

Air Pollution and Non Communicable Diseases An Emerging Public Health Threat



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Evidence linking environmental risk factors to Non Communicable Diseases (NCD) mortality and morbidity is globally acknowledged and undoubtedly recognized. The economic impact of NCDs is now also an undisputable evidence. NCDs rank as one of the major global threats to economic development and are estimated to cost billions of dollars every year in lost productivity knowing that for every 10% rise in NCDs, the annual economic growth falls 0.5%. The prevalence of NCDs is on the rise, and the mortality due to NCDs is on the rise. Global data indicates that 38 million people die each year from NCDs, mainly from cardiovascular diseases, cancers, chronic respiratory diseases, and diabetes. Over 14 million deaths from NCDs occur between the ages of 30 and 70, of which 85% are in developing countries. Global data indicates that 5 out of the top 10 causes of deaths related to environmental factors are NCDs.

While the genetic causes of NCDs are well recognized, risk factors including individual life style and practices (physical activity, diet, smoking) and environmental exposure (air pollution, occupational hazards, water quality) are highly modifiable risks. It is estimated that 23% of all deaths could be prevented through healthier environments, and that nearly two thirds of the 12.6 million deaths caused by the environment each year are due to NCDs.

Air pollution and quality of ambient air constitute an important risk factor for NCDs. In 2012, ambient (outdoor)

and household air pollution together caused more than 6 million deaths from cardiovascular diseases (ischemic heart diseases and stroke), chronic respiratory diseases (Chronic Obstructive pulmonary disease) and lung cancer. Other environmental risks that add to ambient and indoor air poor quality is second-hand tobacco smoke, exposure to chemicals, radiation, and occupational risks. The rise in asthma is largely attributed to second-hand tobacco smoke and ambient and household air pollution, as well as to exposure to dampness, mold, house dust mites and other allergens in homes; more recently, work-related cleaning agents, enzymes, flour, wood dust, latex and metals are increasing the risks of asthma worldwide. The global data also indicates that almost one third of the cardiovascular disease burden is attributable to ambient and household air pollution (13% and 17% respectively), second-hand tobacco smoke (3%) and exposure to lead (2%). Around 29% of chronic obstructive pulmonary diseases (COPD) deaths are attributable to household air pollution, 8% ambient and 11% in workplaces. We now know that early life exposure to environmental risks, such as chemicals and air pollutants, might increase NCD risk throughout the life course. Moreover, poor air quality and ambient air pollution are correlated with stroke in poor countries and in megacities, such as is the case with many African countries (AFR) and South East Asian (SEA) countries respectively, as shown in figure 2 below

Although environment risks and particularly air pollution have not been sufficiently assessed in Lebanon in terms of health impact, the most recent national NCD survey (NCD stepwise survey, MOPH- WHO 2016-2017) indicates a relatively high prevalence of cardiovascular diseases, namely hypertension (35.3%) and diabetes (10.5%) and their risk factors namely smoking (39.7%), low physical activity (61%), and overweight/obesity (64.9%). the national Cancer registry has also documented a steep rise in Cancer incidence, alerting to potential chronic environmental exposure to hazards.

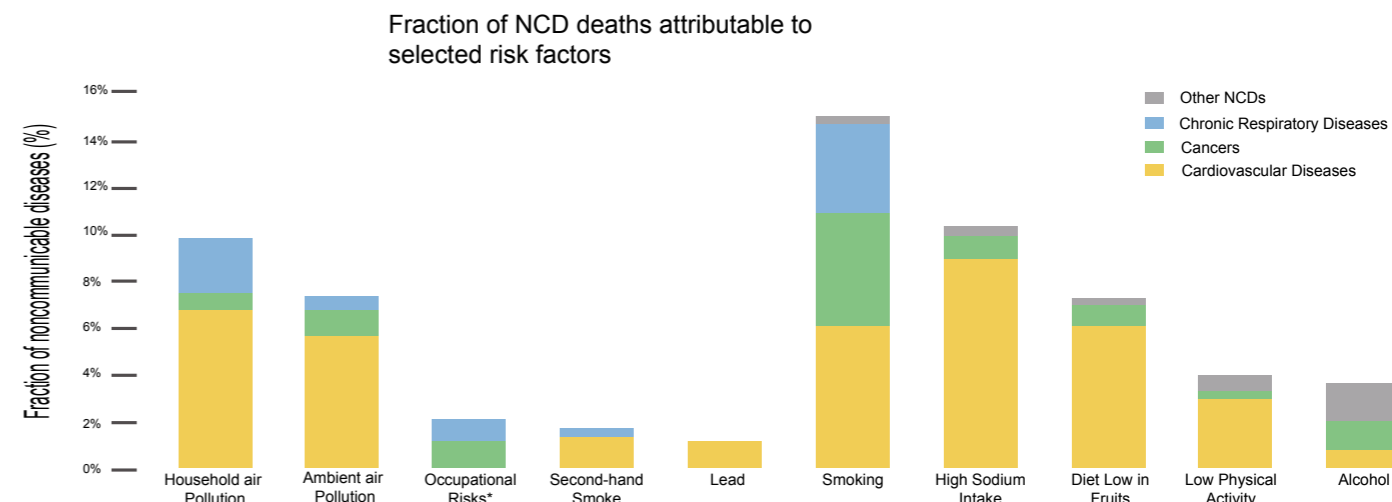


Fig 1- NCDs and attributable risk factors (reproduced from NCD global risk factors report 2017)

Despite the alarming figures worldwide, there are strategies to reduce air pollution that worked. Drastic measures particularly in compact cities were adopted including: traffic control, shutting down highly polluting factories and retrofitting small coal-fired boilers to natural gas, greater public transport use, combined with walking and cycling. These measures resulted in significantly reduced cardiovascular diseases rates. The ban on coal sales in Dublin in 1990 triggered a decline of 15.5% in respiratory and 10.3% in cardiovascular

deaths, and 5.7% of total non-injury deaths. Lung cancer incidence in farmers in Xuanwei, China, decreased by more than 40% when they switched from using smoky coal in unvented fire pits to stoves with chimneys in their homes. A review of 42 workplace health promotion programs to reduce smoking found a mean of 25% lower medical and absenteeism expenditure due to respiratory infections. Remediating houses damaged by dampness and mold decreased asthma related symptoms in adults by 36%. These interventions and measures that proved to be efficient, were at the basis of several Sustainable Development Goals (SDG) elaborated in 2015 for 2030. Health is the heart of the SDGs and interlinked with 3 SDGs that have direct effect on health and increase risk of air pollution namely: Energy sources and types (G7), Cities urbanization, crowding and ambient air (G11), and climate change (G 13)

The fact remains that the quality of air that we breath is

Deaths from Stroke and environment risks

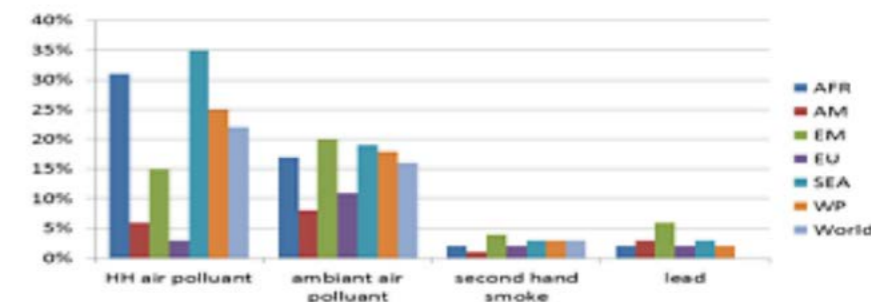


Fig 2- stroke and environment risks (reproduced from NCD global report, WHO 2014)

undeniably affecting our well being. Most governments efforts are geared towards reducing ambient air pollution, at the expense of regulating indoor and household air pollution, to which residents of urban settings are exposed 90% of their time. Of all the various indoor air contaminants, passive tobacco smoke is perhaps the most complicated to control, as it is mainly determined by personal choices, and poorly regulated and enforced in the countries that needed most. Compared to outdoor air pollution, data on exposure of individuals to indoor air is insufficient to allow further studying of its health effects, and to elaborate public health policies to reduce it, and to subsequently reduce its effects on health.

References

- Global NCD report, WHO, 2014
- Global Health risks report. WHO, 2017
- National Stepwise NCD and risk factors survey, MOPH- Lebanon, 2016