Australian College of Nursing

AUSTRALIAN COLLEGE OF NURSING SUBMISSION TO NATIONAL ENVIRONMENT PROTECTION MEASURES REVIEW OF STANDARDS FOR NO2 SO2 O3

General comments

Air pollution has been declared the single largest environmental risk to global health by the World Health Organization (WHO).[i] Australian standards currently exceed the WHO's recommended levels, which were set nearly 15 years ago. They are less stringent than other international standards in several other countries such as the European Union, US, New Zealand, Canada and China.[ii]

In this context the Australian College of Nursing (ACN) supports this review of the national standards and the proposed changes as set out in the Draft Variation to the National Environment Protection (Ambient Air Quality) Measure.[iii]

ACN also received feedback from members which considers that the current air quality monitoring and reporting requirements need to be expanded and strengthened so as to ensure and promote the health of all Australians, including those who live or work in air pollution 'hot spots'.

The pollutants NO_2, SO_2 and O_3

ACN received information from members which pointed out that the two biggest sources of nitrogen dioxide (NO_2) emissions in Australia come from coal-fired power stations and transport.[iv]

Exposure to NO_2 causes irritation of the eyes, nose, lungs and throat, leading to coughing and difficulty in breathing. Greater exposure causes illness impacting many organs including the lungs, heart and the circulatory system. Evidence demonstrates that vulnerable groups such as elderly people, those with chronic illness and children suffer significant deleterious effects.[v]

Sulphur dioxide (SO_2) is also caused primarily through the burning of fossil fuels in power stations, motor transport and similar industrial processes. People with impaired heart or asthma are at greater risk of further health impairment. Sulphur dioxide also creates secondary fine particle air pollution which causes cardiovascular and respiratory diseases, including cancer.[vi]

Ozone (O_3) forms mostly on hot sunny days when oxides of nitrogen react with substances in the air. Ozone is responsible for worsening conditions such as asthma, chronic obstructive pulmonary disease and chronic bronchitis. Children and people with chronic health conditions are affected more severely by unhealthy ozone levels.[vii]

Particulate matter pollution is a further toxic pollutant that forms from SO_2 and NO_2 and other matter in the air. These small particles ($PM_{2.5}$) may penetrate deeply into the lungs, then into the bloodstream to other organs and in sufficient quantity can contribute to significant health problems.[viii] [ix]

Costs and health impacts of air pollution

Evidence provided to ACN by members reveals that air pollution costs Australia an estimated $16 billion per year in deaths.[x] Poor ambient air quality contributes to over 3,000 premature deaths each year in Australia.[xi]

Very recent Australian research has demonstrated that a whole range of premature deaths, reduced weight babies and people developing type 2 diabetes occur each year in NSW as a result of toxic air pollution, primarily $PM_{2.5}$ particles from released SO_2, and NO_2 gases, from the state's coal-fired power stations.[xii]

Exploration about the health impacts of motor vehicle emissions demonstrate similar health impacts. It is estimated that 1715 Australians died from air pollution from vehicles in 2015.[xiii] A further 21000 significant health events including hospitalisations and chronic diseases each year are attributable to motor vehicle pollution in NSW.[xiv]

Air pollution 'hot spots' exist both in urban and regional areas which are close to major freight routes, busy roads, intersections, as well as coal-fired power stations and similar mining and industrial activities. In urban areas vehicle emissions can contribute up to 80% of NO_2 emissions.[xv] The existence of such 'hot spots' mean that some communities bear a much higher burden of air pollution health impacts than the general population.[xvi] [xvii] [xviii]

A further consequence of such 'hot spots' is that additional air quality monitoring and associated reporting are required to identify, assess and address the pollution impacts in such locations.

As there is no threshold below which particle pollution is not harmful to human health, any measure to reduce $PM_{2.5}$ concentrations will result in an immediate health benefit. In their Sydney based study, Broome et al concluded that "reducing air pollution by even a small amount will yield a range of health benefits."[xix]

The way forward

Feedback from ACN members pointed out that if the air pollution standards for sulphur dioxide and nitrogen dioxide and ozone are reduced and made enforceable by law, emissions from coal-fired power stations and the transport sector will need to be brought into line with international best practice.

Power stations in several countries have been required to install pollution controls such as Flue Gas Desulphurisation which can remove up to 99% of sulphur pollution, and Selective Catalytic Reduction which can remove high levels of nitrogen pollution. These controls can reduce emissions of sulphur dioxide and oxides of nitrogen by 85% or more.[xx]

Australia's ten largest coal-fired power stations, however, have not been required to be fitted with these technologies. Although many international, similar power stations have been successfully retrofitted with such pollution reduction technology.[xxi]

As far as motor transport is concerned, the Department of the Environment and Energy in its 2018 Regulation Impact Statement for cleaner vehicle fuels, proposed a "best option" which reduced sulphur in petrol to 10 parts per million by 1 July 2027 and reduced aromatics from 42% to 35% by 1 January 2022. It estimated that this "best option" would avoid health costs of $1.7 billion from 2027-2040.

Recommendations

As stated above, ACN supports this review of the national standards and the proposed changes as set out in the Draft Variation to the National Environment Protection (Ambient Air Quality) Measure.

Feedback by some ACN members suggest expanding the network of NEPM monitors, especially in traffic-heavy urban locations and near well-known sources of air pollution such as power stations, so as to measure more accurately the risks and improve conditions in these pollution 'hot spots'.

Member feedback to ACN also suggests listing air quality monitoring data publicly through a national website. This should contain data about key pollutants, health alerts for the general population as well as at-risk population sub-groups.

[i] World Health Organization Regional Office for Europe (2017*), WHO's commitment to air quality: from the 1950's to today*. at: http://www.euro.who.int/en/health-topics/environment-and-health/air-quality/news/news/2017/02/whos-commitment-to-air-quality-from-the-1950s-to-today, accessed 30th July 2019

[ii] Environmental Justice Australia. https://www.envirojustice.org.au/national-pollution-standards/ accessed 29th July 2019

[iii] Draft Variation to the National Environment Protection (Ambient Air Quality) Measure for sulfur dioxide, nitrogen dioxide and ozone. Impact Statement. Prepared for the National Environment Protection Council, May 2019, at: http://www.nepc.gov.au/system/files/consultations/8710bdfb-ed01-4df9-8697-bc75956991a1/files/aaq-nepm-draft-variation-impact-statement-o3-no2-so2.pdf, accessed 20 July 2019

[iv] Climate Council, Waiting for the green light: Transport solutions to climate change, at https://www.climatecouncil.org.au/wp-content/uploads/2018/09/CC_MVSA0154-Report-Transport_V5-FA_Low-Res_Single-Pages.pdf, page II, accessed 19th July 2019

[v] United States Environmental Protection Agency; Nitrogen Dioxide Pollution. https://www.epa.gov/no2-pollution/basic-information-about-no2 Accessed 15th July 2019. See also Clare Walter, Elena Schneider-Futschik and Louis Irving, Traffic pollution near childcare centres in Melbourne,(2019) at: https://onlinelibrary.wiley.com/doi/pdf/10.1111/1753-6405.12915, accessed 31 July 2019

[vi] United States Environmental Protection Agency: Sulfur Dioxide Pollution. https://www.epa.gov/so2-pollution/sulfur-dioxide-basics#effects Accessed 15th June 2019

[vii] United States Environmental Protection Agency: Ozone Pollution. https://www.epa.gov/ground-level-ozone-pollution/health-effects-ozone-pollution Accessed 15th June, 2019

[viii] Broome, R.A., Fann, N., Navin Cristina, T.J., Fulcher, C., Duc, H. & Morgan, G.G., 2015, The health benefits of reducing air pollution in Sydney, Australia, *Environmental Research* No.143, pp.19-25

[ix] Nay Aung, Mihir M Sanghvi et al., Association between ambient air pollution and cardiac morpho-functional phenotypes: Insights from the UK Biobank population imaging study, *Circulation*, November 13, 2018 at: https://www.ahajournals.org/doi/pdf/10.1161/CIRCULATIONAHA.118.034856, accessed 9/12/2018

- [x] Health Effects Institute (2017), 'State of Global), Air 2017' (online database), www.stateofglobalair.org. (Accessed 07/05/2018) Ambient PM + Ozone mortality: Australia -3099 deaths (2015 global burden of disease x $A5.2M the 2010 value of statistical life)

[xi] Institute of Health Metrics and Evaluation (IHME). GBD Compare Data Visualization. Seattle, WA: IHME, University of Washington, 2016. Available from: http://vizhub.healthdate.org/gbd-compare. Accessed 8/5/2018.

[xii] Ben Ewald, The health burden of fine particle pollution from electricity generation in NSW (November 2018), at: https://www.envirojustice.org.au/wp-content/uploads/2018/11/Ewald_B_2018_The_health_burden_of_fine_particle_pollution_from_electricity_generation_in_NSW.pdf, accessed 3rd December 2018

[xiii] Robyn Schofield, Clare Walter, Jeremy Silver, Michael Brear, Peter Rayner and Martin Bush, Clean Air and Urban Landscapes Hub, Submission on the "Better fuel for cleaner air" discussion paper (March 2017) at: https://nespurban.edu.au/wp-content/uploads/2018/11/CAULRR06_SubmissionFuelQualityStandardsAct2000_Mar2017.pdf , accessed 20th July 2019

[xiv] Electric Vehicle Council and Asthma Australia, *Cleaner and Safer Roads for NSW* (June 2019) at: https://electricvehiclecouncil.com.au/reports/cleaner-and-safer-roads-for-nsw/, accessed 20th July 2019, based on data from NSW Department of Environment and Conservation (2005) *Air Pollution Economics: Health Costs of Air Pollution in the Greater Sydney Metropolitan Region*.

[xv] Australian Government Department of the Environment and Energy. Nitrogen Dioxide Air Quality fact sheet (2005), at: http://www.environment.gov.au/protection/publications/factsheet-nitrogen-dioxide-no2 Accessed 15th June, 2019

[xvi] Chakraborty, J. and Green, D., Australia's first national level quantitative environmental justice assessment of industrial air pollution, Environmental Research Letters 9 (2014) 044010

[xvii] Higginbotham, Freeman, Connor, & Albrecht. (2010). Environmental injustice and air pollution in coal affected communities, Hunter Valley, Australia. *Health and Place*, *16*(2), 259-266

[xviii] Victorian Environmental Protection Agency. May 2012. Publication 1460. Francis Street Air Pollution and Noise Monitoring. http://www.epa.vic.gov.au/~/media/Publications/1460.pdf

[xix] Broome et. al., 2015, as cited above

[xx] Baig, K Shahzad, Yousaf, M., (2017) Coal Fired Power Plants: Emission Problems and Controlling Techniques. J Earth Science Climate Change 8: 404 doi: 10.4172/2157-7617.1000404 at: https://www.omicsonline.org/open-access/coal-fired-power-plants-emission-problems-and-controllingtechniques-2157-7617-1000404.php?aid=92025 accessed 9/12/2018

[xxi] Dr Ron Sahu, 'Recommended Retrofits for Loy Yang A, Loy Yang B, and Yallourn Power Plants', attachment to Environmental Justice Australia *Submission to EPA Victoria on the brown coal power stations licence review*, 8 February 2018