West Midlands
Key Health Data 2004/5

CHAPTER FIVE

Perinatal Mortality
and
Social Deprivation
West Midlands Trends 1998-2003

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5.1 Introduction

In a previous chapter (Key Health Data for the West Midlands 2001), we showed that :

- West Midlands perinatal mortality is consistently one of the highest of all government regions;

- stillbirths are the largest contributor to perinatal mortality, and with current classification systems, most are described as 'unexplained';

- a new classification is being applied which demonstrates that many of these deaths are associated with fetal growth restriction at relatively mature gestations and are therefore potentially avoidable;

- there is a significant link between perinatal mortality and social deprivation.

The purpose of this chapter is to:

1. summarise a recently completed analysis of stillbirth and infant mortality trends from 1998-2003 in the West Midlands;

2. assess the main categories contributing to these deaths;

3. analyse the trends of mortality associated with inequalities and the association with deprivation within different mortality subgroups.

The analysis presented here refers to the whole of the West Midlands.
Sub-analyses for the three strategic health authorities are presented on www.perinatal.nhs.uk/pnm/trends.

For PCTs, there are limitations on the detail in which potentially identifiable data can be published on the web or in print. The results for each PCT are therefore being sent directly to the respective director of Public Health, in line with data protection and confidentiality guidelines.

5.2 Definitions

Stillbirth rate
Number of stillbirths > 24 weeks (168 days) per 1,000 live births and stillbirths.

Early neonatal mortality rate
Number of deaths at ages under 1 week, per 1,000 live births.

Neonatal mortality rate
Number of deaths at ages under 4 weeks, per 1,000 live births.

Postneonatal mortality rate
Number of deaths at ages 28 days and over but under one year, per 1,000 live births.

Perinatal mortality rate
Number of stillbirths plus number of deaths at ages under 1week, per 1,000 live births and stillbirths.

Infant mortality rate
Number of deaths at ages under one year, per 1,000 live births.

5.3 Data source

The data was derived from Rapid Report Forms submitted to the Institute from maternity units in the West Midlands and the ONS Birth Tapes.

5.4 Classification for Stillbirth

The two classifications in this report are listed in Tables 5.1A and 5.1B. They map to those applied by ONS in terms of the chronology of the event. However, they also use a previously developed categorisation which aims to elucidate underlying conditions or causality.

The standard classifications such as Wigglesworth are summarised in the CESDI national reports. However, most of these result in a large 'unexplained' category which confirms the need to improve the classification system (CESDI 2001).

The Perinatal Institute developed a classification for stillbirth, ReCoDe (www.perinatal.nhs.uk/pnm/recode). For the purpose of this aggregated analysis, stillbirth rates are summarised in the following ReCoDe categories.

Table 5.1A Stillbirth Classification by major ReCoDe groups

1. Congenital anomaly
2. Infection
3. Fetal growth restriction
4. Umbilical cord
5. Placenta
6. Maternal conditions
7. Intrapartum asphyxia or trauma
8. Miscellaneous
9. Unclassified/Unknown

5.5 Classification for Neonatal and Infant Death

This was based on the Fetal and Neonatal Classification (Hey 1986) and amended to include cot deaths as a separate category.

Table 5.1B Neonatal and Infant Death Classification

1. Congenital anomaly
2. Asphyxia before birth
3. Severe pulmonary immaturity
4. Hyaline membrane disease
5. Intracranial haemorrhage
6. Infection
7. Cot death
8. Miscellaneous
9. Unclassified/Unknown

5.6 Deprivation Scores

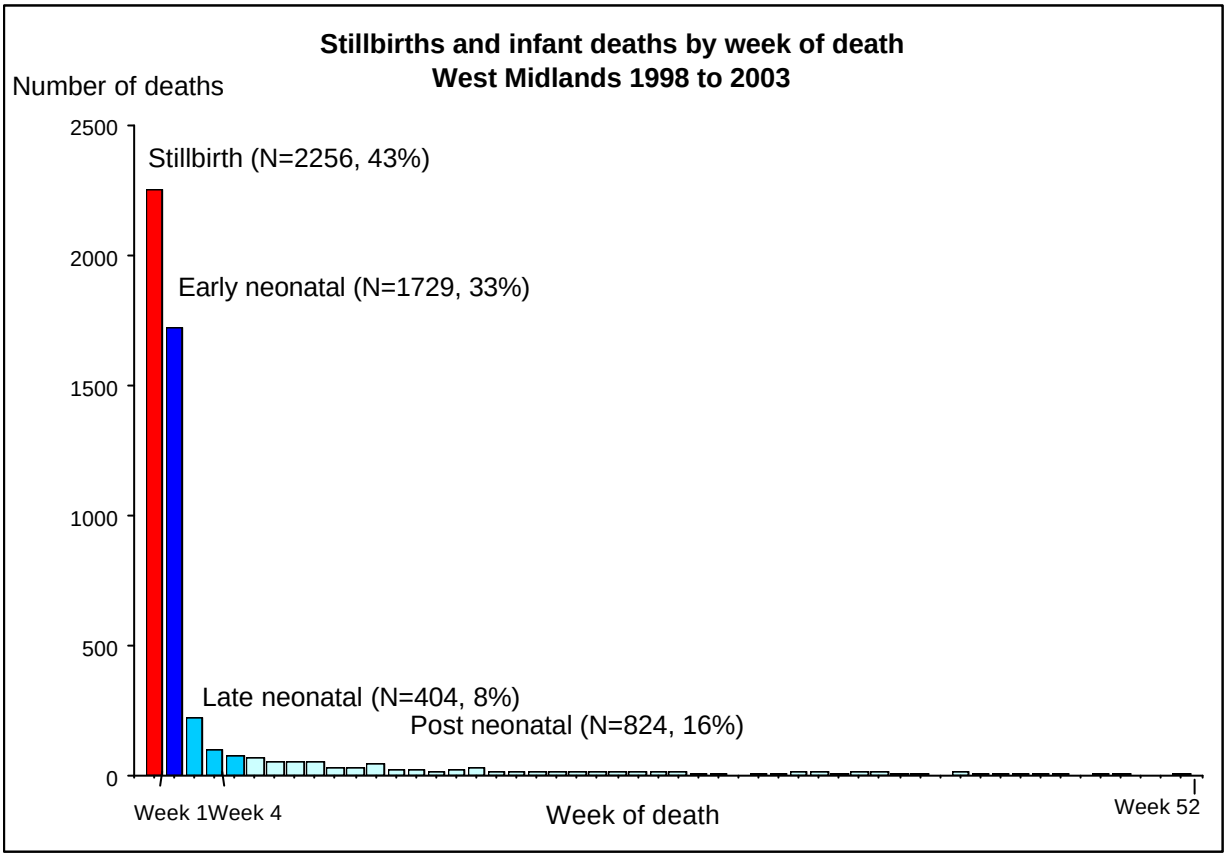
For the purpose of the current analysis, we applied the widely used Index of Multiple Deprivation (IMD). This is a ward-based measure with seven sub domains (income, employment, health, education, housing and services, environment and crime). Larger values indicate higher degrees of deprivation.

For comparative analysis, we defined as cut-off the 197 (8%) most deprived wards of the 798 wards in the West Midlands. These wards had 93,962 of the total of 377,744 births (25%) over the period of the study. We thus compared the 25% of births from the 8% most deprived wards ('IMD 8/25') with 75% of births from the remaining 92% of the wards in the West Midlands ('IMD 92/75').

It should be noted that these births, although from the most deprived wards, were still from a range of social class strata, a consequence of this measure of inequality being ward and not patient based. We currently do not have social class indicators for each birth in the West Midlands, although we expect data from the ONS which will allow us to use these for further analysis in the near future.

5.7 Results: Rates and Trends in Perinatal and Infant Mortality

Figure 5.1 Stillbirths, Early, Late and Postneonatal deaths, West Midlands 1998-2003



The PSA targets on reducing inequalities use infant mortality as a key indicator (Health Inequalities DoH 2004). However, as Figure 1 shows,

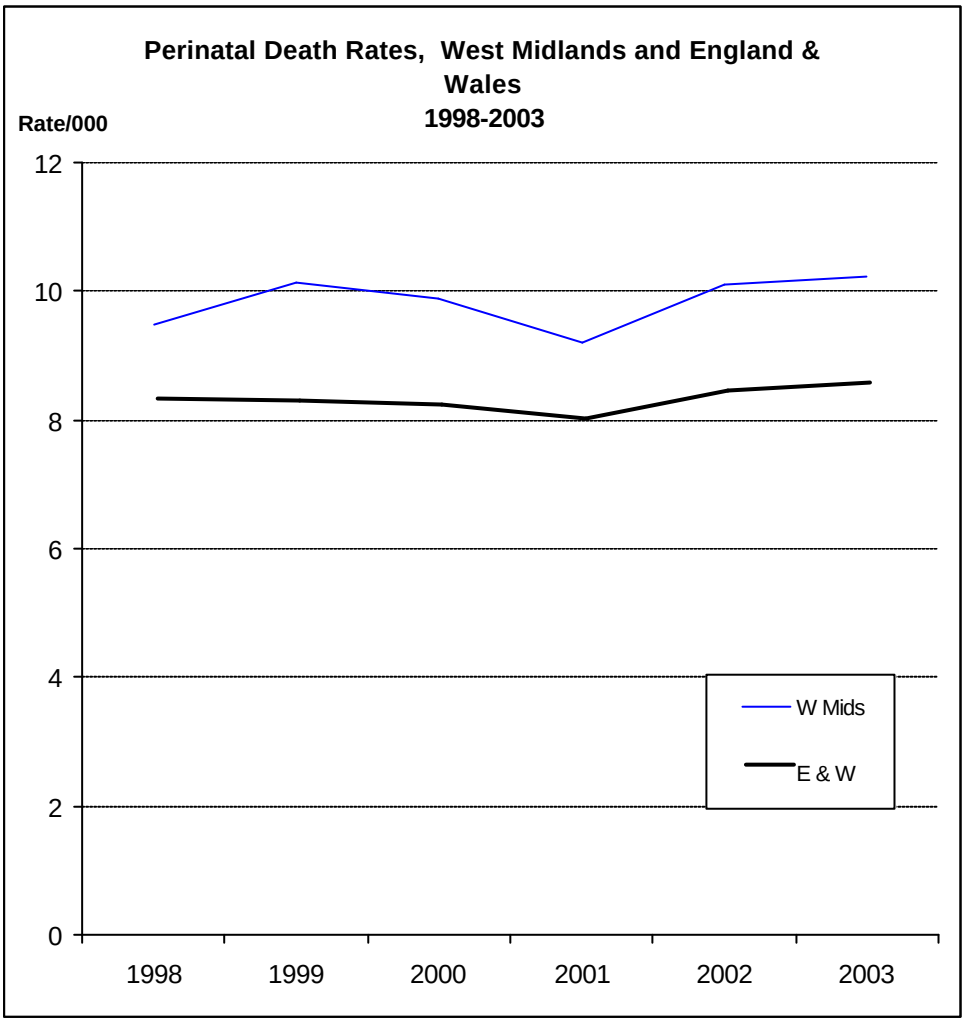
- most infant deaths (birth to 12 months) occur in the first week of life;
- stillbirths are the largest component of adverse outcome, and these are not contained in infant mortality statistics.

It is well established that many instances of adverse outcome have antenatal origins. Therefore, we need to include stillbirths, not just in their own right, but also when seeking to understand and reduce infant mortality. The analysis presented in this chapter will include perinatal (stillbirth and early neonatal) as well as infant (early, late and post neonatal) data.

Table 5.2 Trends for perinatal mortality rates in the West Midlands and England & Wales

	1998	1999	2000	2001	2002	2003
W Mids	9.5	10.1	9.9	9.2	10.1	10.2
E & W	8.2	8.2	8.1	7.9	8.3	8.5

Figure 5.2 Trends for perinatal mortality rates in the West Midlands and England & Wales

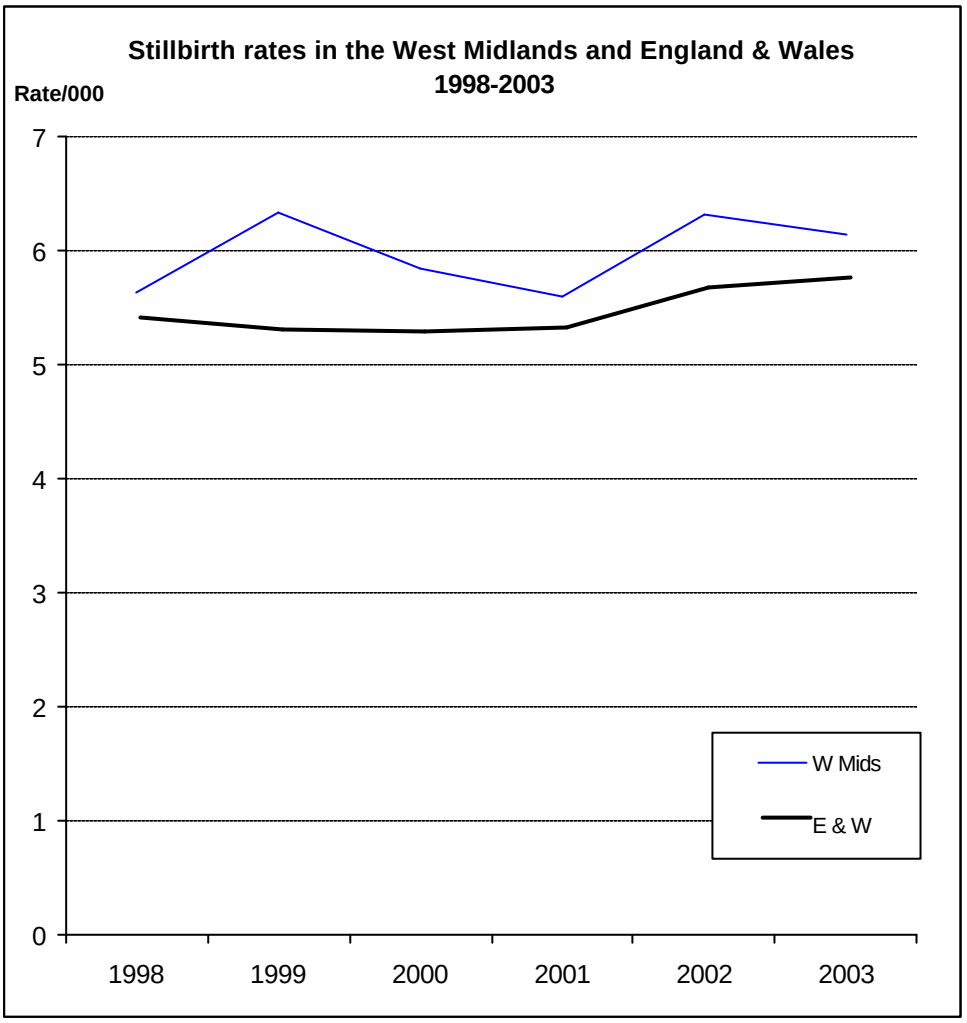


There was a non-significant increase in perinatal mortality in England & Wales (p=0.11; linear trend analysis) and West Midlands (p=0.21). This appears to be associated with a rise in stillbirth rates over the last 2 years (Figure 5.3).

Table 5.3 Stillbirth rates in West Midlands and England and Wales 1998-2003

	1998	1999	2000	2001	2002	2003
W Mids	5.6	6.3	5.8	5.6	6.3	6.1
E & W	5.3	5.3	5.2	5.3	5.6	5.7

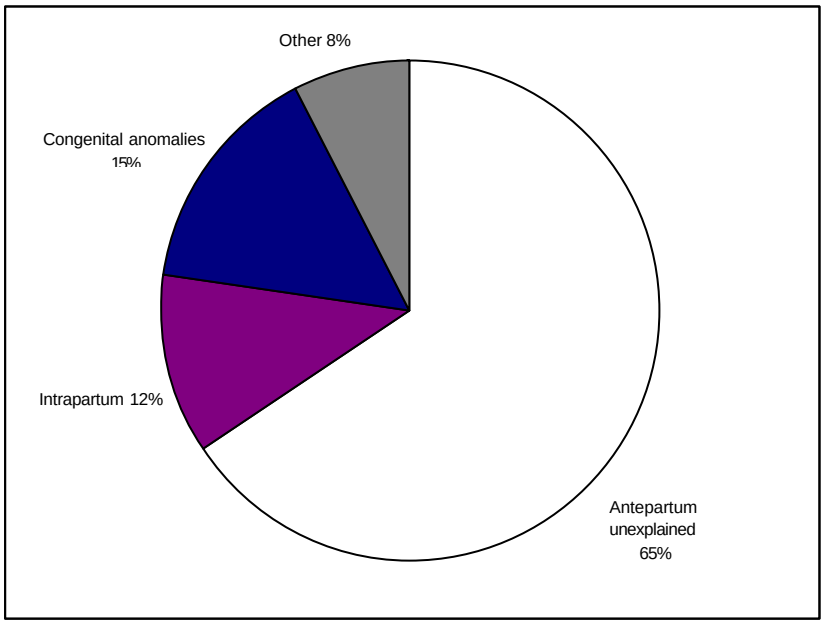
Figure 5.3 Stillbirth rates in West Midlands and England and Wales 1998-2003



Linear trend analysis shows an increase in stillbirth rates in the West Midlands over the last two years, which mirrored those in England and Wales over the same period. Both were significant ($p<0.01$).

Table 5.4 and Figure 5.4
Wigglesworth classification of stillbirths in West Midlands1998-2003

Wigglesworth class'n	No	%
Antepartum unexplained	1482	65
Intrapartum	260	12
Congenital anomalies	346	15
Other	170	8



Consistent with national statistics (CESDI 2001), the Wigglesworth classification used by CEMACH leaves two-thirds of stillbirths in the 'Unexplained' category.

Using RECODE (see Fig 5.5a and Table 5.5), only 16% are left in the 'Unclassified/unknown' category.

Figure 5.5a Stillbirths by major ReCoDe groups, West Midlands 1998-2003

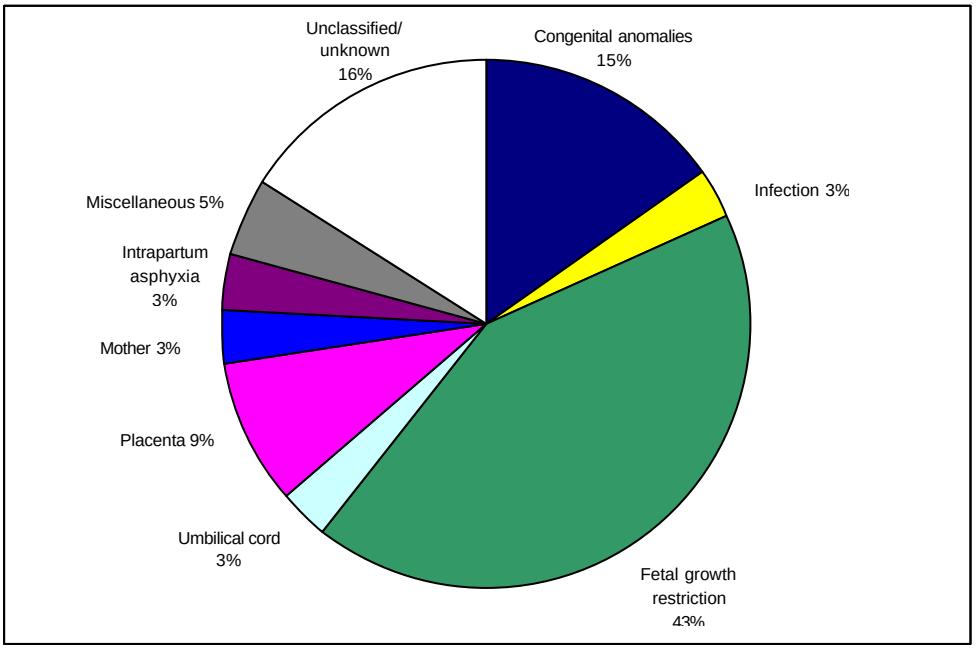


Table 5.5 Stillbirths by major ReCoDe groups, West Midlands 1998-2003

		Number and percentage of total yearly deaths						
Major ReCoDe group		1998	1999	2000	2001	2002	2003	Total
Congenital anomalies	No	56	62	45	61	63	61	348
	%	*15.2*	*15.3*	*12.5*	*17.8*	*16.2*	*15.5*	*15.4*
Infection	No	15	10	7	11	14	11	68
	%	*4.1*	*2.5*	*1.9*	*3.2*	*3.6*	*2.8*	*3.0*
Fetal growth restriction	No	170	157	161	147	160	154	949
	%	*46.2*	*38.8*	*44.6*	*43.0*	*41.2*	*39.1*	*42.0*
Umbilical cord	No	11	13	12	12	11	14	73
	%	*3.0*	*3.2*	*3.3*	*3.5*	*2.8*	*3.6*	*3.2*
Placenta	No	34	39	43	18	35	32	201
	%	*9.2*	*9.6*	*11.9*	*5.3*	*9.0*	*8.1*	*8.9*
Maternal conditions	No	9	14	7	18	15	11	74
	%	*2.4*	*3.5*	*1.9*	*5.3*	*3.9*	*2.8*	*3.3*
Intrapartum asphyxia	No	14	14	9	10	13	14	74
	%	*3.8*	*3.5*	*2.5*	*2.9*	*3.4*	*3.6*	*3.3*
Miscellaneous	No	14	29	15	19	11	17	105
	%	*3.8*	*7.2*	*4.2*	*5.6*	*2.8*	*4.3*	*4.7*
Unclassified/Unknown	No	45	67	62	46	66	80	366
	%	*12.2*	*16.5*	*17.2*	*13.5*	*17.0*	*20.3*	*16.2*
Total	No	368	405	361	342	388	394	2258

Fetal growth restriction was the main category in each year, and represented an average 42% of all stillbirths. The slight downward trend was non-significant (p=0.65). There was no clear reason for the overall increase in stillbirths over the last two years

Figure 5.5b Stillbirths by major ReCoDe groups 1998-2003, West Midlands

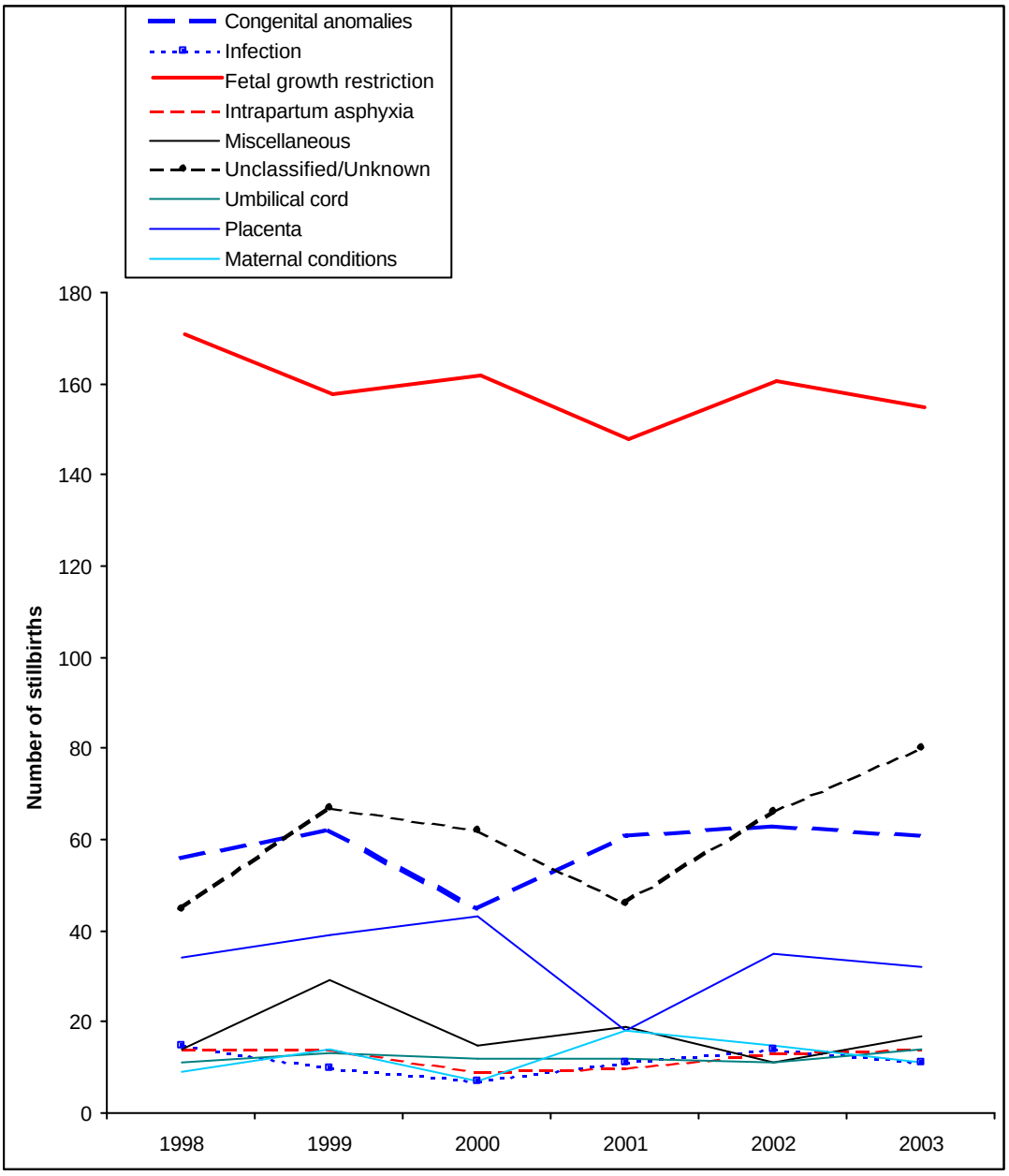
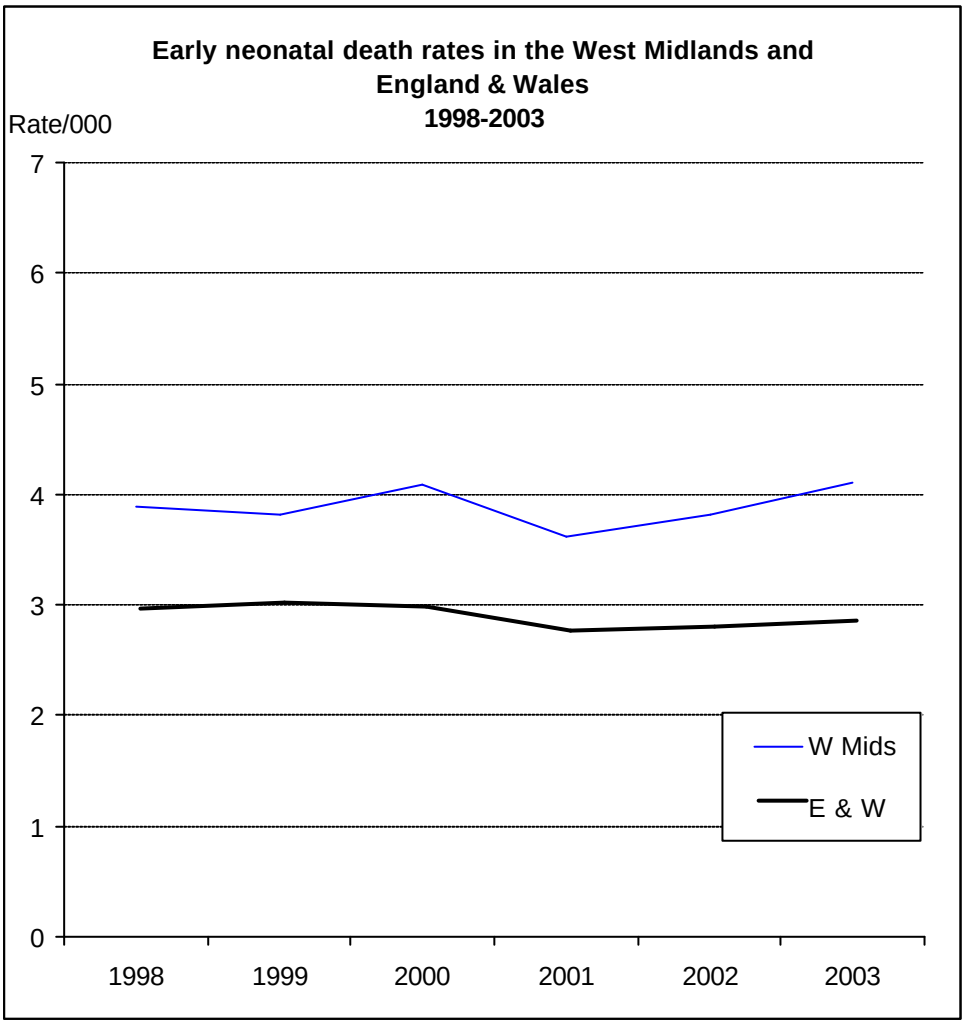


Table 5.6 Early Neonatal Death Rates in the West Midlands and England & Wales 1998-2003

	1998	1999	2000	2001	2002	2003
W Mids	3.9	3.8	4.1	3.6	3.8	4.1
E & W	2.9	2.9	2.9	2.7	2.7	2.8

Figure 5.6 Early Neonatal Death Rates in the West Midlands and England & Wales 1998-2003

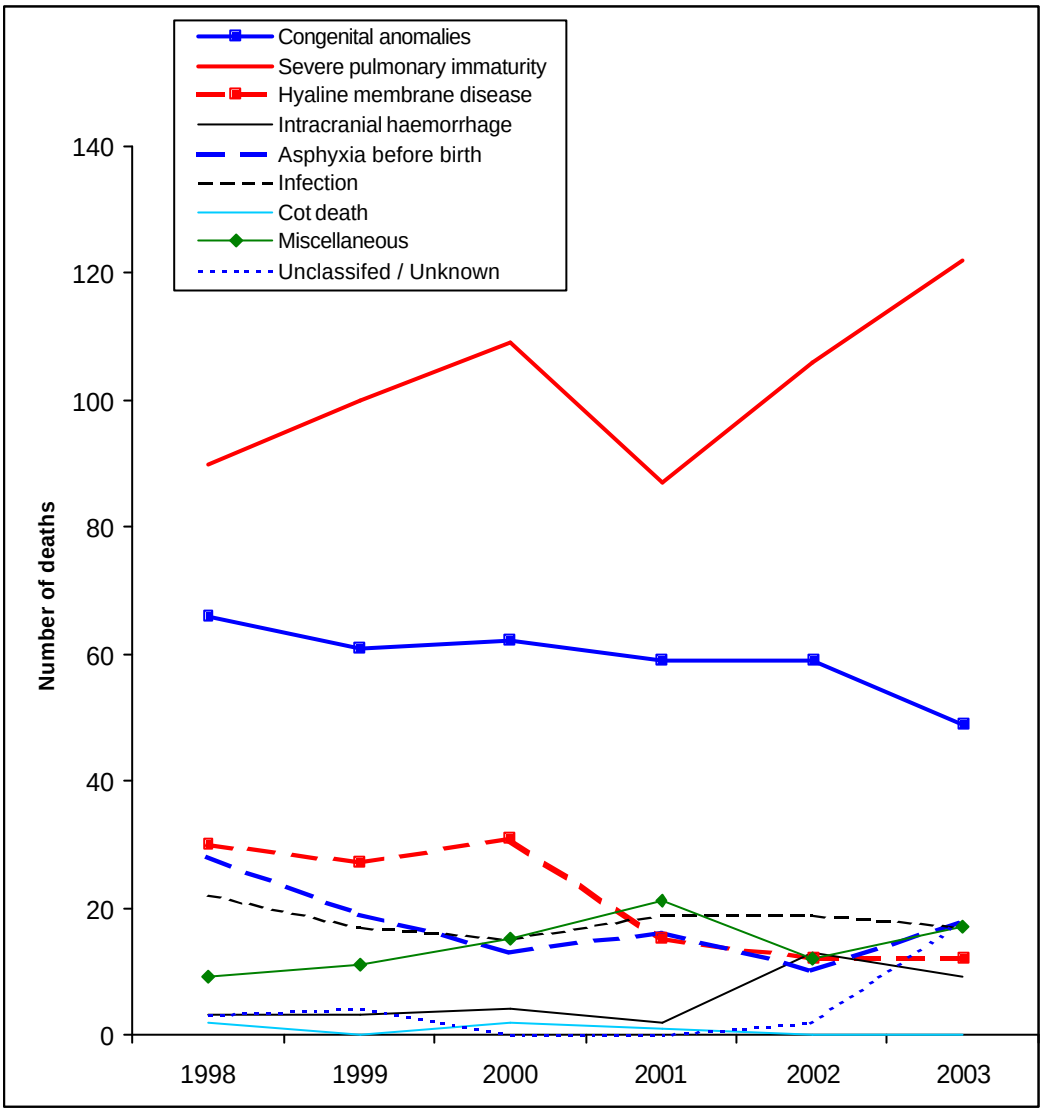


Early Neonatal Deaths showed a gradual downward trend in England and Wales (p=0.02) but not in the West Midlands.

Table 5.7 Early neonatal deaths in West Midlands 1998-2003 - Neonatal and Infant Death classification

Neonatal & Infant Groups		1998	1999	2000	2001	2002	2003	Total
Congenital anomalies	No	66	61	62	59	59	49	356
	%	*26.1*	*25.2*	*24.7*	*26.8*	*25.3*	*18.7*	*24.4*
Asphyxia before birth	No	28	19	13	16	10	18	104
	%	*11.1*	*7.9*	*5.2*	*7.3*	*4.3*	*6.9*	*7.1*
Severe pulmonary immaturity	No	90	100	109	87	106	122	614
	%	*35.6*	*41.3*	*43.4*	*39.5*	*45.5*	*46.6*	*42.0*
Hyaline membrane disease	No	30	27	31	15	12	12	127
	%	*11.9*	*11.2*	*12.4*	*6.8*	*5.2*	*4.6*	*8.7*
Intracranial haemorrhage	No	3	3	4	2	13	9	34
	%	*1.2*	*1.2*	*1.6*	*0.9*	*5.6*	*3.4*	*2.3*
Infection	No	22	17	15	19	19	17	109
	%	*8.7*	*7.0*	*6.0*	*8.6*	*8.2*	*6.5*	*7.5*
Cot death	No	2	0	2	1	0	0	5
	%	*0.8*	*0.0*	*0.8*	*0.5*	*0.0*	*0.0*	*0.3*
Miscellaneous	No	9	11	15	21	12	17	85
	%	*3.6*	*4.5*	*6.0*	*9.5*	*5.2*	*6.5*	*5.8*
Unclassified / Unknown	No	3	4	0	0	2	18	27
	%	*1.2*	*1.7*	*0.0*	*0.0*	*0.9*	*6.9*	*1.8*
Total	No	253	242	251	220	233	262	1461
	%	*100*	*100*	*100*	*100*	*100*	*100*	*100*

Figure 5.7 Early neonatal deaths in West Midlands 1998-2003 - Neonatal and Infant Death classification



There was a significant upward trend in the category Severe Pulmonary Immaturity (p=0.04). The late drop in congenital anomalies did not reach significance (p=0.22).

5.8 Neonatal Deaths and Gestational Age

While stillbirths are recorded from 24 weeks only, neonatal deaths have no lower gestational age limit, and a baby is considered live born if it has demonstrated any signs of life.

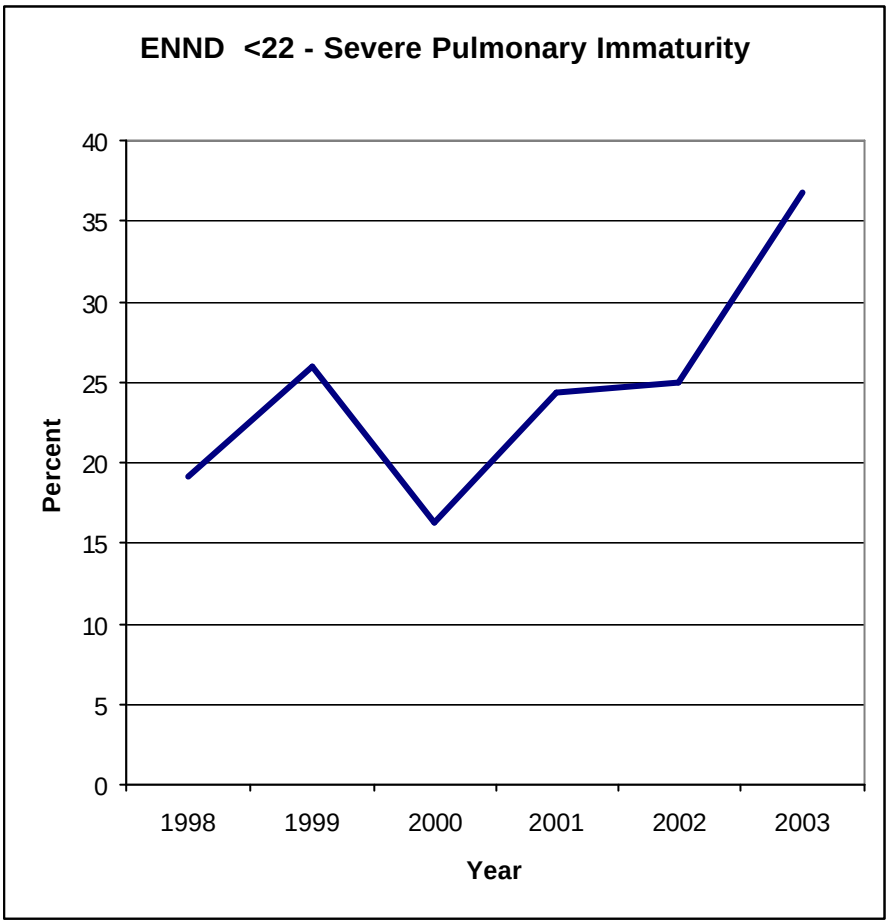
The deaths classified as 'Severe Pulmonary Immaturity' were analysed according to gestational age at birth (Table 5.8)

Table 5.8 Early neonatal deaths due to pulmonary immaturity by gestational age at birth

Numbers:							
Gest wks	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**All**
<20	4	8	4	7	12	17	52
20	4	7	10	5	6	13	45
21	11	13	5	11	10	16	66
22	20	19	15	13	11	14	92
23	23	18	21	14	24	21	121
24+	37	43	61	44	49	44	278
Total	99	108	116	94	112	125	654
Percentages %:							
Gest wks	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**All**
<20	*4.0*	*7.4*	*3.4*	*7.4*	*10.7*	*13.6*	*8.0*
20	*4.0*	*6.5*	*8.6*	*5.3*	*5.4*	*10.4*	*6.9*
21	*11.1*	*12.0*	*4.3*	*11.7*	*8.9*	*12.8*	*10.1*
22	*20.2*	*17.6*	*12.9*	*13.8*	*9.8*	*11.2*	*14.1*
23	*23.2*	*16.7*	*18.1*	*14.9*	*21.4*	*16.8*	*18.5*
24+	*37.4*	*39.8*	*52.6*	*46.8*	*43.8*	*35.2*	*42.5*
Total	*100*	*100*	*100*	*100*	*100*	*100*	*100*
<22 wks	***19.2***	***25.9***	***16.4***	***24.5***	***25.0***	***36.8***	

The table shows an increase in deaths reported at very early gestations. The increasing trend in reports of ENND at gestations < 22 wks is highly significant ($p<0.01$). This is further illustrated in Figure 5.8.

Figure 5.8 Early Neonatal Deaths <22 weeks due to severe pulmonary immaturity West Midlands 1998-2003

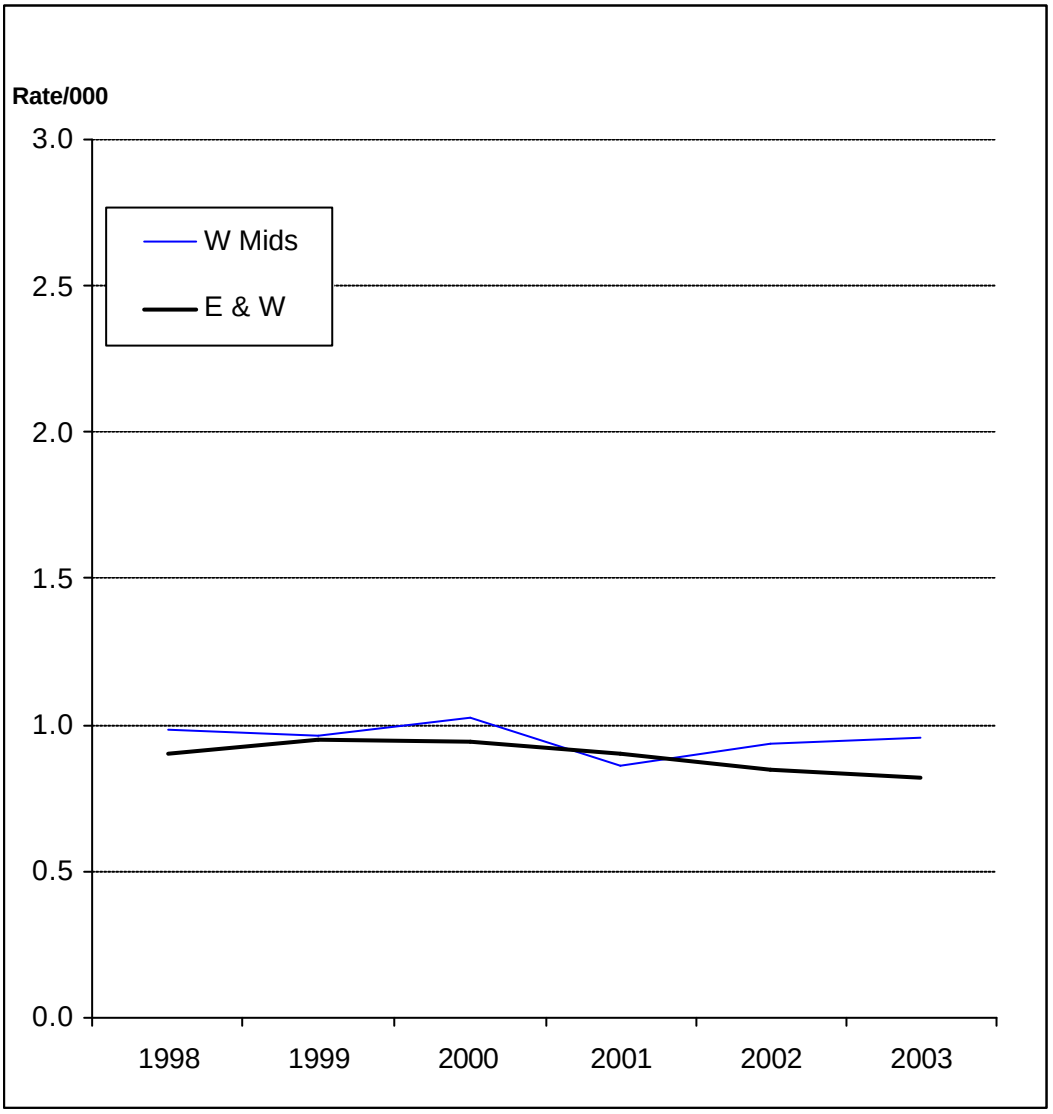


The Perinatal Institute intends to discuss the issue of gestational age and the recording of neonatal deaths with regional stakeholders. One possible explanation for the observed rise is the tendency in recent years to move the management of late miscarriages from a gynaecological to an obstetric ward, where perhaps 'signs of life' are more actively looked for, even at pre-viable gestations.

Table 5.9 Late Neonatal Death Rates in the West Midlands and England & Wales 1998-2003

	1998	1999	2000	2001	2002	2003
W Mids	1.0	1.0	1.0	0.9	0.9	1.0
E & W	0.9	0.9	0.9	0.9	0.8	0.8

Figure 5.9 Late Neonatal Death Rates in the West Midlands and England & Wales 1998-2003

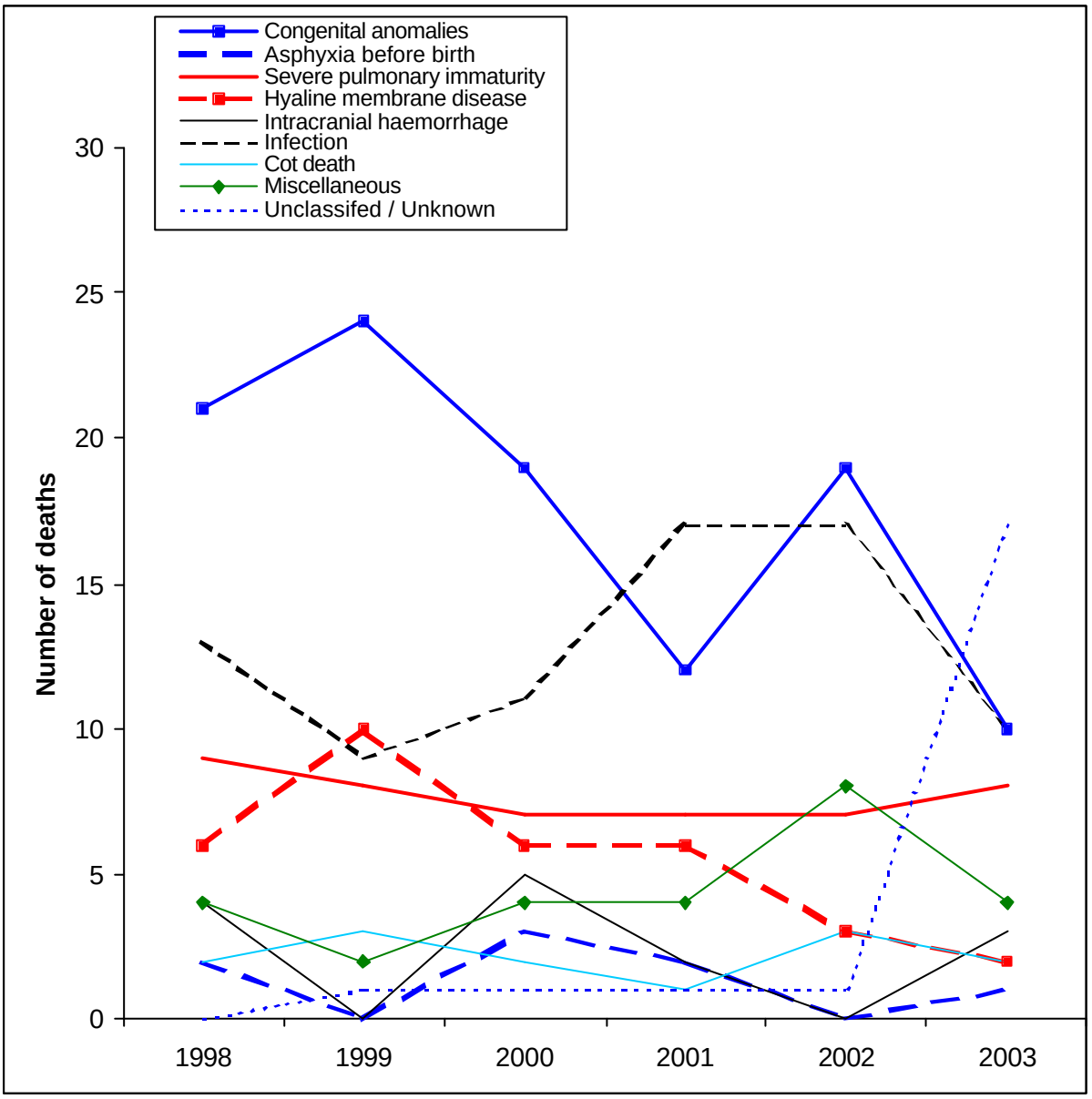


There was a gradual drop in late neonatal death rates in England and Wales, (p=0.01) which was not reflected in the West Midlands data.

Table 5.10 Late neonatal deaths by Neonatal & Infant classification, West Midlands 1998-2003

Neonatal and Infant Groups		1998	1999	2000	2001	2002	2003	Total
Congenital anomalies	No	21	24	19	12	19	10	105
	%	*34.4*	*42.1*	*32.8*	*23.1*	*32.8*	*17.5*	*30.6*
Asphyxia before birth	No	2	0	3	2	0	1	8
	%	*3.3*	*0.0*	*5.2*	*3.8*	*0.0*	*1.8*	*2.3*
Severe pulmonary immaturity	No	9	8	7	7	7	8	46
	%	*14.8*	*14.0*	*12.1*	*13.5*	*12.1*	*14.0*	*13.4*
Hyaline membrane disease	No	6	10	6	6	3	2	33
	%	*9.8*	*17.5*	*10.3*	*11.5*	*5.2*	*3.5*	*9.6*
Intracranial haemorrhage	No	4	0	5	2	0	3	14
	%	*6.6*	*0.0*	*8.6*	*3.8*	*0.0*	*5.3*	*4.1*
Infection	No	13	9	11	17	17	10	77
	%	*21.3*	*15.8*	*19.0*	*32.7*	*29.3*	*17.5*	*22.4*
Cot death	No	2	3	2	1	3	2	13
	%	*3.3*	*5.3*	*3.4*	*1.9*	*5.2*	*3.5*	*3.8*
Miscellaneous	No	4	2	4	4	8	4	26
	%	*6.6*	*3.5*	*6.9*	*7.7*	*13.8*	*7.0*	*7.6*
Unclassifed / Unknown	No	0	1	1	1	1	17	21
	%	*0.0*	*1.8*	*1.7*	*1.9*	*1.7*	*29.8*	*6.1*
Total	No	61	57	58	52	58	57	343
	%	*100*	*100*	*100*	*100*	*100*	*100*	*100*

Figure 5.10 Late neonatal deaths by Neonatal & Infant classification, West Midlands 1998-2003



It should be noted that numbers in the 'Late Neonatal' age range are much smaller, which explains some of the variation.

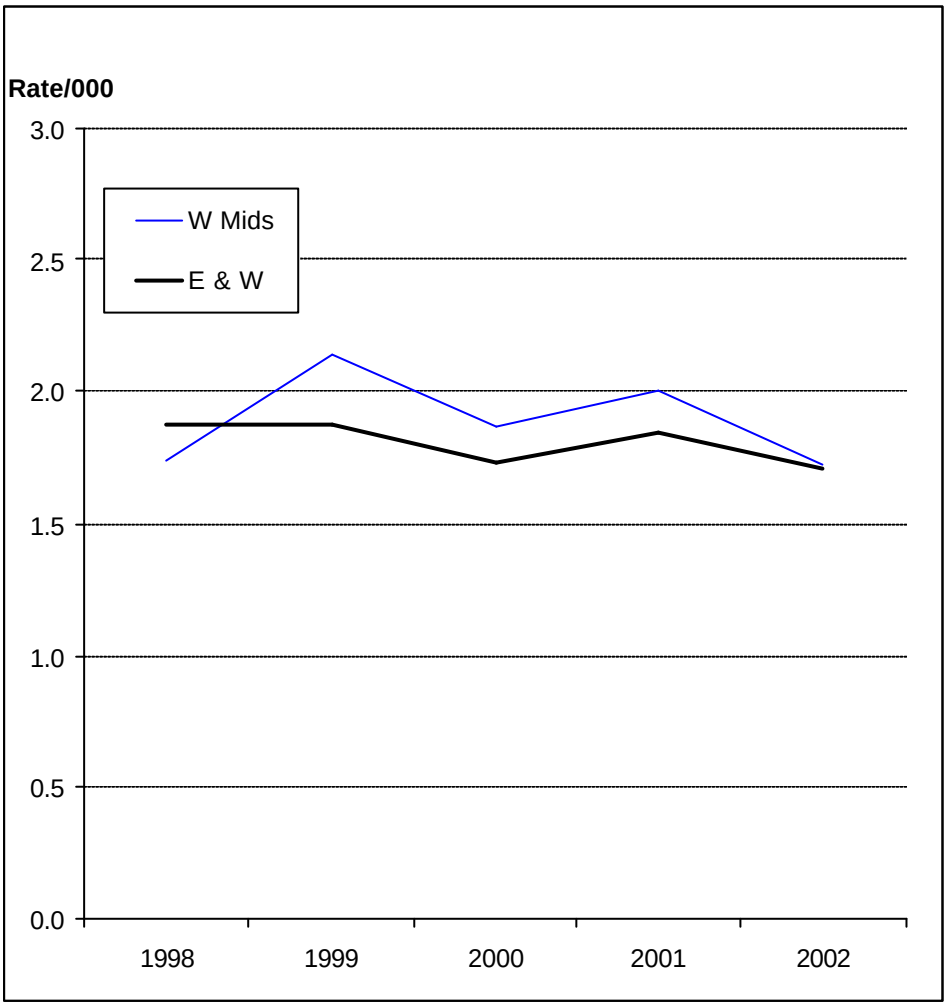
The downward trend in congenital anomalies was statistically significant (p=0.04) but the drop in 2003 was accompanied by an increase in the unclassified/unknown category, which is likely due to delays in diagnosis and classifications of some anomalies.

Table 5.11 Post Neonatal Death Rates in the West Midlands and England & Wales 1998-2002

	1998	1999	2000	2001	2002
W Mids	1.7	2.1	1.9	2.0	1.7
E & W	1.9	1.9	1.7	1.8	1.7

NB – Some post neonatal deaths in 2003 have not yet been notified. Therefore the rates are presented up to 2002 only.

Figure 5.11 Post Neonatal Death Rates in the West Midlands and England & Wales 1998-2002



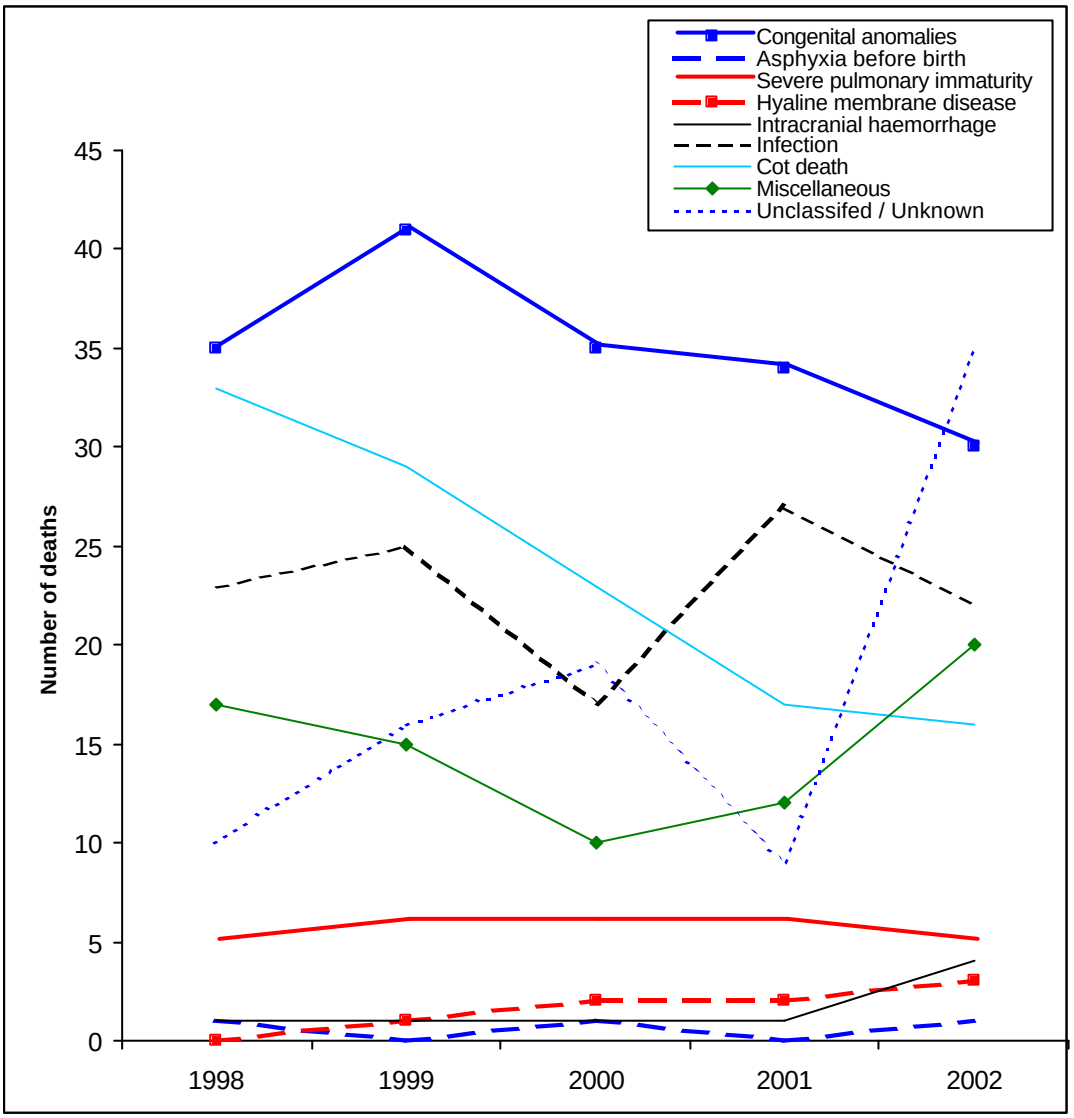
There appears to be a slow downward trend in both data series. This achieves significance in the figures for England and Wales ($p<0.01$) but not in the West Midlands ($p=0.38$).

Table 5.12 Post neonatal deaths analysed using major Neonatal and Infant Death classification groups 1998-2002

NB – A proportion of these deaths in 2003 have not yet been notified, are coroners cases, and / or their final diagnoses have yet to be entered. Therefore the data is presented to 2002 only.

Neonatal / Infant Groups		1998	1999	2000	2001	2002	Total
Congenital anomalies	No	35	41	35	34	30	175
	%	*28.0*	*30.6*	*30.7*	*31.5*	*22.1*	*28.4*
Asphyxia before birth	No	1	0	1	0	1	3
	%	*0.8*	*0.0*	*0.9*	*0.0*	*0.7*	*0.5*
Severe pulmonary immaturity	No	5	6	6	6	5	28
	%	*4.0*	*4.5*	*5.3*	*5.6*	*3.7*	*4.5*
Hyaline membrane disease	No	0	1	2	2	3	8
	%	*0.0*	*0.7*	*1.8*	*1.9*	*2.2*	*1.3*
Intracranial haemorrhage	No	1	1	1	1	4	8
	%	*0.8*	*0.7*	*0.9*	*0.9*	*2.9*	*1.3*
Infection	No	23	25	17	27	22	114
	%	*18.4*	*18.7*	*14.9*	*25.0*	*16.2*	*18.5*
Cot death	No	33	29	23	17	16	118
	%	*26.4*	*21.6*	*20.2*	*15.7*	*11.8*	*19.1*
Miscellaneous	No	17	15	10	12	20	74
	%	*13.6*	*11.2*	*8.8*	*11.1*	*14.7*	*12.0*
Unclassifed / Unknown	No	10	16	19	9	35	89
	%	*8.0*	*11.9*	*16.7*	*8.3*	*25.7*	*14.4*
Total	No	125	134	114	108	136	617
	%	*100*	*100*	*100*	*100*	*100*	*100*

Figure 5.12 Post neonatal deaths using Neonatal and Infant Classification
West Midlands 1998-2002

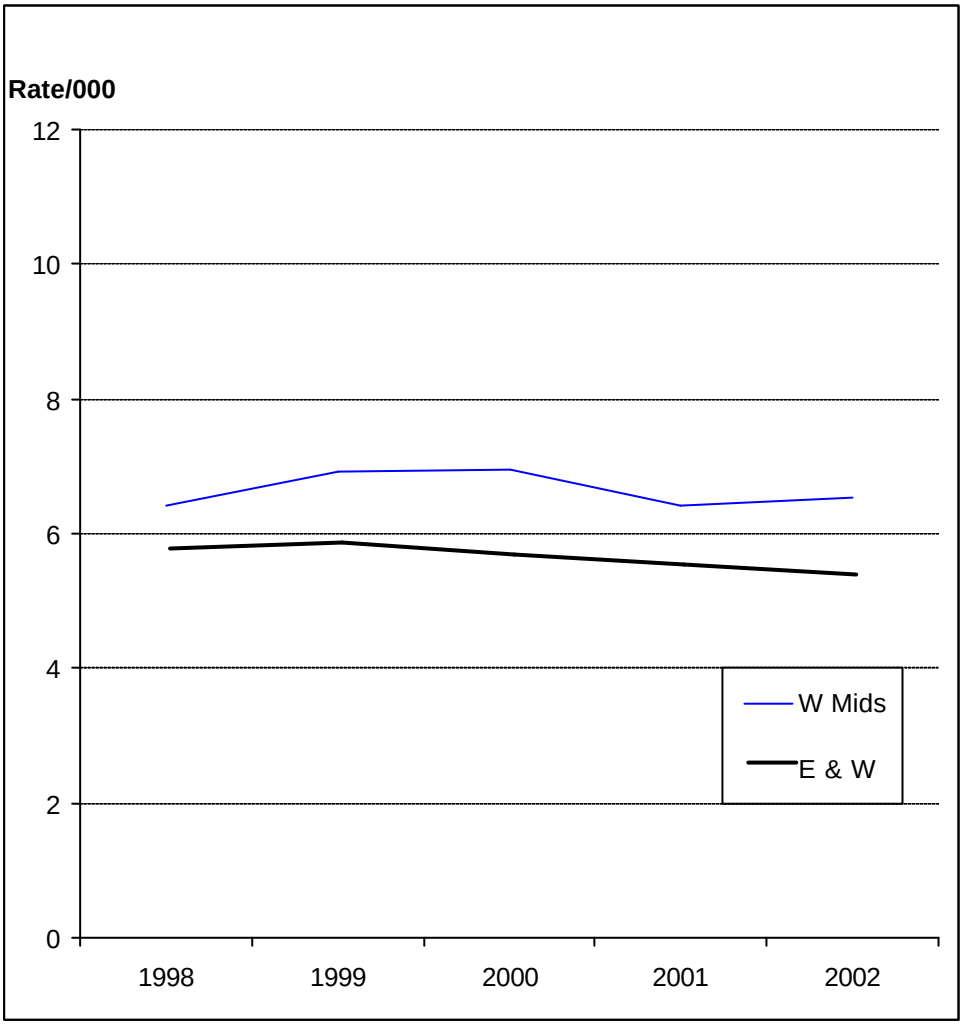


There was a significant drop in cot deaths ($p<0.01$) The apparent downward trend in congenital anomalies is not statistically significant ($p=0.56$).

Table 5.13 Infant Death Rates in the West Midlands and England & Wales 1998-2002

	1998	1999	2000	2001	2002
W Mids	6.4	6.9	6.9	6.4	6.5
E & W	5.7	5.8	5.6	5.4	5.3

Figure 5.13 Infant Death Rates in the West Midlands and England & Wales 1998-2002



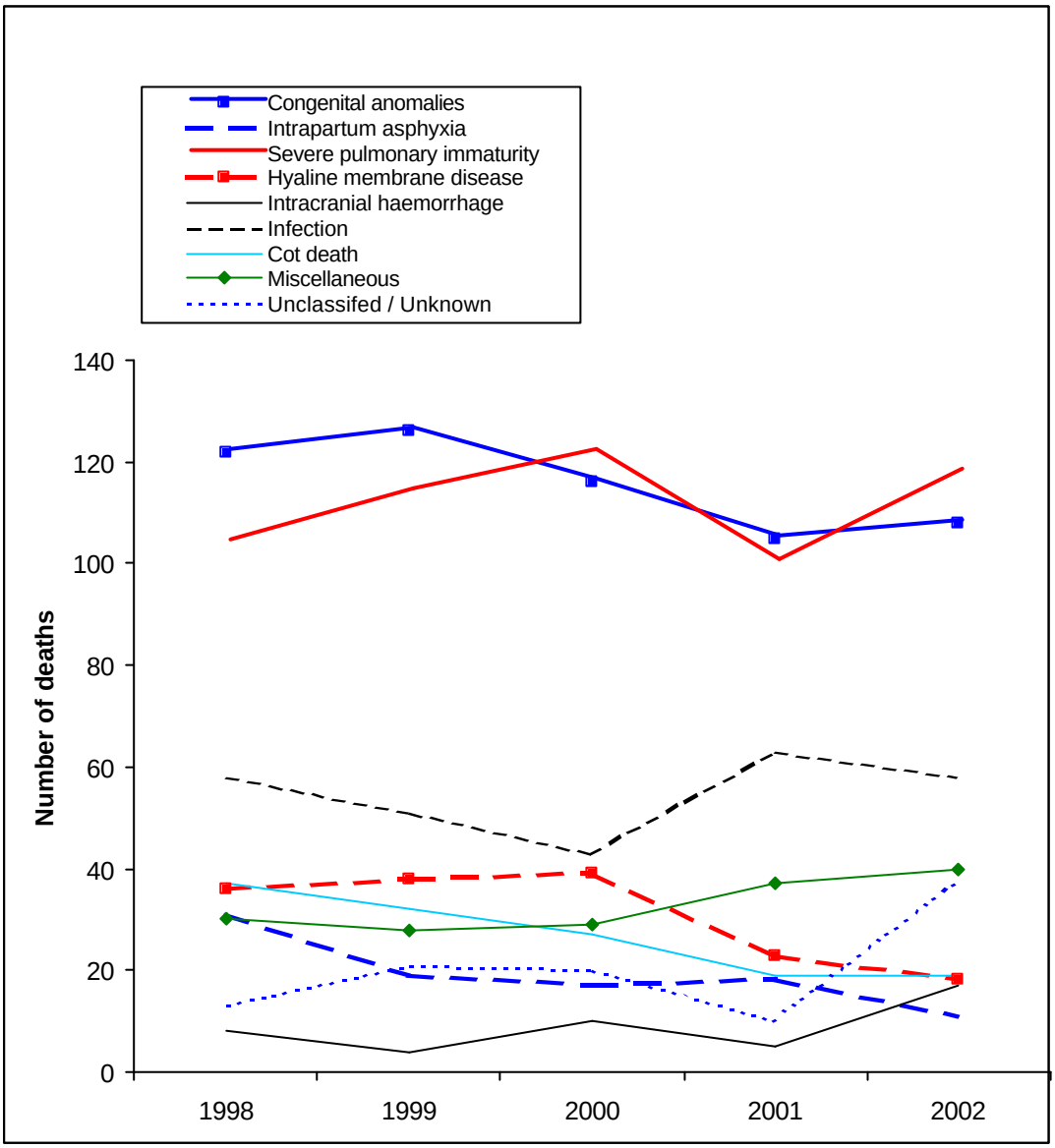
There was a downward trend in infant mortality rates in England and Wales ($p<0.01$) which was not reflected in the West Midlands.

Table 5.14 and Figure 5.14 show an analysis of Infant deaths by the Neonatal and Infant classification.

Table 5.14 Infant deaths by Fetal and Neonatal classification groups, West Midlands 1998-2002

Neonatal and Infant Groups		1998	1999	2000	2001	2002	Total
Congenital anomalies	No	122	126	116	105	108	577
	%	*27.8*	*29.1*	*27.4*	*27.6*	*25.3*	*27.5*
Asphyxia before birth	No	31	19	17	18	11	96
	%	*7.1*	*4.4*	*4.0*	*4.7*	*2.6*	*4.6*
Severe pulmonary immaturity	No	104	114	122	100	118	558
	%	*23.7*	*26.3*	*28.8*	*26.3*	*27.6*	*26.5*
Hyaline membrane disease	No	36	38	39	23	18	154
	%	*8.2*	*8.8*	*9.2*	*6.1*	*4.2*	*7.3*
Intracranial haemorrhage	No	8	4	10	5	17	44
	%	*1.8*	*0.9*	*2.4*	*1.3*	*4.0*	*2.1*
Infection	No	58	51	43	63	58	273
	%	*13.2*	*11.8*	*10.2*	*16.6*	*13.6*	*13.0*
Cot death	No	37	32	27	19	19	134
	%	*8.4*	*7.4*	*6.4*	*5.0*	*4.4*	*6.4*
Miscellaneous	No	30	28	29	37	40	164
	%	*6.8*	*6.5*	*6.9*	*9.7*	*9.4*	*7.8*
Unclassifed / Unknown	No	13	21	20	10	38	102
	%	*3.0*	*4.8*	*4.7*	*2.6*	*8.9*	*4.9*
Total	No	439	433	423	380	427	2102
	%	*100*	*100*	*100*	*100*	*100*	*100*

Figure 5.14 Infant deaths by Neonatal and Infant classification groups, West Midlands 1998-2002



The two largest categories are ‘severe pulmonary immaturity’ and ‘congenital anomalies’.

There was a fall in cot deaths ($p<0.01$). The apparent late drop of congenital anomaly related deaths did not reach statistical significance ($p=0.39$).

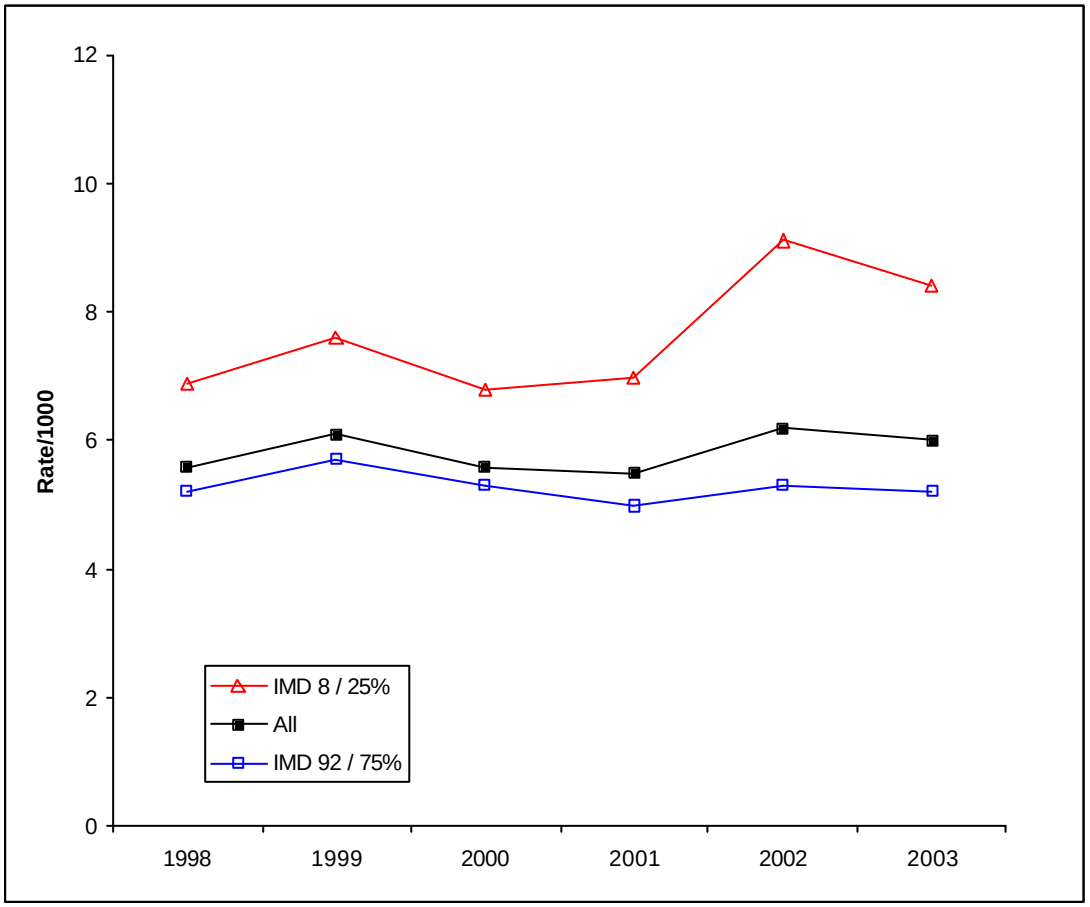
5.9 Stillbirth and Infant Mortality and Deprivation

To analyse the effect of deprivation, a cut–off was selected which identified the 8% most deprived wards in the West Midlands, which accounted for 25% of all births (IMD 8/25). This is used to compare with the other 92% of wards, representing 75% of births (IMD 92/75). (see also Section 5.6, p5)

Table 5.15 Stillbirth Rates by Index of Multiple Deprivation, West Midlands 1998-2003

	IMD 8 / 25%	IMD 92 / 75%
1998	6.9	5.2
1999	7.6	5.7
2000	6.8	5.3
2001	7.0	5.0
2002	9.1	5.3
2003	8.4	5.2
Average	7.6	5.3

Figure 5.15 Stillbirth Rates by Index of Multiple Deprivation, West Midlands 1998-2003

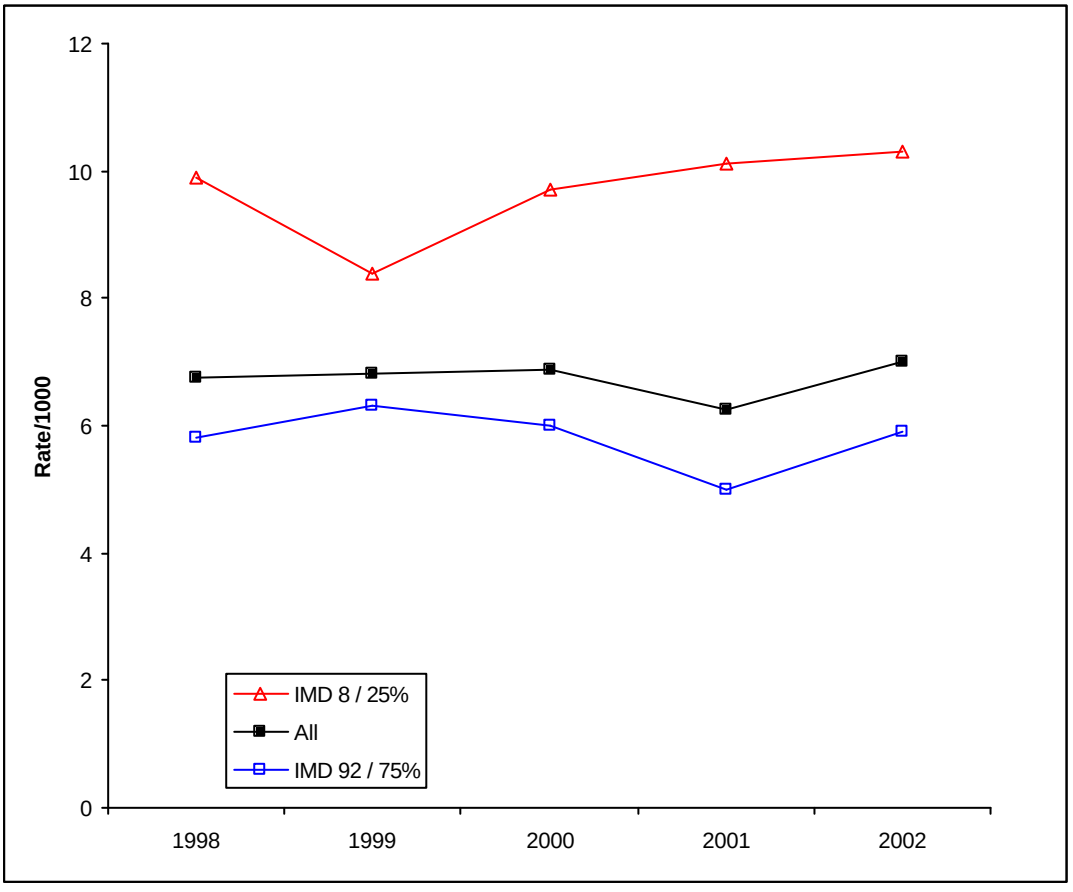


This analysis shows the well known association between deprivation and stillbirths. However, it is also apparent that the gap is not reducing but in fact getting larger, due to a significant increase in stillbirths for the most deprived areas from 6.9 in 1998 to 8.4 in 2003 (p=0.04).

Table 5.16 Infant Death Rates by Index of Multiple Deprivation, West Midlands 1998-2002

	IMD 8 / 25%	IMD 92 / 75%
1998	9.9	5.8
1999	8.4	6.3
2000	9.7	6.0
2001	10.1	5.0
2002	10.3	5.9
2003	9.0	5.4
Average	9.6	5.7

Figure 5.16 Infant Death Rates by Index of Multiple Deprivation, West Midlands 1998-2002



This analysis confirms the well known association between deprivation and infant mortality. There is no decrease in the size of the gap between the most deprived and others. There was even a mild but non-significant (p=0.34) increase in infant deaths in the most deprived areas.

Table 5.17 Stillbirth, early neonatal and perinatal mortality rates in most deprived areas (IMD 8/25) compared to the rest of the population, West Midlands 1998-2003

	Number	Column%	IMD 8/25	IMD 92/75	OR	95% CI
Births – all	377744		93962	283782		
Livebirths	375486		93227	282259		
Perinatal Deaths	3063		1001	2062	**1.48**	**1.37 - 1.60**
Early NND	1199		409	790	**1.58**	**1.40 - 1.78**
Stillbirths	2258		735	1523	**1.46**	**1.34 - 1.60**
Congenital anomalies	348	15.4	117	231	**1.53**	**1.23 - 1.92**
Infection	68	3.0	15	53	0.86	0.48 - 1.52
Fetal growth restriction	949	42.0	319	630	**1.53**	**1.34 - 1.75**
Umbilical cord	73	3.2	12	61	0.60	0.32 - 1.11
Placenta	201	8.9	55	146	1.14	0.84 - 1.56
Mother	74	3.3	25	49	1.54	0.95 - 2.50
Intrapartum asphyxia	74	3.3	26	48	**1.64**	**1.02 - 2.64**
Miscellaneous	105	4.7	28	77	1.10	0.71 - 1.70
Unclassifed / Unknown	366	16.2	138	228	**1.83**	**1.48 - 2.26**

Figure 5.17 Stillbirth and Deprivation: Effect of deprivation (IMD 8/25) on main categories of stillbirth ReCoDe Groups, West Midlands 1998-2003.

Proportion of deaths, significant Odds Ratios and Confidence Intervals are shown

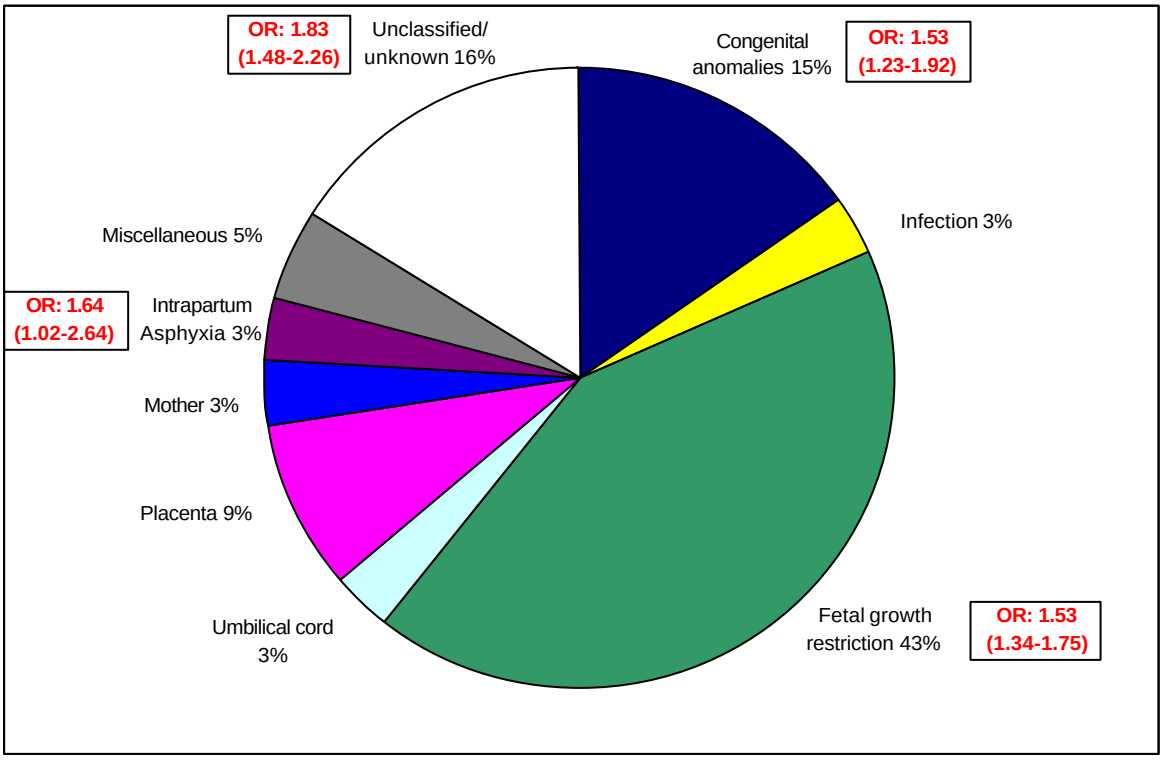
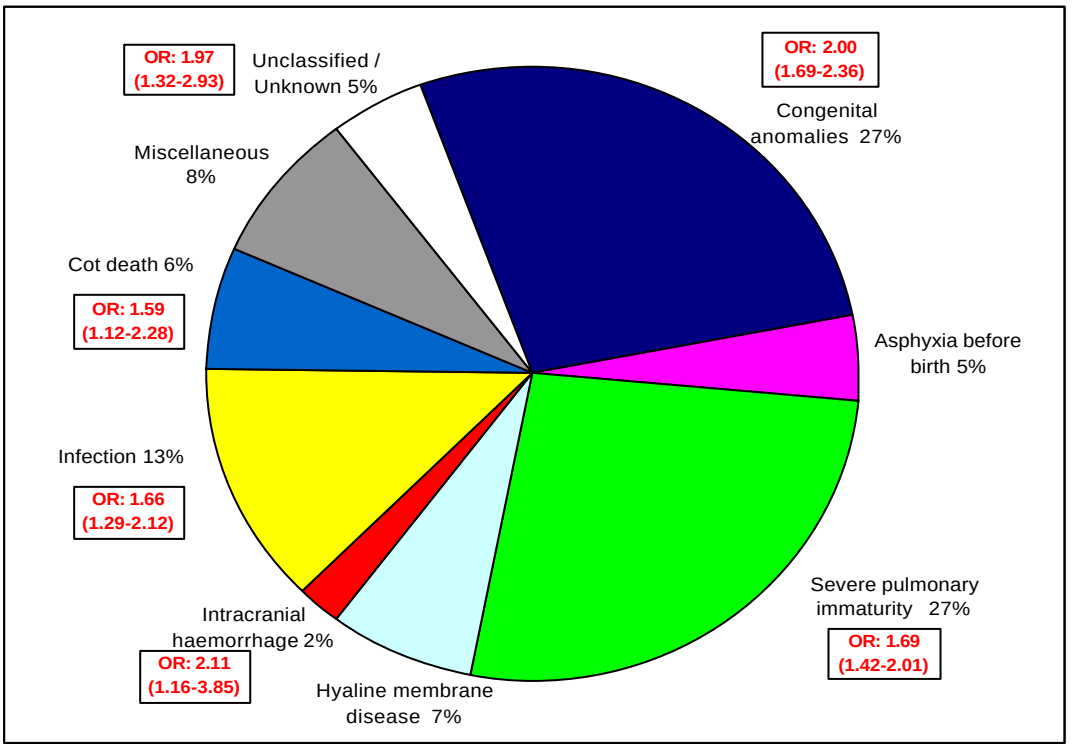


Table 5.18 Infant mortality rates in most deprived areas (IMD 8/25) compared to the rest of the population, West Midlands 1998-2002

	Number	Column %	IMD 8/25	Number 92/75	OR	95% CI
Births	313664		77574	236090		
Livebirths	311800		76982	234818		
Early Neonatal Deaths	1199		409	790	1.58	1.40 - 1.78
Late Neonatal Deaths	286		96	190	1.54	1.21 - 1.97
Post Neonatal Deaths	617		241	376	1.96	1.67 - 2.30
Infants	2102		746	1356	1.68	1.54 - 1.84
Congenital anomalies	577	27.5	228	349	2.00	1.69 - 2.36
Asphyxia before birth	96	4.6	27	69	1.19	0.76 - 1.86
Severe pulmonary immaturity	558	26.5	199	359	1.69	1.42 - 2.01
Hyaline membrane disease	154	7.3	46	108	1.30	0.92 - 1.84
Intracranial haemorrhage	44	2.1	18	26	2.11	1.16 - 3.85
Infection	273	13.0	96	177	1.66	1.29 - 2.12
Cot death	134	6.4	46	88	1.59	1.12 - 2.28
Miscellaneous	164	7.8	46	118	1.19	0.85 - 1.67
Unclassifed / Unknown	102	4.9	40	62	1.97	1.32 - 2.93

Figure 5.18 Infant Mortality and Deprivation: Effect of deprivation (IMD 8/25) on main categories of infant mortality Fetal and Neonatal Classification Groups, West Midlands 1998-2003.

Proportion of deaths, significant Odds Ratios and Confidence Intervals are shown



5.10 Summary Conclusions

1. Stillbirths are the highest contributor (57%) to perinatal mortality, and most infant deaths (58%) occur in the first week of life.

2. Intrauterine growth restriction is the most frequent condition associated with stillbirth.

3. Severe immaturity and congenital anomalies are the largest contributors to infant mortality. There was a recent increase in the proportion of neonatal death registrations at extremely early gestations which the Perinatal Institute will investigate further and consult on with stakeholders.

4. There is a significant gap in stillbirth and infant mortality rates between the most deprived wards and the rest of the West Midlands population, which has been increasing over the period of this analysis.

5. The increased risk applies to all main sub-categories, including deaths associated with congenital anomalies, fetal growth restriction and immaturity.

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