compared with a control series of 220 families not receiving the programme.

Both series will be assessed at baseline, 6 months, 12 months, 24 months and 36 months programme participation on a series of measures of: child health; child development; parenting; parental functioning; family functioning and family economic circumstances. These assessments will make it possible to ascertain the extent to which the Early Start programme has benefits for client children and their families.

PROGRESS TO DATE ON RANDOMISED TRIAL

Funding for both the service provision and research evaluation components of the trial has been obtained. The HRC has provided initial funding for the research evaluation, whereas funding for service provision for a period of 4 years has been provided by the Health Funding Authority (HFA) and the Community Funding Agency (CFA).

The trial has been ethically reviewed and approved by: a) the Canterbury Ethics Committee and; b) the Plunket Ethics Committee.

The field trial organisation has been set up.

PROGRESS TO DATE ON RANDOMISED TRIAL (Cont)

347 families have been recruited into the trial.

It is anticipated that the trial recruitment will be completed in June 2001.

FACTORS CONTRIBUTING TO PROGRAMME SUCCESS

Active researcher involvement in the planning of Early Start.

The formation of strategic linkages with key community groups and providers.

Political interest and involvement in programme.

Timing.

BARRIERS TO SERVICE DEVELOPMENT

Limitations on the time of researchers and community groups to develop the programme.

Resistance to the programme because of inter-agency concerns about the ownership of funding.

Overstated concerns about ethical issues and the stigmatising effects of family support programmes.

Difficulties in recruiting staff experienced in programme development

CHRISTCHURCH HEALTH & DEVELOPMENT STUDY

Department of Psychological Medicine
Christchurch School of Medicine

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