Annual Report of Child Deaths in Greater Manchester, 2015/16

Report written by James Mallion with data analysis from Jacqui Dorman (Tameside MBC),edited by Jacqui Dorman

July 2016

1.0 Executive Summary

This report reviews data regarding all child deaths in Greater Manchester (GM), which a review was completed for during the period 1st April 2015 to 31st March 2016. Data is included from all four Child Death Overview Panels (CDOPs) in GM. Closed cases during the year, rather than notified cases, are the focus of this report as the closed cases represent a more complete dataset.

The findings from all under-18 child deaths are used to inform local strategic planning on how to best safeguard and reduce harm in children and to promote better outcomes for our children in the future.

The responsibility for determining the cause of death rests with the coroner or doctor who signs the death certificate, not the CDOP. The function of the CDOP is to evaluate information about the child's death, identify lessons to be learnt and inform an understanding of all child deaths at a national level.

Depending on the complexity of a case, the time from notification to closure can vary and may span more than one calendar year. This report only considers cases closed during 2015/16.

1.1 Key Findings for Greater Manchester

There were a total of 235 closed cases in 2015/16 with 246 notified deaths. The number of notified deaths is similar to the previous year, however closed cases represent around a 10% reduction from 2014/15.

The time taken from notification of death to closure was between 28 and 1587 days, with an average across GM of 234 days.

The majority of child deaths in GM occurred in early life with 64% of closed cases occurring in the first 12 months and 38% occurring in the first 28 days. Many of these resulted from events around the time of birth (perinatal/neonatal event) or from conditions which pre-date birth such as genetic and congenital anomalies. The remaining age brackets (1-4, 5-9, 10-14 and 15-17) account for similar numbers of deaths which are all low resulting in differences between them not being statistically significant. Of those cases closed in 2015/16 across GM, 112 deaths were classified as relating to the child's health (acute medical, chromosomal, chronic medical, malignancy or infection). Across GM, 17% of neonatal deaths and 44% of deaths among those aged 28-364 days were unexpected. In older children, deaths from unexpected causes such as road traffic collisions were more likely.

Overall, there were more deaths in male children across GM, with deaths of boys accounting for 58% of deaths. There were more deaths of boys in each age category except in category 10-14 years, where there were more female deaths than male, though only by one case. A similar pattern is seen in cause of death where there were a higher proportion of male deaths than female in each category apart from suicide/self-harm, though this is subject to very small numbers. The largest difference here was among death due to trauma and other external factors which was 75% males.

Across GM, modifiable factors were identified in 31% of closed cases (73) in 2015/16. This is higher than the national average of 24% and an increase from the 24% reported in 2014/15. The key modifiable risk factors identified were: parental smoking; co-sleeping; parental drug/alcohol use; and access to appropriate healthcare.

Of the 122 cases closed which had been notified in 2015/16, 60% of the children were from a white background which is equivalent to the national rate. Considering the rates among white and BME populations, there were 3.28 deaths per 10,000 0-18 year olds in the BME population, compared to 1.57 deaths per 10,000 0-18 year olds in the white population, representing a clear inequality.

In terms of deprivation, across GM 37% of the 0 to 18 population lie within the most deprived quintile, however, in 2015/16 59% of child deaths were from this quintile. This proportion in the most deprived quintile has increased in recent years from 43% in 2013/14. This may be partially due to improved recording of deprivation status but also represents a social gradient and health inequality in child mortality.

2.0 Introduction

This is the 4th Annual Report of Child Deaths in Greater Manchester. The process of reviewing child deaths was established in April 2008 and has continued to develop over that time. The report includes data on demographics, duration of review, cause of death, neonatal and infant deaths, characteristics and risk factors, represented at different geographic levels (local authority, CDOP, GM-wide).

This report aims to review child death data to make observations about causes and modifiable factors using information from the four GM CDOP panels. The intention is that this report will be used as a resource to drive public health action to promote child safety and well-being.

3.0 Background

Local Safeguarding Children Boards (LSCBs) in England have had a statutory responsibility for the child death review process since 2008 under the Local Safeguarding Board Regulations 2006.

Chapter 5 of Working Together to Safeguard Children 2015[1] identifies the process used by the CDOP stating that the LSCB must ensure the CDOP conducts a review of every death of a child who normally resides in that area.

The purpose of the child death review processes is to understand how and why children die, put in place interventions to protect other children and prevent future deaths.

The GM report brings together data from the four established CDOP panels across GM into one report. This provides larger numbers enabling a greater depth of analysis. It highlights key issues across GM and any differences between areas, with the intention that the ten local authorities work collectively to tackle safeguarding issues and reduce deaths in children.

As this is the 4th year of the report, there is some trend data available, however this is limited.

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]. These rates continue to fall. Many of the causes and determinants of childhood deaths are preventable[3]. However, there are still significant areas of concern:[4]

- The overall UK childhood mortality rate is higher than in some other Northern European countries.

[1] **Department for Education.** *Working Together to Safeguard Children.* London : Crown Copy Right, 2015. DFE-00130-2015.

[2] **Office of National Statistics.** *Childhood mortality in England and Wales 2014.* ONS. 2016. http://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/deaths/bulletins/childhoodinfantandperinatalmortalityinenglandandwales/2014

[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.

- 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 deaths 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.

5.0 Overview of Greater Manchester population aged under 18 years

Table 1 illustrates the geographical areas covered by each CDOP and their population sizes.

Table 1: Number of children aged under 18 years in each area of GM and its overseeing CDOP (ONS 2015 MYE Data)

CDOP	Under-18 Population Size
Bolton, Salford & Wigan	**187,753**
Bolton	66,374
Salford	53,838
Wigan	67,541
Stockport, Tameside & Trafford	**164,987**
Stockport	61865
Tameside	48985
Trafford	54137
Bury, Rochdale & Oldham	**151,813**
Bury	42653
Oldham	58305
Rochdale	50855
Manchester	**117,262**
Greater Manchester	**621,815**

Source: ONS 2016

5.1 Ethnicity

We can use ethnicity estimates from the 2011 census and apply these to the 2015 mid-year population estimates for each local authority to tell us the breakdown of the 0-18 population by ethnicity. This shows that six of the local authorities in GM have a lower proportion of the population that identify as White British than the North West average. Manchester has the lowest percentage White British population (see table 2 below).

Table 2: Estimated population by ethnic group for GM local authorities, mid-2015 population data applying 2011 census ethnicity breakdown

Area	White British		BME	
Bolton	48,055	72.4%	18,319	27.6%
Bury	35,146	82.4%	7,507	17.6%
Manchester	59,452	50.7%	57,810	49.3%
Oldham	37,024	63.5%	21,281	36.5%
Rochdale	36,107	71.0%	14,748	29.0%
Salford	46,570	86.5%	7,268	13.5%
Stockport	53,884	87.1%	7,981	12.9%
Tameside	41,784	85.3%	7,201	14.7%
Trafford	42,119	77.8%	12,018	22.2%
Wigan	64,569	95.6%	2,972	4.4%
Greater Manchester	464,710	75.0%	157,105	25.0%
North-West	1,282,511	84.3%	238,854	15.7%

Source: ONS 2016

5.2 Index of Multiple Deprivation (IMD)

The IMD changed in 2015 with an update from the 2010 scores. The methodology for calculating this has changed slightly, however there has been relatively little change in the scores across GM. Similar to previous years, six of the ten GM local authorities have higher IMD scores (more deprived) than the North West average. The same six also have a higher proportion of their population living in the most deprived areas in the country, than the North West average (see table 3 below). Manchester has the highest, with 41% of their population living in the most deprived areas in the country, while Trafford has the lowest with just 3% of their population living in the most deprived areas.

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	19.10	9%
E08000009	00BU	Trafford	17.05	15.38	3%
-	-	North West	27.11	28.04	20%

Source: ONS, 2015

6.0 2015/16 Reviews by CDOPs

6.1 Closed Cases 2015/16

The four CDOPs in GM completed reviews of 235 child deaths between 1st April 2015 and 31st March 2016. Table 4 below shows the breakdown across GM by local authority and CDOP area. Bury, Rochdale & Oldham CDOP closed the most cases (74) while Stockport, Tameside & Trafford CDOP closed the least (50). By local authority, Manchester closed the most cases (55) while Bolton closed the lowest number of cases (12). The rates of closed cases have not been calculated as they do not necessarily represent the number of deaths within the 2015/16 population in each area as some of them may have occurred in previous years and have taken a long time to close.

In general there has been a decline in child mortality across GM in recent years, however some areas have shown figures levelling off or even increasing. Between 2010 and 2014 Bolton, Bury, Manchester, Salford, Stockport and Tameside have all seen reductions in child mortality rates, however Oldham, Rochdale, Trafford and Wigan have all seen increases. There are several possible explanations for these figures including random variation (which is likely due to the small numbers being analysed), changes to data collection methods, or a real increase in child mortality in some areas and decrease in others.

Table 4: Number and percentage of deaths (cases closed) across GM 2015/16 by local authority and CDOP		
Local Authority	**Total Deaths Closed**	**Percentage of overall GM deaths (cases closed)**
Bury	17	7%
Rochdale	28	12%
Oldham	29	12%
Bury, Rochdale & Oldham CDOP	**74**	**31%**
Manchester	55	23%
Manchester CDOP	**55**	**24%**
Bolton	12	5%
Salford	23	10%
Wigan	21	9%
Bolton, Salford & Wigan CDOP	**56**	**24%**
Stockport	16	7%
Tameside	20	8%
Trafford	14	6%
Stockport, Tameside & Trafford CDOP	**50**	**21%**
Greater Manchester	**235**	**100%**

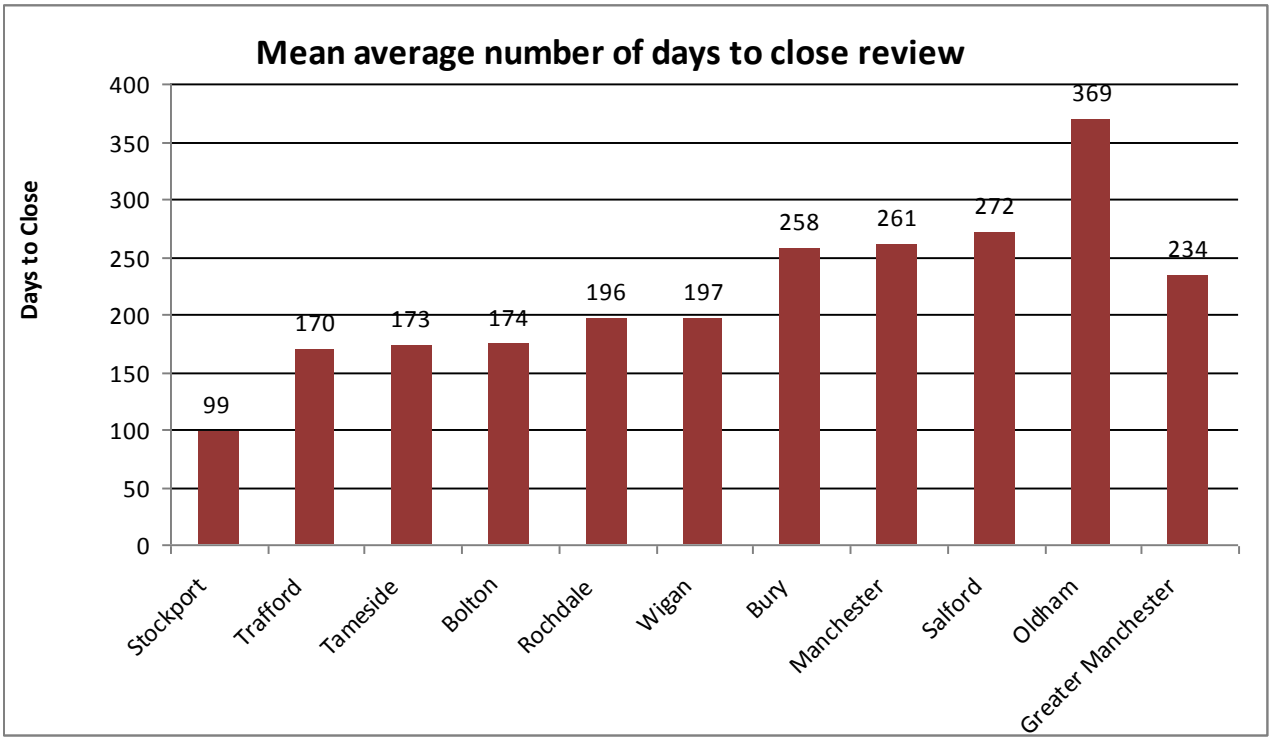
Source: GM CDOPs 2015/16

6.2 Duration of Reviews

A review is completed by a panel when enough information about the death is available to enable a review, and this has taken place. Duration of reviews is the time it takes from the date of death to the case being closed. There is variation in duration of reviews between different areas due to a number of factors: the information each individual CDOP requires before they will review a death; time taken for agencies to notify the CDOP of the death; time taken collating sufficient information from relevant agencies; whether cases are subject to investigations pending conclusion by the Coroner and/or Crown Prosecution Service (CPS) such as an inquest or Serious Case Review (these cases are anticipated to have a much longer duration of review, sometimes taking a number of years).

During 2015/16 Bury, Oldham and Rochdale CDOP closed the most cases (74). The longest time between death and the review being closed was 1,587 days and the shortest was 28 days (see chart 1 below). The average duration of review for cases closed in 2015/16 was 234 days across GM.

Chart 1: Mean number of days to close a review (from date of death) by Local Authority (2015/16)



Source: GM CDOPs 2015/16

As well as variations between CDOPs, the length of time for a review differs according to cause of death. Also, nationally reviews generally take longer if modifiable factors are identified in the death[5]. The data in table 5 below shows the longest average duration of reviews for Trauma and other external factors (category 3), (548 days); and Suicide or deliberate self-harm (category 2), (480 days). The shortest average duration of reviews was for Chromosomal, genetic and congenital anomalies (category 7), (132 days); and chronic medical conditions (category 6), (133 days). It is expected that causes of death in category three and two may require more information to be collected in order to conduct the review and may be more likely to lead to further investigations, both of which are factors which could substantially increase the length of the review. It should also be noted that substantial reductions in the average duration of reviews have been seen since 2014/15 in categories 7, 9 and 10.

[5] **Department of Education.** *Child Death Reviews – Year ending March 2015.* London : s.n., 2015

Table 5: Reviews completed in 2015/16 by duration of review and by category				
Category	**Closed Cases**	**Mean Average**	**Minimum Days**	**Maximum Days**
1. Deliberately inflicted injury, abuse or neglect	0 (0%)	n/a	n/a	n/a
2. Suicide or deliberate self-harm	5 (2.1%)	480	259	567
3. Trauma and other external factors	16 (6.8%)	548	91	1587
4. Malignancy	15 (6.4%)	138	66	219
5. Acute medical or surgical condition	12 (5.1%)	334	83	997
6. Chronic medical condition	11 (4.7%)	133	39	243
7. Chromosomal, genetic and congenital anomalies	56 (23.8%)	132	34	382
8. Perinatal/neonatal event	78 (33.2%)	188	28	951
9. Infection	18 (7.7%)	271	97	1070
10. Sudden unexpected, unexplained death	24 (10.2%)	373	147	770

Source: GM CDOPs 2015/16

6.3 Notified Deaths 2015/16

The number of notified deaths across GM during 2015/16 was 246, with Manchester having the highest proportion of these (23%) and Bury and Trafford having the lowest (6%). These proportions may reflect the population sizes of the respective areas rather than actual trends in child deaths, therefore the rates of child death notifications per 10,000 0-18 population have been calculated to account for population size. In 2015/16 Oldham had the highest rate of notifications (4.80 deaths per 10,000 <18 population) followed by Manchester (4.78 deaths per 10,000 <18 population) and Stockport (4.36 deaths per 10,000 <18 population). Trafford had the lowest rate of notifications (2.77 deaths per 10,000 <18 population). This demonstrates the importance of accounting for the size of the population as the rate in Oldham is higher than Manchester, despite it having half the total number of notified deaths (see table 6 below). Again, it is difficult to determine the reasons for higher or lower rates in different areas and, as we are dealing with relatively small numbers, it is possible these are random variations due to chance.

Table 6: Number, percentage and rate of notified deaths per 10,000 <18 population across GM, 2015/16				
LA	**Total Deaths Notified (number)**	**Percentage of overall GM deaths**	**Population 0-18 yrs**	**Notified cases per 10,000 population**
Bolton	23	9%	66,374	3.47
Bury	14	6%	42,653	3.28
Manchester	56	23%	117,262	4.78
Oldham	28	11%	58,305	4.80
Rochdale	18	7%	50,855	3.54
Salford	22	9%	53,838	4.09
Stockport	27	11%	61,865	4.36
Tameside	16	7%	48,985	3.27
Trafford	15	6%	54,137	2.77
Wigan	27	11%	67,541	4.00
Greater Manchester	**246**		**621,815**	**3.96**

Source: ONS and GM CDOPs 2015/16

6.4 In-Year Closed Cases (by CDOP)

While some cases are not closed until after the year in which they were notified, a large proportion are closed in the same year. Across GM there were 246 death notifications in 2015/16; 64% of which were closed before 31st March 2016. This has increased from the previous year as only 48% of notified cases were closed in-year in 2014/15. There were also large differences between different CDOP areas with Stockport, Tameside and Trafford CDOP closing 84% of their notified deaths in 2015/16, while Bolton, Salford and Wigan closed 40% of notified cases in 2015/16 (see table 7 below). It is difficult to determine the cause of the differences over time and between areas as there are many possible explanations. This could indicate more complex cases in areas where fewer cases are closed in-year but could also relate to data collection methods or random variations.

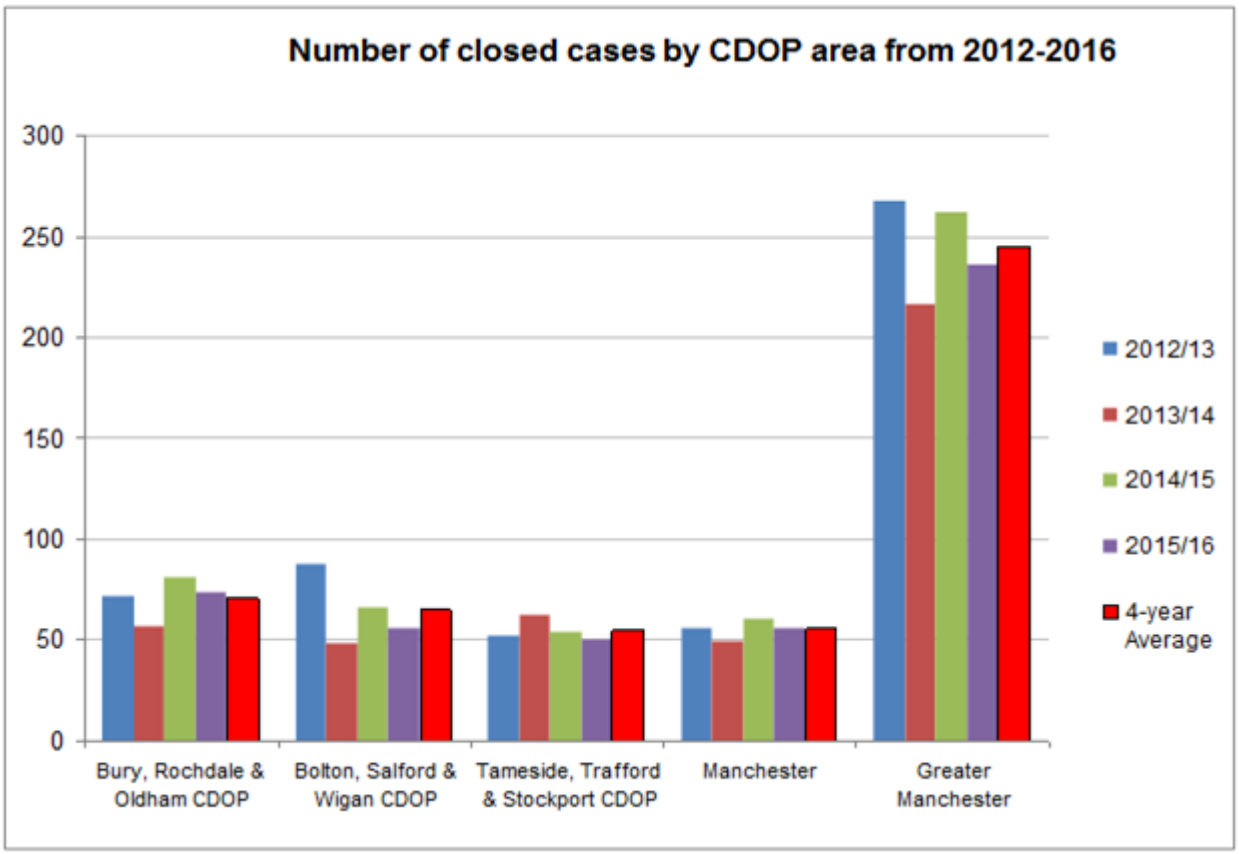
Table 7: Notified cases closed in year (2015/16)				
Area	Number Closed Cases 2015/16	Number of Notified Cases 2015/16	Number of 2015/16 notified cases closed in year	% closed in years 2015/16
Manchester	55	56	43	77%
Stockport, Tameside, Trafford	50	58	49	84%
Bury, Oldham, Rochdale	74	60	36	60%
Bolton, Salford, Wigan	56	72	29	40%
Greater Manchester	236	246	157	64%

Source: GM CDOPs 2015/16

Looking at trend data going back to 2012/13, there is variation year on year in the number of cases closed across GM and also in different CDOPs (see chart 2 below). The red column in the chart below shows the 4-year average number of cases closed in each CDOP. There is a lack of clear trends and further longitudinal analysis of this data is required going forward along with 3-year rolling averages once sufficient data is available as these will level out some of the random variations seen in the figures year-on-year.

Some of the variations seen between CDOPs may be out of their control due to some cases being subject to further investigations such as inquests, serious case reviews and criminal investigations.

Chart 2: Number of closed cases by CDOP area from 2012-2016



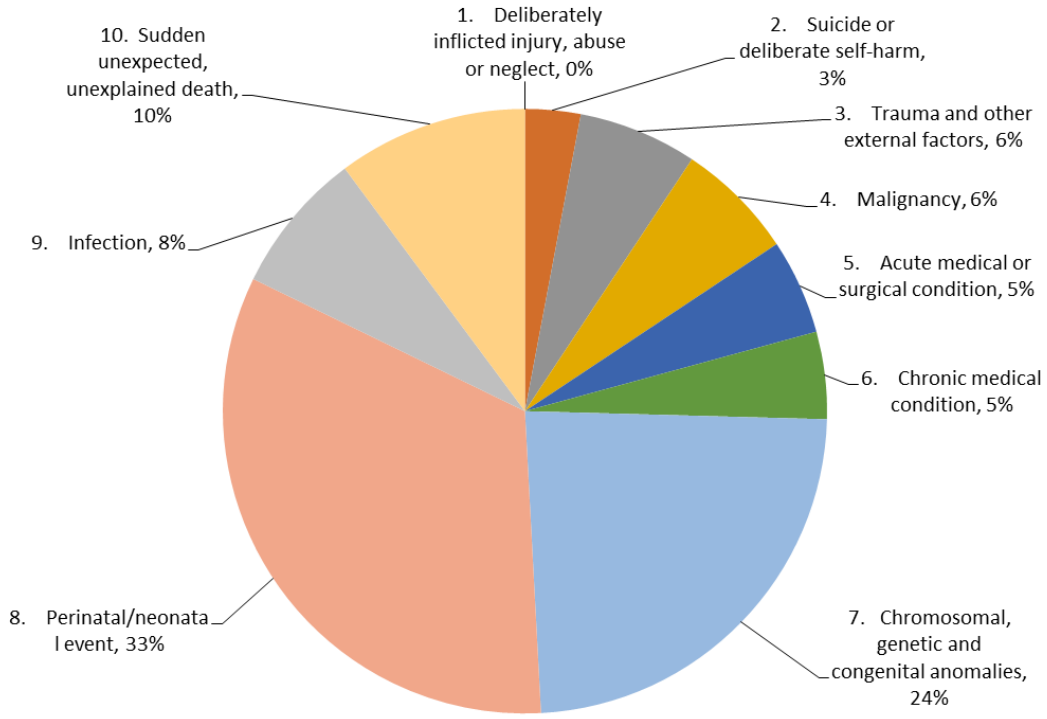
Source: GM CDOPs 2012/13-2015/16

6.5 Causes of death

When closing a case, national guidance around child death reviews requires CDOPs to decide which category the cause of death falls into. This ensures a certain level of consistency in reporting and enables comparison across CDOPs. The categories are defined by national standards. If a death falls into more than one category, it is allocated to the category highest up the ranking. However, this is not always a straightforward task and the decision ultimately lies at the discretion of each panel. In order to achieve greater consistency, the chairs and managers of the four GM CDOPs meet regularly and discuss a small number of cases.

The majority of the 235 cases closed in GM in 2015/16, 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.

Chart 3: Closed Cases 2015/16 Cause of Death



6.5.1 Trend Data

In 2015/16 the largest proportion of deaths occurred in category 8, followed by category 7. These categories have consistently made up the majority of child deaths in GM over the last 4 years; however the total number of deaths in these categories has declined over this period. The number of deaths in other categories is very small resulting in wide year on year variations.

Nationally, 80% of the cases closed had the child's medical condition as the likely cause[6]. In GM this was very similar at 81% (see footnote for list of the categories included). Please note, in a number of Sudden Unexpected Unexplained Deaths, the final cause of death has been established as infection.

[6] Health problems perinatal/neonatal event; chromosomal, genetic and congenital anomalies; infection; malignancy; acute medical or surgical condition and chronic medical condition

Table 8: Category of death by number and percentage for 2012-16								
Form C Category	**2012/2013**		**2013/2014**		**2014/2015**		**2015/2016**	
1. Deliberately inflicted injury, abuse or neglect	<5	1%	<5	1%	5	2%	0	0%
2. Suicide or deliberate self-harm	11	4%	<5	2%	9	3%	5	3%
3. Trauma and other external factors	10	4%	10	5%	14	5%	16	6%
4. Malignancy	12	4%	20	9%	18	7%	15	6%
5. Acute medical or surgical condition	16	6%	20	9%	9	3%	12	5%
6. Chronic medical condition	11	4%	12	6%	10	4%	11	5%
7. Chromosomal, genetic and congenital anomalies	70	26%	50	23%	68	26%	56	24%
8. Perinatal/neonatal event	97	37%	81	38%	97	37%	78	33%
9. Infection	18	7%	5	2%	12	5%	18	8%
10. Sudden unexpected, unexplained death	20	7%	10	5%	19	7%	24	10%

Source: GM CDOPs 2015/16

6.5.2 Cause of Death by Ethnicity

Across GM data is recorded on the ethnicity of all closed cases based on whether they identify as White British or Black and Minority Ethnic (BME). Across the whole 0-18 population in GM, 75% identify themselves as White British and 25% as BME[7]. Table 9 below shows the number of closed cases in 2015/16 broken down into these two groups. As with other measures, the low numbers of categories such as Suicide or self-harm; acute medical/surgical condition; and chronic medical conditions prevent any meaningful inferences from the data. All the cause of death categories apart from sudden unexpected unexplained death, demonstrate an over representation of BME groups, given the proportion of the overall 0-18 GM population in this group (25%). One category which has a particularly high rate among BME populations in GM is Chromosomal/ Genetic/ congenital anomalies. With 64% of these deaths among BME populations, this demonstrates a clear inequality around this issue in BME populations as the representation of these types of deaths in this group (64%) is much higher than the representation of this group in the overall population (25%).

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

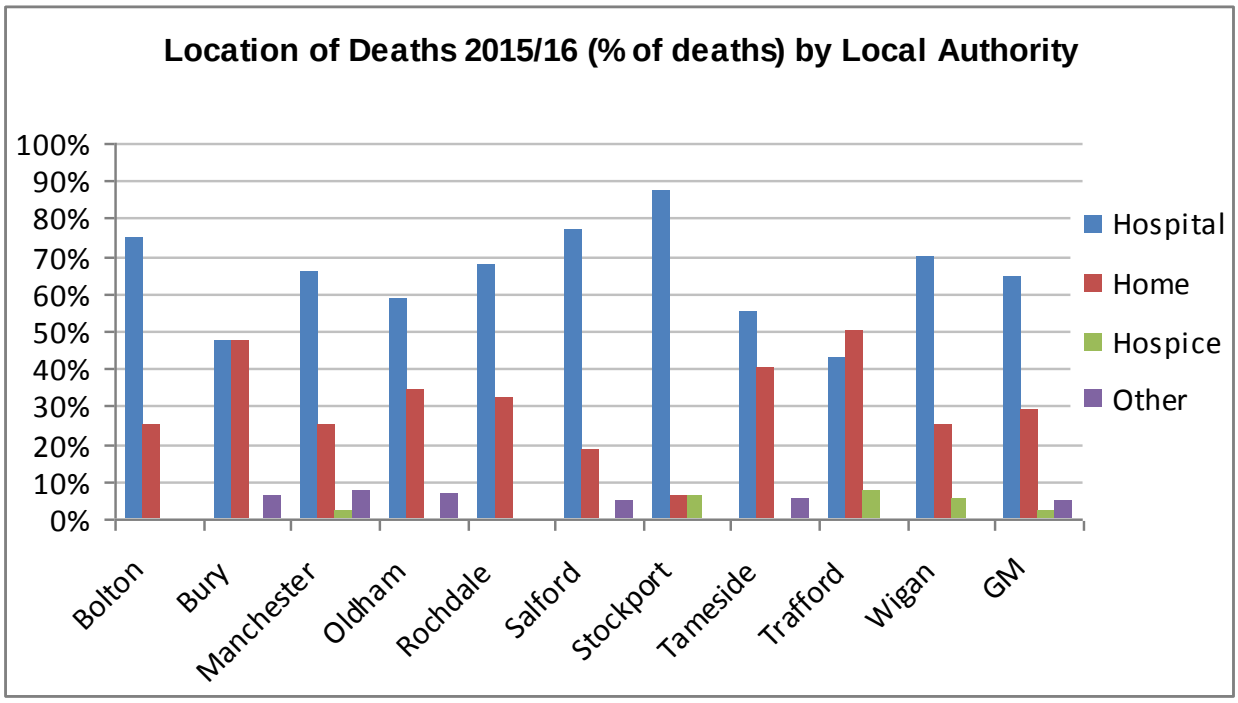
Table 9: Cause of Death by Ethnicity 2015/16			
GM	**White British**	**BME**	**Total**
Trauma and other External Sources	8	8	16
	50%	50%	
Suicide or Self-Harm	5	0	5
	100%	0%	
Perinatal/ Neonatal	53	25	78
	68%	32%	
Acute medical/surgical condition	7	5	12
	58%	42%	
Chromosomal/ Genetic/ congenital	20	36	56
	36%	64%	
Chronic medical Condition	5	6	11
	45%	55%	
Deliberate	0	0	0
	0	0	
Infection	10	8	18
	56%	44%	
Malignancy	10	5	15
	67%	33%	
Sudden Unexpected Unexplained Death	19	5	24
	79%	21%	

Source: GM CDOPs 2015/16

6.6 Location of death

Of all cases closed in 2015/16, 65% (154) occurred in hospital. The second most common location of death was the home with 24% of cases (69). There is some variation between local authorities across GM with some having a higher proportion of deaths occurring in the home (see chart 4 below). In these instances, it is likely that these deaths in the home represent more sudden deaths or those children with life limiting conditions that choose a home death as part of their care pathway.

Chart 4: Location of Deaths 2015/16 (% of deaths) by Local Authority



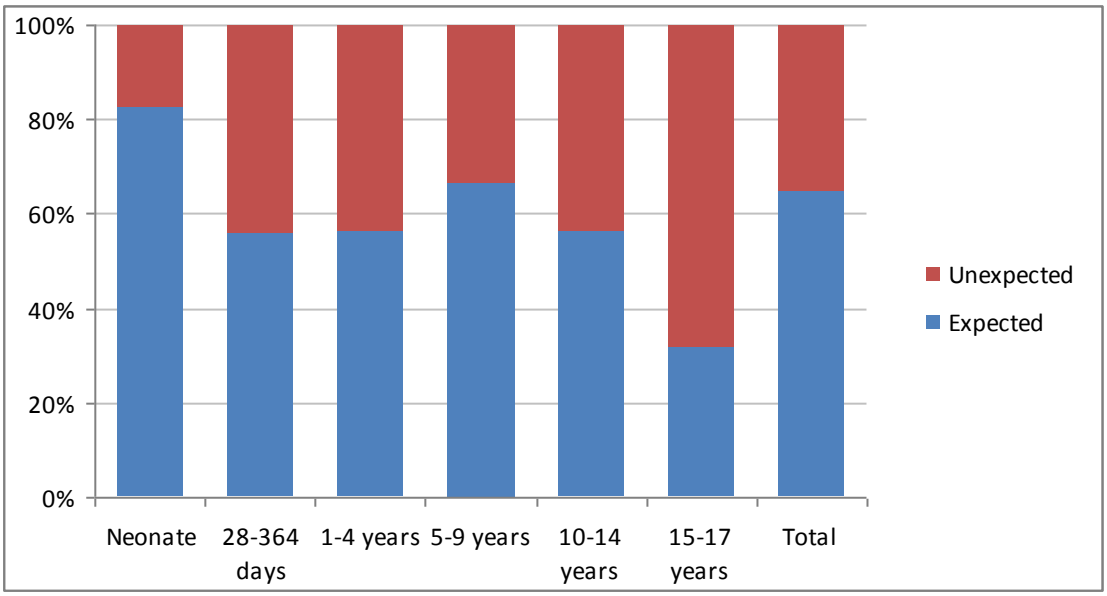
Source: GM CDOPs 2015/16

6.7 Expected verses unexpected deaths

All deaths reported by CDOP are classified as either expected or unexpected. Of the 235 cases closed in 2015/16, 66% were expected. This is an increase from 60% in 2014/15. Unlike previous years, all cases had data on whether the death was expected or unexpected. This shows an improvement in data collection, particularly in the Bury, Rochdale and Oldham CDOP, as there had been difficulties in gaining this information for all cases in previous years.

The proportion of deaths which were expected or unexpected varies between age groups. Generally, most deaths within the first year of life are due to either complications relating to prematurity or due to a chromosomal, genetic or congenital abnormality. Most of these deaths are expected due to medical conditions diagnosed prior to death. Conversely, in older children deaths from unexpected causes such as road traffic collisions are more likely (see chart 5 below).

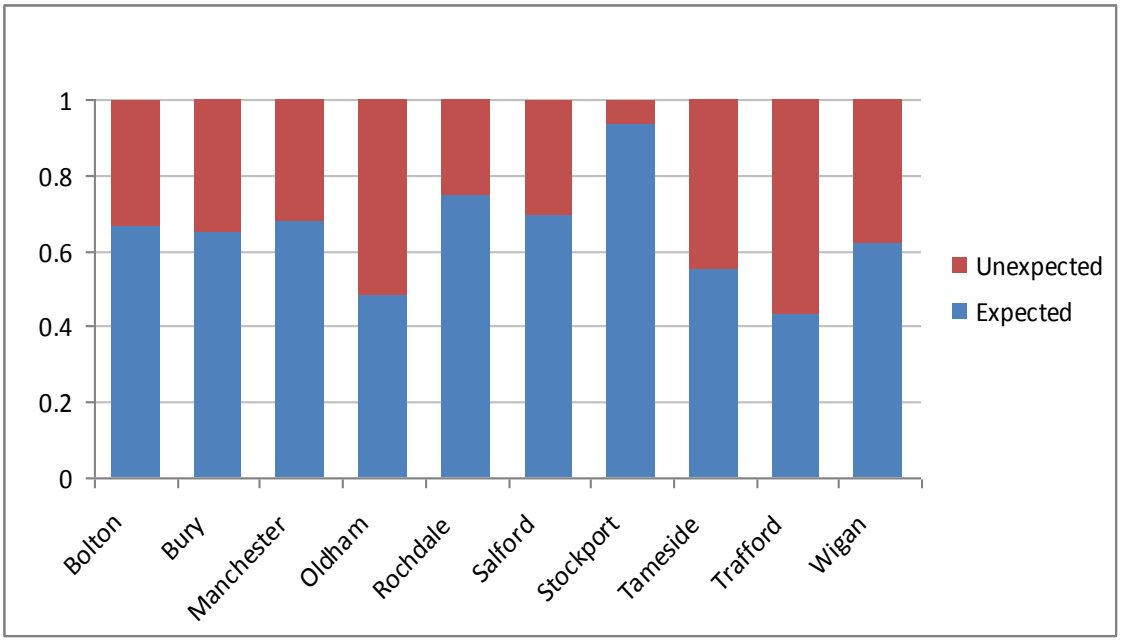
Chart 5: Percentage child deaths expected and unexpected by age group 2015/16



Source: GM CDOPs 2015/16

Only two areas in GM had more unexpected than expected deaths; Trafford and Oldham, though this was only by one and two cases respectively. In Stockport, 94% of child deaths were expected. (See chart 6).

Chart 6: Percentage of child deaths expected and unexpected by local authority 2015/16



Source: GM CDOPs 2015/16

6.8 Modifiable risk factors

For each case closed the CDOP will determine whether there were factors, that could have been prevented, which increased the risk to the child. In line with the Department for Education, the CDOP categorise 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 24%[8] (this is based on 2014/15 data which is the most up to date available at the time of writing).

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

Of the 235 cases closed across GM in 2015/16, modifiable factors were identified in 74 deaths which equates to 31% of all child deaths (increased from 24% in 2014/15). Table 10, shows the proportion and number of closed cases in each CDOP to which modifiable factors were felt to have possibly contributed. In all CDOP areas apart from Bury, Oldham & Rochdale, the proportion of cases with modifiable factors increased in 2015/16. As with other statistics, these figures are subject to a large degree of error due to the small numbers. For example, in Stockport, Tameside & Trafford the proportion of cases with modifiable factors has increased from 18% to 42% between 2012 and 2016. This reflects an increase from 10 to 21 cases. Whether or not the CDOP felt that modifiable factors were present is subject to the discretion of the CDOP members, which could explain part of the variation between areas. Also, changes in their approach could explain variations over time at a CDOP level such as the increase seen in Stockport, Tameside & Trafford.

There were two cases; one in Manchester and one in Rochdale, for which there was insufficient information available for the CDOP to determine whether there were any modifiable risk factors present.

[8] 4. **Department of Education.** *Child Death Reviews – Year ending March 2015.* London : s.n., 2015

Table 10: Percentage and number of child deaths in each CDOP area in which modifiable factors were felt to be present				
CDOP	**2012/13**	**2013/14**	**2014/15**	**2015/16**
Bolton, Salford, & Wigan	39% (34)	27.7% (13)	26% (17)	38% (21)
Bury, Oldham & Rochdale	21% (15)	29.8% (17)	25% (20)	22% (16)
Manchester	29% (16)	20.4% (10)	18%(15)	28% (14)
Stockport, Tameside & Trafford	18% (10)	27.4% (17)	31% (25)	42% (21)

Source: GM CDOPs 2015/16

Modifiable factors identified by the CDOPs included:

- Mother smoked in pregnancy
- Domestic Violence and Abuse
- Road Traffic Accidents
- Co-sleeping
- Access to appropriate healthcare
- Not accessing healthcare in a timely manner
- Drug and alcohol use

6.9 Neonatal and infant deaths

6.9.1 Overview of deaths by age

Across GM in 2015/16, 36% of all closed cases were neonates (under 28 days old) and 62% of all closed cases were infants (under 12 months old). In recent years there has only been a small amount of variation in figures reported in the different age groups. This broadly reflects the proportions among these age groups across England in 2015[9]. The number of deaths generally reduces as age increases (see table 11 below).

[9] **Department of Education.** *Child Death Reviews – Year ending March 2015.* London : s.n., 2015

Table 11: Percent and number of closed cases for each CDOP by age band							
CDOP	**Neonate**	**28-364 days**	**1-4 years**	**5-9 years**	**10-14 years**	**15-17 years**	**Total**
Bolton, Salford, & Wigan	38% (21)	29% (16)	13% (7*)	<9% (<5*)	<9% (<5)	11% (6)	100% (56)
Bury, Oldham & Rochdale	32% (24)	22% (16)	12% (9)	8% (6)	16% (12)	9% (7)	100% (74)
Manchester	46% (26)	29% (16)	<9% (<5)	<9% (<5)	11% (6)	<9% (<5)	100% (55)
Stockport, Tameside & Trafford	38% (19)	28% (14)	10% (5)	<10% (<5)	<10% (<5)	12% (6)	100% (50)

Source: GM CDOPs 2015/16

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

Table 12 below shows the causes of death among all infant closed cases in GM in 2015/16. The greatest causes of death in this age group were: Perinatal/neonatal event; Chromosomal, genetic and congenital anomalies; and Sudden unexpected unexplained death. In some of these categories there was also a notable difference in the number of deaths of a particular cause between neonates and those aged 28-364 days. As would be expected, far more deaths occur as a result of a perinatal/neonatal event among neonates than those aged 28-364 days. There were also a higher proportion of sudden unexpected unexplained deaths among those aged 28-364 days than neonates.

Similarly to England, congenital anomalies in GM are the second most common cause of infant deaths. 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 represents clear health inequalities [(3)10.]

[10] **National Perinatal Epidemiology Unit.** *Infant mortality overview and context* . Oxford : University of Oxford, 2009. Inequaliites in Infant Mortality Project Briefing Paper 1.

Table 12 : Categories of death for neonates and infants (0 – 364 days of life) 2015/16				
Category of Death	**Neonate**		**28-364 days**	
1. Deliberately inflicted injury, abuse or neglect	0	0.0%	0	0.0%
2. Suicide or deliberate self-inflicted harm	0	0.0%	0	0.0%
3. Trauma and other external factors	2	2.3%	4	6.6%
4. Malignancy	1	1.2%	1	1.6%
5. Acute medical or surgical condition	1	1.2%	1	1.6%
6. Chronic medical condition	1	1.2%	1	1.6%
7. Chromosomal, genetic and congenital anomalies	16	18.6%	17	27.9%
8. Perinatal/neonatal event	59	68.6%	13	21.3%
9. Infection	2	2.3%	7	11.5%
10. Sudden unexpected, unexplained death	4	4.7%	17	27.9%
Grand Total	86	100%	61	100%

Source: GM CDOPs 2015/16

6.9.3 Gestation

Babies born prematurely are at increased risk of death compared to those born at full term. Whilst the complications of prematurity commonly manifest within the first 28 days of life, many babies are now surviving beyond the neonatal period making prematurity a more common cause of death in children up to one year of age.

Below are the categories of premature birth:

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

Across GM in 2015/16 gestational age of neonates was recorded for all but two of the closed cases. Among the neonatal deaths in the 2015/16 closed cases, 56% (50) had been extremely premature, 13% (12) premature and 29% (26) full term. This will not be reported at a local authority level as the numbers are very low and potentially disclosive, but Manchester had a higher number of extremely premature births with a total of 17 in 2015/16 which represents 19% of the GM total. This may be due to a larger overall population but with such small numbers, further analysis of this data is of limited use.

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 considered a risk factor for child mortality[11]. There are a number of risk factors for LBW including multiple births, smoking and maternal age.

Of the infant deaths closed across GM in 2015/16, 47% had a birth weight of less than 1500 grams. Of all the 147 deaths in the under 1 year age group, 63% had a birth weight of less than 2500 grams (see table 13 below). This represents a slight increase from 2014/15.

Table 13: Birth weight categories (%) by local authority 2015/16

LA	<1500g	1500g-2499g	2500g-3999g	4000g+	Not Stated
Bolton	33%	33%	33%	0%	0%
Bury	13%	13%	50%	25%	0%
Manchester	55%	17%	29%	0%	0%
Oldham	33%	17%	50%	0%	0%
Rochdale	44%	6%	44%	0%	6%
Salford	43%	29%	29%	0%	0%
Stockport	71%	7%	14%	7%	0%
Tameside	42%	0%	50%	8%	0%
Trafford	33%	50%	17%	0%	0%
Wigan	69%	8%	23%	0%	0%
Greater Manchester	47%	16%	34%	3%	1%

Source: GM CDOPs 2015/16

6.10 Socio Demographic Characteristics

6.10.1 Age and Gender

The distribution of male and female child deaths is similar to the previous year, with 58% of the cases closed in GM in 2015/16 being male. In the majority of local authorities and age groups, there were more male cases closed than female (see chart 7 below).

The largest differences between males and females were in the 28-364 day age group, 15-17 years age group and geographically in Salford and Stockport where there were far more male than female deaths. There may be explanations for the differences between males and females, such as in the 15-17 year age group which consisted of 67% males which could be due to this age group and gender being more likely to engage in risk taking behaviours with tragic consequences. This is supported when we look at cause of death where 75% of all closed cases who died from trauma and other external factors, were male. This category includes road traffic collisions and other accidents. Most of the cause of death categories contain more males than females, however death by suicide or self-harm is the exception this category contained 67% females in 2015/16. This is, again, subject to very small numbers.

[11] **Garcia, R., Ali, N., Papadopoulos, C. & Randhawa, G.** (2015) Specific antenatal interventions for BAME pregnant women at high risk of poor birth outcomes in the United Kingdom: a scoping review. *BMC pregnancy and childbirth*. 15(1). 1.

Chart 7: Cases Closed by Age and Gender

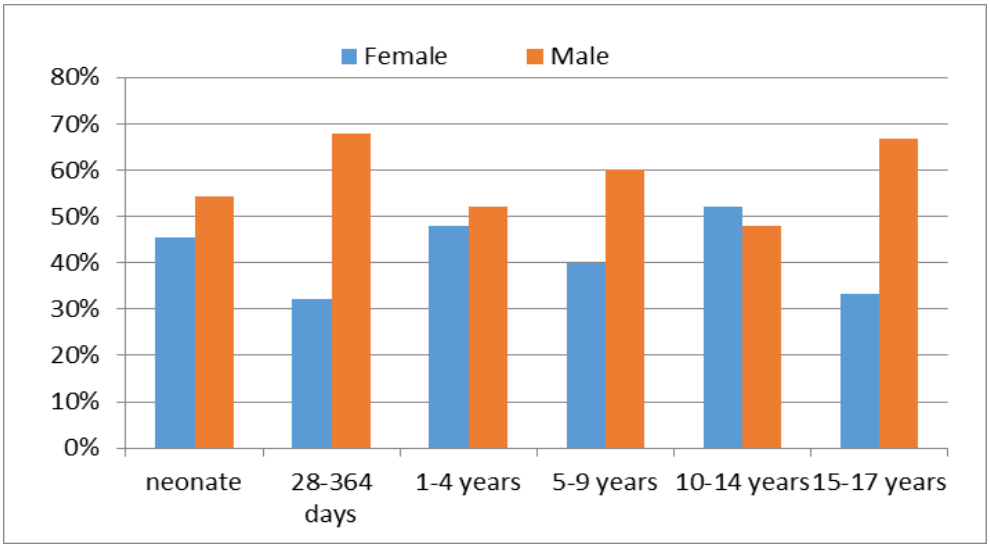


Table 14: Number of cases closed by gender by Local Authority 2015/16		
LA	**Males**	**Females**
Bolton	8	4
Bury	11	6
Manchester	30	25
Oldham	15	14
Rochdale	15	13
Salford	19	4
Stockport	13	3
Tameside	9	11
Trafford	8	6
Wigan	10	11
Greater Manchester	**138**	**97**

6.10.2 Ethnicity

Large inequalities in infant mortality rates exist between White and ethnic minority groups in England and Wales[12].

- 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 3 out of 5 reviews, which was reflected in the 0-18 GM population in 2015/16 with 60% of in-year closed cases (73 of 122) being white. Ethnicity estimates have been calculated by applying total 0-18 ONS mid-year population estimates to the ethnicity rate at the 2011 census for each area. For this reason, the best measure of ethnicity is looking at closed cases where notification was in the same year. This data is displayed in table 15 below, along with the rates per 10,000 to account for varying population sizes. Please note, any potentially disclosive numbers in a local authority area of less than 5 have been labelled <5. This data indicates that approximately 60% of in-year closed cases in 2015/16 were white and 40% were BME populations. While this does reflect national trends, it represents a substantial over-representation of BME populations in child deaths in GM, as BME populations only account for 25% of the total 0-18 GM population, and a stark inequality, likely linked to deprivation. This inequality is largest in Oldham, Rochdale, Trafford and Bury where the child death rate is much higher among BME populations than white.

Table 15 : Cases closed by Ethnicity where date of notification occurred in year 2015/16

LA	White		BME	
	Number	rate/10,000	Number	rate/10,000
Bolton	6	1.25	<5	1.09
Bury	6	1.71	<5	4.00
Manchester	11	1.85	17	2.94
Oldham	<5	0.54	11	8.14
Rochdale	7	1.94	7	4.75
Salford	7	1.50	<5	1.38
Stockport	11	2.04	<5	2.51
Tameside	7	1.68	<5	1.39
Trafford	<5	0.71	5	4.16
Wigan	13	2.01	0	0.00
Greater Manchester	73	1.57	49	3.28

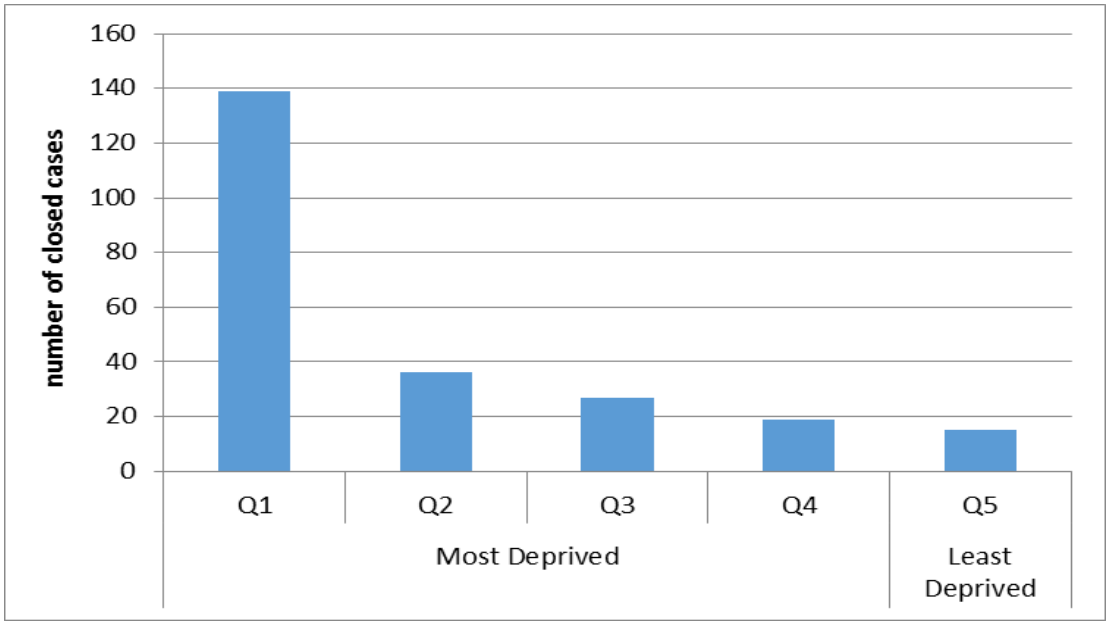
[12] Gray, R., Headley, J., Oakley, L., Kurinczuk, J. J., Brocklehurst, P. & Hollowell, J. (2009) **Inequalities in infant mortality project briefing paper 3.** Towards an understanding of variations in infant mortality rates between different ethnic groups. Oxford: *National Perinatal Epidemiology Unit.*

*Please note, the total number of deaths used in this table for GM was 122 (these were deaths notified in year 2015/16 and also closed in 2015/16)

6.10.3 Deprivation

In Greater Manchester, 37% of the 0 to 18 population live in the most deprived quintile (quintile 1), however in 2015/16, 59% of the child deaths in GM were from this quintile. This proportion in the most deprived quintile has increased in recent years from 43% in 2013/14. This may be partially due to improved recording of deprivation status but also represents a health inequality. This can clearly be seen in chart 8 below. This stark inequality is a consistent trend which has been seen in previous years.

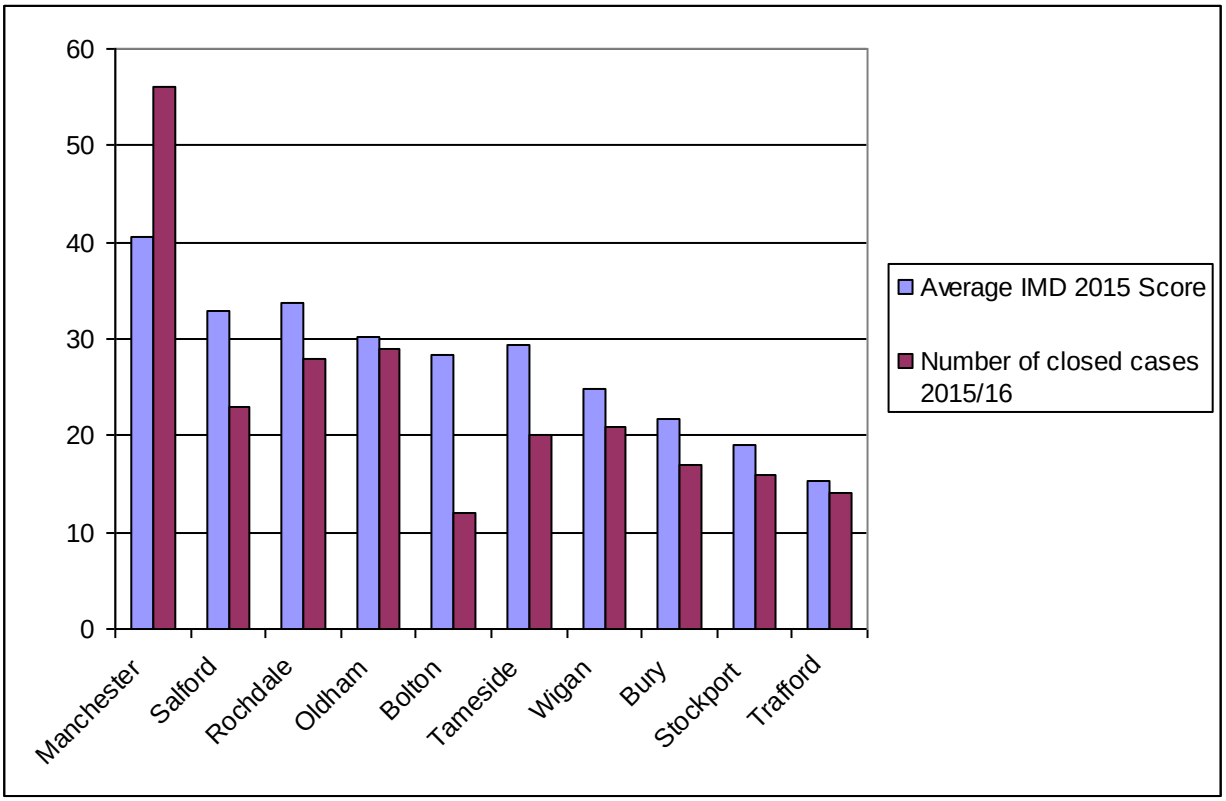
Chart 8: Number of cases closed by deprivation quintile 2015/16



Source: GM CDOPs 2015/16 & IMD 2015

The Index of Multiple Deprivation (IMD) is a general, area-based measure of deprivation. IMD across GM has been previously discussed in section 5.2. Chart 9 below shows how the average IMD score in each local authority relates to 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 indicating a higher rate of child mortality. This is further evidence of the inequality in child mortality and the potential correlation between deprivation and child mortality rate.

Chart 9: Number of closed cases 2015/16 and average IMD 2015 score by Local Authority



Source: GM CDOPs 2015/16 & IMD 2015

6.11 Smoking status of the mother

Smoking can be a particular health risk before, during and after pregnancy for both mother and child. According to the Royal College of Physicians, risks include complications during labour and increased risk of miscarriage, premature birth, still birth and sudden unexpected death in infancy. Maternal smoking is also estimated to increase infant mortality by approximately 40%.

Nationally, around 12% of pregnant women smoke during their pregnancy[13]. Smoking cessation interventions in pregnancy can be effective, leading to higher quit rates (by approximately 6%) and increases in birth weight (by 53g on average) compared with women who do not receive them. However, since most women who smoke in pregnancy continue to do so, the most effective policies are preventative, population-based measures including tobacco price increases, restrictions and school-based health education programmes[14].

Local Tobacco Control Profiles (LTCP) illustrate that nine out of the ten GM local authorities have a higher percentage smoking at time of delivery than the England average (12%). Across GM in 2015/16, smoking was identified as a modifiable factor in 40 reviews which equates to 17% of all closed cases.

[13] Lumley, J., Chamberlain, C., Dowswell, T., Oliver, S., Oakley, L. & Watson, L. (2009) Interventions for promoting smoking cessation during pregnancy. *Cochrane Database of Systematic Reviews.* Issue 3. Art No.: CD001055. DOI: 10.1002/14651858.CD001055.pub3.

[14] Health problems perinatal/neonatal event; chromosomal, genetic and congenital anomalies; infection; malignancy; acute medical or surgical condition and chronic medical condition

The quality of maternal smoking data in the CDOP dataset is relatively high with the vast majority of cases recording maternal smoking status where relevant and only 3 cases not having this data. Currently, smoking data is only recorded when deemed relevant to the cause of death such as neonates, SUDI, asthma etc. For deaths such as RTCs, suicides and other accidental deaths, smoking would not be collated as it is not deemed relevant to cause of death, however data should be collected for all deaths in children under 1 year.

Table 16 below illustrates that, for 26% of closed cases across GM in 2015/16 in children under 1 year old, smoking was deemed relevant and may have or did contribute to the child's death. There has been a substantial improvement in the quality of smoking status data recorded compared to previous years. While some areas appear to have a higher proportion of cases in which smoking is a relevant modifiable factor, a causal link should not be assumed as this may be due to better data collection or other external factors. For example, Tameside has the joint highest proportion with 54% of all infant closed cases in 2015/16 having smoking deemed a relevant modifiable risk factor; however this could be due to a number of reasons.

With data collection for maternal smoking status highly improved, CDOPs should continue to be active in promoting the importance of data collection among front line staff. Paternal smoking status is one area where data collection is not always complete and this could be a focus going forward.

Table 16 : Smoking relevance in closed cases for infants under 1 year by local authority 2015/16

Local Authority	Smoking relevant (key = 2/3)		Not relevant (key = 1)		Not known (key = 0)		Total
	Number	%	Number	%	Number	%	
Bolton	3	33%	6	67%	0	0%	9
Bury	0	0%	7	88%	1	13%	8
Manchester	8	19%	32	76%	2	5%	42
Oldham	4	24%	13	76%	0	0%	17
Rochdale	2	13%	13	87%	0	0%	15
Salford	7	47%	8	53%	0	0%	15
Stockport	0	0%	14	100%	0	0%	14
Tameside	7	54%	6	46%	0	0%	13
Trafford	2	33%	4	67%	0	0%	6
Wigan	7	54%	6	46%	0	0%	13
Greater Manchester	40	26%	109	72%	3	2%	152

Source: GM CDOPs 2015/16

0 = No information available/not known

1 = No factors (smoking contribution) identified-so unlikely to have contributed to the death.

2/3 = Factors (smoking) identified that may have or did contribute to the death

6.12 Raised BMI

Data on maternal BMI is not included in this report as this data was not available in the GM data collection for the majority of cases. BMI can have an impact on maternal and infant health outcomes. It has now been agreed across GM CDOPs that maternal BMI must be collected in all cases under 12 months of age and in any cases where maternal BMI is above 30, it will be considered as a modifiable factor. As with the maternal smoking data above, CDOPs should promote data collection requirements among front line professionals to ensure as much health-related data is collected as possible.

6.13 Other factors

6.13.1 Domestic Violence and Abuse

Although not always considered to be a direct risk factor in a child's death, the panels note the level of domestic abuse within families. Across GM in 2015/16 domestic violence and abuse was deemed a relevant modifiable risk factor in 3% of closed cases (8). This is a reduction from the previous year, in which domestic violence and abuse was deemed relevant in 14% of closed cases.

6.13.2 Consanguinity

Consanguinity was listed as a factor which may have, or did, contribute to the death in 2% of closed cases (5) across GM in 2015/16. Again, this is fewer than in the previous year which identified consanguinity in 5% of closed cases. The issue of consanguinity is highly sensitive. Debate exists surrounding the extent to which cases which appear to be linked to consanguinity are actually due to culturally-related choices regarding reluctance towards termination of pregnancy[15][16]. Data collection issues are apparent with this category similar to maternal smoking status and BMI. It has now been agreed across GM that consanguinity will be considered a modifiable factor if a second child is born with genetic anomalies to consanguineous parents.

6.13.3 Mental health of parents / carers

Recording of maternal mental health status in GM has improved in recent years. In 2015/16, across GM 8% of cases (19) reported the mother having mental health issues as being relevant to the child's death.

6.13.4 Suicide or self-harm

Suicide/self-harm was identified as a factor in 3% of closed cases (7). This represents a slight reduction from the previous year. In 6 of these cases, suicide/self-harm was identified by CDOPs as the primary cause of death. Issues remain around consistent recording of deaths as suicide/self-harm by coroners as, in many cases, some feel there is an absence of evidence to be fully certain the child intended to take their own life and therefore may not record it as a suicide.

6.13.5 Road traffic collisions

There were fewer than five deaths closed across GM in 2015/16 which were categorised as road traffic collisions. This follows data trends seen in previous years with numbers fewer than five in 2013/14 and 2014/15.

---

[15] 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.

[16] 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

6.13.6 Co-Sleeping

Co-sleeping was identified as a modifiable factor in 5% of closed cases (11) across GM in 2015/16. This is an increase from the previous year and continues a trend of a small increase in co-sleeping being identified as a modifiable factor in child deaths across GM. It should be noted that due to the small numbers, this trend could be due to random year-on-year variations.

6.13.7 Housing & Living Conditions

The housing and living conditions of the child were identified as relevant factors in 4% of closed cases (9) across GM in 2015/16. This factor could relate to a wide range of issues such as an unsafe environment leading to increases in accidental injuries or damp and cold in the home which could exacerbate respiratory, circulatory and other, existing chronic conditions.

6.13.8 Late Booking

If a mother is recorded as a late booking for antenatal care (the mother is already at more than 12 weeks gestation when the initial referral to maternity services is made), this is recorded as a relevant risk factor in the event of a child death. Across GM in 2015/16, 3% of closed cases (6) had late booking recorded as a relevant factor. This could contribute to the risk of death for a number of reasons such as missed screening tests and maternal immunisations but further research is required to understand the reasons and characteristics of those who book late[17].

6.13.8 Parental Alcohol/Drug Use

Alcohol and/or drug use by parents has not been a key modifiable factor in previous years of this report, however 4% of cases closed in 2015/16 (10) had parental alcohol/drug use as a modifiable factor. This is often associated with sudden unexplained death in childhood and co-sleeping.

7.0 Discussion and Conclusions

This is the fourth year of the Annual Report of Child Deaths in Greater Manchester, which mainly focuses on the cases reviewed and closed by CDOPs during 2015/16. Cases notified in 2015/16 are referred to but for many of these, the CDOP reviews may not yet be complete. For some categories, data was not available and in several categories examined, caution should be taken when examining and analysing the data as the numbers are very small leaving them open to year-on-year variations due to chance.

It is worth noting that while the numbers of deaths across Greater Manchester remain relatively small (236 closed cases), the numbers of people affected by each death, both directly and indirectly are considerable and the massive impact of losing a child should not be underestimated. The need for care and support following each loss varies from family to family yet there is a lack of consistent bereavement support across GM.

While the number of notified deaths and cases closed in 2015/16 was fewer than in 2014/15, as explained above, due to the small number of child deaths in GM, any changes may be due to chance.

[17] Chinouya, M. & Madziva, C. (2013) Black African women and the antenatal booking appointment in Haringey. *Public Health Department.* Haringey Council, London.

Across GM, 81% of cases closed had a likely cause as the child's health problems. Work needs to continue to look at improvements in optimising healthcare and also access to healthcare as this was noted as a modifiable factor in 9 separate cases in 2015/16.

The numbers of Sudden Unexpected Unexplained Death cases closed (24) has increased slightly for the last two years, which individual local authorities may want to examine further on a case by case basis, however the small number of cases in children after the age of one mean trends and patterns are unlikely to be statistically significant.

The average duration of a CDOP review was 234 days with 56% of the closed cases (122) having been notified during 2015/16. Unexpected cases and those with modifiable factors typically took longer to close. There were some differences in duration of reviews between CDOPs. This may relate to the individual cases having more modifiable factors or requiring further investigation such as Serious Case Review, but may also relate to the procedures and requirements of each CDOP.

Generally the proportion of cases closed which are expected deaths decreases with age, however 44% of the 28-364 days age group and 43% of 1-4 year olds were unexpected. This continues a trend from previous years with relatively high unexpected deaths in these age groups. Oldham and Trafford closed more unexpected than expected cases which differ from previous years where all local authorities have closed more expected than unexpected cases. It should be noted that the numbers are very low with the difference only being one case in Oldham and two cases in Trafford. The quality of the data for this section has improved from previous years where there had been a number of cases where it was not known whether the death was expected or unexpected. In 2015/16 this information was available for all cases.

Across GM, 31% of cases closed in 2015/16 had modifiable factors present which is higher than the national average of 24%. Of the modifiable factors identified, the most common was having one or more parents who smoked, followed by co-sleeping and parental alcohol/drug use.

The majority of child deaths occur in early life with 38% of the cases closed across GM occurring in the first 27 days of life and 64% of cases closed occurring in the first year of life. Birth weight data improved substantially in 2015/16 with only 1% incomplete among closed cases for those under 1 year of age. This is compared to 20% of this data not being recorded in 2014/15. Birth weight is an important indicator of foetal and neonatal health at both individual and population levels with a strong link between maternal health and social circumstances and birth weight. This is of particular importance in neonatal deaths and deaths under 1 year. In closed cases among infants in 2015/16, 63% had a birth weight of less than 2500 grams.

Several inequalities can be seen in the child death data reviewed and these continue to increase, particularly for those who fall into the most deprived quintile (20%) of households and also people from BME groups. While BME groups only make up 25% of the 0-18 population in GM, 40% of child deaths occur in this group. In terms of deprivation, 37% of the 0-18 population are within the most deprived quintile, however, in 2015/16 59% of the child deaths in GM were from this group. These margins have increased from previous years and demonstrate the detrimental impact on health that these inequalities can have.

Progress has been made in collecting data in a number of areas, however some still remain an issue, particularly if they are deemed 'not relevant' to the death (eg. maternal smoking in cases where the child was over 1 year old). While the importance of the collection of individual data may not be initially apparent, when we are looking at child deaths at a population level individual categories become more important.

The proportion of cases with modifiable factors such as parental smoking, co-sleeping, parental alcohol/drug use, access to care, consanguinity, living conditions, housing, late booking, domestic violence, poor parenting and maternal mental health issues has increased this year. A modifiable factor might not be considered causal, but it may impact on the environment the child is living in and its absence could improve outcomes. It is important CDOP panels and public health leads continue to stress that all professionals working with children and families should be supported in identifying potential modifiable risk factors and referring/offering support as appropriate to their setting.

8.0 Recommendations

The following should be considered by each CDOP panel, and public health lead. A co-ordinated GM response is recommended:

1. CDOPs have been in existence since 2008 and child deaths have remained relatively constant over this time period. The next annual report will be the 5th which will provide 5 years of data sets and analysis/comment. At this point it may be appropriate to carry out an aggregate report measure for the previous 5 years to allow for more robust statistical analysis with larger figures, reducing issues such as random error in the data. Examples include the use of 3 and 5 year rolling averages for some of the data which can account for year-on-year random variations. It should be noted that more intensive resource for this analysis and write up would be required in 2016/17.

2. The quality of the CDOP data set is variable in some categories but recent years have seen substantial improvements. Work between the four GM CDOP panels to standardise and increase data collection across partner agencies should continue. Clear guidance should be given around some areas where there may be confusion such as factors which may not be deemed relevant in child deaths after one year of age (eg. maternal smoking).

3. The trend of increasing inequality among BME populations and the most deprived (quintile 1) continues. Emphasis should be placed on emerging trends in these groups and appropriate work should be targeted at these populations – an action plan to reduce child deaths in these groups has been recommended previously. It may be appropriate to dedicate specific time and resource to looking into this issue separately (potentially via a local academic institution who may be interested in carrying out further research into these trends and social patterns of child deaths).

4. There remains a high proportion of child deaths occurring in children under 1 year old. This is a continuing local and national trend. This should be considered along with key modifiable risk factors associated with these deaths (low birth weight, prematurity and maternal smoking and also issues of hypertension, diabetes and obesity in pregnancy). An action plan to reduce child deaths in this group has been recommended previously.

5. It is clear from the evidence that smoking is a key modifiable factor across GM. Therefore it is key that work continues to decrease the rate of smoking in the general population and in particular the smoking rates of pregnant women which for GM are significantly higher than the England average.

6. 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: Categories of Cause of Death by Local Authority

LA	Deliberate		Suicide or Self-Harm		Trauma and other		Malignancy		Acute medical/surgical condition		Chronic medical Condition		Chromosomal/ Genetic/ congenital		Perinatal/ Neonatal		Infection		Sudden Unexpected	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Bolton	0	0%	0	0%	0	0%	<5	7.7%	<5	7.7%	<5	7.7%	<5	23.1%	<5	30.8%	<5	30.8%	<5	7.7%
Bury	0	0%	<5	5.9%	<5	12%	<5	11.8%	<5	5.9%	0	0%	6	35.3%	<5	17.6%	0	17.6%	<5	11.8%
Manchester	0	0%	<5	3.4%	5	9%	<5	3.4%	<5	5.2%	<5	1.7%	14	24.1%	23	39.7%	0	39.7%	8	13.8%
Oldham	0	0%	0	0%	<5	10%	0	0%	<5	10.3%	<5	13.8%	5	17.2%	7	24.1%	5	24.1%	<5	6.9%
Rochdale	0	0%	0	0%	0	0%	<5	11.5%	<5	3.8%	<5	3.8%	10	38.5%	6	23.1%	<5	23.1%	<5	7.7%
Salford	0	0%	0	0%	<5	9%	<5	4.5%	0	0%	<5	4.5%	7	31.8%	7	31.8%	<5	31.8%	<5	13.6%
Stockport	0	0%	0	0%	0	0%	<5	11.8%	<5	5.9%	<5	5.9%	<5	17.6%	9	52.9%	<5	52.9%	0	0%
Tameside	0	0%	<5	5.0%	<5	5%	<5	10%	<5	5.0%	<5	5.0%	<5	10%	7	35.0%	<5	35.0%	<5	10.0%
Trafford	0	0%	<5	7.1%	<5	21%	0	0%	<5	7.1%	<5	7.1%	<5	21.4%	<5	14.3%	<5	14.3%	<5	14.3%
Wigan	0	0%	<5	5.0%	0	0%	<5	10.0%	0	0%	0	0%	<5	15.0%	10	50.0%	<5	50.0%	<5	10%
Greater Manchester	0	0%	5	2.5%	16	7%	15	6.4%	12	5.1%	11	4.7%	56	23.7%	78	33.1%	18	33.1%	24	10.2%

Appendix 2: Child Death Reviews by Area and by Estimated Age (2014/15)

Local Authority	0-27 days		28-364 days		1-4 years		5-9 years		10-14 years		15-17 years		Total
Bolton	6	50.0%	<5	<42%	-	-	-	-	-	-	<5	<42%	12
Bury	5	29%	<5	<29%	<5	<29%	<5	<29%	<5	<29%	<5	<29%	17
Manchester	26	46%	16	29%	<5	<9%	<5	<9%	5	11%	<5	<9%	55
Oldham	12	41%	5	17%	<5	<17%	<5	<17%	7	24%	<5	<17%	29
Rochdale	7	25%	8	29%	5	18%	<5	<18%	<5	<18%	<5	<18%	28
Salford	6	26%	9	39%	<5	<22%	<5	<22%	<5	<22%	<5	<22%	23
Stockport	11	69%	<5	<31%	<5	<31%	<5	<31%	0	0%	0	0%	16
Tameside	7	35%	6	30%	<5	<25%	<5	<25%	<5	<25%	<5	<25%	20
Trafford	<5	<36%	5	<36%	<5	<36%	<5	<36%	<5	<36%	<5	<36%	14
Wigan	9	43%	<5	<24%	<5	<24%	<5	<24%	<5	<24%	<5	<24%	21
Greater Manchester	90	38%	62	26%	25	11%	15	6%	23	10%	21	9%	235

Appendix 3: Summary of Child Deaths

Characteristic	Number			Proportion of child deaths		
Age	**2013/14**	**2014/15**	**2015/16**	**2013/14**	**2014/15**	**2015/16**
0-27 days	89	109	90	41.7%	41.6%	38.1%
28-364 days	48	60	62	22.2%	22.9%	26.3%
1-4 years	26	25	25	12.0%	9.5%	10.6%
5-9 years	19	17	15	8.8%	6.5%	6.4%
10-14 years	20	24	22	9.3%	9.2%	9.7%
15-17 years	13	27	21	6.0%	10.3%	8.9%
Sex						
Male	110	155	138	51%	41%	58%
Female	104	107	97	48%	59%	42%
Indeterminate	<5	0	0	<5%	0%	0%
Ethnicity						
White/White British	128	156	137	60%	60%	58%
BME	79	105	98	40%	40%	42%
Not Known/Not Input	8	1	0	4%	<1%	0%
Deprivation Quintile						
1 (Most Deprived)	45	149	139	21%	57%	59%
2	19	44	36	9%	17%	15%
3	12	27	26	6%	10%	11%
4	14	19	19	7%	7%	8%
5 (Least Deprived)	14	19	15	7%	7%	6%
No data available	111	4	0	52%	2%	0%

Appendix 4: Socio-demographic Characteristics on Neonatal and Infant Deaths: Number & Percentage

Characteristic	Neonatal deaths (0-27 days)			Age 28 days – 365 days		
Sex	**2013/14**	**2014/15**	**2015/16**	**2013/14**	**2014/15**	**2015/16**
Male	47 (52%)	64 (59%)	49 (54%)	25 (52%)	39 (65%)	42 (68%)
Female	42 (47%)	45 (41%)	41 (46%)	23 (48%)	21 (35%)	20 (32%)
Indeterminate	1<5 (1%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Ethnicity						
White/White British	55 (61%)	59 (54%)	52 (58%)	30 (63%)	33 (55%)	35 (57%)
BME	35 (39%)	49 (45%)	36 (45%)	18 (37%)	27 (45%)	27 (44%)
Not Known/Not Input	0 (0%)	<5 (<5%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Deprivation Quintile						
1 (Most Deprived)	47 (52%)	73 (67%)	53 (59%)	28 (58%)	32 (53%)	40 (64%)
2	17 (19%)	16 (15%)	17 (19%)	6 (13%)	15 (25%)	6 (10%)
3	6 (7%)	8 (7%)	9 (10%)	<5 (8%)	8 (13%)	8 (13%)
4	5 (5%)	5 (5%)	6 (7%)	<5 (2%)	<5 (2%)	5 (8%)
5 (Least Deprived)	6 (7%)	6 (6%)	5 (6%)	<5 (8%)	<5 (3%)	<5 (5%)
Data not available	9 (10%)	<5 (1%)	0 (0%)	5 (10%)	<5 (3%)	0 (0%)

Appendix 5: Deprivation Quintile by Age-Band

Age Band	1 (Most Deprived)	2	3	4	5 (Least Deprived)
0-27 day	53 (59%)	17 (19%)	9 (10%)	6 (7%)	5 (6%)
28-364 days	40 (64%)	6 (10%)	8 (13%)	5 (8%)	<5 (5%)
1-4 years	18 (72%)	<5 (12%)	<5 (8%)	<5 (4%)	<5 (4%)
5-9 years	9 (60%)	0 (0%)	<5 (20%)	<5 (20%)	0 (0%)
10-14 years	14 (61%)	<5 (17%)	<5 (4%)	<5 (4%)	<5 (13%)
15-17 years	5 (24%)	6 (29%)	<5 (19%)	<5 (14%)	<5 (14%)