The 1958, 1970 and Millennium Cohort studies in Britain: a unique resource for policy relevant research?

Jane Elliott
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Objectives

Introduction to the content and design of the British Birth Cohort studies at CLS

The use of record linkage to augment the information in the studies

Examples of recent research (focusing on the older cohort studies)

• Cross cohort comparisons
• Early life circumstances and later life outcomes
• Trajectories of development

Examples of how the studies have had an impact on policy

- Basic skills
- Social inequalities and development

How to find out more/access the data
British Birth Cohort Studies

1946: MRC National Survey of Health & Development
1958: National Child Development Study
1970: 1970 British Birth Cohort Study
MCS: Millennium Cohort Study — first national birth cohort study for 30 years (2000-1)
Plans for a 2012/2013 cohort study
1958 Birth Cohort Study

Sample of over 17,000 infants born in 1958 (perinatal mortality study)
Sample followed at ages 7, 11, 16, 23, 33, 42, 46, 50 (biomedical at age 44)
Multipurpose study: family life; education; employment; skills; housing; health; finances; citizenship
Approximately 10,000 individuals are still participating
Mainly quantitative – highly structured interviews, but qualitative interviews with a subsample of cohort members at age 50
Core funded by ESRC with data collected every four years (five years after age 50)
NCDS Follow-ups and sources of information 1958-2010

Original sample: all living in GB born in one week in 1958

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<td>Birth</td>
<td>7</td>
<td>11</td>
<td>16</td>
<td>23</td>
<td>33</td>
<td>42</td>
<td>44-45</td>
<td>46</td>
<td>50</td>
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<tr>
<td>Mother</td>
<td>17,733&lt;sup&gt;a&lt;/sup&gt;</td>
<td>16,883</td>
<td>16,835</td>
<td>16,915</td>
<td>16,457</td>
<td>15,600</td>
<td>15,145</td>
<td>12,037</td>
<td>11,739</td>
<td>12,316</td>
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</tbody>
</table>

Notes
a: Target sample - Excludes emigrants, refusals & deaths. Includes immigrants at NCDS1-3.
b: Achieved sample - At least on survey instrument partially completed
c: Mother - Could be Cohort Member or spouse/partner
Structured interview at age 50

- Household composition, marital status etc
- Housing
- Relationships & domestic division of labour
- Children and parents
- Family income
- Employment and Partner’s employment
- Pensions & attitudes to retirement
- Qualifications, training and skills
- Health (including menopause)
- Alcohol consumption and smoking behaviour
- Memory & Concentration
- Voting behaviour, social participation & social support
- Well-being

Consent to record linkage
Data linkage consent at age 50

Health Records:
• Admissions or attendances at hospital
• Visits to family doctor / other health professional e.g. Midwife
• Records of specific conditions such as cancer or diabetes
• Prescriptions given

(1958 cohort consent rate: Cohort member –80%, Partner –44%)

Economic Records:
• Benefits (e.g. Child Benefit, Income Support) and other DWP programme activity (e.g. New Deal)
• Employment, earnings, tax credits, occupational pensions, national insurance contributions

(1958 cohort consent rate: Cohort member –72%, Partner –39%)

Adds value to data, increases efficiency of data collection, reduces respondent burden, provides additional / more accurate information
Overview

• BCS70 is a multi-disciplinary longitudinal study following the lives of over 17,000 individuals born in Great Britain in one week in 1970
• There have so far been 8 sweeps of data collection: (Birth, 5, 10, 16, 26, 30, 34 and 38)
• The 9th sweep will take place in 2012 when study members will be aged 42:
  ▪ 75 minute face to face interview
  ▪ Additional self-completion questionnaire (paper or online)
• Funded by ESRC
Timing of future sweeps

1970 cohort

1958 cohort
### Sample size (Previous sweeps)

#### Achieved sample size in previous sweeps

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<tbody>
<tr>
<td>Total</td>
<td>16,571</td>
<td>13,071</td>
<td>14,874</td>
<td>11,621</td>
<td>9,003</td>
<td>11,621</td>
<td>9,665</td>
<td>8,874</td>
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<table>
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<tr>
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<th>Postal Survey</th>
<th>Telephone Survey</th>
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<tbody>
<tr>
<td>Total Issued Sample</td>
<td>11,843</td>
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</table>

#### Age 38 Telephone Survey Response

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<tr>
<th>Category</th>
<th>N</th>
<th>% Eligible</th>
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<tbody>
<tr>
<td>Productive</td>
<td>8874</td>
<td>75.6</td>
</tr>
<tr>
<td>Non-contact</td>
<td>1949</td>
<td>16.6</td>
</tr>
<tr>
<td>Refusal</td>
<td>712</td>
<td>6.1</td>
</tr>
<tr>
<td>Other unproductive</td>
<td>198</td>
<td>1.7</td>
</tr>
<tr>
<td>Ineligible (Died / Emigrated)</td>
<td>110</td>
<td>-</td>
</tr>
<tr>
<td><strong>Total Issued Sample</strong></td>
<td>11,843</td>
<td></td>
</tr>
</tbody>
</table>
Data linkage plans

Health Records:
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• Visits to family doctor / other health professional e.g. Midwife
• Records of specific conditions such as cancer or diabetes
• Prescriptions given

Economic Records:
• Benefits (e.g. Child Benefit, Income Support) and other DWP programme activity (e.g. New Deal)
• Employment, earnings, tax credits, occupational pensions, national insurance contributions
Policy relevance of 1958 and 1970 cohort studies

The health impact of smoking in pregnancy
Child poverty
Declining intergenerational mobility
Antecedents and consequences of disability
Health continuities over the lifecourse and health inequalities
Determinants of crime and anti-social behaviour
Social and economic returns to education and training
Access and barriers to higher education
Improving adult basic skills
Women’s opportunities in employment
Maternal employment and child outcomes
Narrative elements of cohort studies

Allow us to trace lives through time & understand how childhood circumstances may impact on adult outcomes

Potentially allow for the construction of individual case studies based on detailed information collected over the years (while preserving confidentiality)

Allow for a focus on the historical context which has helped shape individual experiences

Comparisons between cohorts can enable the development of a narrative about social change
1958 and 1970 birth cohorts

Cohort Comparisons

Life cycle effects
Source: Exploring Data (C. Marsh 1988) Figure 6.1 Unemployment as a problem in Britain: actual and perceived

Source: unemployed claimant count: Employment Gazette December 1982 and May 1986. Percentage naming unemployment as most or second most urgent problem facing the country: Gallup Political Index monthly.
Proportion of women in paid employment, by age and cohort

Source: Jenny Neuburger - Paper presented at CLS June 2008
Basic Skills – a major policy concern in Britain
The value of basic skills in the British labour market: Vignoles, De Coulon and Marcenaro-Guiierrez (Oxford Economic papers 2011)

Aim to evaluate the labour market value of literacy and numeracy
Draw on literacy and numeracy tests carried out with the BCS70 cohort at age 34 in 2004.
Make use of test score information collected during childhood and also information on qualifications and employment history in order to isolate the impact of basic skills on wages
Cross cohort analysis carried out to assess whether the wage return to skills has changed over time.
Richness of data from the cohort studies allows proper control for a wide range of observable characteristics.
How much do all the coins in the box add up to?
Julie has a part-time job in a restaurant

Julie's pay
Basic Pay = £4.80 per hour
Sundays = 1.5 times basic pay
Bank Holidays = 2 times basic

Julie's hours
Saturday .......... 5 hours
Sunday ........... 3 hours
Bank Holiday Monday
........................ 4 hours

How much is she paid altogether?
Numeracy % of sample

<table>
<thead>
<tr>
<th>% of Cohort</th>
<th>1958 cohort</th>
<th>1970 cohort</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level 2 (age 16) or above</td>
<td>27</td>
<td>27</td>
</tr>
<tr>
<td>Level 1 (age 11)</td>
<td>24</td>
<td>34</td>
</tr>
<tr>
<td>Entry level 3 or below</td>
<td>25</td>
<td>25</td>
</tr>
<tr>
<td>Entry level 2 or below</td>
<td>23</td>
<td>14</td>
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Literacy (% of sample)

<table>
<thead>
<tr>
<th>% of cohort</th>
<th>1958 cohort</th>
<th>1970 cohort</th>
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</thead>
<tbody>
<tr>
<td>Level 2 (age 16) or above</td>
<td>43</td>
<td>62</td>
</tr>
<tr>
<td>Level 1 (age 11)</td>
<td>38</td>
<td>30</td>
</tr>
<tr>
<td>Entry level 3 or below</td>
<td>13</td>
<td>4</td>
</tr>
<tr>
<td>Entry level 2 or below</td>
<td>6</td>
<td>4</td>
</tr>
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</table>
Models demonstrated that literacy and numeracy skills have a significant relationship with earnings even for individuals with similar levels of education.

The effects appear to be very similar for both men and women.

One standard deviation difference in skill levels is associated with approx 15% increase in earnings.

Cross-cohort comparisons suggest that the value of basic skills has remained stable over time – this implies that the increase in supply of skills has been matched by an increase in demand for skilled workers.
Millennium Cohort Study (MCS)

Longitudinal birth cohort study following over 19,000 children born in the UK in 2000/2001

Four sweeps so far at 9 months, 3 years, 5 years and 7 years, next planned for 11 years

Funded by UK Economic and Social Research Council (ESRC) and UK government departments

Over sampled places in Scotland, Wales and Northern Ireland, areas with high child poverty and in England areas with higher minority ethnic populations
The Millennium Cohort Study content at glance

- **MCS 1**: 2001/2, 9 months, Mother, Father, Child, Older Siblings, Birth records
  - 18,552

- **MCS2**: 2003/4, AGE 3, Mother, Father, Child, Older Siblings, Medical records
  - 15,590

- **MCS 3**: 2005/6, AGE 5, Mother, Father, Child, Older Siblings, Education records
  - 15,246

- **MCS4**: 2007/8, AGE 7, Mother, Father, Child, Teachers, Medical records
  - 13,857
## Content of MCS Surveys

<table>
<thead>
<tr>
<th></th>
<th>9m</th>
<th>Age 3</th>
<th>Age 5</th>
<th>Age 7</th>
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<td>Interview (and self-completion) with both resident parents</td>
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<td>✓</td>
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<tr>
<td>Cognitive assessments</td>
<td>✓</td>
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<td>✓</td>
<td>✓</td>
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<tr>
<td>Physical measurements</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Child self-completion</td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
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<tr>
<td>Older Siblings</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Interviewer Observations</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Teacher Survey</td>
<td></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>
Record linkage and the MCS cohort

MCS1: Birth registration and Hospital Episode Statistics
MCS 2: Health records (to age 7); and educational records (for siblings)
MCS3: ‘Repair’ of health records; Foundation Stage Profile (for children in England)
MCS 4: Health records for cohort child, parents and siblings; Education records; Economic records for parents
Poverty, family resources and children's early educational attainment: the mediating role of parenting (Kiernan and Mensah, 2011, British Ed Research Journal)

- Uses longitudinal data from first three waves of MCS (N=5462)
- Focus on both episodic and persistent poverty
- Outcome measure is based on the Foundation Stage Profile collected from teachers when children were aged 4-5 in the first year of primary school
- Equivalised family income was used to measure poverty
- Family resources index was also constructed: income poverty, mother’s education, family employment, housing tenure, quality of the local area, mother’s age at birth of her first child, family structure, number of children in the household, child’s birth order, child’s ethnic origin and the language spoken in the home
- Parenting measure constructed using reports of activities with child and interviewer observation
Poverty, family resources and children's early educational attainment (results summary)

Children from poor families and those with low levels of family resources are doing worse in their first year of school.

Poverty matters but persistent poverty is even more detrimental.

The parenting index was also a very important factor predicting children’s early educational attainment.

Positive parenting matters regardless of the levels of resources in the family.

A decompositional analysis suggested that about one-half of the effects of child poverty and 40% of resource disadvantage may be accounted for by the quality of parenting the child has received in early childhood.
Feinstein: Inequality in the early cognitive development of British Children in the 1970 cohort

Develops an index for the development of children—measured at 22 months, 42 months, 5 years, and 10 years.

The score at 22 months predicts qualifications at age 26 and is related to family background.

Children with wealthy or educated parents who had poor early scores had a tendency to catch up.

Children with worse-off parents who scored poorly were found to be an at-risk group.
Class really matters!

Less able richer children overtake more able poorer children by the age of six

Feinstein (2003), Not just the early years, IPPR; Feinstein (2003), Inequality in the early cognitive development of British children in the 1970 cohort, Economica – both studies using data from 1970 birth cohort study
Blanden and Machin (2010) have used data from all three cohort studies, to map the evolution of the relationship between assessment scores, behaviour and parental income over time.

MCS data is being used to replicate Feinstein’s analysis for children growing up in the 2000s.

Results show that high vocabulary achievers at age 3 with low family incomes are losing ground between 3 and 5 while low achievers with high family incomes are improving more quickly than other children starting from a similar baseline.
Progression in MCS vocabulary scores by ability at age 3 and parental income

Extracted from Chapter 9 of *Children in the 21st century: birth to age 5* by Blanden and Machin
*The Policy Press: Bristol (2010)*
CLS Birth Cohort Studies: Web Resources

Resources available via CLS website:
(www.cls.ioe.ac.uk/Cohort/mainncds.htm)

- Searchable bibliography (over 2000 articles, chapters etc)
- Briefings (summaries of recent findings)
- Annotated Questionnaires and CAPI Documentation
- Technical Reports – e.g. on sampling, instrument development and fieldwork of MCS
- Data Dictionaries
- Events and workshops
How do I access the data?

Data is available via the Economic and Social Data Service based at the University of Essex

Data is free for non-commercial use (e.g. teaching and research)

Following a simple registration procedure data can be downloaded directly from the Economic and Social Data Service website

Information about what questions have been asked is provided via the CLS website but we can also answer individual enquiries about specific topics.

Plans to make more potentially disclosive data available via the Secure Data Service at the University of Essex:

http://securedata.data-archive.ac.uk/home
Conclusions: research questions best addressed by birth cohort data

Long term outcomes of experiences and decisions in early life
Medium and short-term outcomes & links between different life domains (e.g. health and employment)
Descriptions of individual trajectories – careers, relationships, fertility, poverty and disadvantage
The links between social change and the changing experiences of different cohorts
Intergenerational transmission of advantage and disadvantage and the processes involved
Appendix with more details of data linkage
Website

www.cls.ioe.ac.uk

Please register for regular updates

Follow us on twitter at:

www.twitter.com/ClSCOHORTS
Motivations for linking to health records

First parent interview took place at 9 months

Collected information on circumstances of pregnancy and birth, early life experiences and social and economic background of family

Limited health information due to multi-disciplinary nature of study and time constraints

Concerns about accuracy of recall about circumstances of delivery etc after 9 months

Supplement survey data with administrative data from birth registration and hospital records
Birth registration records

Personal and demographic information parents at birth registration about baby and

- Birth Weight
- Mother’s/Father’s place/country of birth
- Mother’s/Father’s occupation/employment/social class

Held by:

- Office for National Statistics (ONS) in England and Wales
- General Register Office (GRO) in Scotland
- Northern Ireland Statistics and Research Agency (NISRA), Demography and Methodology Branch in Northern Ireland
Hospital records

Information about mother’s stay in hospital
• General Record – dates of admission and discharge, diagnoses received and treatment given
• Maternity ‘tail’ – pregnancy related e.g. delivery type and pain relief
• Maternity ‘tail’ – baby related e.g. resuscitation, birth weight

Held by:
• Department of Health in England
• Health Solutions Wales (HSW) of the NHS in Wales
• Information Statistics Division (ISD) of the NHS in Scotland
• General record held by Department of Health, Social Services and Public Safety (DHSSPS) and maternity information from local Health and Social Services (HSS) boards in Northern Ireland
### Consent and match rates: birth registration

<table>
<thead>
<tr>
<th></th>
<th>Total MCS families</th>
<th>Total MCS babies</th>
<th>Consent rates: number (%)</th>
<th>Match rates: number (%)</th>
<th>% of total</th>
</tr>
</thead>
<tbody>
<tr>
<td>England</td>
<td>11,532</td>
<td>11,694</td>
<td>10,542 (90%)</td>
<td>10,474 (99%)</td>
<td>90%</td>
</tr>
<tr>
<td>Wales</td>
<td>2,761</td>
<td>2,799</td>
<td>2,594 (93%)</td>
<td>2,578 (99%)</td>
<td>92%</td>
</tr>
<tr>
<td>Scotland</td>
<td>2,336</td>
<td>2,370</td>
<td>2,179 (92%)</td>
<td>2,173 (100%)</td>
<td>92%</td>
</tr>
<tr>
<td>Northern Ireland</td>
<td>1,923</td>
<td>1,955</td>
<td>1,704 (87%)</td>
<td>1,615 (95%)</td>
<td>83%</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>18,552</strong></td>
<td><strong>18,818</strong></td>
<td><strong>17,019 (90%)</strong></td>
<td><strong>16,840 (99%)</strong></td>
<td><strong>89%</strong></td>
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Matching variables and methods: birth registration

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<thead>
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<th>Variables used:</th>
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<tr>
<td>Baby’s date of birth</td>
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<td>Baby’s sex</td>
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<tr>
<td>Mother’s date of birth</td>
</tr>
<tr>
<td>Baby’s name</td>
</tr>
<tr>
<td>Baby’s birth weight</td>
</tr>
<tr>
<td>Hospital of birth</td>
</tr>
<tr>
<td>Mother’s name</td>
</tr>
<tr>
<td>Father’s name</td>
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### Consent and Match Rates: Hospital Records

<table>
<thead>
<tr>
<th></th>
<th>Total MCS Families</th>
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<td>58%</td>
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<td>14,079 (83%)</td>
<td>75%</td>
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### Matching variables and methods: hospital records

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<th>Scotland</th>
<th>N Ireland</th>
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<tbody>
<tr>
<td>Baby’s date of birth</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mother’s date of birth</td>
<td>√ 1,2,3,4,5,6</td>
<td>√</td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td>Baby’s sex</td>
<td>√ 1,2,3</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Baby’s birth weight</td>
<td>√ 2,3,5</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Postcode at birth</td>
<td>√ 1,2,3,4,5,6</td>
<td>√</td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td>Mother’s name</td>
<td></td>
<td>√</td>
<td>√</td>
<td></td>
</tr>
<tr>
<td>Baby’s name</td>
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<tr>
<td>Hospital of birth</td>
<td>√ 6</td>
<td>√</td>
<td>√</td>
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</tr>
</tbody>
</table>
Some evidence of consent bias:
Consent was much lower among mothers living in Northern Ireland and mothers from minority ethnic groups

Education, age and lone parent status also related

(Tate, Calderwood, Dezateaux, Joshi et al., International Journal of Epidemiology, 2005)
Some evidence of match bias – varied by country
Mothers not born in UK, baby not first born, lone parents, black Caribbean/black African were less likely to be matched in England
Baby not first born and English and another language spoken at home were less likely to be matched in Wales
No significant associations in Scotland and Northern Ireland

(Hockley, Quigley, Hughes, Calderwood, Joshi and Davidson, Paediatrics and Perinatal Mortality, forthcoming)
Evaluation of linked data: coverage

Some under-coverage of births at home or in private hospitals

Consent only requested from respondents who were natural mothers
Evaluation of linked data: completeness

Birth Registration
• Birth Weight not available in Scotland and Northern Ireland
• Mother’s/Father’s place/country of birth – not available in Northern Ireland
• Mother’s/Father’s occupation/employment/social class – most complete in Scotland, occupation only in other countries

Hospital Records
• General Record – dates of admission and discharge, diagnoses received and treatment given – generally very well completed
• Maternity ‘tail’ – 100% matched records have a ‘tail’ in Scotland, 80% in England and 22% in Wales. Not available in NI
• Varying levels of completeness of tail variables
Agreement between maternal report in survey data and birth registration was high
• 92% within 100g

Agreement was highest among British/Irish white mothers
Disagreement was more common among mothers from other ethnic groups, long-term unemployed, living in disadvantaged or ethnic areas

(Tate, Dezateaux, Cole, Davidson et al., International Journal of Epidemiology, 2005)
Evaluation of linked data: comparison with survey data on delivery method

Agreement between maternal report in survey data and hospital records was high

- 94% using six mode delivery groups (normal, forceps, ventouse, assisted breech, elective caesarean, emergency caesarean)
- 98% using three groups (normal, assisted, caesarean)

Disagreement more common among mothers with first born babies and mothers not born in the UK

(Quigley, Hockley and Davidson, BJOG, 2006)