Second report of the
Congenital Anomaly Register for Oxfordshire, Berkshire and Buckinghamshire
(CAROBB)
Births in 2005-2008
with Oxford births 1991-2008

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The report can be accessed at website: www.npeu.ox.ac.uk/carobb/

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Confidentiality and policy on non-disclosure of small numbers

As a member of BINOCAR (British Isles Network of Congenital Anomaly Registers), CAROBB has the approval of the Patient Information Advisory Group (PIAG) which is administered by the National Information Governance Board and also the Trent MREC to collect identifiable information without explicit consent from individuals registered. See documentation in Appendix 5.

We have followed the advice of the Office for National Statistics concerning the disclosure of small numbers (www.statistics.gov.uk/about/Consultations/disclosure.asp).

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Part 1 - Introduction and Summary

Introduction

In April 2003 the Department of Health awarded funding for the expansion and development of the Oxford Congenital Anomaly Register (OXCAR), for research purposes. A new population-based register, covering the three counties which make up the former Thames Valley Strategic Health Authority and now are the northern half of the South Central Strategic Health Authority was formed, called the Congenital Anomaly Register for Oxfordshire, Berkshire and Buckinghamshire (CAROBB). CAROBB is based at the National Perinatal Epidemiology Unit, University of Oxford. This is the second full report from CAROBB and provides population based information on congenital anomalies affecting births between 2005 and 2008 to mothers resident in the three counties.

Information on cases with an OX postcode and booked for delivery at the John Radcliffe Hospital is available from 1991 and is provided in Appendix 1.

The principal objectives of CAROBB

- Provide data for research on the aetiology and natural history of congenital anomalies to enable better advice based on accurate information to be given to parents and prospective parents.
- Enable the evaluation and monitoring of new invasive and non-invasive prenatal diagnostic tests and screening programmes.
- Provide data for health care policies and planning.
- Provide data to investigate clusters of abnormalities and putative teratogens by the monitoring of rates over time and of population trends such as maternal age, ethnicity, and health inequalities.
- Improve ascertainment to the National Congenital Anomaly System (NCAS) and to European Congenital Anomaly Surveillance (EUROCAT, www.eurocat.ulster.ac.uk).

The population studied for this report

- This report has information on congenital anomalies suspected and/or confirmed in fetuses / babies born to mothers resident in the three counties of Thames Valley (Oxfordshire, Berkshire and Buckinghamshire), the geographical area of CAROBB.
- Data are provided on cases notified to CAROBB by December 2009 and with a date of birth/delivery 2005-2008 inclusive. For this report a ‘case’ is a birth with a suspected and / or confirmed congenital anomaly notified to CAROBB. The term ‘birth’ (unless otherwise stated) is used to cover all pregnancies (from 10 weeks gestation) ending in live birth, stillbirth, miscarriage/intrauterine death and termination of pregnancy for fetal anomaly (TOPFA).
- Denominator data are provided by the Office for National Statistics and include only live births and stillbirths of 24 weeks gestation or more. There were 116,439 total births in Thames Valley between 2005 and 2008.
- The proportion of births with congenital anomalies are given as a percentage of total births or as a rate per 1,000 total births.

The report gives data on anomalies, their rate and, where appropriate their prenatal detection, in Oxfordshire, Berkshire and Buckinghamshire (Thames Valley). Information on cases by the hospital at which the mother booked for delivery can be provided and will be presented at the individual hospitals.

Definition and coding of congenital anomalies

The definition of congenital anomaly, used by CAROBB is ‘a structural or functional anomaly, presumed to be of prenatal origin’. All anomalies present at birth or diagnosed after birth are recorded. Prenatally suspected anomalies including ultrasound ‘soft markers’ (normal variants) are also recorded including those occurring in cases subsequently confirmed to be structurally normal babies. In line with other British and European registers each anomaly is coded using the ICD10 classification with the BPA extensions where appropriate.

Summary

- From January 2005 to December 2008 there were 2295 births with a confirmed congenital anomaly (2% of all births), to mothers resident in Thames Valley, notified to CAROBB.
- In 51% of these births there was some prenatal suspicion of congenital anomaly.
- Six hundred and ninety six births (30% of all births notified with a congenital anomaly) were terminations of pregnancy for fetal anomaly.
- More male than female births were affected by a congenital anomaly, M:F = 1.4:1
- We recognise that there is under ascertainment of postnatally diagnosed anomalies to CAROBB, particularly cardiac anomalies diagnosed after the mother has been discharged from the maternity hospital and those not requiring surgery under the age of one year. Births to mothers resident in Thames Valley but delivering outside the CAROBB area (e.g. in London) may not at present be notified.
- There were 307 births with Down's syndrome;172 (56%) were prenatally diagnosed. A high risk first trimester screening test result was the most common reason for prenatal diagnosis. Taking into account those cases with a positive Down's syndrome screening test or suspicion on ultrasound scan before 25 weeks gestation where karyotyping was declined, the potential prenatal detection rate was 63%.
- Research using CAROBB (and previously OXCAR) data is reported in Appendices 3 and 4.

Main Aims for 2009/10

- To improve ascertainment of specific congenital anomalies, particularly for those cases diagnosed out of the CAROBB area.
- To explore ways to improve reporting of clusters and trends for specific anomalies.

Table 1 Prenatal detection of specific congenital anomalies in Thames Valley, 2005 - 2008

Anomaly	Test performed	Number of pregnancies notified with prenatal suspicion of anomaly (not incl. false positive diagnoses)	Number of cases notified with anomaly confirmed at birth	Prevalence per 1,000 total births	Prenatal detection rate[3]
Isolated neural tube defects	Ultrasound Scanning +/- MS AFP[1]	101	106	0.9	95%
Isolated cardiac anomaly	Ultrasound scanning	100	283	2.4[2]	35%
Isolated cleft lip +/- palate	Ultrasound scanning	53	82	0.7	65%
Down's Syndrome	Karyotyping, screening tests, ultrasound scanning	202 (172 karyotyped)	307	2.6	63% (56%[3])
Isolated diaphragmatic hernia	Ultrasound scanning	15 (14 with correct diagnosis)	22	0.2	64%
Isolated exomphalos	Ultrasound scanning +/- MS AFP	18	20	0.2	90%
Isolated gastroschisis	Ultrasound scanning +/- MS AFP	41	41	0.4	100%

[1] MS AFP Maternal Serum Alpha Feto Protein screening.
[2] Low prevalence because of low ascertainment of cases diagnosed after birth.
[3] The rates do not give the detection rate for the screening programme

Part 2 - Routine statistics, area covered by CAROBB and outcome of pregnancies

Population and area covered

There were over two million people resident in Thames Valley between 2005 and 2008, with Berkshire having the highest and Oxfordshire the lowest population. The numbers in Table 2 are supplied by the Office for National Statistics.

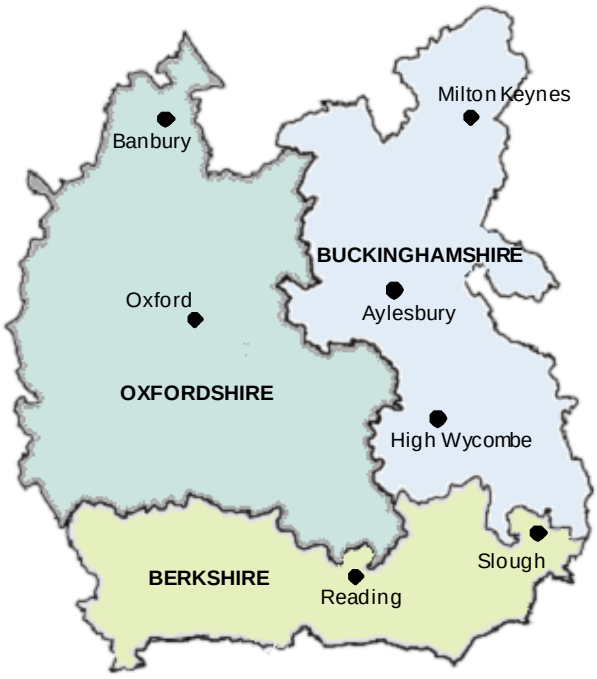
Table 2 Total population covered

	Oxfordshire	Berkshire	Buckinghamshire	Thames Valley
2005	604700	819900	725200	**2149800**
2006	607900	827700	731000	**2166600**
2007	611500	837600	738100	**2187200**
2008	615600	848400	744600	**2208600**

Table 3 Total births (live and stillbirths), by county and year of birth

	Oxfordshire	Berkshire	Buckinghamshire	Thames Valley
2005	7616	10920	8762	**27298**
2006	8028	11391	9276	**28695**
2007	8184	12130	9402	**29716**
2008	8347	12490	9893	**30730**
Total	**32175**	**46931**	**37333**	**116439**

Figure 1 Map of the CAROBB area, Oxfordshire, Berkshire and Buckinghamshire, forming Thames Valley and the northern half of South Central Strategic Health Authority



Total births with congenital anomalies, pre and postnatal diagnosis

Table 4 Number of cases (% of all births) with congenital anomaly*, by year of birth

	Oxfordshire n (%)	Berkshire n (%)	Buckinghamshire n (%)	Thames Valley n (%)
2005	176 (2.3)	154 (1.4)	167 (1.9)	**497 (1.8)**
2006	217 (2.7)	187 (1.6)	183 (2.0)	**587 (1.9)**
2007	220 (2.7)	181 (1.5)	181 (1.9)	**582 (2.0)**
2008	246 (2.9)	189 (1.5)	194 (2.0)	**629 (2.0)**
Total	**859 (2.7%)**	**711 (1.5%)**	**725 (2.0%)**	**2295 (2.0%)**

*including termination of pregnancy for fetal anomaly

There appears to be a lower rate of congenital anomalies in Berkshire. This almost certainly does not reflect a true reduction in prevalence but is probably due to lower ascertainment, partly because more babies with congenital anomalies born to mothers resident in Berkshire are delivered in London (i.e. outside the Thames Valley area). We plan, during the next year, to establish mechanisms to ascertain these cases. The rate in Oxfordshire appears higher and this is probably due to the fact that there are well established practices in place for ascertaining cases because a congenital anomaly register (OXCAR) was established in 1991, whereas in Berkshire and Buckinghamshire these are still being set up.

Table 5 illustrates the number and percentage of cases prenatally and postnatally diagnosed. Twenty- seven percent of cases with a prenatal suspicion of anomaly were apparently normal at birth. Most of these cases were associated with ultrasound 'soft markers'(normal variants) such as choroid plexus cysts.

The percentage of births with a congenital anomaly (2%) in Table 5 differs from that using the data transferred to EUROCAT (1.9%, see Table 7) because some cases are excluded from analysis by EUROCAT (e.g. those cases resulting in miscarriages before 20 weeks gestation).

Table 5 Total births and notifications; number prenatally suspected with and without congenital anomaly at birth and total births with anomalies, by year of birth

Year	2005	2006	2007	2008	Total
Total births	27,298	28,695	29,716	30,730	116,439
Total cases notified to CAROBB*	624	758	725	742	2849
Number of cases notified prenatally (including 'soft markers'/normal variants) (% of total notified)	450 (72%)	563 (74%)	481 (66%)	520 (70)%	2014 (71%)
Number of cases notified prenatally with anomaly confirmed at birth (% of total notified)	324 (52%)	392 (52%)	338 (47%)	409 (55%)	1463 (51%)
Number of cases notified prenatally & considered normal at birth (% of total notified prenatally)	126 (28%)	171 (30%)	143 (30%)	111 (21%)	551 (27%)
Total cases with anomaly at birth, miscarriage or TOPFA (excludes those notified prenatally and lost to follow up) (% of total births)	**497 (1.8%)**	**587 (1.9%)**	**582 (2.0%)**	**629 (2.0%)**	**2295 (2.0%)**

*Including prenatally suspected cases without anomaly present at birth.

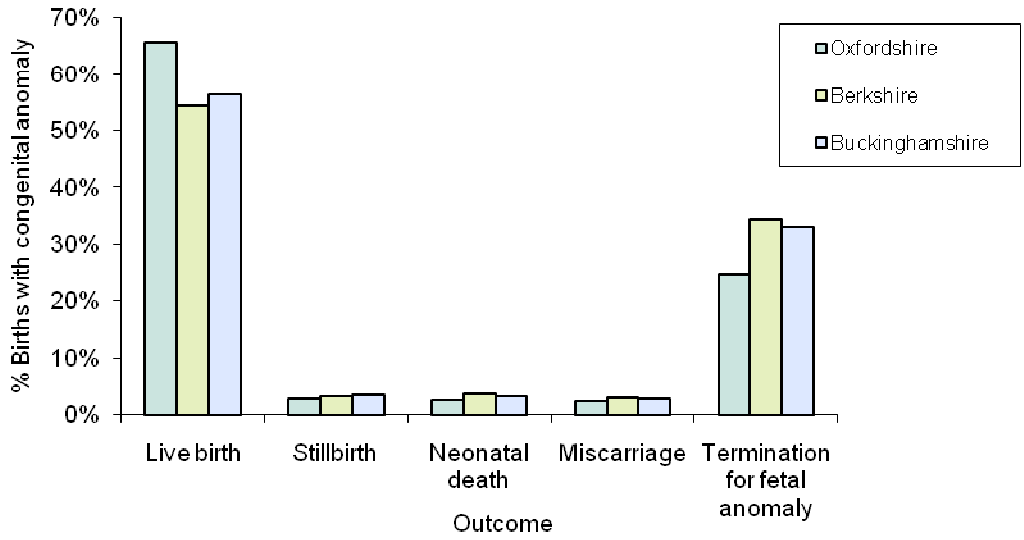
Outcome of pregnancy

Table 6 Outcome of pregnancy of cases notified with congenital anomaly confirmed at birth from 2005 to end 2008, by county (n = 2295)^

	Oxfordshire n (%)	Berkshire n (%)	Buckinghamshire n (%)	Thames Valley n (%)
Live birth	564 (66%)	387 (54%)	409 (56%)	**1360 (59%)**
Neonatal death	22 (3%)	26 (4%)	23 (4%)	**71 (3%)**
Stillbirth	25 (3%)	23 (3%)	26 (3%)	**74 (3%)**
Miscarriage	20 (2%)	22 (3%)	21 (3%)	**63 (3%)**
Termination for fetal anomaly	212 (25%)	244 (34%)	240 (33%)	**696 (30%)**
Not known*	16 (2%)	9 (1%)	6 (1%)	**31 (1%)**
Total notified	**859**	**711**	**725**	**2295**

* pregnancies where the diagnosis was known but the outcome was not known
^percentages may not add up to 100% because of rounding

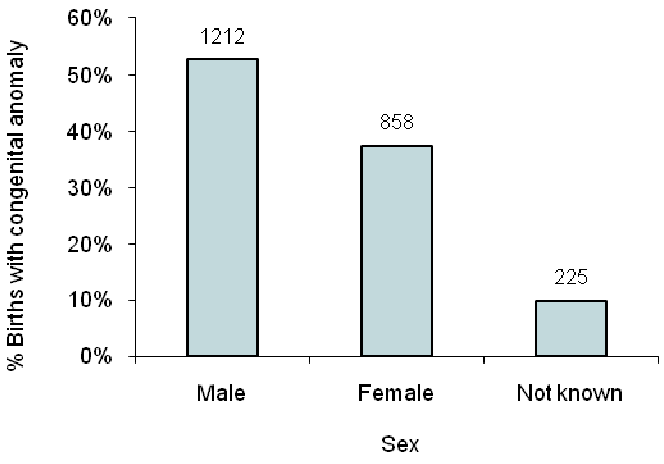
Figure 2 Outcome of pregnancy (percentage of live births, stillbirths, neonatal deaths, miscarriages or terminations of pregnancy) with congenital anomaly, by county, n = 2295



Sex ratio of births with congenital anomalies

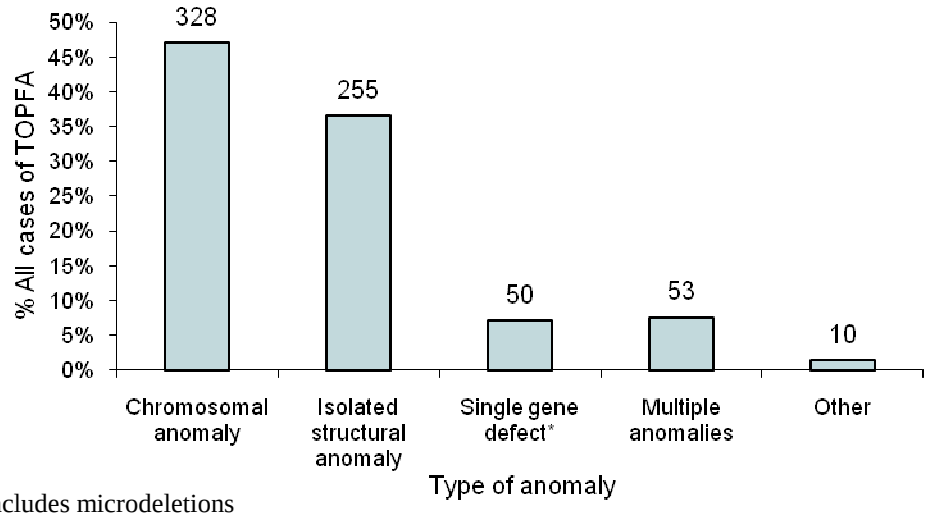
Figure 3 Percentage and number of male and female births with congenital anomaly

Sex ratio of cases with anomaly at birth M:F 1.4:1
(Background rate for all births in England & Wales: M:F 1.05:1.0)



Termination of pregnancy for fetal anomaly (TOPFA)

Figure 4a Percentage and number of cases resulting in TOPFA by type of anomaly, n = 696



*Includes microdeletions

Figure 4b:
TOPFA, chromosome anomalies by type, n = 328

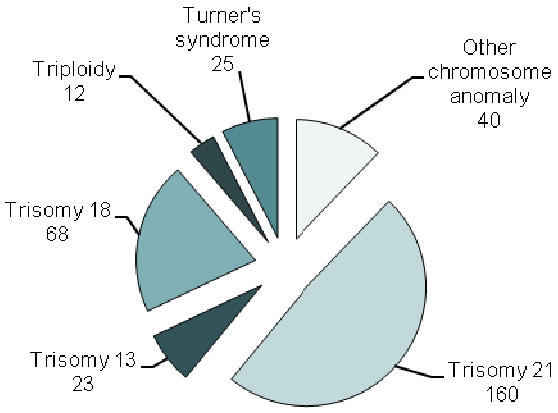


Figure 4c:
TOPFA, isolated anomalies by type, n = 255

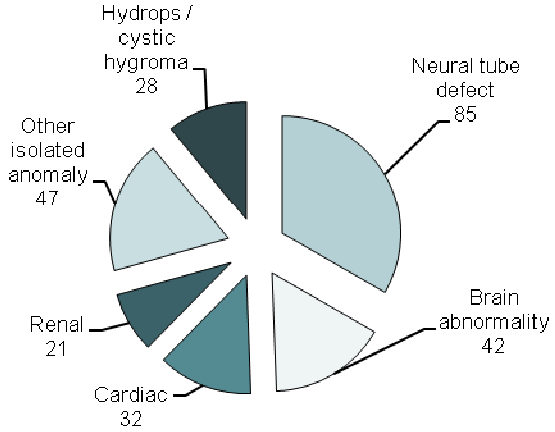
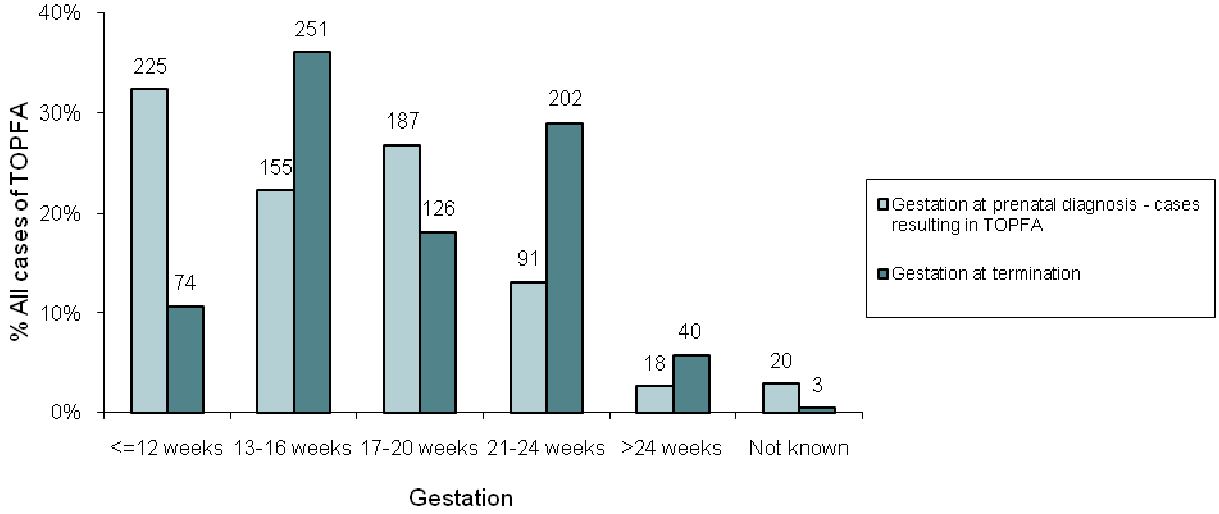


Figure 5 Percentage and number of cases resulting in termination of pregnancy for fetal anomaly (TOPFA), by gestation period at prenatal diagnosis and at termination, n = 696



Part 3 - Rates of congenital anomalies

Table 7 Table of cases and anomalies and rate per 1,000 births using data from CAROBB held by EUROCAT 2005 - 2008 (Total births: 116439)

Please note: *The reason for the lower the rate of births with congenital anomalies than that shown in Table 5 is that not all births notified to CAROBB are transmitted to EUROCAT e.g. miscarriages of less than 20 weeks of gestation.
^Includes cases where a diagnosis was made but the outcome of pregnancy is not known.

Diagnostic Category	ICD 10 code	Live births, stillbirths and fetal deaths >=20weeks (n)	Termination of pregnancy (n)	Including chromosomal anomalies Rate per 1,000 births: Live births, stillbirths, fetal deaths and termination of pregnancy^ (n)	Including chromosomal anomalies Rate per 1,000 births: Live births, stillbirths, fetal deaths and termination of pregnancy (rate)	Excluding chromosomal anomalies Rate per 1,000 births: Live births, stillbirths, fetal deaths and termination of pregnancy (n)	Excluding chromosomal anomalies Rate per 1,000 births: Live births, stillbirths, fetal deaths and termination of pregnancy (rate)
All births with congenital anomalies		**1468**	**656**	**2154**	**18.5**	**1431**	**12.3**
The list below is a list of all anomalies, not individual births. Some births will have more than one anomaly present. An anomaly listed as resulting in termination of pregnancy may be part of a multiple anomaly case.							
Nervous system anomalies	Q00 – Q07	**82**	**173**	**255**	**2.2**	**230**	**2.0**
Neural Tube Defects		20	100	120	1.0	114	1.0
Anencephalus, encephalocoele and similar	Q00 – Q01	9	59	68	0.6	67	0.6
Spina Bifida	Q05	11	41	52	0.4	47	0.4
Hydrocephaly	Q03	32	37	69	0.6	63	0.5
Other		**30**	36	**66**	**0.6**	17	0.1
Congenital heart anomalies	Q20 - Q26	**344**	**78**	**432**	**3.7**	**300**	**2.6**
Ventricular septal defect	Q210	132	10	144	1.2	98	0.8
Atrioventricular septal defect	Q212	28	9	37	0.3	15	0.1
Hypoplastic left heart	Q234	15	17	35	0.3	23	0.2
Coarctation of aorta	Q251	31	<5	34	0.3	27	0.2
Other		138	41	182	1.6	137	1.2
Respiratory anomalies	Q30 – Q34	**53**	**10**	**64**	**0.5**	**51**	**0.4**
Oro-facial clefts	Q35 - Q37	**166**	**24**	**190**	**1.6**	**167**	**1.4**

Digestive system anomalies	Q38 – Q39, Q402, Q408, Q409, Q41 – Q45	**130**	**31**	**161**	**1.4**	**129**	**1.1**
Oesophageal atresia with or without tracheo-oesophagal fistula	Q390 - Q3914	23	<5	27	0.2	21	0.2
Duodenal atresia or stenosis	Q410	13	<5	16	0.1	9	0.1
Hirchspung's disease	Q431	16	<5	16	0.1	14	0.1
Other		78	24	102	0.9	85	0.7
Genital anomalies	Q50 – Q52, Q54 – Q56	**134**	**10**	**144**	**1.2**	**126**	**1.1**
Urinary anomalies	Q60 - Q64, Q794	**180**	**48**	**231**	**2.0**	**197**	**1.7**
Cystic kidney disease	Q61	40	15	57	0.5	55	0.5
Other		140	33	174	1.5	0	0.0
Limb anomalies		**176**	**53**	**229**	**2.0**	**207**	**1.8**
Reduction defects	Q71 – Q73	28	14	42	0.4	40	0.3
Club foot – talipes equinovarus	Q660	78	27	105	0.9	94	0.8
Musculo-skeletal, skeletal dysplasias	Q750 – Q751, Q754 – Q759, Q761 – Q764, Q766 – Q769, Q77 – Q78, Q796 –Q799	**65**	**51**	**116**	**1.0**	**96**	**0.8**
Abdominal wall defects Gastroschisis and Omphalocele	Q792, Q793	**62**	**41**	**106**	**0.9**	**81**	**0.7**
Other anomalies	Q27 – Q28, Q80 – Q85, Q89	**34**	**18**	**52**	**0.4**	**43**	**0.4**
Genetic syndromes & microdeletions	Q87, Q936, D821	**50**	**21**	**71**	**0.6**	**65**	**0.6**
Chromosomal anomalies	Q90 – Q93, Q96 – Q99	**223**	**309**	**543**	**4.7**	**0**	**0.0**
Down's Syndrome (Trisomy 21)	Q90	141	155	300	2.6	0	0.0
Patau syndrome (Trisomy 13)	Q914 – Q917	7	22	30	0.3	0	0.0
Edward syndrome (Trisomy 18)	Q910 – Q913	14	64	80	0.7	0	0.0
Turner's syndrome	Q96	15	25	40	0.3	0	0.0
Other chromosomal		46	43	93	0.8	0	0.0

Part 4 - Information about specific anomalies

1. Open Neural Tube Defects (NTD)

Anencephaly: **Definition:** Total or partial absence of the cranial vault, covering skin and brain tissue.

Encephalocoele: **Definition:** Herniation of the brain and/or meninges through a defect in the skull.

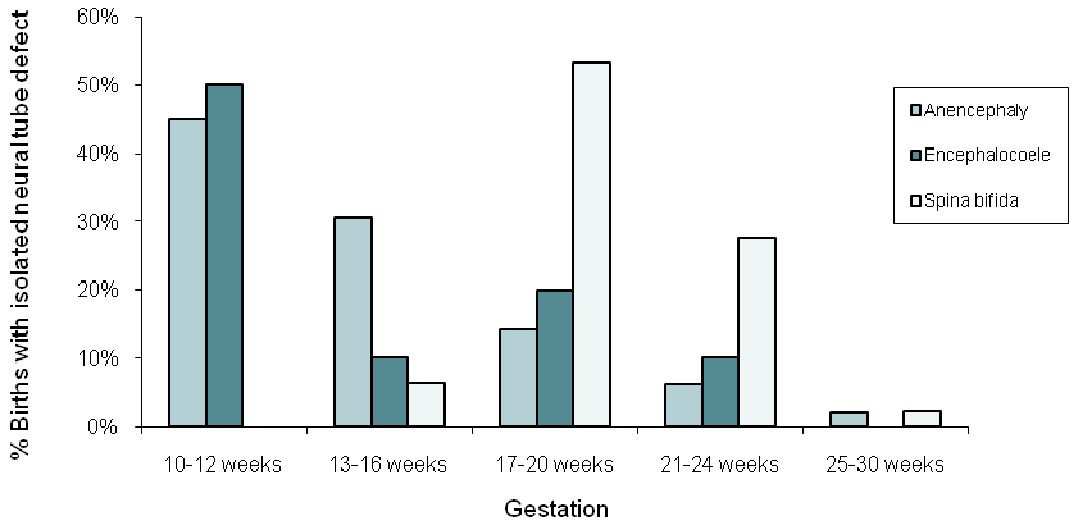
Spina bifida: **Definition:** Non-closure of the spine resulting in herniation or exposure of the spinal cord and /or meninges. Hydrocephaly may or may not be present.

Summary Information

Prenatal Investigation:	Ultrasound scan +/- maternal serum alpha feto protein screening
Rate: **Isolated neural tube defects**	0.9 per 1000 births n = 106
Isolated and non-isolated neural tube defects	1.1 per 1000 births n=123
Prenatal detection rate for isolated cases:	101/106 (95%)
ICD 10 codes:	Q00.0 (anencephaly); Q01.2 (encephalocoele) Q05 – Q05.9 (spina bifida)

Of the 106 isolated cases (49 anencephaly, 10 encephalocoele, 47 spina bifida), 101 were prenatally suspected.

Figure 7 Percentage of isolated Neural Tube Defects diagnosed at different gestational periods



2. Cardiac Anomalies

Definition: Group of anomalies with abnormal structure of the heart.*

Summary information

Prenatal Investigation:	Ultrasound scan
Rate: all notified structural cardiac anomalies isolated and non-isolated cases	3.8# per 1000 n = 441
Prenatal detection rate of isolated cardiac cases <30 weeks	100/283 (35%)
ICD 10 Codes	Q20 – Q26.9

*For a comprehensive description of individual anomalies see Knowles R, Griebsch I, Dezateux C, Brown J, Bull C, Wren C. Newborn screening for congenital heart defects: a systematic review and cost-effectiveness analysis. *Health Technol Assess* 2005;9(44). www.ncchta.org/fullmono/mon944.pdf

#Expected rate 8 per 1,000, also described by Knowles et al.

Figure 8 Percentage and number of births with a cardiac anomaly categorised by type, n=441

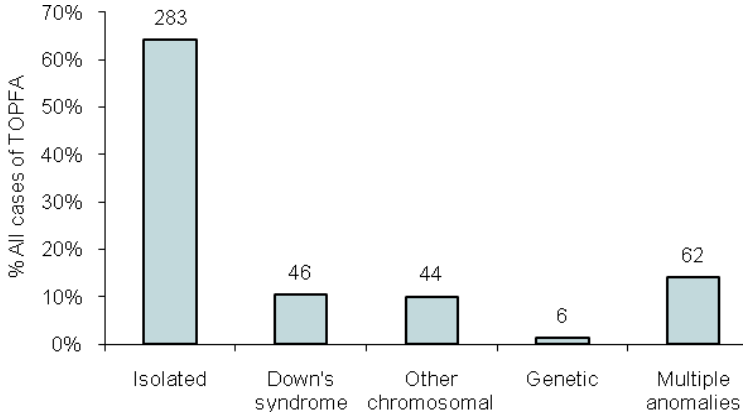
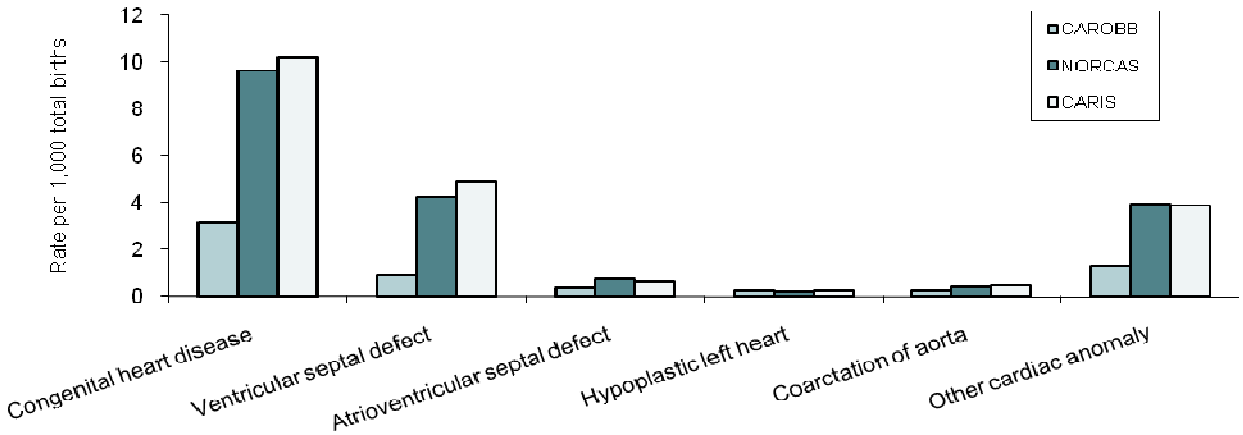


Figure 9 illustrates the rate of cardiac anomalies notified to CAROBB compared to rates in Wales (CARIS, Congenital Anomaly Register and Information Service), and the Northern Region (NorCAS, Northern Congenital Anomaly Survey).The lower than expected rate for cardiac anomalies is clearly due to under-ascertainment. We now have access to an additional in-patient information source at the John Radcliffe Hospital. This has led to some improvement in ascertainment of postnatally diagnosed cases that undergo a surgical procedure since the last report (2005 – 2007). We would now like to improve ascertainment of postnatally diagnosed cases with cardiac anomalies which do not undergo a surgical procedure before the age of 1 year and also improve ascertainment in the other counties. Please contact us on carobb@npeu.ox.ac.uk if you have any ideas on how to improve registration of postnatally diagnosed cardiac cases.

Figure 9 Comparison of rates of cardiac anomalies ascertained by three different UK Congenital Anomaly Registers using EUROCAT data



3. Cleft Lip with or without Cleft Palate (Cleft lip +/- Palate)

Cleft lip: **Definition** - Clefting of the upper lip without clefting of the alveolar ridge and palate.

Cleft lip and palate: **Definition** - Clefting of the upper lip with clefting of the alveolar ridge and palate.

Summary Information

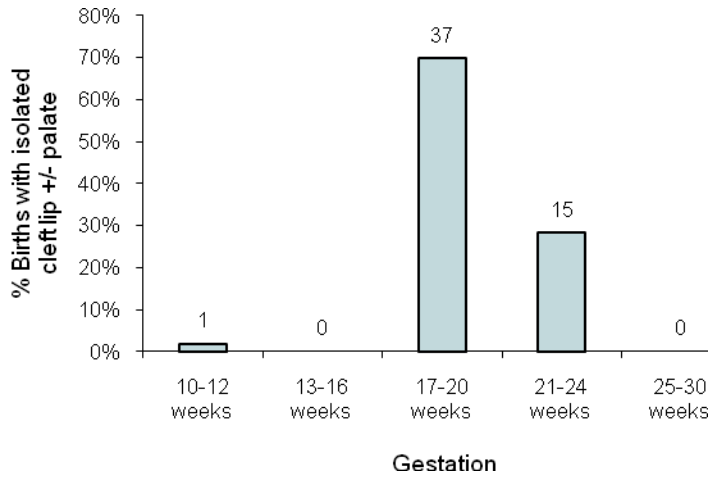
Prenatal Investigation:	Ultrasound scan
Rate: **Isolated cleft lip +/- palate**	0.7 / 1,000 n = 82
Prenatal detection rate:	53 / 82 (65%)
ICD 10 Codes	Q36 – 37.9

We report the prenatal detection of cleft lip with or without cleft palate. It is not possible to visualise isolated cleft palate by ultrasound prenatally. Very minor clefts (forme fruste) have been excluded from this analysis.

There were 82 cases of isolated cleft lip +/- palate of which 53 (65%) were prenatally diagnosed.

There were 29 cases of non-isolated cleft lip +/- cleft palate of which 11 were associated with chromosome anomalies.

Figure 10 Percentage and number of births with isolated Cleft lip +/- palate diagnosed at different gestational age periods, n = 53



4. Diaphragmatic Hernia, Exomphalos and Gastroschisis

a. Diaphragmatic hernia: **Definition -** Herniation of the abdominal organs into the thorax through a defect in the diaphragm.

b. Exomphalos: **Definition -** Herniation of abdominal contents through umbilical insertion and covered by membrane which may or may not remain intact.

c. Gastroschisis: **Definition -** Visceral herniation through an abdominal wall defect lateral to an intact umbilical cord.

Summary information

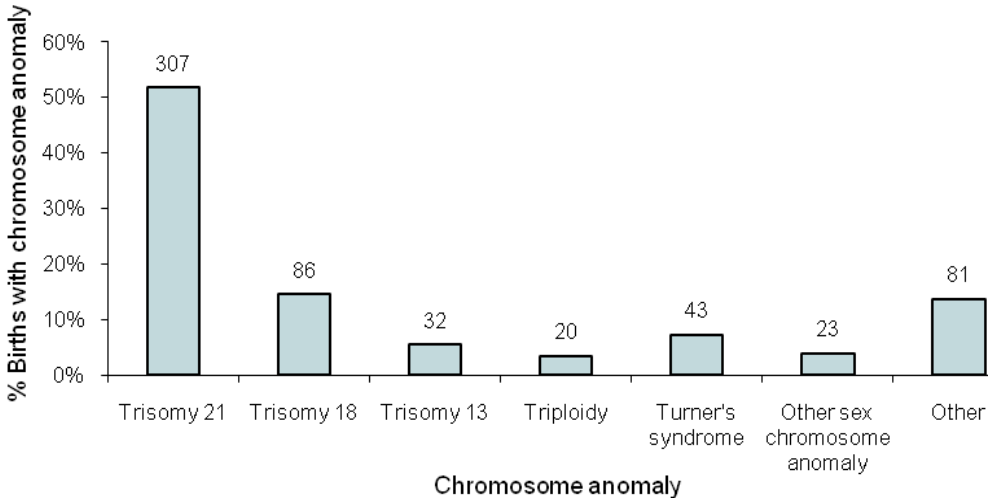
	Diaphragmatic Hernia	Exomphalos	Gastroschisis
Prenatal Investigation	Ultrasound scan	Ultrasound scan +/- maternal serum AFP screening	Ultrasound scan +/- maternal serum AFP screening
Number of isolated cases	22	20	41
Non-isolated cases	11 (eg chromosomal, cardiac and renal anomalies)	45 (eg Trisomy 18, Beckwith-Wiedemann syndrome)	0
Rate:			
Isolated cases	0.2 / 1,000	0.2 / 1,000	0.4 / 1,000
Isolated and non-isolated cases	0.3 /1,000	0.4 / 1,000	0.4 / 1,000
Prenatal detection rate for isolated cases	14/22 (64%)	18/20 (90%)	41/41 (100%)
ICD 10 Codes	Q79.0	Q79.2	Q79.3

There was a high prenatal diagnosis rate for cases with isolated gastroschisis (100%) and for isolated exomphalos (90%). 64% of isolated diaphragmatic hernia cases had a suspicion on scan prenatally. In one of these cases a cystadenomatous malformation of lung was suspected.

It is well recognised that gastroschisis is more common in babies born to younger mothers and that it is more likely to be an isolated lesion compared to both diaphragmatic hernia and exomphalos. All the gastroschisis cases, 67% of diaphragmatic herniae and 31% of exomphalos had isolated lesions in the cases reported to CAROBB and born 2005 – 2008 inclusive. The mean age (range) of mothers babies with gastroschisis was 28 years (17-36 years) compared to 32 years (19-43 years) for isolated exomphalos and 31 years (19-43 years) for isolated diaphragmatic hernia.

5. Chromosome Anomalies

Figure 11 All Chromosome anomalies, percentage of cases and number by chromosome type, n = 592



6. Down's Syndrome (Trisomy 21)

Definition: Additional chromosome 21.

Summary information

Prenatal Investigation:	First and second trimester screening tests. Karyotyping performed because higher risk for Down's syndrome for one of the following reasons: older mother, positive family history, translocation carrier, higher risk screening test or suspicion on ultrasound scan.
Rate:	2.6 / 1,000
From 12 weeks gestation	n = 307
Prenatal detection rate:	172/307 (56%)
ICD 10 Codes	Q90 – Q90.9

Over the last fifteen years there has been a move from offering pregnant women at higher risk for having a baby with Down's syndrome a prenatal diagnostic test, to a national programme for prenatal screening tests to be offered to all pregnant women.

In the CAROBB area there were a variety of screening tests for Down's syndrome in place in 2005 but by 2009 all NHS hospitals were offering first trimester combined screening on the NHS, as recommended by the National Screening Committee Fetal Anomaly Screening Programme www.fetalanomaly.screening.nhs.uk.

There were 307 births with Down's syndrome between 2005 and 2008 inclusive. 172 (56%) of the 307 cases were karyotyped prenatally before 24 weeks gestation. In 201/307 (63%) of cases there was some prenatal suspicion of abnormality either due to a higher risk screening test result or scan appearance but in some cases the offer of karyotyping was declined. Figures 14a shows the percentage of Down's syndrome cases prentally diagnosed, those with some prenatal suspicion and those with no suspicion prenatally, by year. Figure 14b shows the percentage of cases prenatally diagnosed at different gestational ages, by year. These show a tendency towards a higher prenatal diagnosis rate and earlier gestation at diagnosis.

Fig 14a Percentage of Downs Syndrome cases prenatally diagnosed, percentage with some prenatal suspicion, and percentage with no prenatal suspicion, by year (n=307)

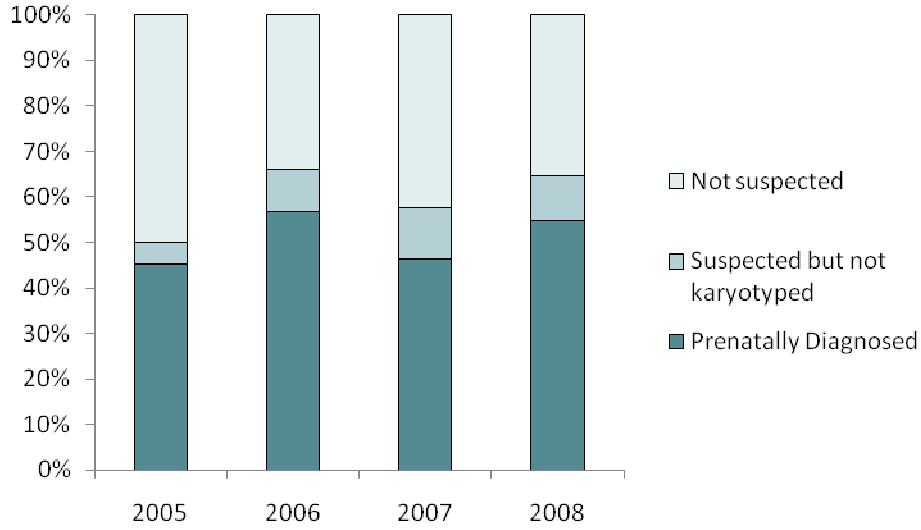
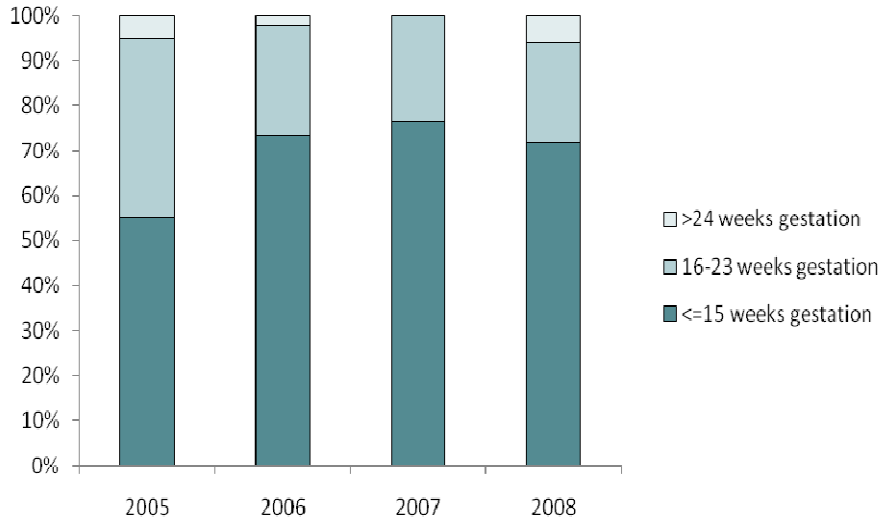


Fig 14b Percentage of prenatally suspected Down's syndrome cases diagnosed at different gestational ages, by year (n=172)



Appendices

Congenital Anomalies in Oxford from 1991-2008 using data from OXCAR and CAROBB

Summary table

Table 1A: Prenatal detection of selected congenital anomalies in the local Oxford population, 1991 – 2008

Defect	Prenatal investigation	Number of pregnancies notified with prenatal suspicion of anomaly (not including false positive diagnoses)	Number of cases notified with anomaly confirmed at birth	Prevalence per 1,000 total births	Prenatal detection rate
Isolated open neural tube defects (anencephaly & spina bifida)	Ultrasound Scanning +/- MS AFP	120	127	1.1	94%
Isolated cardiac anomaly	Ultrasound scanning	114	272	2.4[1]	42%
Isolated cleft lip +/- palate	Ultrasound scanning	48	81	0.7	59%
Down's syndrome	Karyotyping Prenatal detection because MA>35 or 1st or 2nd trimester screening test or ultrasound scanning	222 (177 karyotyped)	322	2.8	69% (55%)
Isolated diaphragmatic hernia	Ultrasound scanning	19	34	0.3	56%
Isolated exomphalos (excludes exomphalos minor)	Ultrasound scanning +/- MS AFP	24	28	0.2	86%
Isolated gastroschisis	Ultrasound scanning +/- MS AFP	28	28	0.2	100%

[1] There is under reporting of cardiac anomalies diagnosed after discharge from the maternity unit

Background

The Oxford Congenital Anomaly Register (OXCAR) was established 18 years ago, in 1991, after consultation with local experts (obstetricians, midwives, paediatricians, neonatologists, paediatric cardiologists, paediatric pathologists, geneticists, biochemists and public health physicians) who gave full support to the register. One of the main aims of the register at that time was to monitor the newly developing techniques used in prenatal diagnosis and particularly the accuracy of antenatal ultrasound scanning. The first six years of data are summarised in a paper in the Lancet (see Appendix 4 reference 42).

Other aims were to improve ascertainment to the National Congenital Anomaly System, to provide data for health care policies and planning and for research on aetiology and natural history of congenital anomalies to enable better advice to be given to parents and prospective parents. In 2003 funding from the Department of Health enabled the expansion of OXCAR to Berkshire and Buckinghamshire (i.e. to cover Thames Valley) and the name was changed to CAROBB. Because there is now 18 years of data for the Oxford area, we are, in this Appendix to the main CAROBB report, summarising these data. More detailed information is available on individual anomalies, prenatal detection rates and outcome of

pregnancy. Please contact us by email at carobb@npeu.ox.ac.uk if you would like further information.

The population studied

Anomalies suspected and or confirmed in fetuses / babies booked for delivery at the Oxford Women's Centre, John Radcliffe Hospital, community hospital or home delivery within the catchment area of the Women's Centre and with an OX postcode during 1991 - 2008 inclusive. Denominator data for this population were provided by the Oxford Radcliffe Hospitals NHS Trust Performance & Information Department. There were 113838 births in this category in the 18 year study period. Please note this population does not equate with the data from the whole of Oxfordshire used in the CAROBB report. The population used here gives the best approximation available to the unselected local Oxford population.

Table 2A: Total births and notifications in the local Oxford population, (John Radcliffe Women's Centre booking, with OX postcodes), 1991-2008 inclusive; number prenatally suspected with and without congenital anomaly at birth, number resulting in termination of pregnancy for fetal anomaly (TOPFA), in six three-year periods

Year	1991-1993	1994-1996	1997-1999	2000-2002	2003-2005	2006-2008	1991-2008
Total births	17438	17157	16953	19354	20532	22404	113838
Total notifications	384	538	801	649	616	899	3887
Total notifications made prenatally (including 'markers') (% of total notified)	185 (48%)	397 (74%)	700 (87%)	557 (86%)	495 (80%)	552 (61%)	2886 (74%)
Notifications made prenatally with anomaly at birth (% of total)	141 (37%)	236 (44%)	335 (42%)	298 (46%)	309 (50%)	341 (38%)	1660 (43%)
Notifications made prenatally & considered normal at birth (% of total notified prenatally)	41 (22%)	159 (40%)	362 (52%)	249 (45%)	184 (37%)	204 (37%)	1199 (42%)
Notifications made prenatally and resulting in TOPFA (% of prenatally diagnosed cases with anomaly confirmed)	62 (44%)	104 (44%)	140 (42%)	129 (43%)	125 (40%)	163 (48%)	723 (44%)
Total with anomaly at delivery. (% of total births)	340 (1.9%)	377 (2.2%)	436 (2.6%)	390 (2.0%)	429 (2.1%)	679 (3.0%)	2651 (2.3%)
Proportion of total births with prenatal suspicion & baby normal at birth*	1 in 425	1 in 108	1 in 47	1 in 78	1 in 112	1 in 110	1 in 95

< 1% lost to follow up

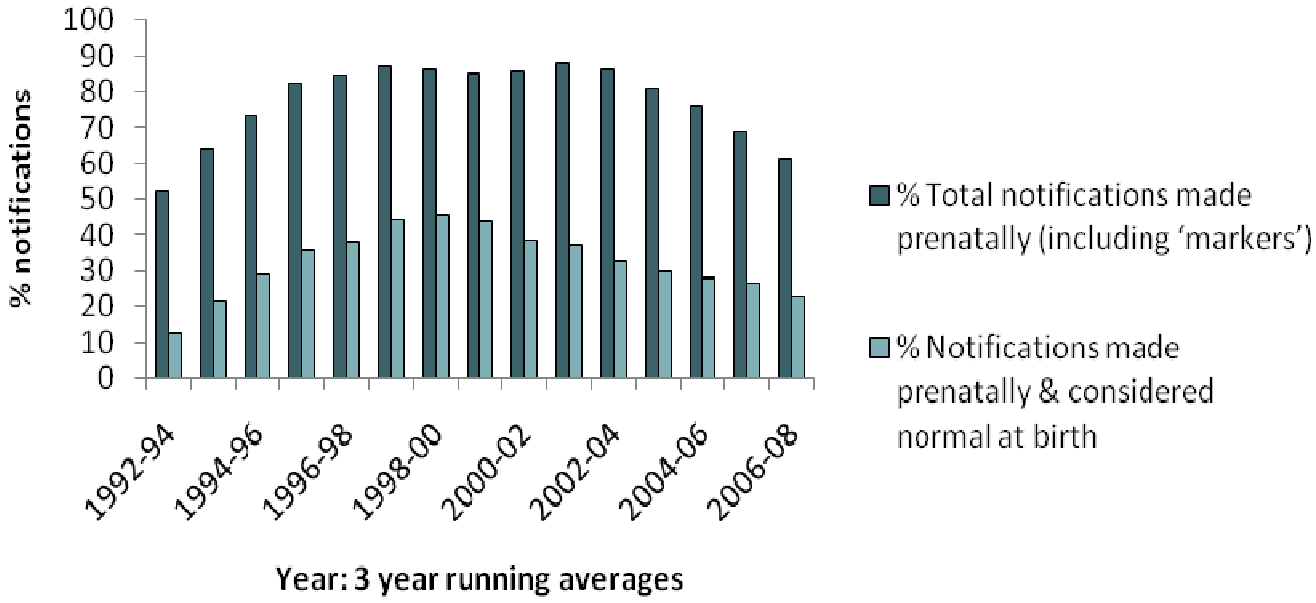
* ultrasound soft markers (normal variants)

Table 2A gives the number of notifications to the OXCAR population in six three-year periods from 1991 – 2008. During these time periods the percentage of cases notified prenatally changed from 48% in the first three years (1991 – 1993), to 87% in the middle time period and to 61% during 2006-2008. However in the same time periods the number of cases where there was a prenatal suspicion but the baby was apparently normal at birth rose from 22% of prenatal notifications in 1991 – 1993 to 52% in 1997-1999 but dropping to 37% for the years 2006-2008.

This trend is illustrated in Figure 2A which, using 3 year running averages shows the percentage of notification made prenatally and those considered to be normal at birth. This demonstrate the evolution of reporting ultrasound soft markers (normal variants such as echogenic bowel and nuchal thickening). Ultrasound soft markers started to be reported regularly in the early 1990s. By the mid-1990s it was realised that most babies with these usually normal variants were normal and local protocols were drawn up to guide professionals on the management of such markers, when to report specific markers and what further tests might be indicated.

The Fetal Anomaly Screening Programme (FASP) has recently produced national guidelines concerning how to manage the reporting of ultrasound soft markers (normal variants). www.fetalanomaly.screening.nhs.uk/standardsandpolicies

Figure 2A Percentage of notification made prenatally and those considered normal at birth using 3 year running averages



Appendix 2

CAROBB Notification form

The standard notification form is shown overleaf but we are happy to accept information in other ways eg copies of discharge letters or clinic lists.

Please contact us if you would like to discuss how best to notify to the register.

We will provide copies of forms on request or forms can be printed from our website: www.npeu.ox.ac.uk/carobb

CAROBB NOTIFICATION FORM

Congenital Anomaly Register for Oxfordshire, Berkshire and Buckinghamshire

Office use only - Case no

Dup | Com | From

Please register any actual OR prenatally suspected anomaly - structural, chromosomal or biochemical in fetus/baby. (See reverse of form for more information about the register and exclusion list)

MOTHER DETAILS

(Sticky label, if available)

Surname.....

Forename.....**Hosp No**.....

NHS Number.....

Postcode *(essential field)*

Mother's DoB *(essential field)*

Booking hosp.....

To deliver at..... *(If different from booking hospital)*

EDD *(essential field)*

Multiple pregnancy?.....**Zygosity:** MCMA / MCDA / DCDA

Assisted conception? ..... *If yes, (please state method, if known)*

No of previous pregnancies/births

.....Livebirth .....Miscarriage/TOP *(<24 weeks)* .....Stillbirth/TOP *(>24 weeks)*

Ethnic origin of mother *(please circle)*

White / Asian / Black / Mixed / Chinese / Other.....

BABY DETAILS

(Sticky label, if available)

Surname.....

Forename.....**Hosp No**.....

NHS Number.....

Sex Male / Female / Ambiguous / Not known *(please circle)*

Date of delivery / TOP *(and date of feticide if performed)*

Place of delivery.....

Gest at delivery.....weeks

Weight g ☐ Not weighed

Outcome *(when possible, please report date of delivery, gest, sex, weight and details of any anomalies, whatever the outcome)*

- ☐ Liveborn, no anomaly identified, no follow up requested
- ☐ Liveborn, anomaly present or req' further tests *(please give details)*
- ☐ Miscarriage/IUD *(<24 weeks)*
- ☐ Stillbirth/IUD *(>24 weeks)*
- ☐ Termination
- ☐ Neonatal death

Date of neonatal death

Post mortem? Yes / No / Not known

PRENATAL INVESTIGATIONS

Screening and Diagnostic tests

Gest	Test *(please circle)*	Result
.....	Nuchal / Combined	NT measurement .....mm
.....	Double / Triple	Down's risk 1 in .....
.....	Other	Tri 13 / 18 risk 1 in .....
		Not offered / Declined
.....	CVS	Normal / Abnormal *(state karyotype if known)*
.....	Amnio	.....
.....	FBS	Not offered / Declined
.....	Other*(please state)*	

Gest	Ultrasound scan findings *(& any other relevant details)*
.....	.....
.....	.....
.....	.....
.....	.....
.....	.....
.....	.....
.....	.....

POSTNATAL DETAILS OF ANOMALY

Prenatally suspected? ☐ Yes ☐ No

.....

.....

.....

.....

.....

.....

.....

Additional details *(eg previous congenital anomalies, consanguinity, illness in mother, exposure to potentially harmful substances)*

.....

.....

.....

.....

.....

.....

Referred to:.....

Notified by:.....Date:.....Hospital:.....Dept:.....Tel:.....

Confidential: Please send in a sealed envelope to: CAROBB, NPEU, Old Road Campus, Oxford OX3 7LF or use confidential fax: 01865 617775. Any queries contact Cath Rounding: Tel: 01865 289721, E-mail: CAROBB@npeu.ox.ac.uk.

Appendix 2

Congenital Anomaly Register for Oxfordshire, Berkshire and Buckinghamshire (CAROBB)

Please complete the form overleaf as fully as possible, registering any anomalies found at whatever stage you become aware of them in the pregnancy/postnatal period.

Uses of the register:

- Audit for prenatal diagnosis
- Evaluation and monitoring of new invasive and non invasive prenatal tests
- Evaluation of new screening programmes
- Provision of data for health care policies and planning
- Provision of data for the investigation of cluster of abnormalities
- Investigation of putative teratogens
- Research on aetiology and natural history of particular malformations
- Improving ascertainment to the National Congenital Anomaly System

Congenital anomalies exclusion list

It is not necessary to report any of the following conditions to us POSTNATALLY, unless there was a prenatal suspicion of an anomaly.

- Spina bifida occulta uncomplicated
- Phymosis
- Stenosis or stricture of lacrimal duct
- Minor skin anomalies less than 4cm^2: skin tag, naevus, angioma, haemangioma, glomus tumor, lymphangioma, birth mark
- Minor anomaly of auricle
- Clicking hip
- Minor anomaly of face or nose
- Minor anomaly of nipple, accessory or ectopic nipple
- Postural clubfoot
- Minor anomalies of the foot: hallux valgus/varus, "orteil en marteau", metatarus valgus/adductus
- Postural talipes calcaneovalgus or pes calcaneovalgus
- Congenital umbilical hernia, inguinal or para umbilical
- Functional or unspecified cardiac murmur
- Absence or hypoplasia of umbilical artery
- Congenital hydrocele or hydrocele of testis

If in doubt, report to us, we will feed back any inappropriate reporting

Confidentiality and data protection

All information held on the register is strictly confidential. Data are stored in a secure environment at the National Perinatal Epidemiology Unit, University of Oxford (data protection registration number: Z575783X). Any research undertaken is subject to ethical approval. The register holds Patient Information Advisory Group approval.

Confidential: Please fax or send in a sealed envelope to:

Cath Rounding
CAROBB Co-ordinator
National Perinatal Epidemiology Unit
University of Oxford, Richards Building
Old Road Campus
Headington
Oxford OX3 7LF

Confidential fax: 01865 617775

Please do not hesitate to contact us with any queries, or requests for more forms.

Tel: 01865 289721
E-mail: carobb@npeu.ox.ac.uk
catherine.rounding@nhs.net
Website: http://www.npeu.ox.ac.uk/carobb/

PLEASE DO NOT SEND ANY NOTIFICATIONS BY E-MAIL, UNLESS USING NHS.NET

Research Projects using data from CAROBB

Ongoing projects

1.	**Project title:**	Prevalence of neural tube defects (NTD) in younger mothers in Europe 2000-2008: analysis of the EUROCAT database
	Investigators:	M Loane, H Dolk, J Morris, H de Walle, L Abramsky & EUROCAT Working Group
	Collaboration:	EUROCAT
	Status of study:	Ongoing
2.	**Project title:**	Association between specific congenital heart anomalies and Smith Lemli Opitz like birth defects
	Investigators:	ME Smilde-Baardman, MK Bakker, WS Kerstjens-Frederikse, RMW Berger & EUROCAT Working Group
	Collaboration:	EUROCAT
	Status of study:	Ongoing
3.	**Project title:**	Trends and patterns of sirenomelia and cyclopia in Europe, a descriptive study based on the European surveillance system of congenital anomalies (EUROCAT)
	Investigators:	Harry Pachajoa, Carolina Isaza, Fabian Mendez
	Collaboration:	EUROCAT
	Status of study:	Ongoing
4.	**Project title:**	The Risk of Congenital Anomalies in Multiple Births: A European Registry Based Study
	Investigators:	Breidge Boyle
	Collaboration:	EUROCAT
	Status of study:	Ongoing
5.	**Project title:**	Diaphragmatic hernia
	Investigators:	Mary Anthony, Spr Vikranth Venugopalan
	Collaboration:	Local
	Status of study:	Ongoing
6.	**Project title:**	Gastroschisis versus exomphalos
	Investigators:	Kokila Lakhoo
	Collaboration:	Local
	Status of study:	Ongoing
7.	**Project title:**	Aneuploidy
	Investigators:	Lawrence Impey
	Collaboration:	Local
	Status of study:	Ongoing
8.	**Project title:**	Analysing the rare unbalanced chromosome abnormalities reported to EUROCAT
	Investigators:	Diana Wellesley, Ingeborg Barisic, Patricia Boyd, Helen Dolk, Ruth Greenlees
	Collaboration:	EUROCAT
	Status of study:	Ongoing

Appendix 3

9.	**Project title:**	A descriptive epidemiological study of small intestinal atresia in Europe
	Investigators:	Dr Judith Rankin
	Collaboration:	EUROCAT
	Status of study:	Ongoing
10.	**Project title:**	Evaluation of prenatal diagnosis rates for major structural congenital anomalies across areas covered by the British Isles Network of Congenital Anomaly Registers: 2005 to 2006
	Investigators:	Patricia A Boyd, Ann M Tonks, Judith Rankin, Catherine Rounding, Diana Wellesley, Elizabeth S Draper, and the BINOCAR working group
	Collaboration:	BINOCAR
	Status of study:	Ongoing
11.	**Project title:**	Exomphalos audit
	Investigators:	Elizabeth Draper
	Collaboration:	BINOCAR
	Status of study:	Ongoing
12.	**Project title:**	Gastroschisis audit
	Investigators:	Elizabeth Draper
	Collaboration:	BINOCAR
	Status of study:	Ongoing
13.	**Project title:**	Esophageal Atresia: Population based study of Epidemiology and outcome in European Regions.
	Investigators:	Rikke Neess Pedersen, Ester Garne, Steffen Husby
	Collaboration:	EUROCAT
	Status of study:	Ongoing
14.	**Project title:**	Prevalence of CCAM and other thoracic anomalies
	Investigators:	Steve Gould
	Collaboration:	Local
	Status of study:	Ongoing
15.	**Project title:**	To define the outcome of prenatally diagnosed gastroschisis with intra abdominal bowel dilatation vs those with no dilatation in the Thames Valley Region
	Investigators:	K Lakhoo
	Collaboration:	Local
	Status of study:	Ongoing
16.	**Project title:**	Fraser Syndrome
	Investigators:	Prof Helen Dolk, Dr Ingeborg Barisic
	Collaboration:	EUROCAT
	Status of study:	Ongoing
17.	**Project title:**	Cognitive and behavioural outcomes of children with an extra sex chromosome
	Investigators:	Prof Pat Jacob, Prof Dorothy Bishop, Dr Gaia Scerif

	Collaboration:	Dept of Experimental Psychology, Oxford University; Wessex Regional Genetics Laboratory
	Status of study:	Ongoing
18.	**Project title:**	Exomphalos
	Investigators:	Kokila Lakhoo
	Collaboration:	Local
	Status of study:	Ongoing
19.	**Project title:**	Info on TOPs following prenat diag of clefts
	Investigators:	Dr Aadil A Khan, Tim Goodacre
	Collaboration:	Local
	Status of study:	Ongoing
20.	**Project title:**	Audit of prenatal lung lesions versus pathological diagnosis
	Investigators:	P. Teong, K Lakhoo, L Impy
	Collaboration:	Local
	Status of study:	Ongoing
21.	**Project title:**	Sentinel phenotypes
	Investigators:	Ms Suzhuang Hong, Prof Helen Dolk, Marlene Sinclair, Diana Wellesley, ingeborg Barisic, Maria Loane, Ian Bradbury
	Collaboration:	EUROCAT
	Status of study:	Ongoing
22.	**Project title:**	FOCAL – Follow-up Of Children with Congenital Anomalies Long-term. Pilot study of diaphragmatic hernia
	Investigators:	FOCAL
	Collaboration:	BINOCAR & BDF Newlife
	Status of study:	Ongoing
23.	**Project title:**	Gastroschisis
	Investigators:	Dr Elizabeth Draper
	Collaboration:	BINOCAR
	Status of study:	Ongoing

Appendix 3

Complete projects

24.	**Project title:**	Supply of data for National Screening Committee - cases of anencephaly and gastroschisis
	Investigators:	Anne Roberts
	Collaboration:	Local
	Status of study:	One off data request
25.	**Project title:**	Supply of data for National Screening Committee - Down's syndrome cases
	Investigators:	Anne Roberts
	Collaboration:	Local
	Status of study:	One off data request
26.	**Project title:**	Ambient air pollution and risk of congenital anomalies in England, 1991-99
	Investigators:	Dolk H, Armstrong B, Lachowycz K, Vrijheid M, Rankin J, Abramsky L, Boyd PA, Wellesley D
	Collaboration:	EUROCAT
	Status of study:	Complete
27.	**Project title:**	Audit – communication of prenatal diagnoses to neonatologists
	Investigators:	Mary Anthony
	Collaboration:	Local
	Status of study:	Complete
28.	**Project title:**	Report on the data collected on congenital anomalies in South East Region for surveillance and for monitoring the national antenatal Down's syndrome and fetal anomaly screening programmes.
	Investigators:	Patricia A Boyd, Diana Wellesley and Catherine Rounding
	Collaboration:	Inter-register
	Status of study:	Complete
29.	**Project title:**	Antenatally diagnosed heart anomalies
	Investigators:	Moira Blyth
	Collaboration:	Inter-register
	Status of study:	Complete
30.	**Project title:**	BINOCAR Down's Syndrome prenatal screening audit
	Investigators:	
	Collaboration:	BINOCAR
	Status of study:	Complete
31.	**Project title:**	Cornelia de Lange Syndrome
	Investigators:	Prof Helen Dolk, Dr Ingeborg Barisic
	Collaboration:	EUROCAT
	Status of study:	Complete
32.	**Project title:**	Abdominal cyst audit
	Investigators:	Kokila Lakhoo
	Collaboration:	Local
	Status of study:	Complete

33.	**Project title:**	Sex Chromosome Trisomies in Europe: Prevalence, prenatal detection and outcome of pregnancy
	Investigators:	PA Boyd, M Loane, E Garne, B Khoshnood, H Dolk, and a EUROCAT working group
	Collaboration:	EUROCAT
	Status of study:	Complete
34.	**Project title:**	Terminations of pregnancy ≥ 24 weeks of gestation after prenatal diagnosis of fetal abnormality in Europe
	Investigators:	Ester Garne, Helen Dolk, Patricia Boyd, Maria Loane, Catherine de Vigan, Babak Khoshnood
	Collaboration:	EUROCAT
	Status of study:	Complete
35.	**Project title:**	Maternal age-specific risk of non-chromosomal anomalies
	Investigators:	M Loane, H Dolk, JK Morris, EUROCAT Working Group
	Collaboration:	EUROCAT
	Status of study:	Complete
36.	**Project title:**	Duodenal atresia audit
	Investigators:	PJ Roy
	Collaboration:	Local
	Status of study:	Complete
37.	**Project title:**	Antenatal diagnosis of duodenal atresia and postnatal outcome
	Investigators:	Ms PG Roy, Miss K Lakhoo, Dr P Boyd
	Collaboration:	Local
	Status of study:	Complete
38.	**Project title:**	Oro-facial Clefts. World-wide Recent Total Prevalence Data.
	Investigators:	Prof Pierpaolo Mastroiacovo
	Collaboration:	International Clearing House for Birth Defects
	Status of study:	Complete
39.	**Project title:**	Prenatal screening in Europe
	Investigators:	Dr Patricia Boyd, Ester Garne
	Collaboration:	EUROCAT
	Status of study:	Complete
40.	**Project title:**	Isolated cleft lip/palate
	Investigators:	Dorothy Halliday
	Collaboration:	Local
	Status of study:	Complete
41.	**Project title:**	Audit of prenatal lung lesions versus pathological diagnosis
	Investigators:	Kokila Lakhoo
	Collaboration:	Local
	Status of study:	Complete
42.	**Project title:**	Audit of gastroschisis 1995-2005
	Investigators:	Dr Gail Whitehead

	Collaboration:	Local
	Status of study:	Complete

43.	**Project title:**	Assessment of ultrasound markers and their value
	Investigators:	National Screening Committee
	Collaboration:	Local
	Status of study:	Complete

44.	**Project title:**	Audit of screening of fetuses with echogenic bowel
	Investigators:	Dr Gail Whitehead
	Collaboration:	Local
	Status of study:	Complete

45.	**Project title:**	Audit echogenic bowel
	Investigators:	Gail Whitehead
	Collaboration:	Local
	Status of study:	Complete

46.	**Project title:**	Audit of screening offered to parents of those babies born with down syndrome
	Investigators:	Dr Gail Whitehead
	Collaboration:	Local
	Status of study:	Complete

47.	**Project title:**	Audit screening for Down’s
	Investigators:	Gail Whitehead
	Collaboration:	Local
	Status of study:	Complete

48.	**Project title:**	Geographical variation in overall rates of congenital abnomalities and the rates for specific abnormalities
	Investigators:	Prof Helen Dolk
	Collaboration:	EUROCAT
	Status of study:	Complete

49.	**Project title:**	Chlorination of water supplies and birth defects
	Investigators:	Prof Paul Elliott
	Collaboration:	SASHU
	Status of study:	Complete

50.	**Project title:**	Congenital hydrocephalus: a population based study on prevalence and outcome
	Investigators:	Dr Ester Garne
	Collaboration:	EUROCAT
	Status of study:	Complete

51.	**Project title:**	Myotonic dystrophy audit
	Investigators:	Prof Paul Chamberlain
	Collaboration:	Local
	Status of study:	Complete

52.	**Project title:**	How have babies born with spina bifida in the 1990's fared?

	Investigators:	Dr Jenny Kurinczuk, Dr Jenny Calvert, Dr Patricia Boyd, Prof Paul Chamberlain, Dr Mary Anthony
	Collaboration:	Local
	Status of study:	Complete
53.	**Project title:**	Absent stomach bubble/TOF/OA
	Investigators:	Prof Paul Chamberlain, Miss Kokila Lakhoo, Dr Patricia Boyd
	Collaboration:	Local
	Status of study:	Complete
54.	**Project title:**	Clinical genetics audit of late TOP
	Investigators:	Dr Dorothy Halliday, Dr Patricia Boyd
	Collaboration:	Local
	Status of study:	Complete
55.	**Project title:**	Isolated cleft lip and palate audit
	Investigators:	Dr Dorothy Halliday, Dr Patricia Boyd
	Collaboration:	Local
	Status of study:	Complete
56.	**Project title:**	Arthrogryposis multiplex congenita (AMC) – causes and risk factors
	Investigators:	Dr Jana Midelfart Hoff
	Collaboration:	EUROCAT
	Status of study:	Complete

Appendix 4

Publications to which CAROBB / OXCAR have contributed information

1. Garne E, Khoshnood B, Loane M, Boyd PA, and Dolk H and EUROCAT Working Group. Terminations of pregnancy >= 24 weeks of gestation after prenatal diagnosis of fetal abnormality in Europe. In press BJOG. 2010.

2. Garne E, Loane M, Addor M, Boyd PA, Barisic I, and Dolk H. Congenital hydrocephalus - prevalence, prenatal diagnosis and outcome of pregnancy in four European regions. European Journal of Paediatric Neurology. 2010; 14:150-155.

3. Loane M, Dolk H, Morris JK, and EUROCAT Working Group. Maternal age-specific risk of non-chromosomal anomalies. BJOG. 2009; 116:1111–1119.

4. Dolk H, Armstrong B, Lachowycz K, Vrijheid M, Rankin J, Abramksy L, Boyd PA, and Wellesley D. Ambient air pollution and risk of congenital anomalies in England, 1991-99. Occupational and Environmental Medicine. 2009. doi:10.1136/oem.2009.045997

5. Choudhry MS, Rahman N, Boyd P, and Lakhoo K. Duodenal atresia: associated anomalies, prenatal diagnosis and outcome. Pediatr Surg Int. 2009; 25:727-730.

6. Sherwood W, Boyd P, and Lakhoo K. Postnatal outcome of antenatally diagnosed intra abdominal cysts. Pediatr Surg Int. 2008; 24:763-765.

7. Nieuwenhuijsen MJ, Toledano MB, Bennett J, Best N, Hambly P, de Hoogh C, Wellesley D, Boyd PA, Abramsky L , Dattani N, Fawell J, Briggs D, Jarup L, and Elliott P. Chlorination disinfection by-products and risk of congenital anomalies in England and Wales. Environmental Health Perspectives. 2008; 116(2):216-22.

8. Boyd PA, Rounding C, and Kurinczuk JJ. First Report of the Congenital Anomaly Register for Oxfordshire, Berkshire and Buckinghamshire (CAROBB) Births 2005-2006. National Perinatal Epidemiology Unit. Oxford. 2008.

9. Boyd PA, DeVigan C, Khoshnood B, Loane M, Garne E, and Dolk H and the EUROCAT working group. Survey of prenatal screening policies in Europe for structural malformations and chromosome anomalies, and their impact on detection and termination rates for Neural Tube Defects and Down's syndrome . British Journal Obstetrics and Gynaecology. 2008; 115(6):689-696.

10. Barisic I;Tokic V;Loane M;Bianchi F;Calzolari E;Garne E;Wellesley D;Dolk H and EUROCAT Working Group. Descriptive Epidemiology of Cornelia de Lange Syndrome in Europe. American Journal of Medical Genetics. 2008; 146A :51-59.

11. Zaki M, Boyd PA, Impey L, Roberts A, and Chamberlain P. Congenital myotonic dystrophy - prenatal findings and pregnancy outcome. Ultrasound in Obsterics and Gynecology. 2007; 29(3):284-8.

12. Choudhry M, Boyd PA, Chamberlain PF, and Lakhoo K. Prenatal diagnosis of tracheo-oesophageal fistula and oesophageal atresia. Prenat Diagn. 2007; 27:608-10.

13. Boyd PA and Keeling JW. Congenital abnormalities: Prenatal diagosis and screening. Eds Keeling and Khong, Fetal and Neonatal Pathology, 4th ed, Springer. 2007.

14. Armstrong BG, Dolk H, Pattenden S, Vrijheid M, Loane M, Rankin J, Dunn C, Grundy

C, Abramsky L, Boyd PA, Stone D, and Wellesley D. Geographic variation and localised clustering of congenital anomalies in Great Britain. Emerging Themes in Epidemiology. 2007; 4(14).

15. Calvert JK, Boyd PA, Chamberlain P, Said S, and Lakhoo K. Outcome of antenatally diagnosed congenital; cystic adenomatoid malformation of the lung: Audit of 10 years' experience 1991-2001. Archives of Disease in Childhood. 2006; 91(1):F26-8.

16. Wellesley D, Boyd P, Dolk H, and Pattenden S. An aetiological classification of birth defects for epidemiological research. J Med Genet. 2005; 42:54-57.

17. Rankin J, Pattenden S, Abramsky L, Boyd P, Jordan H, Stone D, Vrijehid M, Wellesley D, and Dolk H. Prevalence of congenital anomalies in five British regions 1991-99. Archives of Disease in Childhood. 2005; 90:F374-F379.

18. Busby A, Abramsky L, Dolk H, and Armstrong B and a EUROCAT working Group. Preventing Neural Tube Defects in Europe. A population based study. BMJ. 2005; 330(7491):574-5.

19. Boyd PA and Rounding C. CAROBB (Congenital Anomaly Register for Oxfordshire, Berkshire and Buckinghamshire) Report, 1991 - 2004 (Oxford data). National Perinatal Epidemiology Unit. Oxford. 2005.

20. Boyd PA, Armstrong B, Dolk H, Botting B, Pattenden S, Abramsky L, Rankin J, Vrijheid M, and Wellesley. Congenital anomaly surveillance in England - ascertainment deficiencies in the national system. BMJ. 2005; 330:27-29.

21. Wellesley D, DeVigan C, Baena N, Cariati E, Stoll C, Boyd PA, Clementi M, and Euroscan Group. Contribution of ultrsonographic examination to the prenatal detection of trisomy 21: experience from 19 European registers. Annales de Genetique. 2004; 47:373-480.

22. Patel Y, Boyd PA, Chamberlain P, and Lakhoo K. Follow up of children with isolated fetal echogenic bowel with particular reference to bowel-related symptoms. Prenatal Diagnosis. 2004; 24:35-37.

23. Boyd PA, Tondi F, Hicks NR, and Chamberlain PF. Autopsy after termination of pregnancy for fetal anomaly: retrospective cohort study. BMJ. 2004; 328:137-140.

24. Stoll C and Clementi M and the Euroscan Study Group. Prenatal diagnosis of dysmorphic syndromes by routine fetal ultrasound examination across Europe. Ultrasound Obstet Gynecol. 2003; 21:543-551.

25. Haeusler MC, Berghold A, Stoll C, Barisic I, Clementi M, and EUROSCAN Study Group. Prenatal ultrasonographic detection of gastrointestinal obstruction: results from 18 European congenital anomaly registries. Prenat Diagn. 2002; 22(7):616-23.

26. Garne E, Hausler M, Barisic I, Gjergja R, Stoll C, and Clementi M and the EUROSCAN study group. Congenital diaphragmatic hernia: evaluation of prenatal diagnosis in 20 European regions. Ultrasound Obstet Gynecol . 2002; 19:329-333.

27. Stoll C, Tenconi R, and Clementi M and the Euroscan Study Group. Detection of Congenital Anomalies by ultrasonographic Examination across Europe. Community

Genetics. 2001; 4:225-232.

28. Garne E, Stoll C, and Clementi M and the EUROSCAN study group. Evaluation of prenatal diagnosis of associated congenital heart diseases by fetal ultrsonographic examination in Europe. Prenatal Diagnosis. 2001; 21:243-252.

29. De Vigan C, Baena N Cariati E Clementi M Stoll C and the EUROSCAN study group. Contribution of ultrasonographic examination to the prenatal diagnosis of chromosome abnormalities in 19 centres across Europe. Annales de Genetique . 2001; 44:209-217.

30. Boyd PA and Chamberlain PF. Risk of adverse birth outcomes near landfill sites. Local Registers provide more accurate information. (letter). BMJ. 2001; 323:1366.

31. White SM, Chamberlain P, Hitchcock R, Sullivan PB, and Boyd PA. Megacystis-microcolon-intestinal hypoperistalsis syndrome; the difficulties with antenatal diagnosis. Case reports and review of the literature. Prenat. Diagn. 2000; 20:697-700.

32. Stoll C, Weisel A, Quesser-Luft A, Froster U, Bianca S, and Clementi M and EUROSCAN study group. Evaluation of the prenatal diagnosis of limb reduction defects. Prenat Diagn . 2000; 20:811-818.

33. Report of the RCOG working Party. Royal College of Obstetricians Routine Ultrasound Screening in Pregnancy Protocol, Standards and Training. 2000.

34. Garne E, Stoll C, Clementi M, and and the EUROSCAN group. Evaluation of prenatal diagnosis of congenital heart diseases by ultrasound: experience from 20 European registries. Ultrasound Obstetrics and Gynecology . 2000; 17:386-391.

35. Clementi M, Tenconi R, Bianchi F, and Stoll C and EUROSCAN study group. Evaluation of the Prenatal Diagnosis of Cleft Lip with or without cleft palate by ultrasound:
Experience from European Registries. Prenatal Diagnosis. 2000; 20:870-875.

36. Boyd PA, Wellesley DG, De Walle HEK, Tenconi R, Garcia-Minaur S, Zandwijken GRJ, Stoll C, and Clementi M and EUROSCAN study group . Evaluation of the Prenatal Diagnosis of Neural Tube Defects by fetal ultrasonographic examination in different centres across Europe. Journal of Medical Screening. 2000; 7:169-174.

37. Boyd PA, Crocker AJM, Jefferies M, and Chamberlain PF. Screening for Down's Syndrome. (letter). BMJ. 2000:321:762.

38. Bicker et al. Ultrasound screening in pregnancy:a systematic review of the clinical effectiveness, cost effectiveness and women's views. Health Technol Assess. 2000; 4(16, chapter 4).

39. Huddy CLJ, Boyd PA, Wilkinson AR, and Chamberlain P. Congenital diaphragmatic hernia:prenatal diagnosis, outcome and continuing morbidity in survivors. Br J Obstet Gynaecol. 1999; 106:1192-96.

40. Abramsky L, Botting B, Chapple J, and Stone D. Has advice on periconceptional folate supplementation reduced neural tube defects? (Letter). Lancet. 1999; 354:998-999.

41. Gaffney G, Manning N, Gould S, Boyd PA, and Chamberlain P . An ultrasonographic assessment of skeletal dysplasia - a report of the diagnostic and prognostic accuracy in 35

cases. Prenatal Diagnosis. 1998; 18:357-362.

42. Boyd PA, Chamberlain P, and Hicks N. 6-year experience of prenatal diagnosis in an unselected population in Oxford,UK. Lancet. 1998; 352:1577-1581.

43. Boyd PA, Batthacharya A, Gould S, Manning N, and Chamberlain P. Outcome of prenatally diagnosed anterior abdominal wall defects. Archives of Disease in Childhood Fetal and Neonatal. 1998; 78:F209-F213 .

44. Paavola P, Salonen R, Barnicoat A, Winter R, Boyd PA, Gould S, Schinzel A, Tenconi R, and Peltonen L. Clinical and Genetic heterogeneity in Meckel Syndrome . Human Genetics. 1997; 101:88-92.

45. Boyd PA, Anthony MY, Manning N, Lara-Rodriguez C, Wellesley DN, and Chamberlain P. Antenatal diagnosis of Cystic hygroma / nuchal pad. Report of 92 cases with follow up of survivors. Archives of Disease in Childhood Fetal and Neonatal. 1996; 74:F38-F42.

46. Siles P, Boyd PA, Manning N, Tsang T, and Chamberlain P. Omphalocoele and pericardial effusion - possible sonographic markers for the Pentalogy of Cantrell or its variants. Obstetrics and Gynecology. 1995; 87:840-842.

47. Fletcher J, Hicks NR, Kay JDS, and Boyd PA. The use of decision analysis to compare policies for antenatal screening for Down's syndrome. BMJ. 1995; 311:351-356.

48. Firth H, Boyd P A, Chamberlain P F, MacKenzie I Z, and Morriss-Kay G. Analysis of limb reduction defects in babies exposed to chorionic villus sampling. Lancet . 1994; 343:1069-71.

49. Shackley P, McGuire A, Boyd P A, Dennis J, Fitchett M, Kay J, Roche M, and Wood P. Economic appraisal of alternative prenatal screening programmes for Down's Syndrome. Journal of Public Health Medicine . 1993; 15(2):175-184.

50. Firth H V, Boyd P A, Chamberlain P, MacKenzie I Z, Lindenbaum R H, and Huson SM. Severe limb abnormalities after chorion villus sampling at 56-66 days. Lancet . 1991; 337:762-763.

Appendix 5

Data Protection and handling requests for data

5a PIAG approval documentation

5b MREC approval documentation

5c Application form and guidelines for use of CAROBB data

Patient Information Advisory Group (PIAG) approval for CAROBB (as part of BINOCAR) to collect identifiable information without explicit consent from individuals registered.

Application Number	0011	
PIAG Reference	PIAG 2-08(e)/2002	
Other PIAG Refs		
Application Title	Congenital Anomalies Register (BINOCAR)	
Application Summary	To provide continuous epidemiological monitoring of the frequency, nature, cause and outcomes of congenital anomalies by means of national, regional and disease specific registers of congenital anomalies.**Dec 08 Application extended to contain address info at conception**	
Applicant Organisation Name	British Isles Network of Congenital Anomalies Register (BINOCAR)	
Contact Name	Elizabeth S Draper,Chair of BINOCAR	
Address	Department of Health Sciences, University of Leicester	
	22-28 Princess Road West	
	Leicester	
Postcode	LE1 6TP	
Telephone	0116 252 3210	
Fax		
Email	jlsb1@leicester.ac.uk	
Medical Purposes	Y	the surveillance and analysis of health and disease;
	□	the monitoring and audit of health and health related care provision and outcomes where such provision has been made;
	□	the planning and administration of the provision made for health and health related care;
	□	medical research approved by research ethics committees;
	□	the provision of information about individuals who have suffered from a particular disease or condition
Cohort/Population	UK-wide: patients with congenital anomalies	
Description of confidential patient information used	Mother's name, address, postcode, hospital number, NHS number, date of birth. Baby's name, address, postcode, hospital number, NHS number, date of birth, date of death. Address at conception.	
S60 Class(es)	□	Specific Support
	Y	Class I - making the person less readily identifiable
	Y	Class II - present or past geographical locations of patients
	Y	Class III - to identify and contact patients to obtain consent
	Y	Class IV - linking multiple sources;validating quality and completeness; avoiding error
	Y	Class V - audit, monitoring, & analysis of healthcare provision
	Y	Class VI - granting of access to data for purposes I-V
NHS Sponsor		
Status	Approved	
Date Applied		
Date Approved	20/06/02	
Date S60 Granted	20/06/02	
Expiry Date		
Next Review Date	20/06/10	
Details of Approval	PIAG gave Section 60 support for the BINOCAR application.	
Notes		

Appendix 5b

NHS
National Research Ethics Service

Trent Research Ethics Committee
Research Ethics Office
Derwent Shared Services
Laurie House
Colyear Street
Derby
DE1 1LJ

Telephone: 01332 868765
Facsimile: 01332 868930

11 October 2009

Professor Elizabeth Draper
Dept of Health Sciences
22-28 Princess Road West
Leicester
LE1 6TP

Dear Professor Draper

Title of the Database: **British Isles Network of Congenital Anomaly Registers (BINOCAR)**
REC reference: **09/H0405/48**

The Research Ethics Committee reviewed the above application at the meeting held on 1 October 2009. Thank you for attending to discuss the application.

Ethical opinion

The members of the Committee present gave a favourable ethical opinion of the above research database on the basis described in the application form and supporting documentation.

Duration of ethical opinion

The favourable opinion is given for a period of five years from the date of this letter and provided that you comply with the conditions set out in the attached document. You are advised to study the conditions carefully. The opinion may be renewed for a further period of up to five years on receipt of a fresh application. It is suggested that the fresh application is made 3-6 months before the 5 years expires, to ensure continuous approval for the research database.

Approved documents

The documents reviewed and approved at the meeting were:

Document	*Version*	*Date*
Covering Letter		14 August 2009
REC application	IRAS Research Database Form V 2.3 (lock code 25660/56406/9/606)	19 August 2009
Participant Information Sheet	V 1.1	12 August 2009
Protocol	V 2.0	12 August 2009

Research governance

Under the Research Governance Framework (RGF), there is no requirement for NHS research permission for the establishment of research databases in the NHS. Applications to NHS R&D offices through IRAS are not required as all NHS organisations are expected to have included management review in the process of establishing the database.

Research permission is also not required by collaborators at data collection centres (DCCs) who provide data under the terms of a supply agreement between the organisation and the database. DCCs are not research sites for the purposes of the RGF.

Database managers are advised to provide R&D offices at all DCCs with a copy of the REC application for information, together with a copy of the favourable opinion letter when available. All DCCs should be listed in Part C of the REC application.

NHS researchers undertaking specific research projects using data supplied by a database must apply for permission to R&D offices at all organisations where the research is conducted, whether or not the database has ethical approval.

Site-specific assessment (SSA) is not a requirement for ethical review of research databases. There is no need to inform Local Research Ethics Committees.

Membership of the Committee

The members of the Ethics Committee who were present at the meeting are listed on the attached sheet.

Statement of compliance

The Committee is constituted in accordance with the Governance Arrangements for Research Ethics Committees (July 2001) and complies fully with the Standard Operating Procedures for Research Ethics Committees in the UK.

After ethical review

Now that you have completed the application process please visit the National Research Ethics Service website > After Review

Here you will find links to the following:

a) Providing feedback. You are invited to give your view of the service that you have received from the National Research Ethics Service and the application procedure. If you wish to make your views known please use the feedback form available on the website.
b) Annual Reports. Please refer to the attached conditions of approval.
c) Amendments. Please refer to the attached conditions of approval.

Continued/

Appendix 5b

We would also like to inform you that we consult regularly with stakeholders to improve our service. If you would like to join our Reference Group please email referencegroup@nres.npsa.nhs.uk

09/H0405/48	Please quote this number on all correspondence

Yours sincerely

Dr Ian Gaywood
Chair

E-mail: jenny.hancock@derwentsharedservices.nhs.uk

Enclosures: *List of names and professions of members who were present at the meeting and those who submitted written comments*

Approval conditions

Congenital Anomaly Register for Oxfordshire, Berkshire and Buckinghamshire

DATA REQUEST FORM

- This form is intended for requests for data for research purposes.
- Please read the CAROBB Guidelines and the notes on page 2 of this form before you sign.
- All requests will be approved by CAROBB Management Committee.
- Please complete, then **email and post a hard copy** (with signature and supporting documentation eg protocol) to Cath Rounding (CAROBB Co-ordinator) at the address at the bottom of this sheet.
- Please include any details of ethical approvals sought / granted.

Requester details	
Name:	
Job Title/Position:	
Organisation:	
Address:	
Contact phone number:	
Email address:	
Lead Clinician/Supervisor:	

Requester agreement	
Details of funding and source for project	
Name of person responsible for data security	
Request details	
Name of Project	
What question do you wish to answer?	
Intended use of information (e.g. Background, intended presentation/meeting/report)	

CAROBB, NPEU, University of Oxford, Richards Building, Old Road Campus, Headington, Oxford OX3 7LF
Direct: 01865 289721, Confidential fax: 01865 617775, E-mail: catherine.rounding@npeu.ox.ac.uk

Appendix 5c

Congenital Anomaly Register for Oxfordshire, Berkshire and Buckinghamshire

DATA REQUEST FORM

Main outcome measures		
Case definition: (e.g. pre / postnatal diagnosis, live / stillbirths / TOPs.)		
Population: (e.g. CAROBB, Oxfordshire only)		
Time period (births):	By EDD or by Date of Birth? from to:	
Justification for identifiable data		
Do you plan to seek ethical approval / R&D approval for this study? (Please give details if yes)		
Signature:		Date:
Date required by:		

Please tick to confirm that you agree to the following:

- ☐ To supply CAROBB with a 6 monthly update report.
- ☐ On completion of the project all individual records will be destroyed and a CAROBB data destruction form completed and returned (requests for individual records only).
- ☐ Any publications/reports arising from the use of data supplied must include a standard acknowledgement paragraph (CAROBB will supply content).
- ☐ Any publications arising from the use of data supplied must be sent to Register Leads for approval while at draft stage. The register is also obliged to send the draft to the register funding body for approval.
- ☐ I have read and agree to the CAROBB Guidelines

We are keen for the CAROBB information to be used for research purposes and will do our best to help with any requests for data. Please do not hesitate to contact us with any queries.

CAROBB, NPEU, University of Oxford, Richards Building, Old Road Campus, Headington, Oxford OX3 7LF
Direct: 01865 289721, Confidential fax: 01865 617775, E-mail: catherine.rounding@npeu.ox.ac.uk

GUIDELINES for users CAROBB

Congenital Anomaly Register for Oxfordshire, Berkshire and Buckinghamshire

CAROBB (Congenital Anomaly Register for Oxfordshire, Berkshire and Buckinghamshire) was awarded funding by the Department of Health in 2003 to establish a database of information on babies born with suspected or confirmed congenital anomalies for the three counties. Prior to 2003, the register was known as OXCAR and included cases seen at the John Radcliffe Hospital since 1991.

The principal objectives of CAROBB are:

- Provide data for research on the aetiology and natural history of particular malformations to enable better advice based on accurate information to be given to parents
- Enable the evaluation and monitoring of new invasive and non invasive prenatal tests.
- Evaluate new prenatal screening programmes and to provide data for health care policies and planning
- Provide data to investigate clusters of abnormalities and putative teratogens by the monitoring of incidence over time and in population trends such as maternal age, ethnicity, and health inequalities.

CAROBB can be used as a basis for other studies and there are increasing numbers of requests for access to the data for research purposes. The Management Group wishes to encourage the use of the register in this way and the following guidelines have been drawn up to help potential register users. CAROBB conforms to the Data Protection Act 1998 and the Health and Social Care Act 2001.

Please feel free to contact the Register Co-ordinator for a discussion of your proposal at an early stage. It is important to be clear about what information you wish to collect and what information you will be able to obtain through the register.

1. All requests for access to CAROBB data should be made through the research co-ordinator using the accompanying form.

2. The request should be accompanied by a study protocol. The protocol must be approved by CAROBB. Approval by an ethics committee will not guarantee approval by CAROBB. Any amendments required by an ethics committee must be approved by CAROBB before data will be released.

3. If appropriate, the researcher will be responsible for obtaining approval from Ethics Committees in the areas in which the cases live. A copy of the approval must be supplied to the register co-ordinator before data will be released for the study.

4. Researchers are expected to seek peer review of the proposed study.

5. Researchers will need to seek the permission of the parent/child's general practitioner prior to contacting parents and children. If necessary, permission must

also be sought from the appropriate consultant for access to hospital notes.

6. If the researcher has little or no previous experience of research the Management Group will require a written assurance from a supervisor that the work will be carried out and completed satisfactorily.

7. It is the responsibility of the researcher to apply for funds to carry out the proposed study. A small administrative charge may be made to cover the cost of accessing cases from CAROBB.

8. Data supplied by CAROBB must not be passed to a third party, nor should it be re-used for later study without applying to CAROBB for permission. Personal data must not be uploaded to a researchers home computer. Researchers are expected to deposit datasets which have been derived from the original data, with suitable documentation, in the CAROBB database.

9. In compliance with the Data Protection Act, 1998, to keep the database as accurate as possible, researchers will be expected to inform CAROBB of changes to subjects details during the course of the study.

10. The Management Group will request a short progress report at intervals during the course of the study and evidence of the final results in the form of a report or paper. Any change in contact addresses or personnel working on the project should be notified to the Management Group.

11. The Management Group would like to see an advanced draft of any publication, or abstract submitted for a meeting, in which CAROBB data have been used. Congenital Anomaly Register for Oxfordshire, Berkshire and Buckinghamshire should be acknowledged in any publication or presentation, arising from CAROBB data, using the sentence "The Management Group of Congenital Anomaly Register for Oxfordshire, Berkshire and Buckinghamshire approved the release of register data for this study. CAROBB is funded by the Department of Health."

12. On completion of the analysis and after copy datasets have been supplied to CAROBB, ALL PERSONAL IDENTIFIABLE INFORMATION MUST BE DESTROYED, in accordance with any requirements of the ethics approval for the study. If you are unsure on this point, contact CAROBB for clarification.

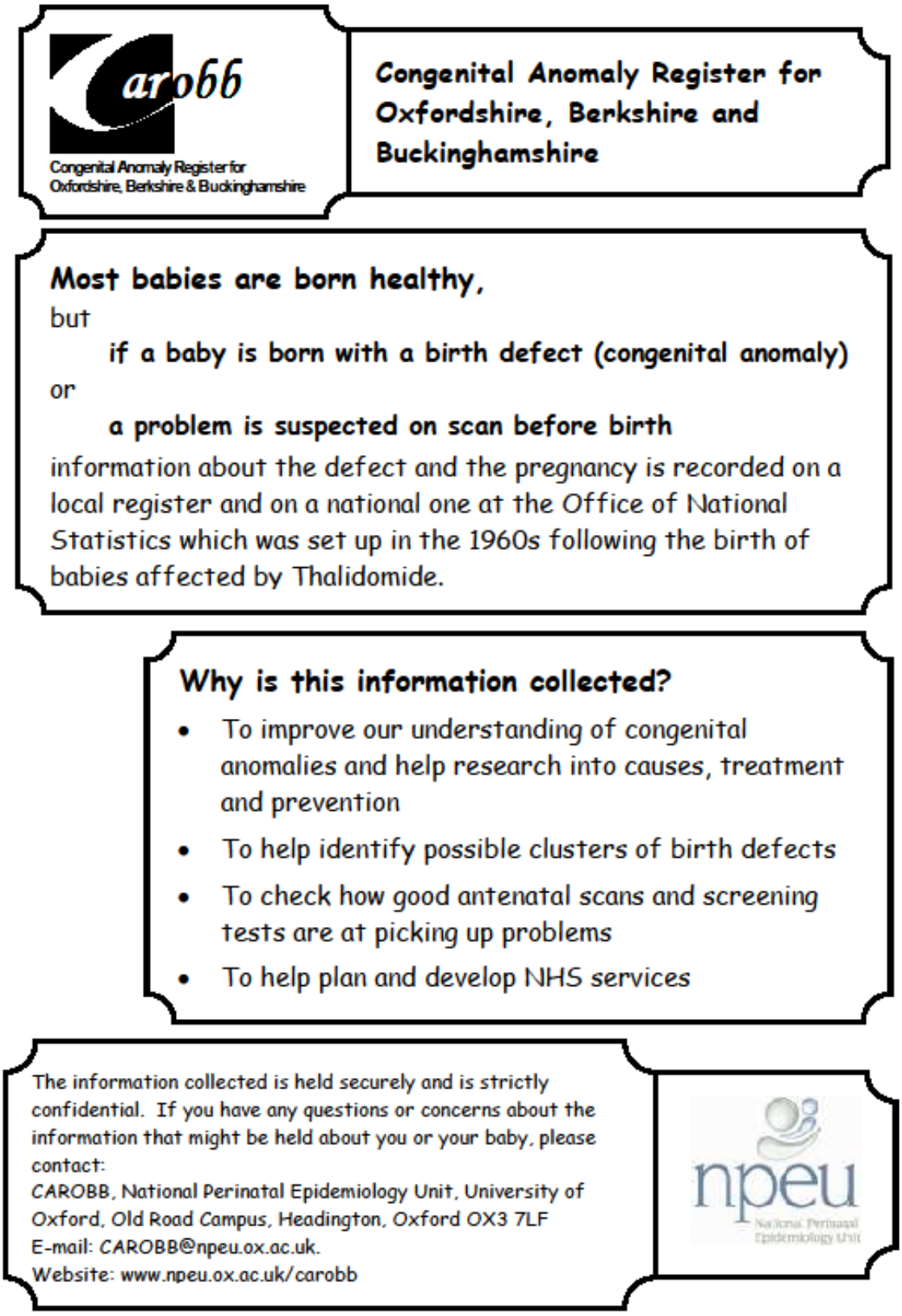
Please complete the application form enclosed and return to the CAROBB office.

Publicity

6a Poster for clinic waiting rooms

6b Leaflet for clinic waiting rooms

Appendix 6a


carobb
Congenital Anomaly Register for Oxfordshire, Berkshire & Buckinghamshire
Congenital Anomaly Register for Oxfordshire, Berkshire and Buckinghamshire
Most babies are born healthy,
but
if a baby is born with a birth defect (congenital anomaly)
or
a problem is suspected on scan before birth
information about the defect and the pregnancy is recorded on a local register and on a national one at the Office of National Statistics which was set up in the 1960s following the birth of babies affected by Thalidomide.
Why is this information collected?
To improve our understanding of congenital anomalies and help research into causes, treatment and prevention
To help identify possible clusters of birth defects
To check how good antenatal scans and screening tests are at picking up problems
To help plan and develop NHS services
The information collected is held securely and is strictly confidential. If you have any questions or concerns about the information that might be held about you or your baby, please contact:
CAROBB, National Perinatal Epidemiology Unit, University of Oxford, Old Road Campus, Headington, Oxford OX3 7LF
E-mail: CAROBB@npeu.ox.ac.uk.
Website: www.npeu.ox.ac.uk/carobb
npeu
National Perinatal Epidemiology Unit

How is information collected?

A member of staff from the hospital who treats you or your baby, completes a notification to the register when the anomaly is identified. The register often receives several notifications from different departments about the same baby. Any information reported in the early stages can be improved or confirmed later by these multiple notifications.

Names and postcodes are included so that information can be updated on the correct case and the same baby is not counted several times.

Information is collected on paper and stored electronically on a computer. This information is held securely by CAROBB, which is based at The National Perinatal Epidemiology Unit, in Oxford.

Does my name or my baby's name have to go on the Register?

We hope everyone will want to be included on the Register, to help us plan and improve services for future mothers and babies. However, your details can be removed at any time.

Will the database be secure and confidential?

The information recorded on the Register about you or your baby is confidential. It is held in a responsible way which respects the rights and privacy of individuals.

The Register follows a strict policy on security and confidentiality. This policy is available to the public. The register conforms to the requirements of legislation on data protection.

How can I find out more about CAROBB?

If you have any questions or concerns regarding the information that could be held on you or your baby, please contact the registry:

CAROBB
National Perinatal Epidemiology Unit
University of Oxford
Old Road Campus
Headington
Oxford OX3 7LF

Tel: 01865 289721
Fax: 01865 617775
E-mail: carobb@npeu.ox.ac.uk
Website: www.npeu.ox.ac.uk/carobb/

CAROBB and The National Perinatal Epidemiology Unit are funded by the Department of Health

Congenital Anomaly Register for Oxfordshire, Berkshire and Buckinghamshire

Information for parents

Appendix 6b

Every parent hopes that their baby will be healthy and most babies are.

However, a few babies do have problems (abnormalities) such as cleft palate, spina bifida, or Down's syndrome. These are sometimes called congenital anomalies or congenital malformations.

Some congenital anomalies are detected during pregnancy, some are found at birth, while others become apparent only as a baby grows older.

Why is information collected about babies with congenital anomalies?

CAROBB collects information:

- To increase our understanding of congenital anomalies and help research into their causes, treatment and prevention.
- To monitor how good antenatal screening tests (serum screening and ultrasound scans) are at picking-up problems.
- To look at trends - for example changes in the number of babies born with congenital anomalies, or changes in the pattern of where they are born.
- To give health professionals information to help them advise families about their chances of having a baby with a congenital anomaly.
- To help plan and develop NHS services.

What is CAROBB?

***CAROBB* (Congenital Anomaly Register for Oxfordshire, Berkshire and Buckinghamshire) is a database of information on babies born with suspected or confirmed congenital anomalies.**

What information is collected?

Information held by the register includes:

- Descriptions of each anomaly.
- Details and results of any investigations carried out during pregnancy (for example, the results of any ultrasound scans).
- Details about mother and baby.

Who sees the information?

There are very strict regulations controlling access to personal information - that is names and addresses. This information will only be available to members of hospital staff treating you or your baby, and to those who work on CAROBB.

Information is also sent to the National Congenital Anomaly Surveillance System, which collects information for the whole country. When this happens only the first three letters of the baby's name are sent.

Information that is used by researchers or published in reports does not contain anything to identify either mother or baby, such as names and addresses.

Can I see the records on the Register?

Yes - you have the right to request a copy of the information held on you or your baby.

To do this, please make your wishes known to a member of your healthcare team or contact CAROBB by telephone or e-mail.

Management Group and Steering Committee Members and Terms of Reference

Management Group members

Dr Patricia Boyd	Senior Clinical Research Fellow/ Director CAROBB, National Perinatal Epidemiology Unit
Prof Peter Brocklehurst	Director National Perinatal Epidemiology Unit, National Perinatal Epidemiology Unit
Dr Paul Chamberlain	Consultant obstetrician, John Radcliffe Hospital
Dr Jenny Kurinczuk	Consultant Clinical Epidemiologist, Deputy Director, National Perinatal Epidemiology Unit
Mrs Jackie Lovstrom	Prenatal diagnosis specialist midwife, John Radcliffe Hospital
Ms Catherine Rounding	Co-ordinator CAROBB, National Perinatal Epidemiology Unit
Ms Geraldine Surman	4Child, National Perinatal Epidemiology Unit

Steering Committee members 2009

Mrs Beverley Beaumont	Radiographer, Horton Hospital
Dr Patricia Boyd	Senior Clinical Research Fellow/ Director CAROBB, National Perinatal Epidemiology Unit
Prof Peter Brocklehurst	Director National Perinatal Epidemiology Unit, National Perinatal Epidemiology Unit
Dr Paul Chamberlain	Consultant obstetrician, John Radcliffe Hospital
Ms Catryn Dixon	Antenatal screening co-ordinator, Wycombe General Hospital
Dr Sanjay Salgia	Consultant Paediatrician, Wycombe General Hospital
Miss Jacqueline Hall	Consultant Gynaecologist , Stoke Mandeville Hospital
Mrs Julia Horsnell	Lay member
Dr Jenny Kurinczuk	Consultant Clinical Epidemiologist, Deputy Director, National Perinatal Epidemiology Unit
Mrs Jackie Lovstrom	Prenatal diagnosis specialist midwife, John Radcliffe Hospital
Ms Catherine Rounding	Co-ordinator CAROBB, National Perinatal Epidemiology Unit
Dr Rekha Sanghavi	Consultant Paediatrician, Wexham Park Hospital

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Miss Pampa Sarkar	Consultant Obstetrician, Wexham Park Hospital
Dr Nick Hicks	Director of Public Health, Milton Keynes
Ms Alison Wainright	Antenatal Screening Co-ordinator, Stoke Mandeville Hospital
Ms Geraldine Surman	4Child, National Perinatal Epidemiology Unit
Prof Andrew Wilkinson	Consultant neonatal paediatrician, John Radcliffe Hospital
Dr Ann Gordon	Consultant Paediatrician, Royal Berkshire Hospital
Ms Louise Abbott	Antenatal Screening co-ordinator, Milton Keynes General Hospital

CAROBB Steering Committee Terms of Reference

1) Terms of Reference
    a. To monitor and supervise the progress of the register towards its interim and overall objectives.
    b. To be accountable to the Department of Health for the register and associated projects.
    c. To determine the strategies for the use and development of the register.
    d. To propose and develop research projects using the register and to encourage the development of satellite projects.
    e. To encourage collaboration with other registers with similar functions in the development of joint projects and pooling of data.
    f. To develop strategies, within existing and future legislation and government guidelines, which authorise the release of personal data from the register to support research as appropriate.
2) Membership
    a. Chair
        i. independent of the management group of the project;
        ii. should be reviewed every three years;
        iii. should serve no more than two consecutive terms;
    b. Vice chair[1]
        i. independent of the management group of the project;
        ii. should be reviewed every three years;
    c. Minimum of two other independent members;
    d. One or two principal contributors;
    e. At least one lay/consumer representative;
    f. Project co-ordinator;
    g. Other members of the project management group should attend as appropriate;
    h. Observers from the funding body and host institution should be invited to all meetings.
    i. Members failing to attend two consecutive meetings may be asked to stand down;
    j. Members with particular difficulty in attending meetings e.g. through disability, child-care, may be asked to contribute to the group by email/telephone with the agreement of other members;

k. Members should aim to serve on the committee for at least three years. Membership should be reviewed after three years for long-running projects.

3) Meetings
   a. Should be organised before the start of a project to finalise the protocol where appropriate;
   b. Should be held at least annually;
   c. Papers for meetings should be circulated in advance;
   d. Meetings should be held face-to-face but in exceptional circumstances telephone conferencing can be considered an acceptable alternative;
   e. Where less than 50 per cent of independent members are able to attend, the meeting should be declared inquorate and a new meeting date arranged;
   f. Accurate minutes of the meeting should be prepared and agreed by all members of the steering committee.

1. This should answer the difficulty when the chair is unable to attend.