

Croydon joint strategic needs assessment

2010/11



Infant mortality

Authors: Anjan Ghosh | Bernadette Alves

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Contents

Figures	59
Tables	59
Summary of key findings.....	61
Recommendations.....	63
Introduction.....	64
Infant death rates	66
Causes of infant death.....	68
Geographical variations in infant mortality and low birthweight	69
Risk factors for infant mortality	71
Deprivation, low birthweight and socio economic status	75
Feedback from people who use maternity services and professionals	77
Maternal and child health services in Croydon	79
Expenditure.....	80
NICE guidance relating to infant mortality.....	82
Appendix 1: Definitions of infant mortality statistics	82
Appendix 2: Maternity and Children’s Universal Services pathway, Croydon.....	84
Appendix 3: Newborn baby review, Children’s Universal Services, Croydon	85

Figures

Figure 1: nationally identified interventions to reduce inequalities in infant mortality	65
Figure 2: infant mortality rate of London boroughs, 2006-2008.....	67
Figure 3: infant mortality rates, Croydon, London, England and Wales, 1975-2008 (three year rolling averages).....	68
Figure 4: causes of infant death in England and Wales 2007.....	69
Figure 5: infant mortality rate by electoral wards, Croydon 2003-2008.....	70
Figure 6: percentage of live and still births with low birthweight (under 2500 grams) by super output areas, Croydon 2000-2009.....	71
Figure 7: low birthweight (under 2500 grams), percentage of live and still births by deprivation quintile, Croydon 2000-2009.....	76
Figure 8: infant mortality by registration, Croydon and England and Wales, 2002-2004 to 2006-2008.....	76
Figure 9: NHS Croydon's total spend and outcome on maternal health services and neonatal conditions, compared with other PCT's in England 2008/09.....	81
Figure 10: time line of deaths up to and during the first year of life.....	83

Tables

Table 1: infant mortality rates 2006-2008.....	67
Table 2: infant mortality numbers and rates, Croydon and England and Wales, 2006-2008.....	68
Table 3: risk factors for infant mortality.....	72
Table 4: composition of the focus groups.....	77
Table 5: Croydon, cluster, London and England expenditure per 100,000 weighted population, 2008/09.....	80

Summary of key findings

Infant death rates in Croydon

Croydon's infant mortality rate in 2006 to 2008 was 5.4 per 1,000 live births.¹ This means that for every 1,000 babies born alive, an average of 5.4 babies died in the first year of life. Croydon's infant mortality rate was higher than that of London (4.6 per 1,000 live births) and England and Wales (4.8 per 1,000 live births). Croydon's stillbirth, perinatal, neonatal, and post neonatal rates were also higher than London and England and Wales. For the three year period 2006-2008, Croydon had the 7th highest infant mortality rate of the 32 London boroughs.

The number of live births in Croydon every year is around 5,300. The number of infant deaths in Croydon per year is around 28, but this varies from year to year. For example, there were 20 infant deaths in 2004 and 37 in 2005. Whilst numbers are small, each death represents a tragedy for a family and infant mortality is a sensitive measure of the overall health of the population.²

In Croydon, as for London and England and Wales, the death rate in the first 28 days (the neonatal period) is more than twice the rate in the following 11 months (the post neonatal period).

Neonatal mortality rates are especially sensitive to events during pregnancy, delivery and the neonatal period, and to the care given to mothers and their babies. Post neonatal mortality rates are thought to be influenced to a greater extent by parental circumstances including socio economic position and the care they provide their infant.³

Risk factors for infant mortality

There are many risk factors for infant mortality, some are social, for example deprivation, others biological such as carrying twins. Some risk factors are modifiable such as smoking during pregnancy, but some are not, such as the sex of the infant.

Prematurity and low birthweight are the biggest risk factors for infant mortality and are strongly inter related, with prematurity leading to low birthweight. For babies of low birthweight, the risk of infant death is 20 times greater than babies with normal birthweight. For babies born before 32 weeks of gestation, the risk of infant death is 70 times greater than for babies born at full term.

Other groups at higher risk include babies born to:

- Mothers with multiple births (twins, triplets or more)
- Mothers from Black ethnic groups
- Mothers not born in the UK
- Single mothers and mothers who register their baby alone
- Families in routine and manual socio economic groups
- Mothers aged less than 20
- Mothers who smoke
- Mother who are obese.

1 Recently released figures show Croydon's 2009 infant mortality rate is lower than the 2008 rate. The 2007-09 infant mortality rate in Croydon is down to 5.0, although this is still higher than both London and England & Wales.

2 Macfarlane A and Mugfirs M. Birth Counts: *statistics of pregnancy and childbirth: Volume 1, 2nd edition*. London: The Stationery Office; 2000

3 Kurinczuk J, Hollowell J, et al. Inequalities in infant mortality project briefing paper I: Infant mortality: overview and context. National Perinatal Epidemiology Unit, University of Oxford. June 2009: p7

Within Croydon between 2003 and 2008:

- 3% of births were multiples (twin, triplets or more) and the risk of infant mortality was five times higher than for singletons
- 27% of births were to black women and the risk of infant mortality was almost twice as high (1.9 times higher) than for white women
- 19% of births were to single mothers and the risk of infant mortality was twice as high (2.1 times higher) than for married women
- 6% of births were to women aged under 20 and the risk of infant mortality was 1.4 times higher (40% higher) than for women aged 30 to 39
- 14% of women smoked during pregnancy and the risk of infant mortality was 1.2 times higher (20% higher) than for non smokers
- 20% of births were to women who were obese and the risk of infant mortality was 1.3 times higher (30% higher) than for babies born to women of normal weight.

The risk of infant mortality in Croydon is linked with deprivation. Between 2003 and 2008, 26% of births were to women living in the most deprived fifth of areas (quintile), and the risk of infant mortality was 1.3 times higher than for babies born to women in the least deprived quintile. This relationship was not consistent across all deprivation quintiles, probably because of small numbers. National analyses show successively higher infant mortality rates in successively more deprived quintiles. Low birthweight is sometimes used as a proxy for infant mortality. A clear relationship with deprivation is seen in Croydon, where the risk of low birthweight increases with increasing levels of deprivation.

Many of the risk factors associated with high rates of infant mortality are more prevalent in deprived areas. Women in deprived areas have higher rates of low birthweight and prematurity, and are more likely to smoke and be obese. Sudden unexplained death in infancy is also more common in disadvantaged populations.

Expenditure

In 2008/09 NHS Croydon spent £67 per head on "maternity and reproductive health" and £29 per head on "neonatal conditions". Compared with the national average, NHS Croydon spent more on maternal and reproductive health and achieved much worse outcomes (as measured by the proportion of low weight births). For neonatal conditions, NHS Croydon spent much more than the national average and achieved worse outcomes (as measured by neonatal infant mortality).

Recommendations

- 1 The director of public health should lead on the development of an infant mortality strategy, drawing on the findings of the needs assessment and which has clear targets and actions which can be used to inform commissioning and service development.
 - 1a: Obtain senior support for the targets and actions in the strategy from partners and stakeholders and to position the strategy effectively in the emerging organisational structures.
 - 1b: Integrate the targets and actions with existing strategies and action plans, including the Child Family Place propositions and the children's trust priorities such as teenage pregnancy and parenting.
- 2 Build on existing mechanisms and develop new mechanisms for providers and commissioners to continually learn from patient experiences.
- 3 Use the Department of Health guidance on key elements to reduce infant mortality overall and health inequalities associated with infant mortality. This will identify where services ought to change and identify opportunities for the release of resources to enable the change to happen.⁴ The guidance is divided into two subsections:
 - 3a: Commission evidence based interventions that reduce infant mortality overall, by:
 - Improving quality of maternity and neonatal care
 - Increasing screening
 - Reducing maternal and infant infections
 - 3b: Commission evidence based interventions that reduce the inequalities gap in infant mortality (figure 1) and focus resources on families of routine and manual workers and other high risk groups by:
 - Reducing maternal obesity
 - Reducing maternal smoking
 - Reducing teenage pregnancy
 - Reducing sudden unexplained deaths in infancy
 - Reducing child poverty
 - Reducing household overcrowding and improving housing quality
 - Improving access to maternity care including ensuring pregnant women are assessed by 12 weeks + six days of gestation
 - Increasing breastfeeding rates.

High risk groups include:

- Families in routine and manual social groups
- Women with complex social needs (women who misuse substances, women who are recent migrants, asylum seekers or refugees, young women aged under 20 and women who experience domestic violence)⁵
- Women not born in the UK
- Black women
- Single mothers
- Women carrying more than one baby
- Women with mental health problems

⁴ Central Office of Information. *Implementation plan for reducing health inequalities in infant mortality: a good practice guide*. London: Department of Health; 2007

⁵ National Institute for Health and Clinical Excellence. *Pregnancy and complex social factors*. London: NICE; 2010.

Introduction

This chapter looks primarily at the issues surrounding infant deaths during the first year of life. Infant mortality is the specific term used to refer to the death of a live born baby in the first year of life.⁶ Infant mortality is usually expressed as a population rate, that is, the number of infant deaths per 1,000 live births. This allows comparison with other populations or areas. Babies can be born after 24 weeks gestation with no signs of life (stillbirth). Some data is presented about stillbirths in this chapter and the risk factors for stillbirths are very similar to those for infant deaths in the first few weeks of life.

Appendix 1 defines the wide range of infant death statistics commonly used.

Policy context

Reducing infant mortality and the inequalities associated with infant mortality has been a policy aim for successive governments for a number of years. In 2003 the government set a national health inequalities public service agreement (PSA) target:

To reduce inequalities in health outcomes by 10% by 2010 as measured by infant mortality and life expectancy at birth.

One of the targets underpinning this was:

Starting with children under one year, by 2010 to reduce by at least 10% the gap in infant mortality between the routine and manual group and the population as a whole.⁷

More recently, the Marmot review *Fair society, healthy lives* (2010) identified six policy objectives to reduce health inequalities.⁸ The first of these is the need to give every child the best start in life with actions starting before birth and followed throughout the life of the child. One of its recommendations is to give priority to pre and postnatal interventions that reduce adverse outcomes of pregnancy and infancy.

The current government remains firmly committed to reducing infant mortality. Drawing on the Marmot review, the public health white paper *Healthy lives, healthy people* sets out the government's strategy for public health in England.⁹ It adopts a life course approach, recognising the profound impact early experiences have on the entire life of an individual: physically, emotionally and socially. It recognises that although there has been substantial progress in reducing infant deaths, there is much that can be done to reduce rates further. It highlights the importance of reducing maternal obesity, increasing breastfeeding rates and reducing smoking rates in pregnancy as public health interventions that will reduce infant mortality.

Reducing deaths in babies and young children is an objective within the recently published NHS outcomes framework for 2011/12.¹⁰ Infant mortality and a range of related outcomes such as low birthweight, breastfeeding, teenage pregnancy, child poverty and overcrowded housing are also in the public health outcomes consultation document.¹¹

6 Note that some infant mortality data, such as perinatal deaths, do include stillbirths. This is highlighted in the text.

7 Central Office of Information. *Review of the health inequalities infant mortality PSA target*. London: Department of Health; 2007

8 The Marmot Review. *Fair society, healthy lives executive summary*. 2007 Feb; p 14
<http://www.ucl.ac.uk/ghcg/marmotreview/FairSocietyHealthyLivesExecSummary>

9 Department of Health. *Healthy lives, healthy people: our strategy for public health in England*. London: Department of Health; 2010

10 Department of Health. *The NHS outcomes framework 2011/12*. London: Department of Health; 2010

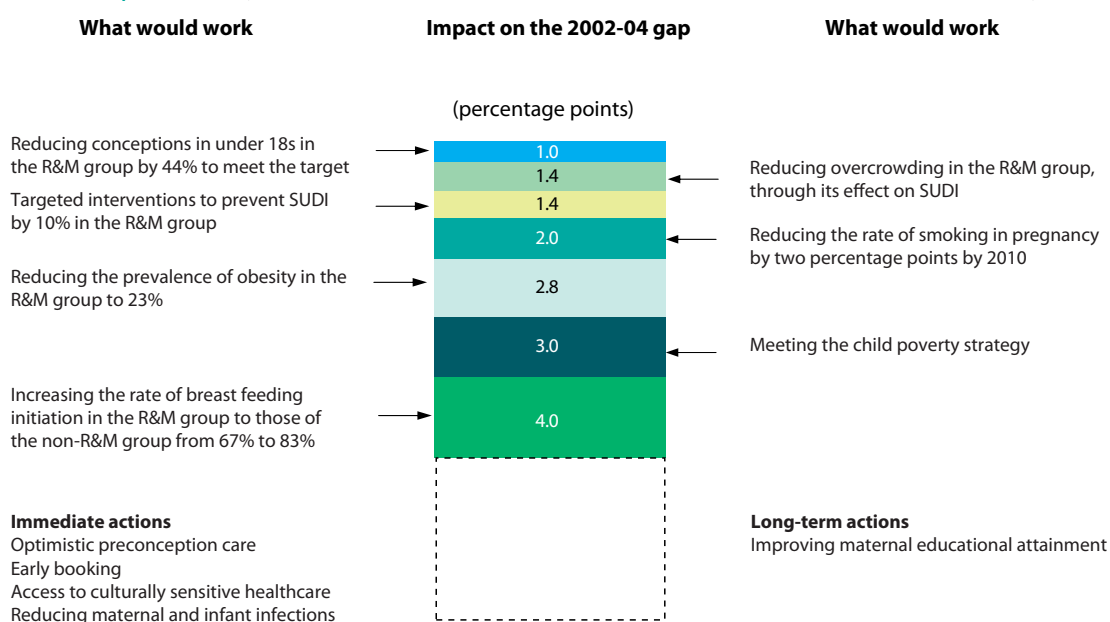
11 Department of Health. *Healthy lives, healthy people: transparency in outcomes. A consultation document*. London: Department of Health; 2010

Guidance

The National Institute for Health and Clinical Excellence (NICE) provides guidance relevant to infant mortality. Guidelines are based on the best available evidence and give a range of advice and recommendations, for example on effective interventions. Existing guidance relates to risk factors for infant mortality such as quitting smoking during pregnancy and following childbirth,¹² and supporting pregnant women with complex social factors.¹³ Guidance is also being developed specifically on reducing infant mortality among those living in disadvantaged circumstances. Some guidance is referred to in more detail within the chapter and a full list of NICE guidance relevant to infant mortality can be found at the end of this chapter.

In 2007, the Department of Health published a framework of specific evidence based interventions that reduce infant mortality and the inequalities associated with infant mortality (figure 1).¹⁴ These include reducing conceptions in those under 18 years, reducing smoking in pregnancy, reducing obesity in mothers and reducing overcrowding. Some are picked up in the government's outcomes frameworks.¹⁵ Many of the interventions such as meeting the child poverty target require partnership working with other agencies and a joint approach to supporting women and babies.

Figure 1 | nationally identified interventions to reduce inequalities in infant mortality



Source: Department of Health. Implementation plan for reducing health inequalities in infant mortality: a good practice guide. London: 2007.

Methodology and data limitations

The data in this chapter was gathered from:

- Routinely available statistics
- Analysis of local data 2003-2008 using a linked dataset
- A focus group consultation with 61 Croydon parents
- A seminar for senior managers and service leads, supported by the infant mortality national support team

¹² National Institute for Health and Clinical Excellence. *Quitting smoking in pregnancy and following childbirth*. London: NICE; 2010

¹³ National Institute for Health and Clinical Excellence. *Pregnancy and complex social factors*. London: NICE; 2010

¹⁴ Central Office of Information *Implementation plan for reducing health inequalities in infant mortality: a good practice guide*. London: Department of Health; 2007

¹⁵ Department of Health. *Healthy lives, healthy people: transparency in outcomes. A consultation document*. London: Department of Health; 2007

The actual numbers of infant deaths in Croydon each year are small (around 28 per year) and vary from year to year. For example, in 2004 there were 20 infant deaths in Croydon and in 2005 there were 37 infant deaths. For this reason, infant mortality rates are often expressed as three year rolling averages to smooth the data and give a more robust comparison over time.

Where appropriate, statistical analyses were carried out to see if differences in rates and relationships were likely to have occurred by chance or be a result of actual differences. Because of the small numbers, few of the results from the analysis were statistically significant. If figures are not statistically significant, it does not mean that they should be dismissed, rather that the results should always be interpreted with caution, taking account of other factors such as national figures where larger numbers mean that findings may be more reliable.

A linked dataset was created from routinely available local data collected between 2003 and 2008. This dataset has been used to look at the relative risk of different variables such as maternal age, maternal ethnicity and gestation on infant mortality. The linked dataset was created from birth notifications (hospital records), cross checked with the Office for National Statistics' birth and death registrations and linked to the Centre for Maternal and Child Enquiries' (CMACE) data. This approach takes account of Croydon's mobile population where mothers move in and out of the area.

The linked dataset covered six years from 2003 to 2008 and included 29,322 live births and 171 deaths. Based on Office for National Statistics' data, between 2003 and 2008 there were 29,834 births and 162 deaths. The numbers of deaths in the linked dataset are slightly greater because it includes the deaths of babies where the mother was living in Croydon at the time of death but not necessarily at the time of birth and also the deaths of babies where the mother was living in Croydon at the time of birth but not necessarily at the time of death.

Infant death rates

Croydon's infant mortality rate between 2006-2008 was 5.4 deaths per 1,000 live births. This is higher than the rate for both London (4.6) and England and Wales (4.8).¹⁶

Table 1 shows that the stillbirth, perinatal, neonatal and post neonatal mortality rates in Croydon for 2006-2008 were also higher than both London and England and Wales. Based on 95% confidence intervals, the differences between Croydon rates and those of London and England and Wales are not statistically significant.¹⁷

In Croydon, as for London and England and Wales, the death rate in the first 28 days (the neonatal period) is more than twice the rate in the following 11 months (the post neonatal period).

Neonatal mortality rates are especially sensitive to events during pregnancy, delivery and the neonatal period and to the care given to mothers and their babies. Post neonatal mortality rates are thought to be influenced to a greater extent by parental circumstances including socio economic position and the care they provide their infant.¹⁸

¹⁶ Recently released figures show Croydon's 2009 infant mortality rate is lower than the 2008 rate. The 2007-09 infant mortality rate in Croydon is down to 5.0 although this is still higher than both London and England & Wales.

¹⁷ A 95% confidence interval is a statistical measure of the precision of a rate. There is a 95% probability (confidence) that the true rate is contained within the confidence limits. A narrow confidence interval indicates a more precise estimate. Smaller sample sizes, such as the number of infant deaths, produce wider confidence intervals.

¹⁸ Kurinczuk J, Hollowell J, et al. Inequalities in infant mortality project briefing paper I: Infant mortality: overview and context. National Perinatal Epidemiology Unit, University of Oxford. June 2009: p7

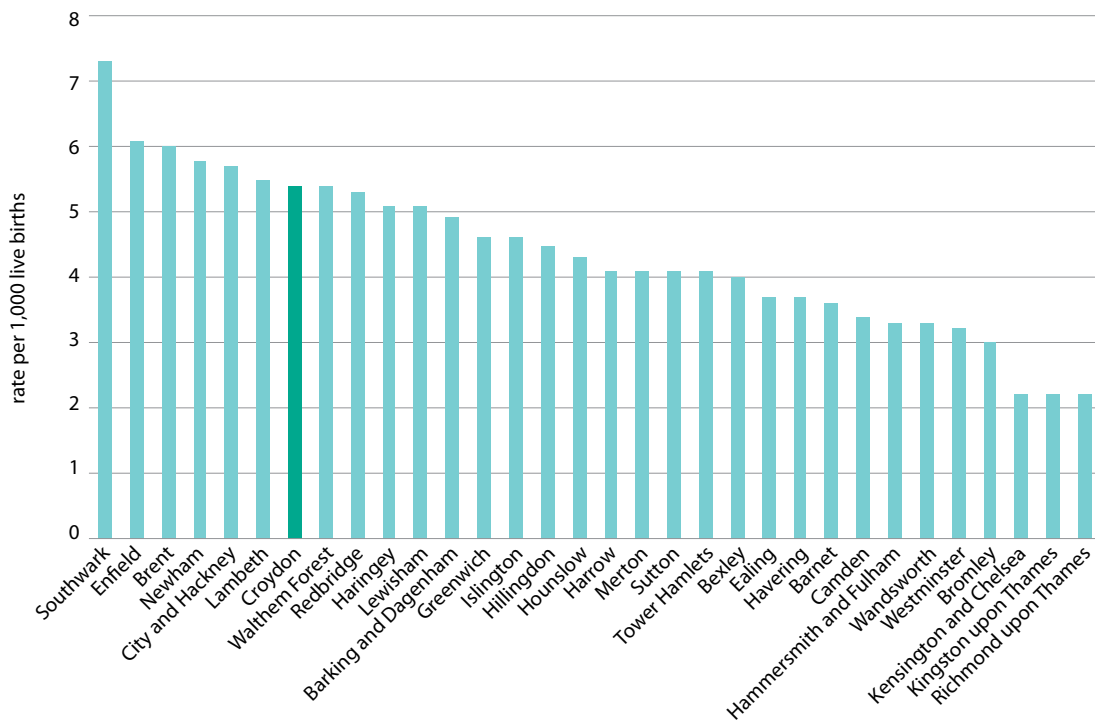
Table 1 | infant mortality rates 2006-2008

Indicator	Croydon	London	England & Wales
Infant mortality rate (per 1,000 live births)	5.4 (4.4, 6.7)	4.6 (4.4, 4.8)	4.8 (4.7, 4.9)
Stillbirth rate (per 1,000 live and still births)	6.4 (5.3, 7.8)	6.0 (5.8, 6.3)	5.2 (5.1, 5.3)
Perinatal mortality rate (per 1,000 live and still births)	9.4 (8.1, 11.1)	8.4 (8.1, 8.7)	7.7 (7.6, 7.8)
Neonatal mortality rate (per 1,000 live births)	3.7 (2.9, 4.8)	3.1 (2.9, 3.3)	3.3 (3.3, 3.4)
Post neonatal mortality rate (per 1,000 live births)	1.7 (1.2, 2.5)	1.5 (1.3, 1.6)	1.5 (1.4, 1.5)

Source: Office for National Statistics
 NOTE: The figures in brackets are 95% confidence intervals

Between 2006 and 2008, Croydon had the 7th highest infant mortality rate of the 32 London boroughs (figure 2).

Figure 2 | infant mortality rate of London boroughs, 2006-2008



Source: Lakhani A, Olearnik H, Eayres D (eds). Compendium of Clinical and Health Indicators. London: The Information Centre for health and social care / National Centre of Health Outcomes Development, 2008.

Table 2 shows that numbers of annual infant deaths vary. Between 2006 and 2008 there were 85 deaths (an average of 28 per year) of which 68% (58 of 85) were in the first four weeks (neonatal deaths).

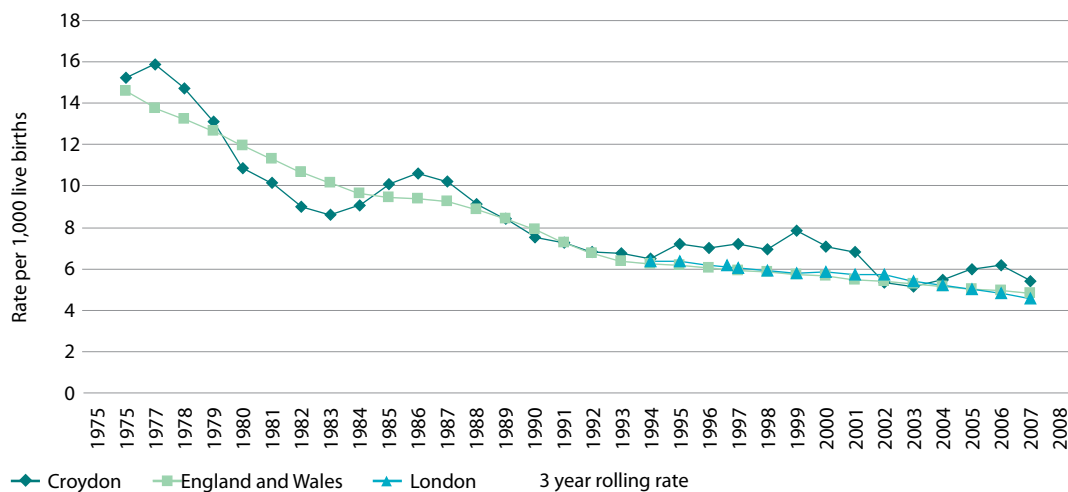
Table 2 | infant mortality numbers and rates, Croydon and England and Wales, 2006-2008

	Croydon					England & Wales
	Infant deaths	Neonatal deaths	Post neonatal deaths	Live births	Infant mortality rate	Infant mortality rate
2006	30	22	8	5,024	6.0 (4.0 - 8.5)	5.0 (4.8 - 5.1)
2007	26	19	7	5,315	4.9 (3.2 - 7.2)	4.8 (4.6 - 5.0)
2008	29	17	12	5,331	5.4 (3.8 - 7.8)	4.7 (4.5 - 4.9)
2006-2008	85	58	27	15,670	5.4 (4.4 - 6.7)	4.8 (4.7 - 4.9)

Source: Office for National Statistics

Figure 3 shows that over the last three decades, the infant mortality rate for England and Wales has fallen from 14.6 per 1,000 live births (1975-1977) to 4.8 per 1,000 live births (2006-2008). The Croydon infant mortality rate has fallen from 15.3 to 5.4 per 1,000 live births over the same time period.

Figure 3 | infant mortality rates, Croydon, London, England and Wales, 1975-2008 (three year rolling averages)



Source: Office for National Statistics

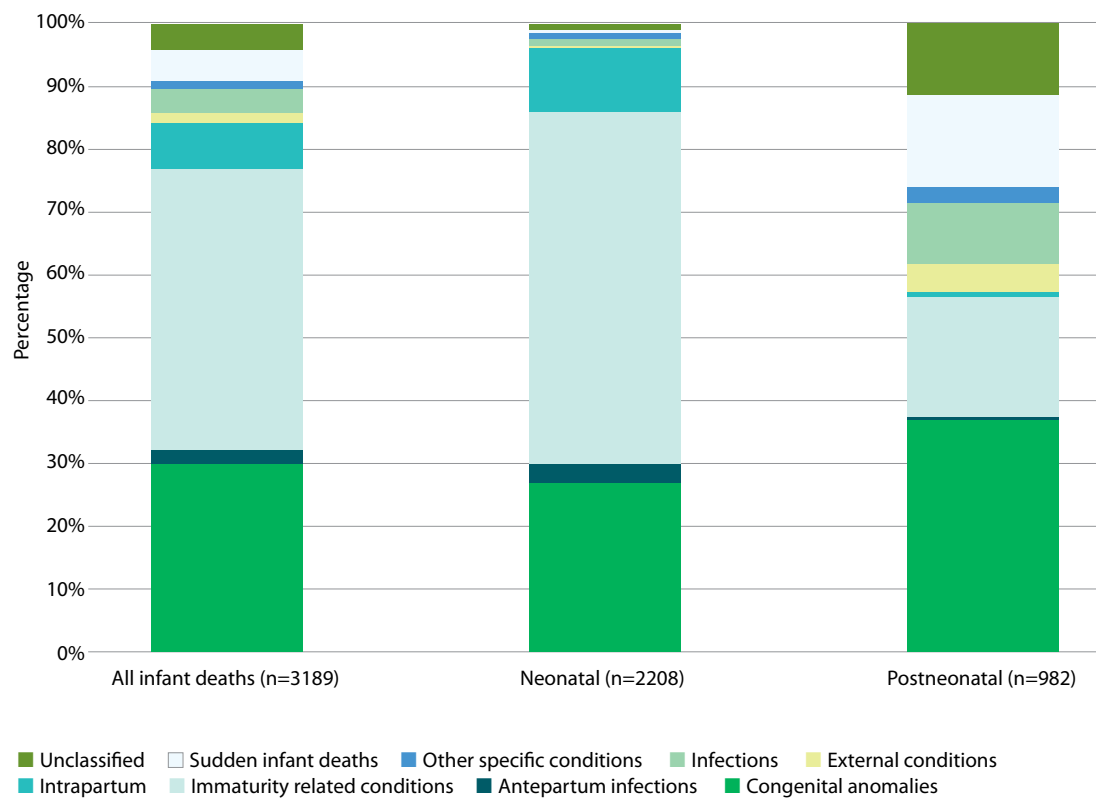
Causes of infant death

Nationally, immaturity and congenital defects are the two commonest causes of death in infants (figure 4) and together they account for 75% of infant deaths.¹⁹

The relative frequency of cause of death differs in the neonatal and post neonatal period. For neonatal deaths, the commonest causes of death are immaturity (56%) and congenital defects (27%), accounting for 83% of neonatal deaths. For post neonatal deaths, the commonest causes of deaths nationally are congenital defects (37%), immaturity (19%), sudden unexplained infant deaths (15%) and infections (10%). Together these account for 81% of post neonatal deaths.

19 Office for National Statistics. Mortality Statistics: childhood, infant and perinatal 2007 Series DH3 No.40. 2010

Figure 4 | causes of infant death in England and Wales 2007



Source: Office for National Statistics 2010. Mortality statistics. Childhood, infant and perinatal 2007 Series DH3 No.40

Congenital defects are an important cause of childhood illness and disability. Antenatal and neonatal screening can reduce congenital defects and improve management of conditions through early detection.

The risk of sudden unexplained deaths in infancy is higher for males, those living in deprived areas, preterm and low birthweight babies and those sleeping in non supine (on their front or side) positions.²⁰ Reducing sudden unexplained infant deaths in high risk groups is one of the recommendations of this needs assessment.

Infections are more common in the post neonatal period (10% nationally) than in the neonatal period (4% nationally). Reducing maternal and baby infections is one of the recommendations of this needs assessment.

Geographical variations in infant mortality and low birthweight

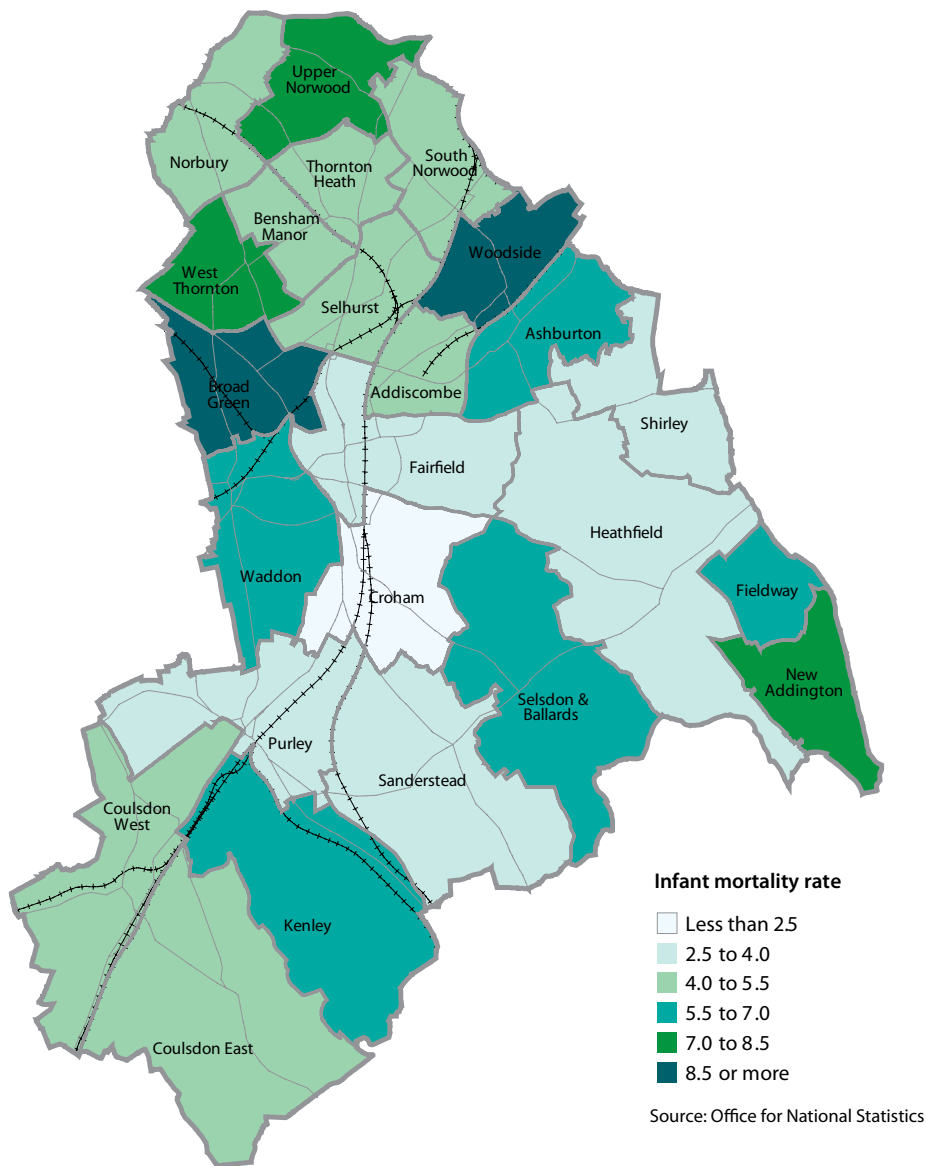
Within Croydon there was wide variation in the geographical distribution of infant mortality between 2003 and 2008.

Figure 5 shows that the five wards with the highest infant mortality rates are Broad Green, Woodside, Upper Norwood, West Thornton and New Addington. All five wards are areas of higher deprivation (in the top 10 most deprived wards in Croydon).²¹ However numbers of infant deaths in each ward are very small (on average one per ward per year) and where wards have high rates, this may not reflect underlying patterns, nor predict future rates.

²⁰ Blair P, Sidebotham P, Berry P, Evans M, Fleming P. *Major epidemiological changes in sudden infant death syndrome: a 20 year population based study in the UK.* 2006; Lancet.

²¹ South East Public Health Observatory. Infant mortality deaths by ward. SEPHO; 2007

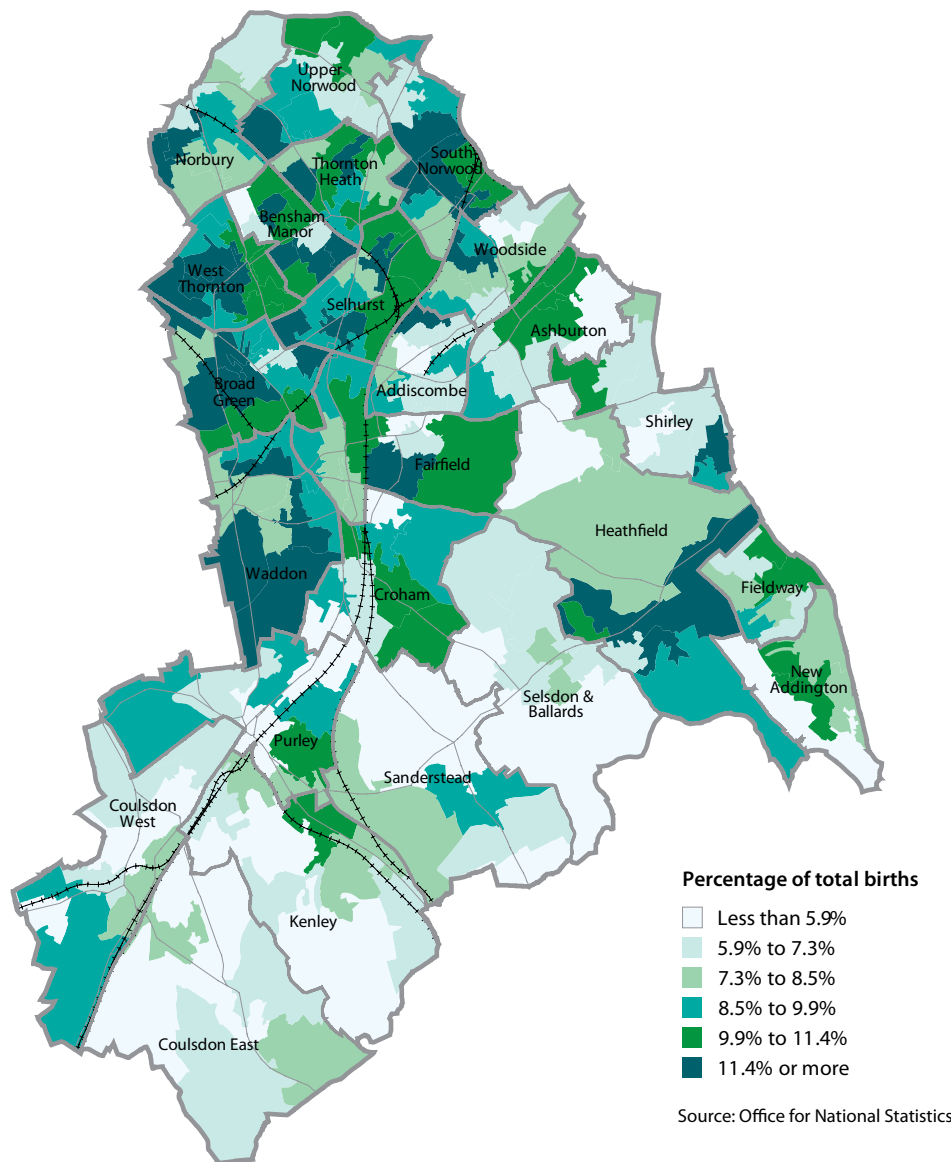
Figure 5 | infant mortality rate by electoral wards, Croydon 2003-2008



Low birthweight is a much more common outcome than infant deaths. Approximately 8.8% of babies born in 2009 were of low birthweight whereas only 4.8 per 1,000 babies died in their first year of life.²² Low birthweight is a major risk factor for infant death and is therefore sometimes used as a proxy measure for it. Figure 6 shows the variation in low birthweight by geographical area in Croydon. The highest rates are seen in the north west of the borough although there are pockets of high rates near Heathfield ward in the east.

²² Office for National Statistics.

Figure 6 | percentage of live and still births with low birthweight (under 2500 grams) by super output areas, Croydon 2000-2009



Risk factors for infant mortality

There are many risk factors for infant mortality. Some are social, for example deprivation and others biological, such as carrying twins. Some risk factors are modifiable such as smoking during pregnancy but some are not, such as the sex of the infant.

Prematurity and low birthweight are the biggest risk factors for infant mortality and are strongly interrelated, with prematurity leading to low birthweight.

Other groups at higher risk include babies born to:

- Mothers with multiple births (twins, triplets or more)
- Mothers from Black ethnic groups
- Mothers not born in the UK
- Single mothers and mothers who register their baby alone
- Families in routine and manual socio economic groups
- Mothers aged less than 20
- Mothers who smoke
- Mother who are obese.²³

23 Kurinczuk J, Hollowell J, et al. Inequalities in infant mortality project briefing paper I: Infant mortality: overview and context. National Perinatal Epidemiology Unit, University of Oxford. June 2009; p8

The following analysis uses 'relative risk' to describe the chance of infant mortality occurring in one group compared with another. It is based on the linked dataset of 171 infant deaths between 2003 and 2008.²⁴

Table 3 shows the relative risk, with confidence intervals and numbers of deaths, for factors that are linked with infant mortality in Croydon. Where possible, a comparable national or international relative risk is also given. Due to small numbers, each risk factor was examined in isolation without factoring in the additional effect that other risk factors might have had. For example, low birthweight carries an increased risk of infant mortality, as does smoking during pregnancy. However, smoking during pregnancy also produces low birthweight so to look at the effect of both, it is not possible to simply combine the two relative risks.

Looking at mother's age in table 3, we see that the risk of infant mortality in babies born to mothers aged less than 20 is 1.4 times higher than for babies born to women age 30 to 39. Relative risk can be expressed as a percentage. Infant mortality is 40% more likely in babies born to women aged less than 20 compared with babies born to women aged 30 to 39. Overall, 6% of births are to women aged less than 20. The number of deaths in the two categories (64 + 11) does not add up to 171 (total deaths in the dataset) as some babies are born to women of other ages such as women in their twenties or forties.

Table 3 | risk factors for infant mortality

	Croydon (2003-2008)		Comparative evidence (Rates are for England & Wales unless otherwise stated)
	relative risk (95% CI)	% of births	
Gestation at birth			
Term (37- 41 weeks) (n=48)	1.0 (0.7 - 1.5)		Gestational age at birth has a profound impact on mortality - the more premature, the greater the risk of infant death ²⁵
Moderately preterm (33-36 weeks) (n=14)	4.0 (2.2 - 7.2)	6%	
Preterm <32 weeks (n=97)	78.0 (59 - 102)	2%	
Birthweight			
Normal (2500g-4499g) (n=54)	1.0 (0.7 - 1.5)		Rate for low birthweight is 24 times higher than normal birthweight ²⁶
Low (<2500g) (n=110)	22.0 (17 - 28)	8%	
Multiple births			
Singleton (n=143)	1.0 (0.8 - 1.3)		Rates for twins is five times higher and for triplets 18 times higher than singletons ²⁷
Multiple births (n=24)	5.3 (3.4 - 8.1)	3%	
Marital Status			
Married (n=21)	1.0 (0.5 - 1.8)		Rates for sole registrant births are 1.5 times higher than rates for births registered within marriage ²⁸
Single (n=15)	2.1 (1.1 - 4.1)	19%	
Mother's age			
30-39 (n=64)	1.0 (0.7 - 1.4)		Rates in women aged < 20 are 1.8 times higher than rates in women age 30-34 ²⁹
under 20 (n=11)	1.4 (0.8 - 2.6)	6%	

²⁴ See methodology and data limitations section.

²⁵ Jennifer J Kurinczuk, Jennifer Hollowell, Peter Brocklehurst, Ron Gray. Inequalities in infant mortality project briefing paper 1. Infant mortality: overview and context. National Perinatal Epidemiology Unit; Oxford. 2009

²⁶ Oakley L, Maconochie N, Doyle P, Dattani N, Moser K. Multivariate analysis of infant death in England & Wales in 2005/06, with focus on socio economic status and deprivation. Health Statistics Quarterly. 2009 Summer: (42):22-39 – table 1

²⁷ ibid

²⁸ ibid

²⁹ ibid

	Croydon (2003-2008)		Comparative evidence (Rates are for England & Wales unless otherwise stated)
	relative risk (95% CI)	% of births	
Deprivation			
Least deprived quintile (n=16)	1.0 (0.5 - 2.0)		Rates in most deprived quintile (using Carstairs index of deprivation) is two times higher than in least deprived quintile ³⁰
Most deprived quintile (n=49)	1.3 (0.8 - 2.3)	26%	
Mother's country of birth			
UK (n=59)	1.0 (0.7 - 1.4)		Rates in women born outside UK are 1.2 times higher than rates in women born in the UK ³¹
Non-UK (n=67)	1.3 (0.9 - 1.8)	47%	
Mother's ethnicity			
White overall (n=51)	1.0 (0.7 - 1.5)		Rates in women born in Pakistan two times higher, born in Africa (excl southern and east Africa) 1.8 times higher than UK born women ³²
Mixed overall (n=6)	1.8 (0.8 - 4.3)	3%	
Asian overall (n=12)	0.8 (0.4 - 1.5)	14%	
Black overall (n=56)	1.9 (1.3 - 2.8)	27%	
Chinese & other (n=5)	0.7 (0.3 - 1.6)	7%	
Sex of baby			
Female	1.0 (0.7 - 1.4)		Rates in male babies is 1.2 times higher than in female babies ³³
Male	1.3 (1.0 - 1.7)	51%	
Mother's weight (BMI)*			
Normal range (18.5-24.99) (n=36)	1.0 (0.6 - 1.6)		Danish study: neonatal rates in obese women 2.6 times higher than in women of normal weight ³⁴
Pre-obese (25.00-29.99) (n=26)	1.2 (0.7 - 2.0)	29%	
Obese (> 30) (n=19)	1.4 (0.8 - 2.2)	19%	
Smoking during pregnancy			
No (n=115)	1 (0.8 - 1.3)		US study: Smoking in pregnancy increases infant mortality by about 40% ³⁵
Yes (n=22)	1.2 (0.8 - 1.9)	14%	

Source: Croydon linked dataset (birth notifications, death registrations and CMACE data). National rates are referenced.

Notes: * Body Mass Index (BMI) was only recorded for 54% of women

Table 3 shows that for Croydon between 2003 and 2008, the biggest risk factors are preterm birth and low birthweight:

- 8% of births are preterm (born before 37 weeks' gestation) and for the 2% born before 32 weeks, the risk of infant mortality is 78 times higher than for those born at full term.
- 8% of babies are of low birthweight (< 2500 g) and risk of infant mortality is 22 times higher than for those of normal birthweight.

30 Oakley L, Maconochie N, Doyle P, Dattani N, Moser K. Multivariate analysis of infant death in England & Wales in 2005/06, with focus on socio-economic status and deprivation. Health Stat Q. 2009 Summer: (42):22-39 – table 1

31 ibid

32 Jennifer J Kurinczuk, Jennifer Hollowell, Peter Brocklehurst, Ron Gray. Inequalities in infant mortality project briefing paper 1. Infant mortality: overview and context. National Perinatal Epidemiology Unit, Oxford. 2009

33 Oakley L, Maconochie N, Doyle P, Dattani N, Moser K. Multivariate analysis of infant death in England & Wales in 2005/06, with focus on socio economic status and deprivation. Health Stat Q. 2009 Summer:(42):22-39, table 1

34 Kristensen J, Vestergaard M, Wisborg K, Kesmodel U, Secher NJ. Pre-pregnancy weight and risk of stillbirth and neonatal death. BJOG, 2005. 112: 403-8

35 Salihi HM, Aliyu MH, Pierre-Louis BJ, Alexander GR. Levels of excess infant deaths attributable to maternal smoking during pregnancy in the United States. Matern Child Health J, 2003: 7: 219-27

Other groups with increased risk include women carrying twins, women from Black ethnic groups, single women and teenage mothers:

- 3% of births are multiples (twins, triplets or more), and the risk of infant mortality is five times higher than for singletons
- 27% of births are to women from Black ethnic groups, and the risk of infant mortality is almost twice as high (1.9 times higher) than for women from White ethnic groups
- 19% of births are to single mothers and the risk of infant mortality is twice as high (2.1 times higher) than for married women
- 6% of births are to women aged under 20 and the risk of infant mortality is 1.4 times higher than for women aged 30 to 39
- 26% of births are to women living in the most deprived quintiles and the risk of infant mortality is 1.3 times higher than for babies born to women in the least deprived quintiles.

Supporting these groups is a recommendation in the needs assessment.

Two modifiable lifestyle factors that are known to contribute to inequalities in infant mortality are maternal obesity and smoking during pregnancy. Reducing obesity and smoking rates are recommendations in this needs assessment.

20% of births are to women who are obese and risk of infant mortality is 1.4 times higher (40% higher) than for babies born to women of normal weight (body mass index of 18.5 - 24.99).

14% of women smoke during pregnancy and their risk of infant mortality is 1.2 times higher (20% higher) than for non smokers.

Nationally, babies of mothers who smoked during pregnancy are more likely to be born prematurely, twice as likely to have a low birthweight and are up to three times as likely to die from sudden unexplained death.³⁶ Smoking in pregnancy is much higher in routine and manual socio economic groups and nationally, 45% of mothers under 20 years smoke through their pregnancy, nearly three times higher than smoking rates for all pregnant mothers.³⁷

The relative risks for Croydon are similar to the relative risks nationally as shown in table 3. However, some differences are seen for ethnicity, breastfeeding and maternal obesity.

Ethnicity

National data is presented by country of birth with the highest rates in women born in Pakistan and Africa (excluding southern and east Africa). In Croydon, there is no apparent increased risk for Pakistani women; the risk for women of Asian ethnicity is actually slightly lower (0.8) than of white women. However, Croydon data relates to ethnicity not country of birth and does not distinguish between Pakistani women and other women of Asian ethnicity.

In common with national data, the risk of infant mortality for women from Black ethnic groups in Croydon is very high. One quarter of births are to women who are Black, and their risk of infant mortality is double the rate for women from White ethnic groups.

The London Health Observatory found that one of the five most important factors associated with infant death in London is mothers born in East or West Africa and the Caribbean.³⁸ This is borne out locally as the risk of infant death is even higher for Black mothers not born in the UK. This group makes up 16% of all births in Croydon and has a risk 2.2 times higher than for White mothers born in the UK, a finding that is statistically significant.

³⁶ Green N, Damus K, Simpson J, Iams J, Reece A, Hobel C, Merkatz I, Greene M, Schwarz R and the March of Dimes Scientific Advisory Committee on Prematurity. Research agenda for preterm birth: recommendations from the March of Dimes. *Am J Obs Gynae*, 2005; 193: 626-35.

³⁷ NICE PH26, *Quitting smoking in pregnancy and following childbirth*. 2010

³⁸ Bowles, Walters and Jacobson. *Born Equal? Inequalities in infant mortality in London*. London Health Observatory. 2007

Obesity

Whilst the risk of infant mortality is increased in women who are obese, the risk is not as high as that found in a Danish study. This may be due to the fact that recording of obesity in the Croydon dataset was poor, with body mass index recorded for only 54% of women.

Deprivation

Whilst deprivation leads to increased risk of infant mortality in Croydon, this is not as great an increase as reported nationally (although the difference between the Croydon and national risk is not statistically significant). This may be due not only to random variation but also to the use of a different index of deprivation. In the Croydon analysis, the index of multiple deprivation was used whereas nationally the Carstairs index of deprivation was used.³⁹

Deprivation, low birthweight and socio economic status

Deprivation can be measured using the socio economic status of the baby derived from the father's occupation or area based measures of economic and social deprivation such as the index of multiple deprivation (IMD) score. In this section, associations with infant mortality are discussed for both measures of deprivation.

Nationally, there are higher rates of infant mortality in more deprived areas.⁴⁰ Many of the risk factors associated with high rates of infant mortality are more prevalent in deprived areas. For example, women in deprived areas tend to have higher rates of low birthweight and prematurity and are more likely to smoke and be obese. Sudden unexplained death in infants is more common in disadvantaged populations.⁴¹

Nationally, it has been estimated that one quarter of all infant deaths would potentially be avoided if all levels of deprivation were reduced to those of the least deprived group.⁴²

As shown in table 3, babies born in the most deprived quintiles (IMD quintile 1) in Croydon had a risk of infant mortality that was 1.3 times greater than the least deprived fifth of areas (IMD quintile 5). However this relationship was not consistent across all deprivation quintiles. This is likely to be due to small numbers as national analyses show successively higher infant mortality rates in successively more deprived quintiles.⁴³

Low birthweight is sometimes used as a proxy for infant mortality. A clear relationship with deprivation is seen in Croydon (figure 7) where the risk of low birthweight increases with increasing levels of deprivation. A greater proportion of babies have a low birthweight in Croydon than across England and Wales. Between 2006 and 2008, 8.9% of babies were born under 2,500 grams in Croydon compared with 7.6% in the whole of England and Wales.⁴⁴

39 Oakley L, Maconochie N, Doyle P, Dattani N, Moser K. Multivariate analysis of infant death in England & Wales in 2005-06, with focus on socio-economic status and deprivation. *Health Statistics Quarterly*. 2009 Summer;(42):22-39

40 *ibid*

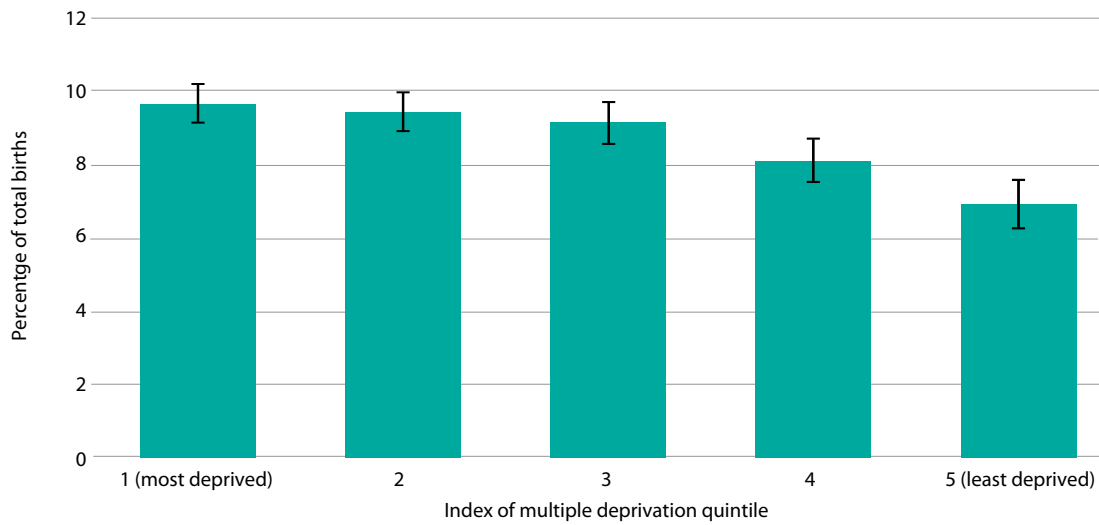
41 Spencer N and Logan S. Sudden unexpected death in infancy and socio economic status: a systematic review. *Journal of Epidemiology and Community Health*. 2004; 58: 366-73.

42 Oakley L, Maconochie N, Doyle P, Dattani N, Moser K. Multivariate analysis of infant death in England & Wales in 2005/06, with focus on socio economic status and deprivation. *Health Statistics Quarterly*. 2009 Summer;(42):22-39

43 *ibid*

44 Office for National Statistics

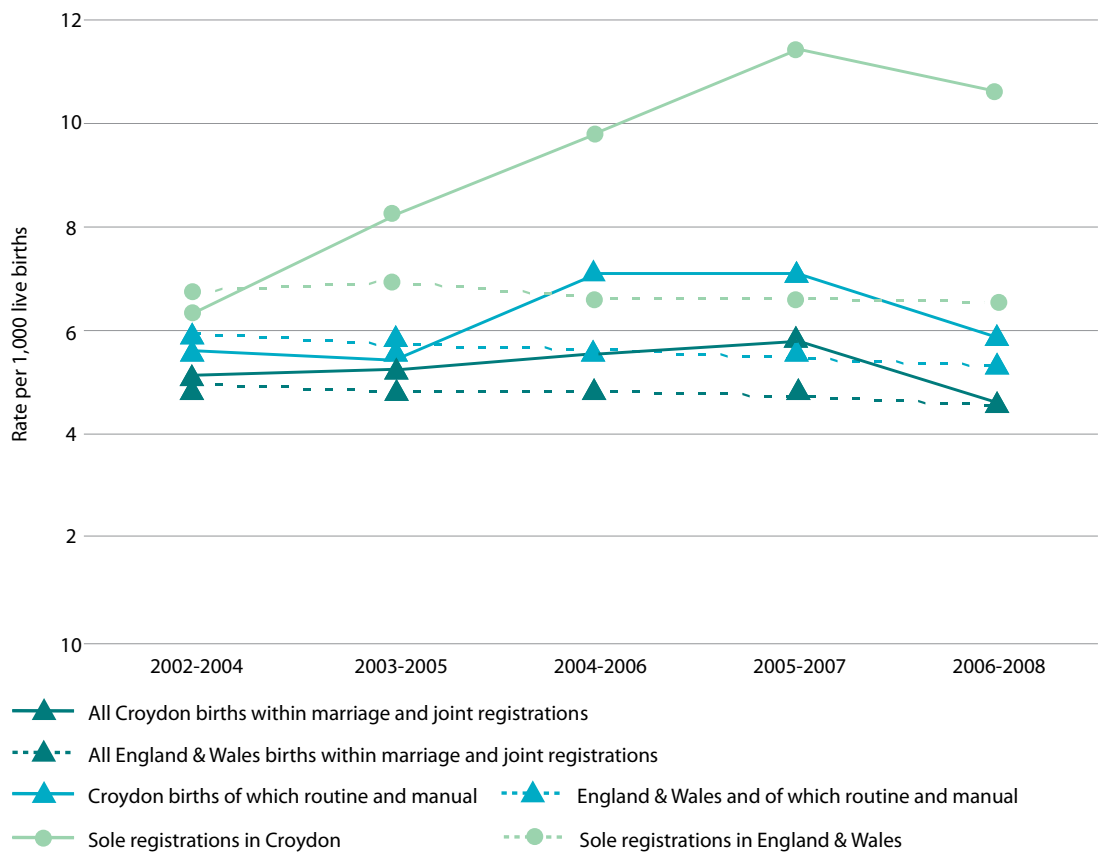
Figure 7 | low birthweight (under 2500 grams), percentage of live and still births by deprivation quintile, Croydon 2000-2009



Source: Office for National Statistics

Figure 8 shows infant mortality by the socio economic status of the baby based on the father’s occupation. In common with England and Wales, Croydon has the lowest mortality rates for births within marriage or joint registrations, higher rates for routine and manual classes and the highest rates for sole registrations. The figure also shows that for all three groups, the Croydon rates are higher than the corresponding England and Wales rates.

Figure 8 | infant mortality by registration, Croydon and England and Wales, 2002-2004 to 2006-2008



Source: London Health Observatory, infant mortality tool

Feedback from people who use maternity services and professionals

Focus groups

In order to gain a user perspective of maternal health services in Croydon, eight focus groups (61 people) were conducted between April and May 2010. Participants included those who had been pregnant in the UK in the previous two years, women currently pregnant, relatives or carers of pregnant woman and fathers.

The focus groups were aimed at potentially vulnerable people where poorer outcomes of pregnancies are more likely to occur (table 4). Some participants, in particular refugees and asylum seekers, had little support or family in the UK or had to deal with the fear associated with being an illegal immigrant during pregnancy. This means reported experiences are likely not to be typical of the majority of service users but provide an excellent opportunity to identify areas for improvement.

Table 4 | composition of the focus groups

Focus Group	No. of participants
Asian communities (2 groups)	7
African and Caribbean communities (2 groups)	19
White British community	6
Refugees and asylum seekers	7
Teenage parents and young people under 25 years	11
Polish community	11
Total	61

The three key areas for improvement identified through the focus groups were:

- Access to services
- Quality of care
- Information and communication

These are described in more detail below.

Access to services

For most of the participants in all eight groups, their GP was the first point of contact once pregnant. For most, the first booking for an antenatal appointment was made through their GP. Almost no one had heard of either the Croydon University Hospital internet booking system or the telephone helpline.

Lack of fluency in the English language was perceived as a barrier. Participants, particularly the refugees and asylum seekers, felt that a person lost out if they did not speak or understand English easily.

The majority of the Eastern European group preferred to go to a private Polish obstetrician who they felt had a better cultural understanding and rapport with them.

Teenage mothers and young people up to 25 years felt that midwives were not easy to access and they had the perception that staff were too busy to give them enough time.

Few of the participants had attended antenatal classes. Some said that they did not know about them, others experienced difficulties trying to obtain the details of these classes and others found classes difficult to access in terms of location, time and day.

"I feel sometimes I am not English so I don't have proper service in hospital..."

"I go to the Polish doctor because I don't trust the English doctor, I feel let down. I feel a sense of security with the Polish doctor"

Quality of care

Reported experiences were very mixed. Many participants felt their GP was “better” than the midwife and health visitor. Participants were often critical of midwifery services both during pregnancy and during labour. Many felt that midwives were unhelpful, impersonal, judgmental and rude. There was dissatisfaction with the lack of continuity of care brought about by seeing a different midwife every time. Those who saw the same midwife through pregnancy reported more positive experiences of midwifery.

“Every time you go you see a different midwife and each one asks you the same questions and information, they don’t pass information on to each other and don’t pass notes to one another”

“They don’t take you seriously if you are young”

“They need to act like they care; it is not just a job, just give a friendly smile.”

“It looks like they don’t have time”.

“They were judgmental.”

“I wanted to talk but they treated me like a panicky woman asking too many questions.”

Two participants were positive about having been seen by the same midwife throughout pregnancy, having one to one care in labour and the care by the specialist teenage pregnancy midwife. One participant said that the health visitor was supportive and visited frequently.

“Health visitor was so good... and GP in Purley so good. I saw same midwife all the time.”

“With my first baby with the cleft palate she kept coming back for the whole month, she was excellent.”

Information and communication

Many participants commented on the need for better communication skills in healthcare professionals. Participants felt there was not enough information about antenatal classes, eligibility for immunisations and Sure Start, for example. The inability to speak English fluently and the perceived lack of interpreters or support were seen as major barriers to access and communication, particularly among refugees and asylum seekers and the Polish group.

“I wanted to talk but they didn’t explain anything.”

The Bounty book, pregnancy book and baby book were the prime sources of information for the participants and were found to be particularly useful.

Stakeholder consultation

Senior managers from the local authority, NHS Croydon and Croydon University Hospital maternity services, attended a seminar held in June 2010. The seminar was supported by the infant mortality national support team from the Department of Health.

The aim of the seminar was to produce ideas for action and recommendations to help address the key determinants of infant mortality in Croydon, based on the evidence presented. Participants discussed the findings from local data analysis, the focus groups and the national evidence base on infant mortality.

Some of the key themes and ideas were:

- Improving smoking cessation in pregnancy
- Appropriate referral for women before conception who are overweight for weight management
- Exploration of feasibility of different strategies for screening for Group B streptococcus infections in late pregnancy
- Agreement of the formation of a strategic group to ensure the development of the strategy for infant mortality which will report to Croydon children’s trust parenting group
- Infant mortality actions should be embedded within Total Place initiatives and the local children’s trust boards.

The issues, themes and ideas raised within the focus groups and seminar have informed the needs assessment recommendations, including those around patient experience and developing interventions to reduce maternal and infant infections.

Maternal and child health services in Croydon

Croydon maternal health services

Of the 29,322 live births in Croydon from 2003 to 2008, 25,156 (86%) were at Croydon University Hospital.⁴⁵ The remaining births took place out of the Croydon area.

Most of the care and support provided to women and their babies before, during and after pregnancy in Croydon is provided by GPs, the Croydon University Hospital midwifery services, obstetricians and paediatricians at Croydon University Hospital and Croydon Community Health Services.

The Croydon antenatal care pathway is based on various antenatal and postnatal care guidance from NICE and is underpinned by the Department of Health *Healthy child* programme.⁴⁶

Appendix 2 illustrates the care pathway for a pregnant woman in Croydon from the time she learnt she was pregnant until the first immunisations of her baby, if she had no major concerns and was an 'uncomplicated' case.

95% of referrals to midwifery services are made through GPs, after which the midwifery team makes strenuous efforts to ensure that the first booking interview takes place before 13 weeks and ideally between 8-10 weeks gestation of the baby. In the last quarter of 2009/10, 91% of women in Croydon had an early booking (before 12 weeks and six days gestation).⁴⁷ The 9% that booked in later included young women aged under 20 years, women who were undecided about whether to continue with their pregnancy and refugees and asylum seekers who may have arrived in the UK late in their pregnancy.

There are specialist services for those with additional needs. The Crocus team provides care to women who book to have a homebirth, those who require additional support in pregnancy (including teenagers) and those who have drug and alcohol dependency issues.

Other services relevant to reducing the risks of infant mortality include advice and support for women who are obese (BMI of over 30kg/m²), breastfeeding support (including baby cafés and peer support programmes), parent education sessions and smoking cessation services.

The key mechanism by which stakeholders, including service users, inform the development and monitoring of services is through the Maternity Services Liaison Committee (MSLC). The group is made up of users of the services, providers, commissioners and voluntary sector representatives. This multi disciplinary forum aims to improve the local maternity service by advising on its monitoring, planning, development and promotion.

Children's universal service

The children's universal service (CUS) is part of Croydon Community Health Services and is an integrated early intervention and prevention provision for all families with children from birth up to the age of 19 years. Those at higher risk or who are more vulnerable, including young women under 19, are also seen when they become pregnant. The service is provided by a team of health visitors, staff nurses, school nurses and community child development advisers (formally known as nursery nurses). Part of the service is visiting families in their homes and delivering services through child health clinics at various venues across Croydon including children's centres, GP surgeries, Croydon Community Health Services' community bases and in school settings.

⁴⁵ Including home births supervised by hospital staff

⁴⁶ Department of Health. *Healthy child* programme. DH 2009

⁴⁷ Vital signs monitoring return

The children's universal service follows well defined care pathways to deliver the *Healthy child* programme at different stages throughout a child and young person's life. Their role in delivery of the *Healthy child* programme begins with notification of higher risk pregnancies and all new births by midwifery services. Following delivery, care of the new baby is transferred from community midwifery services to the children's universal service by 10 days. By 14 days, they visit the family at home and carry out a new baby review. This review, along with the family health needs assessment, is undertaken to determine the level of support and early intervention which the family requires (appendix 3). By working in partnership with families, the service is able to focus on supporting families, promoting protective factors such as breast feeding, immunisations to reduce the risk of infection (especially increasing uptake in hard to reach groups)⁴⁸ and minimising risk factors that might lead to sudden infant death. All these factors play a part in reducing infant mortality.

As a universal child and family centred service, it is well placed to identify early those families who may be more vulnerable and at higher risk. These include teenage parents who may be referred to the Family nurse partnership programme or those mothers with perinatal and postnatal mental health issues who require support as recommended by NICE clinical guidelines on antenatal and postnatal mental health.⁴⁹ For some families with more complex needs, a multi agency approach using the common assessment framework may be required.

As a public health nursing service the children's universal service has a holistic approach to health and wellbeing assessment, which takes account of the wider determinants of health such as housing, poverty and maternal educational attainment. It works with families to identify ways to address these issues, such as signposting to other services.

Expenditure

Expenditure on health services which relate to infant mortality includes programme 18 maternity and reproductive health and programme 19 conditions of neonates.

Table 5 shows that in 2008/09, NHS Croydon spent £6,741,039 per 100,000 population on the maternity and reproductive health programme (£67 per head). This was slightly lower than the London average, lower than the London Suburbs cluster average but more than the England average. In contrast, it spent £2,924,092 per 100,000 population on neonatal conditions (£29 per head). This was 70% more than the England average and higher than both other comparators (London and London Suburbs cluster).⁵⁰

Table 5 | Croydon, cluster, London and England expenditure per 100,000 weighted population, 2008/09

Programme budget category	Croydon	London Suburbs cluster	London	England
18 Maternity and reproductive health	£6,741,039	£7,181,856	£6,872,898	£6,044,223
19 Neonatal conditions	£2,924,092	£2,258,812	£2,308,350	£1,722,642
Total	£9,665,131	£9,440,668	£9,181,248	£7,766,865

Source: Department of Health

Note: The figures shown are £s per 100,000 unified weighted population.

The London Suburbs cluster includes other comparable PCTs in the London suburbs.

48 National Institute for Health and Clinical Excellence. *Reducing differences in immunisations*. London: NICE; 2009

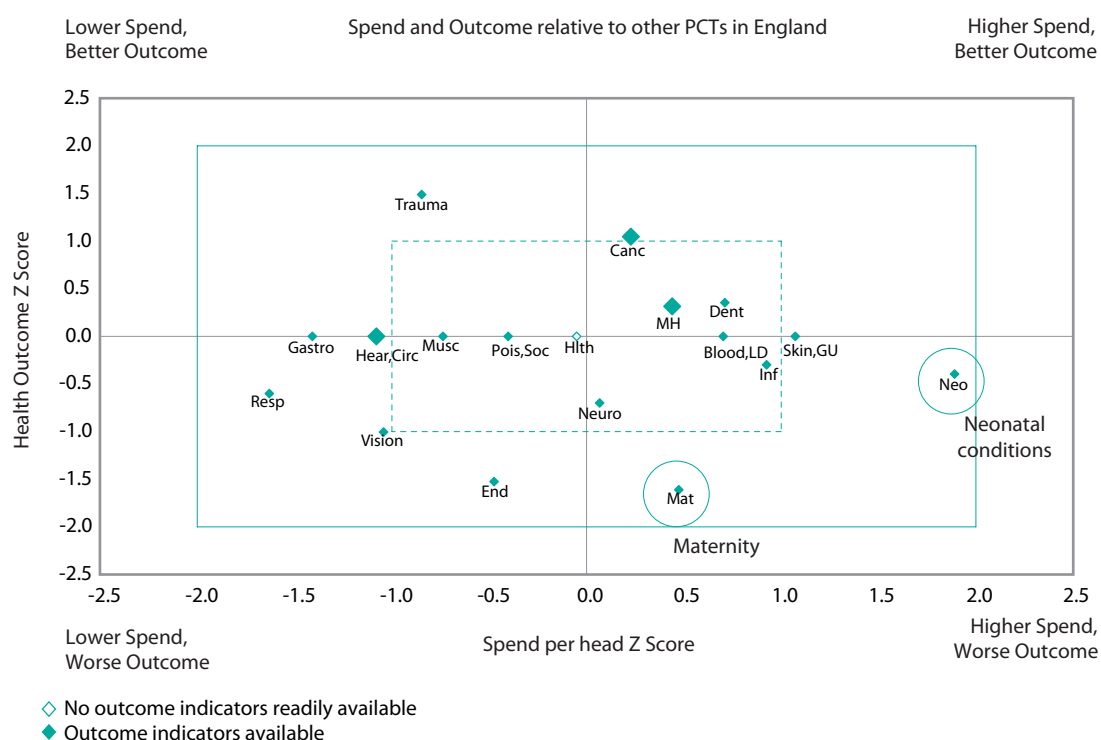
49 National Institute for Health and Clinical Excellence. *Antenatal and postnatal mental health*. London: NICE; 2007

50 Department of Health. Programme budgeting PCT benchmark tool 1.3. 2008/09

In 2008/09, NHS Croydon ranked 10th out of 152 primary care trusts in terms of expenditure on neonatal conditions and 46th for expenditure on maternity and reproductive health services.⁵¹

Figure 9 shows the relationship between expenditure and outcome for both maternal and reproductive health services and neonatal conditions. Croydon is situated in the bottom right quadrant for both. This indicates that we have higher expenditure and worse outcomes compared with the national average of 152 primary care trusts. In 2008/09, NHS Croydon spent more than the national average on maternal and reproductive health and had much worse outcomes (as measured by the proportion of low birthweight births). For neonatal conditions, NHS Croydon spent much more than the average and had worse outcomes (as measured by the neonatal infant mortality rate).

Figure 9 | NHS Croydon's total spend and outcome on maternal health services and neonatal conditions, compared with other PCTs in England 2008/09⁵²



Programme Area Abbreviations

Infectious diseases	Inf	Hearing	Hear	Disorders of blood	Blood
Cancers & tumours	Canc	Circulation	Circ	Maternity	Mat
Respiratory system	Resp	Mental health	MH	Neonates	Neo
Endocrine, nutritional & metabolic	End	Dental	Dent	Neurological	Neuro
Genito urinary system	GU	GI system	Gastro	Healthy individuals	Hlth
Learning disabilities	LD	Musculoskeletal	Musc	Social care needs	Soc
Adverse effects & poisoning	Pois	Trauma & injuries	Trauma		

⁵¹ ibid

⁵² Association of Public Health Observatories. PCT spend and outcome factsheets and tool (SPOT). 2009.

NICE guidance

Guidance from the National Institute for Health and Clinical Excellence relevant to maternal health that relates directly or indirectly to infant mortality:

NICE PH11, *maternal and child nutrition*. March 2008

NICE PH26, *quitting smoking in pregnancy and following childbirth*. June 2010

NICE CG55, *intrapartum care*. September 2007

NICE CG62, *antenatal care*. March 2008

NICE CG45, *antenatal and postnatal mental health*. February 2007

NICE CG37, *postnatal care*. July 2006

NICE PH21, *reducing differences in the uptake of immunisations*. September 2009

NICE CG110, *pregnancy and complex social factors*. September 2010

NICE PH27, *weight management before, during and after pregnancy*. July 2010

NICE CG107, *hypertension in pregnancy*. August 2010

NICE CG98, *neonatal jaundice*. May 2010

NICE CG63, *diabetes in pregnancy*. March 2008

NICE CG70, *induction of labour*. July 2008

NICE CG13, *caesarean section*. April 2004

NICE guidance relating to infant mortality in development:

Reducing infant mortality among those living in disadvantaged circumstances

Multiple pregnancy (due to be published September 2011)

Pain and bleeding in early pregnancy

Appendix 1 Definitions of infant mortality statistics

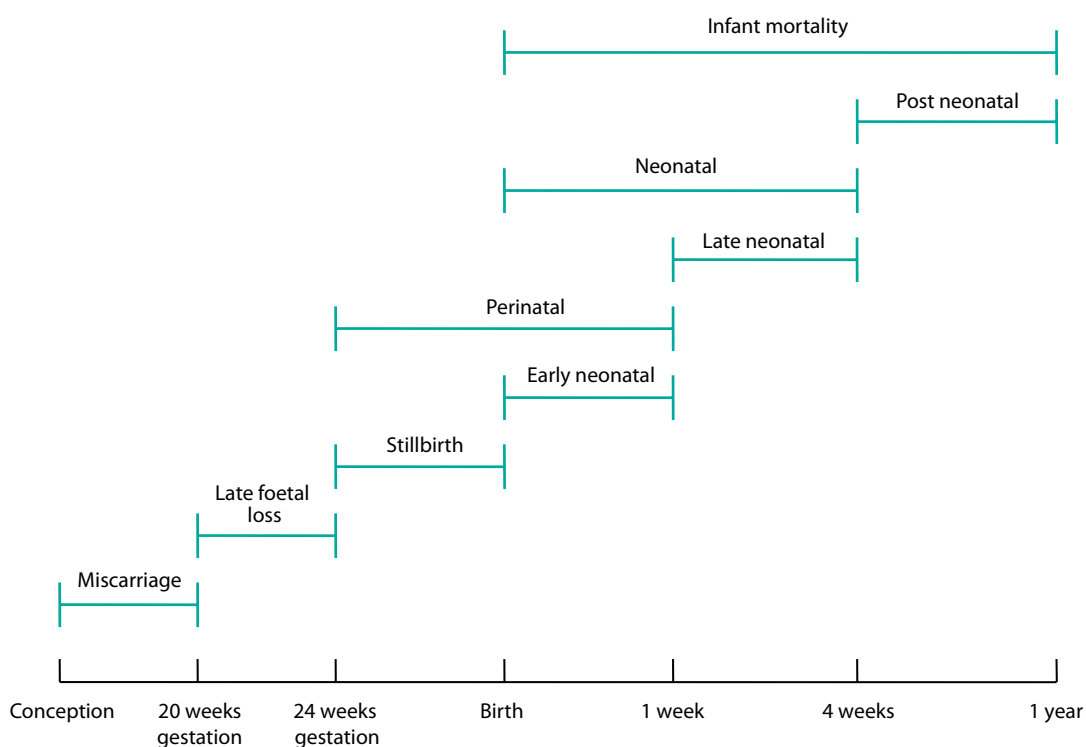
Infant mortality is usually expressed as a population rate, that is, the number of infant deaths per 1,000 live births. This allows comparison with other populations or areas. The infant mortality rate is a sensitive measure of the overall health of the population.⁵³

The infant mortality rate is often broken down into two time periods: neonatal (death of a live born baby in the first 28 days of life) and post neonatal (death of a live born baby between 28 days and one year).

There are however, a range of other statistics relating to mortality up to birth and during the first year of life. Figure 10 and the accompanying text define these indicators and how they are categorised according to when the death happened.

⁵³ Macfarlane A and Mugfirs M. *Birth Counts: statistics of pregnancy and childbirth*. 2000; Volume 1, 2nd

Figure 10 | time line of deaths up to and during the first year of life⁵⁴



Stillbirth

Stillbirth is the death of a child born after the 24th week of gestation with no sign of life. The stillbirth rate is defined as the number of stillbirths per 1,000 total births. Stillbirths are usually measured separately from data on infant mortality but they are included in perinatal death rates.

Perinatal mortality

Perinatal mortality includes deaths after 24 weeks' gestation (stillbirths) and deaths during the first week of life. The perinatal mortality rate is the number of perinatal deaths per 1,000 total births.

Neonatal death

This is the death of a live born baby up to 27 completed days of life. This is a more sensitive measure for deaths which occur in the early weeks of life. The neonatal mortality rate is the number of neonatal deaths per 1,000 live births.

Early neonatal death

The death of a live born baby occurring less than seven completed days from the time of birth. The early neonatal mortality rate is the number of early neonatal deaths per 1,000 live births.

Late neonatal death

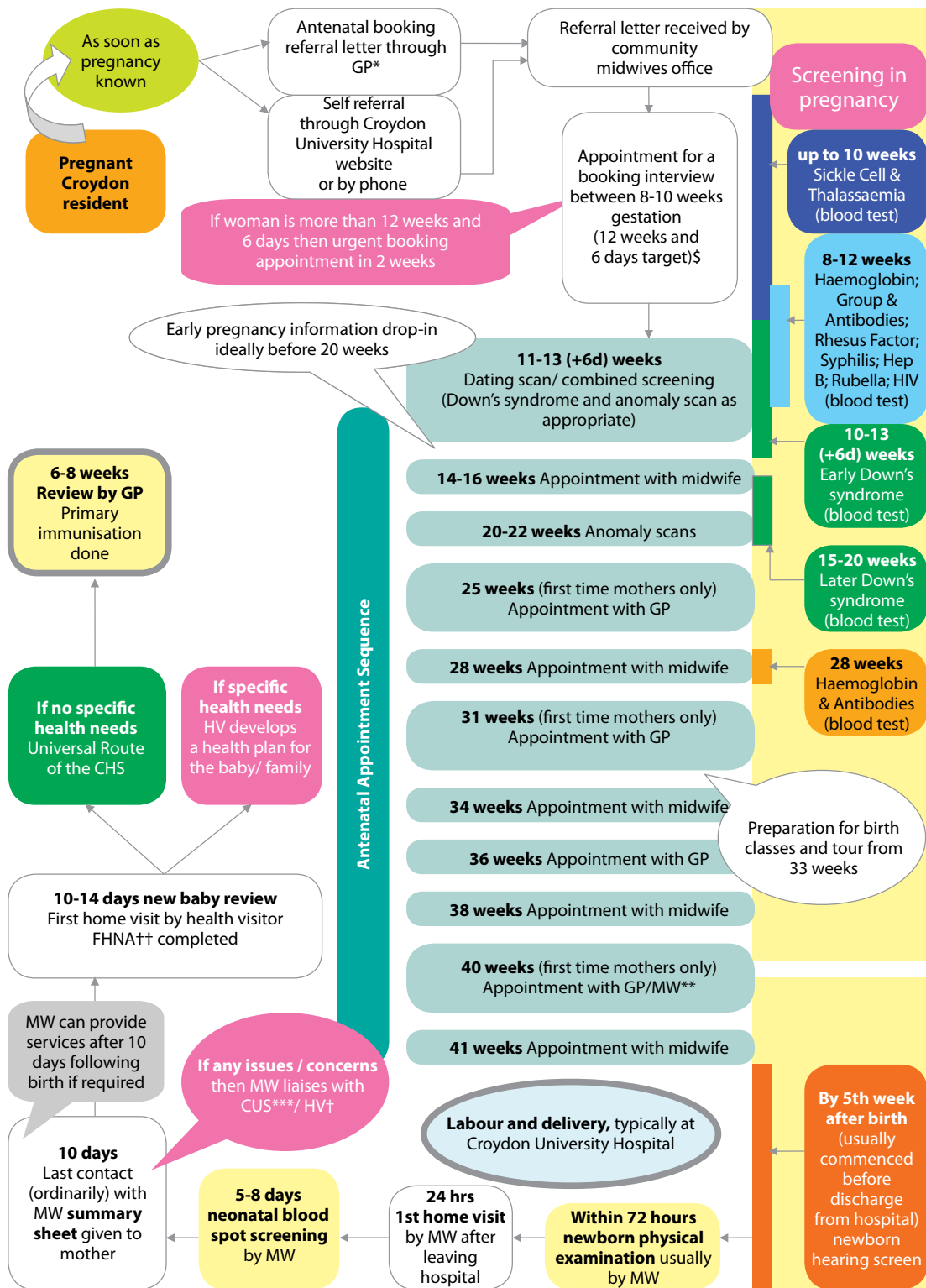
This is the death of a live born baby occurring from the seventh day of life to 27 completed days from the time of birth. The late neonatal mortality rate is the number of late neonatal deaths per 1,000 live births.

Post neonatal deaths

Post neonatal deaths are those which occur between 28 days and one year of age. The post neonatal mortality rate is the number of post neonatal deaths per 1,000 live births.

⁵⁴ Bradford and District Infant Mortality Commission, Bradford & Airedale Teaching Primary Care Trust. Adapted from: *Analysis and Interpretation of infant mortality data*. London: The Stationery Office; 2006.

Appendix 2 Maternity and Children's Universal Services pathway, Croydon



*General Practitioner §Health & Social Care Assessment #by 01/04/2011 anomaly scans will be at 18-20 weeks
 Midwife *Children's Universal Services †Health Visitor ††Family Health Needs Assessment

Appendix 3

Newborn baby review, Children's Universal Services, Croydon

