

Growing Up

in Australia

The first 12 months of a landmark study

ANN SANSON reports on what the new Longitudinal Study of Australian Children will offer to policy makers, researchers and service providers



The Longitudinal Study of Australian Children (*Growing Up in Australia*) is a large-scale national study tracking the development of Australian children over the early years of life. In March 2002, the Australian Institute of Family Studies signed the contract with the Department of Family and Community Services (FaCS) to implement the study as one of the major initiatives in the Stronger Families and Communities Strategy. The Institute is the lead agency in a large national consortium of nine research institutions.

This paper discusses the rationale for conducting such a study in Australia today. It outlines various overseas and past Australasian studies in order to highlight some of the key issues to be considered, and it provides a broad overview of the study, including the conceptual model on which it is grounded and some of its key design features. It discusses progress made in the 12 months since the contract was signed and the study's future plans and timelines.

The overall intent of the paper is to give readers a sense of the unique contribution that the Longitudinal Study of Australian Children (LSAC) will make, and what the study will offer to policy makers, researchers and service providers.

Need for the study

Why bother to undertake such a project? From both research and policy perspectives, there are two parts to the answer to this question.



The first rests on developments in research and understanding about child development, and the need for policy to be informed by a strong evidence base. In recent years there has been growing awareness of the following six issues.

■ *The critical importance of the early years for later outcomes*

Existing longitudinal studies tracking children's development over time have contributed to an increasing recognition that the early years of life have a substantial impact on children's later social, emotional, physical and cognitive development and wellbeing, as well as their physical development (Prior, Sanson, Smart and Oberklaid 2000; Sanson 2002; Shonkoff and Phillips 2000). Furthermore, these different facets of development are closely interlinked.

■ *The social determinants of health and wellbeing*

It is now well established that aspects of children's social environment – from socio-economic factors like poverty, through to community factors like violence and social cohesion, to family factors like parenting styles and intrafamily conflict – are vital determinants of children's future health and wellbeing (Keating and Hertzman 1999). Since social environments differ substantially across nations, it is not viable to rely upon overseas data to inform Australian policy and practice.



■ *The “new morbidities” such as asthma, depression, obesity*

Despite our relative prosperity as a nation, it has become clear that rates of childhood disorders remain high, and in some cases appear to be on the rise. These disorders include health conditions, emotional distress, antisocial behaviour and school failure, and together they are enormously costly for the individuals concerned as well as the broader society (Stanley, Sanson and McMichael 2002).

■ *The effectiveness of prevention and early intervention*

While there is still a dearth of carefully evaluated interventions in the Australian context, overseas studies have shown that well-founded and well-implemented interventions, starting early in life and either universal or targeted, can be effective in reducing the rate of poor developmental outcomes, and can more than pay for themselves in terms of reducing the need for later services (Vimpani, Patton and Hayes 2002).

■ *The need for a strong evidence base*

The need for a strong evidence base is critical given the concerns about children’s wellbeing, and the crucial role that prevention and early intervention can play. We need to fully understand the various influences on the development of children in the current social context so as to ensure that policies and interventions are evidence based and appropriately targeted.

■ *The value of longitudinal data*

Given that children’s development is a dynamic and interactive process, cross-sectional studies are limited in their information value. Longitudinal studies provide the strongest data for understanding the complex interplay of factors which contribute to children’s development. Following children over time enables researchers to track the developmental pathways of children, identify factors which lead to positive and problematic developmental outcomes and identify major transition points which could provide potential opportunities for shifting from problematic to positive pathways.

The second part of the answer to the question of “why do it?” is more straightforward: there is no available Australian study which can provide the required data. To provide reliable data to guide Australian policy around children, the following criteria need to be met: the study needs to be broadly focused in order to comprehensively examine the interconnections between the different aspects of children’s development and how these interact with the various facets of the social environment; a large-scale nationally representative sample is needed; and the study needs to be longitudinal in order to provide an understanding of the developmental process that will shed light on opportunities for early intervention.

There have been valuable cross-sectional studies such as the National Mental Health Survey of Children

and Youth (Sawyer et al. 2001) and the Western Australian Child Health Survey (Garton, Zubrick and Silburn 1998) which have given a point-in-time picture of children's wellbeing; as well as longitudinal studies such as the Australian Temperament Project (Prior, Sanson, Smart and Oberklaid 2000), and the Mater Hospital University of Queensland Study of Pregnancy (Keeping et al. 1989), which have provided insights into children's development. However, the longitudinal studies have been more narrow in scope, and since they began in the 1980s are of uncertain relevance to early childhood today.

Some overseas longitudinal studies could be argued to fulfil all but one of these criteria: they are not Australian, and we know that we cannot safely generalise from them to the unique socio-cultural context of Australia.

Taking into account issues such as those above, the Commonwealth Government they initiated and funded the Longitudinal Study of Australian



The study seeks to identify developmental pathways to a wide range of outcomes, and child, family and environmental markers predicting these pathways; indicators of risk, and of resilience; and vital transition points in the lives of Australian children.

Children to inform government policy on early childhood. Being part of the Government's Stronger Families and Communities Strategy, the study is designed to identify policy

opportunities for early intervention and prevention strategies.

To provide a context for the study, it is useful to review a selection of the more influential recent longitudinal studies overseas, as well as look at existing Australian and New Zealand studies (see accompanying box). These and other studies are also reviewed in Nicholson et al. (2002).

EXISTING LONGITUDINAL STUDIES OF CHILDHOOD

National Longitudinal Study of Children and Youth

Canada's *National Longitudinal Study of Children and Youth* (NLSCY) began in 1994, with an initial sample of 22,861 children aged 0–11 years (Statistics Canada 1996). Up to four children per family were recruited, so approximately 13,000 families are involved. Despite the large overall sample, the numbers of children at any one age at any one time are relatively small because of the wide spread of ages. As a supplement to the main study, new cohorts of 0–1 year old children are recruited every two years and followed until they are four years of age.

The initial sample was nationally representative (excluding only those children living on Aboriginal reserves), and was not stratified geographically. However, in response to the finding that community-level effects were quite powerful influences on children's development, another, smaller community-based study was initiated and is run in parallel.

The study is funded and directed by the Canadian Human Resources Development Department, with Statistics Canada being responsible for the data collection. The department seeks expert input from five multi-disciplinary groups of academic researchers across Canada.

The research issues which this Canadian study is designed to address reflect the broad policy interests of the Human Resources Development Department, and hence the measures span a range of child, family and community variables. Child outcomes of interest include children's physical and mental health, cognitive development and school achievement, and key determinants of these which are

being examined include parental health, parenting, family functioning, socio-demographic and neighbourhood factors.

Early Childhood Longitudinal Study

The *Early Childhood Longitudinal Study* (ECLS), conducted in the United States, has two sub-studies: ECLS-B involves a birth cohort of 13,500 infants born in 2001, followed from nine months to first grade; ECLS-K is following 22,000 children who were in kindergarten in 1998-1999 to fifth grade (see website address in reference section). Both samples are nationally representative but chosen to over-sample some disadvantaged groups (for example, some ethnic groups, and low birthweight children) where rates of problematic outcomes are known to be higher, as well as twins who are of interest scientifically because they allow investigation of genetic effects and gene-environment interactions.

While being quite broadly focused, the studies have a particular interest in educational contexts and outcomes. The key child outcomes of interest include children's cognitive, social and emotional development, and health (for ECLS-B), with the additional interests in early learning and performance at school (for ECLS-K). Key determinants being assessed include the home environment (including educational practices), early care experiences, and the school and classroom environment.

The study receives fairly broadly-based government funding through various health, education and human services agencies, and is run by the National Centre for Educational Statistics (Department of Education) in conjunction with a government consortium.

Background

Funding for the study was announced in April 2000 by the Department of Family and Community Services (FaCS). It was intended that the study will provide a major evidence base for policy and intervention initiatives under the Stronger Families and Communities Strategy, by examining the impact of Australia's unique social, economic and cultural environment on the next generation.

Throughout the project scoping phase, FaCS undertook extensive consultation. This resulted in the specification of the conceptual framework and research questions for the study. A holistic approach to child development which is grounded in Bronfenbrenner's (1979) socio-ecological model was adopted. As a result, the study is predicated on collection of data on the whole gamut of children's developmental outcomes (a whole-of-child perspective which acknowledges that children's social, emotional, cognitive and physical functioning are all important and interdependent), and a broad range of determinants of these aspects of functioning.

The study seeks to identify developmental pathways to a wide range of outcomes, and child, family and environmental markers predicting these pathways; indicators of risk, and of resilience; and vital transition points in the lives of Australian children. While the breadth of the study is one of its key

strengths, it also poses the challenge of collecting sufficiently rich data across a wide spectrum.

The broad research questions which LSAC is to address are shown in Table 1. The more specific questions are grouped into four areas – family functioning, health, child care and education – as well as a question addressing their interrelationships. The ways in which these questions are being addressed is described in the study's first discussion paper, *Introducing the Longitudinal Study of Australian Children* (2002) (available from the Australian Institute of Family Studies).

Table 1 LSAC: broad research questions

1.	How well are Australian children progressing on a number of key developmental outcomes?
2.	What are the pathway markers, early indicators, or constellations of behaviours that are related to different child outcomes?
3.	How are child outcomes interlinked with their wider circumstances and environment?
4.	In what ways do features of children's environment (such as families, communities and institutions) impact on child outcomes?
5.	What helps maintain an effective pathway, or change one that is not promising?
6.	How is a child's potential maximised to achieve positive outcomes for children, their families and society?
7.	What role can the government play in achieving these outcomes?

Avon Longitudinal Study of Pregnancy and Childbirth

The *Avon Longitudinal Study of Pregnancy and Childbirth* (later renamed Parenting and Children) (ALSPAC) started in 1991 (Golding 1990). In contrast to the national studies above, it has a regional sample, with over 14,000 mothers recruited during pregnancy from the Avon region in the United Kingdom (Bristol being the regional city). The focus of the study was initially on children's health, but broadened over time to consider other aspects of development. Biological and genetic factors are key determinants of interest, but a broader range of psychological and social factors are also assessed. Unlike the studies above, ALSPAC has been supported mainly by competitive research grants funds, and its research agenda revolves around current scientific issues rather than policy issues.

Around 13 European studies (collectively known as ELSPAC) have been granted approval to use the methods and measures of ALSPAC, allowing direct comparisons to be made across countries. Their cohort sizes vary from 1,300 to 14,000. They are conducted under the umbrella of the World Health Organisation, and coordinated from Bristol.

Millennium Cohort Study

The *Millennium Cohort Study* ("Child of the new century") in the United Kingdom recruited a sample of 18,700 infants over 2001 and 2002, drawn from an administrative dataset (the Child Benefits register) (see website address in reference section). Particular electoral wards were selected, oversampling the smaller countries of the UK (Wales and Northern Ireland), and also areas at most risk (disadvantaged and high-ethnic wards).

The study focuses on the first year of a child's life, with a strong interest in the impacts of economic and social deprivation and community-level factors on children's health and development.

Unlike most studies, it is collecting data from both mothers and fathers, on a biennial basis.

The study was tendered by the UK Government through the Economic and Social Research Council, and involves a consortium headed by the Centre for Longitudinal Studies at the University of London.

Three Scandinavian studies

There are three substantial Scandinavian studies for which planning began in the early 1990s and which are at various stages of implementation.

- The *Norwegian Mother and Child Cohort Study* has a proposed sample of 100,000. Taking advantage of the universal public health coverage in Norway, mothers are recruited at the time of having an ultrasound in the 17th week of pregnancy, and a number of biological samples are obtained from the mother, father and child. To date, there are 20,000 families in the study, with recruitment due to be complete by 2005. The focus is on biological, genetic and environmental determinants of health, including low-incidence disorders such as autism. Despite the emphasis on physical health, parental lifestyle measures and some psychosocial outcomes are also being assessed.

The study is primarily government funded, and run by the Norwegian Institute of Public Health. Separately funded sub-studies are encouraged, to address specific health issues; on last report, there were 69 such sub-studies underway (Wiik, pers com).

- The *Danish Birth Cohort* is similarly aiming for a sample of 100,000 families recruited when women are 12 weeks pregnant.
- The *Swedish Olive Tree Project* is a smaller matching study which is currently getting underway.



The data collected will be geared towards facilitating longitudinal analysis of children's developmental pathways over time. Confidentialised data sets will be developed and warehoused at the Australian Institute of Family Studies.

Broad design features

The design proposed by the consortium was accepted by FaCS and involves a cross-sequential design with two cohorts: nationally representative samples of 5000 children below the age of 12 months and 5000 children aged four years. This design has a number of strengths in comparison to single cohort designs, including the capacity to provide data on older children in a shorter time frame, and allowing some assessment of cohort effects. It has the advantage over multi-age designs (for example, NLSCY) in permitting more age-specific measures to be employed. The age ranges at the time of interview within each cohort will be limited

as much as possible while still ensuring that children born in each month of the year are included and that the data are collected over a relatively short period of time.

Sampling frame

The Health Insurance Commission has agreed to the use of Medicare enrolments as the sampling frame, ensuring that almost all Australian children will have a chance of being included in the sample. This provides the study with a much stronger sampling frame than any other available administrative dataset or cold-calling contact methods.

Children with a Medicare card who have Australian citizenship, permanent residency or application for

Australasian studies

There are a number of longitudinal studies in Australia and New Zealand which began during the 1980s (with most of them still continuing) which have been very influential and informative.

Studies include the Dunedin (NZ) Multidisciplinary Health and Development Study; the Christchurch (NZ) Health and Development Study; the Australian Temperament Project; the Mater University of Queensland Study of Pregnancy; the Port Pirie Cohort Study; and Tasmanian Infant Health Study. These studies provide an excellent source of learning for the Longitudinal Study of Australian Children (see Nicholson et al. 2002 for further details and references on these studies).

All these studies involve birth cohorts. Some have been quite narrowly focused – for example, the Port Pirie study examined the impacts of lead exposure, and the Tasmanian Infant Health Study addressed Sudden Infant Death Syndrome, and both shed important light on these issues.

Most have broadened their focus over time from their initial goals, as the richness of the data is recognised and exploited. As an example, the Australian Temperament Project, which initially was concerned with children's temperament and social adjustment, is currently working collaboratively with a number of agencies. These include working with Crime Prevention Victoria to address pathways to adolescent and young adult antisocial behaviour, with the National Drug Research Institute on predictors of substance use and misuse, and with the RACV and Traffic Accident Commission to explore risky driving behaviour. The project is also addressing

issues such as citizenship, relationship formation and social competence (see Smart elsewhere in this edition).

The key drawback of all these studies is that they involved single cohorts which were born in the 1980s, and so the relevance of their findings to early childhood in the early 21st century is uncertain.

Commonalities and differences

Despite this diverse array of longitudinal studies, some *common features* emerge.

Most studies have relied on *biennial data collection* – this frequency allows contact to be maintained with families without over-burdening them, and at the same time allowing reasonably sensitive data on development and change to be obtained.

A number of the more recent studies involve a *multidisciplinary team* of academic researchers, reflecting recognition of the interconnections between different aspects of children's development and their social context. As a corollary, most studies have been conducted by consortia. Some studies (for example, the Christchurch study) have ensured continuity by having a small team involved throughout the life of the study, whereas others (such as NLSCY) have involved extensive consultation and a large consortium of researchers. One way to ensure that the needs for both continuity and broad multidisciplinary input are met is to have a small core team of researchers working in conjunction with a large consortium.

Because of the need for a substantial funding base over an extended period of time, most studies have relied at least in part on government funding. Over-reliance on short-term competitive research

permanent residence will be included. Children in very remote locations may potentially be excluded if they are too costly to visit. The Health Insurance Commission also requires that children without any registered Medicare activity for a specified period of time are excluded due to concerns that the child may have died or contact details may be incorrect.

It has been decided that there should be no over-sampling of any particular group, but it is hoped that “nested” studies may focus on some such groups. The sample will be clustered at the postcode level, both for economy of data collection and to facilitate analysis of community level effects. There will be biennial waves of data collection starting in 2004, involving face-to-face interviews in the home, as well as an additional mail-back questionnaire wave in 2005.

Respondents and data collection

The study will collect data from multiple informants. Extending beyond most other studies, both the child’s parents will be asked to provide information through a face-to-face interview and self-completion questionnaires. In cases where a parent does not live with the child, consent will be sought to contact the non-resident parent. Further, non-parental child care providers will be asked to complete questionnaires. Data will be sought about all forms of care – long day care centres, family day

care, preschools, nannies, relatives, friends and neighbours. This again is an area where LSAC will go beyond almost all existing studies.

As children become older, we will be asking schools and teachers to provide data. Direct assessment of the child’s language and school readiness skills will be undertaken for four-year-olds, and we will measure children’s height and weight. When the children reach an appropriate age, they will also be asked to provide their own perspectives on their lives.

In total, 18 different instruments will be used to collect data, since separate questionnaires are needed for the two cohorts and the different informants. (See Christine Millward’s AIFS conference paper on the Institute’s website for more details about the data that will be collected.)

In addition, the study will use community level indices (for example, SEIFA and ARIA), to help assess community level effects. We are currently pilot-testing the feasibility of collecting saliva samples (to allow the analysis of cortisol levels) and collecting time use data through a simple diary. Other forms of data linkage are also under consideration.

The data collected will be geared towards facilitating longitudinal analysis of children’s developmental pathways over time. Confidentialised data sets will be developed and warehoused at the Australian Institute of Family Studies. It is intended that these data will be widely available to researchers

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grants has led to reductions in scope and frequency of data collection in a number of these studies.

However, the studies also *differ* markedly – in sampling decisions, sampling frame, cohort design, focus, extent of government involvement, and their accessibility for value-adding.

Sampling decisions – the majority of the studies have opted for a representative sample at a national or regional level while the others have opted to oversample populations thought to be at most risk of adverse child outcomes. Many of the studies have had to exclude some difficult-to-access children. While most are non-clustered designs, the Millenium study has adopted clustering to facilitate analysis of neighbourhood effects. In designing a new study, difficult decisions need to be made about whether to oversample and whether to cluster, and what resources should be devoted to including difficult-to-access children.

Sampling frame – some have relied on random selection, others have used administrative datasets, or have taken advantage of hospital visits.

Cohort design – resource limitations have resulted in trade-offs between the number of cohorts involved and the size of those cohorts. Most studies reviewed have used a single birth cohort design, which has the advantage of simplicity. However, this limits the rate of knowledge acquisition (that is, it takes four years to acquire information on four year olds) and does not allow assessment of cohort effects (possible differences in the child-rearing environment for children born in different years). The NLSCY has a wide age range, so outcomes for older age groups are more

quickly available, but the costs are that the number of children within any one age group is relatively small, and it is difficult to tailor measures to the specific ages of the children. ECLS involves slightly overlapping cohorts (at the end of the study the children in ECLS-B will be the same age as the ECLS-K cohort at the start of the study), allowing some limited examination of cohort effects. Other designs, such as accelerated longitudinal or cross-sequential designs (see main text) have rarely been adopted in large-scale studies of early childhood.

Focus – perhaps because funding is more easily available in the health arena, the largest-scale studies have tended to focus on health outcomes. Others have an educational focus, while yet others have an interest in the whole gamut of developmental outcomes.

Extent of government involvement – the extent of government direction and control, as well as the priority given to either policy relevance or scientific enquiry, varies across the studies. For example, studies like ALSPAC are driven primarily by scientific concerns such as understanding gene-environment interactions, while others like the Millenium study are addressing issues of current policy relevance such as poverty and disadvantage.

Accessibility for value-adding – the studies also differ in their accessibility for nested studies and extensions which can value-add to the main study. The use of the ALSPAC methodology for the ELSPAC group of studies is a good illustration of such value-adding. Similarly, the large number of studies drawing from the Norwegian cohort data to address specific research issues ensures that the data are used to maximum effect, as well as attracting additional funding to the main study. ■

LSAC CONSORTIUM



The contract to implement the Longitudinal Study of Australian Children (*Growing Up in Australia*) was awarded to a consortium headed by the Australian Institute of Family Studies. Consortium members and the management structure are shown in the Table 2 and Figure 1.

The strengths of the consortium lie in its multi-disciplinary nature, the comprehensive understanding of the conceptual and empirical research base held by its members, its expertise in large longitudinal and/or population based studies, its awareness of and interest in the current policy context, and its long-term commitment to study.

In adopting the management structure shown, we have ensured that there is a small dedicated team working on the study (the Project Operations Team), and have mechanisms for engaging the expertise within the consortium (through the Design Teams and Consortium Advisory Group). There is a close working relationship between the Project Operations Team, the Consortium Advisory Group and FaCS, and broader consultation and input through FaCS's Steering Committee, the Scientific and Policy Advisory Group, and the Reference Group.

The Project Operations Team currently comprises the Project Director (Ann Sanson), Design Manager (Christine Millward), Survey Manager (Carol Soloff), Senior Research Officer (Grace Soriano), and Survey Officer (Emma White).

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Table 2 LSAC Consortium and LSAC Consortium Advisory Group

LSAC Consortium

Australian Institute of Family Studies
Associate Professor Ann Sanson – Project Director

Centre for Developmental Health, Curtin University
Professor Stephen Zubrick
Professor Sven Silburn

Australian Council for Educational Research
Dr John Ainley

Macquarie University
Associate Professor Judy Ungerer

Charles Sturt University
Ms Linda Harrison

Murdoch Childrens Research Institute
Dr Melissa Wake

Australian National University
National Centre for Epidemiology and Population Health
Dr Dorothy Broom
Dr Lyndall Strazdins
Centre for Mental Health Research
Dr Bryan Rodgers

Queensland University of Technology
Dr Jan Nicholson
Dr Donna Berthelsen

Social Policy Research Centre, University of New South Wales
Dr Michael Bittman

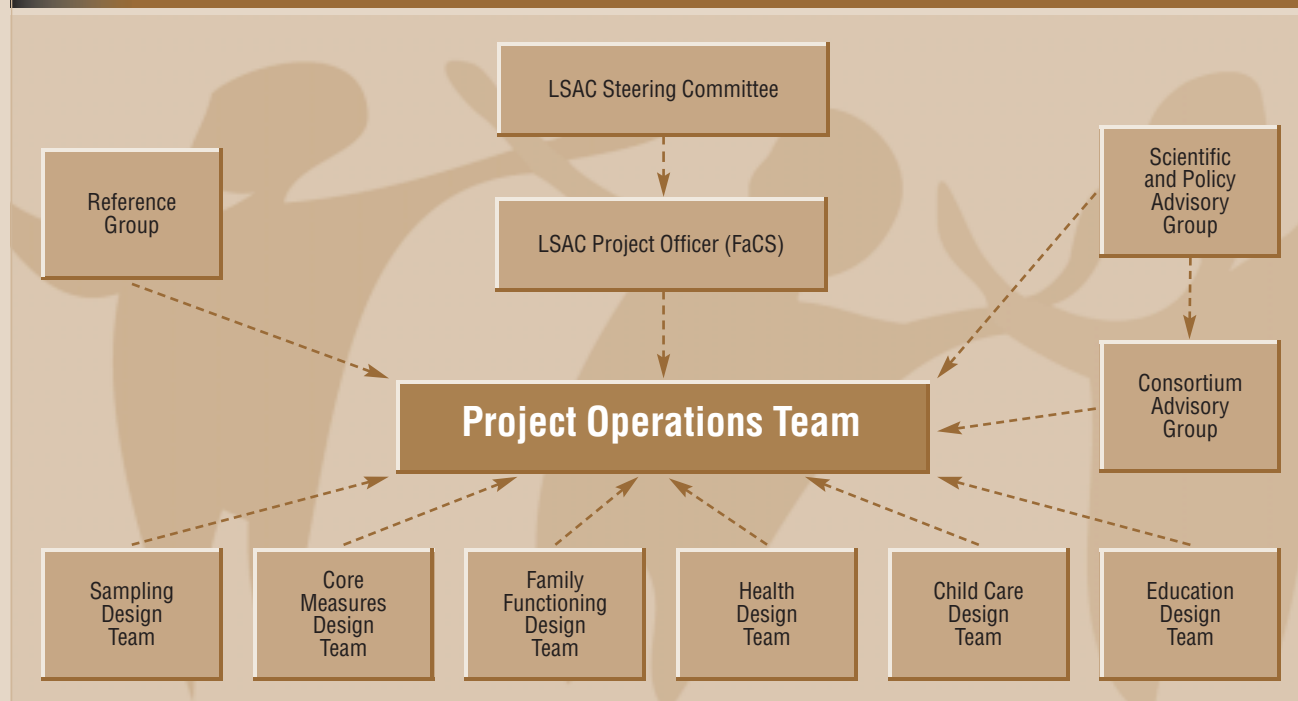
Consortium Advisory Group consultants

Professor Margot Prior
University of Melbourne

Professor Michael Sawyer
University of Adelaide

Professor Graham Vimpani
University of Newcastle

Figure 1 LSAC: management structure



in accordance with stringent privacy and security protocols. User support will be provided through newsletters, a website and training courses.

Current status and next steps

In the first year of the project extensive consultation has occurred with scientific experts, state and territory government representatives, and other stakeholders. A first Discussion Paper on the approach to addressing the research questions has been published (Sanson et al. 2002). Draft instruments for collecting the data from the various informants for both cohorts have been developed.

Extensive pre-testing of the instruments and study methodology has occurred, and a more formal pilot test is underway. The sample design has been developed and refined, and the fieldwork for the study has been subcontracted to Colmar Brunton Social Research in association with NCS Pearson.

The website for the study (www.aifs.gov.au/growingup) has been established, and a logo developed.

A dress rehearsal involving approximately 250 children per cohort will take place in August-October 2003, followed by first main wave of data collection in March 2004. Release of the first wave of data is planned for April 2005.

Conclusion

The Longitudinal Study of Australian Children is a landmark study that will provide a unique opportunity to provide policy-makers with a solid, comprehensive evidence base to guide future support, intervention and prevention policies for children and families. In this way, we believe that it will help future Australian children to have the best possible start in life.

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LSAC is a landmark study that will provide a unique opportunity to provide policy-makers with a solid, comprehensive evidence base to guide future support, intervention and prevention policies for children and families.

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Websites

www.nces.ed.gov/ecls – for more information on the Early Childhood Longitudinal Study (Birth Cohort (ECLS-B) and Kindergarten Cohort (ECLS-K).

<http://qb.soc.surrey.ac.uk/does/contact.htm> – for more information on the new Millennium Cohort Study known as "Child of the New Century".

Ann Sanson is the Acting Director of the Australian Institute of Family Studies, and Project Director of the Longitudinal Study of Australian Children. The contributions to this paper by the Project Operations Team and the LSAC Consortium are gratefully acknowledged