Infant Mortality in Wirral

Wirral Intelligence Service

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V1	April 2023	Hannah Cotgrave	Sarah Kinsella
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Links with other topic areas	• Life Expectancy • Children and Young People • Maternity and Pregnancy

Contents

Key Messages

- Infant mortality is a reliable indicator as to the health of the overall population (along with life expectancy)
- Causes and risk factors for infant mortality are complex but are often associated with deprivation and other factors which can be preventable.
- Wirral performs worse than England on several important risk factors for infant deaths including deprivation, maternal obesity, maternal smoking and breastfeeding, but performs better than England on other measures, such as early access to maternity care and the proportion of new mothers who receive a birth visit within 2 weeks.
- The infant mortality rate in Wirral in 2019-21 was 3.6 per 1,000 live births; this was a lower rate than both England (3.9) and North West overall (4.4)
- This was a small increase on 2018-20 but is still reflective of the declining trend over the last 40 years.
- In terms of actual numbers, Wirral's rate of 3.6 for the period 2019-21 equates to a total of 33 infant deaths: 6 in 2019, 13 in 2020 and 14 in 2021.
- Nationally, reductions in infant mortality have stalled for the last seven time periods; the rate per 1,000 in England overall has been 3.9 since 2013-15
- In 2019-21, although Wirral had a lower infant mortality rate than the North West, England, and nearest statistical neighbour Sefton, the borough had a higher stillbirth rate than all comparator areas.

Introduction

Infant mortality is widely considered to be an important Public Health measure because it acts as an indication for the health of the population.

This is because, similarly to Life Expectancy, it reflects the impact of wider determinants such as economic, social and environmental conditions on the health of the population.

Deaths occurring during the first 28 days of life (the neonatal period) in particular, are considered to reflect the health and care of both mothers and new-borns [1].

No current national or local targets have been set for infant mortality, but it is a Public Health Outcomes Framework indicator (4.01), highlighting its importance as a measure of the health of the population.

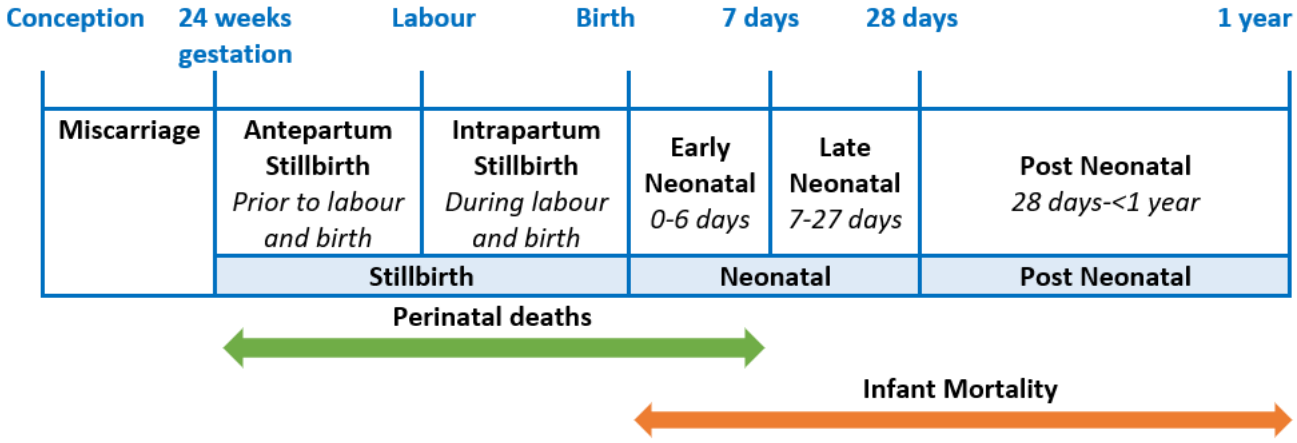
Definition of Infant Mortality

The infant mortality rate is the number of deaths in babies aged under 1 year, per 1,000 live births. It can also be split into two components:

1. The neonatal mortality rate: The number of neonatal deaths (those occurring during the first 28 days of life) per 1,000 live births.
2. The post-neonatal mortality rate: The number of infants who die between 28 days and less than one year, per 1,000 live births.

Figure 1 below shows the timeline by which infant deaths are defined and categorised in the UK.

Figure 1: Definitions and timeline for infant deaths



Note: The above uses various ONS definitions and relate to the UK only. Other countries vary on timescales.

Risk Factors

ONS (Office for National Statistics), PHE (Public Health England was dissolved in 2021 and some of its functions have now been taken over by OHID, or the Office for Health Improvement and Disparities) and the Royal College of Paediatrics and Child Health and the Marmot Review report the following as risk factors for infant mortality; many of these risk factors are complex, inter-related and/or show a socio-economic gradient, see **Table 1** [1,2,3,4,6]

Table 1: Risk factors for infant mortality

Risk factor	Association with infant mortality
Parental/pre-birth	
Ethnicity	Infants of Black, Asian and minority ethnic (BAME) parents show the highest rates of infant mortality.
Infection during pregnancy	Contracting infections such as influenza increase the risk of infant mortality.
Maternal age	Mothers under 20 and over 35 years old have the highest risk of infant mortality.
Maternal education	Higher level of maternal education is associated with lower levels of infant mortality.
Maternal obesity	Maternal obesity is associated with conditions that increase the risk of infant mortality such as gestational diabetes and pre-eclampsia.
Maternal smoking	Smoking during pregnancy exposes the foetus to harmful chemicals such as nicotine and carbon monoxide, reduces nutrient and oxygen availability and increases the risk of infant mortality.
Maternal substance misuse	Alcohol and illicit substances consumed during pregnancy increase the risk of infant mortality.
Maternity/health services	Booking in after 12 weeks gestation and/or non-attendance are risk factors of infant mortality.
Parental socioeconomic status	Infants born to parents in the most deprived areas are the most likely to experience infant death. Deprivation is also associated with many other risk factors for infant mortality.
Parents marital status	Births outside marriage increase the risk of infant mortality.
Previous stillbirth	If a previous stillbirth has been experienced the risk of infant mortality is increased.
Congenital anomalies	Congenital anomalies (particularly in preterm births) are associated with a higher rate of pregnancy complications, neonatal morbidity and perinatal mortality.
Infant/post-birth	
Birthweight	Low birthweight increases the risk of infant mortality.
Exclusive breastfeeding	Breastfeeding reduces the risk of infant mortality.
Infant immunisations	Lack of infant immunisations increases the risk of infant mortality.
Multiple births	Multiple births increase the risk of infant mortality and are associated with low birthweight and prematurity.
Prematurity	Prematurity increases the risk of infant mortality.
Gender of infant	Male gender of the infant is independently associated with an increased risk of infant mortality.

Sources: [1,2,3,4,6]

Table 2 below shows the comparison of infant mortality risk factors between Wirral, North West and England. Wirral performs worse than England on several important risk factors for infant deaths including deprivation, maternal obesity, maternal smoking and breastfeeding.

The borough does, however, perform better than England on several other measures, such as early access to maternity care and the proportion of new mothers who receive a birth visit within 2 weeks.

On other measures, Wirral did not differ (significantly) from England, e.g. teenage mothers, premature births, low birth weight and some immunisations. The RAG ratings in the table below are all in comparison to England and can be viewed here on the OHID Child & Maternal Health Profile.

Table 2: Comparison of infant mortality risk factors in Wirral, North West and England

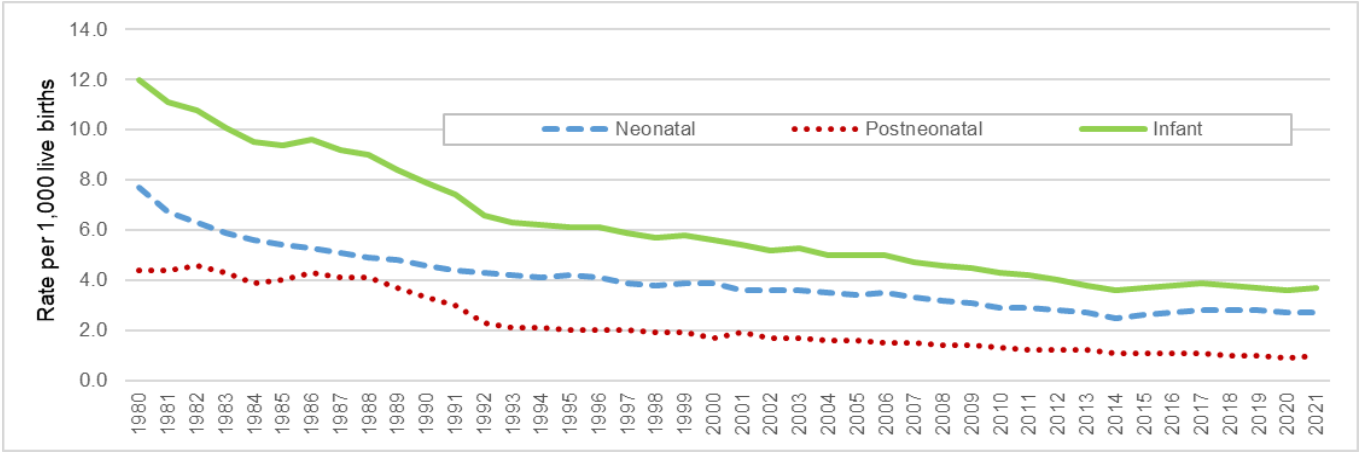
Indicator	Period	Wirral			Region England	England	England		
		Recent Trend	Count	Value	Value	Value	Worst/ Lowest	Range	Best/ Highest
Deprivation score (IMD 2019) (Persons, All ages)	2019	–	-	29.6	28.1	21.7	45.0		5.8
Teenage mothers (Female, 12-17 yrs)	2020/21	→	15	0.6%	0.7%	0.6%	2.4%		0.0%
Obesity in early pregnancy (Female)	2018/19	–	-	26.4%	23.6%	22.1%	30.5%		
Early access to maternity care (Female)	2018/19	–	1,680	61.4%	56.8%	57.8%	16.0%		79.1%
Percentage of deliveries to women aged 35 years and above (Female, 35+ yrs)	2020/21	→	550	20.9%	20.3%	23.4%	13.6%		
Percentage of deliveries to mothers from Black and Minority Ethnic (BME) groups (Female, All ages)	2020/21	→	125	4.7%	18.5%	21.6%	2.3%		
Premature births (less than 37 weeks gestation) (Persons, >=37 weeks gestational age at birth)	2018 - 20	–	699	74.5	83.5	79.1	114.8		56.0
Proportion of New Birth Visits (NBVs) completed within 14 days (Persons, <14 days)	2021/22	↑	2,698	90.0%	85.7%	82.7%	9.5%		99.0%
Smoking status at time of delivery (Female, All ages)	2021/22	↓	-	11.4%	10.6%	9.1%	21.1%		3.1%
Low birth weight of all babies (Persons, 0 yrs)	2021	→	194	6.4%	7.0%	6.8%	11.0%		.6%
Low birth weight of term babies (Persons, >=37 weeks gestational age at birth)	2021	→	76	2.7%	2.6%	2.8%	5.0%		1.5%
Multiple births (Female, 15-44 yrs)	2021	→	40	13.3	12.9	13.7	6.4		19.4
Breastfeeding prevalence at 6-8 weeks after birth - current method (Persons, 6-8 weeks)	2021/22	→	965	31.9%	*	49.2%*	-	*Insufficient number of values for a spine chart*	
Population vaccination coverage: Dtap IPV Hib (1 year old) (Persons, 1 yr) <90% 90% to 95% ≥95%	2021/22	↓	2,795	93.2%	91.5%	91.8%	64.0%		98.4%
Population vaccination coverage: Dtap IPV Hib (2 years old) (Persons, 2 yrs) <90% 90% to 95% ≥95%	2021/22	↓	3,114	95.7%	93.7%	93.0%	70.6%		99.1%
Population vaccination coverage: PCV (Persons, 1 yr) <90% 90% to 95% ≥95%	2019/20	↓	3,102	94.9%	93.5%	93.2%	74.8%		98.7%
Population vaccination coverage: PCV booster (Persons, 2 yrs) <90% 90% to 95% ≥95%	2021/22	↓	3,015	92.6%	90.1%	89.3%	64.3%		97.6%

Sources & Notes: For full details and definitions, please see the Infant Mortality Indicator profile

National picture

Nationally, there were 2,323 infant deaths (aged under 1 year) which occurred in England and Wales in 2021, the most recent year for which data is available, equating to a rate of 3.7. Although this is a small increase on the number and rate of infant deaths in 2020 (2,226 and 3.6), figures are still representative of the declining trend over the last four decades.

Figure 2: Neonatal, post-neonatal and infant mortality rates, England and Wales, 1980-2021



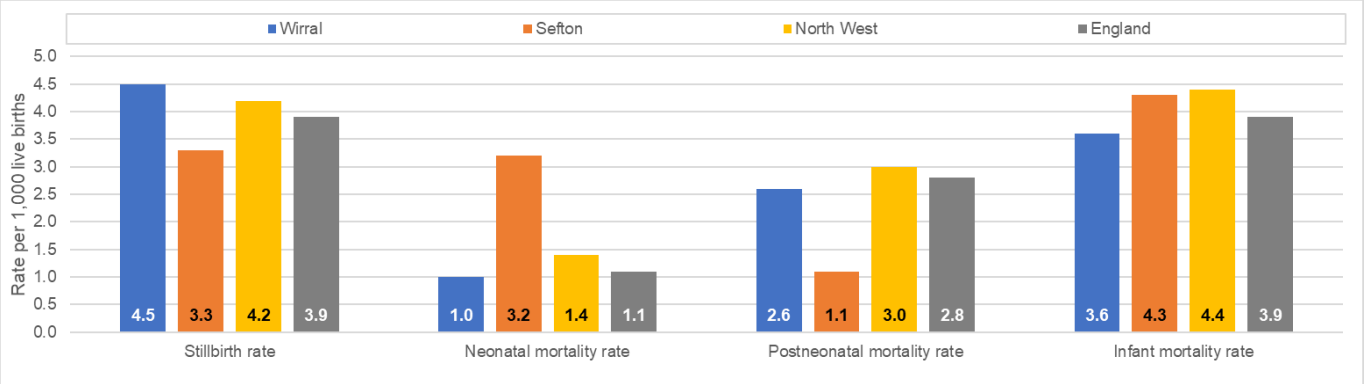
Source: Office for National Statistics (ONS), 2023

Figure 2 above shows the rate of infant mortality (along with the 2 components of the overall rate - neonatal and post-neonatal mortality) in England and Wales. Infant mortality has shown a decreasing trend over the last 40 years, although the rate of decrease appears to have plateaued somewhat in recent years overall. The 2021 bulletin by ONS provides more insight into the possible reasons for this, including gestation length, mother's age and any impact from COVID-19.

Current local picture

Although stillbirths do not contribute to the overall infant mortality rate, they are included in **Figure 3** below as they are also an important indicator of maternal health.

Figure 3: Comparison of mortality rates (per 1,000); Wirral and comparators, 2021



Source: Child and Maternal Health Fingertips Profile

As **Figure 3** shows, during 2019-21, the infant mortality rate in Wirral was lower than England, North West and nearest statistical neighbour Sefton. In terms of actual numbers, there were 41 stillbirths and 33 infant deaths in Wirral between 2019-21 (this compares to 33 infant deaths in 2018-20 and 38 in 2017-19).

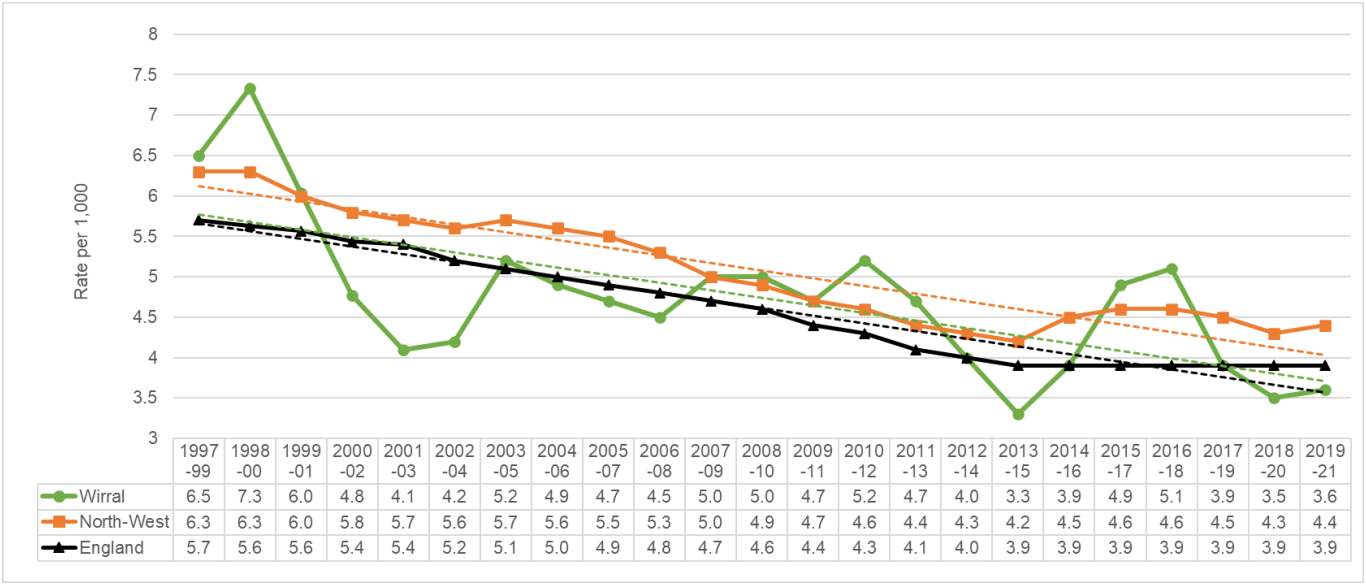
Trend

Figure 4 shows that infant mortality rates have, in general, been declining nationally, regionally and locally for a long period of time. National rates have shown a steady decrease from 5.7 deaths per 1,000 live births in 1997-99 to 3.9 per 1,000 live births in 2019-21.

Wirral rates have shown more fluctuation due to small numbers (even when using 3-year pooled averages as shown here to attempt to smooth out random year on year fluctuations), peaking in 1998-00 with 7.3 deaths per 1,000 live births, but then sharply decreasing to 3.3 in 2013-15.

In 2019-21, Wirral had the third lowest rate since records began and was below both England and the North West overall. It is interesting to note that reductions in infant mortality have stalled in England for the past seven time periods; the rate per 1,000 has been 3.9 since 2013-15.

Figure 4: Trend in infant mortality rate; Wirral, North West and England; 1997-99 to 2019-21 (3 year rolling rates), rate per 1,000 live births



	1997 -99	1998 -00	1999 -01	2000 -02	2001 -03	2002 -04	2003 -05	2004 -06	2005 -07	2006 -08	2007 -09	2008 -10	2009 -11	2010 -12	2011 -13	2012 -14	2013 -15	2014 -16	2015 -17	2016 -18	2017 -19	2018 -20	2019 -21
Wirral	6.5	7.3	6.0	4.8	4.1	4.2	5.2	4.9	4.7	4.5	5.0	5.0	4.7	5.2	4.7	4.0	3.3	3.9	4.9	5.1	3.9	3.5	3.6
North-West	6.3	6.3	6.0	5.8	5.7	5.6	5.7	5.6	5.5	5.3	5.0	4.9	4.7	4.6	4.4	4.3	4.2	4.5	4.6	4.6	4.5	4.3	4.4
England	5.7	5.6	5.6	5.4	5.4	5.2	5.1	5.0	4.9	4.8	4.7	4.6	4.4	4.3	4.1	4.0	3.9	3.9	3.9	3.9	3.9	3.9	3.9

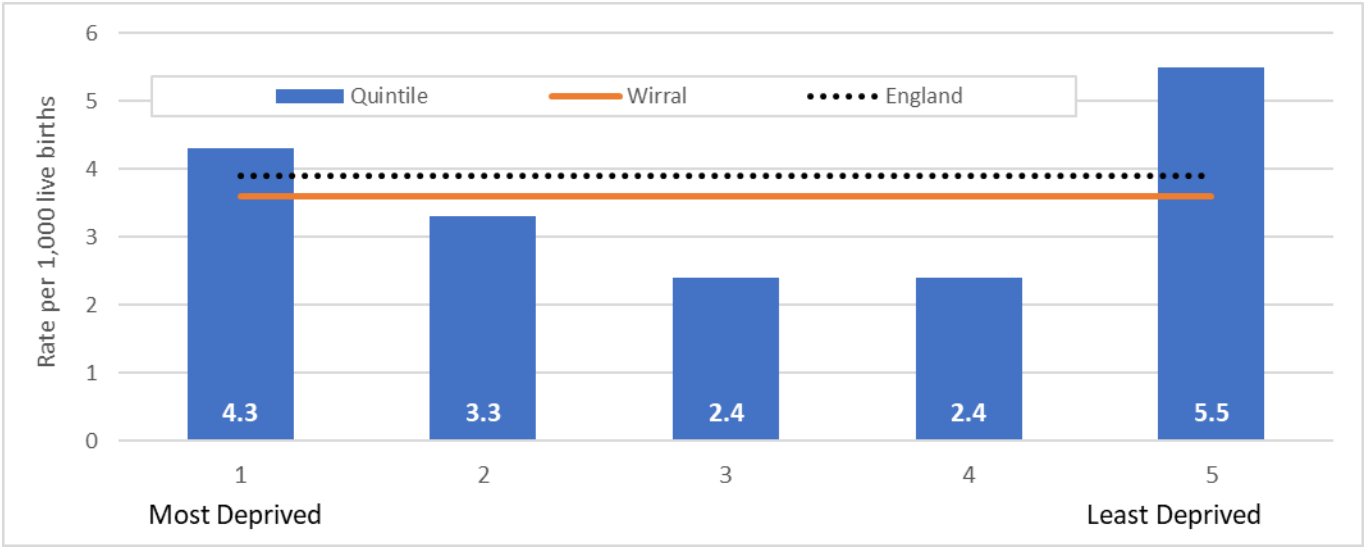
Source: Child and Maternal Health Fingertips Profile

In terms of actual numbers, Wirral's rate of 3.6 (per 1,000 live births) for the period 2019-21 equates to a total of 33 infant deaths; 6 in 2019, 13 in 2020 and 14 in 2021.

Deprivation

At a national level, deprivation is associated with infant mortality (higher deprivation areas showing higher rates of infant deaths). **Figure 5** below shows the rate of infant mortality in Wirral by deprivation quintile.

Figure 5: Infant mortality in Wirral, by deprivation quintile, 2019-21



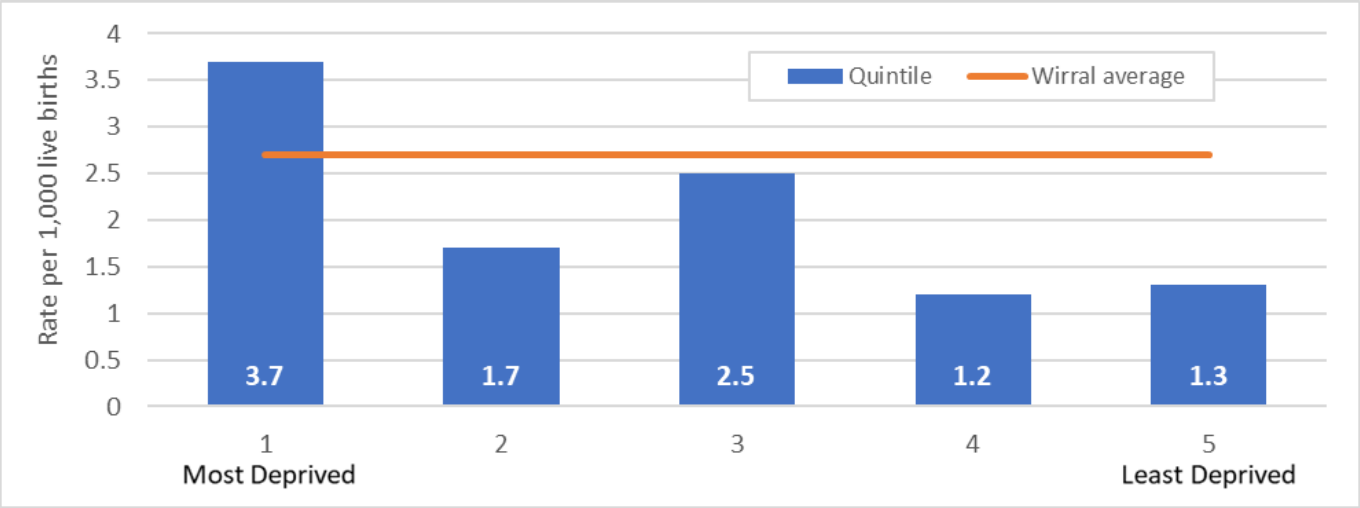
Source: PCMD (Primary Care Mortality Dataset – restricted dataset), ONS

Figure 5 shows that the rate of infant mortality in Wirral differs from the national picture, as the quintile with the highest rate of infant mortality is Quintile 5, the least deprived quintile. Reasons for this are likely to be related to this quintile experiencing the smallest number of births of any quintile in Wirral, combined with the overall low number of infant deaths (n=33 for all areas of Wirral for the 3 pooled years of 2019-21). Quintile 1 contained the largest number of these infant deaths (n=18), while two of the other four quintiles had less than 5 deaths. These small numbers can sometimes result in large fluctuations.

It is also possible that maternal age is a factor, i.e. according to ONS, less deprived areas tend to have a higher proportion of older mothers, which ONS believe may be a significant factor in the recent plateauing of infant mortality rates in England overall.

Both deprivation and low birth weight (term births with a stated birth weight of less than 2,500 grams/5lb 8oz) are some of the most important risk factors for infant mortality. See **Figure 6** below which shows the proportion of full-term births in which the infant was of low birth weight.

Figure 6: Percentage of low-birth-weight babies (as a percentage of all term births) by deprivation quintile, Wirral, 2019-21



Source: Birth registrations data (restricted dataset), ONS
Notes: 1 = most deprived quintile, 5 = least deprived quintile. Term classed as those pregnancies of at least 37 weeks gestation.

As **Figure 6** shows – around 1 in 27 babies born in the most deprived areas of Wirral are of a low birth weight, compared to around 1 in 76 in the least deprived quintile. Overall, 2.6% of term babies born in Wirral were of a low birth weight in 2019-21 (or 1 in 38 babies). In numbers, there were 218 babies born in Wirral during 2019-21 who were of low birth weight; nearly two thirds of these were in the most deprived quintile of the Wirral population (142 in Quintile 1).

Public Health Interventions

In 2015, NHS England commissioned a National Maternity Review [5] report to further drive these improvements and meet the changing needs of women and babies. Seven key priorities were highlighted:

1. Personalised care
2. Continuity of carer
3. Better postnatal and perinatal mental health care
4. A payment system to fairly compensate providers for delivering different types of care.
5. Safer care
6. Multi-professional working
7. Working across boundaries

A number of national and local public health interventions are provided in Wirral to reduce the health inequalities in infant mortality and improve infant and maternal outcomes, summarised in **Table 3**.

Table 3: National and local interventions to target infant mortality

Intervention	Description
National	
Infant Mortality National Support Team	Established in 2008 to help disadvantaged local areas address inequalities in infant mortality and improve infant and maternal health outcomes.
National Childbirth Trust	A UK-based charity offering information and support during pregnancy, childbirth and early parenthood.
The Lullaby Trust	The Lullaby Trust raises awareness of sudden infant death syndrome (SIDS), provides expert advice on safer sleep for babies and offers emotional support for bereaved families.
Local	
Koala NW	Provides a range of services and support to children and their families in the first critical 1,001 days, e.g. Antenatal and Postnatal Breastfeeding Peer Support and Parent & Infant Mental Health Service. Tailored to need using a responsive and user-led approach.
Infant Feeding Team	Provides information, support and training to healthcare professionals to ensure a high standard of care for pregnant women and breastfeeding mothers and babies.
0-19 Health and Wellbeing Service	Offers services starting in the antenatal period including support from the Health Visiting and Family Nurse Partnership (FNP) team, regular health reviews and infant feeding support. Safe sleep guidance is shared with all families when visited for targeted antenatal and universal birth visits. Care of Next Infant (CONI) for parents who have experienced an infant death a CONI support plan is offered which provides access to weekly contacts, regular weight monitoring and specific resources through the Lullaby Trust with a focus on reducing anxiety and tailored support for up to 6 months postnatally.
Parentcraft (Antenatal) Sessions	Practical guidance and advice for the first few months of parenthood. Takes place in the community, often in local Children's Centres.
Early Childhood Services	Brings together a range of services for families and children from pre-birth to five. The services give families access to universal and targeted help at the earliest opportunity from accessing universal groups to targeted family support. They empower families to access community services.

Source: Wirral Strategic Maternity Group, 2022

In November 2017 there was an announcement from the government that from April 2018 every stillbirth, early neonatal death and severe brain injury cases would be referred to the Healthcare Safety Investigation Branch, a new NHS safety investigator led by safety experts.

It was hoped they would help drive the goal of halving the overall rate of stillbirths, deaths and brain injuries by 2025; a Safer Maternity Care Progress Report was published by NHS England in 2021.

References

1) Public Health England, Child and Maternal Health Fingertips Profile https://fingertips.phe.org.uk/profile/child-health-profiles

2) Tackling Health Inequalities in Infant and Maternal Health Outcomes Report, Department of Health (2010) https://www.gov.uk/government/publications/tackling-health-inequalities-in-infant-and-maternal-health-outcomes-report-of-the-infant-mortality-national-support-team

3) The Marmot Review (2010). Fair Society, Healthy Lives: The Marmot Review http://www.instituteofhealthequity.org/resources-reports/fair-society-healthy-lives-the-marmot-review

4) Maternal and Fetal Risk Factors for Stillbirth: Population Based Study (2013) https://www.bmj.com/content/346/bmj.f108

5) National Maternity Review: Better Births – Improving outcomes of maternity services in England, NHS England (2016) https://www.england.nhs.uk/wp-content/uploads/2016/02/national-maternity-review-report.pdf

6) Child and infant mortality in England and Wales - Office for National Statistics (ons.gov.uk), 2021

Further Reading/Links

- Wirral JSNA: https://www.wirralintelligenceservice.org/
- Saving Babies' Lives: A care bundle for reducing stillbirth: https://www.england.nhs.uk/wp-content/uploads/2016/03/saving-babies-lives-car-bundl.pdf

Glossary of terms

Antepartum infections: An infection that occurs just before birth.

Congenital anomalies: Structural or functional anomalies caused by single gene defects, chromosomal disorders, multifactorial inheritance, environment teratogens and/or micronutrient deficiencies.

Early neonatal mortality rate: number of deaths occurring under 7 days per 1,000 live births.

Infant mortality rate: number of deaths of infants (aged under one year) per 1,000 live births

Late neonatal mortality rate: number of deaths between 7 and 27 days per 1,000 live births

Neonatal mortality rate: number of deaths occurring under 28 days per 1,000 live births.

Perinatal mortality rate: number of stillbirths and early neonatal deaths per 1,000 live and stillbirths

Post-neonatal mortality rate: number of deaths in infants aged between 28 days and under one year, per 1,000 live births.

Statistical Neighbours: Other local authorities deemed to have similar characteristics to Wirral (used for benchmarking); Wirral tend to use is Sefton as it is also the closest geographically to Wirral.

Stillbirth: Babies born after 24 weeks of completed gestation who did not breathe or show signs of life

Preterm Birth: A preterm birth is a birth that takes place before 37 weeks' gestation. We use the following classifications of preterm live births:

- extremely preterm (under 28 weeks)
- very preterm (28 to 31 weeks)
- moderate preterm (32 to 36 weeks)

Term birth: A term birth is a birth that takes place during or after 37 weeks gestation.

Contact Us

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