



**GROWING UP IN AUSTRALIA -
THE LONGITUDINAL STUDY
OF AUSTRALIAN CHILDREN**

**Proposed Study Design
and Wave 1 Data Collection**

Discussion Paper No. 2

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June 2003



Australian Institute of Family Studies

Foreword

This Discussion Paper represents the second formal publication for *Growing Up in Australia* - the Longitudinal Study of Australian Children (LSAC). *Growing Up in Australia* is a major study funded by the Commonwealth Department of Family and Community Services as part of the Commonwealth Government's Stronger Families and Communities Strategy. The Australian Institute of Family Studies is leading a consortium of nine eminent Australian research institutions in the development of this study, which will track the development of two cohorts of young children for at least 7 years.

Growing Up in Australia is one of the largest and most complex studies of this nature that has ever been undertaken in Australia. The study aims to provide the database for a comprehensive understanding of Australian children's development in the current social, economic and cultural environment, and hence to become a major element of the evidence base for policy and practice regarding children and their families. *Growing Up in Australia* is now also part of the Government's move towards the development of a national agenda for early childhood.

The first discussion paper 'Introducing the Longitudinal Study of Australian Children' provided an overview of the study, incorporating descriptions of the rationale for the study, relevance for policy development, the conceptual framework, broad and specific research questions, and an overview of the study design. Most of the paper was taken up with a discussion of current thinking about how the research questions will be addressed, and what data are to be collected. Copies of this paper can be downloaded from the website at www.aifs.gov.au/growingup or are available from the Institute.

This second discussion paper outlines progress on *Growing Up in Australia* since the release of the first discussion paper. This paper concentrates on providing more detail on the proposed sample design and data collection for the first wave of the study, including information on the development and testing process to date. The development and testing program will continue throughout 2003, with the first main wave of data collection due to commence in early 2004. It is expected that data from this first wave will be publicly released in early 2005.

The Institute continues to appreciate and acknowledge the support of the Department of Family and Community Services and its LSAC Steering Committee, and the support of the LSAC Scientific and Policy Advisory Group. It is also grateful for the cooperation of the Health Insurance Commission in the development of this landmark study.

This study will also rely on the cooperation and involvement of thousands of families across Australia. Already, we have received significant cooperation from many families who have helped us with our testing program, and we are extremely encouraged by the level of enthusiasm in the Australian community for this study. *Growing Up in Australia* is certainly shaping up to be a study that will benefit both present and future generations of Australians.

Ann Sanson
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Dr David Lawrence who is Senior Statistician in the Centre for Developmental Health at Curtin University of Technology. David previously worked as a Survey Methodologist at the Australian Bureau of Statistics, and is currently involved in the Western Australian Aboriginal Child Health Survey.

Acknowledgements

Initial work on the study design was undertaken by members of the *Growing Up in Australia* Consortium Advisory Group. Further development on the design has been undertaken by the principal authors, in partnership with the Consortium and with particular contributions from the Sampling Design Team. The authors would like to thank Jan Nicholson for her useful feedback and contributions to earlier drafts of this report.

Considerable input and advice has been received from staff in the Department of Family and Community Services; our thanks to Karen Wilson, Diana McNeill, Paula Chevalier and Fiona Skelton. There has also been input from staff in the Health Insurance Commission and the Australian Bureau of Statistics.

Material has been used from the Longitudinal Study of Australian Children Proposal submitted by the Consortium to the Department of Family and Community Services, which included significant work undertaken by Jim Millwood, Consultant to the Consortium.

Summary

The *Growing Up in Australia* study is funded by the Department of Family and Community Services as part of the Commonwealth Government's *Stronger Families and Communities Strategy*, and is being developed as Australia's first national longitudinal study of children. This paper outlines the progress with the development of the study since the release of the first discussion paper 'Introducing the Longitudinal Study of Australian Children' in June 2002.

This paper details the proposed sample design and wave 1 data collection strategies and content for the study. It includes information on the sampling frame, the sample selection process, expected response rates, instrument content, data collection procedures and the development and testing program. Some rationale for the proposed sample design is included in this paper; more detailed explanation of all aspects of the design will be provided in a separately available methodology paper.

A two age cohort cross-sequential design has been adopted, with one cohort of 5,000 infants (aged under 12 months), and the other of 5,000 children aged 4 years. With facilitation by the Department of Family and Community Services, the Health Insurance Commission has agreed that the sample can be selected from the Medicare database, the most comprehensive database of Australia's population.

Every effort is being made to ensure that the sample chosen is as representative as possible of Australia's children and strategies are in place to maximise response rates and minimise sample loss. A clustered design, based on postcodes, has been chosen as it allows community level effects to be measured and analysed, and also allows for reasonably cost effective face-to-face interviewing.

The main data collection will be via face-to-face interview with a parent at the child's home, with self-complete modules for both parents either filled in during the interview or returned later. The interviewer will also undertake physical and other assessments of the child. Where applicable, and if the parent agrees, questionnaires will be mailed out or administered by telephone to a non-resident parent and a carer or teacher who looks after the child for at least 8 hours per week.

Development of the instruments began in early 2002 and testing and refinement of all aspects of the methodology will continue during 2003, with the Dress Rehearsal scheduled for August-October 2003. The first main wave of data collection will commence in March 2004 and continue into the second half of the year, with data due for release in April 2005.

Introduction

Growing Up in Australia - the Longitudinal Study of Australian Children (LSAC), is a broad, multi-disciplinary study that is being developed to examine the impact of Australia's unique social, economic and cultural environment on the next generation, particularly in regard to issues of policy relevance. The study is being funded by the Department of Family and Community Services as part of the Commonwealth Government's *Stronger Families and Communities Strategy*.

Growing Up in Australia will identify the developmental pathways that Australian children follow and the factors (both risk and resilience) that predict the course of these pathways. It is therefore important that the sample of children selected for the study is as representative as possible of Australian children, so that the results can be generalised to all Australian children. Some details of the design have yet to be finalised, and in these areas the paper presents a discussion of the design issues under consideration.

Some of the rationale for the proposed sample design is included in this paper; more detailed explanation of all aspects of the design will be provided in a separately available methodology paper that is under development and will be available on the study's website (<http://www.aifs.gov.au/growingup/>).

Reference population

The essential focus of the study design is on the early years of children's lives, and therefore defines 'the child' as the sampling unit of interest. It is intended that the sample will be representative of all Australian children (citizens, permanent residents and applicants for permanent residency) in each of two selected age cohorts, allowing assessment of developmental outcomes from infancy until middle childhood. By following two cohorts whose ages will overlap as the study progresses, the design is cross-sequential in nature. Cross-sequential designs have a number of advantages over simple single-cohort designs (see LSAC Discussion Paper No. 1, 'Introducing the Longitudinal Study of Australian Children').

The two selected age cohorts are infants (children aged under 12 months) and 4 year olds. Within each cohort, the reference population includes children born during a 12-month period.

There are about 250,000 Australian children in any single year age group. It is intended that about 2 per cent of these children (about 5,000) will be included in the main study. Children will be selected so that, at the time of interviewing, most of them will be aged between 6 and 12 months for Cohort 1, and between 4 years 6 months and 5 years for Cohort 2. These children will be followed at least every two years for six years.

Most of the information about the child will be obtained from the child's primary caregiver, defined as the person who knows the child best. This will generally be the child's biological mother, but may be the father or another guardian. Information will also be sought from this person's partner (usually the biological father), if living in the



same house as the child, and from any non-residential parent, if consent is obtained to contact this person. In addition, information will be sought from a non-parental carer or teacher, if permission to contact this person is received.

Sample composition

The sample design requirements specified by the Department of Family and Community Services were that:

- The minimum sample size of each cohort at the first data collection point should be one per cent of the population in each selected age cohort (about 2,500 children);
- The sample should be representative of all Australian children in each of the selected age cohorts, that is, proportional to the regional distribution of the Australian population;
- Study informants should include the child (when of an appropriate age) and their parents; and
- Oversampling of sub-populations is not required.

There has been extensive discussion with stakeholders about the optimal composition of the sample. There have been suggestions that *Growing Up in Australia* should be over-sampled for children with particular characteristics (for example, children from indigenous or culturally diverse families or children with disabilities of various sorts) as these are groups of particular interest for policy development. However, a major strength of a study like *Growing Up in Australia* is the large and nationally representative nature of its sample.

In addition, oversampling for small subgroups of the population tends to give only limited improvement in the statistical precision of the data unless there is a significant increase in the numbers sampled in such subgroups, and this can have a major impact on the statistical and economic efficiency of the whole study.

It has therefore been concluded that more intensive studies of subgroups are better conducted as separate studies, perhaps nested within or linked to *Growing Up in Australia*.

Consideration was also given to ensuring a minimum sample size in each state and territory (for example, 1000 children per cohort for each state and territory). However, this would add significantly to the costs of the study since it would involve a large increase in the sample size. An alternative is to increase the sample in the smaller states through the transfer of sample from the larger states. However, this would result in a less efficient sample at the Australian level, without a significant improvement in the accuracy of state level estimates. It has therefore been concluded that funds would be best spent on ensuring high quality comprehensive information from a nationally representative sample.

Table 1 shows the Australian Bureau of Statistics June 2001 Estimated Resident Population estimates and the corresponding distribution of the sample when based on these estimates.

Table 1 ABS population estimates, June 2001 and corresponding regional distribution for each cohort

Population estimates, 30 June 2001						
State/ territory	Children aged under 1 year			Children aged 4 years		
	Capital city	Rest of state	Total	Capital city	Rest of state	Total
New South Wales	55,465	31,789	87,254	54,936	33,849	88,785
Victoria	43,518	16,519	60,037	44,755	18,739	63,494
Queensland	22,370	26,998	49,368	22,502	28,035	50,537
South Australia	12,584	5,060	17,644	13,192	5,619	18,811
Western Australia	17,237	7,555	24,792	17,920	7,834	25,754
Tasmania	2,597	3,583	6,180	2,485	3,841	6,326
Northern Territory	1,805	1,865	3,670	1,592	1,797	3,389
Australian Capital Territory	4,038	2	4,040	4,273	4	4,277
Australia	159,614	93,371	252,985	161,655	99,718	261,373
Corresponding distribution of sample						
State/ territory	Children aged under 1 year			Children aged 4 years		
	Capital city	Rest of state	Total	Capital city	Rest of state	Total
New South Wales	1,096	629	1,725	1,051	648	1,699
Victoria	860	327	1,187	856	359	1,215
Queensland	442	534	976	431	537	967
South Australia	249	100	349	253	108	360
Western Australia	341	150	490	343	150	493
Tasmania	52	71	122	48	74	121
Northern Territory	36	37	73	31	35	65
Australian Capital Territory	80	0	80	82	0	82
Australia	3,155	1,846	5,000	3,093	1,908	5,000

Timing

The development phase for *Growing Up in Australia* is continuing through 2003 with a pilot test recently conducted in March - April and the Dress Rehearsal scheduled for August-October. The main wave of data collection will commence in March 2004, with fieldwork due to finish in August 2004 and all follow-up completed by September 2004. Data are due to be publicly released in April 2005. Subsequent main waves will be conducted in 2006, 2008 and 2010, with a between-wave mail back collection occurring in 2005.



Sampling frame

Background

The central issue faced with any sampling process is that of the sampling frame. Conceptually, this frame is a listing of all the members of the population being sampled, but no such perfect list actually exists.

Locating the *Growing Up in Australia* target populations of children aged less than 12 months and children aged 4 years is not a straightforward task. These populations are relatively rare in the Australian population – they each make up just over one per cent of the total Australian population. Based on recent Australian Bureau of Statistics Census of Population and Housing figures¹, about one in 15 Australian households at any one time has a child aged under 12 months or aged four years.

Locating rare populations can be more (cost) efficient using administrative sources, as opposed to locating the sample through methods such as area sampling or telephoning households (even though the efficiency of these other methods can be increased through over-sampling from areas with likely higher concentrations of the target population). However, administrative sources also have limitations, principally with the extent of coverage of the target population and the currency of information.

A number of possibilities for the sampling frame were considered in earlier stages of the development of this study. These included using reverse telephone directory CD-ROM or random digit dialling to help locate in-scope families, or making use of Birth Registry or Family Tax Benefits recipient listings. The latter options were not investigated in any detail because these listings could not be used as the source for the study sample due to legislative requirements. In addition, all of the methods investigated had other significant problems and/or costs associated with them.

With facilitation by the Department of Family and Community Services, it is now intended to extract the sampling frame from the Medicare enrolment and activity databases held by the Health Insurance Commission. Medicare records contain data on date of birth and hence provide a direct way of locating the required target population. Medicare enrolments appear to be the only administrative source that can supply reasonably current information on both cohorts for *Growing Up in Australia*. Details of the advantages and limitations of the Medicare enrolment database are discussed in the next section.

The Health Insurance Commission and Medicare are well regarded by the Australian community and an ‘invitation to participate’ letter sent by the Health Insurance Commission is therefore likely to be well received by selected families. The Health Insurance Commission, the Department of Family and Community Services and the Institute are all very mindful, however, of privacy issues related to the selection of the

¹ There were about 7 million households in Australia and about 450,000 of these had children aged under 12 months or 4 years - Australian Bureau of Statistics 2002, Census of Population and Housing: Selected Social and Housing Characteristics, Australia (catalogue no. 2015.0) plus unpublished Census data.



sample in this way, and every effort will be made to respect people's privacy and give them the opportunity to 'opt-out' of the study before any contact information is released from the Health Insurance Commission to the Institute.

Medicare enrolment frame

The major advantage of the Medicare enrolment database over any other available sampling frame is that both cohorts of children can be directly identified from this source, through use of the date of birth field on the database. This is a cost efficient search method for finding the *Growing Up in Australia* target population and it means that selected families can be contacted using a personal pre-approach letter, rather than cold-calling. The use of such a letter is expected to have a positive effect on the response rates. It is also likely that the information for most children will be reasonably current (as opposed to Births Registry information, for example, which may be quite out-of-date for 4 year olds). However there will be some under-coverage of recently born children as there can be a delay in parents registering new-born children with Medicare.

In addition, use can be made of the fact that the Medicare database contains age and sex information for all people listed on a Medicare card. This information can be used by staff from the Health Insurance Commission to provide some level of non-response analysis.

Scope

Theoretically, Medicare includes all Australian residents. In practice, it can exclude some Australian residents who have access to alternative health services such as some defence force personnel, prisoners, and persons eligible for Department of Veteran's Affairs' Health Services. This should not affect the *Growing Up in Australia* target population, as any dependent children of these persons still need to be enrolled for Medicare.

Conversely, Medicare's population base is expected to exceed the ideal population base (i.e. all Australian residents) with regard to international visitors and Australian residents who have died or are now permanently resident overseas but have not yet been removed from the database.

Non-permanent residents who have access to Medicare (such as some temporary residents, and people from countries with Reciprocal Health Arrangements) can be excluded from the sample through the specification of the required enrolment type. Children with an end-date (indicating that the child has either died or been cancelled from that enrolment for some other reason) are also able to be excluded. However, if a death or movement overseas has not been registered with Medicare, then these children will still be included in the sampling frame.

Coverage

The Health Insurance Commission believes that coverage of children by the Medicare register, especially the recently born and toddlers, has been enhanced by the introduction of the Australian Childhood Immunisation Register – a subset of the

Medicare enrolment file that contains information on children aged 7 years and under. Information from the last evaluation report of the Australian Childhood Immunisation Register (Hull et al 2002, p5) indicates that approximately 98 per cent of children are enrolled with Medicare by 12 months of age.

Coverage for 4 year old children appears to be very good when compared with the Australian Bureau of Statistics estimated resident population figures. However, coverage for children aged less than 12 months is incomplete due to the above-mentioned lag in registering babies with Medicare.² Information from the Australian Childhood Immunisation Register indicates that once missing data are excluded, about 80 per cent of children are registered on Medicare by 2 months, just over 90 per cent by 4 months and almost all by 6 months (Hull et al 2001, p46).

Currency of address information

It is expected that address information for families with young children should be reasonably current, especially for those with babies who have recently been registered with Medicare. The Women's Health Australia project, which involved a mail-out survey from the Medicare database in 1996, found that about 6.1 per cent of addresses were out of date for women aged 18-23 years, 3.8 per cent for those aged 45-50 years and 2.8 per cent for those aged 70-75 (email correspondence from Women's Health Australia staff).

The Health Insurance Commission is likely to be notified of a change of address through cardholder contact with a Medicare Branch with regard to patient claims, replacement for a lost, stolen or expired card or through its card replacement program every seven years. However, there is no opportunity for address details to be checked when claims for medical services are bulkbilled. In 1999-2000, 73 per cent of claims were bulkbilled, so the flow through of change of address information to the Health Insurance Commission via patient claims does not occur across the board. In recent times it is thought there has been a reduction in bulkbilling (Hanna, 2002) and current facilities now give Medicare cardholders the ability to update their address across a range of government services and make it easier for people to lodge address changes over the telephone or the internet.

Exclusions

Activity indicator

Only children who have had Medicare activity in a set period (the previous 12 months for children aged 4 years, and the previous 6 months for the infants) will be included in the sample. Medicare activity means that either a claim has been made with Medicare or an immunisation has been recorded on the Australian Childhood Immunisation Register. The exclusion of those without such activity is due to concerns about causing

² Correspondence with the Australian Bureau of Statistics indicated that at December 2001, the number of Medicare enrolments of children aged 4 years was 101.5 per cent of the Australian Bureau of Statistics estimated resident population figures, and the proportion for children aged under 12 months was 88.5 per cent.

distress to a grieving family of a child who has died or privacy issues related to change of parental care.

Statistical information from the Health Insurance Commission shows that about 10 per cent of children aged 4 years have not had Medicare activity in a 12 month period. About 2 per cent of children aged 4 – 12 months have not had Medicare activity in the previous 6 months, but over 50 per cent of children registered with Medicare and aged under 4 months have not had Medicare activity since birth (see Appendix A).

Confidentiality requirement

The Health Insurance Commission has a confidentiality requirement that statistical information is not provided if the number of children in a postcode is less than 6, for any statistical extract. About 1-2 per cent of children in each cohort are in postcodes that have less than 6 of the target population. Although various options for including these children are being investigated (e.g. combining adjacent postcodes), it is possible that children in postcodes that have less than 6 target children in either cohort will be excluded from the sample selection.

Remote locations

A number of children in remote locations will be excluded because they do not meet the activity requirement or (potentially) because they are in postcodes that have very few children. When these conditions do not apply, wherever possible children in remote locations will be included in the scope of the study. However, there may be some very remote locations where the benefits of obtaining data are not sufficient to justify the expense of data collection. Postcodes in very remote areas with sufficient 'active' target population will be examined on an individual basis to determine whether it is cost-effective to include them in the sample selection process.

Other issues

Children on multiple Medicare enrolments

Unpublished Medicare data provided to the Institute show that no child under 6 years of age is on more than two enrolments. About 2 per cent of children under 12 months and 8 per cent of children aged 4 years are on two enrolments. Children on two enrolments will only be given one chance of selection, based on the card which has had the most recent activity.

This selection rule has been adopted after undertaking considerable work to determine the optimal process for deciding which card to associate the child with, to maximise the probability that this cardholder is the child's primary caregiver. This selection rule also has the advantage of being straightforward for the Health Insurance Commission to apply.

Children in foster care

A very small proportion of children aged 0 – 6 years are in non-parental care. There is no easy way to identify children who are in foster care, or looked after by other carers, from Medicare enrolments. Some analysis is currently being undertaken on this issue.

Informal information from people involved with foster care suggests that few foster families add the fostered child to their enrolment – that is, they continue to use the child’s original Medicare number. Whether a child is added to a carer’s card is likely to be related to how permanent the care arrangement is. It is therefore likely that most children being fostered will be selected at a biological parent’s address, and this situation will have to be catered for in the survey processes. Wherever possible, attempts will be made to contact and interview the person who knows the child best. If the person caring for the child changes during the course of this study, then the intention is to try to locate and then interview the person who knows the child best at that point in time.

Post Office boxes as address information

About 5 per cent of *Growing Up in Australia* target children with Medicare/Australian Childhood Immunisation Register activity are likely to have a post office box as the contact address (based on unpublished data provided by the Health Insurance Commission). The proportion of families who use post office box numbers is particularly high in the Northern Territory (about 30 per cent). For these families to be interviewed, a residential address needs to be obtained.

A tailored pre-approach letter will be sent by the Health Insurance Commission to families in this situation, asking them to contact a 1800 number or return a reply-paid form with the child’s residential address details. Where families do not make contact, the data collection agency will try to locate the family using a wash against the White Pages. If a telephone number can be found, the agency will ascertain correct address details and send another tailored letter. If contact is still not made, interviewers will be asked to use reasonable means to try to make personal contact with the family. These strategies are being tested in the Dress Rehearsal.

Process for initial contact with in-scope families

The Health Insurance Commission will select children of the appropriate ages, based on specifications provided by the Institute.

The Health Insurance Commission will then mail-out an ‘invitation to participate’ letter, along with a brochure on *Growing Up in Australia*, to the Medicare cardholder. If families do not wish to be involved with the study, they can either ring a 1800 ‘opt-out’ telephone line staffed by the Health Insurance Commission or return a reply-paid form to the Commission.

Families will have four weeks to register their withdrawal from the study. At the end of this period, cardholder name and address details for families who have not contacted the Health Insurance Commission to withdraw from the study will be given to the Institute. This list will also exclude any families for whom the initial letter was returned to the Health Insurance Commission, due to a change of address or other reasons; possibilities for locating a current address in such circumstances have been explored, but none appear viable in the existing timeframe.

The Institute will then pass these contact details to the data collection agency for formation into field workloads. The data collection agency will send a letter to everyone on the list, indicating when an interviewer will be in their area and providing a 1800 number for queries. Families will have a further chance to decline to take part



in the study once the interviewer makes contact (or at any subsequent stage). Strict privacy protocols will be observed.

Sample design

Primary sampling units: postcodes

A clustered (by area) sample design is desirable for two reasons: it provides the opportunity to gather multiple observations within a community, increasing the capacity of the study to analyse community level effects; and it offers the opportunity to cost-effectively conduct face-to-face interviews.

The geographic indicator available through Medicare is postcode. This has some challenges for sample design purposes when interviewing is to be conducted face-to-face at the child's home. A postcode can cover a wide geographic area and one postcode can include urban, rural and remote areas. The possibility of coding the 500,000 addresses of the target population to Census Collector Districts was investigated but is not an operationally feasible option. Automated coding programs will at best code up to 80 per cent of records, meaning that about 100,000 records would have to be manually coded. Post office box addresses could not be coded. This process would need to be undertaken by the Health Insurance Commission (due to privacy requirements) and is not possible in the time frame. It would also be a very expensive exercise. Despite their limitations, postcodes do offer a degree of clustering that would not have been available through some telephone contact methods.

Design effect

The potential sample design effect associated with the proposed *Growing Up in Australia* study design is the loss in statistical precision that would result from a clustered sample not covering fully the diversity evident throughout the entire population in regard to specific issues measured by the study. The extent of such loss in statistical precision depends largely upon whether the issues that are the focus of the study are likely to have underlying geographic variations.

The potential design effect on the precision of estimates derived from a clustered sample is essentially related to the heterogeneity of the stratum population. If the members of a cluster are effectively no more like each other than they are to others within the stratum population, then the intra-cluster correlation is zero and there is no design effect. However, where regional clusters result in cluster members being more like each other and less like other members of the stratum population, then even where the intra-cluster correlation is quite small, there will be a design effect, the size of which is then dependent upon cluster size.

The design effect will also be influenced by the accuracy of the sampling frame and the differing response rates of different groups in the population. Separate design effects will be calculated for selected variables collected in *Growing Up in Australia* once the Dress Rehearsal data are available, and will be recalculated with the Wave 1 data.

Accuracy of estimates

It is expected that the standard errors for survey estimates will be no more than those approximated in the table below (assumed design effect is 1.5). More exact calculation of errors is not feasible until data have been collected and analysed.

Table 2 95 per cent confidence limits ^(a) for survey estimates of proportions

Sample size	Survey estimate of proportion									
	5%	10%	20%	30%	40%	50%	60%	70%	80%	90%
5000	0.7%	1.0%	1.4%	1.6%	1.7%	1.7%	1.7%	1.6%	1.4%	1.0%
4000	0.8%	1.1%	1.5%	1.7%	1.9%	1.9%	1.9%	1.7%	1.5%	1.1%
3000	1.0%	1.3%	1.8%	2.0%	2.1%	2.2%	2.1%	2.0%	1.8%	1.3%
2500	1.0%	1.4%	1.9%	2.2%	2.4%	2.4%	2.4%	2.2%	1.9%	1.4%
1500	1.4%	1.9%	2.5%	2.8%	3.0%	3.1%	3.0%	2.8%	2.5%	1.9%
1000	1.7%	2.3%	3.0%	3.5%	3.7%	3.8%	3.7%	3.5%	3.0%	2.3%
500	2.3%	3.2%	4.3%	4.9%	5.3%	5.4%	5.3%	4.9%	4.3%	3.2%
250	3.3%	4.6%	6.1%	7.0%	7.4%	7.6%	7.4%	7.0%	6.1%	4.6%
100	5.2%	7.2%	9.6%	11.0%	11.8%	12.0%	11.8%	11.0%	9.6%	7.2%
50	7.4%	10.2%	13.6%	15.6%	16.6%	17.0%	16.6%	15.6%	13.6%	10.2%

(a) For example, for a (sub) sample size of 1000 and a variable that is estimated to be present in 50 per cent of the population, there is a 95 per cent chance that the true value is 50 per cent plus or minus 3.8 per cent - i.e. the true value is in the range 46.2-53.8 per cent.

It should be noted that analysis of the relative precision of estimates derived from clustered and unclustered sample designs focuses only on sample error and fails to adequately account for the more substantial reduction in 'non-sample' error provided by a clustered sample design. This reduction in non-sample error results from several factors, including:

- more valid measurement of specific issues that result from the more detailed and accurate information collected through face-to-face interviewing; and
- more reliable measurement of such issues through more efficient sample management, and consequent control against non-response bias resulting from sample loss through non-contacts, and ensuring greater sample retention over time.

For this study, a clustered sample design offers a further advantage in providing for multiple observations within a community, increasing the capacity of the study to analyse community-level effects. The study design proposed will result in there being sufficient children from a community to use community-level indicators in analysis (for example, various indices can be developed at the community level that can be used in analysis), and for comparisons to be made between children within the one community (for example, do parents within that community share similar or different views of that community).

Stratification

Postcodes will be stratified by state/ territory and by capital city statistical division/rest of state. Postcodes will be allocated to a stratum using the Australian Bureau of Statistics postal area to statistical local area concordance (or a postcode concordance if it is available). Postcodes will also be split into 2 (or more) strata based on size (see next section).

Postcode selection

The sample design will involve a first stage random selection of a number of postcodes within each stratum, then a random selection of a number of in-scope children within each selected postcode.

There are over 3000 postcodes in Australia, but about 600 of these are not likely to have any children from the reference population, based on unpublished Health Insurance Commission data. The distribution of the target populations across postcodes varies widely and many postcodes have small numbers of target children.

Table 3 Distribution of postcodes with at least 1 target child (an infant or 4 year old) from a 12 month cohort – Health Insurance Commission unpublished data

State	Size ^(a)				Total
	1	2	3	4	
New South Wales	162	71	72	371	676
Victoria	269	93	74	269	705
Queensland	111	53	55	214	433
South Australia	144	43	26	120	333
Western Australia	225	56	31	106	418
Tasmania	48	15	20	32	115
Northern Territory	6	8	4	20	38
Australian Capital Territory	5	6	0	19	30
Australia	970	345	282	1151	2748

(a) Where:

- Size 1 has 0-9 active infants or active 4 year olds
- Size 2 has 10-19 active children in each cohort
- Size 3 has 20-39 active children in each cohort
- Size 4 has 40+ active children in each cohort

It is intended that postcodes (within regional strata) will be selected on a probability proportional to size basis using systematic selection, and then a fixed number (cluster) of children selected within the postcode, also using systematic selection. The size variable to be used will be the sum of the number of reference children in each cohort in the postcode at a given point in time. Postcodes will be ordered by one of the Australian Bureau of Statistics' Socio-Economic Indices for Areas (within strata).



A different approach will be needed for postcodes that have less target children than the cluster size. Various options are being considered (such as combining contiguous postcodes, or selecting postcodes with equal probability then including all children in the selected postcodes) and will be examined in detail in the methodology paper.

For postcodes with a very large number of the reference population, where selecting a fixed cluster size would mean that children in that postcode would have a lower chance of selection than other children in the same stratum, a process will be applied to ensure that all children will have the same chance of selection.

As indicated earlier, the number of children to be selected within each stratum will be based on Australian Bureau of Statistics' population estimates of the distribution of infants and children aged 4 years in each stratum, rather than the number of children on the Medicare frame.

Cluster size

It is important that an appropriate balance is found between the number of postcodes included in the study, and the number of children selected within a postcode (cluster size). Sufficient postcodes need to be chosen across Australia to help ensure the representativeness of the sample and to help minimise sampling error, but there need to be sufficient children selected within each postcode for operational efficiency and to allow for analysis of community level effects.

Having considered the approach taken in other studies, and weighing up the statistical, analytical and operation implications of different cluster sizes, it has been concluded that a (final) cluster size of around 20 children per cohort per postcode is reasonable. This means that about 1 in 10 postcodes that have children from the reference population will be included in the study.

A possible distribution of postcodes is shown in the following table. This has been calculated assuming that probability proportional to size selection and fixed cluster sizes are used.

Table 4 Expected distribution of postcodes in main study

State/region	Capital city	Rest of state	Total
New South Wales	56	37	93
Victoria	45	22	67
Queensland	23	30	53
South Australia	13	7	20
Western Australia	18	11	29
Tasmania	3	4	7
Northern Territory	2	3	5
Australian Capital Territory	4	0	4
Australia	164	114	278

Children in the sample

Age range of children in the sample

Ideally children who are born in all months of the year should be included in the sample. If the range of birth dates is restricted to less than a year, this will limit the representativeness of the sample and limit assessment of possible seasonal effects on children's development. For example, when a child is born may influence the child's susceptibility to certain health conditions (such as eczema or asthma), and the age that a child starts school (associated with their month of birth) may be an important variable for examining a child's adjustment to school.

It is also desirable to restrict the age range of children at interview, to allow for the use of more age-targeted measures, and to try to ensure that the majority of infants are aged at least 6 months at the time of interview.

Added to the above requirements is the need to ensure that the selected sample can be distributed into sensible workloads for interviewers. Further data collection needs to be completed in a relatively short period of time in order to be able to release the data by April 2005.

In order to ensure that all birth months are represented in the sample, that the children are about the required age at the time of interview, and that sensible workloads can be created, a staged selection process is needed.

The proposed solution involves selecting the sample in two stages, as shown in Table 5 below. Note that due to the lead time required for the mail-out/opt-out process and workload formation, the selection of children has to occur about three months prior to the start of fieldwork.

This solution requires the Health Insurance Commission to undertake the sample selection and mail-out process twice. In terms of the demands on the Health Insurance Commission, and the need to staff the 'opt-out' telephone line, more than 2 selection phases is not desirable.

Given all the requirements noted above, the following appears to be the only solution possible that meets the requirements of:

- All birth months included;
- The 4 year old cohort being exactly 4 years older than the infant cohort, to facilitate inter-cohort comparisons over time;
- As many infants as possible in the 6-12 month age range at time of interview;
- Only 2 selection processes from Medicare.

The first stage will involve children born in March to August 2003 (infants) and March to August 1999 (4 year olds). This sample will be selected in December 2003, invitation letters sent at the end of January 2004, with data collection commencing during March and April 2004. Follow-up will occur during May.

The second stage sample will be selected in late March, for children born in September 2003 to February 2004 (infants) and September 1999 to February 2000 (4 year olds).



Letters will be mailed out after Easter (9-12 April 2004), with data collection occurring during June and July 2004. Follow-up will occur during August. Wherever possible, schools holidays will be avoided for the main data collection periods.

Table 5 Age (years and months) child turns during month of data collection

		Infants					Four year olds				
Birth month	Month of data collection: 2004										
	March	April	May	June	July	March	April	May	June	July	
March	12m	13m				5y 0m	5y 1m				
April	11m	12m				4y 11m	5y				
May	10m	11m				4y 10m	4y 11m				
June	9m	10m				4y 9m	4y 10m				
July	8m	9m				4y 8m	4y 9m				
August	7m	8m				4y 7m	4y 8m				
September				9m	10m				4y 9m	4y 10m	
October				8m	9m				4y 8m	4y 9m	
November				7m	8m				4y 7m	4y 8m	
December				6m	7m				4y 6m	4y 7m	
January				5m	6m				4y 5m	4y 6m	
Feb				4m	5m				4y 4m	4y 5m	

This design does involve selecting some children who have been born just prior to the time the second stage sample is selected from Medicare (that is, children born in February, and to a lesser extent, January 2004). There are two issues for these children: many children born in these months will not yet be enrolled with Medicare, and many who are enrolled will not have had any Medicare activity (see Appendix A). However, growing recognition of season-of-birth effects, and the preferability for the infant and 4 year cohorts to be exactly 4 years apart (to facilitate inter-cohort comparison) means that recently born children will be included.

One advantage of the two-staged sample selection is that it will help ensure the most up-to-date address information is used. Another advantage is that adjustments to the size of the second sub-sample may be able to be made once a better indication of sample loss is obtained from the first sub-sample.

It is proposed that the two sub-samples will be selected from the same postcodes. This will ensure that in general postcodes will have children of all birth months represented as a control for possible bias if (for some reason) month of birth and region are in some way correlated. It will also mean that the same interviewers can be used, reducing the number who need to be recruited and trained – this is particularly beneficial for the non-metropolitan areas.

The design and the timing of the fieldwork will mean that about 700 (14 per cent) children (in New South Wales, Australian Capital Territory, Victoria and Western Australia) in the first 4 year old subsample will have started school at the time of their *Growing Up in Australia* interview. Thus, transition to school issues will be able to be examined, as well as age of entry effects.

Families with more than one target child

About 1.5 per cent of families with children in the target population have multiple births. Given that respondent load is going to be considerable for *Growing Up in Australia*, it has been decided to include only one child per family. The situation is similar for families with both infants and children aged 4 years. It is felt that the scientific contribution resulting from the relatively small group with two or more target children is not sufficient to counterbalance the increased respondent burden (and hence potential attrition) and operational complexities (such as tailoring of the study instruments) of including more than one child.

Special populations

The letter of invitation from the Health Insurance Commission will include a leaflet with a short message in a number of languages, indicating that people can ring the 1800 number for assistance. They would then be linked to an interpreter service. Bilingual interviewers will be available for the main interview to cover the most common foreign languages. However, if respondents nominate their own preferred interpreter, this will be accepted.

There will not be any over-sampling for Indigenous children. Data on Indigenous children will be collected to the extent that they are selected through the proposed selection process, and Indigenous interviewers will be used when required by the family. It is to be noted that a separate Longitudinal Study of Indigenous Children is being developed by the Department of Community and Family Services.

For families where the parents may have difficulty in completing the interview, for example where a parent is blind or deaf, special arrangements will be made for the conduct of the interview.

Selection of children

Within each selected postcode, children in the required age ranges will be listed in date of birth order, with any children from the same multiple birth grouped together in a random order. The required number of children from this postcode will be selected by taking a random start and then applying a skip interval through the list. This will ensure that children across a range of birth months are selected.

The sample selection will be undertaken first for the infant cohort. Only one infant on any given Medicare card will be retained (so that only one child is selected from any family). Once this is completed, all 4 year old children on the same Medicare card as the selected infants will be excluded from the 4 year old population. The selection process will then be repeated for the 4 year old cohort.

This process does introduce a slight selection bias since a 4 year old whose infant sibling has already been selected will not have a chance of being selected. While this bias is not considered substantial, it would be possible to divide the postcodes into two groups, and select the infants first for one group, and the 4 year olds first for the other. Alternatively, the selection order for the second sub-sample draw could be reversed. These options will be discussed in more detail in the methodology paper.

Expected response rates

It is important to minimise the amount of non-response for a number of reasons. It is possible that the characteristics of children ‘lost’ from the sample will be different from those of children included in the final sample and this could lead to biased estimates of population parameters. Low response rates (and high attrition rates) can also increase the variance of the study estimates, as well as causing the study results to have limited generalisability.

There are several places where sample may be lost. It is important to be able to make a reasonable estimate of the size of the loss associated with each, in order to determine the number of selections that need to be made from the Medicare data base to achieve a final sample of around 5,000 children in each cohort, as well as being able to understand the bias that may result.

It is hoped that the final sample will be about 60 per cent of the initial sample. Details are given in Table 6. Although this is less than ideal, other designs are unlikely to give a higher yield. Considerable effort will be given to retaining this sample for future waves, to minimise further bias through attrition. Details on strategies for minimising attrition are given in a later section.

Loss from the initial Health Insurance Commission sample

Of the sample initially selected by the Health Insurance Commission, a number will have incorrect contact details or will decide not to participate in the study. On the basis of the Women’s Health Australia experience, *Growing Up in Australia* can expect a ‘return to sender’ rate of about 5 per cent. Information from the Department of Family and Community Services surveys, which also involve an ‘invitation to participate’ letter and a similar opt-out process, suggests an opt-out rate of about 10 per cent is to be expected.

It is estimated that 5% of families will have post office box addresses. For these families the initial letter from the Health Insurance Commission will ask them to make contact by ‘phone or by return of a form to provide their residential address, but it is expected that the response rate to this request will be low. Other attempts to make contact are described elsewhere. However, it can be expected that contact will not be achieved for a proportion of those families.

Loss from the fieldwork sample

Every effort will be made to minimise the number of non-contacts. Interviewers will make at least 6 calls to dwellings at different times and days of the week. Other usual fieldwork practices will be used to try to minimise the number of non-contacts. These include such practices as:

- a second approach letter sent just prior to interview;
- ensuring calls/interviews are scheduled at times most conducive to cooperation;
- making appointments to reduce resistance to participation;
- extensive call-back procedures, both to make a contact and to convert a contact into a successfully completed interview (while at the same ensuring that the privacy of individuals is respected);

- appropriate interviewer selection and training; and
- assigning the better, more experienced, interviewers to the most difficult cases (where possible).

However, based on experience with the HILDA survey, it is expected that interviewers will not be able to make contact with about 4 per cent of households (Watson and Wooden, 2002, p15). It is not intended to provide financial incentives, due to the costs involved for what is likely to be only a small increase in response rate, but this issue will be revisited after the Dress Rehearsal. Indications from other studies of children are that the nature of the study will encourage response along with such factors as:

- interviews which engage and interest respondents;
- high public recognition of and regard for the study;
- a long period in the field; and
- use of mementos and provision of feedback to sample members.

Based on the experience from related studies both overseas and in Australia, a refusal rate of 20-30 per cent can be expected once contact with the selected family is made. While every effort will be made to encourage families to participate, given the longitudinal nature of the study, it is important that the *Growing Up in Australia* families are happy to participate and feel some commitment to the study.

In addition, it is expected that a further 4 per cent of cases will not result in an interview (Watson and Wooden, 2002, p15). These include families who are away, where the family speaks a language for which an interpreter cannot be found, where the family is unable to complete an interview due to illness or death in the family, cases where the Health Insurance Commission letter was sent to an out-of-date or wrong address (but the letter was not returned) and where the family has moved since the Health Insurance Commission letter was received.

The Dress Rehearsal will be the best source for estimating the likely final sample loss for Wave 1 and for deciding what cost-effective procedures can be used to minimise this loss. This will also allow the number of children who need to be selected by the Health Insurance Commission to be calculated.

Representativeness of the final sample

As is evident from the discussion so far, there are many factors that will influence the degree to which the final sample is representative of Australian children. To reiterate, the main sources of possible bias are likely to be:

- the exclusion of very young (and some other) children not yet registered with Medicare;
- the exclusion of children without Medicare activity;
- low response from families with post office box address information;
- low response from families who have recently moved; and
- the exclusion of families who cannot be contacted or who refuse.

Wherever possible, steps will be taken to minimise both sample loss and sample bias, and use will be made of weighting and non-response adjustment to compensate for these factors. A more detailed examination of potential bias will be included in the

methodology paper. Table 6 provides an example of the sample loss that could occur for one of the cohorts.

Table 6 Estimates of sample loss for an initial sample of 8,500 from Medicare

	Sample loss	Cumulative response rate (per cent)	Number of children left in sample	Comment
Children initially selected		100	8,500	From Medicare enrolments
Children excluded - 'fact of death' file, multiple births	20	100	8,480	Expect very few
Return to sender – incorrect address, out-of-scopes	426	95	8,056	5 per cent of initial selections
Opt-out via HIC process	850	85	7,206	10 per cent of initial selections
PO Box families not located	400	80	6,806	Assume most not found
Other non-contact	272	77	6,532	4 per cent of sample that is left
No interview obtained, out of scope (eg wrong age)	262	74	6,272	4 per cent of sample that is left
Refusals to interviewer	1,354	59	5,018	20 per cent of sample that is left

Weighting

In survey research, weighting is often necessary to ensure that data derived from a sample accurately reflect the population from which the sample is drawn. Weighting is necessary when the sample has been designed with disproportionate sampling fractions among strata (though this is not intended in this design) or when there has been differential non-response among strata resulting in disproportionate representation in the achieved sample. In the case of a longitudinal study non-response may be cumulative, with each wave of the study resulting in differences in attrition between groups in the study (leading to attrition weights).

The main purpose of weights in this study will be to compensate for differences between the population on the sampling frame and the 'real' population, as best estimated from ABS data, differential initial non-response and, in subsequent years, differential attrition. It is important to remember that weighting can only be based on characteristics for which the distribution across strata in the population is known. Two or three key socio-demographic variables (such as family type) available for an area from ABS Population Census or other data, and known to be related to outcomes of interest, will be used to indicate whether the achieved sample is representative of the population. Use will also be made of the data available from the Medicare database (such as the age and sex of people on a Medicare card) for respondents versus non-respondents. Weights can be derived as the ratio of the expected frequency in the population divided by the observed frequency in the sample (although there are iterative methods that could also be used).

To allow for any non-response effects, a post-stratification weighting system using population benchmarks derived from the 2001 Census is likely to be used, in conjunction with the Health Insurance Commission non-response information. Separate weights could

be determined for each of the cohorts within each regional stratum, based on the appropriate sub-populations and response rates.

Appropriate sample weighting will be determined once the study design is finalised and a process for analysing and allowing for non-response bias is determined. Details of these will be included with the third discussion paper on Data Management, due for release in early 2004. Some information on weighting issues will also be given in the methodology paper.

Data collection

Base design

Since the start of the development phase for *Growing Up in Australia*, there has been extensive research undertaken into the best measures to be used in order to address the key research questions, shown in Appendix B (see ‘Introducing the Longitudinal Study of Australian Children, Discussion Paper No.1 for a full description of the research questions).

One of the main strengths of the design is that multiple informants will be used to gather comprehensive information across all domains.

Study informants for Wave 1 will include:

- the primary care-giving parent (Parent 1);
- other resident parent or step-parent (Parent 2);
- non-resident parent ;
- childcare providers (formal or informal);
- pre-school or school teachers;
- the child her/himself (physical markers and direct assessment tasks); and
- some interviewer observation of the external environment.

The primary respondent will be the child's primary parent (Parent 1) or main caregiver. This person will typically be the child’s biological mother, but is defined as the person who knows most about the child and their birth, history and current routines (therefore this person *could* be a father, guardian, grandparent, etc).

For the first wave of the study, the base design data collection will involve an interviewer spending 1-2 hours in the home with the following objectives:

- to obtain detailed information about the child, plus some information on the parent, from Parent 1. This information covers the key areas of health, family functioning, parenting, education, childcare and social support;
- to obtain socio-demographic information on the family (such as household structure and parental labour force status, educational attainment and income). This can be obtained from either Parent 1 or Parent 2;
- to leave behind self-complete modules for both Parent 1 and Parent 2, covering other aspects of family functioning, health and support, that will take about 20 minutes to complete. Where time permits, these modules will be completed while the interviewer is in the home;
- to undertake physical measurement of the child (such as height, weight, girth and head circumference);
- to administer the ‘Who am I?’ school readiness test and Peabody Picture Vocabulary Test of receptive language to the 4 year old children; and
- to obtain consent to contact any non-resident parent or child care provider or teacher, plus contact details for the parents so that they can be located for future waves.

Where consent is obtained, questionnaires will be mailed out to any non-resident parent and a teacher/child carer where the child has at least 8 hours of care per week. These questionnaires should take about 20 minutes to complete. It is possible that

some of these questionnaires may be administered by telephone (for example, for care undertaken by relatives). The mail out and any telephone interviews will be undertaken from a central location (not by the interviewer) and will be sent as soon as feasible after the completion of the interview.

Follow-up procedures

A number of procedures will be implemented to ensure as high a response as possible to any questionnaires mailed out or left behind. These will be systematically tested in the Dress Rehearsal in order to select the most cost-effective methods, and include:

- telephoning families about a week after the interview to see whether they have sent back their forms;
- picking up forms if the interviewer is in the neighbourhood;
- making appointments to pick up forms;
- making special calls to pick up forms;
- staying in the home while the Parent 1 self complete is filled in;
- sending ‘thank you’/reminder cards to non-resident parents and child carers/teachers after 2 weeks;
- sending another copy of the questionnaire with another reminder after a further 2 weeks if no reply received (for parents and carers/teachers);
- undertaking one further reminder after another 2 weeks. The Dress Rehearsal will test whether the interview can be done by telephone at this stage;
- completing the teacher/carer questionnaire by telephone interview rather than mail-out.

Study instruments

Since April 2002, five Consortium Design Teams (totalling around 20 advisors – see Appendix C for Design Team membership) have been working with the Project Operations Team to develop the content of Wave 1 study instruments. These teams cover five domains:

1. Core measures

(A) Socio-demographics - family and social constructs

- Household and family
- Parents’ paid work
- Parents’ finances
- Parents’ other human capital
- Housing
- Neighbourhood and community involvement
- Use of services

(B) Child development and functioning

- Behavioural functioning
- Emotional functioning
- Language development

(B) Child development and functioning (cont.)

- Cognitive development
- Psychological development
- Readiness to learn
- Motor/physical development
- Social competence

2. Family Functioning

- Parenting practices (intact and separated parents)
- Contact and contributions from non-resident parents
- Parenting stress
- Couple relationships
- Parent-child relationships (both parents and step-parents)
- Family relationships (including extended family)
- Work and family balance
- Other social support (informal or formal)

3. Health

- Gestation and birth (child and mother)
- General health – child (diet, exercise etc)
- Chronic conditions/ disabilities
- Physical development (including speech)
- Parental physical and mental health (resident, non-resident and step-parents)
- Direct physical measures of child (height, weight, girth and head circumference)

4. Child Care

- Use of non-parental care – amount, changes, age at start
- Quality of care – parent and carer report
- Child assessment by carer

5. Education

- At home learning activities
- Preschool/kindergarten programs
- Child assessment by teacher
- Other out-of-home activities
- Transition to school
- Direct cognitive assessment (by interviewers)

There are differences in content in the instruments used for each cohort, due to the need to use age-appropriate measures and the varying amount of retrospective data to be collected.

A listing of all the study instruments is given in Appendix D. Copies of these instruments are available to researchers upon request to the Institute. A document outlining the rationale for the content of these instruments will also be available shortly.

Enhancements

During the development phase some possible enhancements to the base design have been proposed and were tested in a pilot study. These are a 'light' Time Use Diary to record the child's activities over three 24 hour periods, the collection of saliva to allow cortisol levels in the child to be determined (as a possible link with physiological stress) and some data linkage.

Testing in the dress rehearsal will determine whether these enhancements are feasible, given cost and respondent burden (including the need to retain families for subsequent waves).

Time Use Diary

One area for investigation for this study is how children spend their time (eg sleep, outdoor activities, unstructured play, watching television, computer use, reading) and how time-use patterns relate to child outcomes, including family attachment, physical fitness levels, obesity, social skills and school readiness. One way to address this issue is to use a Time Use Diary.

Time use of children has received increased attention in recent years and collecting good quality information about children's time use could be one of the most original and distinctive features of this study. Time use has not traditionally been collected in major longitudinal studies because techniques suitable for large-scale use have only recently been developed and validated.

A draft 'light' Time Use Diary has been developed that could be incorporated into the overall design, depending on budget, respondent burden and other practical considerations. This lists around 25 age-appropriate events or activities, plus information on who the child was with and where they were during each activity (including travel), in quarter hour blocks for each 24 hour period, over 3 days. Time Use Diaries are proposed for all participating children, with separate versions being developed for each age group. These diaries will be tested in the Dress Rehearsal for all participating children.

Cortisol

It is proposed that saliva samples are collected from a subsample of 500 infants, mainly in New South Wales, in order to assay for cortisol, a hormone whose levels can be an indicator of health and well-being. A protocol has been developed with input from national and international experts, and rigorous ethical procedures are being followed.

Children can be sensitive or vulnerable to stressors in early life, which may alter their physiological systems in ways that impair academic achievement and mental and physical health. Cortisol is a hormone that influences the immune system and metabolism and aids in adaptation to stress by preparing bodies for illness and exercise. If an association between child cortisol and family stress can be demonstrated, this may provide policy makers with robust evidence of a physiological impact of children's early environments.

The parents will be asked to take saliva samples from the child using special cotton buds, one sample per day for three days. Different strategies for collection of the sample from the family will be tested in the Dress Rehearsal. In addition to assaying the samples at the laboratory, the circumstances under which the samples were taken, including date and time, will be collected.

Data linkage

It would be advantageous if HIC and Medicare records could be linked to the data. This would facilitate analysis of response bias and allow access to current Medicare address details when contacting respondents in subsequent waves. Consideration is being given to testing the response to requests for consent to such linkage in the dress rehearsal. Linking to personal hospital birth records, maternal and child health records and other health records (such as the Australian Childhood Immunisation Register) may be considered at a later stage, although much of this information can be obtained more simply and efficiently directly from the parent.

Another form of data linkage to individual records that is currently being investigated is a link to data from the National Childcare Accreditation Council. This agency collects extensive data on all long day care centres and family day care schemes, through a quality assessment process. Discussions are underway on linking some data to child records, in order to enhance the data on the quality of children's child care experiences. Ethical issues and privacy considerations are being taken into account.

All other data linkages will only be to statistical data, such as the Australian Bureau of Statistics' Socio-Economic Indices For Areas and other relevant Census of Population and Housing data. These can be linked to the child's record via the Census Collector District code, which will be assigned to the child's home by the interviewer through the use of a Global Positioning System recorder.

Data collection agency

In September 2002, an Expression of Interest was advertised in the national press for survey organisations who would be interested in tendering for the data collection for *Growing Up in Australia*. A tender selection process followed, resulting in Colmar Brunton Social Research, in conjunction with NCS Pearson, being contracted to undertake the data collection for the testing and main phase for Wave 1.

Colmar Brunton Social Research is the largest Australian owned social marketing research agency in Australia that is dedicated to the complexities of research for Commonwealth, State/Territory and Local Governments and service suppliers. Their stated mission is to help build social profit through the effective use of exemplary research design and implementation.

NCS Pearson Inc. is a global organisation providing leading edge technology-based solutions that speed the delivery of information, benefits, and services to a diverse set of constituents. NCS Pearson is an International Standards Organisation accredited, quality oriented company, which wishes to be associated with complex, exacting and socially significant studies.



Pilot testing

Pre-test

Drafts of all instruments were pre-tested by the Project Operations Team at the Institute using focus groups, individual interviews and mail-out during September and October 2002 in metropolitan and rural Victoria. A total of 50 in-scope volunteers were recruited via snowball methodology using personal contacts, charitable organisations, and some child care and pre-school centres already involved with other Institute projects. Families with a range of socio-economic backgrounds were included, as well as some from non-English speaking and Indigenous backgrounds. Physical measures and cognitive assessment tasks for 4 year olds took place either at the end of the focus groups or in the home.

The first pre-tests covered the following aspects:

- appropriateness for respondents - mothers, fathers, teachers, care providers;
- clarity, acceptability, layout and time taken for questions (and alternatives) and instructions;
- consent procedures and acceptability of approaches for contact details of non-resident parents, carers and teachers, and alternative methods of administration;
- process for collecting data from non-resident parents, carers and teachers; and
- feasibility, acceptability, and time needed for the Time Use Diary and saliva sample enhancements. (The Time Use Diary was completed by several respondents, but only the consent process was tested for the saliva samples.)

The pre-testing found that most parents thought the content of the study was interesting and acceptable, although too long. Most had no difficulty answering the majority of questions, but some questions or sections were difficult to understand, repetitive or thought inappropriate. Very few questions were considered too sensitive to ask. There were mixed reactions to consent for data linkage and mail-outs to carers or teachers, but most parents agreed to the direct assessment of children, both physical and cognitive.

In order to meet budget and targets, and to keep respondent burden at a manageable level, the length of most instruments needed significant reduction. A process of question reduction took place between November 2002 and March 2003, which took into account the relative priority of questions with regard to the key research questions, and how well questions appeared to be working.

Pilot test

During March-April 2003, a pilot test was conducted on the revised instruments. The Institute and the contracted data collection agency used informal, snowball sampling and direct recruitment of families, as well as mail-outs to teachers, child carers and non-resident parents.

A total of 101 family interviews were conducted in the pilot test, 50 from the infant cohort and 51 from the 4 year old cohort. Families with a diversity of income, education and areas of residence were recruited. Interviews were conducted in four

metropolitan locations (Sydney, Melbourne, Brisbane and Canberra) and five regional locations (Wagga Wagga, Toowoomba, Ballarat, Geelong and Shepparton).

The objectives for the pilot test were similar to those of the pre-test, but also included the actual completion of Time Use Diaries and collection of the saliva samples. In addition, the information obtained from Parents 1 and 2 was data-entered, to assess the validity, reliability, variance and distribution of many of the measures tested. Cognitive testing was also undertaken, and qualitative analysis performed, to explore the understanding and appropriateness of a number of measures.

Results indicated the need for further reduction in the main Parent 1 face-to-face interview for both age cohorts, plus some refinement of other measures. Results from this pilot test have allowed the study instruments to be further refined during May and June, to reduce the number of changes required between the Dress Rehearsal and Wave 1 data collection phases. Although response rates and compliance to the Time Use Diary and the cortisol measures were not high, it has been decided to test these further in the Dress Rehearsal.

Dress Rehearsal

The Dress Rehearsal for the *Growing Up in Australia* study is scheduled to occur during August-October 2003.

Objectives

The Dress Rehearsal has a number of objectives, which include the following:

1. To recruit a range of respondents who will be used to pilot instruments for the life of the study.
2. To provide information to guide the finalisation of the study design for Wave 1 by modelling the Wave 1 proposed processes as closely as possible, in particular:
 - a. the processes involved with using Medicare enrolments as the sampling frame;
 - b. the formation of workloads;
 - c. the processes for 'return to senders', Post Office box addresses and remote areas;
 - d. the processes for, and estimates of numbers of, respondents with special situations (eg non-English speaking, foster children, etc); and
 - e. the processes for, and estimates of numbers of, non-resident parents and child care providers and teachers who will be surveyed.
3. To discover any issues not yet identified that will affect the study design.
4. To obtain estimates of all types of sample loss to allow calculation of the initial sample that will need to be extracted from Medicare to ensure the final sample yield required.
5. To test the interviewer and supervisor manuals, instructions, training and other fieldwork (including follow-up) procedures.
6. To test all the study instruments, including the Time Use Diary and the cortisol collection, for content and timing, and to test all consent and follow-up procedures.

The data collection agency will have responsibility for the formatting of the questionnaires to allow for efficient data scanning and overall interviewing efficiency. Training processes, interviewer instructions and manuals are currently being developed and considerable attention is being given to the recruitment, training and supervision of interviewers.

Sample

An initial Medicare extraction of about 1000 children (500 in each age cohort) has been drawn. This number will ensure that estimates of sample loss are accurate enough to help determine the Wave 1 sample and that the final sample yield (expected to be at least 250 children per cohort) is sufficient to allow for attrition over the life of the study.

Postcodes

The distribution of 25 residential postcodes for the Dress Rehearsal is shown below. In the table, the Australian Bureau of Statistics Remoteness Area classification has been applied to group postcodes according to major city, inner or outer regional, and remote.

Table 7 Location of Dress Rehearsal postcodes

	Major City	Regional	Remote
Victoria	8	4	1
New South Wales	6	1	1
Queensland	0	2	2
Total	14	7	4

Postcodes in Victoria were drawn at random from postcodes that had at least 50 children in each age cohort. Postcodes in the other states were selected to include areas with high numbers of families from culturally and linguistically diverse backgrounds, remote areas, Indigenous areas and inner city areas.

Composition

The statistical extract from the Health Insurance Commission, for information on the distribution of the target populations across postcodes, was taken in early May 2003. The infants were selected from those born between 1 August 2002 and 30 April 2003 (who will be aged 3-12 months at the time of the Dress Rehearsal). The 4 year old cohort was selected from those born between 1 August 1998 and 30 April 1999 (who will be aged 4 years 3 months to just over 5 years at the time of the Dress Rehearsal). The selection process ensured that about 100 of the sample has post office box addresses.

As none of the 4 year old children selected are likely to be in school at the time of the Dress Rehearsal, whereas some of the children in the 4 year old cohort in Wave 1 will be at school, a separate exercise will be undertaken to test the teacher questionnaire on school teachers in Victoria and New South Wales.

Respondent tracking

The intent is that all children included in the Dress Rehearsal and first wave will continue to be followed in all subsequent waves. The only exceptions are likely to be children whose families move overseas. The primary parent will continue to be the principal informant on the child and family and it is likely that the other parent will also continue to be asked to provide data. Contact information will be sought from both parents independently during Wave 1 to assist in cases where there is a later separation of the parents.

The potential for non-response is present at every wave of a longitudinal study. Since there is detailed information on the characteristics of all respondents at Wave 1, it will be relatively easy to apply weights to the data to compensate for any bias resulting from subsequent non-response. However, such procedures are only likely to be effective in the short-run.

Over the longer term it is important to minimise attrition because of the probability that those lost from the study are different from the ‘stayers’ in ways that may not be observable at Wave 1. Furthermore, high rates of attrition have obvious detrimental effects on the sample size then available for longitudinal analyses of developmental trajectories and pathways to outcomes. Finally, there are good reasons to be concerned about the adverse effects of high attrition on the perceived legitimacy of continuing the study.

The experience of several overseas longitudinal studies indicates that attrition is likely to be highest in the early years. In the Canadian National Longitudinal Study of Children and Youth, for example, attrition between the first and second wave was approximately 11 per cent (NLSCY, 1999), but it is reported that retention has been maintained at 85-90 per cent over the later years (A. Zeeman, the Department of Family and Community Services Workshop, May 2001, Canberra). Similarly, in the Christchurch Health and Development Study the attrition rate was almost 9 per cent between birth and age 2, but dropped to less than 1 per cent per year subsequently, with a total attrition of 19 per cent by age 18 years (Fergusson et al 1989; Horwood & Fergusson, 1999). For these reasons, a minimum level of 85 per cent retention from wave to wave is expected across the entire life of the project. To achieve this will require implementing strategies that maximise the retention of sample within each cohort over the entire life of the project. The most successful sample retention strategies that are typically used are:

- inclusion of tracking questions in study instruments;
- maintenance and frequent updating of a database on respondents’ location;
- promoting participant identification with the study; and
- extensive communication with sample members, including training interviewers in interviewee friendly techniques.

Information will be obtained from both parents on names, addresses and telephone numbers of 2 relatives or friends not living at the same address, as well as their own email addresses, and business and mobile telephone numbers.

Season's Greetings cards will be sent to all families, and birthday cards to all children annually, together with change-of-address cards for notification of any intended moves. Participating children will be given a small gift with the *Growing Up in Australia* logo, and such merchandise as attractive 'fridge magnets' will be left with parents with the study's contact details. Contact will also be maintained with participants between study waves through regular newsletters.

In addition, the study will be promoted through marketing of the logo and tagline, and through media exposure to the study, and a 1800 telephone number and website will be maintained so that participants can contact the data collection agency.

If a family cannot be located through the contacts they have given, then forwarding addresses or telephone numbers will be sought from residents at the address or telephone number of the original sample member. If these means prove unsuccessful, the Electronic White Pages, Australia Post and the electoral roll will be accessed to pursue contact details for persons who have changed address.

In addition, the use of a between-waves mail-back survey in 2005 may help in maintaining contact.

Privacy and confidentiality issues

Participation in *Growing Up in Australia* is voluntary, and informed consent is required. Families selected from the Health Insurance Commission database will have two separate opportunities to refuse participation in the study: after receiving the approach letter and when contacted by an interviewer. They may also withdraw from the study at any point. The letter sent from the Health Insurance Commission will make it clear that name and address information will not be passed to the Institute if the selected family indicates it does not want to participate.

Obtaining formal informed consent to participate will be the responsibility of the contracted interviewers and will be sought from the primary parent before proceeding with the interview. An explanatory brochure will be distributed to all participants in Wave 1 of the study introducing the study and explaining how both their privacy and confidentiality will be protected.

The security and anonymity of the data, including the full unit record and any linked data, will be protected throughout the project. Policies and procedures are in place or being further developed to ensure that the identity of the study respondents is not disclosed and that data are protected from theft and subsequent misuse. A policy on the management of personal information will be provided to respondents upon request.

Other aspects of data management will be discussed in the third Discussion Paper, due for release in early 2004.

Conclusion

The proposed sample design and Wave 1 data collection for *Growing Up in Australia* has been developed to ensure that this study will provide extensive high quality information for both research and policy purposes.

Growing Up in Australia will recruit two representative cohorts of Australian children (5,000 infants and 5,000 four year olds). The sample will be distributed in proportion to the regional distribution of children in Australia. Clustering by postcode will provide opportunities to explore community-level effects and will offer cost-efficiencies in data collection.

The initial sample will be drawn from the Health Insurance Commission's Medicare database. Ninety-eight per cent of all children are registered with the Medicare database by age 12 months. While the Health Insurance Commission database has some limitations (such as non-activity restrictions, out-of-date addresses and post office box addresses), it still provides the best listing of children available in Australia. It is estimated that this sampling method will provide excellent coverage for almost all birth months for the infant cohort, in combination with the Australian Childhood Immunisation Register, and will provide coverage of 90 per cent of children aged 4 years. To ensure that data derived from the sample accurately reflect the population from which the sample is drawn, weightings will be used to adjust for any differential response rates at the commencement of the study, and subsequently to account for differential attrition over time.

The quality of longitudinal data rests on initial sample representativeness and high sample retention over time. A number of steps have been developed for *Growing Up in Australia* that aim to maximise these. Strategies to promote high initial response rates include the use of primary approach letters and highly trained interviewers who will make several visits to try to make contact. Strategies to promote sample retention include interviews designed to be interesting, frequent contact with families via greeting cards and newsletters, and an approach that helps respondents feel they are part of an important and interesting study. It is estimated that the selected sample will represent around 60 per cent of the eligible population, with retention of 85 per cent from wave to wave.

Many of Australia's leading researchers and research institutions have contributed their expertise to the development of the study instruments, to ensure that the best measures possible are used to address the key research questions set for this study.

One of the largest data collection processes ever undertaken in Australia has been proposed, providing comprehensive data on children's social environments and their development over time.

A full testing program, involving pre-testing, a pilot test and a large scale Dress Rehearsal, has been established to ensure that all study instruments and processes are thoroughly tested before the first main wave of data collection commences. A data collection agency has been recruited and is working in partnership with the Institute and the Consortium to ensure that all data collection and processing practices are of the highest quality.

We are confident that the information obtained from this landmark study will provide the most comprehensive dataset ever to be collected on Australian children. The breadth of data collected will enable Australian researchers to explore many issues regarding the factors that influence early childhood health and development in the present day context. *Growing Up in Australia* will become an important evidence base for the future, informing the development of child and family policy with the ultimate aim of helping to ensure that every child in Australia has the best possible start in life.

References

- Hanna, B. (2002). 'An alternative way to estimate population in local areas: The second phase of the Medicare Project', paper presented to the APA conference, 2-4 October, 2002.
- Fergusson, D.M., Horwood, L.J., Shannon F.T. & Lawton, J.M. (1989), 'The Christchurch Child Development Study: A review of epidemiological findings', *Pediatric and Perinatal Epidemiology*, vol. 3, pp. 278-303.
- Horwood, L.J. & Fergusson, D.M. (1999). 'A longitudinal study of maternal labour force participation and child academic achievement'. *Journal of Child Psychology and Psychiatry*, vol.40, pp.1013-1024.
- Hull, B., Lawrence, G., MacIntyre, C.R. & MacIntyre, P. (2001). 'Immunisation Coverage: Australia 2001' National Centre for Immunisation Research and Surveillance of Vaccine Preventable Diseases, University of Sydney.
- National Longitudinal Survey of Children and Youth (NLSCY) (1999). *Overview of survey instruments for 1998-99 data collection cycle 3*. (Catalogue no. 89FOO78XPE, no. 3). Canada: Statistics Canada.
- Sanson, A., Nicholson, J., Ungerer, J., Zubrick, S., Wilson, K., and the LSAC Consortium Advisory Group (2002). 'Introducing the Longitudinal Study of Australian Children', LSAC Discussion Paper No 1. Australian Institute of Family Studies, Melbourne.
- Silva, P.A. & McCann. M. (1996) 'Introduction to the Dunedin Study'. In P.A. Silva and W.R. Stanton (Eds) *From 'Child to Adult: The Dunedin Multidisciplinary Health and Development Study'* (pp. 1-23). Oxford Uni Press, Oxford.
- Watson, N. & Wooden, M. (2002) 'The Household, Income and Labour Dynamics in Australia (HILDA) Survey; Wave 1 Survey Methodology', HILDA Project Technical Paper Series, No. 1/02.

Appendix A Children registered on Medicare in March 2003 (a)

Birth Month	Active	Inactive	Per cent inactive	Total	Birth Month	Active	Inactive	Per cent inactive	Total
<i>Infants</i>					<i>4 year olds</i>				
Feb-03	1,983	13,122	87%	15,105	Feb-99	18,264	2,376	12%	20,640
Jan-03	9,850	8,774	47%	18,624	Jan-99	19,530	2,522	11%	22,052
Dec-02	17,369	1,687	9%	19,056	Dec-98	18,834	2,363	11%	21,197
Nov-02	18,580	582	3%	19,162	Nov-98	18,605	2,157	10%	20,762
Oct-02	20,832	366	2%	21,198	Oct-98	20,451	2,387	10%	22,838
Sep-02	20,771	309	1%	21,080	Sep-98	20,405	2,383	10%	22,788
Aug-02	20,590	259	1%	20,849	Aug-98	19,868	2,182	10%	22,050
Jul-02	20,776	306	1%	21,082	Jul-98	20,522	2,252	10%	22,774
Jun-02	19,544	361	2%	19,905	Jun-98	19,575	2,059	10%	21,634
May-02	20,681	428	2%	21,109	May-98	19,921	2,036	9%	21,957
Apr-02	20,000	427	2%	20,427	Apr-98	19,951	1,842	8%	21,793
Mar-02	20,885	598	3%	21,483	Mar-98	20,979	1,775	8%	22,754
Total	211,861	27,219	11%	239,080	Total	236,905	26,334	10%	263,239

(a) by presence or absence of Medicare or Australian Childhood Immunisation Register activity in the previous 6 months (for infants) or 12 months (for 4 year olds)

Appendix B List of key research questions

1. What are the impacts of family relationships, composition and dynamics on child outcomes, and how do these change over time?
2. What can be detected of the impacts and influences of fathers on their children?
3. How are child outcomes affected by the characteristics of their parents' labour force participation, their educational attainment and family economic status, and how do these change over time?
4. Do beliefs and expectations of children (parental, personal and community, in particular the parents' and child's expectations of the child's school success, workforce participation, family formation and parenting) impact on child outcomes, and how do these change over time?
5. How important are broad neighbourhood characteristics for child outcomes? Does their importance vary across childhood? How do family circumstances interact with neighbourhood characteristics to affect child outcomes?
6. How important are family and child social connections to child outcomes? How do these connections change over time and according to the child's age? Does their importance vary across childhood?
7. What is the impact over time of early experience on health, including conditions affecting the child's physical development?
8. What is the impact on other aspects of health and other child outcomes of poor mental health, including infant mental health and early conduct disorder? How does the picture change over time?
9. How do socio-economic and socio-cultural factors contribute over time to child health outcomes?
10. What are the patterns of children's use of their time (eg outdoor activities, unstructured play, watching television, reading) and how do these relate to child outcomes including family attachment, physical fitness level and obesity, social skills and effectiveness over time?
11. What is the impact of non-parental child care on the child's developmental outcomes over time, particularly those relating to social and cognitive competence, impulse control, control of attention and concentration, and emotional attachment between child and family?
12. What early experiences support children's emerging literacy and numeracy?
13. What factors over the span of the early childhood period ensure a positive 'fit' between child and school and promote a good start in learning literacy and numeracy skills in the first years of primary education?
14. What are the interactions among factors in family functioning, health, non-parental care and education that affect child outcomes?

Appendix C Design Team membership

Education Team

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Dr John Cresswell – ACER
Julie McMillan – ACER
Prof Steve Zubrick – TVW Telethon Institute for Child Health Research
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Consultants

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Appendix D Study instruments

INSTRUMENT	RESPONDENT/INFORMANT
BOTH COHORTS	
Household form	Either parent
Family questionnaire	Either parent
INFANTS	
Face to face interview (for parent 1 and child)	Parent 1
Self-completion module	Parent 1
Self-completion module	Parent 2
Self-complete questionnaire	Non-resident parent
Self-complete or telephone questionnaire	Centre based childcare provider
Self-complete or telephone questionnaire	Home based childcare provider (eg Family Day Care or informal carer such as relative)
Direct assessment (weight and head circumference)	Child
Light time-use diary ^(a)	Parent 1
Cortisol measurement ^(b)	Child
4 YEAR OLDS	
Face to face interview (for parent 1 and child)	Parent 1
Self-completion module	Parent 1
Self-completion module	Parent 2
Self-complete questionnaire	Non-resident parent
Self-complete or telephone questionnaire	Preschool teacher/ Centre based childcare provider
Self-complete or telephone questionnaire	Home based childcare provider (eg Family Day Care or informal carer such as relative)
Direct assessment (weight, height and girth)	Child
Who am I?, Peabody Picture Vocabulary Tests	Child
Light time-use diary ^(a)	Parent 1

(a) Inclusion in first wave dependent on results of Dress Rehearsal.

(b) If included, to be collected from sub-sample of about 500 infants.