

ITEM No ...6.....

REPORT TO: COMMUNITY SAFETY & PUBLIC PROTECTION COMMITTEE –24 FEBRUARY 2020

REPORT ON: IMPACTS OF AMBIENT AIR POLLUTION ON HEALTH

REPORT BY: EXECUTIVE DIRECTOR OF NEIGHBOURHOOD SERVICES

REPORT NO: 65-2020

1.0 PURPOSE OF REPORT

1.1 To provide Committee with information on the impacts of ambient air pollution on health.

2.0 RECOMMENDATIONS

2.1 It is recommended that Committee note the contents of this report.

3.0 FINANCIAL IMPLICATIONS

3.1 There are no financial implications of this report.

4.0 CONTENT

4.1 Reference is made to Article III of the minute of the meeting of the Community Safety and Public Protection Committee of 6 June 2019, where it was agreed to remit the Chief Executive to bring forward a report on the actions which could be taken, along with NHS Tayside, to mitigate the problems caused by poor air quality in the city of Dundee.

4.2 It is well established that there is a correlation between ambient levels of local air pollutants such as nitrogen dioxide and particulates and respiratory and cardiovascular diseases as well as other health impacts. For these reasons, the Local Air Quality Management regime was introduced by the Environment Act 1995 that imposed a duty for local authorities to monitor local air quality, if necessary declare Air Quality Management Areas and develop Air Quality Action Plans. More recently, Scottish Government introduced the Cleaner Air for Scotland Strategy and made the commitment to introduce LEZs in Scotland's four main cities. These initiatives are designed to provide a means to reduce levels of local air pollutants and consequently reduce the potential for associated adverse health impacts.

4.3 Work is ongoing on development work to introduce a Low Emission Zone in Dundee, as well as other actions in the Council's Air Quality Action Plan. The Council also has a number of ongoing projects that promote active and sustainable travel, such as the Dundee Cycling Strategy 2019, Drive Dundee Electric, the city-wide Dundee Climate Action Plan 2019 and is in the process of completing a new Staff Travel Plan. Other planned projects include the construction and opening of an active travel hub at the Waterfront and the launch of a public bike hire scheme. DCC continues to lead the way in electric vehicle uptake with the proportion of the DCC fleet that is electric increasing year on year. DCC has also opened dedicated charging hubs at Lochee, Princes Street, and Broughty Ferry, plus additional charging infrastructure at the Greenmarket and Olympia carparks to assist those who have made the change to driving an electric vehicle.

4.4 In addition, in order to address the issue raised by Committee as outlined at 4.1, officers have been in discussion with NHS Tayside Public Health Team, who are also represented on both the Corporate Air Quality Steering Group and the Dundee LEZ Delivery Group, to consider current evidence on the impacts of ambient air pollution on health and to outline areas where the Council and NHS Tayside can work together, over and above the ongoing initiatives to

reduce the impact of, in particular, road transport on local air quality. The paper, produced by the Health Protection Team of NHS Tayside and included at Appendix 1 summarises this work.

- 4.5 National policy initiatives may also influence the rate of improvement, potentially including the introduction of fossil fuel free city centres, the ongoing initiatives to increase the uptake of electric vehicles and the development of hydrogen as a viable alternative to fossil fuels.

5.0 POLICY IMPLICATIONS

- 5.1 This report has been subject to an assessment of any impacts on Equality and Diversity, Fairness and Poverty, Environment and Corporate Risk. There are no major issues.

6.0 CONSULTATIONS

- 6.1 The Council Management Team were consulted in the preparation of this report.

7.0 BACKGROUND PAPERS

- 7.1 **None**

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Executive Director of Neighbourhood Services

Tom Stirling
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5 February 2020

1. The impacts on ambient air pollution on health

While low- and middle-income countries disproportionately suffer the greatest health burden of poor air quality, air pollution remains the single largest environmental health risk in the United Kingdom, contributing to premature death and disease.ⁱ Poor air quality, due to gaseous and particulate pollution, is associated with both short- and long-term adverse effects on human health. The size of polluting particles, concentration of pollutants and the duration of exposure are key determinants of potential adverse health effects. Particles larger than 10 µm are mainly deposited in the nose or throat, whereas particles smaller than 10 µm pose the greatest risk because they can be drawn deeper into the lung. The strongest evidence for effects on health is associated with fine particles (PM_{2.5}). However, epidemiological studies have also shown associations of outdoor Nitrogen Dioxide (NO₂) with adverse effects on health, including reduced life expectancy. While some of the health effects are caused by NO₂ itself, other pollutants emitted at the same time are also likely to be contributing.ⁱⁱ

As well as exposure related factors, the effects of air pollution on health also depend on an individual's vulnerability. Long term exposure to air pollution can affect everyone's health. However, some people are more vulnerable to the effects of air pollution because of their age (children and older people are at increased risk), existing medical conditions and/or health determining behaviours.

Air pollution is ubiquitous but in urban areas especially with those with large volumes of traffic, exposure to air pollution can be high. The levels of air pollution experienced on high pollution days in Scotland are usually not sufficient to cause acute problems in healthy individuals but can exacerbate symptoms in people who have pre-existing health conditions e.g. exacerbations of respiratory and cardiovascular conditions. This would only be expected on days where the daily air quality index exceeded a score of 4 or more [Table 1].

Table 1: Daily Air Quality Index – Recommended Actions and Health Advice

Air pollution banding	Value	Accompanying health messages for at risk individuals	Accompanying health messages for the general population
<u>Low</u>	<u>1-3</u>	Enjoy your usual outdoor activities.	Enjoy your usual outdoor activities
<u>Moderate</u>	<u>4-6</u>	Adults and children with lung problems, and adults with heart problems who experience symptoms, should consider reducing strenuous physical activity, particularly outdoors.	Enjoy your usual outdoor activities
<u>High</u>	<u>7-9</u>	Adults and children with lung problems, and adults with heart problems, should reduce strenuous physical exertion, particularly outdoors, and particularly if they experience symptoms. People with asthma may find they need to use their reliever inhaler more often. Older people should also reduce physical exertion.	Anyone experiencing discomfort such as sore eyes, cough or sore throat should consider reducing activity, particularly outdoors.
<u>Very High</u>	<u>10</u>	Adults and children with lung problems, adults with heart problems, and older people, should avoid strenuous physical activity. People with	Reduce physical exertion, particularly outdoors, especially if you experience

		asthma may find they need to use their reliever inhaler more often	symptoms such as cough or sore throat.
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In Dundee, the daily air quality index exceeded a score of '4' on 32 times between 2017-2019. On the majority of occasions the score was 4 or 5. However, on at least four occasions the daily air quality index was 7 or above, although in one situation in 2019 polluted air from the continent was thought to be largely responsible.

In addition to the acute health impacts of peak air pollution, there is an extensive body of evidence which associates lower level long-term exposure to air pollution with increases in premature mortality and morbidity. Ambient air pollution has been associated with respiratory disease and cardiovascular disease (e.g. ischaemic heart disease and stroke).ⁱ Outdoor air pollution, especially particulate matter, has also been classified by the International Agency for Research on Cancer (IARC) as carcinogenic to humans (a Group 1 carcinogen) and causing lung cancer.^{iii,iv} In addition, there is emerging evidence which links air pollution with dementia, low birth weight and Type 2 diabetes.ⁱ

While Scotland enjoys relatively good air quality in comparison to its own past and compared to other developed countries, air pollution remains a public health concern. This is due to a number of factors:

- Even in the UK where particulate matter concentrations in many cities do comply with guidelines, life expectancy can still be improved through improvements in air quality.^v
- Small particulate pollution has health impacts even at very low concentrations. Indeed, no threshold has been identified below which no damage to health is observed. For this reason the World Health Organization's air pollution guideline limits aim to achieve the lowest concentration of particulate matter possible.^{vi} There have been associated adverse health effects for NO₂ at and below the legal limits.^{vii}
- It is our most vulnerable populations who are most effected by air pollution. Areas of high deprivation are associated with poorer air quality. The health impacts of poor air quality compound pre-existing health inequalities.
- Air pollution and climate change are inextricably linked. The climate emergency is a significant risk to population health. Measures to combat air pollution which lead to a reduction in the combustion of fossil fuels will bring about additional health benefits by mitigating climate change.
- Measures to reduce air pollution can bring about health co-benefits (i.e. benefits in addition to the direct benefits from reducing air pollution). For example, there are considerable physical and mental health benefits from people walking and cycling rather than driving.

2. Actions to be taken to mitigate the health impact of poor air quality

While the NHS can provide treatment to relieve symptoms and in some cases reverse the physiological consequences of air pollution, in the long-term irreversible damage will be done. As there is no known safe threshold for particulate matter in terms of health, it follows that if we continue to improve air quality (e.g. through low emission zones and investment in active travel networks) then the negative health impacts should reduce if all things else remain the same. Measures to improve air quality should be true improvements rather than shifting the issue from

one location to another, and should be designed to reduce health inequalities and maximise health co-benefits. In other words, the greatest health benefits will be achieved by a reduction in the number of fossil fuel powered vehicles on roads, and replacing them with safe, segregated active travel networks and public transport vehicles with ultra low emissions, prioritising socio-economically deprived areas.

NHS Tayside and Dundee City Council already collaborate in this area. NHS Tayside's Public Health Department support the Corporate Air Quality Steering Group/Low Emission Zone Delivery Group with the aim of mitigating the health impacts of poor air quality and maximising health and wellbeing co-benefits of these mitigation actions. In addition to this, going forward NHS Tayside and Dundee City Council will update the public facing online resource providing proportionate health advice regarding air pollution and ways to minimise exposure particularly on high pollution days (including links to appropriate resources such as 'Know & Respond' which issues alerts for medium, high, very high pollution levels for specific areas).

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February 2020

References

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- ^v Danjak D, Walton H, Smith JD. Birmingham City Health and Economic Impact Assessment study. Kings College London, 2019. <https://www.uk100.org/wp-content/uploads/2019/05/KCL-UK100-Birmingham-City-Health-and-Economic-Impact-2019.pdf>
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