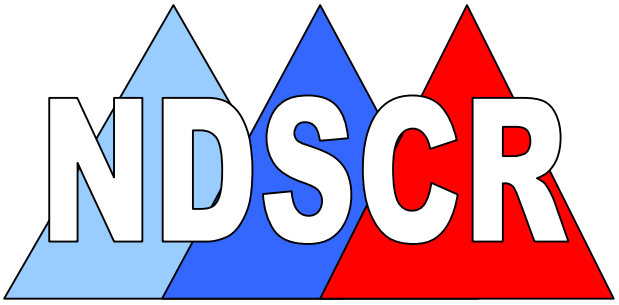
# The National Down Syndrome Cytogenetic Register

# 2005 Annual Report

*(data collection funded by the National Screening Committee)*

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# Foreword

This 2005 annual report contains information about the NDSCR – who we are and what we do as well as detailed data on all reported cases of Down syndrome diagnosed cytogenetically from 1989 to 2005 and cases of Edwards syndrome (trisomy 18) and Patau syndrome (trisomy 13) diagnosed in 2004 and 2005.

We would like to thank all the individuals who contribute to the NDSCR to make it such a valuable resource. We hope that we can continue to count on their collaboration.

Joan Morris – Director NDSCR
Eva Alberman
David Mutton
Haiyan Wu
Annabelle Stapleton
Beth Crane
George Savva

# Executive Summary

- The NDSCR is approved to gain support under Section 60 of the Health and Social Care Act 2001 and has ethical approval from Trent MREC.
- The NDSCR has continued to maintain a near complete record of all Down syndrome diagnoses in England and Wales in 2005.
- In 2005 there were 1,829 diagnoses of Down syndrome, of which 60% were prenatally diagnosed.
- In 2005 there were 731 Down syndrome live births rate, a live birth rate of 1.1 per 1000 (these figures are provisional as there are a large number of missing outcome forms).
- In 2005 there were 165 diagnoses of Patau and 428 diagnoses of Edward's syndrome of which 22 and 40 respectively were live births.
- At present the large number of missing outcomes is unacceptable. We hope that by working with the local screening co-ordinators we will be able to reduce this and prevent it from occurring in future years.
- Data collection by the NDSCR is funded by the National Screening Committee. The NDSCR is working with the regional and local screening co-ordinators to help them fulfil their audit function.

February 2007

# Contents

## Introduction

The NDSCR is based at the Centre for Environmental and Preventive Medicine, Wolfson Institute of Preventive Medicine, Queen Mary's in London. The register is funded by the National Screening Committee.

## Aims of the NDSCR

The NDSCR was started in 1989 and we aim to collect all cytogenetic or DNA reports of trisomies 21, 18 and 13 and their cytogenetic variants occurring in England and Wales. These data can then be used to help:

- monitor the Down syndrome antenatal screening and diagnostic services and the effect they have on the diagnoses of trisomies 18 (Edwards syndrome) and 13 (Patau syndrome);
- provide data on annual numbers of affected births to help those planning for their health, educational and social care;
- provide information for research into the epidemiology of Down, Edwards and Patau syndromes.

## How the NDSCR works

All cytogenetic laboratories in England and Wales collaborate with the NDSCR, and provide, on standard forms, a notification of all prenatal and postnatal diagnoses of Down, Edwards and Patau syndromes. (Appendix A gives a list of all 19 laboratories and a copy of the form used in 2005 is shown in Appendix B). The form is self-copying and has 4 pages. The top copy is sent to the NDSCR by the laboratory, the 2nd (blue) and 3rd (green) are sent to the referring clinician and the 4th (pink) sheet is retained by the laboratory. The clinicians are asked to forward the 3rd (green) copy to the local screening co-ordinator, who is usually based within the Antenatal Unit at referring hospital.

## What data are collected

The notification form contains details of the chromosome analysis and some information on the mother and child, including postcode of residence, mother's age, length of pregnancy, the reason for referral for diagnosis and antenatal screening information. To preserve anonymity, the data do not include full names or addresses, but include enough information to enable us to identify duplicate registrations.

## Data completion and processing

**Follow-up of prenatal diagnoses**
We request the referring physicians to inform us of the pregnancy outcome (birth, termination or miscarriage) and the date and gestational age where a prenatal diagnosis has been made. **No direct contact is ever made with the mothers by the NDSCR.**

The data we have on outcome show that after the prenatal diagnosis of Down syndrome 94% of affected pregnancies are legally terminated and 6% are continued, some miscarrying naturally and some ending as stillbirths. There is often a time lapse before we are informed of these outcomes (see below).

**How the data are stored**
The data are entered onto password-protected computers in locked offices. The full data are accessible only to the research team.

**Validation of data**
In order to ensure high levels of ascertainment, the data are matched with those held by the National Statistics Congenital Anomaly System and some of the Regional Congenital Anomaly Registers. In previous years this has shown the NDSCR data on births to be over 94% complete. Annual lists are sent to the laboratories for them to check that all cases have been registered.

**Data quality**
The Table in Appendix C gives the proportion of missing data on forms for the years 1989 to 2002 combined; and separately for 2003, 2004 and 2005. This is always highest in the most recent data where the clinicians have not yet been contacted. Requests for missing data are sent out regularly. The major problem is to ascertain the outcome of prenatally diagnosed pregnancies, particularly where the referral has been from a centre other than that where the mother was booked. Missing data for variables other than outcome are rare, with the exception of the numbers of previous pregnancies, a question that may not be seen as relevant to the clinicians, although it is important in terms of risk of recurrence. There have been many changes in postcodes since the start of the register and the same is true for health authority definitions. Regular recoding is carried out to keep these up-to-date.

**Speed of reporting**
Although most laboratories provide data within six months of the diagnoses we are hopeful that the involvement of the National Screening Committee and local screening co-ordinators will speed up the provision of outcome data, and provide more complete information on pregnancy history. We are also developing a web site to enable the laboratories in the future to complete the forms on the website if they wish.

## Data confidentiality and informed consent

Personal information held on a computer system is safeguarded by the Data Protection Act 1998 and the NDSCR is registered under this Act.

The Government has made it clear that informed consent is a fundamental principle governing the use of patient identifiable information. However it also recognises that situations arise where informed consent cannot practicably be obtained. Section 60 of the Health and Social Care Act 2001 provides a power to ensure that patient identifiable information needed to support essential NHS activity can be used without the consent of patients. The Act requires that the National Patient Information Advisory Group (PIAG) consider applications to use patient identifiable information without full informed consent. Since 2003, the NDSCR as a part of the British Isles Network of Congenital Anomaly Registers (BINOCAR) has been given permission to operate without informed consent. In 2005 the application of the NDSCR for ethics approval from the Trent multi-centre research ethics committee (MREC), as part of BINOCAR, was also approved.

## How the data are used

**Audit of Down Syndrome Screening**

- All local screening co-ordinators should receive the green copy of the NDSCR form to assist them in their audit requirements.

- Annual reports are produced describing numbers of prenatal and postnatal diagnoses, and the methods of prenatal screening which led to prenatal diagnoses.

- More detailed information is regularly published in medical journals.

**Feedback**

- NDSCR leaflets giving information on the trends in Down syndrome diagnosis are produced annually and distributed to cytogenetic laboratories, local screening co-ordinators and clinicians.

- The NDSCR web site is regularly updated.

**Recent special studies**

**In-house studies**

1) By combining data from the NDSCR and data from registries who are members of EUROCAT (European Concerted Action on Congenital Anomalies and Twins) we are investigating the risk of a woman having a Down syndrome pregnancy given that she has already had a pregnancy affected with trisomy 13 or 18.

2) We have demonstrated that the risk of natural fetal loss in Down syndrome pregnancies increases with the age of the mother more steeply than this risk in chromosomally normal pregnancies.

3) By combining data from the NDSCR and data from registries who are members of BINOCAR we are estimating the prevalence of trisomies 13 and 18 according to maternal age and gestational age.

4) By combining data from the NDSCR with data from registers who are members of BINOCAR and data from the Office for National Statistics, we are evaluating the completeness of these three sources of data.

**Collaborative studies**

1) We are continuing our collaboration with the National Childhood Cancer Register, to estimate the age-specific risk of leukaemia in children with Down syndrome, where we are able to provide denominator data for children on their register.

2) We have helped Dr Jill Ellis of the Institute of Child Health, Great Ormond Street Hospital for Sick Children, with a study of the effect of special diets on the development of children with Down syndrome.

**Future studies**

1) In 2005 we started collecting data on whether women had been offered screening and had accepted or rejected the offer. Once more data is available we will be reporting on the completeness and efficacy of screening for Down syndrome in England and Wales.

A list of publications based on, or using NDSCR data, are given in Appendix D.

**The NDSCR Steering Committee**

A steering committee was established in 2004 to be an independent source for :

a) Monitoring the progress of the register towards its overall objectives;
b) Advising on the strategies for the use and development of the register;
c) Advising on the undertaking and conduct of new research projects;
d) Providing technical advice.

The membership is :

Dr Joan Morris (Chair – Director NDSCR)
Dr Jenny Kurinczuk, National Perinatal Epidemiology Unit.
Professor Charles Rodeck, Royal Free and University College Medical School
Ms Susannah Seyman, The Down's Syndrome Association.
Dr Jonathan Waters, NE London Regional Cytogenetics Laboratory

# The Data in the NDSCR

## Down syndrome cases diagnosed in 2005

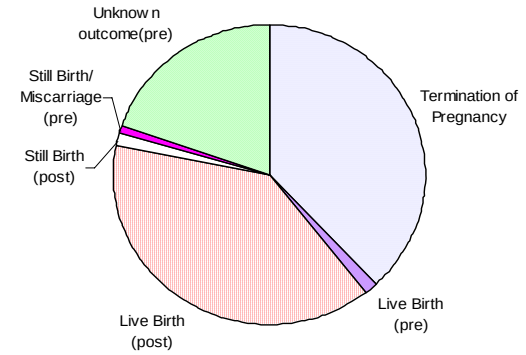
1829 Down syndrome diagnoses were made in 2005, 1100 (60%) prenatally and 729 (40%) postnatally (Table 1 and Figure 1). The outcome of 362 of the prenatal diagnoses is as yet unknown. Assuming that their proportion terminated remains as before 2005, the likely number of Down syndrome live births in England and Wales in 2005 would have been 753 (25+ 706 + 6% of 361), a prevalence of 1.1 per 1000 in the livebirths occurring in England and Wales in 2005.

Table 1: Down syndrome cases diagnosed in 2005* by time of diagnoses and outcome

| | | No. | % |
|---|---|---|---|
| Prenatal | Termination of pregnancy | 697 | 38 |
| | Live Birth | 25 | 1 |
| | Still Birth / Miscarriage | 17 | 1 |
| | Unknown outcome† | 361 | 20 |
| Postnatal | Live Birth | 706 | 39 |
| | Still Birth | 23 | 1 |
| Total | | 1829 | 100 |

* 2005 data are provisional.
† About 6% of those with unknown outcomes are likely to result in a live birth.

Figure 1: Down syndrome diagnoses in 2005*
(pre= prenatal diagnosis, post = postnatal diagnosis)




* 2005 data are provisional.

**Indication for prenatal karyotyping**
The indications for karyotyping reflect the occurrence of different methods of prenatal screening (Figure 2). In 52% of all prenatally diagnosed cases the indication mentioned was an early ultrasound (likely to have been a nuchal translucency (NT) measurement) with or without serum screening, in 8% it was a serum screening test result and in 36% it was an ultrasound at 15 weeks or later.

**Gestational age at prenatal diagnoses**
Of the 1100 prenatally diagnosed cases, 27% were diagnosed before 13 weeks, 65% before 17 weeks and only 8% over 20 weeks gestation (Table 2). This pattern reflects the type of screening that had led to the prenatal diagnosis.

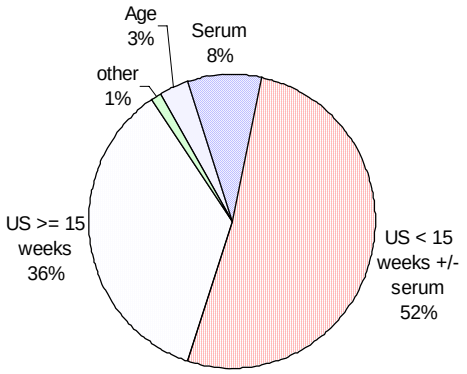
Table 2: Down syndrome cases diagnosed prenatally according to gestational age at diagnoses in 2005*

| Gestational age (wks) | No. | % |
|---|---|---|
| <13 | 295 | 27 |
| 13- | 211 | 19 |
| 15- | 204 | 18 |
| 17- | 216 | 20 |
| 19- | 77 | 7 |
| 21+ | 95 | 9 |
| Total | 1100 | 100 |

* 2005 data are provisional.

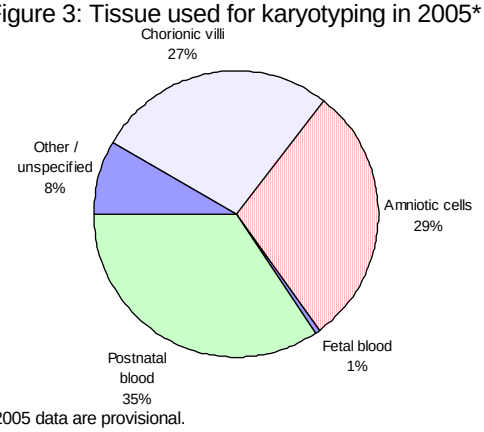
**Tissue used for karyotyping**
Although in 2005 amniocentesis remained the most common method of sampling fetal cells, chorionic villus sampling was almost as common (Figure 3). The median time from CVS sampling to termination of pregnancy was 7 days compared with 9 days for amniocentesis. 91% of all terminations following CVS were within 14 days of the procedure compared with 79% for amniocentesis.

Figure 2: Indication for prenatal karyotyping in 2005*




***2005 data are provisional.**

Figure 3: Tissue used for karyotyping in 2005*




*****2005 data are provisional.

**Maternal age at diagnosis**

The mean age of the mother at the time of diagnosis of fetal Down syndrome was 37 and 64% (989/1550) of the mothers of known age were between 35 and 44 years (Table 3).

Table 3: Down syndrome cases diagnosed in 2005* according to maternal age at diagnosis

| Maternal age (years) | No. | % |
|---|---|---|
| <20 | 28 | 2 |
| 20- | 78 | 4 |
| 25- | 126 | 7 |
| 30- | 292 | 16 |
| 35- | 568 | 31 |
| 40- | 421 | 23 |
| 45+ | 37 | 2 |
| missing | 279 | 15 |
| Total | 1829 | 100 |

* 2005 data are provisional.

## Patau and Edwards syndrome cases diagnosed in 2005

As expected, over 90% of both the Patau and Edwards syndrome diagnoses were made prenatally (Table 4), with only a small proportion of all diagnoses being live births.

Table 4: Patau and Edwards syndrome cases by time of diagnoses and outcome in 2005*.

| | Syndrome | | | |
|---|---|---|---|---|
| | Patau | No.(%) | Edwards | No. (%) |
| Termination (pre) | 94 | (57) | 228 | (53) |
| Live Birth (pre) | 3 | (2) | 2 | (0) |
| Still Birth/ Mis(pre) | 5 | (3) | 11 | (3) |
| NK$^{+}$ outcome(pre) | 42 | (25) | 144 | (34) |
| Live Birth(post) | 19 | (11) | 38 | (9) |
| Still Birth(post) | 2 | (1) | 5 | (1) |
| Total | 165 | (100) | 428 | (100) |

* 2005 data are provisional; $^{+}$ NK: unknown
pre: prenatal diagnosis; post: postnatal diagnosis

The main indications for karyotyping were an ultrasound scan after 15 weeks (around one half) or an early ultrasound (likely to have been an NT measurement) with or without serum screening (around one third) (Table 5).

Table 5: Prenatally diagnosed Patau and Edwards syndrome cases in 2005: Percent of different indications for karyotyping

| Indication for Karyotyping | Syndrome | |
|---|---|---|
| | Patau (%) | Edwards (%) |
| Serum screening alone | 2 | 4 |
| Ultrasound < 15 weeks +/- serum | 39 | 38 |
| Ultrasound 15+ weeks | 56 | 57 |
| Maternal age alone | 2 | 3 |
| Other | 1 | 0 |
| Total | 100 | 100 |

* 2005 data are provisional.

## Regional differences in cases diagnosed in 2005

Table 6 shows the patterns of diagnoses of Down syndrome across England and Wales, according to the mothers region of residence. The proportion of cases diagnosed prenatally varies from 45% in North East GRO to 70% in East of England GRO. Women in the regions with a higher proportion of referrals due to an ultrasound scan before 15 weeks (probably nuchal translucency measures in the first trimester) were more likely to have had a CVS than an amniocentesis.

## Trends over time in Down syndrome Diagnoses

Since the register started collecting data on 1st January 1989 the total number of Down syndrome diagnoses has increased steadily partly due to increasing maternal age and partly because of the increase in prenatal diagnosis. The proportion diagnosed prenatally has risen from 30% in 1989 to 60% in 2005, and the numbers from 321 to 1084 in 2005. (Table 7 and Figure 4) Since the rate of natural fetal loss in Down syndrome is very high, the potential losses in those diagnosed and subsequently terminated early must be adjusted for before looking at the maternal age-related risk and having a Down syndrome birth. When this is done it is evident that although the numbers of Down syndrome diagnoses are rising annually, the maternal age-related risk of having a Down syndrome birth has remained constant since 1989.

There was an increase in the proportion of mentions of a serum test only as an indication for karyotyping from only 6% in 1989 to just under 40% from 1993 to 1996 (Table 8). This proportion then decreased with the introduction of nuchal translucency measurements as a screening test. In 2005 a serum test only was mentioned as an indication for prenatal diagnosis in 8%, with 52% mentioning an ultrasound before 15 weeks (with or without serum screening. The use of maternal age alone as an indication for karyotyping is decreasing steadily, and in 2005 it was given as an indication in only 3% of prenatal diagnoses.

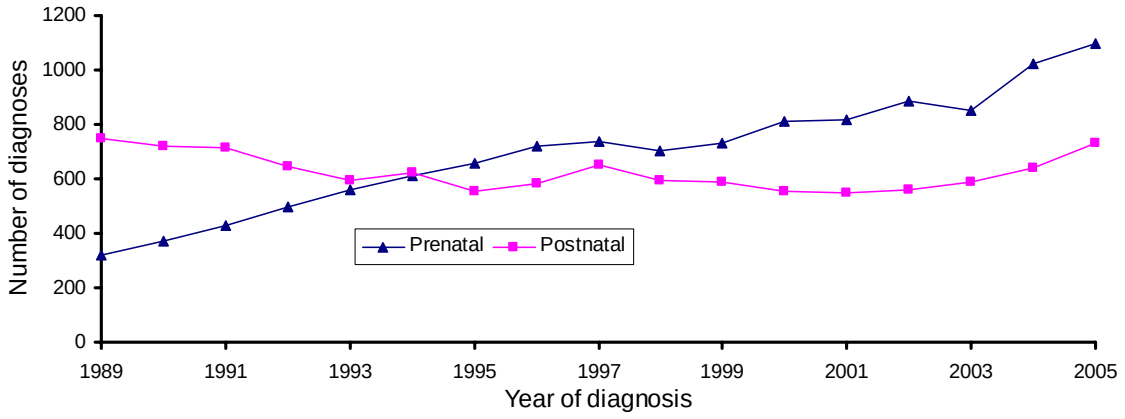
As the screening tests are being done at earlier gestations, an increasing number of women are having chorionic villus sampling (CVS) instead of amniocentesis, the ratios being 18% CVS to 77% amniocentesis in 1989, and 46% to 50% respectively in 2005. (Table 8)

Table 6: Down syndrome diagnoses in 2005 according to Government Regional Office (GRO)*

| Government Regional Office | No. of diagnoses | % of prenatal diagnoses | % of Indication for Karyotyping | | | | % of tissue sampled | |
|---|---|---|---|---|---|---|---|---|
| | | | Serum | Ultrasound <15 weeks +/- serum | Ultrasound 15+ weeks | Age only reason | CVS | Amnio |
| North East | 55 | 45 | 16 | 28 | 48 | 8 | 14 | 71 |
| North West | 199 | 47 | 7 | 37 | 44 | 11 | 22 | 74 |
| Yorkshire and the Humber | 118 | 51 | 33 | 33 | 28 | 5 | 31 | 69 |
| East Midlands | 125 | 57 | 12 | 47 | 34 | 6 | 39 | 59 |
| West Midlands | 172 | 60 | 23 | 36 | 35 | 4 | 25 | 72 |
| East of England | 182 | 70 | 7 | 50 | 43 | 0 | 50 | 48 |
| London | 359 | 66 | 4 | 69 | 25 | 1 | 64 | 33 |
| South East | 299 | 63 | 1 | 66 | 30 | 2 | 59 | 38 |
| South West | 161 | 63 | 4 | 48 | 44 | 2 | 47 | 47 |
| Wales | 91 | 59 | 10 | 39 | 45 | 6 | 26 | 68 |
| Unknown | 68 | 57 | 0 | 39 | 55 | 5 | 58 | 37 |
| Total | 1,829 | 60 | 8 | 52 | 36 | 3 | 46 | 50 |

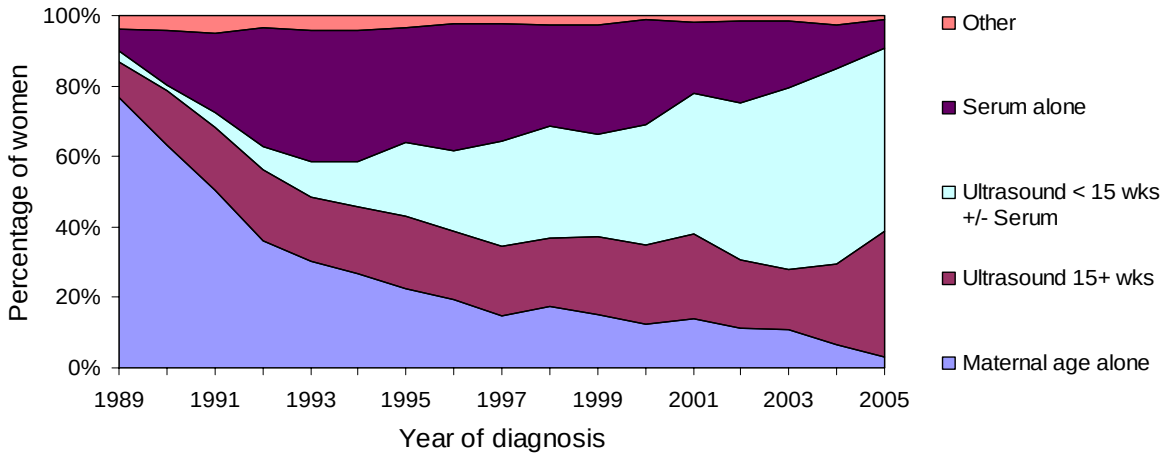
* 2005 data are provisional.

Figure 4: The number of prenatal and postnatal diagnoses according to year of diagnosis




2005 data are provisional.

Figure 5: Indication for karyotyping according to year of diagnosis




2005 data are provisional.

Table 7: Down syndrome diagnoses and outcomes in England and Wales from 1989 to 2005*

| Year | No. diagnoses | % prenatal | No. liveborn | No. TOP | No. Misc[+]/ Still | No. Unknown outcome |
|---|---|---|---|---|---|---|
| 1989 | 1067 | 30 | 750 | 293 | 16 | 8 |
| 1990 | 1095 | 34 | 738 | 328 | 17 | 12 |
| 1991 | 1144 | 38 | 735 | 369 | 31 | 9 |
| 1992 | 1146 | 44 | 662 | 442 | 24 | 18 |
| 1993 | 1155 | 48 | 622 | 507 | 18 | 8 |
| 1994 | 1234 | 50 | 638 | 542 | 29 | 25 |
| 1995 | 1214 | 54 | 579 | 578 | 32 | 25 |
| 1996 | 1304 | 55 | 606 | 651 | 31 | 16 |
| 1997 | 1390 | 53 | 667 | 658 | 40 | 25 |
| 1998 | 1297 | 54 | 632 | 609 | 21 | 35 |
| 1999 | 1315 | 55 | 606 | 642 | 31 | 36 |
| 2000 | 1365 | 59 | 591 | 686 | 23 | 65 |
| 2001 | 1365 | 60 | 571 | 666 | 30 | 98 |
| 2002 | 1448 | 61 | 590 | 686 | 41 | 131 |
| 2003 | 1441 | 59 | 625 | 657 | 31 | 127 |
| 2004 | 1666 | 61 | 661 | 697 | 59 | 249 |
| 2005 | 1829 | 60 | 731 | 697 | 40 | 361 |
| Total | 22475 | 52 | 11004 | 9708 | 514 | 1248 |

[+] Only miscarriages after prenatal diagnosis are included.
* 2005 data are provisional.

Table 8: Down syndrome prenatal diagnoses 1989 to 2005*

| Year | No. of prenatal diagnoses | % of Indication for Karyotyping | | | | Median gestational age (wks) | % of tissue sampled | |
|---|---|---|---|---|---|---|---|---|
| | | Serum | Ultrasound <15 weeks +/- serum | Ultrasound 15+ weeks | Age only reason | | CVS | Amnio |
| 1989 | 321 | 6 | 3 | 10 | 77 | 16 | 18 | 77 |
| 1990 | 374 | 16 | 2 | 15 | 63 | 16 | 16 | 76 |
| 1991 | 430 | 23 | 4 | 18 | 50 | 17 | 15 | 73 |
| 1992 | 500 | 34 | 7 | 20 | 36 | 17 | 11 | 79 |
| 1993 | 558 | 39 | 10 | 18 | 30 | 17 | 17 | 77 |
| 1994 | 613 | 39 | 13 | 19 | 27 | 17 | 23 | 69 |
| 1995 | 660 | 35 | 21 | 21 | 22 | 16 | 25 | 69 |
| 1996 | 721 | 37 | 23 | 19 | 19 | 16 | 30 | 65 |
| 1997 | 739 | 35 | 30 | 20 | 15 | 16 | 35 | 61 |
| 1998 | 704 | 30 | 32 | 19 | 18 | 16 | 35 | 61 |
| 1999 | 729 | 32 | 29 | 22 | 15 | 16 | 33 | 60 |
| 2000 | 811 | 31 | 34 | 23 | 12 | 16 | 37 | 59 |
| 2001 | 819 | 20 | 40 | 24 | 14 | 15 | 45 | 52 |
| 2002 | 888 | 23 | 44 | 19 | 11 | 15 | 43 | 55 |
| 2003 | 850 | 19 | 52 | 17 | 11 | 15 | 47 | 52 |
| 2004 | 1024 | 12 | 56 | 23 | 7 | 15 | 47 | 51 |
| 2005* | 1100 | 8 | 52 | 36 | 3 | 15 | 46 | 50 |

* 2005 data are provisional.

## Appendix A

List of Cytogenetic Laboratories in England and Wales

1. Northern Genetics Service
2. Central Manchester and Manchester Children's Hospital
3. Cheshire and Merseyside Genetics Service
4. Yorkshire Regional Genetics Service
5. North Trent Genetics Service
6. Nottingham Genetics Service
7. Leicestershire Genetics Centre
8. West Midlands Regional Genetics Service
9. Oxford Regional Genetics Service
10. East Anglia Regional Genetics Service
11. Norwich Molecular and Cytogenetics Service
12. South Western Regional Genetics Service
13. NW Thames Regional Genetics Service
14. NE Thames Regional Genetics Service
15. SW Thames Regional Genetics Centre
16. Guy's and St Thomas' Hospital NHS Trust
17. Wessex Clinical Genetics and Laboratory Service
18. Cardiff, Wales
19. TDL Genetics (Cytogenetics Services up till 20/02/04)

## Appendix B

**Data Completeness**

The following table shows the completeness of the different data items for the years 1989 to 2002, 2003, 2004 and 2005. We are still following up the missing data for 2003 and 2004. The data from 1989 to 2002 are included for comparison purposes to demonstrate the levels we are aiming to achieve for the 2003, 2004 and 2005 data.

Table B1: Completeness of data from 1989 to 2005*

| | Percentage complete | | | |
|---|---|---|---|---|
| Data Item | 1989-2002 | 2003 | 2004 | 2005* |
| Reason for referral for karyotyping | 100 | 100 | 100 | 97 |
| Type of tissue karyotyped | 100 | 100 | 99 | 95 |
| Sex of fetus (some DNA based diagnoses such as FISH and q-PCR do not include sex chromosome analysis) | 100 | 98 | 97 | 97 |
| Maternal age | 97 | 92 | 91 | 85 |
| Gestational age at sample for prenatal diagnosis | 100 | 100 | 100 | 100 |
| Outcome of pregnancy† | 97 | 90 | 85 | 80 |
| Gestational age at outcome for prenatal diagnosis | 84 | 70 | 67 | 56 |
| Number of previous pregnancies | 68 | 64 | 64 | 55 |
| Post Codes (some information) | 92 | 97 | 92 | 89 |
| (complete postcodes) | 84 | 89 | 90 | 87 |

* 2005 data are provisional.
† A large proportion of the missing outcomes are from one single large private cytogenetic laboratory in London, which analyses samples from women throughout the South East of England. Excluding this lab this percentage complete would be 97%, 96%, 94% and 88% respectively.

## Appendix C

**Form in 2005**

Reference No. 7234 NDSCR |___|___|___|___|___|

# NATIONAL DOWN SYNDROME CYTOGENETIC REGISTER

NOW INCLUDING TRISOMIES 13 AND 18 *(In collaboration with the National Screening Committee)*

**LABORATORY: PLEASE RETURN THIS FORM TO:** **(Please send blue and green copies to the referring clinician)**

Joan Morris, Wolfson Institute of Preventive Medicine, Barts and the London, Charterhouse Square, London, EC1M 6BQ
Telephone: 0207 882 6220 Fax: 0207 882 6221 Website: http://www.wolfson.qmul.ac.uk/ndscr/

## PLEASE ENTER CASE DETAILS AND TICK APPROPRIATE BOXES

Laboratory ID |___|___| PLEASE INCLUDE TRISOMIES 13 & 18

Specimen ID |___|___|___|___|___|___|___|___|___|

Karyotype .....

### STAGE AT DIAGNOSIS

Prenatal |___| Postnatal |___| After miscarriage |___|

### INDICATION FOR KARYOTYPE

Screen +ve |___| Mat age alone |___| Postnatal signs |___|

Other referral reasons: .....

(e.g. anxiety, history, ultrasound markers, etc.) .....

Confirmation of previous diagnosis |___|

ID |___|___|___|___|___|___|___|___|

### SCREENING TEST (both positive and negative results)

Offered |__| Not offered |__|

Accepted |__| Declined |__| >20 weeks |__| other |__|

Risk 1 in ..... Test result: +ve |__| -ve |__|

Please tick all markers measured

| 1st trimester | | 2nd trimester | |
|---|---|---|---|
| NT | |___| | AFP | |___| |
| Papp-A | |___| | uE3 | |___| |
| Free ß-hCG | |___| | hCG (total or freeß) | |___| |
| | | Inhibin-A | |___| |

If other combination, please specify.....

### CYTOGENETICS

| Tissue | | Method of karyotyping | |
|---|---|---|---|
| CVS | |___| | Full | |___| |
| Amniotic Fluid | |___| | PCR | |___| |
| Fetal Blood | |___| | FISH | |___| |
| Postnatal Blood | |___| | | |
| Skin | |___| | | |
| Placenta | |___| | Other: ..... | |

D D M M Y Y

Date sample taken |___|___|___|___|___|___|

Date of mother's LMP |___|___|___|___|___|___|

Gestation when sample taken |___|___| wks

### FOR AUDIT PURPOSES PLEASE COMPLETE

Mother's hospital ID |___|___|___|___|___|___|___|___|___|___|

First 3 letters of mother's surname |___|___|___| Initial |___|

Mother's NHS No. |___|___|___|___|___|___|___|___|___|___|

Infant's hospital ID |___|___|___|___|___|___|___|___|___|___|

D D M M Y Y age

Mother's date of birth |___|___|___|___|___|___| |___|___|
(age at testing)

Father's date of birth |___|___|___|___|___|___| |___|___|
(age at testing)

### OUTCOME

Termination |___| Miscarriage |___| Stillborn |___| Liveborn |___|

D D M M Y Y

Date of outcome/ termination/ birth |___|___|___|___|___|___|

Gestation at outcome |___|___| wks

Infant's birth weight |___|___|___|___| gms

Please specify consultant and hospital providing pre/postnatal care

.....

If terminated or delivered elsewhere, please specify hospital:

.....

Number of foetuses / babies in this pregnancy |___|

Sex/ outcome of unaffected twin, triplet, etc.

.....

Number of previous pregnancies: (not including this pregnancy)

Termination |___| Miscarriage |___| Stillborn |___| Liveborn |___|

Previous anomalies (number): Trisomy 21 |___| 18 |___| 13 |___|

Other chrom. anomaly (spec.) .....

If previous anomaly, please specify outcome .....

Mother's usual town of residence:

.....

Postcode |___|___|___|___| |___|___|___| PCT |___|___|___|

Note: (e.g. condition of infant, previous family history, fertility problems, etc.)

.....

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(Please continue overleaf)

### FOR OFFICE USE ONLY

Reference No. 7234 NDSCR |___|___|___|___|___|

Laboratory |___|___| Trisomy 21 18 13 pren/ postn/ misc

Specimen ID |___|___|___|___|___|___|___|___|

## Appendix D

**NDSCR Publications**


1. Mutton DE, Alberman E, Ide R, Bobrow M. Results of first year (1989) of a national register of Down's syndrome in England and Wales. *BMJ* 1991; **303**:1295-7
2. Mutton DE, Ide R, Alberman E, Bobrow M. Analysis of National Register of Down's syndrome in England and Wales: trends in prenatal diagnosis. *BMJ* 1993; **306**: 431-2.
3. Morris JK, Mutton DE, Ide R, Alberman E, Bobrow M. Monitoring trends in prenatal diagnosis of Down's syndrome in England and Wales, 1989-1992. *J Med Screen* 1994; **1:** 233 -7.
4. Alberman E, Mutton D, Ide R, Nicholson A, Bobrow M. Down's syndrome births and pregnancy terminations in 1989 to 1993: preliminary findings. *Br J Obstet Gynaecol* 1995; **102**; 445-7.
5. Huang T, Watts HC, Wald NJ, Morris JK, Mutton D, Alberman E. Reliability of statistics on DS notifications. *J Med Screen* 1997; **4**: 94-97. Subsequent letter in same journal.
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7. Smith-Bindman R, Waters J, Mutton D, Alberman E. Trends in the effectiveness and efficiency of prenatal Down syndrome (DS) screening in England and Wales, 1989-1999. *J Med Genet* 2001: Supplement 1 SP33.
8. Mutton DE, Alberman ED, Hook EB. (The National Down Syndrome Cytogenetic Register and the Association of Clinical Cytogeneticists) Cytogenetic and epidemiological findings in Down syndrome: 1993. *J Med Genet* 1996; **33**: 387-394.
9. Hook EB, Mutton DE, Ide R, Alberman ED, Bobrow M. The natural history of Down syndrome conceptuses diagnosed prenatally which are not electively terminated. *Am J Hum Genet* 1995; **57**: 875-881
10. Morris JK, Wald NJ, Watt HC. Fetal loss in Down's syndrome pregnancies. *Prenat Diagn* 1999; **19**:142-145
11. Morris JK, Alberman E, Mutton D. Is there evidence of clustering in Down syndrome? *Int J Epidem* 1998; **27**: 495-498.
12. Mutton D, Bunch K, Draper G, Alberman E. Children's cancer and Down syndrome. Abstract in *J Med Genet* 1997; **34**: Supplement 1, S65.
13. Hook EB, Cross PK, Mutton DE. Female predominance (low sex ratio) in 47, +21 mosaics. *Am J Med Genet* 1999; **84**:316-319.
14. Vrijheid M, Dolk H, Armstrong B, Abramsky L, Bianchi F, Fazarinc I, Garne E, Ide R, Nelen V, Robert E, Scott JES, Stone D, Tenconi R. Chromosomal congenital anomalies and residence near hazardous waste landfill sites. *Lancet* 2002; **359**, 320-3.
15. Morris JK, Mutton DE, Alberman E. Revised estimates of the maternal age specific live birth prevalence of Down's syndrome. *J Med Screen* 2002; **9**,2-6
16. Alberman E. The National Down Syndrome Cytogenetic Register (NDSCR) *J Med Screen* 2002; **9**, 97-98 (Editorial)
17. Morris JK, Wald NJ, Mutton DE, Alberman E. Comparison of models of maternal age-specific risk for Down syndrome live births. *Prenat Diagn* 2003,**23**:252-8.
18. Smith-Bindman R, Chu P, Bacchetti P, Waters JJ, Mutton D, Alberman E. Prenatal screening for Down syndrome in England and Wales and population-based birth outcomes. *Am J Obstet Gynecol* 2003; **189(4):** 980-5.
19. Alberman E, Huttly W, Hennessy E, McIntosh A. The use of record linkage for auditing the uptake and outcome of prenatal serum screening and prenatal diagnostic tests for Down syndrome. *Prenat Diagn* 2003 Oct; **23(10):** 801-6.
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21. Morris JK, de Vigan C, Mutton DE, Alberman E. Risk of a Down syndrome live birth in women of 45 years of age and older. *Prenat Diagn* 2005; **25**:275-8.
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23. Savva GM, Morris JK, Mutton DE, Alberman E. Maternal age-specific fetal loss rates in Down syndrome pregnancies. *Prenat Diagn*. 2006;**26**:499-504.
24. Crane B, Morris JK. Changes in maternal age in England and Wales – Implications for Down syndrome. Down syndrome research and practice 2006;**10**: 41-43.
25. Morris JK, Mutton DE, Alberman E. The proportions of Down's syndrome pregnancies detected prenatally in England and Wales from 1989 to 2004. *J Med Screen* 2006;13:163-5.


## Appendix E

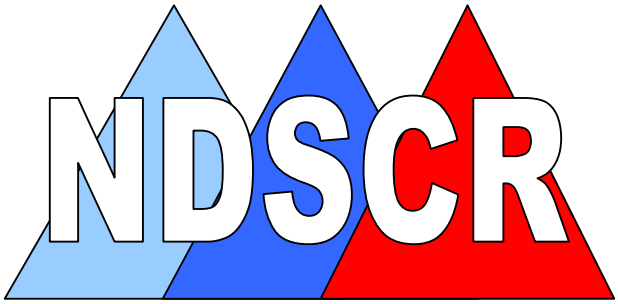
**Other Useful Websites:**

DS Medical Interest Group
www.dsmig.org.uk

Down syndrome Association, UK
www.dsa-uk.com

Down Syndrome Health Issues
www.ds-health.com

Association of Clinical Cytogeneticists
www.cytogenetics.org.uk




*(data collection funded by the National Screening Committee)*

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