Annual Report of Child Deaths in Greater Manchester, 2018/19

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Contents

1.0 Executive Summary

This is the seventh annual report which reviews the data taken from all four Child Death Overview Panels (CDOPs) across Greater Manchester (GM). This report includes data from closed cases from 1st April 2018 to 31st March 2019.

All under-18 child deaths are referred to a CDOP, and the findings are recorded and used to inform local strategic planning on preventing child death, safeguarding children and improving outcomes. The CDOP does not determine the cause of death; that is carried out by either the medical team or the coroner depending on the circumstances of the death. The CDOP's responsibility is to consider all the information around the child's death, identify potentially modifiable factors, and lessons that can be learned. The outcome of all cases closed by the CDOPs is collected nationally by the Department for Education to build up a picture of child deaths in the UK.

1.1 Key Findings for Greater Manchester

There were a total of 204 closed cases in 2018/19 with 217 notified deaths. The number of closed cases is less than in 2017/18 (274) as is the number of deaths notified (250). The time taken from notification of death to closure was between 31 and 2,328 days, with an average across GM of 297 days.

The large majority of child deaths in GM occurred in the first year of life; 42% of closed cases occurred in the first 28 days and 60% in the first 12 months. This is a reduction from last year, when deaths in infants aged under 1 year accounted for 65% of closed cases, but the main causes of these deaths remain the same. Most were due to events around the time of birth (perinatal or neonatal events), the next most common issue was genetic or congenital conditions.

The older age groups: 1-4, 5-9, 10-14 and 15-17 accounted for 11%, 8%, 10% and 11% of deaths respectively. This does indicate a slightly wider spread of deaths throughout the age groups than in previous years, but the absolute numbers are too small to draw statistical conclusions. Out of all the closed cases in 2018/19, 162 (79%) were classed as 'medical' causes, i.e. acute medical, chromosomal, chronic medical, malignancy, perinatal / neonatal event or infection. Across GM, 82% of neonatal deaths were expected, falling to 45% of infants aged 28-364 days. The pattern is more mixed across the older age groups, but again this could be due to small numbers. However, in children aged 10-14 years, only around 1 in 5 deaths were expected which reflects a greater number of deaths from unexpected causes, such as health-related causes of death and trauma in this age group. This low percentage also reflects the good health of children in this age group, and that those with serious underlying conditions were likely to have died prior to the age of 10.

The ratio of male to female deaths was similar to previous years (60% male, 40% female). However, in contrast to last year, the gender difference is more evident in some older age brackets, rather than infancy. Whilst deaths due to trauma and other external causes usually have a higher ratio of male to female deaths, in 2018/19 these were roughly equal, but numbers were small in this category (7 males and 6 females).

Modifiable factors were identified in 79 closed cases (39%) across GM, which is similar to the findings from 2017/18 (40%). Smoking was still the most common modifiable factor (24 cases), followed by obesity (19). Access to health care or poor care management was the third largest modifiable factor (11) followed by substance misuse (10).

In 199 of the 204 closed cases in 2018/19 the ethnicity of the child was recorded. Of these, 57% were from a white background, which is below the national rate of 63%. Across GM there was a rate of 4.77 deaths per 10,000 in the 0-17 years BME population compared to 2.50 per 10,000 0-17 years among the white population. This marked difference represents a health inequality between the two groups.

Thirty-seven percent of all children under 18 years old across Greater Manchester are within the most deprived quintile. In 2018/19, 62% of deaths occurred in this group, which is similar to 2017/18 (61%). Eighty-two percent of all GM child deaths occurred within the two most deprived quintiles. This remains a significant health inequality.

2.0 Introduction

This is the 7th Annual Report of Child Deaths in Greater Manchester (GM). The current processes for reviewing child deaths were established in 2008 and have continued to develop year on year. This report focuses on the cases that were closed in GM for the year 2018/19 and will include data on the demographics of the cases, duration of reviews, causes of death, and potentially modifiable risk factors. These may vary across local authorities and CDOP areas reflecting the different make-up of populations across GM.

The aim of this report is take data from the four CDOP panels that cover GM and to make observations about causes of death and potentially modifiable risk factors. This would allow an evidence based discussion about how to promote child safety and reduce child deaths in GM.

3.0 Background

In 2004, the Children Act required each local authority to establish a Local Safeguarding Children Board (LCSB) to safeguard and promote the welfare of children in that area. Since 2008 the LCSBs have the statutory responsibility for the child death review process and in 2015 the government published Working Together to Safeguard Children 2015[1] which built on previous reports detailing how each LSCB must ensure that the CDOP carries out a review of the death of any child normally resident in that area. The purpose of the child death review processes is to gather information on how and why children die, look at potentially modifiable factors and try to put in place interventions to reduce future deaths.

[1] http://www.who.int/mediacentre/factsheets/fs178/en/

In GM there are four CDOPs set up to cover the LSCBs of the ten local authorities:

- Bolton, Salford & Wigan
- Stockport, Tameside & Trafford
- Bury, Rochdale & Oldham
- Manchester

As the number of deaths for each area are small, combining the data from the four CDOPs allows for more detailed analysis as well as comparison between different areas of GM. There is well established co-operation between the local authorities in GM and this report is an opportunity to consider how GM as a whole can improve child health and child safeguarding and work together to reduce avoidable child deaths.

As this is the 7th year of the report, there is some limited trend data available.

4.0 Key findings for the UK

Infant, child and adolescent death rates in the UK have declined substantially since the 1980s with a 64% reduction since 1984 in England and Wales[2]. The infant mortality rate in England and Wales was lowest in 2014 (3.6 deaths per 1,000 live births), but increased to 3.9 per 1,000 live births in 2017[2]. Many of the causes and determinants of childhood deaths are potentially preventable[3]. Some areas of improvement are listed below.[4]

- The overall UK childhood mortality rate is higher than in some other Northern European countries.
- The key areas where the UK rates appear to be relatively high are infant deaths and deaths among children and young people who have chronic conditions.
- Injuries are the most frequent cause of death in children after their first year of life, and although unintentional injuries are the most common, the failure to reduce intentional injury and deaths by suicide among young people recently is also a pressing concern.
- Several reports have shown that health services do not always deliver optimal care for children and young people and lives may be lost as a result.
- There are marked social inequalities in death rates.

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[2] https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/deaths/bulletins/childhoodinfantandperinatalmortalityinenglandandwales/2017

[3] http://www.who.int/mediacentre/factsheets/fs178/en/

[4] **Wolfe I, MacFarlane A, Donkin A, Marmot M, Viner R.** *Why children die: death in infants, children, and young people in the UK - Part A.* London : RCPCH, NCB, BACAPH, May 2014.

5.0 Overview of Greater Manchester population aged under 18 years

Table 1, below, demonstrates the population of children aged under 18 years in each GM borough.

Table 1: Number of children aged under 18 years in each area of GM and its overseeing CDOP (ONS Data 2018)	
CDOP	**Population Size**
Bolton, Salford & Wigan	**192,624**
Bolton	67,670
Salford	56,566
Wigan	68,388
Stockport, Tameside & Trafford	**169,451**
Stockport	63,141
Tameside	50,223
Trafford	56,087
Bury, Rochdale & Oldham	**155,247**
Bury	43,142
Oldham	59,416
Rochdale	59,416
Manchester	**121,962**
Greater Manchester	**646,011**

Source: ONS 2017

5.1 Ethnicity

We can use ethnicity estimates from the 2011 census and apply these to the 2019 mid-year population estimates for each local authority to tell us the breakdown of the under 18 population by ethnicity. This shows that nine of the local authorities in GM (all except Wigan) have a higher proportion of the population that identify as BME and lower proportion of the population that identify as White British than the North West average. Manchester has the highest percentage BME population and the lowest percentage White British population (see table 2, overleaf).

Table 2: Estimated population by ethnic group for GM local authorities, mid-2018 population data applying 2011 census ethnicity breakdown (source ONS)				
Area	**White British**		**BME**	
Bolton	46,895	69.3%	20,775	30.7%
Bury	34,600	80.2%	8,542	19.8%
Manchester	55,249	45.3%	66,713	54.7%
Oldham	36,125	60.8%	23,291	39.2%
Rochdale	41,056	69.1%	18,360	30.9%
Salford	44,574	78.8%	11,992	21.2%
Stockport	52,975	83.9%	10,166	16.1%
Tameside	41,836	83.3%	8,387	16.7%
Trafford	40,551	72.3%	15,536	27.7%
Wigan	65,447	95.7%	2,941	4.3%
Greater Manchester	459,309	71.1%	186,702	28.9%
North-West	1,309,303	84.3%	243,844	15.7%

Source: ONS 2019

5.2 Index of Multiple Deprivation (IMD)

The Index of Multiple Deprivation (IMD) data has not been updated recently, so the scores from 2015 are still currently used. For GM, 6 out of the 10 local authorities have higher IMD scores than the North West average, i.e. are more deprived than the average. These local authorities also have a higher proportion of their population living in the most deprived areas of the country than the North West average (see table 3). On this measure Manchester ranks as the most deprived local authority in GM with Trafford the least, with 41% and 3% of their respective populations living in the most deprived areas of the country.

Table 3: Average IMD 2015 score and percentage in the most deprived 10% for GM local authorities (source ONS)					
Current Code	**Former Code**	**Area**	**Average IMD 2010 score**	**Average IMD 2015 score**	**% of people in an area in most deprived 10%**
E08000003	00BN	Manchester	41.13	40.51	41%
E08000006	00BR	Salford	34.74	32.95	29%
E08000005	00BQ	Rochdale	33.85	33.68	28%
E08000004	00BP	Oldham	30.41	30.29	23%
E08000001	00BL	Bolton	30.46	28.42	20%
E08000008	00BT	Tameside	29.62	29.38	17%
E08000010	00BW	Wigan	26.01	24.85	14%
E08000002	00BM	Bury	22.23	21.76	10%
E08000007	00BS	Stockport	18.88	19.1	9%
E08000009	00BU	Trafford	17.05	15.38	3%

Source: Local Government and Communities

6.0 2018/19 Reviews by CDOPs

6.1 Closed Cases 2018/19

The four CDOPs in GM completed reviews of 204 child deaths between 1st April 2018 and 31st March 2019. Table 4 below shows the breakdown across GM by local authority and CDOP area.

Bolton, Salford & Wigan CDOP closed the most cases (64) whilst Stockport, Tameside & Trafford CDOP closed the fewest, with 40 closed cases. Looking at individual local authorities (LAs), Manchester closed the most cases (47) with Trafford the fewest (10). The number of closed cases in each area is not the same as the number of deaths that occurred in 2018/19. Of the 2018/19 cases closed, a number of these deaths will have occurred in previous years and it is likely that these were subject to investigation (such as criminal proceedings, or serious case review) which can delay the closure of the case by the CDOP significantly. Some of the deaths notified in 2018/19 will not be closed within that year, therefore the rate of closed cases for 2018/19 has not been calculated as they cannot be interpreted without more information.

Data from Public Health England's (PHE) child health profiles show a small decline in child mortality for GM since 2010. However there is not a clear trend for the whole of GM, with some areas showing a levelling off or an increase. Given the small numbers involved it is impossible to tell whether this is random variation, different data collection methods in different areas or a real effect. Longer term monitoring of the data is needed to establish whether there is an underlying trend.

Table 4: Number and percentage of deaths (cases closed) across GM 2018/19

LA	Total Deaths Closed	Percentage of overall GM deaths (cases closed)	Closed cases per 10,000 populatio
Bolton	33	16%	4.88
Bury	12	6%	2.78
Manchester	47	23%	3.85
Oldham	14	7%	2.36
Rochdale	27	13%	5.12
Salford	16	8%	2.83
Stockport	17	8%	2.69
Tameside	10	5%	1.99
Trafford	13	6%	2.32
Wigan	15	7%	2.19
Greater Manchester	**204**	100%	3.19
Bolton, Salford, Wigan	**64**	31%	3.32
Bury, Oldham & Rochdale	**53**	26%	3.41
Manchester	**47**	23%	3.85
Stockport, Tameside & Trafford	**40**	20%	2.36

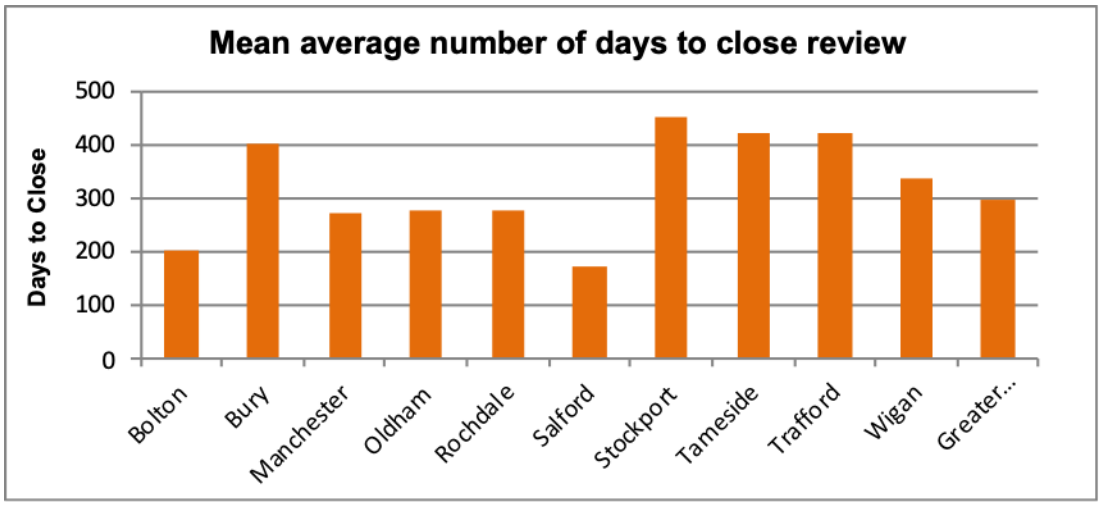
Source: GM CDOPs 2018/19

6.2 Duration of Reviews

The duration of a review is the length of time it takes from the date of notification of death until the review is closed and it is recorded as the number of days. Complex cases that involve agencies such as the Coroner or the Crown Prosecution Service (CPS) will take much longer to close as a CDOP will not review these cases until the relevant authorities have completed their investigations, such as a Serious Case Review (SCR). In these cases it can potentially take years for a case to be closed. There are other factors which can lead to variation in the length of time that different CDOP areas take to review cases; the amount of information that each CDOP requires before opening a review, the speed with which other local agencies notify the CDOP of the death and the time that it takes to gather all the of the relevant information from the external agencies involved.

During 2018/19 Bolton, Salford and Wigan CDOP closed the most cases (64). The longest duration of review was 2,328 days, with the shortest lasting 31 days. The average duration of review for 2018/19 was 297 days across GM.

Chart 1: Mean number of days to close a review (from date of death) by Local Authority (2018/19)



Source: GM CDOPs 2018/19

The different CDOP area is not the only factor that can affect the length of time a review takes. Nationally, it is recognised that cases with potentially modifiable factors, on average, take longer than those without[5] probably because these tend to be more complex cases that can require further investigation.

The cause of death can also effect the duration of the review, so a death involving trauma and other external factors is likely to require more extensive investigation and data collection than a death due to a chronic medical condition which may have been expected.

In 2018/19 the longest average duration of reviews was for Deaths by Suicide or Deliberate Self-harm (248 days), and then Chronic Medical Condition (238 days).

The shortest average duration of review was seen for deaths due to Infections (192 days), and then deaths due to Acute Medical or Surgical Conditions (203 days). This could reflect the fact that deaths in these categories are less likely to involve external agencies, and due to the nature of the deaths,

death certificates may be able to be completed and post-mortem examinations avoided. However, again the absolute numbers are small. All the data on average duration of review by category is summarised in Table 5 below. Categories which include less than 5 cases, and the next smallest category, have been obscured with an asterisk (*).

Table 5: Reviews completed in 2018/19 by duration of review and by category

Category	Closed cases	Average	Minimum days	Maximum days
a. Deliberately inflicted injury, abuse or neglect	*	223	0	2328
b. Suicide or deliberate self-harm	*	248	0	685
c. Trauma and other external factors	13 (6%)	214	0	798
d. Malignancy	16 (8%)	205	0	452
e. Acute medical or surgical condition	14 (7%)	203	0	917
f. Chronic medical condition	8 (4%)	238	0	738
g. Chromosomal, genetic and congenital anomalies	41 (20%)	207	0	562
h. Perinatal / neonatal event	66 (32%)	218	0	1784
i. Infection	17 (8%)	192	0	819
j. Sudden unexpected, unexplained death	20 (9%)	208	0	804

Source: GM CDOPs 2018/19

6.3 Notified Deaths 2018/19

The number of notified deaths across GM decreased in 2018/19 to 217 (from 250 in 2017/18), with Manchester having the highest proportion of these (26%) and Bury having the lowest (6%). Given the wide variation in population size for local authorities across GM it is necessary to adjust these figures to a rate before interpreting them. The rates of child death notifications per 10,000 of the under 18 year old population have been calculated to allow for meaningful comparison across GM.

In 2018/19 Manchester had both the highest crude number of notified deaths and the highest rate at 4.59 deaths per 10,000 <18 population. The next highest rates were seen in Oldham and Tameside with 3.53 and 3.38 deaths per 10,000 under 18 year old population respectively. Trafford had the lowest rate of notified deaths in GM for the second year in a row (2.67 deaths per 10,000 <18 population). It is hard to draw conclusions for the variation in child death rates across GM; it is notable that Manchester is the most deprived local authority in GM and Trafford the least, but the absolute numbers are sufficiently small that any variations could be due to chance.

Table 6: Number, percentage and rate per 10,000 of notified deaths across GM, 2018/19

LA	Total Deaths Notified (number)	Percentage of overall GM deaths	Population 0-17 yrs	Notified cases per 10,000 population
Bolton	22	10%	67,670	3.25
Bury	14	6%	43,142	3.25
Manchester	56	26%	121,962	4.59
Oldham	21	10%	59,416	3.53
Rochdale	17	8%	52,689	3.23
Salford	18	8%	56,566	3.18
Stockport	17	8%	63,141	2.69
Tameside	17	8%	50,223	3.38
Trafford	15	7%	56,087	2.67
Wigan	20	9%	68,388	2.92
Greater Manchester	**217**		639,284	3.39
Bolton, Salford, Wigan	**60**	28%	192,624	3.11
Bury, Oldham & Rochdale	**52**	24%	155,247	3.35
Manchester	**56**	26%	121,962	4.59
Stockport, Tameside & Trafford	**49**	23%	169,451	2.89

Source: GM CDOPs 2018/19

6.4 In-Year Closed Cases (by CDOP)

As previously discussed above, not all cases will be closed in the same year that the death was notified. In GM in 2018/19, 34% of cases were closed in the same year they were notified.

There are also geographical variations between the CDOP areas, in 2018/19 Bolton, Wigan and Salford closed the highest proportion of cases in year (45%) compared to Stockport, Tameside and Trafford which only closed 10% in year.

There is not a clear explanation for these rates of variation, it could be due to the number of cases subject to investigation, differences in how data is recorded in different areas over time, random variation or it might simply reflect how the complexity of the cases reported varies over time and place.

6.5 Causes of death

There are ten nationally defined categories that a CDOP can use when reviewing a death and each case must be assigned to one of these categories. It is a hierarchical list, so if more than one category could reasonably be applied, the highest up on the list should be given.

1. Deliberately inflicted injury, abuse or neglect
2. Suicide or deliberate self-harm
3. Trauma and other external factors
4. Malignancy
5. Acute medical or surgical conditions
6. Chronic medical condition
7. Chromosomal genetic and congenital anomalies
8. Perinatal/neonatal event
9. Infection
10. Sudden unexpected, unexplained death

Having nationally defined categories and standards makes it possible to compare CDOP data from across the country. The chairs and managers of the four GM CDOPs regularly discuss a small number of cases in order to ensure that all of the panels are applying the standards in a consistent way.

The majority of the 204 cases closed in GM in 2018/19, occurred in early life and resulted from events around the time of birth (perinatal/neonatal event) or from conditions which pre-date birth such as genetic and congenital anomalies. This is consistent with the previous year's findings.

6.5.1 Trend Data

In 2018/19, the greatest proportion of deaths occurred due to a perinatal/neonatal event (category 8) followed by chromosomal genetic and congenital anomalies (category 7).

The number of deaths falling into other individual categories are very small, meaning that there is too much variation from year to year to establish clear trends. The table below demonstrates trends in the category of death from 2013/2013 to 208/2019. Categories with small numbers (between 1 and 5) have been obscured with an asterisk (*). Where only one category has a count of between 1 and 5, the next smallest category during that year has also been obscured.

Table 7: Category of death by number and percentage for 2012/13, 2013/14, 2014/15, 2016/17, 2017/18, 2018/19

Form C Category	2012/2013		2013/2014		2014/2015		2015/2016		2016/2017		2017/18		2018/19	
a. Deliberately inflicted injury, abuse or neglect	*	*	*	*	*	*	0	0%	0	0%	*	*	*	*
b. Suicide or deliberate self-harm	11	4%	*	*	*	*	7	29%	6	3%	*	*	*	*
c. Trauma and other external factors	*	*	10	5%	14	5%	15	63%	16	7%	15	5%	13	6%
d. Malignancy	12	4%	20	9%	18	7%	15	63%	15	6%	20	7%	16	8%
e. Acute medical or surgical condition	16	6%	20	9%	*	*	12	50%	12	5%	11	4%	14	7%
f. Chronic medical condition	11	4%	12	6%	10	4%	11	46%	11	5%	16	6%	8	4%
g. Chromosomal, genetic and congenital anomalies	70	26%	50	23%	68	26%	56	24%	56	24%	67	24%	41	20%
h. Perinatal/neonatal event	97	37%	81	38%	97	37%	78	33%	78	33%	102	37%	66	32%
i. Infection	18	7%	*	*	12	5%	18	75%	18	8%	12	4%	17	8%
j. Sudden unexpected, unexplained death	20	7%	10	5%	19	7%	24	100%	24	10%	19	7%	20	9%

6.5.2 Cause of Death by Ethnicity

All closed cases in GM should have data recorded on their ethnicity. This is classed as either White British or Black and Minority Ethnic (BME). In GM as a whole, for the under 18 year old population, 75% identify as White British and 25% as BME[5].

The small numbers demonstrated in most of the categories prevent meaningful analysis, however, BME groups are over represented in both perinatal / neonatal events and chromosomal / genetic / congenital conditions, with 48% and 51% of deaths in these categories despite having only 25% of the population. The BME data is not further subdivided into different populations so it is not possible to tell if particular communities are more affected by these issues. However, consanguineous marriages are known to increase the risk of congenital abnormalities[7], so it may follow that communities where consanguineous relationships are more likely to take place may suffer a disproportionate burden of these cases. The increased risk of perinatal / neonatal events and chromosomal / genetic / congenital conditions does represent a clear health inequality for the BME population in GM.

6.6 Location of death

For the cases closed in 2018/19, 71% (145) occurred in hospital, this in part will reflect the high proportion of deaths from medical causes. The second most common location of death was the home (20% of cases (41)). There is some variation between local authorities across GM in terms of the proportion of deaths occurring in the home) but the absolute numbers are very small. In the case of deaths in the home, these end to represent either sudden deaths or those in children on an end of life pathway where families choose for their child to die at home.

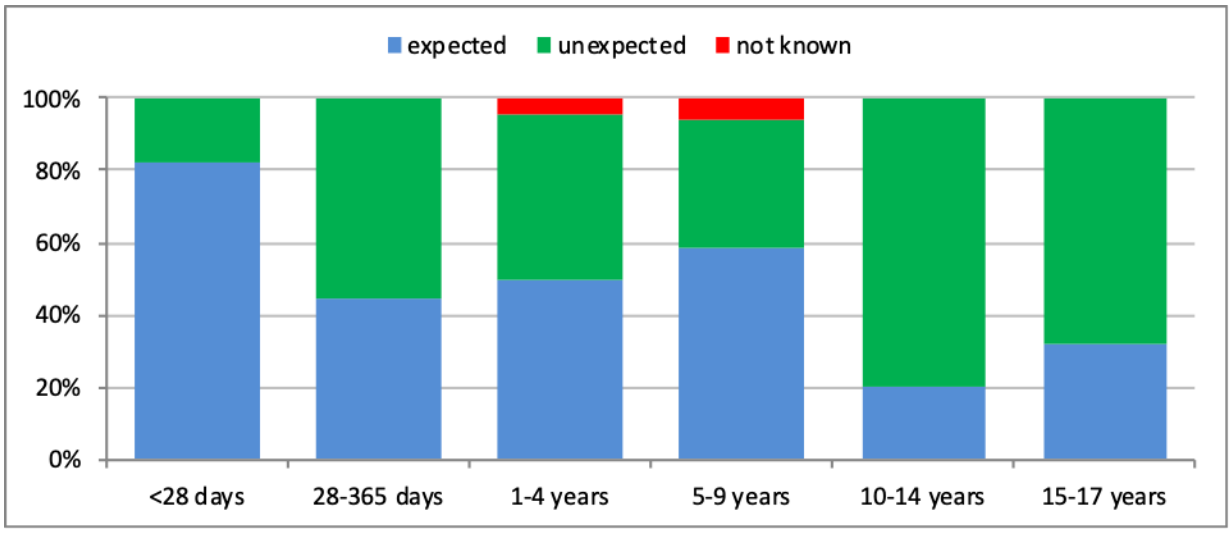
6.7 Expected verses unexpected deaths

Each CDOP will classify cases as either an expected or unexpected death. For 2018/19, 58% of cases were classified as expected, This is in line with the last 5 years, where the overall proportion of deaths categorised as 'expected' has remained stable (60-69%).

The proportion of deaths which are expected or unexpected varies across the age bands, with more expected deaths occurring within the neonatal period. This reflects the fact that deaths in the first year of life are often due to the complications of prematurity or from congenital conditions, whereas older children are more likely to be accidental or trauma related and therefore tend to be unexpected. However, in 2018/19 (similar to the year before), there was also a high proportion of expected deaths in the 1-4 year and 5-9 year age categories. It has been suggested that some improvements have been made in medical and social care of children with known life-limiting conditions, meaning more children may survive infancy and live longer. This may increase the overall population of children with these conditions, meaning numbers of deaths could stay the same but rates of death in that population may reduce. It may also lead to a change in the age breakdown of deaths of children with life limiting conditions.

[5] Source: ONS 2015 mid-year estimate and 2011 Census data

Chart 2: Percentage child deaths expected and unexpected by age group 2018/19



Source: GM CDOPs 2018/19

6.8 Potentially modifiable risk factors

In reviewing the death of each child, the CDOP considers factors which are potentially modifiable in a number of different domains (the child, the family and environment, parenting capacity, and service provision). Once identified, the CDOP can consider what action could be taken locally and what action could be taken at a regional or national level to prevent future deaths. The guidance defines potentially preventable child deaths as those in which modifiable factors may have contributed to the death. In line with the Department for Education, the CDOP categorises each case under one of the following:

1. **Modifiable factors identified**
   The panel have identified one or more factors, in any domain, which may have contributed to the death of the child and which, by means of locally or nationally achievable interventions, could be modified to reduce the risk of future child deaths

2. **No Modifiable factors identified**
   The panel have not identified any potentially modifiable factors in relation to this death

3. **Inadequate information upon which to make a judgement**
   NB this category should be used very rarely.

Nationally, the percentage of reviews which were closed and identified as having modifiable risk factors was 27%[6] in the year ending March 2017 (the most recently published data), which is an increase from 24% in 2014/15.

[6] 4. **Department of Education.** *Child Death Reviews – Year ending March 2017.* London : s.n., 2017

The CDOP analyses any relevant environmental, external, medical or personal factors that may have contributed to the child's death under the following headings.

0 - Information not available

1 - No factors identified or factors identified but are unlikely to have contributed to the death

2 - Factors identified that may have contributed to vulnerability, ill-health or death

3 - Factors identified that provide a complete and sufficient explanation for the death (This category will no longer exist in the new analysis forms).

Of the 204 cases closed across GM in 2018/19, there were modifiable factors identified in 79 deaths (39%), which is similar to the findings from 2017/18 (40%). There were approximately 89 different issues related to the 79 cases. Smoking was still the largest potentially modifiable factor (24 cases), followed by obesity (19). Access to health care or poor care management was the 3rd largest modifiable factor (11) followed by substance misuse (10).

Table 10, shows the proportion and number of closed cases in each CDOP in which modifiable factors were identified. In all CDOP areas apart from Bolton, Salford and Wigan, the proportion of cases with modifiable factors decreased slightly in 2018/19, which differs to the pattern seen last year where there was a slight increase in all areas. These statistics have to be interpreted with caution due to the small numbers involved.

There is an element of subjectivity in deciding whether modifiable factors are present or not which could explain some of the variation between the four CDOP areas. It is also possible that areas could change their approach over time. The variability seen from year to year in the different areas does not indicate a consistent trend, but the annual data reflects cases closed in that year, this will include deaths occurring over a number of years which could mask any change in approach over time.

Table 8: Percentage and number of child deaths in each CDOP area in which modifiable factors were felt to be present

CDOP Area	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19
Bolton, Salford and Wigan	39% (34)	28% (13)	26% (17)	38% (21)	34% (23)	35% (29)	44% (28)
Bury, Oldham and Rochdale	21% (15)	30% (17)	25% (20)	22% (16)	41% (21)	46% (33)	40% (21)
Manchester	29% (16)	20% (10)	18% (15)	29% (16)	27% (17)	34% (21)	32% (15)
Stockport, Tameside and Trafford	18% (10)	27% (17)	31% (25)	42% (21)	29% (14)	47% (27)	38% (15)

Source: GM CDOPs 2016/17

Modifiable factors identified by the CDOPs included (in order of frequency):

- Smoking
- Obesity
- Access to appropriate healthcare
- Substance misuse
- Unsafe sleeping
- Safeguarding
- Housing issues / home environment
- Gestational diabetes
- Domestic abuse
- Mental health
- Consanguinity

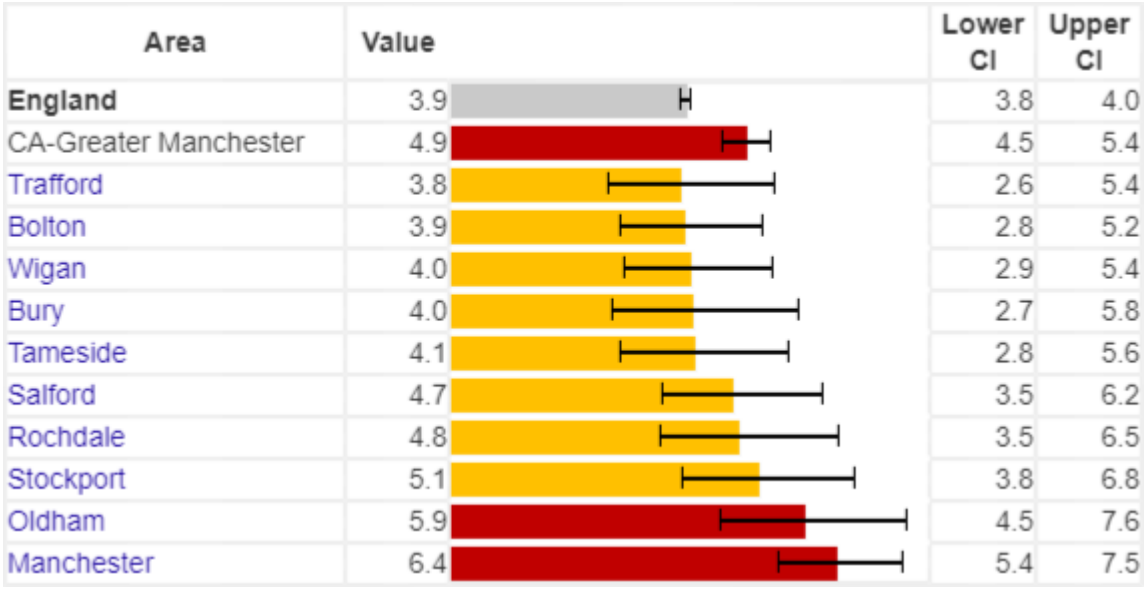
6.9 Neonatal and infant deaths

6.9.1 Infant Mortality Rates

Infant mortality rates are published by the Office for National Statistics, and are available publicly on the Public Health England Fingertips website[7]. These are crude rates, per 1,000 live births, so are likely influenced by population and demographic differences. Due to the small numbers involved, the figures for three years are combined into one. Chart 3 (overleaf) demonstrates the infant mortality rate in each Greater Manchester borough from 2015-2017.

[7] https://fingertips.phe.org.uk/profile/child-health-profiles/data#page/3/gid/1938133228/pat/126/par/E47000001/ati/102/are/E08000008/iid/92196/age/2/sex/4

Chart 3: Infant mortality rate, per 1000 live births, by local authority, 2015-2017 (Source: Fingertips)



Area	Value	Lower CI	Upper CI
England	3.9	3.8	4.0
CA-Greater Manchester	4.9	4.5	5.4
Trafford	3.8	2.6	5.4
Bolton	3.9	2.8	5.2
Wigan	4.0	2.9	5.4
Bury	4.0	2.7	5.8
Tameside	4.1	2.8	5.6
Salford	4.7	3.5	6.2
Rochdale	4.8	3.5	6.5
Stockport	5.1	3.8	6.8
Oldham	5.9	4.5	7.6
Manchester	6.4	5.4	7.5

6.9.2 Overview of CDOP deaths by age

Across GM in 2018/19, 42% of all closed cases were neonates (under 28 days old) and 61% of all closed cases were infants (under 12 months old). This is similar to 2017/18 when the figures were 36% and 62% respectively. In previous years there has only been a small amount of variation in figures reported in the different age groups. The number of deaths is generally expected to reduce as age increases, and in GM the large majority of deaths were seen in the neonatal and infant categories with small numbers for all other ages.

6.9.3 Neonatal and Infant Categorisation of Death (0 – 364 days of life)

There were a total of 123 cases in this age category with around three quarters occurring in the first 28 days of life. The most common causes of death in the neonatal age group were Perinatal/neonatal event followed by Chromosomal, genetic and congenital anomalies and then Infection with 60, 14 and 6 cases respectively. There is however a different pattern of deaths between the two age bands. Unsurprisingly, perinatal/neonatal events was a far more common cause of death in neonates than older infants, with only 5 cases recorded over the age of 28 days. Sudden unexpected, unexplained deaths on the other hand were rare in neonates (<5 cases) but the most common cause of death in babies aged 28-364 days (15 cases).

Overall, congenital anomalies are the second most common cause of death for infants under 1 year old across GM, this reflects the situation for England as a whole. Nationally, congenital anomalies contribute approximately one third of the extra infant deaths experienced by lower socio-economic groups compared with the population as a whole, which is a clear health inequality[8].

[8] **National Perinatal Epidemiology Unit.** The contribution of congenital anomalies to infant mortality . Oxford : University of Oxford, 2010. Inequaliites in Infant Mortality Project Briefing Paper 4.

6.9.3 Gestation

Rates of infant mortality are higher in babies born prematurely compared to those born at term. In the majority of cases the excess deaths occur in the neonatal period, however, improvements in medical care mean that more premature babies are surviving the neonatal period. This has the effect of increasing the number of cases where prematurity is the cause of death recorded in infants up to 1 year old.

The categories of premature birth are:

- Extremely Premature (<26 weeks)
- Premature (26 weeks to <37 weeks)
- Full Term (37+ weeks)

Of the 85 neonatal deaths across GM, 59% (50) were in the extremely premature category with 21% (18) premature and 20% (17) at full term. This is unsurprising as gestational age has a significant effect on a neonate's chance of survival outside the womb and a foetus is not considered viable until after 24 weeks. (Please note, the numbers are not reported at local authority level as they are sufficiently low to be potentially identifiable.)

6.9.4 Low birth weight

Please note that this section refers only to cases closed that occurred when the child was less than 1 year old

Low birth weight (LBW) is recognised risk factor for infant mortality[9]. There are a number of risk factors for LBW including multiple births, smoking and maternal age, as well as gestation at delivery.

Of the infant deaths closed across GM in 2018/19 50% had a birth weight of less than 1500 grams, which is a slightly higher proportion than 2017/18 (47%). However, the data for this year is less complete than last year with no birth weight recorded in 2% of cases.

For the 161 deaths in the under 1 year age group, 69% had a birth weight of less than 2500 grams, which is higher than 2017/18 (63%).

Table 9: Birth weight categories (%)

	<1500g	1500g-2499g	2500g-3999g	4000g+	Not Stated
Greater Manchester	50%	19%	26%	3%	2%

Source: GM CDOPs 2018/19

[9] ONS (2015) Statistical bulletin: Childhood mortality in England and Wales: 2015.

6.10 Socio Demographic Characteristics

6.10.1 Age and Gender

The distribution of male and female child deaths is in line with recent years, with 60% of closed case deaths occurring in males (122) and 40% in females (82).

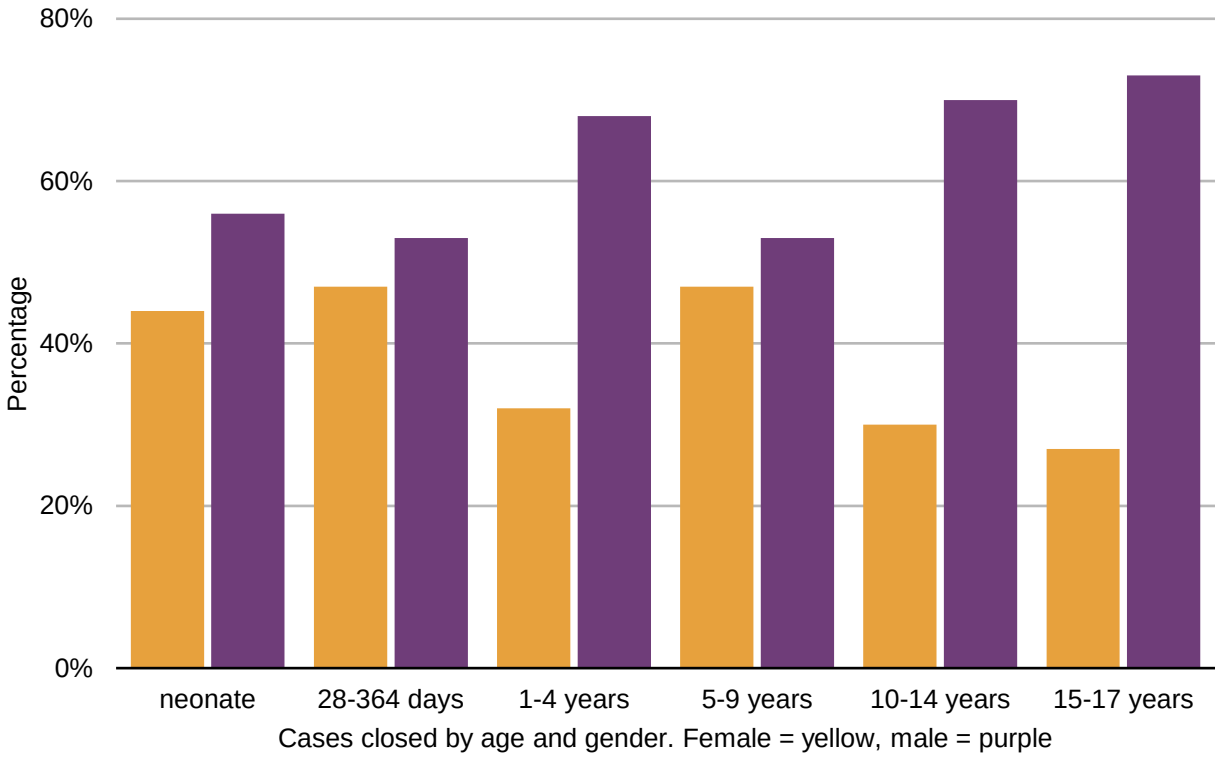
The difference in proportion of male and female deaths is most apparent in the 1-4, 10-14 and 15-17 age groups (see Chart 7). This differs to last year's data, when the gender difference was more pronounced in those aged under 1. Given the small numbers involved, it is possible that this change is due to random variation rather than a changing trend. Continuing to monitor the gender data going forward will be the only way to establish if this year is an anomaly in the longer term trend.

In the 15-17 age group in 2018/19, 38% of deaths in males were categorised as due to suicide or deliberate self-harm, compared to 17% for females in this age group. This is in line with national gender differences in suicide in the UK[10].

Looking at the gender data across local authorities, this pattern continues, as nine areas have more male deaths than female. However, the numbers involved are small.

Chart 4: Cases Closed by Age and Gender

Source: GM CDOPs 2018/19



[10] https://www.samaritans.org/about-samaritans/research-policy/suicide-facts-and-figures/

Table 10: Number of cases closed by gender by Local Authority 2018/19		
LA	**Males**	**Females**
Bolton	19	14
Bury	*	*
Manchester	26	21
Oldham	8	6
Rochdale	18	9
Salford	10	6
Stockport	10	7
Tameside	*	*
Trafford	6	7
Wigan	*	*
Greater Manchester	**122**	**82**

6.10.2 Ethnicity

Large inequalities in infant mortality rates exist between White and ethnic minority groups in England and Wales[11].

- Caribbean and Pakistani babies are more than twice as likely to die before the age of one as white British or Bangladeshi babies, in part due to a higher prevalence of preterm birth and congenital anomalies, respectively, in these particular groups.
- There is considerable heterogeneity between different ethnic groups in both the causes and the risk factors for infant mortality.
- Explanations for variations in infant mortality between ethnic groups are complex, involving the interplay of deprivation, physiological, behavioural and cultural factors.
- More research is needed in order to identify the pathways that lead to higher risks of infant death among black and other ethnic minority groups.

Nationally, reviews of deaths of children from a white background account for around two thirds of cases[12], which is higher than the proportion across GM in 2018/19, with 57% of in-year closed cases being from a white background. Ethnicity estimates have been calculated by applying total ONS mid-year population estimates for the <18 year old population to the ethnicity rate at the 2011 census for each area. As the estimate is specific to a particular year, the best measure of rates by ethnicity is looking at closed cases where notification was in the same year. This data is displayed in table 11

[11] Gray, R., Headley, J., Oakley, L., Kurinczuk, J. J., Brocklehurst, P. & Hollowell, J. (2009) **Inequalities in infant mortality project briefing paper 3.** Towards an understanding of variations in infant mortality rates between different ethnic groups. Oxford: *National Perinatal Epidemiology Unit.*

[12] **Department of Education.** *Child Death Reviews – Year ending March 2017.* London : s.n., 2017

below, along with the rates per 10,000 to account for varying population sizes. Please note, any potentially small numbers in a local authority area of between 1 and 5 have been labelled with an asterisk (*), to reduce any risk of identification.

This data indicates that 57% of in-year closed cases in 2018/19 were white (similar to previous years) and 43% were from BME populations. The data was reasonably complete, with five cases having no recorded ethnicity data. The proportion of BME cases is slightly higher than the national picture and indicates a substantial over-representation of BME populations in GM as BME groups make up only 25% of the under 18 year old population. Whilst differences in deprivation could account for some of this effect it is also possible that there are separate inequalities related to race such as additional barriers for BME women accessing antenatal care[13].

The inequality varies from area to area, so in Oldham, Trafford, Bolton and Rochdale, the child death rate was much higher amongst populations other than white British for 2018/19. However, this is not consistent year on year. Due to the small numbers involved, even small variations due to chance can make the figures look very different from one year to the next.

Table 11 : Cases closed by Ethnicity where date of notification occurred in year 2018/19

Local Authority	White		BME	
	Number	rate/10,000	Number	rate/10,000
Bolton	11	2.35	21	1.37
Bury	*	*	*	*
Manchester	23	4.19	24	3.34
Oldham	*	*	*	*
Rochdale	10	2.78	15	9.24
Salford	16	3.65	0	0.00
Stockport	*	*	*	*
Tameside	*	*	*	*
Trafford	*	*	*	*
Wigan	15	2.30	0	0.00
Greater Manchester	113	2.50	86	4.77

*Please note there were 5 cases where ethnicity was not recorded

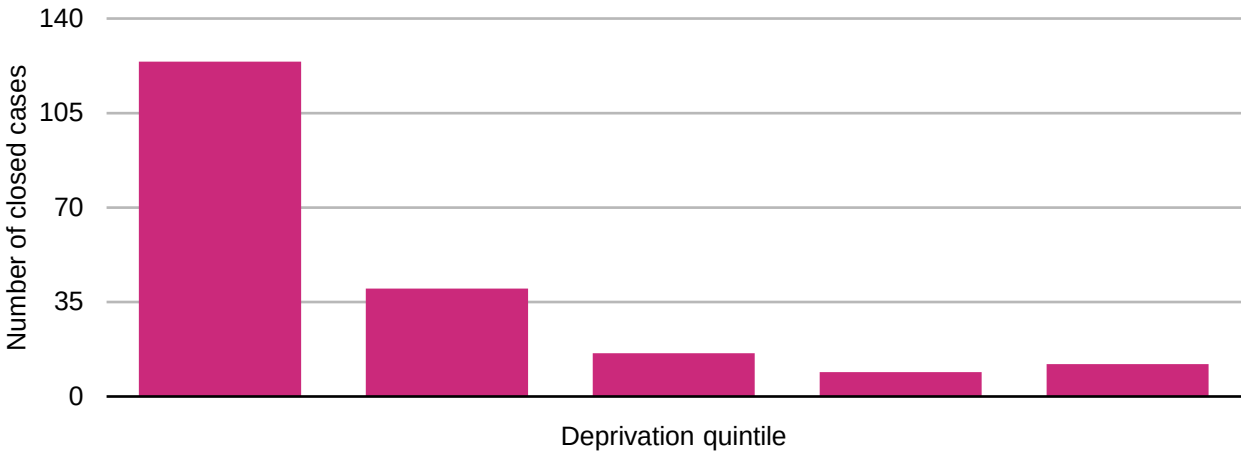
** The total number of deaths used in this table for GM was 199, excluding the 5 not recorded

[13] Hollowell. J, Oakley. L, Vigurs. C, Barnett-Page. E, Kavanagh. J & Oliver S. (2012) Increasing the early initiation of antenatal care by Black and Minority Ethnic women in the UK. Oxford: *National Perinatal Epidemiology Unit.*

6.10.3 Deprivation

The Index of Multiple Deprivation (IMD) is a widely used, area-based score that combines a number of markers to give an overall measure of deprivation. IMD across GM has been previously discussed in section 5.2. In Greater Manchester, 37% of the 0 to 18 population live in the most deprived quintile (quintile 1); in 2018/19, 63% of the child deaths in GM were from this quintile. This is similar to 2017/18, where 61% of child deaths were from this quintile. There is a consistent trend over recent years of higher rates of child deaths in the most deprived groups. Chart 5 shows the number of closed cases by deprivation quintile, demonstrating a much higher risk for those in the most deprived two quintiles.

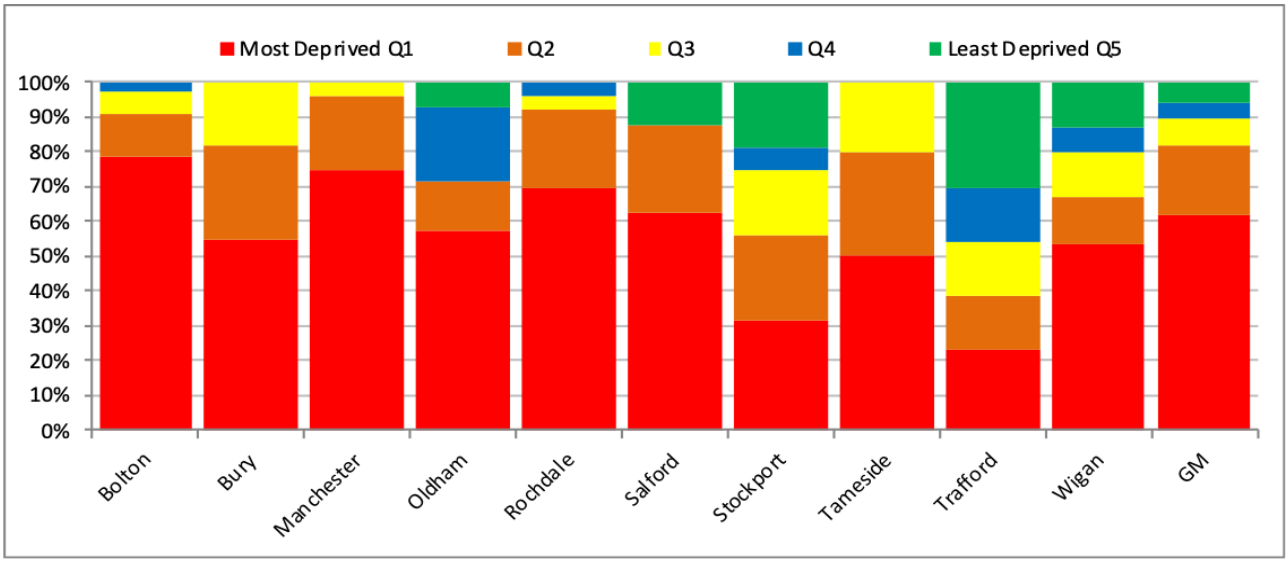
Chart 5: Number of cases closed by deprivation quintile 2018/19



Source: GM CDOPs 2018/19 & IMD 2015

Chart 6 below shows the average IMD score for each local authority and the number of closed cases. There is some variation but, generally, local authorities with higher (more deprived) IMD scores have higher numbers of closed cases. As this data is not adjusted for the different population sizes of these areas it can only show a potential correlation between deprivation and child mortality.

Chart 6: Proportion of closed cases 2018/19 and deprivation quintile by Local Authority



Source: GM CDOPs 2018/19 and IMD 2015

6.11 Smoking status of the mother

Whilst smoking is always hazardous to health, it is associated with worse outcomes in pregnancy for mother and child. These were described by the Royal College of Physicians[14] as an increased risk of complications in labour, as well as an increased risk of miscarriage, still birth, low birth-weight and sudden unexpected death in infancy. Maternal smoking is also estimated to increase infant mortality by approximately 40%[15].

Public Health England (PHE) uses smoking at time of delivery (SATOD) as a national measure to record rates of smoking in pregnancy. The most up to date figures available for this measure are from 2017/18[16] and show an average SATOD for England of 10.8% and 12.6% for Greater Manchester. The figures for GM show that 7 out of 10 local authorities are above the England average. This shows that smoking in pregnancy is a considerable problem for GM. Two of the areas in GM under the national average were the least deprived local authorities, Trafford and Stockport, which recorded rates of 6.7% and 10% respectively. This reflects that tobacco use is strongly linked to deprivation and constitutes another health inequality. However Manchester also had a rate of 10.7, which was just under the England average.

For 2018/19 smoking was deemed to be relevant in 23 closed cases for infants under the age of one year. This appears to be a decrease from 38 in 2017/18. The proportion of cases in which smoking was a factor ranges from 0-50% across the ten local authorities, demonstrating huge inter-borough variation, but the absolute numbers are small only ranging from 0-6.

6.12 Raised Body Mass Index

Maternal obesity is known to be associated with worse pregnancy outcomes and higher rates of stillbirth[17]. Maternal obesity is also strongly associated with socioeconomic deprivation, so mothers in more deprived groups are more at risk of these negative outcomes. Since 2015/16 data on maternal BMI has been collected for all cases where the child was aged less than 1 year old, and it was agreed that a BMI of over 30 should be considered as a modifiable factor in cases categorised as perinatal / neonatal deaths.

In 2018/19 there were 19 cases where maternal obesity was identified as a modifiable factor, this was second only to smoking (24) as a leading modifiable factor in GM. This is a decrease from 2017/18 where obesity was identified as a modifiable factor in 39 cases, but similar to the data in 2016/17. Given that there are rising rates of obesity nationally and across GM, it is important that this data continues to be gathered in future years so that the trend can be monitored. As with maternal smoking data, CDOPs should promote data collection requirements among front line professionals to try and capture as much health-related data as possible.

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[14] J R Coll Physicians Lond. **1992** Oct;26(4):352-6. **Smoking and the young**

[15] NICE Guidance PH26 (2010) Smoking: stopping in pregnancy and after childbirth. https://www.nice.org.uk/guidance/ph26/chapter/2-public-health-need-and-practice

[16] http://fingertips.phe.org.uk/search/smoking

[17] Maternal obesity in the UK: findings from a national project (2010) UK. Centre for Maternal and Child Enquiries

6.13 Other factors

6.13.1 Consanguinity

From 2015/16 it was agreed that to standardize recording between different CDOPs, consanguinity would be considered as a modifiable factor if a second child was born with genetic anomalies to consanguineous parents. In 2018/19, consanguinity was recorded as a modifiable factor in a small number of cases (<5), which was a decrease from last year (3%) and a decrease from 2017/18 (4%).

This is a sensitive and complex topic because some cultures have higher rates of marriage amongst relatives than others. It can be argued that different cultural attitudes to screening and termination of pregnancy may affect the rates of congenital anomalies[18,19], however given that not all of the conditions that the NHS screens for are fatal conditions (e.g. Down syndrome) this is unlikely to provide a full explanation of the difference. Some groups, such as women who are born outside of the UK, may experience additional barriers to accessing antenatal care and education and so may miss out on measures such as folic acid supplementation which can reduce the risk of some defects.

Parents from all social groups require genetic counselling services to be widely available for couples with a family history or past history of pregnancy affected by congenital anomalies[20] so that they have the information and support they need to plan their families.

6.13.2 Parental Alcohol/Drug Use

Alcohol and/or drug use by parents was identified as a potentially modifiable factor in just under 5% of cases (10) which is the same as last year (13). Although not always a direct risk factor, parental drug or alcohol use is associated (although not proven to be causal) with higher rates of sudden unexplained deaths in childhood and co-sleeping.

6.13.3 Co-sleeping

Co-sleeping was identified as a potentially modifiable factor in just under 4% of closed cases (8) across GM in 2018/19. This is a similar proportion of cases to last year (4%) however, co-sleeping persistently appears as a key modifiable factor in the years since this report began even if the numbers are small. This suggests that more parental education around safe sleeping for babies would be helpful to ensure that the key messages are understood and acted upon.

6.13.4 Domestic Violence

In GM, domestic violence and abuse was deemed a relevant modifiable risk factor in a small number of closed cases (<5) for 2018/19. This is similar to previous years. However, it is difficult to draw conclusions around trends with such small numbers.

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[18] Hawkins, A., Stenzel, A., Taylor, J., Chock, V. & Hudgins, L. (2012) Variables Influencing Pregnancy Termination Following Prenatal Diagnosis of Fetal Chromosome Abnormalities. *Journal of Genetic Counselling.* 22(2) pp. 238-248

[19] Gil, M., Giunta, G., Macalli, E., Poon, L. & Nicolaides, K. (2015) UK NHS pilot study on cell-free DNA testing in screening for fetal trisomies: factors affecting uptake. *Ultrasound in Obstetrics and Gynecology.* 45(1) pp. 67-73. DOI: 10.1002/uog.14683

[20] **National Perinatal Epidemiology Unit.** The contribution of congenital anomalies to infant mortality . Oxford : University of Oxford, 2010. Inequaliites in Infant Mortality Project Briefing Paper 4.

6.13.5 Access to Appropriate Healthcare

Access to appropriate healthcare includes a wide range of factors relating to the mother or child receiving appropriate medical and maternity care. This can include factors such as parents being unable or unwilling to seek medical help when advised, as well as failings within the system such as medical errors or factors around service provision. Access to appropriate healthcare was identified as a modifiable factor in 5% of cases (11) for 2018/19, which was similar to the numbers in 2017/18 (14).

7.0 Discussion and Conclusions

This report focuses on the cases reviewed and closed by CDOPs during 2018/19. The number of cases notified in 2018/19 is referred to but full details are only available to analyse for cases that have been closed. As the overall number of child deaths for GM is small compared to the size of population (204 closed cases for the whole of GM), all of the analysis has to be treated with some caution as variation between areas or over time may be due to chance.

Whilst the absolute numbers are small, each child's death represents many years of potential life lost and a huge loss to the family and community involved. There is a need to ensure that all those affected have access to timely and appropriate support services, including specific provision for bereaved children.

Both the number of closed cases and the number of notified cases have decreased slightly in 2018/19 compared to those from the year before. There is not a clear trend in the number of child deaths across GM over the last few years as the small variations seen from year to year can be explained by chance.

The large majority of child deaths in GM occurred in the first year of life; 42% of closed cases occurred in the first 28 days and 60% in the first 12 months. This is a decrease on last year, when deaths in infants aged under 1 year accounted for 65% of closed cases, but the main causes of these deaths remain the same. Most were due to events around the time of birth, perinatal or neonatal events, with the next most common issue being genetic or congenital conditions, which would have been present from before birth.

The older age groups: 1-4, 5-9, 10-14 and 15-17 account for 11%, 8%, 10% and 11% of deaths respectively, which does indicate a slightly wider spread of deaths throughout the age groups than in previous years, but the absolute numbers are too small to draw conclusions. From all the closed cases in 2018/19, most deaths (79%) were classed as 'medical' causes, i.e. acute medical, chromosomal, chronic medical, malignancy, perinatal / neonatal event or infection. Across GM 82% of neonatal deaths were expected, falling to 45% of infants aged 28-364 days. However, in children aged 10-14 years, only a small number of deaths were expected which reflects a greater number of deaths from unexpected causes, such as health-related causes of death and trauma in this age group. Overall, 79% of closed cases were attributed to medical causes. The high proportion of deaths relating to the child's health mean that the provision of high quality maternity and paediatric care across all the local authorities is essential and work needs to ensure services work together. Access to appropriate healthcare was listed as a modifiable factor in 11 of the closed cases from 2018/19 but this figure was higher in 2017/18 and should be considered, as deprived or vulnerable groups are likely to face greater barriers to accessing care.

The proportion of cases where potentially modifiable factors were identified has continued to remain above the national average, at 39% in Greater Manchester. Whilst potentially modifiable factors are not often directly causal, they reflect factors in the child's situation that make poorer health outcomes more likely and reducing potentially modifiable factors, such as parental smoking, for the population as a whole would be likely to reduce child mortality. This is why it is important to identify the factors associated with higher rates of childhood deaths, to try and reduce their prevalence in the population.

8.0 Recommendations

The following should be considered by each CDOP panel and the Public Health lead for children's health. A coordinated GM response is recommended:

1. This report means that there are now seven sets of data and analysis which are available to review and combine into an aggregate report. This should help to identify trends, and having larger numbers to work with should reduce the impact of random error in the data. This will be a large piece of work and will need greater resources than for the stand alone annual report, but it should be possible to identify a group of public health registrars to carry out this work.

2. Health inequalities in the distribution of child deaths remain a concern. The BME population remains at increased risk of childhood mortality and the proportion of deaths in the most deprived groups is consistently high. Although data is now being collected for more BME subgroups by CDOP panels, meaningful analysis may take several years as the small numbers involved would mean that aggregate will be required. However, further analysis on these subgroups should be conducted as it may help to identify further patterns and areas for intervention.

3. A higher proportion of deaths occurred in males (60%) compared to females (40%). Although the age at which this disparity was most apparent has changed since 2017/18, possibly due to the small numbers of cases involved, this may require further investigation. Suicide prevention, especially in males age 15-17, should be a public health and CDOP priority.

4. As in previous years, smoking remains a key modifiable factor for child deaths across GM, with the proportion of cases where smoking is identified as a relevant factor higher than the rate of smoking in pregnancy. This has been recognised in the Greater Manchester Population Health Plan which is putting in place a GM evidence-based approach to reducing smoking, particularly in pregnancy. CDOP data and action plans should be linked to this and allow an opportunity to review the impact of smoking on deaths through the in depth CDOP review process. Work to reduce smoking prevalence across Greater Manchester should continue.

5. GM CDOPs should consider any emerging evidence from other areas and from international research to identify any risk factors which have not received the focus that others have, including areas for future data collection and analysis. In particular, it may be worthwhile recording the relevance (1,2,3) for factors which are not (yet) on the national data analysis proforma but which CDOPs currently record, such as physical health or learning disability.

The above recommendations should be followed up at the next GM CDOP panel meeting and CDOP panels and public health leads should continue to conduct reviews and monitor the number of child death notifications.

Appendix 1: Summary of Gender, Ethnicity and Deprivation Data for 2018/19

Characteristic	Number of child deaths for Greater Manchester 2018/19	Greater Manchester <18 year old Population (%)
Sex		
Male	122 (60%)	51%
Female	82 (40%)	49%
Undetermined	0 (0%)	
Ethnicity		
Asian/Asian British	52 (25%)	White (72%)
Black/Black British	17 (8%)	BME (29%)
White British	109 (53%)	
Other/mixed	22 (10%)	
No data	<5 (<5%)	
Deprivation		Approximately 20% of the GM population live in the most deprived 10% quintiles
1 (most deprived)	124 (62%)	
2	40 (20%)	
3	16 (8%)	
4	9 (4%)	
5 (least deprived)	12 (6%)	
No data	<5 (<5%)	

Appendix 2: Population and number of cases closed by CDOP panel (2012/2013 - 2018/19)

Area	0-17 population 2016	Number of cases closed in 2012/13	Number of cases closed in 2013/14	Number of cases closed in 2014/15	Number of cases closed in 2015/16	Number of cases closed in 2016/17	Number of cases closed in 2017/18	Number of cases closed in 2018/19
Manchester CDOP	**119,825**	**56**	**49**	**61**	**56**	**64**	**62**	**47**
Bury, Oldham & Rochdale CDOP	**153,144**	**72**	**57**	**81**	**74**	**48**	**71**	**53**
Bury	42,879	20	13	17	17	11	14	12
Oldham	58,802	25	20	28	28	24	31	14
Rochdale	51,463	27	24	36	29	13	26	27
Bolton, Salford & Wigan CDOP	**189,634**	**88**	**48**	**66**	**56**	**68**	**83**	**64**
Bolton	66,918	43	17	20	12	23	23	33
Salford	54,881	27	12	19	23	21	27	16
Wigan	67,835	18	19	27	21	24	33	15
Stockport, Tameside & Trafford	**166,675**	**52**	**62**	**54**	**50**	**48**	**58**	**40**
Stockport	62,372	18	18	14	20	21	24	17
Tameside	49,349	16	15	25	14	16	16	10
Trafford	54,954	18	29	15	16	11	18	13
Greater Manchester	**629,278**	**268**	**216**	**262**	**236**	**228**	**274**	**204**