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**The Gateshead Millennium Baby Study: a prospective study of feeding  
and growth**

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## **Abstract**

This is a study investigating feeding and growth in infancy. Its principal aim was to examine the joint influence of infant feeding behaviour and maternal psychological characteristics on weight gain. Infants of mothers resident in Gateshead, UK, born in pre-specified weeks in 1999-2000 were eligible, and 1029 were recruited. Routine clinic weights were collected, and heights and weights were measured by research nurses at 13 months for 82% of the cohort. Parental postal questionnaire completion rates varied from 81% at 6 weeks to 63% at 12 months and 49% at 30 months. A strength of the study was that many data were collected at routine clinical contacts. The main difficulties were maintaining up-to-date contact details and keeping the families involved, for which direct contact was more successful than postal contact. Support from health professionals, telephone reminders, media involvement, birthday cards and newsletters helped the success of the study. More recently 83% of the cohort has been traced to local schools. The overall result is a unique longitudinal dataset of early feeding patterns and maternal characteristics from birth which will form the basis of further investigation and analysis of the cohort.

## **Introduction**

Slower than expected weight gain, traditionally known as failure to thrive, is a common problem in infancy that has never been satisfactorily explained. Early assumptions that it is strongly related to poverty, maternal deprivation and neglect (Elmer, 1960; Patton & Gardner, 1962) have been challenged (Frank & Zeisel, 1988; Skuse, 1985). The term 'failure to thrive' is now often replaced by the more appropriately descriptive term 'weight faltering', and other relevant causes considered. These include child feeding behaviour problems (Batchelor & Kerslake, 1990; Kotelchuck, 1983; Pollitt & Eichler, 1976; Raynor & Rudolf, 1996)

and low appetite (Wright, Loughbridge, & Moore, 2000) (Wright, Loughbridge, & Moore, 2000; Wright & Birks, 2000), low socioeconomic status (Wright, Waterston, & Aynsley-Green, 1994), depression (O'Brien, Heycock, Hanna, Jones, & Cox, 2004) and restrained eating (McCann, Stein, Fairburn, & Dunger, 1994; Stein, Murray, Cooper, & Fairburn, 1996; Stein, Stein, Walters, & Fairburn, 1995) in the mother.

There are three general methodological problems for research investigating weight faltering. The first is the use of attained weight criteria to identify slow weight gain in infancy. This confounds poor postnatal weight gain with poor prenatal weight gain, which has quite different causes. More appropriate criteria using changes in weight after birth are now available (Drewett, Corbett, & Wright, 1999; Wright, Matthews, Waterston, & Aynsley-Green, 1994). The second is the use of referred samples of children who have 'failed to thrive'. This introduces selection biases that have been well documented (Batchelor, 1999; Batchelor & Kerslake, 1990; Boddy, 1997; Wright, Loughbridge, & Moore, 2000). The third is the use of retrospective accounts from parents after poor weight gain has already been identified. This may cause recall bias (Kotelchuck, 1983; Pollitt & Eichler, 1976; Raynor & Rudolf, 1996) and the possibility that the child's or mother's behaviour is altered as a result of intervention. The Gateshead Millennium Baby Study (GMBS) was thus designed as a population based prospective study to avoid the above problems.

The GMBS set out to examine infant and maternal behaviour during early feeding and relate it to subsequent weight faltering. Sources of feeding data in the early weeks are scarce; the exceptions in UK datasets include the quinquennial Infant Feeding Survey (Foster, Lader, & Cheesbrough, 1997) and the Avon Longitudinal Study of Parents and Children. Our working assumption was that characteristics of a child's feeding behaviour (for example, a low appetite or poor oral-motor

skills) will lead to poor weight gain in particular contexts. We also examined maternal characteristics because epidemiological work has shown no association between poor weight gain and the social class or education of the child's family in the UK (Blair, Drewett, Emmett, Ness, Emond et al., 2004). Depression is common in women and could make a child's mother less sensitive to cues of a child's hunger, and maternal attitudes to eating can affect the way they feed their children (Stein, Murray, Cooper et al., 1996). The central research hypotheses tested were that relatively slow weight gain would be associated with (a) a lack of interest in feeding in the child, (b) the late onset of weaning, (c) maternal depression and (d) dietary restraint, and that relatively slow weight gain would not be associated with socioeconomic indicators. A range of other issues were also examined, notably the correlates of cessation of breastfeeding and initiation of solids, risk factors for iron deficiency, and the prevalence of repetitive behaviour and eating problems in toddlers.

This paper reports how the GMBS was set up and conducted, the strategies used to maximise recruitment and retention, the problems encountered and how we are addressing them in order to maximise the success of future follow-up studies.

## **Design and methodology**

Ethical approval was obtained from Gateshead Local Research Ethics Committee, and from Newcastle & North Tyneside Health Authority Joint Ethics Committee.

### *Setting, population and sample*

The study office was based in Gateshead where we had established relationships with NHS service providers. Gateshead is an urban area situated in the north east of England within the Tyneside conurbation. Around 65% of Gateshead

deliveries take place at the local maternity unit in the Queen Elizabeth Hospital (QEH) in Gateshead, and approximately 30% at the maternity unit in the Royal Victoria Hospital (RVI) located in the nearest city, Newcastle upon Tyne. A small number are home births or take place in regions other than Gateshead or Newcastle. Managers running the two main maternity units and the health visitor service in Gateshead were consulted at an early stage. NHS staff, mainly midwives and health visitors who would be involved in helping with recruitment and collecting data, were briefed in seminars. In recognition of the NHS input, managers and staff were invited to nominate an audit topic for inclusion in the questionnaires; we thus also examined services for breast feeding mothers and the role of health visiting.

As only one in twenty infants show significant sustained weight faltering, large numbers of children need to be studied in order to identify a sufficient number of affected children. The study aimed to recruit 1000 infants born within one calendar year from 1<sup>st</sup> June 1999 to 31<sup>st</sup> May 2000, which would provide 50 cases of weight faltering giving sufficient power to identify differences of 0.5 of a standard deviation between cases and the remainder of the cohort. Within the year, each week (from Saturday 00.00 am, to Friday 24.00 pm) was specified in advance as either a 'recruiting' or a 'non-recruiting' week. There were two eligibility criteria: that the mother was a Gateshead resident at the time of delivery; and that the birth occurred within a recruiting week.

#### *Measures and procedures*

Data were collected in three ways. The first was a series of questionnaires. The first questionnaire was completed by the mother at recruitment and subsequent ones by post at 6 weeks, 4, 8, 12 and 30 months. Each took the form of an A4 double-sided booklet, and successive questionnaires were printed in a different

colour; this helped in describing the booklet to mothers during telephone reminders, and helped study staff in data handling. A core set of feeding items was devised for the questionnaires based on past research studies, and each questionnaire included age appropriate items from the set, together with items dealing with other areas of interest (for example, adverse family life events at 4 months, and infant temperament at 6 weeks and 8 months). Parents were also asked to transcribe all infant weights collected since the last data collection points from their Personal Child Health Record (see below for details). Each of the questionnaires was piloted with a sample of mothers with children of the relevant age, and focus groups were run to check opinions on ease of completion. The questionnaires were modified according to the feedback received. Table 1 details the contents of the each of the questionnaires.

[Insert Table 1 about here]

The second was via the Personal Child Health Record (PCHR) routinely issued to all UK mothers. Mothers recruited to the GMBS were given a special edition which contained extra GMBS forms pre-stamped with the baby identity number, so health staff could complete the form, tear it out and return it (without identifying names) in a supplied self-addressed envelope. The forms had a carbonated copy which remained in the PCHR as a permanent record for the family. The forms for completion by health staff comprised:

- a) Maternity Discharge Form; rating of baby's feeding, and their weight
- b) Six Day Visit Form; rating of baby's feeding, and their weight
- c) Primary Visit Form; rating of baby's feeding, and their weight
- d) Three Month Visit Form; rating of baby's feeding, and their weight; mother's Edinburgh Postnatal Scale score (Cox, Holden, & Sagowsky, 1987)
- e) Well Baby clinic weight records

The PCHR also contained diaries for completion by the parent, dealing with milk feeding after birth, first weaning foods, first finger foods and illnesses in the child.

The third was via a clinic-based health check at 13 months.

#### *Recruitment and initial data collection*

Prior to the recruitment period, community midwives working in Gateshead were supplied with a GMBS Antenatal Information Leaflet to give to expectant mothers at their 28 weeks antenatal check. Both maternity units involved in the study were given a list of the pre-specified recruiting weeks, a study diary to use to communicate with the GMBS study worker, a spare pad of GMBS Maternity Discharge forms and 'posting boxes' for returning GMBS forms.

Methods for identifying the birth varied with the place of delivery. Births at the QEH maternity unit in Gateshead were identified via the maternity unit computer system. Community midwives notified the study about home births and births outside Gateshead (after they came under the care of Gateshead health staff) or were identified from paper records made available by the QEH. Births to Gateshead residents at the RVI maternity unit in Newcastle were identified from the hospital's paper records.

Mother-infant pairs were recruited as soon after delivery as reasonable. Most mothers were recruited into the study within a few days of delivery by visiting the maternity units daily (Monday to Friday), or their home. Mothers giving birth in Newcastle commonly opted for 6 hour or next day discharges, while mothers in the Gateshead maternity unit tended to stay longer. This meant that the former mothers were more likely to be recruited at home and later. Likewise, if the baby was transferred to the Special Care Baby Unit recruitment was somewhat later.

Eligible mothers were given a Postnatal Information Leaflet when newly-delivered. It fully explained the study, and that they might be asked to take part in future phases of the study. Consenting mothers were asked for contact details and information about the baby and birth, and they completed the first questionnaire at recruitment. A GMBS logo sticker was put on the front of the hospital notes so that staff could easily identify families in the study. After recruitment, letters were sent to the community midwife, health visitor and GP informing them of the mother's participation.

The Maternity Discharge form in the PCHR was completed on the third day after birth or at an earlier hospital discharge, whether or not the mothers had been asked to take part by then, but the information was only used if the mother and infant were recruited into the study. In general, community midwives completed the Six Day Visit Form when they went to the baby's home to take blood for the phenylketonuria screening test, and health visitors completed the Primary Visit Form when care was handed over to them, usually at Day Ten. Hospital staff completed the forms instead if the baby was still in hospital at these times. Health visitors completed the Three Month Form when the mother completed the Edinburgh Postnatal Depression Scale.

Subsequent questionnaires were posted to the mother who generally completed and returned them in a prepaid addressed envelope provided. However, fathers, grandparents or another main carer were able to complete the questionnaires if that was more appropriate. If the questionnaire was not returned within two weeks a telephone reminder was made. If the questionnaire was still not returned within a few weeks, a second questionnaire was sent to the family (needed for approximately 50%). Families were offered help at all stages of the study; they could request a home visit or for someone to ask the questions over

the telephone. They could also ask for a translator or interpreter, though none of them did so.

Two research nurses dedicated to the study contacted families at 13 months to carry out a health check. Families were sent appointments and asked to attend or contact the office to make alternative arrangements. Special clinics were run, and home visits offered if necessary. At this contact weights and lengths of all children were measured using SECA electronic scales and the Raven Rollameter. Weights and heights of the attending parent(s) were measured using SECA electronic scales and the Leicester height measure; heights and weights of parents who did not attend were obtained where possible by report. If consent was obtained to do so, a venous blood sample was taken from the child for the determination of haemoglobin, mean cell volume and mean cell haemoglobin, ferritin and zinc proto-porphyrin.

The children's weights and heights measured at school entry were extracted from the local Child Health Records. In anticipation parents were offered the opportunity to opt-out at three and four years but very few did so.

#### *Data management*

A dedicated database was developed using Microsoft Access, and the mothers' contact details were entered onto it. Data entry was mainly carried out by a specialised data preparation service. All data were double entered and cleaned prior to analyses.

The principal outcome measures were weight gain and the prevalence of weight faltering (Wright, Drewett, & Parkinson, 2004). The weight data were checked for duplicates and obvious errors (Wright & Parkinson, 2004) and then converted into

standard deviation scores compared to the UK 1990 growth reference (Freeman, Cole, Jones, White, & Preece, 1995; Preece, Freeman, & Cole, 1996). For each child, all available weight SD scores within five age ranges (10-18 days, 4 to <9 weeks, 9 to <26 weeks, 26 to <43 weeks, and 43 to <78 weeks) were identified and the average score per child for that time period calculated. The target ages and ranges were chosen to reflect both universal contact points (health visitor at 10 days, doctor's check at 6-8 weeks, immunisation at 4 months) and the changing tempo of growth in the first year (i.e. very rapid in the early weeks, slowing thereafter). Fairly wide bands were chosen to maximise the proportion of children with weights in each band as we know that children who are growing well tend to be weighed less frequently (Wright, 1997). The bands chosen ensured that over 80% were represented in all bands in the first year apart from at 8 months.

## **Results**

There were 34 recruiting weeks throughout the year. Within these weeks there were 1270 births to Gateshead resident mothers, and 1029 infants from 1011 families were recruited (18 sets of twins). Table 2 shows the proportion recruited from different locations and the characteristics of the cohort. Attrition has been higher in the lower socio-economic groups (Wright, Drewett, & Parkinson, 2004; Wright, Parkinson, & Drewett, 2006b).

[Insert Table 2 about here]

Table 3 shows the completeness of the weight data obtained, which were crucial to the study. Weighing young babies is routine practice in the UK and the study had effective methods of retrieving the weights. The return rates for NHS staff forms held in the PCHR varied (Table 3). For example, the EPDS data collected at

3 months was often not returned to the study office but writing to the health visitors to retrieve the EPDS scores was very successful. Because forms held in the PCHR were used at usual clinical contact times they were usually completed and if not returned could be retrieved later. For the postal questionnaires at 6 weeks, 4, 8, 12 and 30 months, the return rate dropped by approximately 10% with each questionnaire (Table 3). There was a low take-up rate of the 13 month check for certain groups but home visits increased the take-up rate to 82%. To date, 83% of the children have been traced to Gateshead schools, and school entry heights and weights obtained for 70% (Table 3).

[Insert Table 3 about here]

Table 4 summarises the results of publications from the study to date.

[Insert Table 4 about here]

## **Discussion**

Setting up and maintaining a population cohort is a major investment of research effort. The most labour intensive phase of the study was the initial recruitment period as an important element of the study was the face-to-face recruitment. The team were trained to be knowledgeable and professional in their approach, and to create trust and confidence in the study amongst participants.

It has been necessary to update the study's identity to account for developmental changes; the study logo displayed on all documents was updated when the children were two to three years old to show toddlers rather than babies, and a further change is planned for late 2007. When the children reached five years the

word 'baby' was dropped from the study title, which was renamed the Gateshead Millennium Study (GMS).

The study has used a range of approaches to keep the cohort involved. Birthday cards have been sent since the children's first birthday, which provided the opportunity for families to inform us of changes in contact details via tear-off slips and post-paid addressed envelopes, and to send parents progress reports and some of the key results. Periodic local press coverage has also been used to raise the study profile, and a survey website has been developed and its address printed on all study documentation (<http://www.ncl.ac.uk/gms/>).

In order to maximise the potential research benefit of the cohort is it essential to be able to remain in contact with the participants. Gateshead has a stable population, but even so keeping in touch with families is a major challenge. Mothers' surnames often change with marriage and divorce. Since 1999 the widespread use of mobile phones means that telephone numbers frequently change and new numbers are more difficult to identify. Newer longitudinal studies may anticipate this problem, best resolved by the traditional method of obtaining the contact details of close relatives such as grandparents who tend to move house less often than new parents. Participants are assured that these contact details are only used for the purpose of tracing should this become necessary. We also now try to obtain work phone numbers and email addresses. Regular small scale support from the NHS Research and Development office has been valuable in allowing us to keep the cohort's contact detail up-to-date on the database between waves. Funding has been secured for two new follow-up phases, one running from August 2005 and another from April 2006. With this funding the cohort is now being traced again. A protocol for these phases of work will be published in due course.

Preparing the questionnaires at each stage was labour-intensive. The measures had to be developed specifically and piloted or the properties of existing measures assessed. Stamping the PCHR and questionnaires with the identity numbers and collating mailing was also a substantial job. The logistics of this work in a longitudinal study, keeping the ongoing recruitment whilst sending out successive questionnaires was complex and demanding, and produced a progressively increasing workload as the first year progressed. The decision about number and timing of data collection waves must take the burden on parents into consideration. In the first year, follow-ups were fairly intense, but intrusiveness was low because the contacts were postal only. We believe we successfully balanced the burden on parents and the study's aim for extensive data from early in the child's life as, since the beginning of the study, only 112 children in the cohort have dropped out altogether.

The study had the great advantage of NHS help and support – there is no other source of information on all births in a population available so soon after the birth. Study procedures were developed to engage the co-operation of NHS staff, and to facilitate their contribution to data collection by ensuring that the only extra task was to complete the readily available forms and return them. This was possible since the principal investigator (CMW) worked as a consultant community paediatrician in Gateshead with responsibility for the PCHR.

During the first year, there were problems with keeping NHS staff informed due to midwifery rotation patterns and staff turnover. This made keeping up-to-date with births and PCHR form completing more difficult than anticipated. Although notices were placed on the wall and hospital notes identified participation via GMBS logo stickers, by far the most successful method was reminding staff in person or by telephone.

The GMBS has been successful in collecting data from a population cohort for five years. The benefit of setting up and maintaining this cohort from birth is that it has provided the opportunity to study the growth of unselected children. This unique dataset provides data about the child's early eating patterns from birth and at several time points over the first year with a follow-up sweep in the second year. It will also provide crucial information for future investigation dealing with other issues. One of obvious importance is the examination of the role of fast weight gain in infancy in the development of later obesity.

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**Table 1. Details of parent-completed questionnaires from birth to 30 months**

<b>Time and place</b>	<b>Measured</b>	<b>Published questionnaire</b>
After birth at hospital or home	Core feeding questions* Socio-economic questions <sup>†</sup>	
6 weeks at home	Core feeding questions* Question concerning cessation of breast feeding, weaning etc* Illness <sup>†</sup> Infant temperament ** Weights (from PCHR)	Infant Behaviour Questionnaire (Rothbart, 1981)
4 months at home	Core feeding questions* Question concerning cessation of breast feeding, weaning etc* Illness <sup>†</sup> , Accidents <sup>†</sup> Adverse family life events  Weights (from PCHR)	Social Readjustment Rating Scale (Hobson, Kamen, Szostek, Nethercut, Tiedmann et al., 1998) (Holmes & Rahe, 1967)
8 months at home	Core feeding questions* Question concerning cessation of breast feeding, weaning etc* Illness <sup>†</sup> , Accidents <sup>†</sup> Infant temperament Weights (from PCHR)	Infant Behaviour Questionnaire (Rothbart, 1981)
12 months at home	Core feeding questions* Question concerning cessation of breast feeding, weaning etc* General behaviour <sup>†</sup> Illness <sup>†</sup> , Accidents <sup>†</sup> Maternal eating behaviour  Maternal childhood Weights (from PCHR)	Dutch Eating Behaviour Questionnaire (Van Strien, Frijters, Bergers, & Defares, 1986) (Altemeier, O'Connor, Sherrod, & Vietze, 1985)
30 months at home	General feeding questions <sup>†</sup> Food preferences  Drinks <sup>†</sup> General behaviour <sup>†</sup> Repetitive behaviour  Difficulties with child <sup>†</sup> Illness <sup>†</sup> Weights (from PCHR)	(Department of Health, 1989; McCance & Widdowson, 1991)  Repetitive Behaviours Questionnaire (Turner, 1996; Wing, Leekam, Libby, Gould, & Larcombe, 2002)

\* Influenced by Foster, Lader, & Cheesbrough (1997) or developed for the GMBS

\*\* Items relevant to six week infants used

<sup>†</sup> Items developed for the GMBS

**Table 2. Details of cohort of children (n=1029) and mothers (n=1011)**

<b>Variable</b>	<b>No. (%) unless otherwise specified</b>
Recruitment venue	
QEH	654 (63.6)
RVI	334 (32.5)
Other hospital	29 (2.8)
Home	12 (1.2)
Sex	
Male	523 (50.8)
Female	506 (49.2)
Gestation (weeks) (Mean (range))	39 (27-43)
Birth weight (kg) (Mean (range))	3.33 (.84-5.37)
Wage earner in household	
Yes	757 (74.9)
No	236 (23.3)
Missing	18 (1.8)
Owned home	
Yes	559 (55.3)
No	440 (43.5)
Missing	12 (1.2)
Owned car	
Yes	662 (65.5)
No	345 (34.1)
Missing	4 (0.4)
Mother's educational qualifications	
Above GCSE level	237 (23.4)
GCSE level	493 (48.8)
Below GCSE level or none	206 (20.4)
Missing	75 (7.4)

**Table 3. Completion rates of study measures**

Type of data	No. (%)	Range
<b>Weights</b>		
Birth	1029 (100%)	
<i>One or more weights in age band:</i>		
Target age:		
12 days	858 (83%)	10 – 18 days
6 weeks	852 (83%)	4 – <9 weeks
4 calendar months	875 (85%)	9 – <26 weeks
8 calendar months	650 (63%)	26 – <43 weeks
12 calendar months	858 (83%)	43 – <78 weeks
<i>Weight and length/height (age):</i>		
30 months	417 (41%)	
4/5 years (school entry)	724 (70%)	
<b>Health staff forms in PCHR</b>		
Maternity hospital discharge form	633 (61.5)	
Six day visit form	801 (77.8)	
Primary visit form	944 (91.7)	
Edinburgh Postnatal Depression Scale score	792 (76.9)	
<b>Questionnaires</b>		
Birth	1027 (98%)	
6 weeks	832 (81%)	
4 months	762 (74%)	
8 months	675 (65%)	
12 months	636 (62%)	
30 months	492 (48%)	
<b>Health check at 13 months</b>	848 (82.4)	

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**Table 4. Summary of results from GMBS publications to date**

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<b>Topic and reference</b>	<b>Summary of findings</b>
Post natal weight loss (Wright & Parkinson, 2004)	Postnatal weight loss was less than previous studies have shown. Babies who were lightest at birth lost the least weight. Only 26 babies lost more than 10% of their weight, none showing any signs of serious illness.
Early feeding patterns (Casiday, Panter-Brick, Wright, & Parkinson, 2004; Wright, Parkinson, & Scott, 2006)	More frequent feeding in the first week was related to higher weight gain at 6 weeks of age for breast-feeders but not for bottle-feeders. Babies who were fed by both breast and bottles were less likely to continue to be fed by breast at 6 weeks of age than those who received only breast milk.
Weaning (Wright, Drewett, & Parkinson, 2004)	Nearly one quarter of the babies started eating solids before 3 months of age and only 10% started after the previously recommended age of 4 months although few problems were reported by parents. Characteristics associated with early weaning were fast weight gain to age 6 weeks, lower socioeconomic status, the parents' perception that their baby was hungry, and being bottle fed. Babies weaned before 3 months, compared with those weaned after 4 months of age, had increased risk of diarrhoea.
Appetite and weight gain (Wright, Parkinson, & Drewett, 2006a)	Appetite at 6 weeks and 12 months was positively related to weight gain to 12 months, and persuading a child to eat was associated with worse not better weight gain. Children appear to have appetite patterns that determine how well or poorly they eat and grow.
Influence of maternal characteristics on weight gain (Wright, Parkinson, & Drewett, 2006b)	Mothers' characteristics such as their eating behaviour, mood, and social characteristics was not strongly associated with children's weight gain over the first year. Postnatal depression had a significant but transient effect.
Mealtime energy intake and feeding behaviour (Parkinson, Wright, & Drewett, 2004)	Video tape observations were used to identify types of children's feeding behaviour. Energy intake, weight of food eaten and length of time of the meal were also measured. The children who were gaining less weight seemed to be offered and eat the same amount of food as children with normal weight gain but in fact had a lower energy intake. They were also less likely to sit in a high chair throughout the meal.
Diagnosis of borderline iron deficiency (Wright, Kelly, Trail, Parkinson, & Summerfield, 2004)	This study tried to discover how successful various blood markers were at identifying true iron deficiency. Anaemia was usually associated with a response to treatment, but about half the children who responded were not anaemic. Other markers were effective at identifying iron shortage only when two or more were both abnormal. Of the children tested, 13% could be defined as truly iron deficient. The children with low iron levels did not generally show differences in diet, social factors or growth compared to those with normal iron levels.

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The Millennium Cohort Study (MCS) is a nationally representative UK longitudinal study of 18 818 infants born in the United Kingdom. 9.

Plewis I (Ed). *Journal of Social Studies Education Research (JSSER)* (ISSN: 1309-9108) is an international, scholarly open access, peer-reviewed and fully refereed journal focusing on theories, methods and applications in Social Studies Education. As an online-only journal it is devoted to the publication of original, primary research (theoretical and empirical papers) as well as practical applications relating to Social Studies Education.Â It is brought to our attention that a predatory publisher website has using our journalsâ€™ name. Please be careful that <https://jsser.org/index.php/jsser> is the official web site of "Journal of Social Studies Education Research" (JSSER). We have been using only the <https://jsser.org/index.php/jsser> website for article submission and publication. The Gateshead Millennium Study (GMS) began as a prospective study of 1029 infants and their families recruited shortly after birth between June 1999 and May 2000 in Gateshead, an urban district in north east England. Full details of recruitment and measures taken since birth are reported elsewhere [22]. Briefly, all babies born in pre-specified recruiting weeks between June 1999 and May 2000 to Gateshead-resident mothers were eligible to join the study. For the present study, all families who had not previously opted-out from the cohort were sent a letter and information leaflet inviting them to take part.

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