Review of the Health Inequalities Infant Mortality PSA Target

DH Department of Health

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Description	This review was established to consider why, despite a general improvement in infant mortality rates, health inequalities in infant mortality between different social groups remain. It identifies a range of issues and makes recommendations relevant to the health inequalities 2010 PSA target. Its recommendations are being shared with the NHS and others prior to DH issuing further guidance.
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Foreword

This report reaffirms the Government's commitment to tackle health inequalities in infant mortality and paves the way for further action to narrow the gap as part of wider efforts to reduce health inequalities and meet the 2010 target which is:

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

We set up the review because we were concerned that while the infant mortality rate in England is at an all-time low, the gap between different social groups remains. There is more we can do to reduce infant mortality and narrow the health inequalities gap. The relatively small number of infant deaths is no excuse for inaction – one avoidable infant death is one too many – and strategies that reduce the gap will also reduce the incidence of illness and disability among children.

This report sets out what we know about infant mortality health inequalities, what people in the field are doing to tackle them and what needs to be done to reduce these inequalities and help meet the target. We have worked together on this review with mothers and children, practitioners and professionals, and health experts and statisticians to explore these key issues.

The report contains clear messages about how to sharpen local delivery by building on the good practice that already exists around the country. In particular, it notes the importance of applying simple principles systematically to achieve change at local level. This will be one of the quickest ways to narrow the gap and help deliver the target. These principles – or "high impact changes" – are to:

- know the target, know your gap

- make the target part of everyday business – integrate it into commissioning plans and provider contracts

- take responsibility, engage communities and families in this work

- match resources to need

- focus on what can be done

The national health inequalities strategy (*Tackling Health Inequalities: A Programme for Action,* 2003) recognised the challenge posed by the target when it was published in 2003. It stressed we can only meet this challenge by doing things differently and by acting in partnership with others. This has been our approach. Recently – and for the first time – health inequalities has been made one of the top six priorities for the NHS, a vital lever for change alongside other issues such as waiting times. This will give new impetus to health inequalities work across the service and will help tackle issues like smoking and obesity. The Children's National Service Framework provides an important context for action. Reducing infant mortality and improving the health of mothers and young children in disadvantaged groups and areas means taking account of their many

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different needs. We are doing this by working across government – at local, regional and national level – through a range of new and existing programmes such as Sure Start Children's Centres, maternity services, the teenage pregnancy strategy, housing, social services and the work on tackling child poverty.

This report is not the last word on tackling health inequalities in infant mortality. It is, however, a crucial first step in focusing our efforts on reducing the inequalities gap and ensuring that mothers and families receive the support that they need. A best practice guide to help implement the report's recommendations – which are advocated as good practice – and promote the themes emerging from this review will be published Spring 2007, building on the actions set out in the forthcoming guidance for implementing the Government maternity commitments.

Reducing health inequalities in infant mortality will need a major effort from all involved – agencies, communities and families. The enthusiasm, energy and support of many of those who participated in this review encourage us to believe that we have a good basis on which to develop further action to help narrow the gap and meet the target.

Executive summary

1. The Government has made tackling health inequalities a priority by setting a national health inequalities Public Service Agreement target, which is underpinned with objectives on reducing infant mortality and increasing life expectancy in disadvantaged populations.

2. The infant mortality element of the target is:

    Starting with children under one year, by 2010 to reduce by at least 10% the gap in mortality between the routine and manual group and the population as a whole. The baseline is 1997–99.

3. The routine and manual (R&M) group includes those in lower supervisory and technical, semi-routine and routine occupations. Typical examples might be porters, cleaners, bar staff, waiters/waitresses, sales assistants, catering assistants, train drivers, people working in call centres, electricians and sewing machinists.

4. This review of the infant mortality aspect of the target has identified what we currently know about avoidable infant mortality and sets out a strategy to deliver the target.

5. Data analysis, fieldwork visits and modelling on actions to reduce the gap helped the review team understand what the target means and factors that can make local delivery more challenging.

Data findings

6. There are 354 local authority areas in England. The infant mortality rate (IMR)* was higher than that of the England average in 66% (46/70) of Spearhead local authority areas (compared to 27%, 77/284, in non-Spearhead local authority areas), showing that high IMR and low life expectancy often go hand-in-hand in the Spearhead areas; the 70 local authority areas with the worst health and deprivation indicators

7. The data for 2002–04 confirm that, while rates in the R&M group are continuing to improve, the gap between the R&M group and the population as a whole has widened to 19% from the target baseline in 1997–99 of 13%. The IMR in England and Wales was 4.9 deaths per 1,000 live births and the rate for those in the R&M group was 5.9 per 1,000 live births.

8. The target does not take into account all dimensions of health inequalities in infant mortality. In 2002–04, the infant mortality rate of babies of mothers:

    *   born in Pakistan (10.2 per 1,000 live births) was double the overall IMR;

    *   born in the Caribbean (8.3 per 1,000 live births) was 63% higher than the national average;

    *   aged under 20 years (7.9 per 1,000 live births) was 60% higher than for older mothers aged 20–39;

    *   where the birth was registered by the mother alone (6.7 per 1,000 live births), was 36% higher than among all births inside marriage or outside marriage or jointly registered by both parents.

9. Tackling health inequalities in infant mortality at a local level is complicated by the relatively small numbers of infant deaths in individual localities. To help investigate local progress, the review identified the 43 local authority areas that faced the biggest challenge in reducing infant mortality in the R&M group. These were areas with 20 or more infant deaths in the R&M group over a three-year period, 2002–04.

*The infant mortality rate is defined as the number of deaths under the age of one year, per 1,000 live births.

10.   Local progress in these 43 areas from 2002–04 to 2003–05 illustrate that progress is far from uniform, with changes in the relative gap ranging from around 0.24 to -0.3. If a 0.3 decrease* in the gap occurred in all 43 areas, then this would prevent around a further 130 infant deaths per year.

11.   Census data from 2001 showed that 7% of people in the R&M group were from black and ethnic minority groups. However, when looking at the 43 areas with the highest numbers of R&M infant deaths, this proportion increased to 14%.

12.   This suggests that reductions in infant mortality for black and minority ethnic groups could have a greater impact on the target group compared to the population as a whole.

Fieldwork findings

13.   The review team visited six local areas and three Children's Centres around the country. During each of the visits, the team interviewed a range of local staff from within the NHS and local government to gain different perspectives.

14.   The key message from the fieldwork was that the infant mortality target was not known or understood despite individual examples of leadership and good practice.

15.   The visits identified five challenges to delivering the target:

- no recognition of the target or the widening gap between the R&M group and the overall population;

- services were not fully delivering to the target group;

- lack of leadership and systems to support delivery;

- lack of knowledge and understanding of the target;

- poor handling of data and gaps in the evidence base.

16.   The visits provided clear evidence that services could be designed to help meet the target and reduce health inequalities in infant mortality. Five areas of good practice (high impact changes) were identified:

- knowing the target, knowing your gap;

- making the target part of everyday business – integrate into commissioning plans and provider contracts;

- taking responsibility and engaging communities;

- matching resources to needs;

- focusing on what can be done.

*A change in the ratio of R&M deaths to all deaths e.g. the ratio decreasing from 1.30 to 1.00 would be a 0.30 decrease.

Strengthening delivery

17.   There were 9,132 infant deaths in England and Wales in the period 2002–04, 40% (3,631) of these deaths were in the R&M group. A reduction of around 800 to 900 deaths in the period 2009–11 compared to 2002–04 might reduce infant mortality sufficiently in the R&M group to achieve the target. Details on how steady progression to do this might be achieved are shown in Chapter 4.

18.   Three quarters of neonatal deaths are due to immaturity related conditions and congenital anomalies. Over two-fifths of all post-neonatal deaths (44%) are due to "Signs, symptoms and ill defined conditions" predominantly sudden unexpected deaths in infancy. All causes of neonatal death show a socio-economic gradient. All except one cause of post-neonatal deaths (diseases of the nervous system and sense organs) show a socio-economic gradient.

19.   Literature reviews were performed and expert opinions were sought to:

- identify what actions could prevent infant deaths, particularly in the R&M group;

- quantify the impact of these actions on the infant mortality gap.

20.   In summary, the evidence about the effectiveness of interventions to reduce infant mortality is weak, particularly those that will narrow the gap between the R&M group and the overall population. In spite of this, there are interventions that:

- will have a demonstrable impact, e.g. reducing smoking;

- are likely to have an impact even without all the evidence, e.g. early booking and effective use of high-quality healthcare.

- are likely to improve infant mortality rates overall, e.g. introduction of Medium Chain Acyl-CoA Dehydrogenase Deficiency (MCADD) screening, prevention of maternal and infant infections, e.g. introduction of pneumococcal vaccine and ensuring appropriate health service configuration through networks of care for maternity and neonatal services.

21.   It was possible to quantify the impact of only four interventions on reducing the gap. These accounted for 7% of the gap. Modelling suggests that:

- If the prevalence of obesity in the R&M group were to fall by 23% to the current levels of obesity in the population as a whole, this would reduce the gap by 2.8%.

- Meeting the national target to reduce smoking in pregnancy from 23% to 15% in the R&M group would reduce the gap by 2%.

- Reducing sudden unexpected deaths in infancy in the R&M group by persuading 1 in 10 women in this group to avoid sharing a bed with their baby or putting it to sleep prone (on its front) would reduce the gap by 1.4%.

- Achieving the teenage pregnancy target would reduce the gap by 1%.

22.   However, given that the gap has widened considerably since the baseline, this alone does not provide a solution to achieving the target. It was not possible to quantify the impact of other interventions on reducing the gap, e.g. early booking and improving services for teenage parents. Nevertheless, ensuring that these interventions are delivered to the R&M group may help to reduce the gap in infant mortality and help to meet the target.

Recommendations

23.   The review team developed five recommendations that if implemented rapidly, could enable the target to be delivered. The recommendations address the delivery challenges identified in the fieldwork:

- develop and promote action that will help deliver the targe;

- promote joined up delivery of services to the target group, with the soon-to-be published guidance for implementing the Government maternity commitments;

- encourage ownership of the target through effective performance management;

- sharpen and raise awareness of the target;

- improve data quality and strengthen the evidence base.

24.   An implementation plan based on good practice will be published in Spring 2007.

Acknowledgements

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Departments

- The Confidential Enquiry into Maternal and Child Health (CEMACH)
- The Department for Education and Skills (DfES)
- The Department for Communities and Local Government (DCLG)
- Her Majesty's Treasury (HMT)
- The London Health Observatory (LHO)
- The Office for National Statistics (ONS)

Individuals

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Angela Bartley	Professor Catherine Law
Christine Beels	Professor Alison Macfarlane
Professor Robert Carpenter	Catherine MacGruer
Nirupa Dattani	Dr Alan Maryon-Davies
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Glossary

CEMACH	Confidential Enquiry into Maternal and Child Health
95% CI	95% confidence interval
DCLG	Department for Communities and Local Government
DfES	Department for Education and Skills
DH	Department of Health
FSID	Foundation for the Study of Infant Deaths
IMR	infant mortality rate
LA	local authority
LHO	London Health Observatory
MCADD	Medium Chain Acyl-CoA Dehydrogenase Deficiency
NHS	National Health Service
NS-SEC	National Statistics Socio-Economic Classification
ONS	Office for National Statistics
PCT	Primary Care Trust
PMDU	Prime Minister's Delivery Unit
PSA	Public Service Agreement
R&M group	routine and manual group
SHA	Strategic Health Authority
SUDI	Sudden unexpected death in infancy

1. Background to the review

The health inequalities target

1.1 Health and life expectancy are still linked to social circumstances and childhood poverty. While England has seen increased prosperity and reductions in mortality over the past 20 years, differences in health status have persisted and, in some cases, the gap in health status has widened.[1]

1.2 The Government has made tackling health inequalities a priority by setting a national health inequalities Public Service Agreement (PSA) target. The 2004 Spending Review reaffirmed this target:

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

1.3 This target is underpinned by the following objectives on infant mortality and life expectancy:

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

Starting with local authorities, by 2010 to reduce by at least 10% the gap between the fifth of areas with the lowest life expectancy at birth and the population as a whole.

1.4 The areas covered by the life expectancy target are known as the Spearhead areas, the 70 local authority areas with the worst health and deprivation indicators.

1.5 Reducing health inequalities has been made one of the top six NHS priorities for 2006–07, putting the issue and the target at the heart of NHS service planning and performance.

Infant mortality

1.6 Infant mortality is a sensitive measure of the overall health of a population. It reflects the apparent association between the causes of infant mortality and other factors that are likely to influence the health status of whole populations, such as their economic development, general living conditions, social well being, rates of illness and the quality of the environment.[2]

1.7 The infant mortality rate (IMR) is defined as the number of deaths under the age of one year, per 1,000 live births. It consists of two components:

- The neonatal mortality rate: The number of neonatal deaths (those occurring during the first 28 days of life) per 1,000 live births.

- The post-neonatal mortality rate: The number of infants who die between 28 days and less than one year, per 1,000 live births.

Mortality during the neonatal period is considered a good indicator of both maternal and newborn health and care.

1.8 The infant mortality target is based on the routine and manual (R&M) group of the National Statistics Socio-Economic Classification (NS-SEC), which is derived from the father's occupation as recorded on the death certificate. The target compares the IMR in the R&M group with that of the population as a whole. The population as a whole refers to all births inside marriage and outside marriage jointly registered by both parents.

1.9 The R&M group include those in lower supervisory and technical, semi-routine and routine occupations, e.g. porters, cleaners, bar staff, waiters/waitresses, sales assistants, catering assistants, train drivers, people working in call centres, electricians and sewing machinists.

1.10   Some particularly disadvantaged groups are excluded from the target, including:

- **Births registered by the mothers alone (sole registrations)**: because the socio-economic classification is based on the father's occupation, sole registrations cannot be classified. This group has a higher IMR than the R&M group and a higher proportion of teenage mothers. A quarter of births to teenage mothers are sole registrations compared to 6% of births in the population as a whole.

- **NS-SEC "Other" category**: this is a diverse group, which includes the long-term unemployed, those who have never worked and students. This group is associated with particularly high death rates in infancy.

We are committed to monitor and improve rates among these other disadvantaged groups alongside the R&M target group.

Review of the infant mortality target

1.11   In September 2005, the Department of Health (DH) and Her Majesty's Treasury commissioned the Prime Minister's Delivery Unit (PMDU) to review the life expectancy element of the target. It concluded that:

- the target is challenging, but can be delivered;

- to deliver the target the focus needs to be on preventing early deaths, particularly in those who already have disease or are at high risk;

- successful delivery will be primarily through NHS actions, rather than actions to tackle wider determinants.

1.12   It was agreed that, following the completion of this review, a further internal (DH) review of the infant mortality aspect of the target would be carried out to identify the current position and develop a strategy for delivering the target.

1.13   The review aimed to identify how the DH, and in particular the Health Inequalities Unit, could help secure delivery of the infant mortality aspect of the health inequalities PSA target.

A series of other relevant questions was considered by the review:

- What are the most important actions, at national, regional and local levels, for delivering the target?

- What steps need to be given priority to increase the likelihood of delivery?

- How could work primarily designed to support delivery of other PSAs, e.g. reducing teenage pregnancies, and priorities contribute to the health inequalities infant mortality target?

- How can performance management of the delivery of the infant mortality target be improved?

1.14   Some issues were outside the scope of the review. These included:

- other aspects of DH's inequalities work;

- future funding requirements for successful delivery of health inequalities targets;

- current or future NHS organisational changes.

Review process

1.15   Three groups were assembled (Annex 1):

- an overarching steering group, which had general oversight of the review;

- a working group, which was responsible for the day-to-day activities of the review;

- an analytical support group, which was responsible for data analysis and modelling.

1.16   The review was carried out between May and November 2006.

1.17   The review gained a clear understanding of the infant mortality target, local delivery challenges and identification of interventions that would help meet the target through data analysis, fieldwork visits and modelling to quantify the effect of identifiable actions to reduce the gap. More detailed methodology is described in the relevant chapter.

1.18   This report describes the findings of the review at the time that it was carried out. At that time, the latest data available related to the three-year average, 2002–04; since then, data for 2005 have been published by the Office for National Statistics. These show a slight narrowing in the gap between the R&M group and the population as a whole compared with last year. Updated data are available at www.dh.gov.uk/assetRoot/04/14/17/40/04141740.pdf.

2. Data findings

Local performance

2.1 There are 354 local authority areas in England. There is a wide variation in IMRs across the country, including differences in registration of live births (Annex 2). Figure 1 shows the spread of infant mortality across the local authority areas.

2.2 The IMR ranged from 11.9 per 1,000 live births (95% CI: 7.8–18.2) in Boston and 9.8 per 1,000 live births (95% CI: 9.0–10.8) in Birmingham to 1.6 per 1,000 live births (95% CI: 0.7–3.6) in Eastleigh, in the period 2002–04. This contrast is more sharply drawn by reference to the number of infant deaths.

Table 1. Local Authority Areas with the highest numbers of infant deaths, 2002–2004

	Total number of deaths (2002–04)
Birmingham	449
Bradford	177
Manchester	147
Leeds	134
Kirklees	128
Newham	121
Eastleigh*	6

Source: Office for National Statistics (ONS)
*LA area with low numbers of infant deaths

2.3 The IMR was higher than that of the England average in 66% (46/70) of Spearhead local authority areas (compared to 27%, 77/284, in non-Spearhead local authority areas), showing that high IMR and low life expectancy often go hand-in-hand in the Spearhead areas.

Figure 1. Infant mortality rate between 2002–2004 by local authority
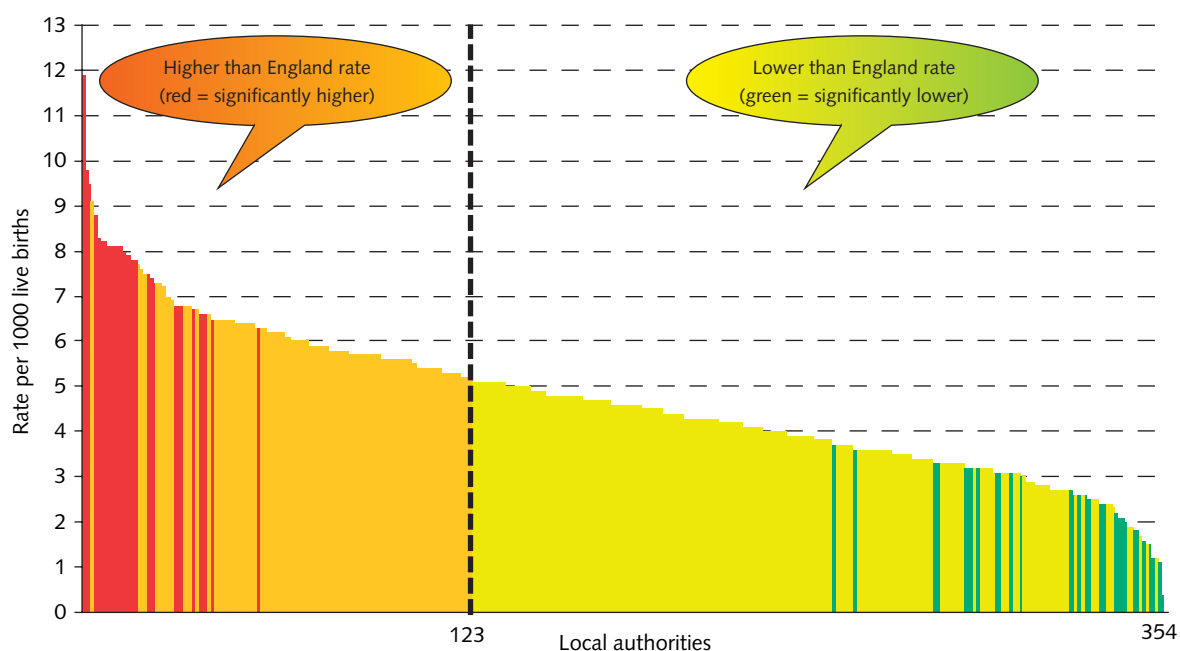
Note: This graph illustrates local variation but some areas with "higher" rates may not have rates that are statistically significantly different from the average.
Source: ONS

Infant mortality by socio-economic group

2.4   In order to smooth out the trend and minimise any problems caused by the relatively small numbers of infant deaths, the infant mortality inequality target is monitored using three-year average rates.

2.5   The data for 2002–04:

- show that the overall IMR in England and Wales (for all births in marriage or out of marriage jointly registered by both parents) was 4.9 deaths per 1,000 live births, and the rate for those in routine and manual (R&M) group was 5.9 per 1,000 live births;

- confirm that while the rate in the R&M group is continuing to improve, the relative gap between the R&M group and the population as a whole has widened since the target baseline;

- the IMR among the R&M group was 19% higher than in the population as a whole in 2002–04, the same as in 2001–03. This compares with an IMR 13% higher in the baseline period of 1997–99.

Figure 2. Infant mortality rates in England and Wales from 1994–2004 by socio-economic group with projection to 2010 target
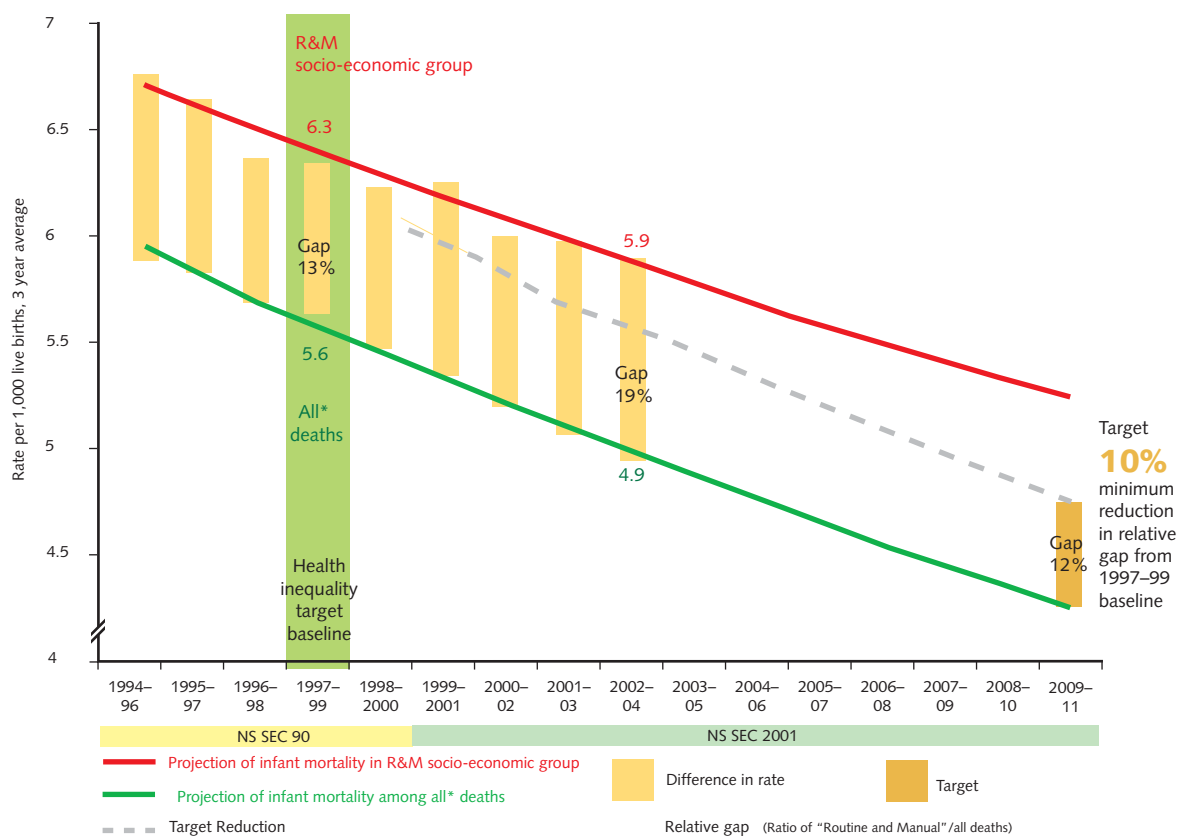
*'All relates to inside marriage and joint registrations outside marriage, not including "social class not specified" for 1995 and 1999. Sole registration and unlinked births are excluded. Information on the father's occupation is not collected for births outside marriage if the father does not attend the registration of the baby's birth. Figures for live births are a 10% sample coded for father's occupation.

Source: ONS

Infant mortality in other disadvantaged groups

2.6   The target does not take into account all dimensions of health inequalities in infant mortality. Examples include the following:

Black and minority ethnic populations

2.7   It has not been possible to provide analyses of infant mortality by ethnic origin, as this information is not collected at birth or death registration. So the results quoted below relate to mother's country of birth (which is collected at birth registration), and is used as a proxy for ethnic origin. However, from 2005 onwards, ONS has access to the NHS Numbers for Babies records, which include information on ethnicity. This will be linked to information collected at birth and death registration and hence future analyses of infant mortality will be made available by ethnicity.

The IMR in babies of mothers born in Pakistan was 10.2 per 1,000 live births in 2002–04, double the overall IMR (4.9 per 1,000 live births in 2002–04) for all babies born in England and Wales. The IMR in babies of mothers born in the Caribbean was 8.3 per 1,000 live births in 2002–04, 63% higher than the national average.

Teenage parents (or mothers)

2.8   Infant mortality for babies with mothers aged under 20 is 60% higher than for babies of older mothers aged 20 to 39. In 2002–04, the IMR for mothers under 20 was 7.9 per 1,000 live births. Three-quarters of births to women aged under 20 were registered by both parents, of whom 45% were in the R&M target group.

Sole registrations

2.9   The IMR among sole registrations (births registered by mother only) was 6.7 per 1,000 live births for 2002–04, 36% higher than that among all births inside marriage or jointly registered in 2002–04. This difference is similar to that observed in the baseline period (1997–99), but has fluctuated in the intervening years.

NS-SEC "Other"

2.10   This diverse group accounts for around 9% of all infant deaths, though only 5% of live births, and is associated with particularly high death rates in infancy, 9.3 per 1,000 live births in 2002–04.

Making sense of the target locally

2.11   Tackling health inequalities in infant mortality at local level is complicated by the relatively small number of infant deaths in individual localities. Therefore, the in IMR in the R&M group and the population as a whole are very sensitive to small changes in the number of deaths.

2.12   To help investigate local progress on infant mortality and the reducing gap, the review identified the 43 local authority areas that faced the biggest challenge in reducing infant mortality in the target group. These were areas with 20 or more infant deaths in the R&M group over a three-year period, 2002–04 (Annex 3).

2.13   Local progress in the 43 areas from 2002–04 to 2003–05 illustrate that progress is far from uniform, with changes in the relative gap ranging from around 0.24 (widening gap) to -0.3 (narrowing gap)* (Figure 3).

2.14   If a 0.30 decrease** in the gap occurred across all 43 areas, this would prevent around a further 130 deaths a year, ranging from around one or two deaths per year in the smallest areas to around 5 to 15 deaths per year in larger areas.

*Though clearly this is only based on a single year of change with a large degree of overlap between the periods analysed and therefore these are unlikely to be statistically significant.

**A change in the ratio of R&M deaths to all deaths: e.g. the ratio decreasing from 1.3 to 1.0 would be a 0.3 decrease.

Figure 3. Local progress in reducing infant mortality health inequalities
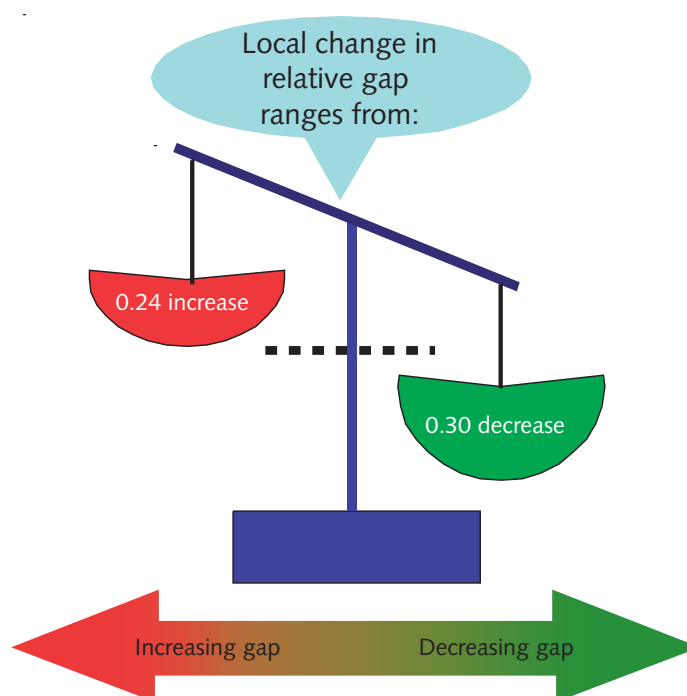
Source: ONS, Department of Health (DH) analysis

2.15   Although progress can be achieved at local level, it is important to recognise that, given the variations around small numbers, local data alone do not tell us about progress towards meeting the target. Local data need to be analysed, but in the context of the range of local activities to reduce infant mortality in the target group, e.g. reducing teenage pregnancies, smoking in pregnancy and incidence of sudden unexpected death in infancy (SUDI).

Relationship between deprivation and socio-economic group

2.16   The relationship between the deprivation score and socio-economic group was investigated to determine whether it would be possible to monitor local progress using the deprivation score as a proxy for socio-economic group.

2.17   Figure 4 illustrates the proportion of infant deaths within super output areas grouped by deprivation scores. It shows that the percentage of deaths attributable to the R&M group increases as deprivation increases.

2.18   This demonstrates the potential for using the deprivation score as a proxy to monitor local progress in infant mortality.

Figure 4. Percentage of infant deaths in each National Statistics Socieo-Economic Classification group by deprivation score of super output area birth cohorts 2001–2003
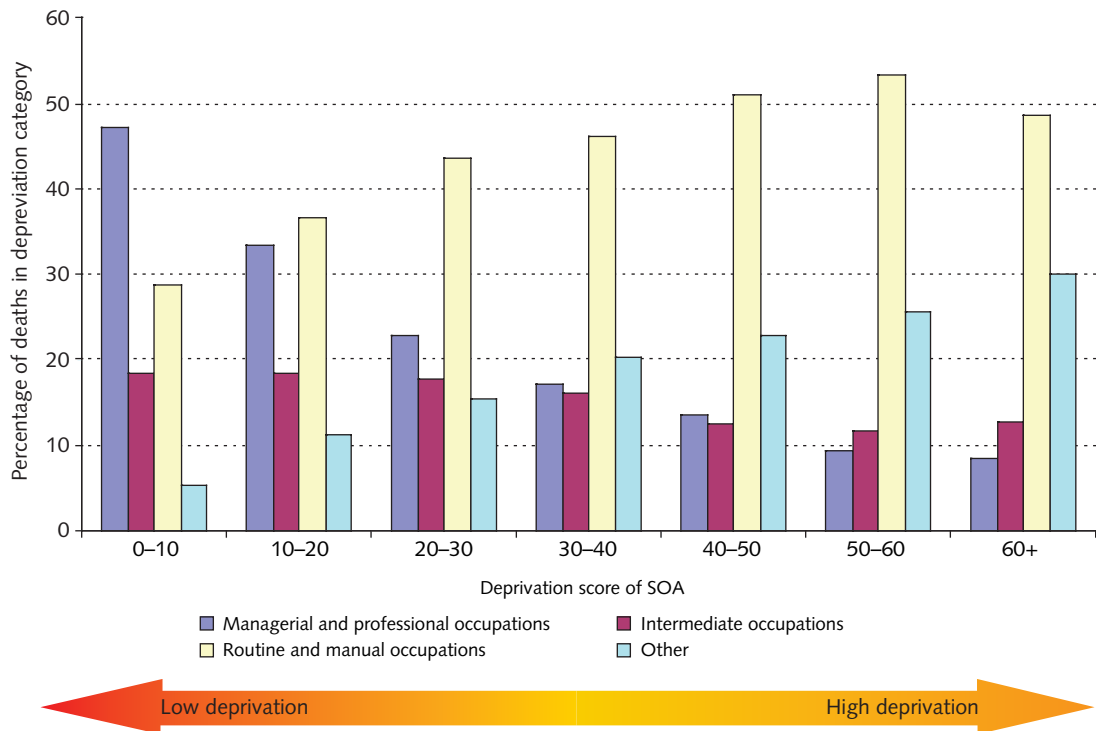
Source: ONS, London Health Observatory (LHO) analysis

Ethnic differences in infant mortality and cause of death

2.19   The following figures show the relationship between the overall IMR by selected causes of death and ethnic minority women of child-bearing age (15 to 44) in the population of the 43 local authority areas – with the highest number of infant deaths in the R&M group in 2002–04, although this is not a direct measure of these causes of death in the ethnic groups concerned.

2.20   There is a suggestion that IMRs from immaturity related conditions generally increase as the proportion of females aged 15 to 44 from black and black British ethnic groups increases.

Figure 5. Relationship between infant mortality due to immaturity-related conditions and percentage of women aged 15 to 44 of black or black British origin in the 43 local authority areas with the highest numbers of infant mortality (>20) in the R&M group from 1998–2001
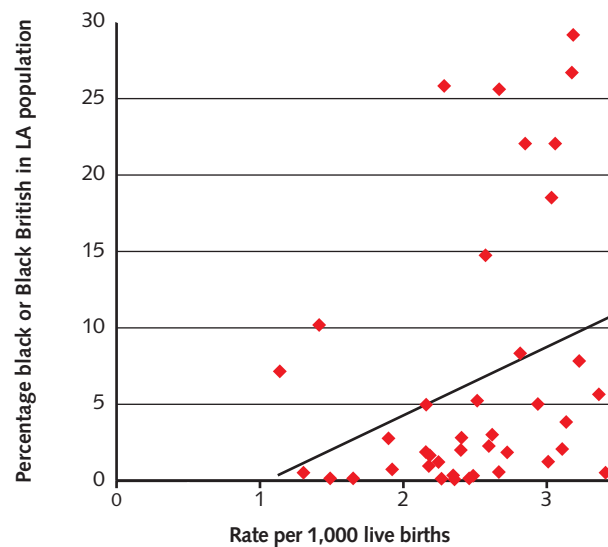
Source: ONS, DH analysis

2.21 There is an even clearer relationship between higher proportions of females aged 15 to 44 from Asian and Asian British ethnic groups and higher IMR from congenital anomalies.

Figure 6. Relationship between infant mortality due to congenital anomalies and percentage of women aged 15 to 44 of Asian or Asian British origin in the 43 LA areas with the highest numbers of infant mortality (>20) in the R&M group from 1998–2001
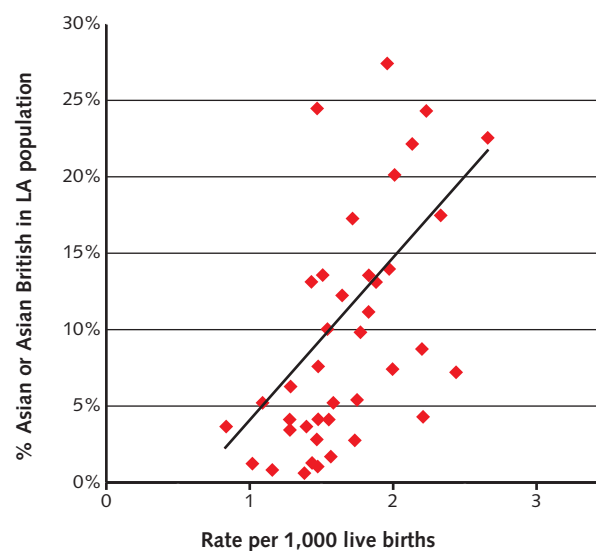
Source: ONS, DH analysis

Relationship between ethnic group and socio-economic group

2.22 Census data from 2001 showed that 7% of people in the R&M group were from black and minority ethnic groups. However, when looking at the 43 areas with highest numbers of R&M infant deaths, this proportion increases to 14%.

2.23 This suggests that reductions in infant mortality for black and minority ethnic groups could have a greater impact on the target group compared to the population as a whole.

3. Fieldwork findings

Purpose

3.1   The fieldwork provided the review team with an opportunity to look in more detail at what:

- frontline staff and organisations are doing to deliver the target;
- service users think of local services;
- experts (medical and public health professionals, management and data analysts) think of service delivery.

Methods

3.2   The review team developed semi-structured interviews to identify what:

- stakeholders understood about the infant mortality target;
- stakeholders were doing to deliver the target;
- challenges stakeholders faced in trying to deliver the target.

Different interview schedules were developed for different professional groups.

3.3   Purposive sampling was used to identify areas (local authority areas or regions) with high numbers (20 or more) infant deaths that had varied population demographics.

3.4   The team visited six local areas and three Children's Centres around the country.

3.5   A local contact was identified in each area and requested to help organise the visit. During each of the visits the team interviewed a range of local staff from within the NHS and local government to gain different perspectives. This included Chief Executives, senior staff and professionals from local authorities, Strategic Health Authorities, Primary Care Trusts (PCTs), acute trusts and general practice.

3.6   A team of up to six members of the core and steering groups attended each visit and split into two groups. Each of these groups interviewed between three and five stakeholders, a total of 10 to 12 stakeholders per visit. Each interview lasted between 45 minutes and an hour. The interviews were transcribed and analysed by a process of repeated review to identify themes that emerged. Theoretical saturation was achieved.

3.7   In order to gain a comprehensive understanding of the challenges to meet the target and delivery, the team also had meetings with:

- experts in the infant mortality field, such as the West Midlands Perinatal Institute;
- service users and families;
- met with the voluntary sector.

Delivery challenges

3.8   The key message from the fieldwork was that the infant mortality target was not known or understood despite individual examples of leadership and good practice.

3.9   The fieldwork provided clear evidence of significant delivery challenges. Five main areas were identified as barriers to effective delivery of the target. These will need to be addressed in order to ensure that the gap is narrowed and the target met.

No recognition of the target or the widening gap

- Infant mortality was recognised as an issue and health inequalities were a priority, but the infant mortality aspect of the target was not recognised and the widening of the gap in infant mortality was not recognised as a priority.

- There was a lack of knowledge about what works for the target group in terms of reducing infant mortality or improving child health.

Services were not fully delivering to the target group

- There was poor organisation of healthcare services, with areas reporting lack of effective cross-sector working between local authorities and the NHS.

- Most services were focused on other disadvantaged groups, such as the unemployed, never worked and asylum seekers.

- There was a lack of facilities for health in Children's Centres.

- The transition from Sure Start local programmes to Children's Centres raised issues of levels of service.

- Lack of interpreters was a barrier for some ethnic minority women accessing services and caused difficulties for professionals delivering the service.

Lack of leadership and systems to support delivery

- There was a lack of leadership on health inequalities and the target was not a PCT priority.

- There was a lack of performance management indicators for monitoring the target.

- There was no accountability for the target in many areas.

Lack of knowledge and understanding of the target

- Many stakeholders were unaware of the target and did not understand who constituted the R&M group.

- The target was not seen as a priority.

Poor handling and use of data and gaps in the evidence base

- Data collection systems were unsophisticated and paper-based.

- Many areas lacked robust data collection, IT infrastructure to support data collection and timely data linkage and analysis.

- There is a lack of robust evidence of interventions to reduce infant deaths in the R&M target group.

Messages from the fieldwork

The public said…

The professionals said…

The target has nothing to do with this PCT

The hospital was packed and the staff run off their feet, everything took forever and we never knew why

We are in a time-warp here. Some of our services are stuck in the 60s, others in the 70s

It would be great if I could see the same midwife all the time

There has been no conversation on infant mortality

As a young couple we found the antenatal classes great

The target is a low priority, partly because of a lack of meaningful data

The only nutritional advice I had [during pregnancy] was that I should not eat under-cooked eggs

We need seamless services – maternity, neonates, paediatrics and primary care could work better

I lost contact with the services moving between addresses and had to email the head of midwifery to get some advice

Lessons for delivery of the infant mortality target

3.10   The fieldwork provided clear evidence that services could be designed to help meet the target and reduce health inequalities in infant mortality. Five high impact actions were identified.

Knowing the target, knowing your gap

- Infant mortality was a priority for some areas; the Bradford Infant Mortality Commission has done significant work and launched a research project, "Born in Bradford" in December 2006 to address local gaps in the evidence base.[3]

Make the target part of everyday business – integrate into commissioning plans and provider contracts

- Infant mortality was recognised as an issue in some areas. There was a joint NHS/local authority programme to tackle worsening perinatal and infant mortality rates in most disadvantaged areas.

- Health was included and key professionals were fully engaged at the start of the development of a Children's Centre.

Taking responsibility and engaging communities

- There was joint leadership of health inequalities shared between NHS and local government in some areas, including joint working in health and education.

- Links with other initiatives (Children's Centres, extended schools) offered professionals opportunities for engagement with the target group.

Matching resources to need

- There was a focus on reducing infant mortality through service redesign, Sure Start Children's Centres, community educators and targeted work to prevent teenage pregnancies, using school nurses and other professionals working with teenage mothers.

- There were plans to develop improvements in data sharing between health and the local council to respond to these needs.

Focusing on what can be done

- There was a focus on delivering community services and targeting deprived families to provide family support.

- There was a focus on helping families to access services and joined-up working.

Facing up to the challenges

3.11   The review found examples of good practice in the fieldwork and in other areas. A clear lesson for the review was the importance of effective and sustainable good practice which could be translated and used by other areas as a way of encouraging action to help narrow the infant mortality gap.

3.12   Good practice examples drawn from across the country in response to the challenges identified by the review include:

ACTING TO HELP MEET THE TARGET

Addressing SUDI

Pendle has a high number of deprived wards and some of the highest numbers of SUDI in the country – up to six times more deaths than should be expected for the number of births 2000–2002. A multi-agency approach was used to try to achieve a sustainable reduction in these infant deaths.

The Lancashire Constabulary, the Foundation for the Study of Infant Deaths (FSID) and other partners agreed a joint strategy and mounted local public awareness days, information days, and a Christmas campaign. They took the message to street markets and other areas where target families were likely to visit. They produced carrier bags with infant safety messages printed on them, distributed bibs and tea towels with the message, and provided beer mats with the message to pubs.

Infant deaths from SUDI fell in Pendle from ten in 2001–02 to one in 2005–06, while deaths in the neighbouring areas remained the same or increased.

Contact: Mikala Dawson, FSID Regional Development Officer, 01663 747 107

Introducing smoke-free homes

West Yorkshire Smoking and Health, a tobacco control alliance covering the county, launched a campaign to raise awareness of the dangers of breathing tobacco smoke and helping families living in deprived areas to make their homes as smoke-free as possible without endangering valued relationships. The alliance worked with health professionals and the public to promote smoke-free homes through a promise scheme with three options:

- Gold promise: smoke-free home;

- Silver promise: smoking limited to one room in the house and never in the presence of children;

- Bronze promise: never smoke in the presence of children.

To date, almost all (85%) of the applicants (3,000) opted for the Gold promise and the scheme is extremely popular with a wide variety of health professionals as it provides a friendly non-judgemental way of bringing up the topic of smoking.

It is now being rolled out across the entire region as a result of its success. Yorkshire and Humber have also published a document (*Reducing Smoking Preconception, During Pregnancy and Postpartum, December 2006*) which highlights eight high impact actions to reduce smoking during pregnancy.

Contact: Joy Lane, Smokefree Home Development Worker, 07989 959 036 or joy.lane@nhs.net

REACHING OUT TO THE TARGET GROUP

Promoting health in community cafes

Community cafés were set up in Southwark to reach disadvantaged populations and communities with a high black and minority ethnic population. The cafés are run by a combination of health visitors, other community health professionals and trained peer counsellors.

Based in community centres, these cafes encourage breastfeeding, offer practical health guidance and family support for pregnant women and new mothers. All the cafés have a resource library and a wide range of free leaflets.

The evaluation was overwhelmingly positive, with women feeling that they had benefited from coming to the cafés and many wishing they had known about them earlier.

Due to its success in engaging and supporting women, more cafés were set up including two in Sure Start Children's Centres.

Contact: Clarissa Georgestone, 020 7138 7815 or clarissa.georgestone@southwarkpct.nhs.uk

Texting teenagers at risk

As part of Nottinghamshire's teenage pregnancy strategy, SEXions provides a text messaging service for young people (aged 13 to 19) to access sexual health information, advice and signposting to services and arranging appointments with a SEXions personal adviser.

This work is supported by a targeted leaflet on breastfeeding, with others to follow on miscarriage, abortion and difficult feelings after having a baby. SEXions also offers access to free condoms as part of the Nottinghamshire C Card scheme.

Contact: Sarah Oakley, SEXions Manager, Nottinghamshire County teaching PCT, 01623 727476 or sarah.oakey@cnxnotts.co.uk

SYSTEMS TO HELP DELIVER THE TARGET

Shifting to a whole city approach

Birmingham has the highest number of infant deaths and the second highest IMR in the country (2002–04). The city's Health and Well Being partnership, run by the council and the three PCTs, has identified at-risk groups and recognised that mainstream community midwifery services needed to be improved and modernised to reduce the number of infant deaths and reach these at-risk groups. This required working with disadvantaged communities to:

- promote more effective planning, co-ordination and commissioning of community services;
- target the areas and groups with the highest infant mortality rates;
- work with key partners to improve children's health;
- redesign services, making them more attractive to vulnerable users – for early booking and regular access.

Backed by a city wide Floor Target Action Plan for reducing infant mortality in the wards with the highest rates, this work is supported by an enhanced data set – early booking, detection of foetal growth restriction, continuity of carer, smoking during pregnancy and breastfeeding initiation.

This whole city approach has a number of distinctive features including:

- relocating maternity services within Children's Centres – four are already in operation;
- promoting early booking through the introduction of call centre active patient management;
- developing more effective services for tackling smoking in pregnancy.

Contact: Annette Williamson, Children's Strategy and Planning Manager, 0121 687 4664 or Annette.Williamson@HoBtPCT.nhs.uk

RECOGNISING THE NEED TO FOCUS ON THE ISSUE

Leading at local level

In response to high and persistent levels of infant mortality, Bradford Vision (the local strategic partnership) set up an Infant Mortality Commission. For two years, the Commission carried out a wide-ranging review with detailed analysis of local data and investigated the reason for such high rates. It held a series of meetings at which it received evidence from experts in relevant fields. Some of these were open to the media and the public.

The Commission reported on 6 December 2006. The report reaffirmed the link between poverty, deprivation and infant mortality. It identified 10 priority areas for action to improve infant health and survival including action to:

- improve housing and the social environment of Bradford District's residents;
- ensure access to appropriate healthcare;
- reduce the number of women who smoke or have high levels of use of alcohol and/or non-prescribed drugs in pregnancy.

For more details of the work of the Commission and its report, including the technical recommendations, visit www.bdimc.bradford.nhs.uk

USING LOCAL DATA TO HELP DELIVER OUR SERVICES

Matching needs and resources

Using local data, Milton Keynes health visitors allocate resources according to need. They use a caseload and health inequalities audit tool to carry out a health needs assessment that enables them to allocate resources more equitably. This includes providing resources for face-to-face contact with any family with children under five years old moving into the area.

Managers can see how far these needs are being met through group sessions and how much intensive family work is required. The information is used to inform the development of the city's Children's Centre's strategy and related programmes. The data generated by the exercise also inform local public health work, such as on disability, breastfeeding and smoking.

The tool will be updated to take account of ethnicity.

Contact: Christine Thompson, Professional Lead, Health Visiting and School Nursing (Children's Lead), 01908 230525 or christine.thompson@mkpct.nhs.uk

Backing targets with data

The Birmingham & the Black Country Strategic Health Authority (now NHS West Midlands) and its PCTs sponsored a project aimed at reducing perinatal mortality. Part of this work has now been picked up by the Birmingham city wide Floor Target Action Plan.

A distinctive part of the project was the use of data to frame and monitor targets. A number of targets were set including early booking, continuity of carer and detection of foetal growth restriction. This was supported by the collection of data to measure and monitor these key process indicators.

New systems were set up to collect the data and this involved considerable time and effort. It provided, however, a sound basis for informing service delivery in reducing perinatal mortality.

Contact: Toni Martin, Project Lead, Reducing Perinatal Mortality project, NHS West Midlands, 07970 501 672 or Toni.Martin@westmidlands.nhs.uk

3.13   *Reaching Out: An Action Plan on Social Exclusion* is a national programme that is supporting good practice in this area through the Department of Health/Department for Education and Skills health-led parenting programme for at-risk families. It will promote and test a programme of intensive home visiting delivered by midwives and health visitors and a list of projects will be announced shortly. Further examples of good practice can be found in Annex 5.

4. Strengthening delivery

Estimates of number of lives saved if the target is met

4.1   There were 9,132 infant deaths in England in the period 2002–04, 40% (3,631) of these were in the R&M group.

4.2   A reduction of around 800–900 deaths in the period 2009–11 compared to 2002–04 might reduce infant mortality sufficiently in the R&M group to achieve the target. This is based on estimated projections of overall IMRs in 2009–11 of around 4.0 deaths per 1,000 live births, indicating a rate of around 4.5 deaths per 1,000 live births in the R&M group in 2009–11, to narrow the gap sufficiently (Figure 7).

4.3   There were 1,565 infant deaths in the period 2002–04 in the R&M group in the 43 local authority areas where there were 20 or more infant deaths. In theory, a reduction of 50% of deaths in the R&M group in these areas would achieve the target. In general terms, though, steady cumulative improvements of about 50 fewer deaths each year, year-on-year (50 in year 1, 100 in year 2, etc.) until 2011 would be required to achieve the target on this basis.

Figure 7. Infant mortality in routine and manual group and all deaths, to achieve 2010 target, 3-year totals, 2002–04 (current) to 2009–11 (projected)

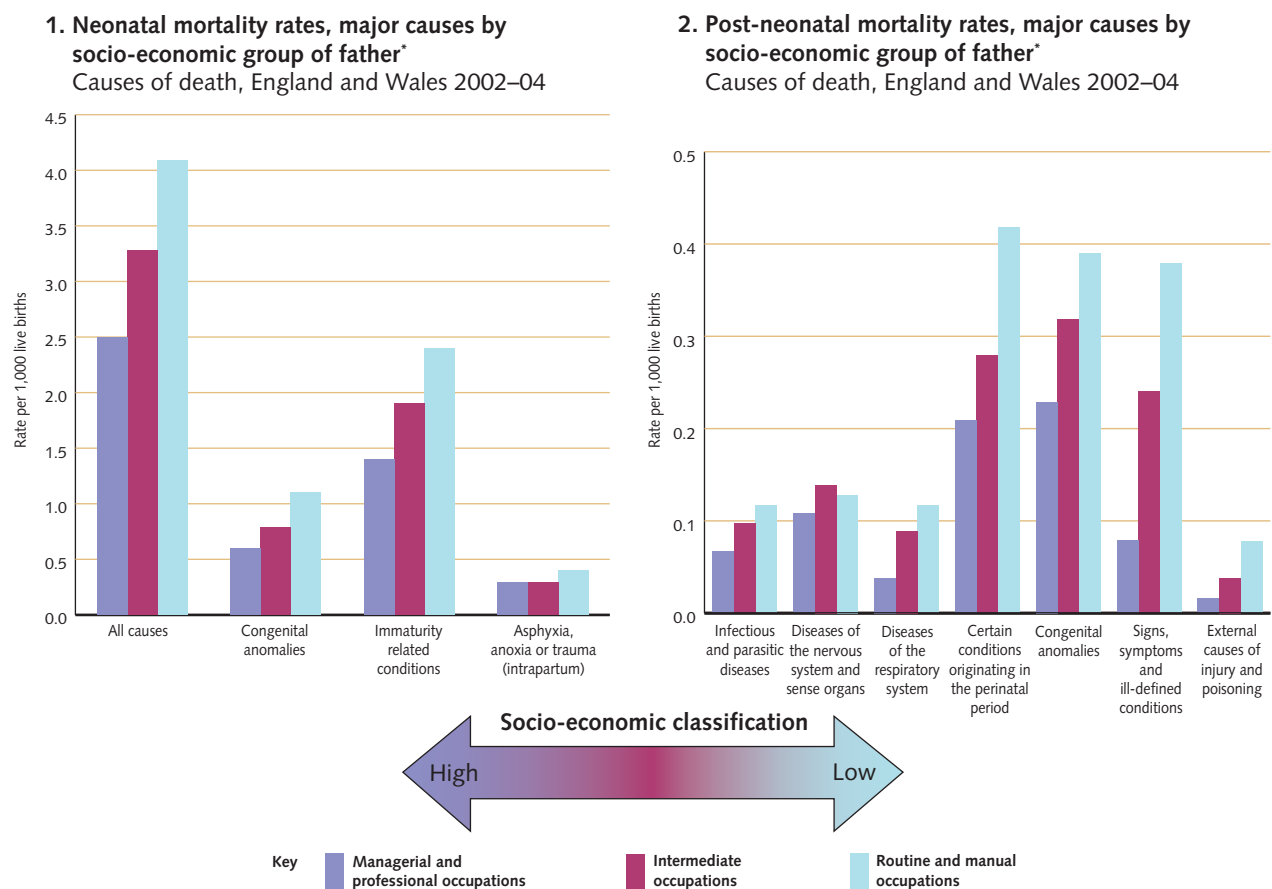|	2002–04	2003–05	2004–06	2005–07	2006–08	2007–09	2008–10	2009–11
Infant deaths – all	9,132	8,836	8,541	8,245	7,949	7,653	7,358	7,062
Infant deaths – R&M	3,631	3,581	3,481	3,331	3,181	3,030	2,880	2,730
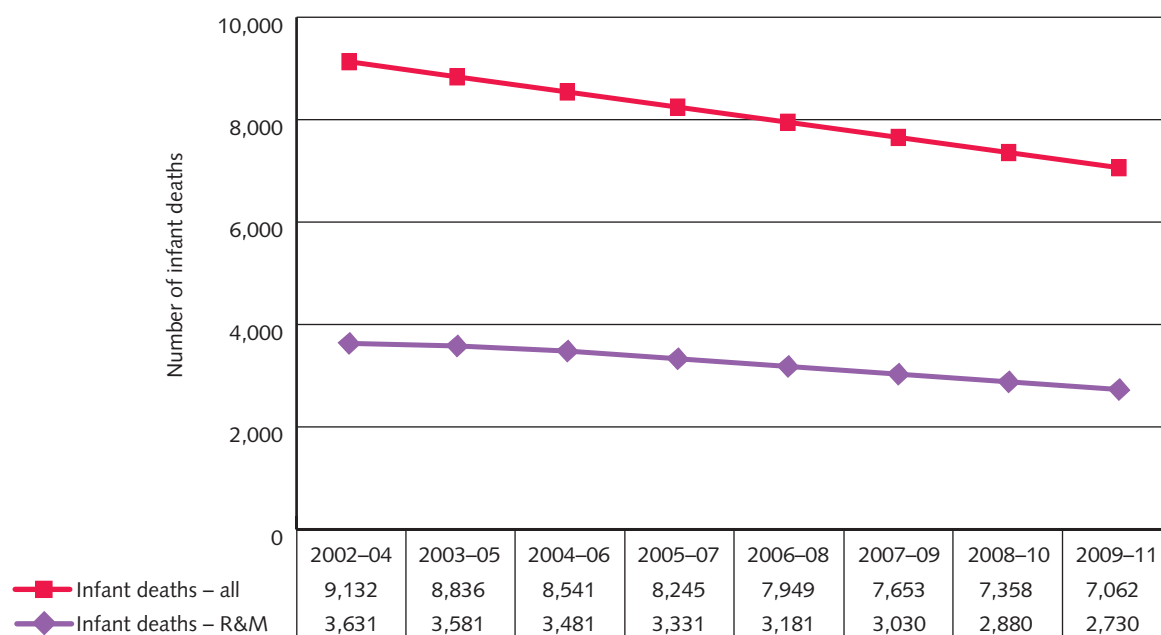
Source: ONS, DH analysis

What are the causes of infant mortality?

4.4   Three-quarters of neonatal deaths are due to immaturity related conditions and congenital anomalies (Figure 8).

4.5   Over two-fifths of all post-neonatal deaths (44%) are due to "Signs, symptoms and ill defined conditions" (predominantly SUDI) and congenital anomalies (Figure 8).

4.6   All causes of neonatal mortality show a socio-economic gradient and all except one cause of post neonatal deaths (diseases of the nervous system and sense organs) show a socio-economic gradient.

Figure 8. Major causes of infant (neonatal and postnatal) mortality by socio-economic group of the father

1. Neonatal mortality rates, major causes by socio-economic group of father*
Causes of death, England and Wales 2002–04

2. Post-neonatal mortality rates, major causes by socio-economic group of father*
Causes of death, England and Wales 2002–04

Socio-economic classification
High — Low

Key
Managerial and professional occupations
Intermediate occupations
Routine and manual occupations

* Socio-economic classification of father (inside marriage and joint registration)

Source: ONS

Actions that could prevent infant mortality in the routine and manual socio-economic group

4.7   Literature reviews were performed and expert opinions were sought to:

- identify what actions could prevent infant deaths, particularly in the R&M group;
- quantify the impact of these actions on the infant mortality gap.

4.8   A workshop was held in June 2006, attended by data analysts, policy leads, experts in the field and clinicians, to consider what actions could prevent infant mortality, particularly in the R&M group (Annex 6). The group agreed to initially assess the three main causes of infant deaths – immaturity related conditions, congenital anomalies and SUDI and national priorities, e.g. reducing teenage

pregnancies and improving maternal nutrition, due to time constraints. Further work is planned to address the other causes of infant mortality.

4.9   Modelling illustrated the impact on the gap of the effects of reasonably feasible changes in a risk factor, the achievement of other targets or the effect of specific interventions, such as a screening programme. Methodology is described in paragraph 4.47.

4.10   In summary, the literature reviews concluded that the evidence base for many interventions to reduce infant deaths, particularly those that will reduce deaths in the R&M group is weak. Nevertheless, interventions to reduce infant mortality can be divided into three groups. Those that:

- will have a demonstrable impact on the gap, e.g. reducing smoking;

- are likely to have an impact on the gap even without all the evidence, e.g. early booking and effective use of high quality healthcare;

- are likely to improve IMRs overall e.g. introduction of Medium Chain Acyl-CoA Dehydrogenase Deficiency (MCADD) screening, prevention of maternal and infant infections, e.g. introduction of pneumococcal vaccine and ensuring appropriate health service configuration through networks of care for maternity and neonatal services.

4.11   The current evidence is summarised in more detail in the following sections.

Actions that could prevent infant mortality for the three main causes of infant deaths

Immaturity related conditions

4.12   Preterm birth (babies born less than 37 weeks gestation) is a significant cause of infant mortality and short- and long-term morbidity. The subsequent impact of the ill health of babies who are born prematurely on families, hospital services and society may be great.

- The Epicure study found that 46% of extremely premature babies (less than 26 weeks gestation) have moderate or severe disabilities at six years.[4]

- The total duration and number of hospital admissions for infants born <28 weeks and 28 to 31 weeks gestation is 85 and 16 times that for term infants.[5]

- Health, social and broader resource use is 2.5 times higher for extremely premature babies.[5]

4.13   Prevention of deaths from immaturity related conditions focuses on preventing preterm births and ensuring that babies who are born prematurely receive high quality healthcare through networks of care for maternity and neonatal services.

4.14   Four major pathophysiological pathways have been described that may lead to the outcome of preterm birth: maternal/foetal infection; maternal/foetal stress; placental abruption; mechanical stretch.[6] Risk reduction strategies include eliminating environmental factors (e.g. smoking) and stressors, treating underlying medical disorders, optimising preconceptual and prenatal maternal and mental health and reducing teenage pregnancies as well as targeted support for teenage parents.[6]

4.15   If a baby is born prematurely, there are a number of effective actions to prevent deaths from immaturity related conditions. These include providing high-quality healthcare, ensuring appropriate health service configuration and increasing breastfeeding uptake.

4.16   Babies who are born prematurely are more likely to die in infancy than those who are born at term. Research has identified many risk factors for spontaneous preterm birth, and that preterm babies who receive high-quality healthcare are less likely to die.[6,7] However, accurate prediction and prevention of preterm births remains elusive[6] and there is no evidence to suggest that the quality of care babies receive is socially patterned. It is not possible to quantify the impact of actions to prevent deaths from immaturity related conditions on the gap.

Congenital anomalies and conditions

4.17   Congenital anomalies and conditions are an important cause of infant mortality and childhood morbidity. They are conditions or malformations present before or at the time of birth and include structural malformations, genetic and chromosomal defects, congenital infections and inborn errors of metabolism. Most congenital anomalies are detected antenatally or in the neonatal period.

4.18   Children with congenital anomalies have a significant impact on their family, the healthcare system and society:

- ten per cent of all disabilities are due to congenital anomalies;[8]

- it costs at least three times more to bring up a child with a disability than a child without a disability;[9]

- children with disabilities may have a reduced life expectancy.

4.19   Antenatal and neonatal screening allow for the detection of some congenital anomalies.

Antenatal screening

4.20   There are a number of antenatal screening tests. Biochemical and/or ultrasound screening for Down's syndrome takes place between 10 and 20 weeks gestation. Infectious disease screening normally takes place at the booking appointment. Screening for the presence of structural abnormalities takes place between 18 and 20 weeks gestation.

4.21   Substantial social and cultural inequalities exist in knowledge about antenatal screening. There are ethnic inequalities in access to prenatal testing,[10] and more research is needed to establish whether there are social inequalities.

4.22   Early booking by 10–12 weeks gestation allows for antenatal diagnosis and planned management. Ensuring that women in the R&M group and black and ethnic minority groups book early and are able to access antenatal screening tests may help reduce infant mortality health inequalities.

Neonatal screening

4.23   Newborn physical examination at birth and at six weeks and newborn bloodspot screening may prevent infant deaths by detecting life-threatening congenital anomalies (e.g. congenital heart disease and MCADD deficiency) before symptoms develop.

4.24   Early detection of cardiac anomalies through newborn screening can potentially improve outcomes, although the current programme performs poorly.[11] Screening for sickle cell disease is likely to prevent 15 infant deaths per year,[12] while screening for MCADD is estimated to prevent about 7–8 deaths in children under three-years-old, acute serious illness would be prevented in another 15–22 cases and serious life-long neurological disability would be avoided in a few children.

4.25   Some congenital anomalies are more likely to occur in some populations, e.g. sickle cell disease is more common in black, Asian and Mediterranean populations. However, there is no current evidence to suggest that uptake of neonatal screening programmes is likely to be socially patterned. In these circumstances, newborn screening is unlikely to contribute very much to reducing inequalities in infant mortality, although it will prevent infant deaths. There will be an opportunity to review developments on the impact of screening on these groups as the new ONS data on ethnicity comes on stream.

Sudden unexpected death in infancy

4.26   SUDI are a significant cause of infant mortality, normally occuring within eight months of life. The risk is higher for males, preterm and low birth weight babies and those sleeping in non-supine (on their front or side) positions.[13] SUDI occurs in all socio-economic groups but is more common in disadvantaged populations.[13,14]

4.27   There are a number of effective actions to prevent SUDI:

- ensuring infants sleep in the supine position "Back to Sleep";

- ensuring infants sleep in a separate cot especially if parents smoke, have been drinking alcohol or have taken drugs;

- ensuring infants sleep in the same room as their parents;

- reducing parental smoking.

4.28   SUDI have fallen in recent years, but the evidence suggests that although these messages have been taken up by those in higher socio-economic groups, they have not been taken up by the R&M group.[13]

4.29   Modelling suggests that a 1.4% reduction of the gap (of the 10%) required could be achieved if 1 in 10 R&M mothers currently sharing a bed with their baby or putting it down to sleep prone could be persuaded to avoid doing so.

Other actions that were considered

Reducing smoking in pregnancy

4.30   Smoking in pregnancy is a cause of ill health for the mother and baby. Babies of mothers who smoked during pregnancy:

- are more likely to be born prematurely;

- twice as likely to have a low birth weight;

- up to three time as likely to die from SUDI.[6]

4.31   Smoking in pregnancy increases infant mortality by about 40%.[15] Smoking in pregnancy is much higher in the R&M group; in 2000, women in the R&M group were 1.5 times more likely to smoke during pregnancy than the population as a whole. Among mothers under 20, 45% smoke through their pregnancy – nearly three times higher than smoking rates for all mothers when they are pregnant.

4.32   Modelling suggests that meeting the national target to reduce smoking in pregnancy – "to reduce the percentage of women who smoke during pregnancy from 23% to 15% by the year 2010" – in the R&M group would reduce the gap by 2%.

Reducing teenage pregnancies

4.33   Tackling teenage pregnancy is central to the Government's work to prevent health inequalities, child poverty and social exclusion.[16] In 2005, there were 21,000 births conceived under the age of 18 in England. Young women from the poorest backgrounds are 10 times more likely to become teenage mothers than young women from professional backgrounds. Around 7% of babies born in England are to a mother under 20. These children are at high risk of growing up in poverty and experiencing poor health and social outcomes. IMRs for babies born to mothers under the age of 20 are around 60% higher than for babies born to mothers aged 20 to 39 (7.6 per 1,000 live births compared to 4.7 per 1,000 live births for 2002–04), with excess mortality of 125 infant deaths per year.

4.34   The Teenage Pregnancy Strategy has targets to:

Reduce by 50% the 1998 England under 18 conception rate by 2010, with an interim target of a 15% reduction by 2004.

Achieve a firmly established downward trend in the under 16 conception rate by 2010.

and targets to improve outcomes for teenage parents and their children:

Increase to 60% the proportion of mothers aged 16–19 in education, employment and training.

Ensure that all lone teenage parents under 18, not able to live with their parents or partners, are in supported housing and not in independent tenancies without support.

4.35   There are particular risks to the babies of lone teenage mothers in poor living conditions, such as poor quality bed and breakfast or temporary accommodation or staying with friends or relatives where the mother may be sleeping with the baby in the same bed or on a sofa, which increase the risk of SUDI.

4.36   Modelling suggests that achieving the teenage pregnancy target would make a 1% contribution to reducing the gap.

Improving maternal nutrition

4.37 Optimising maternal nutrition preconceptually is important for maternal and infant health.

4.38 Body mass index (BMI) is a tool for classifying whether a person is a healthy weight for their height. It is calculated by dividing weight in kilograms by height in metres squared (BMI=weight (kg)/height (m)^2). Normal BMI ranges between 18.5 and 24.9.

4.39 Neonatal deaths are more common in women who are underweight, overweight or obese before they conceive.[17,18]

4.40 Obesity is one of the major public health issues in England.[19] Health inequalities in obesity exist; the occurrence of obesity is socially and ethnically patterned. The highest rates of obesity are in the lower socio-economic groups and in black African or black Caribbean ethnic groups (Annex 4).

4.41 A number of interventions (e.g. diet and drug therapy or exercise) are clinically effective in reducing obesity.[20,21] The DH is currently developing a National Support Team to help disseminate best practice across Spearhead areas and to provide intensive support to those areas that need it.

4.42 There is not yet a national target to reduce the percentage of adult obesity. However, if the prevalence of obesity in women in the R&M group were to fall by 23% to the current levels of obesity in the population as a whole, this would be a 2.8% contribution to the target of 10%. This establishes the importance of actions to reduce obesity in women in the R&M group.

Improving immunisation uptake

4.43 Immunisation protects children against diseases that can kill or cause serious long-term ill health. Babies routinely receive vaccines to prevent seven illnesses in their first year of life. These are:

- diphtheria
- tetanus
- pertussis (whooping cough)
- poliomyelitis
- Haemophilus influenzae type B
- type C meningococcal disease
- pneumocococcal disease

4.44 Inequalities in immunisation uptake are persistent and result in lower coverage for poorer families.[22]

4.45 The pneumococcal vaccine was introduced in August 2006 and may have the potential to prevent eight infant deaths per year.[23] It is not possible to quantify the impact of reducing health inequalities on the gap in this and other vaccine preventable diseases. However, PCTs need to examine immunisation uptake rates to develop local plans for prioritising actions to improve immunisation uptake for those most in need.[22]

Identifiable actions to reduce the gap in infant mortality by at least 10%

4.46   Modelling illustrated the impact on the gap of the effects of reasonably feasible changes in a risk factor, the achievement of other targets or the effect of specific interventions, such as a screening programme.

4.47   The interventions were assessed on their impact on the gap in 2004. The estimates of impact on the target rely on comparative statistics with the assumption of other things being equal. Because of the nature of the target, an intervention that reduces infant mortality by the same proportion across all socio-economic groups will not contribute to the target. It will have to achieve a greater percentage reduction in the R&M group. This requirement argues for targeting the R&M group or focusing on the selection of interventions likely to have greater effects in the R&M group, perhaps because the R&M group has higher prevalence. Detailed methodology is being prepared for publication.

4.48   Figure 9 illustrates a set of interventions, that could make a significant contribution towards narrowing the infant mortality gap by at least 10%. However, given that the gap has widened since the baseline, this does not necessarily provide the whole solution to achieving the target.

4.49   It was possible to quantify the impact of only four interventions on reducing the gap: reducing teenage pregnancy and targeted interventions to reduce SUDI, smoking and obesity in the R&M group. These accounted for 7% of the gap.

4.50   It was not possible to quantify the impact of other interventions on reducing the gap, e.g. early booking. Nevertheless, ensuring that these interventions are delivered to the R&M group may help reduce the gap in infant mortality and help meet the target.
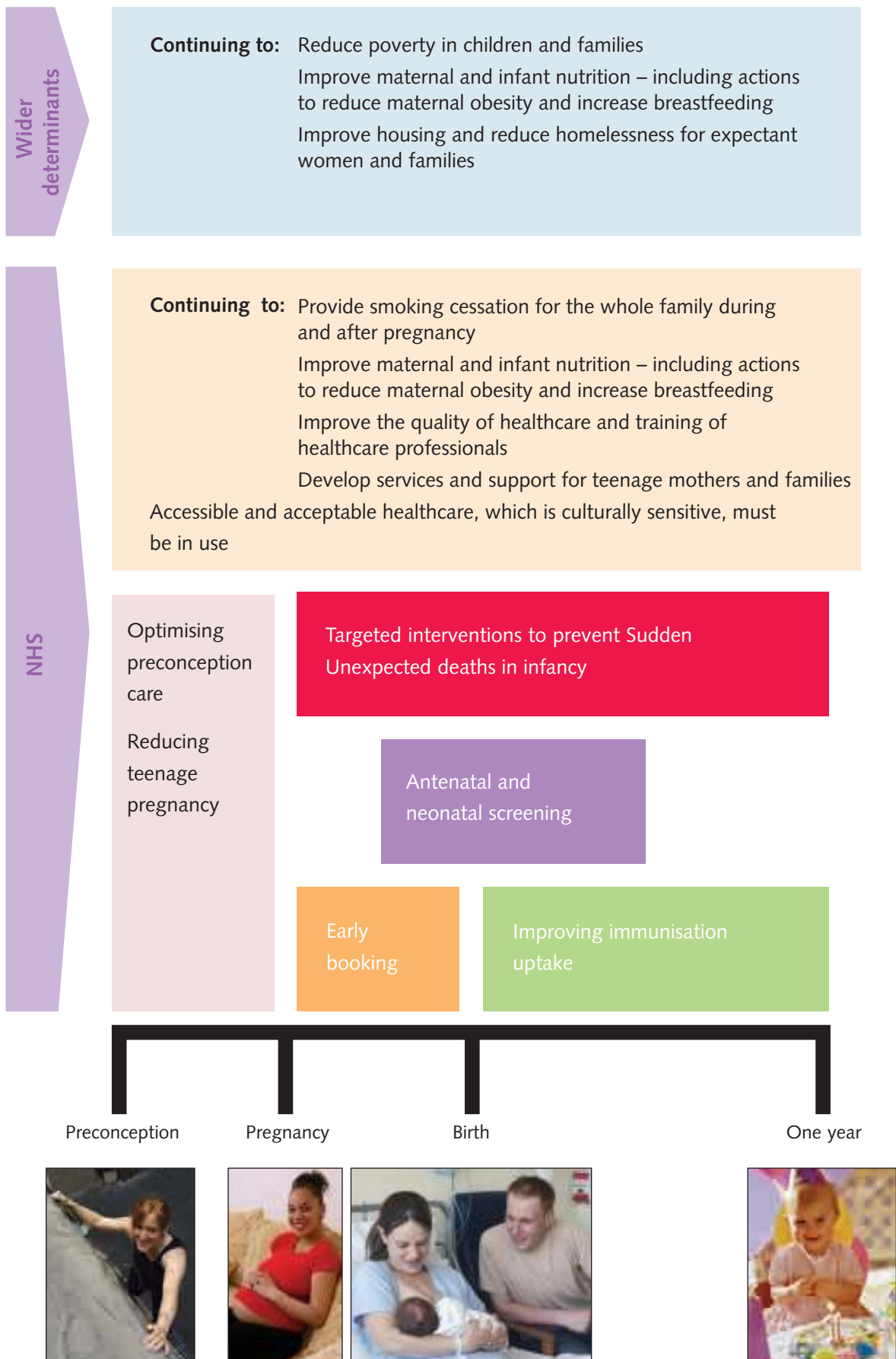
Figure 9. Identifiable actions to reduce the gap in infant mortality by at least 10%

| WHAT WOULD WORK | IMPACT ON 2002–04 GAP | ACTIONS/INTERVENTIONS |

Reducing pregnancies in <18 years in R&M group by 44% to meet the 2010 target

1.0%

Targeted prevention work with at-risk teenagers and targeted support for pregnant teenagers and teenage parents

Targeted interventions to prevent SUDI by 10% in the R&M group

1.4%

Maintain current information given to mothers and target the Back to Sleep campaign and key messages for the target group

Reducing smoking in pregnancy rate by 2 percentage points by 2010

2.0%

Smoking cessation as an integral part of service delivery for the whole family during and after pregnancy

Reducing the prevalence of obesity in the R&M group to 23%

2.8%

Targeted weight loss programmes:
– low-calorie diet, physical activity and behaviour therapy
– drug therapy
– surgical procedures

Provide comprehensive preconception services

Provide advice/support for at-risk groups within the target, e.g. black and minority ethnic groups

Increase direct access to community midwives

Provide 24/7 maternity direct line for advice and access

Other – may include:
Immediate actions
Optimising preconception care
Early booking
Access to culturally sensitive healthcare
Reducing maternal and infant infections

Long-term actions
Continuing to:
• improve infant nutrition
• reduce poverty
• improve housing/reduce homelessness

2.8% +

Implement National Institute for Health and Clinical Excellence antenatal and postnatal guidelines

Health equity audit of women booked by 12 weeks and >22 weeks

Commissioners and maternity service providers agree improvement plans in contract

Improve uptake of immunisation in deprived population

Implement Baby Friendly standard

This illustrates a set of interventions, that could make a significant contribution towards narrowing the infant mortality gap by 10%.

There is a need to commission research to improve the evidence base on modelling interventions and outcomes and good practice.

Timing of actions to prevent infant mortality

Wider determinants

Continuing to: Reduce poverty in children and families

Improve maternal and infant nutrition – including actions to reduce maternal obesity and increase breastfeeding

Improve housing and reduce homelessness for expectant women and families

NHS

Continuing to: Provide smoking cessation for the whole family during and after pregnancy

Improve maternal and infant nutrition – including actions to reduce maternal obesity and increase breastfeeding

Improve the quality of healthcare and training of healthcare professionals

Develop services and support for teenage mothers and families

Accessible and acceptable healthcare, which is culturally sensitive, must be in use

Optimising preconception care

Reducing teenage pregnancy

Targeted interventions to prevent Sudden Unexpected deaths in infancy

Antenatal and neonatal screening

Early booking

Improving immunisation uptake

Preconception   Pregnancy   Birth   One year

Future modelling

4.51   Modelling is planned to quantify the impact of the following areas on the gap in the first instance:

- improving housing conditions in disadvantaged populations;

- meeting the 2010 child poverty target;

- reducing infant deaths from non vaccine preventable infections;

- reducing infant deaths from accidents and violence.

5. Recommendations and conclusions

5.1   The review team developed five recommendations that, if implemented rapidly, could help the target to be delivered. The recommendations address the delivery challenges identified in the fieldwork.

Develop and promote action that will help deliver the target

- Refine modelling and further analysis of why the gap has widened in the R&M group to identify additional potential interventions

- Promote examples of good practice that can be disseminated through national and local networks

- Match interventions to the needs of different groups, assessing risk factors and shaping responses to take account of ethnicity, health behaviours and age

- Engage key professionals in the 43 local authority areas and 70 Spearhead local authorities

Promote joined-up delivery of services to the target group, with the soon-to-be published guidance for implementing the Government maternity commitments

- Promote partnership working

- Promote seamless delivery of services

- Strengthen service delivery and family support for pregnant women and new mothers, including the use of interpreters for black and minority ethnic groups

- Reflect the target in the joint commissioning of services by the NHS and local authorities, e.g. by developing maternity services in Children's Centres to improve their accessibility

- Develop a strategy of tailored interventions with other government departments, Royal Colleges, Strategic Health Authorities, local community leaders and voluntary organisations

Encourage ownership of the target through effective performance management

- Promote action in local and Spearhead strategies

- Develop appropriate performance measures, aligning these measures for the NHS and local authorities

- Build the target into local health systems

- Develop good practice guidance in reporting and monitoring progress

Sharpen and raise awareness of the target

- Develop a communications strategy to clarify the target

- Use existing networks to spread key messages

- Promote best practice in training for healthcare professionals to ensure the workforce has the right skills and competencies needed to tackle infant mortality health inequalities

Improve data quality and strengthen the evidence base

- Ensure that Connecting for Health delivers the electronic maternity and child data set at a local level

- Increase the availability of key data sets

- Present crude IMR and IMR standardised for gestation (< 22 weeks and 22+ weeks)

- Commission research to improve the evidence base

Understanding key actions for successful delivery of the infant mortality target

5.2 The review has identified five recommendations that offer the best prospect for meeting the target. Successful narrowing of the gap between the R&M group and the rest of the population by 2010 will, however, require urgent and concerted action from all interested groups. The Health Inequalities Unit at the DH has a key role in promoting and overseeing action.

5.3 Effective implementation of recommendations in this review will depend on the following.

Engaging key players around this agenda

- Clarifying and raising the profile of the target is a crucial first step in engaging the support of key players to work towards meeting the target. This will involve different groups from within the NHS, local government and other organisations working across traditional boundaries.

Developing and maintaining momentum

- Taking an area-based approach will help to concentrate action first in the areas with the highest number of infant deaths in the R&M group and build momentum for action in other areas.

Focusing on delivery

- Identifying and promoting the key interventions that are most likely to contribute to meeting the target and to contribute long-term to improved maternal and child health and to a sustainable reduction in health inequalities.

Sharing progress

- Keeping in touch with key players and keeping track of what is happening both with the data and on the ground by sharing examples of good practice in organising systems to focus on the target and working with the target group.

5.4 Each tier of the delivery chain will need to fully understand its role.

Department of Health

- Lead for promoting awareness and knowledge about the target; identifying and encouraging the 43 key local authority areas, including working with the Spearhead group (Health Inequalities Unit with maternal and child health team); co-ordinating good practice in systems and with the target group, and disseminating available data (with other DH and ONS colleagues).

Strategic Health Authorities

- Lead for promoting importance of target in their area as lead NHS body through Regional Directors of Public Health, Children's Leads and local supervising authority midwifery officers; oversight of Public Service Agreement (PSA) targets, including performance against infant mortality PSA target and providing Primary Care Trust and other data comparisons; and tracking the impact of infant mortality on the life expectancy PSA target.

Primary Care Trusts

- Lead responsibility for delivering target and working with local authorities and other organisations through local strategic partnerships; promoting target through health equity audit, planning and commissioning functions; and monitoring performance on selected local basket of indicators.

Other government departments

- Promote the importance of and need for focus on the infant mortality target among organisations leading on services designed to improve health and reduce health inequalities among key target groups, e.g. teenage parents and among services seeking to address the wider determinants of health, e.g. child poverty.

Next steps

5.5   In order to ensure effective implementation of the recommendations, the DH will:

- develop an implementation plan identifying areas for delivery and focusing on specific interventions with the greatest impact on the gap – this plan will be published in Spring 2007;

- establish a national intensive support team, focusing on both the infant mortality and the life expectancy elements of the health inequalities target;

- develop more timely indicators related to interventions and identify appropriate local delivery plan changes with the Commissioning Directorate;

- develop a plan to strengthen NHS data systems;

- develop a plan to strengthen the evidence base about interventions to reduce infant mortality.

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Differences in registration of births

A live birth occurs when an infant shows some sign of life at birth, for example, breathes or shows evidence of life such as voluntary movement, heartbeat, pulsation of the umbilical cord or definite movement of voluntary muscles.[24]

In 1993, the WHO defined viability as birth after 22 weeks gestation and more recently. This was supported by the Nuffield Council of Bioethics who recommended that infants born at less than 22 weeks gestation should not be resuscitated, except in the context of an approved research study.[24]

There is a regional variation in registering live births according to gestational age category.

An infant born at 20 weeks gestation may be regarded as a miscarriage in the North East (hence would not be included in the target) but as a live birth and then subsequently a neonatal death in the West Midlands (hence would be included in the target).

As a consequence, some regions may appear to have worse IMRs than others. However, there does not appear to be a social gradient (using deprivation as a proxy) in the recording of births by gestation. Although unlikely to be significant for the target, greater consistency in reporting by gestational age will enable proper comparisons to be drawn locally, regionally and internationally.

Figure 10. Percentage of babies who died who were less than 22 weeks gestation at birth (1997–2003)

Percentage of babies who died who were less than 22 weeks gestation at birth

Distribution of births at less than 22 weeks gestation and all births according to deprivation quintile
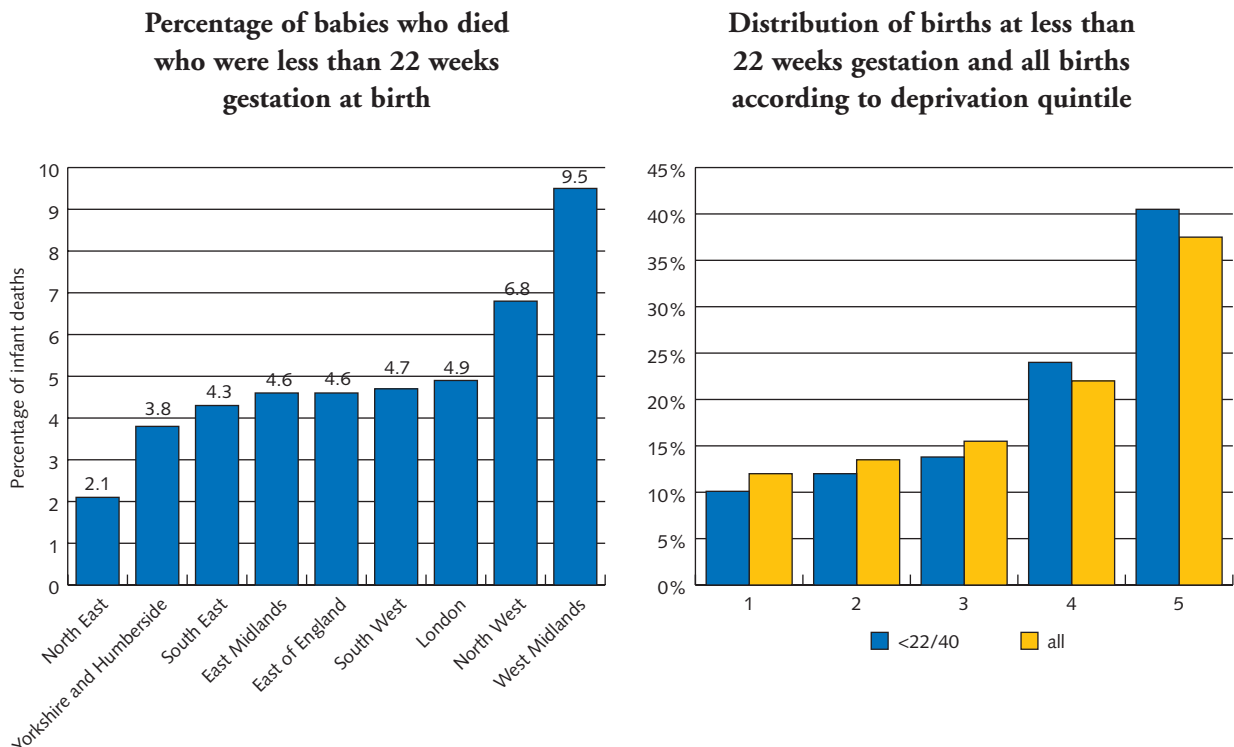
Source: CEMACH, DH analysis

Local authority areas with 20 or more infant deaths in the routine and manual group from 2002–2004

Birmingham
Blackburn with Darwen
Bolton
Bradford
Brent
Bristol
Calderdale
Coventry
Croydon
Derby
Doncaster
Dudley
Ealing
East Riding of Yorkshire
Greenwich
Hackney
Haringey
Kingston upon Hull
Kirklees
Lambeth
Leeds
Leicester

Liverpool
Luton
Manchester
Medway Towns
Milton Keynes
Newham
Northampton
Nottingham
Oldham
Portsmouth
Preston
Rotherham
Sandwell
Sheffield
Southwark
Stoke-on-Trent
Sunderland
Tower Hamlets
Wakefield
Walsall
Wolverhampton

Proportion of obese females aged 16 and over, by equivalised household income tertile within ethnic group

Figure 11.
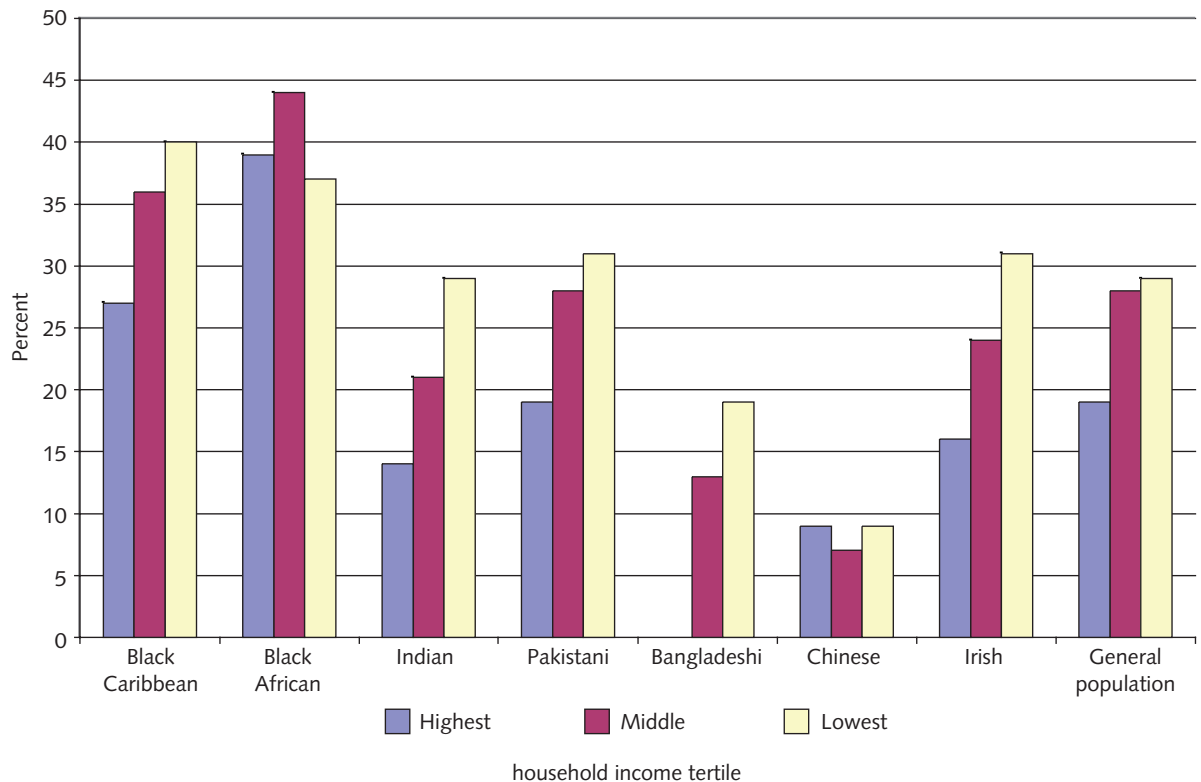
Source: 2004 Health Survey for England (The National Centre for Social Research)

Note: Data for Bangladeshi high income tertile not available due to small sample size

Examples of good practice

The review emphasised the importance of sustainable good practice that can be successfully replicated across the country and that can help narrow the gap between the R&M (and other disadvantaged) group and the rest of the population. This handful of examples looks at models in tackling smoking, providing professional support and engaging hard-to-reach populations. **Please let us know of other examples of good practice in your area by emailing: HIUmailbox@dh.gsi.gov.uk**

STOPPING SMOKING

The Sheffield experience

The Sheffield Stop Smoking Service works closely with Midwives to provide an effective service to pregnant women and their families. It conducts mandatory training for midwives and also offers training sessions to student midwives and support workers.

A leaflet "Breathe" is distributed to all pregnant women at their first antenatal appointment. At this appointment, women who have indicated that they smoke are referred to the Stop Smoking Service. Progress is reviewed at every antenatal appointment.

Specialist midwives also attend the teenage pregnancy antenatal clinic because teenage parents are more likely to smoke during pregnancy. The midwife gives an overview of the service to all pregnant teenage mothers and offers a one-to-one consultation (home visit).

Contacts: Pam Hancock and Jane Grice, Specialist Smoking Cessation Midwives, 0114 226 4718 (pam.hancock@sheffieldpct.nhs.uk or jane.grice@sheffield.pct.nhs.uk)

Identifying smoking families and providing support

Increased use of smoking cessation services for pregnant women and parents has been promoted as part of routine clinical practice by the North Birmingham PCT and Good Hope Hospital NHS Trust. It started because of the high rates of smoking in pregnancy and infant mortality in the West Midlands.

The programme was heavily promoted using various strategies, including mandatory training for midwives, articles in newsletters, attaching fliers to payslips, and parent education sessions.

Partners and family members of smoking mothers were targeted, to provide support and prevent relapse. Nicotine replacement services are readily accessible to mothers.

More efficient data systems have been introduced, and smoking status can now be tracked from booking to delivery. From 1 November 2006, resources have been targeted at wards with higher smoking levels, and carbon monoxide (CO) breath testing, introduced into clinical practice in these areas.

There is regular and sustained contact and support with women throughout pregnancy. Midwives also assess smoking status during postnatal follow-up, targeting and extending support to partners as this is vital in getting pregnant and new mothers to stop smoking.

Contact: Carmel O'Gorman, Midwifery lead, Stop Smoking Services in Pregnancy 07970 844545 (Carmel.o'gorman@goodhope.nhs.uk)

TARGETING MIDWIFERY SERVICES ON DEPRIVED AREAS

Providing continuity of care

The One to One Midwifery within Sure Start Holloway seeks to provide continuity of midwifery care in order to improve health and social outcomes for mothers and babies within the Holloway Sure Start patch.

This service was provided by a team of six dedicated midwives (Whittington NHS Trust provided four and Sure Start provided two). One to one midwifery services improve birth outcomes, reduce the need for costly analgesia, improve breastfeeding rates, increase homebirths and reduce maternal and neonatal morbidity.

There was a dramatic fall in the DNA (did not attend) rate from 20% to nil, as midwives were offering care to women at home. Comparing 2003 and 2004 showed that breastfeeding rates at 28 days were 4% higher, homebirths were 2% higher and epidural rates were 19% lower for first time mothers and 5% lower for non first time mothers among a total of 343 women. A qualitative evaluation of the service also indicated high levels of satisfaction from the women who received one-to-one care.

This model of care will work anywhere but requires a dedicated and adequate workforce able to work flexibly. Ongoing support and training are vital.

Contact: Linda McGurrin, Divisional Manager, Women and Children Services, 020 7288 5744 (Linda.McGurrin@whittington.nhs.uk)

Targeting deprivation in Blackburn

A similar approach was adopted in deprived areas of Blackburn, with a high proportion of the women from mainly South Asian groups. Almost two-thirds of the women have risk factors, which require consultant-led care.

Jointly funded by East Lancashire Hospitals NHS Trust, Sure Start Blackburn West and the University of Central Lancashire (Midwifery Research Department), the team of six midwives each have individual caseloads of 30–36 women a year. Women who have had previous traumatic birth and those suffering from moderate depressive illness are referred to the team, who aim to maximise the potential for normal delivery and improve health outcomes for mother and baby.

Early outcomes are encouraging, with the normal birth rate higher than the England average and the caesarean section rate lower than the national average. The group's smoking cessation programme has also been successful, and more than 50% of pregnant women either reduced their smoking or stopped completely.

Contact: Anita Fleming, Caseload Midwifery Team Leader, 07967 576536

Working with Sure Start

In Southampton, a model of team midwifery caseloading, set up as a pilot working in partnership with Sure Start has been rolled out in similar areas across the city. Like Holloway and Blackburn, caseloads were set at between 36 and 40 births per midwife per year, with working teams of five to eight.

The pilot showed improved attendance for antenatal care and classes. Breastfeeding rates improved from 62% in 2003 to 68% in 2005. There was also an improvement in smoking cessation rates and some birth outcome measures, including a reduction in low birth weight rates. Informal feedback from families has also been very positive.

Now other parts of the service are trying to replicate the model.

Contact: Maria Dore, Senior Midwifery Manager, 02380 777222 Ext 4731 or 6022 (maria.dore@suht.swest.nhs.uk)

REACHING THE RIGHT PEOPLE

Seeking out those at risk

FSID took a travelling roadshow van to deprived areas of London, bringing safe infant care advice to locations where deprived families might come, including street markets, outside post offices, free summer fairs in parks, supermarkets, and GP clinics. Advisors gave out leaflets, answered questions, and distributed free goodies donated by companies. They held individual discussions about Reduce the Risk advice with 9,814 people during a three-year period and gave out nearly 20,000 leaflets.

Feedback showed that 80% said they had learned something new that they had not known before about safe infant care. The single most common thing learned was the risk of overheating of babies, but as the following quotes show, new information covered a wide range of topics:

"I know that smoking is bad for the baby and we never smoke in the same room, but I didn't know that you shouldn't let the baby sleep in your bed if you smoke." (mother of 6-week-old)

"I thought that babies only died in their cots." (mother of a 2-month-old)

"I thought putting babies on their backs to sleep would be dangerous because of vomiting, so I'm glad you were here to talk to." (pregnant woman seen at hospital antenatal clinic)

Local health practitioners also said that the roadshow encouraged people to discuss an issue which worried them but which they would not usually raise themselves.

Contact: Joyce Epstein, FSID, 020 7222 8001 (JoyceE@sids.org.uk)

Engaging vulnerable families

Getting in touch with vulnerable families, mothers and children requires action across a variety of settings. Engagement is the key. For example, the South Acton Children's Centre provides practical and family support by reaching out to families in their deprived neighbourhood and setting up a playgroup for young children with behavioural and feeding problems.

In the Finicky Eaters Group, the children played and ate together and a dietician supported parents in the preparation of healthy snacks and meals. In this way, parents were brought together and were able to talk about the challenges they faced, understand they were not alone in facing them and receive support from healthcare and other professionals.

The evaluation showed that establishing the group has proved to be an important way of reaching out to mothers who were otherwise isolated in the community.

Contact: Gwen Watkins, Sure Start Manager, South Acton Children's Centre 020 8993 4049

Interventions to reduce infant mortality

The following interventions were considered at a workshop on infant mortality held in June 2006:

- action on SUDI

- antenatal screening

- early antenatal booking

- fortifying flour with folic acid

- improving breastfeeding rates among disadvantaged populations

- improving housing conditions in disadvantaged areas

- improving nutrition before, during and after pregnancy

- improving the quality and accessibility of antenatal care and early years support in disadvantaged areas

- good monitoring of high-risk pregnancies during labour

- introducing new vaccinations, e.g. pneumococcal vaccine, and improving vaccine uptake

- preventing teenage pregnancy and provision of supporting for teenage parents

- providing high-quality neonatal intensive care

- providing high-quality obstetric and midwifery services offering effective high-quality family support

- preventing rickets, thereby reducing respiratory problems, which can lead to mortality

- reducing accidents in the home

- reducing alcohol consumption in pregnancy

- reducing infants' exposure to tobacco smoke

- reducing smoking in pregnancy

- reducing non-vaccine preventable infections

- reducing poverty

- reducing violence to infants

DH *Department of Health*