them to the clinic sessions for the first time. So far 1,530 partners and fathers have agreed to be contacted about future opportunities to be involved in ALSPAC directly.

**Genetic Resources & Analysis**

Cell lines, used as an ongoing source of DNA, are now available for 6,760 ALSPAC children, 3,891 mothers and 562 partners. Sample collection is ongoing and it is anticipated that final numbers of established cell lines will exceed 7,000 from children, 6,000 from mothers and 3,000 from partners.

The DNA resource, itself, currently contains DNA from 11,343 ALSPAC young people and 10,433 from their mothers. Postal and home-visit collection of saliva samples for DNA is planned for later in the year to target individuals for whom there is no sample.

Rapid progress has been made generating genotype data from the samples. Genome wide data will be available for 10,000 children and 10,000 mothers later this year. Genome wide copy number variation (CNV) and genome wide expression data is available on 1000 children. In addition epigenetics projects on subsets of individuals are also underway. A summary of the genotyping available can be found on our website [http://www.bristol.ac.uk/alspac/sci-com/resource/genotypes/](http://www.bristol.ac.uk/alspac/sci-com/resource/genotypes/).

**17 year clinic data**

Since December 2008 clinic sessions have been running to gather biological, physiological and psychological data in the mother’s and young people’s 17th year.

So far over nearly 5,000 study young people and 5,000 mother’s have attended these clinics and donated thousands of samples that ensure the validity of the ALSPAC data resource.

Work is continuing to increase this recruitment.

**Focus on partner recruitment**

Previously records of the biological father of the study children have not been collected. In the past, mothers have been asked to forward on questionnaires to the biological father, the father figure or the partner who is bringing up the study child with the mother, but partner’s have never been contacted directly.

In recent months there has been an initiative to recruit the mother’s partner and/or the child’s father directly and to invite
Data Now Available

**Questionnaire data**

<table>
<thead>
<tr>
<th>Year 11 Questionnaire</th>
<th>Young people and their carers assess their school experience, quality of education, home-school link &amp; future aspirations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Puberty Questionnaires</td>
<td>15 years old</td>
</tr>
<tr>
<td></td>
<td>16 years old</td>
</tr>
<tr>
<td>16 year old Questionnaires</td>
<td>16+ years old child completed questionnaire “Life of a 16+ Teenager”</td>
</tr>
<tr>
<td></td>
<td>16+ years carer completed questionnaire “Your Daughter/Son 16+ Years On”</td>
</tr>
</tbody>
</table>

**External Data**

| Annual School Census | 2002 |
|                     | 2003 |
|                     | 2004 |
| Key Stage 4         | GCSE exam data school Year 10 |
|                     | GCSE exam data school Year 11 |

**Clinic data**

| Teenage clinics     | 12 ½ years old |
|                     | 13 ½ years old |
|                     | 15 ½ years old |

**Recent Response Rates**

Response rates overtime are falling, although ALSPAC concentrates a huge effort in trying to maintain participation.
Recent initiatives have been successful in re-engaging the study children, now young adults, in attending the focus clinics, which collect biological, physiological and psychological information from the study families.

Few young people were attending the clinics due to study, work and social commitments. The ALSPAC team developed an initiative to invite the schools and colleges where ALSPAC children study to Oakfield House. This acted as a “Development Day” for the participants’ fellow students, while those enrolled in the study engaged in the focus clinics.

To date this has encouraged 82 young people to participate in the clinics who had previously not been involved.

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**Research In Focus**

**Child fat mass & educational attainment - Dr. Stephanie von Hinke Kessler Scholder, University of Bristol**

As I am sure you are aware, Britain is facing an epidemic. Two-thirds of adults and one-third of children are currently overweight or obese. If nothing is done, this is expected to rise to 90% of adults and two-thirds of children by 2050. This trend affects everyone, as it causes ill health and brings a financial cost to society.

A study I have undertaken with Professors George Davey Smith, Debbie Lawlor, Carol Propper and Frank Windmeijer has focused on the trend that obesity is associated with lower economic outcomes like educational attainment in children.

We consider three ways through which childhood obesity can be related to academic attainment:

1. Obesity could cause lower test scores by affecting child development. For example, obese children may be bullied, lowering their confidence and through that, their performance.

2. There may be reverse causation: children may over-eat to compensate for doing poorly at school.

3. Instead of a causal relationship, the association may be driven by other factors that affect both weight and outcomes. For example, a family’s social class may shape both diet and attitudes to school-
Research in Focus (continued...)

ing, affecting both weight and test scores.

Using the ALSPAC data, we have focused on the first of the above: the causal effect of children’s obesity (fat mass) at age 11 on their Key Stage 3 results at age 14. Using a Mendelian randomization approach, we have specified children’s genetic markers as instrumental variables for their fat mass to deal with possible confounders.

Using this technique, we have found no evidence that obesity causally affects test scores. It therefore suggests that the observed negative relationship are driven by other factors that affect both fat mass and educational attainment.

Please see the links below for further information on this area:

http://www.bris.ac.uk/CMPO

**Department for Education**

**Deborah Wilson**, ALSPAC contract manager

The Department for Education (and the Department for Children Families and Schools before it) has supported ALSPAC over the last few years to ensure that data has been collected on young people’s lives and school experience.

As well as funding for a specific survey in year 11 at school, and contributing to the rolling surveys too, the Department has recently funded two specific studies to look at the development of maths capabilities and confidence in primary school and the role of language in children’s educational and social outcomes.

**The Development of Maths Capabilities & Confidence in Primary School** led by Terezinha Nunes and Peter Bryant, University of Oxford

This project looked at the development of competence in different aspects of maths and the effect of this on young people’s key stage results.

The project found that Mathematical reasoning, even more so than children’s knowledge of arithmetic, is important for children’s later achievement in mathematics, and that spatial skills are important for later attainment in mathematics, but not as important as mathematical reasoning or arithmetic.

The Department’s STEM team (Science, Technology, Engineering and Mathematics) have used the findings of the research in guidance on the Mathematics curriculum and it has been the main focus of both internal and external seminars during 2009.

**The Role of Language in Children’s Educational & Social Outcomes** led by Sue Roulstone, University of the West of England

This current project is looking at the role that language plays in the education and social success of individual children.

The role that children’s language plays in promoting their educational and social success is increasingly recognised and this analysis will identify the factors that impact on language development and children’s educational progress. The report is scheduled for publication at the end of the year.

Please send us details of your ongoing research to alspac-socsci@bristol.ac.uk
The Antecedents of Physical Health in Adolescents led by Professor Debbie Lawlor, University of Bristol

Since the last newsletter we have continued to work on exploring socioeconomic inequalities in growth, obesity and related cardiovascular risk factors in children and adolescents. Using data from 7,772 ALSPAC participants who attended the Focus at 9 (mean age 9.9 years) follow-up, we examined the association between maternal education and a large number of cardiovascular risk factors and explored whether inequalities were mediated by adiposity, measured by DXA-assessed total fat mass.

There were socioeconomic differences in a number of the cardiovascular risk factors, with children whose mothers had lower educational achievements having more adverse levels of apolipoprotein B, systolic and diastolic blood pressure, C-reactive protein (CRP) and interleukin-6 (IL-6). Inequalities were greater in girls than boys. Inequalities in CRP were completely mediated by adiposity and those in other cardiovascular risk factors were partially mediated by adiposity. When we compare these findings with previously published work from older birth cohorts it is notable that socioeconomic differentials in adiposity as seen in ALSPAC children are novel. Thus, these findings suggest future adults may have greater inequalities in diabetes and CHD than current adults (Howe et al, 2010).

However, the nature of socioeconomic differentials between populations has shown to be a dynamic one, in that adiposity differentials...
Updates (continued…)

in children from Belarus were found to be in the opposite direction to that found in ALSPAC. That is, children from non-manual households and with better educated mothers having higher body mass index, larger waist circumference and a higher % body fat (Patel et al, 2010).

The addition of Dr Catherine Chittleborough to the grant investigators (see below) is fantastic and over the coming months we will work with her, Professor Lynch, Prof Gregg, Dr Emmett, and Dr Kate Northstone and others to explore how behavioural and biological pathways might mediate socioeconomic differentials in physical health and also examine how socioeconomic differentials in growth and adiposity affect cognitive ability and ultimately educational attainment.

One project entails examining the social patterning of early life weaning diet from ages 0-3 and how this is related to socioeconomic differentials in physiological risk factors in adolescence. In addition we will look at how diet in later childhood is socioeconomically patterned and whether this mediates associations of socioeconomic position with adiposity and cardiovascular risk factors in adolescence. We are also examining the social origins of non-cognitive factors such as impulsivity and time preference (linked to executive function in the brain) on health behaviours and how they might mediate observed health inequalities in adolescents and young adults.

**Dr Catherine Chittleborough, University of Bristol**

I am a research associate in the Department of Social Medicine and started working with the project in September 2009. I am working with Professor John Lynch at the University of South Australia and my projects are relevant to several streams of the project. I will be looking at how trajectories of non-cognitive, personality characteristics affect health and behaviour, and the family and childhood characteristics that are associated with favourable non-cognitive profiles in later teenage years.

I am currently exploring risk factors routinely measured in pregnancy that could predict child health and development outcomes at age 4 or 5 years.

This research will be useful for early identification of risk factors for inclusion in prevention programs such as the Family Nurse Partnership.

**Methodology** led by Professor Fiona Steele & Professor Frank Windmeijer, University of Bristol

There has been pleasing process by the Methods Strand. Within the IFSOCCA project, we have been collaborating with Anna Vignoles and Claire Crawford from the Education strand, comparing different ways of analysing pupil progress in schools that take into account differences between the schools. Moreover, we also advised Debbie Lawlor, Kate Tilling and Laura Howe from the Health strand in their investigation into measurement errors of height and weight, and how best to model the way children grow.

The work within the Methods Strand is also progressing well. Frank Windmeijer and Paul Clarke are concluding an extensive investigation into methods that allow...
Finally, Michael Spratt has been working with Jonathan Sterne on working out the best ways of handling missing data in longitudinal studies. Michael is also working with Paul Clarke to extend these methods to incorporate some data which have recently been obtained on participants who missed the last Teen Focus Clinic. This will eventually allow us to see how much different those who turn up to clinics are from those who do not, and how badly this affects statistical analyses. Paul and Michael will be collaborating with Glyn Lewis and Roberto Melotti from the Risky Behaviours strand to look how analyses of tobacco, alcohol and drug use are affected by missing data.

Please send us details of your ongoing research to alspac-socsci@bristol.ac.uk

**Upcoming Events**

**The economic return to education: what we know, what we don’t know and where we’re going**  
Thursday 16 September 2010  
University of Bristol  
**Conference Organiser:** Matt Dickson

The economic return to education has long been a parameter of great interest and over the last two decades advances in econometric methodology and the availability of large micro datasets have afforded researchers new tools and better data to address this question.

At the start of a new decade it seems an appropriate time to bring together leading academic economists and policy makers to evaluate what we know, what we do not yet know and the direction in which the literature is moving when it comes to quantifying the economic return to education.
Upcoming Events (continued...)

The economic return to education:
Speakers

"The Economic Return to Education: A Review"
Colm Harmon (University College Dublin) with Matt Dickson and 
Cathy Redmond

"How Large are Returns to Schooling? Hint: Money Isn’t Everything”
Kjell Salvanes with Philip Oreopoulos (National Bureau of Economic
Research)

"Estimates of the Causal Effect of Education on Earnings over the
Lifecycle: UK evidence from Non-separable Specification with Cohort
Effects and Endogenous Education”
Ian Walker with Giuseppe Migali (Lancaster University)

"Education & Labour Force Participation: Evidence from the UK”
Damon Clark (University of Florida)

"What determines the return to education – an extra year or a hurdle cleared?”
Matt Dickson with Sarah Smith (Centre for Market and Public Organisation, University of Bristol)

Admission is free and lunch will be provided for all participants.

For more information and to register for this workshop please contact:
Amanda Edmondson
E-mail: amanda.edmondson@bristol.ac.uk
Telephone: +44 (0)117 33 10799
Website: www.bristol.ac.uk/cmpo/events/2010/education/index.html

Longitudinal Data Analysis:
Multilevel modelling and
Structural Equation Modelling
Approaches
20-21 September 2010
University of Bristol
Instructors: Fiona Steele, Kate Tilling, Jon Heron and George Leckie

This course will provide an introduction to methods for analysing longitudinal continuous and binary response data, with a focus on methods for analysing individual trajectories over time. Multilevel modelling and structural equation modelling (SEM) approaches will be described and compared. Throughout the course there will be an emphasis on what kinds of research questions and different types of method can be used to explore the interpretation of results.

Lectures will be accompanied by practical sessions each morning and afternoon using the MLwiN and Mplus software packages. Example datasets will come from the Avon Longitudinal Study of Parents and Children (ALSPAC).

Day 1: Multilevel Growth Curve Models
Random intercept and slope models for continuous data
Autocorrelation
Fractional polynomials and spline
Modelling binary data

Day 2: Structural Equation Modelling
Fitting a growth curve model as an SEM
Comparison of multilevel modelling and SEM approaches
Group-based trajectory models for continuous data & binary data

Registration
Unfortunately, registration has now closed for this workshop.
USING THE ALSPAC RESOURCE

ALSPAC is currently run as a supported-access resource for the research community. The ALSPAC website—www.bris.ac.uk/alspac—describes the steps that must be taken by those wishing to make use of the resource. It also contains brief details on the sort of data that has been collected; however this information is far from comprehensive. A CD containing more detailed information (including individual frequency tables for data that are currently available) can be obtained by contacting the ALSPAC executive (alspac-exec@bris.ac.uk).

THE FUTURE FOR ALSPAC DATA ACCESS

The ALSPAC Executive is committed to making the data resources held by ALSPAC available through more open access. As a publicly funded project, it is right and proper that the use of the data is maximised.

ALSPAC is an exemplar study for the new MRC Data Support Service pilot, and will be working with this group to ensure that researchers will be able to discover exactly what is available (the metadata) using an openly available on-line resource. This project commenced in January 2009, and will last for at least 2 years.

We are also reviewing different ways in which we can make the actual data available directly to researchers, rather than having to obtain our support. This could be implemented in a number of ways, including a Nesstar-type service akin to that provided by the ESDS in the UK Data Archive, or the Virtual Microlaboratory system used by the ONS (or indeed, something else entirely). We are actively investigating the governance and technical issues associated with these types of access and are committed to providing a service before the end of our next strategic award (2011-2016). We have also lodged some example datasets with the UK Data Archive, and these are freely available to any bona fide researcher/teacher. These datasets provide tasters to the wider social science community, and we hope they will encourage social scientists to seek to engage more with the ALSPAC resource.

The Future of ALSPAC Data Access is Bright!

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Email: alspac-socsci@bristol.ac.uk