

Manchester City Council Report for Information

Report to: Health Scrutiny Committee – 6 December 2023

Subject: The Impact of Climate Change on Health

Report of: Director of Public Health

Summary

The impacts of a changing climate are felt through both direct and indirect means. The direct impacts of climate change include the effects of adverse weather events and air pollution on the population's health and wellbeing. The indirect impacts of climate change include the disruption in the delivery of health services and the effects on the food supply chain. However, through climate action, we can not only minimise the effects of climate change on our community but capitalise on the additional co-benefits of climate action to health.

This report builds on previous health scrutiny reports "An Introduction to the Impact of Climate Change on Health and Healthcare in Manchester" (February 2022) and "Climate Change - The Impact of the Recent Heatwave" (December 2022). It provides a brief overview of how and why climate change impacts the health of Manchester residents and what activities are underway to monitor and mitigate these impacts. This report also recognises the co-benefits to health from climate action, such as the increased provision of greenspace or promotion of active travel.

It is the most vulnerable residents in Manchester that will be disproportionately disadvantaged in the face of more floods, more heatwaves, worsening air quality, disruption to the running of health services, and food insecurity. This report outlines how work undertaken as part of the Making Manchester Fairer strategy helps to recognise and minimise health inequalities exacerbated by climate change.

Recommendations

The Committee is recommended to consider and comment on the report.

Wards Affected: All

<p>Environmental Impact Assessment -the impact of the issues addressed in this report on achieving the zero-carbon target for the city</p>	<p>Undertaking action to both reduce carbon emissions and adapt to the impacts of climate change is essential both for the immediate future and for the longer-term. This report demonstrates the importance of such action, as climate change and health are closely linked. The evidence described demonstrates that the effects of climate change such as extreme weather events, air quality, and food will directly negatively impact health. We are already seeing the impacts of climate change in Manchester’s population, and it is predicted that these impacts will worsen over time.</p>
<p>Equality, Diversity and Inclusion - the impact of the issues addressed in this report in meeting our Public Sector Equality Duty and broader equality commitments</p>	<p>Evidence shows that climate change will further exacerbate existing health inequalities, highlighting the need to better understand our communities that are most vulnerable to remove or reduce disadvantages.</p>

Manchester Strategy outcomes	Summary of how this report aligns to the OMS/Contribution to the Strategy
A thriving and sustainable city: supporting a diverse and distinctive economy that creates jobs and opportunities	Healthy and resilient residents and communities will be able to thrive in employment and opportunities which will support the local economy.
A highly skilled city: world class and home grown talent sustaining the city's economic success	A healthy population living in a zero-carbon environment is essential for the city's future economic success. In addition, providing people with the skills to obtain jobs in the zero-carbon sector will be important
A progressive and equitable city: making a positive contribution by unlocking the potential of our communities	There is compelling evidence to suggest that climate change and social inequality are linked with disadvantaged groups suffering disproportionately from the adverse effects of climate change. Supporting communities to be healthy, resilient and adaptable to climate change will ensure they can make a positive contribution and reach their full potential.
A liveable and low carbon city: a destination of choice to live, visit, work	More floods, more heatwaves, worsening air quality, disruption to the running of health services, and food insecurity will have a negative impact on the city's liveability
A connected city: world class infrastructure and connectivity to drive growth	Zero carbon transport will enable Manchester resident to live healthy lives and significantly reduce the negative impact of poor air quality in the city

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Background documents (available for public inspection):

The following documents disclose important facts on which the report is based and have been relied upon in preparing the report. Copies of the background documents are available up to 4 years after the date of the meeting. If you would like a copy, please contact one of the contact officers above.

- An introduction to the impact of climate change on health and healthcare in Manchester Health Scrutiny Report February 2022
- The impact of the Recent heatwave, both in terms of physical and mental health and resilience building across the system Health Scrutiny Report December 2022

1. Introduction

- 1.1. This report builds on previous health scrutiny reports “An Introduction to the Impact of Climate Change on Health and Healthcare in Manchester” (February 2022) and “Climate Change - The Impact of the Recent Heatwave” (December 2022).
- 1.2. The purpose is to provide an overview of how and why climate change impacts the health of Manchester residents and what activities are underway to monitor and mitigate these impacts. This report also highlights the co-benefits to health from climate action, such as the increased provision of greenspace or promotion of active travel.
- 1.3. It is the most vulnerable residents in Manchester that will be disproportionately disadvantaged in the face of more floods, more heatwaves, worsening air quality, disruption to the running of health services, and food insecurity. This report outlines how work undertaken as part of the Making Manchester Fairer strategy helps to minimise health inequalities exacerbated by climate change.

2. Background

2.1. The International picture

- 2.1.1. The Paris Agreement is a legally binding international treaty on climate change, adopted by 196 Parties at the Conference of the Parties (COP21) in Paris in 2015. The goal of the agreement was to limit global warming to well below 2, preferably to 1.5 degrees Celsius (°C), compared to pre-industrial levels. Even at 1.5°C warming essential systems will be affected, such as housing, transport, healthcare, food and water supplies, thus highlighting the need for investment in adaptation plans.
- 2.1.2. Despite the warnings, current climate policies would not deliver close to the targets stipulated in the Paris Agreement and consequently the world is currently on track to an expected temperature rise of approximately 2.7°C.

2.2. The National Picture

- 2.2.1. The UK government, under the Climate Change Act (2008), is required to create a Climate Change Risk Assessment (CCRA) every 5 years. The first CCRA in 2012 influenced the initial National Adaptation Programme (NAP) in 2013. The NAP outlines actions for the government and other entities to adapt to climate change challenges in the UK for the next 5 years. The second CCRA in 2017 highlighted 4 out of the 6 highest priority risks as directly linked to public health and the broader health sector.
- 2.2.2. The third CCRA Technical Report strongly warns that, without immediate action, the UK faces costly impacts from 1.5°C to 2°C warming scenarios. It identifies

61 climate risks affecting various sectors, including health, and for 8 of these, UK-wide economic damages are estimated to exceed £1 billion per annum by 2050 under a 2°C-warming scenario.

- 2.2.3. Since 2010, the Climate Change Committee (CCC) has conducted adaptation progress reports to government to assess the effectiveness of adaptation action across the UK. In 2023 the CCC introduced a monitoring framework to enable monitoring of adaptation progress by thirteen sectors including those most relevant to this committee: health, communities, food and business (<https://www.theccc.org.uk/publication/ccc-adaptation-monitoring-framework/>)
- 2.2.4. In recognition of the hazard climate change poses to health, the UK Health Security Agency (UKHSA) announced The Centre for Climate and Health Security programme in their most recent annual business plan. The programme will include:
 - The development of a prototype of a virtual climate and health knowledge hub
 - The launch of phase one of a climate and health training hub
 - The launch of a 5-year climate change and health security assessment cycle
 - The delivery of commitments within the Adverse Weather and Health Plan to support future responses to extreme weather events.

2.3. **The Manchester Picture**

- 2.3.1. In July 2019, Manchester City Council declared a “Climate Emergency”. This recognised the need for the Council, and the city as a whole, to do more to reduce carbon dioxide (CO₂) emissions and mitigate the negative impacts of climate change. The Council had already adopted a science-based carbon budget for Manchester of 15 million tonnes of CO₂ between 2018 and 2100 following analysis by the Tyndall Centre for Climate Change Research. This also committed the city to become zero-carbon by 2038 at the latest. NHS Greater Manchester followed suit and declared a “Climate Emergency” in August 2019.
- 2.3.2. Manchester’s Climate Change Framework, written by Manchester Climate Change Agency on behalf of the Manchester Climate Change Partnership, sets the city’s high-level strategy for tackling climate change, with a key aim for “Manchester to play its full part in limiting the impacts of climate change and create a healthy, green, socially just city where everyone can thrive”. This is aligned to a key commitment in the Our Manchester Strategy 2016-25.
- 2.3.3. The Framework was updated in 2022 and remains a live document, responsive to a changing city and an increasingly urgent climate emergency. The Update presented seven recommendations that were co-designed with stakeholders where direct control for delivery lies within Manchester:

- To carry out a vulnerability assessment to map where climate change will exacerbate health inequality so action can be prioritized.
- To develop city-scale indicators to track the impacts of climate change on health inequalities.
- To incorporate health equity and climate action into Council policies and strategies.
- To implement the Making Manchester Fairer plan.
- To share knowledge across the health sector to support its decarbonisation and adaptation.
- To maximise uptake of Carbon Literacy and NHS toolkits to support climate action in the health sector.
- For MCCP's Health & Wellbeing Advisory Group (which also reports to the Health & Wellbeing Board) to expand this list of recommendations to encompass collaborative action across Greater Manchester and a clear set of asks of national government.

2.3.4. The implementation of the Making Manchester Fairer Plan is key to ensuring we not only minimise the direct and indirect impacts of climate change to the health and wellbeing of Manchester residents, but also capitalise on the co-benefits of climate action to health. As such, climate action activities undertaken by Manchester's Department of Public Health and partners will be reported through Making Manchester Fairer governance structures.

2.4. The Evidence Base

2.4.1. An overview of the numerous pathways through which climate change has the potential to impact health is depicted in Figure 1 below.

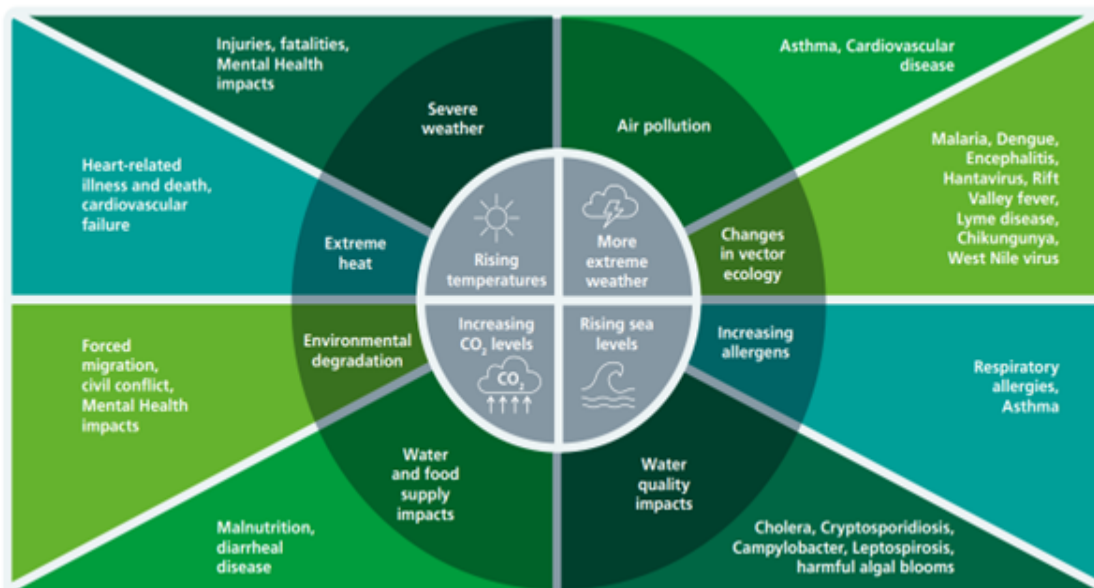


Figure 1: The impacts of climate change on human health adapted from Ebi Hess and Watkiss (2017)

- 2.4.2. The 2023 Report of the Lancet Countdown on health and climate change summarises the latest international evidence on health and climate change. As mean temperatures have risen to 1.14°C over pre-industrial levels, authors note how climate change is "increasingly impacting the health and survival of people worldwide" and warn against the ongoing investment in fossil fuels. Authors also discuss their hope for the future. As health is brought to the forefront of climate change negotiations, the report highlights the opportunity to deliver "health-promoting climate change action". Authors cite how "public health interventions to reduce air pollution, enabling and supporting active travel and healthier diets, and promoting improvements in the environmental conditions and commercial activities that define health outcomes" are key to delivering a healthy sustainable future for all.
- 2.4.3. UKHSA have produced a robust evidence base of national research, setting out; the direct and indirect health impacts of climate change, the impacts of climate change on vulnerable communities, and interventions that may minimise these impacts. They have also recently published an overview of indicators that may be used to measure and monitor the health impacts of climate change in the UK.
- 2.4.4. The purpose of this report is to give an overview of how and why climate change impacts the health of Manchester residents through both direct and indirect mechanisms. The report will also describe what activities are underway to monitor and mitigate these health impacts and minimise health inequalities arising due to climate change. The actions in each of the boxes for each section of the report are summarised in a table in section 6 and the lead responsible agency for the action is provided.

3. Direct Impacts

3.1. Adverse Weather Events

- 3.1.1. The impact of extreme weather on health is substantial. The escalating frequency and intensity of adverse weather events, such as flooding and heatwaves, requires proactive measures to mitigate health risks and adapt our behaviors and environments to the changing climate.

Flooding

- 3.1.2. In the 2021 UK Climate Change Risk Assessment (CCRA), flooding emerged as a significant challenge for climate change adaptation. Manchester postcodes identified as high risk include M1, M3, M4, M8, M12, M19, M14, M20, M22. Around 10,000 homes are estimated to be vulnerable.
- 3.1.3. In October 2023, Storm Babet caused River Mersey water levels to rise to 7.6m, triggering flood warnings in South Manchester. While emergency flood basins were not activated, these defenses were employed in 2021 and 2022. 3000

properties were evacuated during Storm Christoph in January 2021 and reception centres were set up to support residents.

- 3.1.4. Predictions indicate warmer, wetter winters, and by 2050, rainfall and precipitation is expected to increase by a third, potentially amplifying flooding risks in Manchester.
- 3.1.5. Death and severe injury as a direct result of floods are rare events in the UK. However, the health impacts of flooding extend beyond drownings and the immediate impact of physical trauma from flood waters, as outlined in the UK Health Security Agency (UKHSA) evidence base.
- 3.1.6. Contaminated flood water may cause a rise in skin and gut infections and other water borne diseases. The subsequent damp and mould that develop in people's homes may cause or exacerbate underlying respiratory disease in vulnerable individuals, and unsanitary building conditions secondary to contaminated flood waters can lead to problems with pest control. Increases in carbon monoxide poisoning may also be observed due to increased generator use following the disruption to energy supplies.
- 3.1.7. The longer-term harm that results from floods, such as the mental health impacts of losing possessions and being temporarily displaced, are also detrimental to the health and wellbeing of residents living in flood risk areas. The fear of further floods and the inability to afford comprehensive insurance can compound this stress and anxiety.
- 3.1.8. A Manchester Flood Plan, that outlines the emergency response required in the event of flooding is in place and up to date. However, further work is required to better measure and monitor the health impacts of flooding in Manchester.

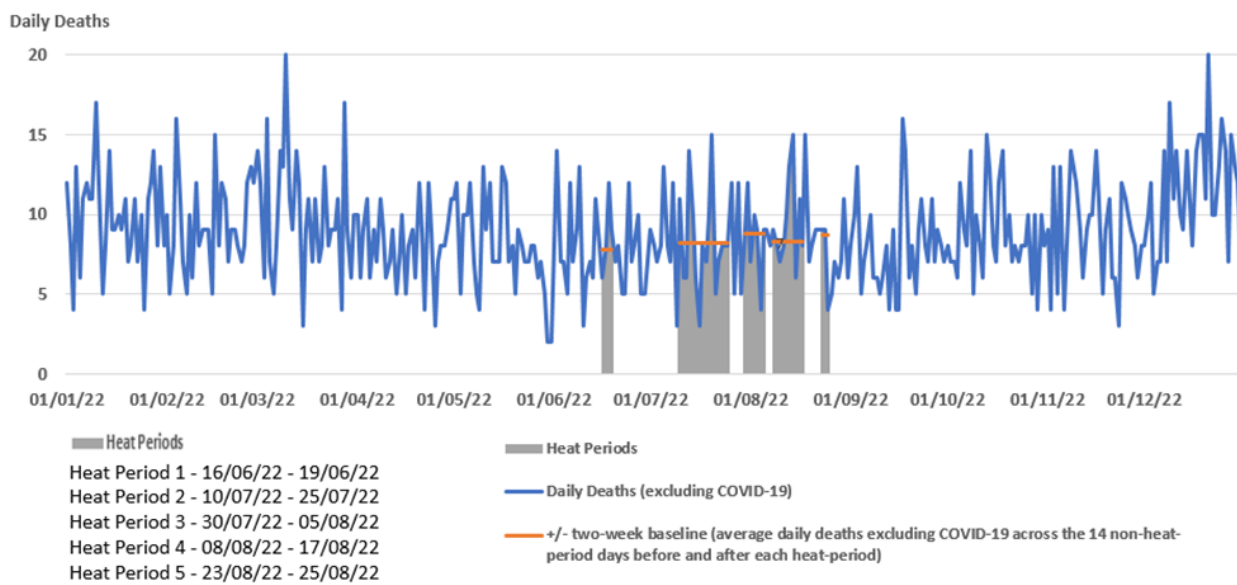
ACTION: The Department of Public Health will work with partners to co-develop a series of appropriate indicators to monitor the health impacts of flooding in Manchester.

Extreme Heat and Heatwaves

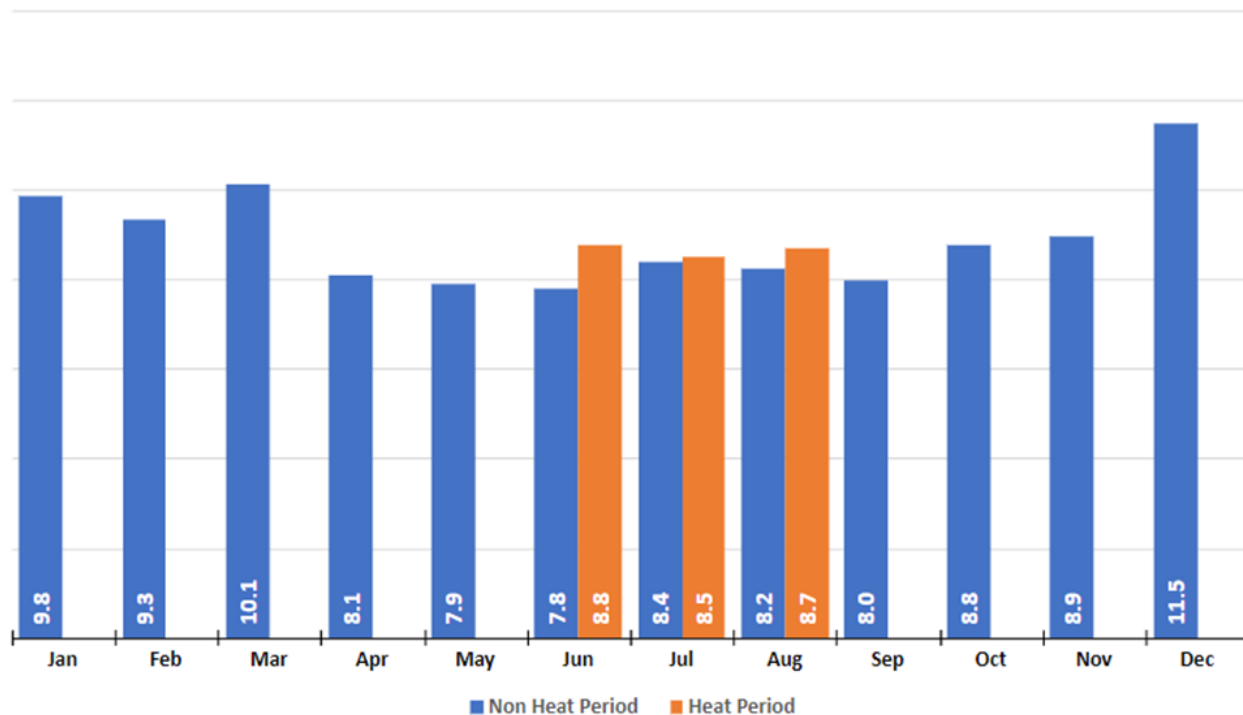
- 3.1.9. In the summer of 2022, the UK experienced several heatwaves. On the 19 July 2022 temperatures in Manchester peaked at 37.2°C, the highest on record in Greater Manchester. Hotter summers are expected to become the norm as global warming continues, which will be harmful to the health and wellbeing of the population, as described in the UKHSA evidence base.
- 3.1.10. Heat related illnesses, such as heat stroke and dehydration, are most concerning for children, the elderly, and those with underlying conditions that make them vulnerable to rapid changes in hydration status, such as kidney disease and diabetes. Individuals with underlying heart conditions and higher

blood pressure are more prone to having heart attacks and strokes, and those with underlying lung conditions are also at increased risk of ill health during periods of extreme heat. Due to the high prevalence of these conditions in older people, as the population ages, the number of heat-related health events will rise. It has been estimated that 2,800 people aged over 65 died from the heat in England and Wales in 2022, and this number has been predicted to increase three-fold by 2050.

3.1.11. Locally, it was found that the average number of deaths per day in Manchester were higher during heat period days when compared with non-heat period days, as depicted in graphs 1 and 2 below.



Graph 1: Daily deaths during heat period and non-heat period days in Manchester 2022



Graph 2: Average number of daily deaths per month during heat period and non-heat period days in Manchester 2022

3.1.12. Due to the small number of deaths occurring on a single day, it is hard to determine if these deaths were linked to higher temperatures or whether it was simply a random occurrence. However, monitoring this on an annual basis could help assess whether future heat periods have similar patterns of increased mortality.

ACTION: The Department of Public Health will serially monitor mortality in periods of extreme heat, comparing the number of daily deaths in heat periods and non-heat periods.

3.1.13. However, it is not only increased mortality rates that are of concern. Heatwaves are associated with poorer mental wellbeing in the population, increased presentations to mental health facilities, and an increased number of suicides. Nationally, an increase in accidental drownings is seen in hot weather due to more people open water swimming. International research has suggested heatwaves are associated with increased violence. However, though a brief review of local data has indicated there are more domestic violence incidents in the summer months, this increase is also observed over the Christmas period. Therefore, further work is required locally to explore the relationship between weather and violence in Manchester in more detail.

ACTION: The Department of Public Health will explore the impact of extreme heat on morbidity, mental wellbeing, and violence, using similar methods described to monitor mortality.

- 3.1.14. Despite the mounting evidence of the health harms associated with periods of extreme heat, in England, more people die in cold weather.

Extreme Cold

- 3.1.15. Direct cold exposure may cause hypothermia, which if severe or left untreated, may lead to illness and death, though cases where hypothermia is the primary cause of death are rare. Exposure to cold can also exacerbate breathing difficulties, increase the risk of chest infections, increase the risk of heart attacks or strokes, and increase the risk of falls, particularly in older people.
- 3.1.16. Like extreme heat, extreme cold can negatively impact the mental wellbeing of the population, due to an increased risk of anxiety and depression during winter. More people may have an increased exposure to indoor air pollution in colder weather due to reduced ventilation. Carbon monoxide poisoning is also more likely in the colder winter months, and disproportionately affects those from more deprived backgrounds who are at higher risk of having appliances that are faulty, poorly maintained, or not installed properly.
- 3.1.17. The Office for Health Improvement and Disparity (OHID) calculate a yearly winter mortality index (WMI). The WMI compares the average number of deaths in winter with the average number of deaths in non-winter periods. During the 12-month period August 2020 to July 2021 (the most recent published data), the WMI in Manchester was 23.4%, meaning that the average number of deaths in winter months was 23.4% higher than that seen in non-winter months. The WMI in Manchester (23.4%) was lower than the comparable figure for England as a whole (36.2%) which suggests that seasonal factors have less of an impact on deaths in Manchester compared with the country as a whole. In part, this is because the number of deaths in Manchester is relatively consistent throughout the year. However, a historically lower WMI does not necessarily mean that we would not expect periods of extreme cold to have an impact on mortality or other health outcomes in the future.

ACTION: The Department of Public Health will explore the impact of extreme cold on morbidity and mortality in the Manchester population using similar methods described to measure mortality in extreme heat periods.

Employment and Adverse Weather Events

- 3.1.18. The relationship between an individual's occupation and their exposure to adverse weather events is complex. People who work in temperature-controlled offices may experience protection from the health harms associated with adverse weather event exposure such as extreme heat or cold. They may also experience additional advantages such as lower fuel bills compared with those who spend more time in their homes. However, those who work outside may be more vulnerable to an increase in the frequency and severity of adverse weather events. Employers have a responsibility to ensure the health and wellbeing of staff whilst in the workplace, including the consideration of adverse weather event exposure, and whether this is happening should be monitored.

ACTION: The Department of Public Health will work with partners to explore whether climate change has been identified as a health and safety issue by employers at the council and anchor institutions, and what climate adaptation plans have been developed to mitigate these health and safety risks.

3.2. **Air Pollution**

- 3.2.1. Many drivers of climate change also contribute to air pollution. Air pollution is harmful to health, having been shown to reduce life expectancy and exacerbate cardiovascular and respiratory disease in vulnerable individuals. Those most vulnerable to harm include people with pre-existing heart and lung conditions, as well as children, and older people.
- 3.2.2. Air pollution also drives health inequalities. Areas with higher levels of deprivation often have higher levels of air pollution. Those living in more deprived areas also typically have less choice over where they live and are less able to move if their health is impacted by poor air quality.
- 3.2.3. The impacts of air pollution in Manchester can be considered as consequences of either indoor or outdoor air pollution.

Indoor Air Pollution

- 3.2.4. Actions to promote and improve indoor air quality, such as increasing ventilation, may inadvertently increase energy use and thus increase carbon emissions. Likewise, interventions to reduce carbon emissions, may have the unwanted consequence of worsening air quality, increasing people's exposure to indoor air pollution. This is why it is important that indoor air quality is monitored and considered alongside the impacts of climate change.
- 3.2.5. Sources of indoor air pollution include second hand tobacco smoke, damp and mould, burning fuel inside the home, and the use of gas stoves rather than electric hobs for cooking.

- 3.2.6. People living in more deprived areas are more likely to smoke, and to have household appliances more prone to causing indoor air pollution. People experiencing fuel poverty are also more likely to live in cold, damp, and mouldy homes. Plans to improve the energy efficiency of homes and to reduce the number of families experiencing fuel poverty outlined in Making Manchester Fairer will be vital to improving the air quality in the most deprived homes and to reduce health inequalities due to indoor air pollution exposure.

Outdoor Air Pollution

- 3.2.7. The leading contributor to outdoor air pollution is traffic, though local industry and the use of wood burning stoves that generate smoke plumes may also contribute to poor air quality in some areas.
- 3.2.8. The monitoring of outdoor air quality in Manchester is led by the Environmental Health team, details of which can be found in appendix 1. In Manchester 2021 fine particulate matter emissions, also known as Particulate Matter 2.5 (PM2.5) emissions, were recorded as 7.9mcg/m³, higher than both regional (7.1) and national (7.4) annual concentrations. However, due to a lack of more robust data, it is unclear if these differences are statistically significant.
- 3.2.9. The health impacts of outdoor air pollution are difficult to quantify, and work is ongoing both in local authorities and alongside local NHS organisations to explore how we can best measure and monitor the effects of poor air quality on health using local data.
- 3.2.10. The Office for Health Improvement and Disparity (OHID) currently recommend using the fraction of mortality attributable to particulate air pollution. This shows the proportion of deaths in adults aged 30 or over that is estimated to be associated with long-term air pollution exposure. In Manchester in 2021 this was calculated as 5.9%, meaning just over 1 in 20 deaths are associated with air pollution. This is slightly higher than the national average of 5.5%. However, due to a lack of data, it is unclear if this difference is statistically significant.
- 3.2.11. At present, there are no indicators used by OHID to measure the morbidity associated with outdoor air pollution. The amount of time spent exercising in greenspace may be used as a proxy measure for satisfactory outdoor air quality in an area. However, data was last collected for this indicator in 2016.
- 3.2.12. People who work outside, near heavy traffic, or in certain industries are more likely to be exposed to outdoor air pollution. Children attending schools located near busy roads will also have increased exposure. However, further work is required to monitor the extent of occupation and school related exposure to air pollution in Manchester.

ACTION: The Department of Public Health will continue to review the UKHSA evidence base and engage with local and national partners to advocate for the development of appropriate indicators to measure morbidity related to air pollution and how this varies according to occupation or school location.

4. Indirect Effects

4.1. The Impact of Climate Change on NHS Organisations in Manchester

- 4.1.1. Adverse weather events can impact the ability of local NHS organisations to deliver services. NHS buildings in flood risk areas may need to be evacuated or may become damaged in the event of flooding. Poorly ventilated NHS buildings may be prone to overheating, creating an unsafe work environment for patients and staff. Staff may be unable to come to work due to disruption to travel infrastructure during adverse weather events.
- 4.1.2. An increase in the demand for services may also arise during adverse weather events. Without appropriate planning to allow for an increase in the delivery of services to meet demand, this will negatively impact the health of the local population.
- 4.1.3. As outlined in the “Impact of the Heatwave” health scrutiny report, “during the heatwave in July 2022, there was no increase in A&E attendances, or emergency admissions...but there was a spike in demand for primary care”. However, findings from international research undertaken in countries that more commonly experience extreme heat suggest that demand also increases for emergency services, citing increased ambulance call outs and A&E attendances. Therefore, ongoing monitoring of the impact of extreme heat on local health service use is warranted.

ACTION: The Department of Public Health will explore the impact of adverse weather events, such as periods of extreme heat, on local health service use.

4.2. The Impact of Climate Change on the Food System

- 4.2.1. Adverse weather events, such as droughts and floods, can reduce agricultural productivity. Though Manchester is not at substantial risk of droughts, nor is it a large producer of food, other countries, and other parts of the UK, which Manchester depend on for food, may be affected. This disruption of supply chains leads to less food being available and higher prices. This results in more people becoming food insecure and more people becoming reliant on food banks. A systematic review from Oldroyd et al has shown that food provided by food banks is not of sufficient quality to maintain a healthy and balanced diet as per national healthy eating guidelines. Therefore, the increased use of food

banks will drive diet-related health inequalities, resulting in those residing in more deprived areas and with lower incomes becoming at increased risk of obesity and other associated health complications such as diabetes and cardiovascular disease.

4.3. The Impact of Climate Change on Migration

- 4.3.1. Climate change may lead to an increase in migration to Manchester. This may be from within the UK due to floods, coastal erosion and rising sea levels, as well as from overseas due to an increase in the number of displaced people seeking refuge from catastrophic weather events around the world. This increase in need places further demand on already stretched services. Without sufficient additional resources and planning, this could impact the delivery of health services in Manchester.

5. Mitigation, Adaptation and Emergency Response

- 5.1. The direct and indirect impacts of climate change can be addressed through mitigation, adaptation, and provision of a robust emergency response.

5.2. Mitigation

- 5.2.1. These activities are concerned with reducing carbon emissions, to help limit temperature increases associated with global warming, and reducing air pollution. This will reduce the impact of both the direct and indirect effects of climate change outlined above.

5.3. Activities to Reduce Carbon Emissions

Activities: Manchester City Council

- 5.3.1. The carbon budget for the council is outlined in the Climate Change Action Plan (CCAP) 2020-2025. Quarterly updates are provided to the Environment, Climate Change, and Neighbourhoods Scrutiny Committee that detail ongoing activities to reduce carbon emissions and the progress made by the council and partners towards becoming a zero-carbon city by 2038.
- 5.3.2. Providers of services commissioned by the Department of Public Health must provide information to commissioners on how they mitigate the environmental impact of services and are required to support the Council to become a zero-carbon city. Performance monitoring currently varies between services, but some providers report on this every Quarter. In an example of recent good practice, commissioners included the requirement for providers to commit to reduce single use plastic in their contract report, thus reducing the environmental impact of that service

ACTION: The Department of Public Health will improve consistency in performance monitoring of commissioned services by requiring all providers to report on environmental impact every Quarter

Activities: NHS Organisations

- 5.3.3. The NHS is a major contributor to the UK's annual carbon emissions. As such NHS organisations have responsibilities to achieve net zero by 2040. How these national targets will be met should be outlined in Green Plans and performance must be described in annual reports, to include "quantitative progress data, covering as a minimum greenhouse gas emission in tonnes, emissions reduction projections and an overview of the Provider's strategy to deliver those reductions."
- 5.3.4. The Manchester University NHS Foundation Trust (MFT) Green Plan was board approved in January 2022. A review of progress has been detailed in the annual sustainability report 2022/2023. The report includes quantitative data to support claims of meeting key performance indicators and thus demonstrates progress in the implementation of the Green Plan. Highlights include 5% annual carbon reductions for direct carbon emissions and the establishment of a walking aid reuse scheme. However, the carbon budget for the Green Plan will be exceeded as, although reductions are occurring, they are not at the scale needed to stay within the plan, meaning a more challenging carbon budget for MFT in the future. More detailed data outlining the performance of MFT sites are outlined in the MFT annual sustainability report, some of which has been described in appendix 2.
- 5.3.5. The Greater Manchester Mental Health Trust (GMMH) lists sustainability as one of five key objectives in their estate strategy and states the trust is committed to reducing the environmental impact of service provision. In GMMH's annual report and accounts 2022-2023, authors highlight the procurement of green renewable energy, the removal of single use plastics, and the introduction of energy efficient LED lighting. The report describes "a high-level three-year sustainability vision" which will focus on climate resilience, social value, and the continued reduction of carbon emissions. The report also states the ambition to build the country's first all-electric mental health facility, which will reduce the overall operational carbon footprint of the trust, whilst being more resilient to a changing climate. However, though some quantitative data is used in this report to describe the dominant sources of the trust's carbon emissions, the total reduction in carbon emissions for the reporting year and against baseline is not reported.
- 5.3.6. The Christie NHS Foundation Trust developed a Green Plan and appointed a sustainability manager and sustainable development committee (SDC) to drive through the objectives and obligations. The NHS Net Zero Target is to become a

Trust Corporate objective and key sustainability highlights outlined in the Christie NHS Foundation Trust Annual Report and Accounts 2022-2023 include:

- Green Team competition, with five teams receiving mentoring from the Centre for Sustainable Healthcare to deliver sustainable quality improvement projects with 99 tonnes CO₂e savings reported.
- Reducing the use of desflurane, a volatile anaesthetic gas with an extremely high global warming potential to less than 3% by volume.
- Delivery of a package of energy efficient infrastructure improvements, with expected emission reductions of 1,000 tonnes CO₂e by mid 2023.

5.3.7. However, overall reductions in carbon emissions for the reporting year and against baseline are not reported.

5.3.8. There is no formal Green Plan for the primary care network, as there is no legislative requirement for one, but there is comprehensive guidance and support available via the Greener Practice programme to support interventions to reduce carbon emissions. A local Green Network has been established, and there has been activity to reduce carbon emissions through medication changes to lower carbon inhalers.

Activities: The Manchester Food Board

5.3.9. Food systems account for up to 40% of total greenhouse gas emissions and significantly contribute to biodiversity loss. Creating targeted action plans to minimise waste in the food system and engage in more sustainable practices may therefore lead to a significant reduction in carbon emissions and protect biodiversity within the city.

5.3.10. In addition to the objectives and workstreams outlined in the Manchester Food Strategy, local businesses are also encouraged to sign up to a sustainable business code. The code has a holistic understanding of sustainability. This includes the more 'traditional' aspects such as food waste and shorter supply chains, as well as broader social, health and economic aims. This ensures that those that sign up for the code are doing what they can to mitigate the impacts of climate change for the residents of Manchester.

5.3.11. Due to the far-reaching impacts of the food system on the health and wellbeing of Manchester residents, a more detailed update on the complex relationship between climate change and the food system is required. It is advised that a separate report, authored by a member of the Manchester Food Board, is produced to provide sufficient information and detail to the committee.

ACTION: Member of the Manchester Food Board to compile a report outlining the impacts of climate change on the food system in Manchester and ongoing activities to mitigate against these impacts.

5.4. **Activities to Reduce Air Pollution**

- 5.4.1. In addition to reducing carbon emissions, mitigation activities are planned to improve air quality, outlined in the Greater Manchester Clean Air Plan, thus minimising the impact of air pollution on health.
- 5.4.2. The Clean Air Plan includes the transition to “zero-emission bus fleets”, minimising the impact of exhaust fumes on air quality. However, particulate matter air pollution is still generated from vehicles even without exhaust emissions, for example, when vehicles break. Therefore, reducing the number of vehicles on the road is still urgently required to improve air quality in the city.
- 5.4.3. The Clean Air Plan hopes to achieve this through encouraging more residents to actively travel. This is supported by other workstreams outlined in the Making Manchester Fairer Strategy, such as collaborative working with TFGM to improve cycling infrastructure in the city.
- 5.4.4. TFGM have also been working closely with the University of Manchester to develop a research project to evaluate and reduce the impact of wood burning on air quality in Manchester, details of which can be found in appendix 3.

5.5. **Adaptation to Climate Change**

- 5.5.1. The climate has already begun to change. Therefore, city-wide climate adaptation is urgently required to address the health impacts of climate change and air pollution.

Activities: The Council

- 5.5.2. A Manchester Adaptation Plan will be developed that will be cross sectoral and will cover:
 - Natural Environment
 - Infrastructure
 - People and the built environment
 - Business and industry
 - Local government
 - Health.
- 5.5.3. A high-level plan will be produced in mid to late 2024 followed by a full adaptation plan that will:
 - Build on the Greater Manchester mapping work and commitments in the new Greater Manchester 5 year Environment Plan (2024-29).

- Build on the content in the Council's Organisational Adaptation Plan to develop local government as a sector.
- Establish a clear timeline developed alongside the Climate Change Action Plan 2025-30 and Climate Change Framework 2025-30.

5.5.4. The Council will produce an adaptation plan covering the various roles and responsibilities covered by an upper tier local authority including:

- Infrastructure managers (roads, green spaces, public buildings)
- Place makers (local plans, development oversight)
- Service providers (social care, public health)
- Community support (needs assessment, partnerships)
- Conveners (stakeholder engagement, business support)
- Resilience partners (preparing and responding to climate risks).

5.5.5. The Council's plan will kick off with a series of directorate and thematic workshops which will use data from a range of sources including the Manchester Heat Pack, flooding data, and climate vulnerability information. The sessions will identify interdependencies with other sectors, develop clarity in governance, identify gaps in current organisational resilience, and produce an action plan to embed climate adaptation into plans, strategies and service provision.

ACTION: The Department of Public Health will work in collaboration with partners to help support the production of a Manchester Adaptation Plan.

Activities: NHS Organisations

5.5.6. NHS organisations have responsibilities around adaptation, outlined in the NHS Standard Contract.

5.5.7. Work is underway to produce a climate adaptation plan for the Greater Manchester Integrated Care System (ICS). The primary focus of the ICS plan will be on the health impact of climate change and possible disruption to services.

5.5.8. The impact of climate change to estates will vary between local organisations. As such, it is recommended that each local NHS organisation should also produce a robust climate adaptation plan. This should include:

- The risks climate change poses to the running of the health service.
- Actions that can be taken to mitigate against these risks.
- Contingency plans to cope with any increase in demand for health service use due to adverse weather events.

ACTION: NHS Organisations in Manchester will publish Local Climate Adaptation Plans.

5.5.9. Details of the work already underway by individual NHS organisations can be found in appendix 4.

5.5.10. To support adaptation plans, a series of indicators should be agreed upon at a Greater Manchester level that will require monitoring by each NHS organisation to determine whether adaptation plans are sufficiently robust.

ACTION: The Department of Public Health will work collaboratively with local partners to compile a series of Greater Manchester specific indicators to measure the health impacts of adverse weather events and air pollution relevant to local NHS organisations.

5.6. **Adaptation to Air Pollution**

5.6.1. Work is planned to reduce the exposure of the most vulnerable residents to air pollution. The Clean Air Practice intervention, due to be rolled out in the coming months, asks GP practices to advise their vulnerable patients to sign up to air quality alerts. By signing up to the alerts, those most at risk of harm will be notified when air quality is poor and are signposted to advice on how they can reduce their exposure.

5.6.2. The Royal College of Paediatrics and Child Health (RCPCH) have outlined their concerns that air pollution is negatively impacting the health and wellbeing of children. At Manchester University NHS Foundation Trust (MFT), a pilot study in which clinicians will be able to directly refer to housing and environmental health teams has been planned to try and reduce vulnerable children's exposure to damp and mould, a source of indoor air pollution. It is hoped this will expediate the treatment of damp and mould in homes and results of the pilot study are eagerly awaited.

ACTION: Evaluate the pilot undertaken at MFT in which clinicians are able to directly refer to housing and environmental health teams.

5.6.3. Further workstreams are also being explored that would allow the inclusion of air quality data in electronic patient records. However, this is in the very early stages at present. Working collaboratively with public health and paediatric medicine colleagues based at MFT, we hope to build on the evidence base that explores the impact of air pollution on child health.

ACTION: Continue to work collaboratively with colleagues at MFT to explore the impact of air quality on children.

5.7. **Emergency Response**

- 5.7.1. Action must be taken to protect the health and well-being of Manchester residents during severe adverse weather. It is therefore important to have robust emergency response plans in case of severe adverse weather events.

5.8. **Cold Weather Plan**

- 5.8.1. The Cold Weather Plan for England is a framework intended to protect the population's health in cold weather. In addition to the national plan, a series of Greater Manchester and Manchester specific actions that ensures the needs of Manchester residents are met during cold weather periods are outlined below:

Command and Control

- Weather alerts are monitored throughout the year and forwarded to the weather alert group via an automated process.
- Members of the weather alert group include Forward Incident Officers and Tactical Officers, allowing for the ongoing dissemination of information and triggering of key actions as necessary.
- Situation Report templates are included as part of the overall Manchester City Council Response and Recovery Plan.
- Should the need arise a Strategic Coordinating Group will be called to ensure all responders have arrangements in place to respond to any adverse weather.

Transport and Highways

- Transport for Greater Manchester (TFGM) will provide specific travel information for Greater Manchester.
- The Highways Winter Service Operational Plan is reviewed and updated every year.
- A Greater Manchester framework for salt suppliers is in place, allowing flexible provision options for the procurement of extra salt if required.
- Further information regarding salt and grit stocks for Manchester are outlined in detail in the Highways Winter Service Operational plan - at present it is understood there are 5000 tons of salt at Hooper Street.
- 4x4 vehicle service provision is maintained via the voluntary sector, managed at a Greater Manchester level.

Health and Wellbeing

- Continued public health surveillance of excess mortality and cases of Flu, Norovirus, and COVID 19.

- Excess mortality can be monitored using data on the number of deaths registered in England and Wales, published by Office of National Statistics (ONS) on a weekly basis
- UKHSA monitor flu and norovirus cases in Manchester residents and report on these regularly
- Covid-19 surveillance comes from the ONS and hospital admissions data
- The Public Health Community Health Protection Team monitor outbreaks and all infectious diseases cases in high-risk settings, such as Care Homes, and works with local teams from these settings to control outbreaks and respond as appropriate.
- Vulnerable residents are identified via a vulnerable person's list
 - Information obtained from Adult's and Children's social care teams, allowing the council to quickly identify vulnerable residents.
 - Quarterly meetings are scheduled with the Adult Social Care (ASC) Duty Principal Managers to ensure lists are up to date.

Education

- Dissemination of information regarding school closures is managed via the School Closures Communications Plan.
- The Public Health Community Health Protection Team works closely with schools to support them with infection prevention and control.
 - A webinar has been held with school leaders to remind them of online reporting systems for cases or situations so that our team can pick this up early and work with the school to manage the situation
 - Preparations are underway for potential outbreaks of flu, covid and norovirus during winter months
 - Key information on isolation from school time periods for different infections has been shared.

Communications

- National advice is available via UKHSA cold weather alert cards.
- Greater Manchester Resilience Forum (GMRF) have scheduled tweets in place to promote winter preparedness and specific pages that provide advice in relation to winter weather.
- A Manchester specific communications plan is in place for health awareness during winter months and "Winter Warmth Advice" is disseminated to vulnerable residents.
- Information on local services is available in easy read format and translated in several languages.
- An additional Manchester City Council Emergency Communications plan is also in place

Evacuation

- A Community Assistance Plan is in place with Greater Manchester Fire and Rescue Service (GMFRS) to provide support to Greater Manchester Local Authorities and residents during severe cold weather.
- Reception centres were reviewed in August and the Sheltering Evacuees, and City Centre Evacuation Plans are both up to date.

5.8.2. During extreme cold weather periods, we need to ensure the needs of the most vulnerable populations are being met. This is particularly important when thinking about the needs of those at highest risk of exclusion, such as people who are rough sleeping, people who work in the sex industry, people in prison, or members of Gypsy, Roma, Traveller, Showpeople, and Boater communities.

5.8.3. A task and finish group can work closely with other groups that also target these communities, such as groups working to improve the uptake of the winter flu vaccine, thus ensuring wrap around support for our most vulnerable Manchester residents. Members would include those from the council, local NHS organisations, local voluntary community and social enterprise (VCSE) groups, and community leaders.

<p>ACTION: The Department of Public Health will set up an adverse weather event task and finish group to ensure the needs of the most vulnerable residents during adverse weather events.</p>
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5.9. **Heatwave Plan**

5.9.1. During the 2022 heatwaves, the council worked closely with partners to ensure the safety and wellbeing of Manchester residents experiencing extreme heat. Vulnerable individuals were identified from pre-existing vulnerable person's lists and national guidance was followed. However, moving forward, a Manchester specific heatwave plan will be developed.

5.9.2. This plan will draw on UKHSA guidance, the Manchester Heat Pack, the Heat Vulnerability Index, and other locally available data, to outline a series of recommended actions in the event of further heatwaves. The heatwave plan will include hot weather warnings that will align with the Met Office risk matrix, providing graded advice according to risk for residents. The heatwave plan will also recognise the vulnerability of Manchester's institutionalised residents, such as prisoners, who reside in buildings at higher risk of overheating.

5.9.3. In addition to advice provision, the heatwave plan will also review measures to protect the population from extreme heat proposed in the Local Climate Adaptation Tool (LCAT). The plan will consider the available evidence and determine whether the implementation of measures suggested, such as cool

shelter provision, is appropriate in the Manchester context, and the impact of such interventions on health inequalities.

- 5.9.4. The heatwave plan will then be combined with pre-existing cold weather and flood plans to form a single adverse weather event plan.

ACTION: We will create a Manchester specific heatwave plan and combine this with the cold weather plan and flood plan to produce a single adverse weather event plan.

6. Co-benefits of Climate Action

- 6.1. The promotion of active travel and the increased provision of greenspace are key actions identified in the Making Manchester Fairer Strategy to improve the local environment and reduce the impacts of climate change. However, these will both have additional positive impacts on the health and wellbeing of Manchester residents, independent of their effect on the environment.

6.2. Activity in Manchester

- 6.2.1. In February 2023 Manchester City Council published the Manchester Active Travel Strategy and Investment Plan which aims to:

- Improve access to the city centre, district centres, parks, and other key destinations.
- Enable safe access to schools and colleges.
- Improve citywide health and wellbeing.
- Reflect the diversity of Manchester and address transport inequalities.

- 6.2.2. Between July and September, a prioritisation tool was developed which takes into account deprivation and inequality within the design of Active Travel schemes.

- 6.2.3. In September, the University of Manchester engaged in work looking at the cultural, social and accessibility barriers to accessing green spaces. An initial conversation about this issue has taken place at the Green and Blue Infrastructure Board, with plans to explore this further.

- 6.2.4. Further details of activities to encourage active travel and improve access to greenspace, to include the delivery of the “In Our Nature” programme, can be found in appendix 5.

7. Summary and next steps

- 7.1. The actions highlighted throughout this document are summarised in the table below.

Action	Lead Responsible Agency
Co-develop a series of indicators to monitor the health impacts of flooding	Manchester Climate Change Agency in partnership with GMCA
Serially monitor mortality in periods of extreme heat	MCC Department of Public Health
Explore impact of extreme heat on morbidity, mental wellbeing, and violence	MCC Department of Public Health
Explore impact of extreme cold on morbidity and mortality	MCC Department of Public Health
Explore whether climate change has been identified as a health and safety issue for employers and what climate adaptation plans are in place at the council and anchor institutions	Manchester Climate Change Agency in partnership with GMCA
Air pollution morbidity indicators	GMCA/UKHSA with support from MCC Department of Public Health
Explore impact of adverse weather events, such as extreme heat, on local health service use	MCC Department of Public Health working with MCC Neighbourhoods Directorate and GMCA
Monitoring of public health commissioned services to report quarterly on environmental impact	MCC Department of Public Health
Compile report outlining impacts of climate change on the food system and ongoing activities by the Manchester Food Board to mitigate against these impacts	Manchester Food Board
Development of a Manchester Adaptation Plan	Manchester City Council strategic team with support from Department of Public Health
NHS Organisations to publish Local Climate Adaptation Plans	Each Local NHS Organisation
Compile a series of GM indicators to measure the health impacts of adverse weather events and air pollution relevant to local NHS Organisations	GMCA with support from MCC Department of Public Health
Evaluate pilot undertaken at MFT in which clinicians can directly refer to housing and environmental health teams	MFT

Continue to work collaboratively with colleagues at MFT to explore the impact of air quality on children	MFT
Set up adverse weather event task and finish group to ensure the needs of Manchester's most vulnerable residents receive wrap around support	MCC Department of Public Health
Develop Manchester specific Heatwave Plan	MCC Department of Public Health

7.2. The health impacts of the escalating climate crisis are supported by an abundance of evidence, and Manchester City Council has a key role to play in influencing local climate change action. The development of a series of indicators will allow the effective monitoring of such health impacts and robust adaptation and emergency response plans will ensure the health and well-being of Manchester residents is preserved in the face of a rapidly changing climate. Through the implementation of the "Making Manchester Fairer" strategy, it should be possible to simultaneously monitor health inequalities to ensure that any interventions implemented do not drive inequity and that the most vulnerable members of the population are protected.

8. Recommendations

8.1. The Committee is recommended to consider and comment on the report.

9. Appendices

Appendix 1 The monitoring of outdoor air quality in Manchester

Appendix 2 Manchester University NHS Foundation Trust (MFT) performance

Appendix 3 Research on air quality and wood burning stoves

Appendix 4 Climate adaptation activities in Local NHS organisations

Appendix 5 Activities to encourage active travel and improve access to greenspace