

Preventing NCD deaths through better air quality

This section outlines compatibility and harmonization of data on deaths attributable to risks to health with the NCD strategy, without the scope of comprehensively addressing other issues in this area.

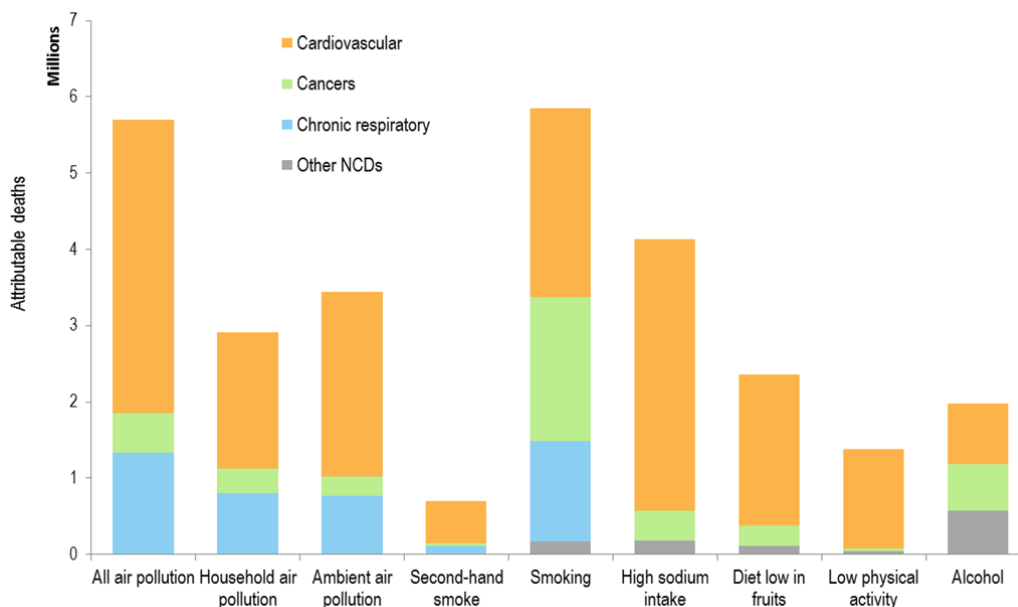
Draft v 1.4, 21.3.2018

Current situation

In 2012, air pollution has caused 6.5 million deaths globally, including ambient and household air pollution. This risk factor is in the same range as active smoking in terms of NCD deaths caused annually. 92% of people globally live in places where ambient air pollution is unsafe to breathe, and more than 40% of households are still using solid fuels for cooking, producing harmful smoke in the home.

Ambient air pollution is referred to as the mean air pollution level a person is exposed to during the year as measured outdoors. Household air pollution is measured by the use of unclean fuels and technologies for cooking. These two exposures do not include second-hand tobacco smoke. As much of 36% of lung cancer deaths, 34% of stroke, and 27% of heart disease deaths were attributable to air pollution [1] in 2012. Climate change is also closely connected to air pollution, and those economic and health benefits have not yet been covered here.

Figure 1 and Table 1 NCD deaths attributable to selected risks, all ages, world.
(see Annex for same figures but limited to the age range 30-69 years)



	All air pollution	Household air pollution	Ambient air pollution	Second-hand smoke	Smoking	High sodium intake	Diet low in fruits	Low physical activity	Alcohol
Other NCDs	0	0	0	0	167,446	175,291	117,313	39,120	577,901
Chronic respiratory dis.	1,337,248	805,373	764,676	112,823	1,313,880	0	0	0	0
Cancers	515,529	318,196	262,550	28,552	1,890,411	397,208	261,550	33,353	606,487
Cardiovascular diseases	3,848,542	1,785,848	2,413,738	561,506	2,476,113	3,557,162	1,982,337	1,300,865	797,869
Total NCDs	5,701,319	2,909,417	3,440,964	702,881	5,847,850	4,129,661	2,361,200	1,373,339	1,982,257

Sources: Air pollution: WHO, updated from [1], data for 2016; other risks [2]: IHME, data for 2016.

Notes:

1. Deaths attributable to risk factors are generally being presented for all ages, but total NCD deaths have often been reported for ages 30-70 years only. For comparison, alternative data summaries are provided in the Annex.
2. Generally, air pollution figures should be provided for single risk factors, i.e. separately for ambient and for household air pollution. In certain cases, and depending on the context and purpose, the joint air pollution estimate can be used.
3. Estimates of deaths attributable to risk factors are not directly additive, because one case could for example be prevented by reducing various exposures.

Table 2 Total NCD deaths and air pollution-attributable NCD deaths, 30-69 years

	Premature deaths (ages 30-69 years) from NCDs				Subset of which is attributable to air pollution (ambient and household)			
	Women	Men	Total	Percentage	Women	Men	Total	Percentage
Low-income countries	0.4 million	0.4 million	0.9 million	6%	0.07 million	0.09 million	0.16 million	6.5%
Lower-middle-income countries	2.6 million	3.6 million	6.1 million	41%	0.51 million	0.84 million	1.35 million	53.6%
Upper-middle-income countries	2.4 million	3.5 million	5.8 million	39%	0.36 million	0.52 million	0.88 million	35%
High-income countries	0.8 million	1.4 million	2.2 million	15%	0.04 million	0.08 million	0.12 million	4.9%
Total	6.2 million	8.9 million	15.0 million	100%	0.98 million	1.53 million	2.52 million	100%

In total, 17% of NCD deaths between ages 30 to 69 years can be attributed to air pollution in 2016.

Data availability

All health impact and exposure data to inform decision-making are readily available. Data on burden of disease from air pollution are available by country, age and sex. Exposure to ambient air pollution and cooking fuel in households is available by country, and urban/rural. WHO also has a database of ambient air pollution on more than 3,000 cities, and has an on-line interactive map with grids of

10x10km for the world. WHO has developed the largest database of exposure on these important risks to health.

SDG reporting

In the area of air pollution, WHO is the custodial agency to report on the following SDGs:

SDG 3.9.1: mortality from air pollution (ambient and household).

SDG 7.1.2 Proportion of population with primary reliance on clean fuels and technology.

SDG 11.6.2 Annual mean levels of fine particulate matter in cities.

In connection, work is also ongoing to contribute to SDG 13 on climate change.

Interventions to prevent disease from air pollution

Interventions to reduce ambient and household air pollution are readily available, such as:

Ambient air pollution:

- Develop healthy and efficient **transport** options, such as combining rapid transit combined with walking/cycling.
- Provide transport network space for **pedestrian and cycling infrastructure**.
- Improve **land use** systems, leading to reduced travel times.
- Implement Engineering and **speed reduction** measures.
- Regulate and implement **industrial emission controls**.
- Select **energy options** while considering health impacts and their financial implications.

Household air pollution:

- Provide access to **clean fuels** and technologies for all cooking lighting and heating as defined by *WHO guidelines for indoor air quality: household fuel combustion*.
- Avoid use of unprocessed **coal**, and **kerosene**, as well as the inefficient use of solid fuels, in the household.
- Acknowledging the switch to clean household energy will take time, **prioritize transition fuels and technologies** that offer **substantial health benefits**.
- Promote the **exclusive use of clean energy** for all cooking, heating and lighting activities.
- Build a larger market ecosystem for clean and modern household energy solutions through **innovations in financing** and **business models** for household consumers, stove designers, and distributors.
- Develop health-based **national performance and safety standards** for household energy fuels and technologies.

Both household and ambient air pollution

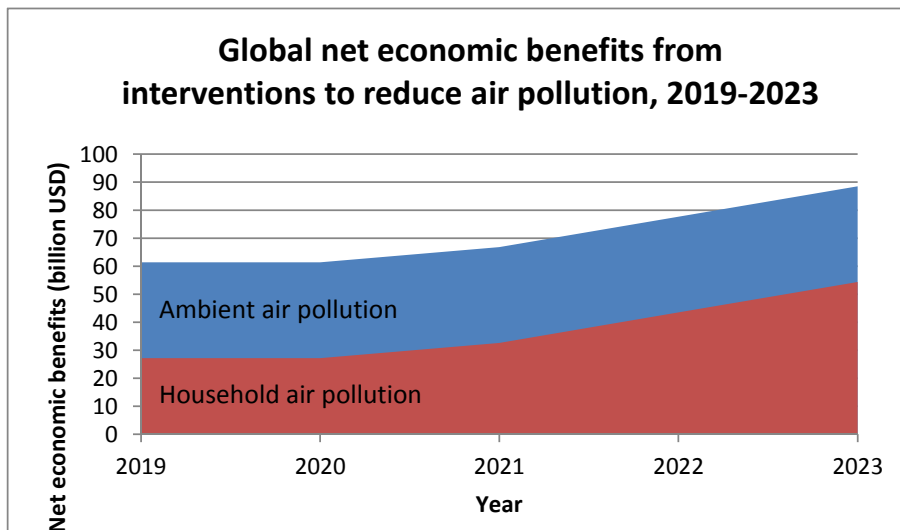
- Remove **fossil fuel subsidies**.

Economic evaluation of interventions

Interventions to prevent disease from air pollution have not recently been evaluated with the CHOICE tool. However cost-benefit evaluations have recently been developed for WHO's Investment Case. The investment case for household air pollution and ambient air pollution have shown returns of 1:16, and were the areas of interventions with by far the highest return in the investment case within the analysis developed for that report.

INVESTING IN CLEAN AIR ACTION FOR HEALTH

Investments will enable the Organization to demonstrate bold new leadership in combatting one of the largest single health risks faced worldwide. Through the Global "Road Map" approved by Ministers of Health in 2016 (WHA A69/18), WHO will advance adoption of national norms and standards based on WHO Air Quality Guidelines; support tools and capacity for health-wise assessment of energy and development choices at national and local level ; and expand awareness about air pollution's health effects. Investments will also support WHO monitoring of air pollution-related SDG indicators for Health (3), Energy (7) and Sustainable Cities (11). WHO's work will accelerate global scale-up of cleaner transport, energy and waste management strategies, leading to a two-thirds reduction in deaths from air pollution by 2030, or 5.4 million lives saved over 2018-2023, for annual net economic benefits of almost US\$D 90 billion by 2023 (graphic). These measures will also cut carbon emissions driving climate change. Examples of WHO initiatives include the global www.BreatheLife2030.org campaign raising awareness and generating commitments by member states and cities to meet WHO Air Quality guidelines and related SDG targets; the Urban Health Initiative contributing to the scale-up of the most cost-effective interventions for healthier cities; and



Source: Draft, WHO Investment Case

Conclusion

In conclusion, WHO has been producing comparable estimates on burden of disease attributable to ambient and household air pollution. Data are available by country, disease and sex. Also data on exposure to the risk factors are available by country.

Some data on economic evaluations are available, but need to be performed more systematically.

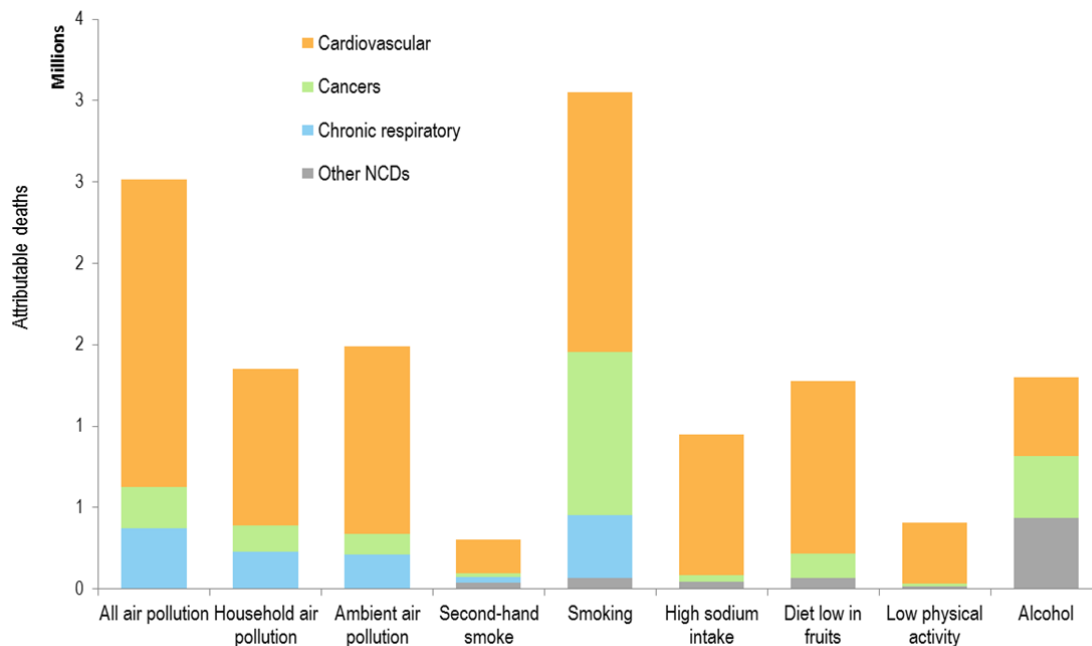
References

1. WHO, *Ambient air pollution: A global assessment of exposure and burden of disease*. 2016, WHO: Geneva.
2. IHME. *Global Health Data Exchange*. 2016 [cited 2016 8 December 2016]; Available from: <http://ghdx.healthdata.org/gbd-results-tool>.

Annex

1. Alternative age categories and data sources

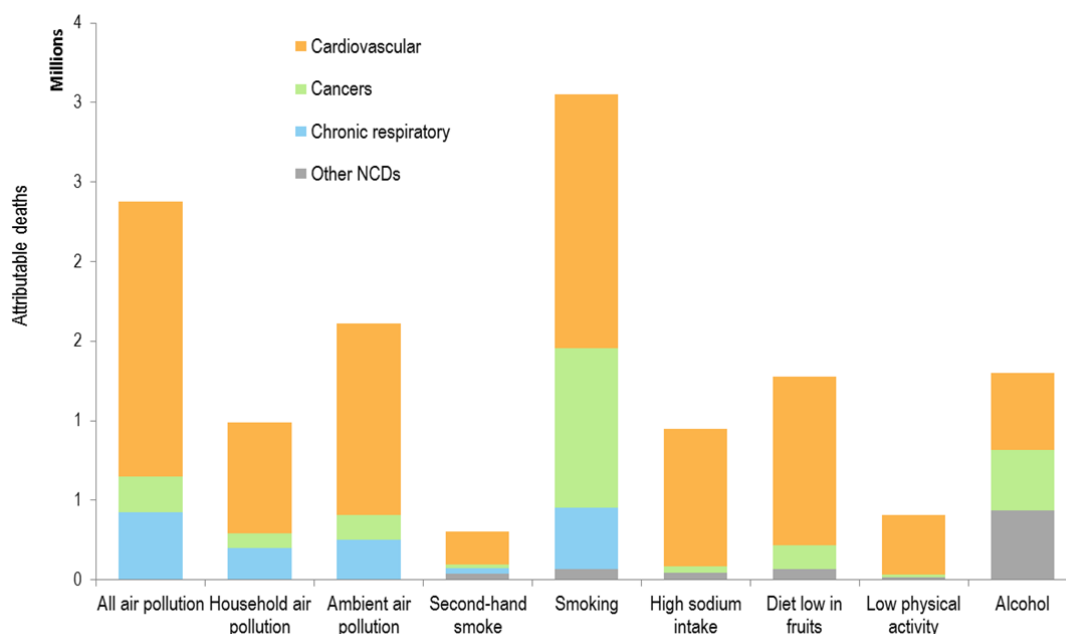
Figure 2. NCD deaths attributable to selected risks, 30-70 years, world (WHO and IHME data).



	All air pollution	Household air pollution	Ambient air pollution	Second-hand smoke	Smoking	High sodium intake	Diet low in fruits	Low physical activity	Alcohol
Other NCDs	0	0	0	40,527	70,063	41,500	67,783	15,522	437,783
Chronic respiratory dis.	372,186	229,931	209,197	32,620	383,578	0	0	0	0
Cancers	256,144	159,085	129,784	22,979	999,285	40,905	148,647	14,847	380,122
Cardiovascular diseases	1,886,439	961,737	1,151,746	210,244	1,596,154	866,664	1,061,317	376,211	479,917
Total NCDs	2,514,769	1,350,753	1,490,727	306,370	3,049,080	949,069	1,277,747	406,580	1,297,822

Sources: Air pollution [1]: data for 2012; other risks [2]: data for 2016.

Figure 2. NCD deaths attributable to selected risks, 30-70 years, world (only IHME data).



	All air pollution	Household air pollution	Ambient air pollution	Second-hand smoke	Smoking	High sodium intake	Diet low in fruits	Low physical activity	Alcohol
Other NCDs	0	0	0	40,527	70,063	41,500	67,783	15,522	437,783
Chronic respiratory dis.	422,036	200,178	248,917	32,620	383,578				
Cancers	227,197	93,139	156,123	22,979	999,285	40,905	148,647	14,847	380,122
Cardiovascular diseases	1,728,635	693,387	1,208,405	210,244	1,596,154	866,664	1,061,317	376,211	479,917
Total NCDs	2,377,868	986,705	1,613,445	306,370	3,049,080	949,069	1,277,747	406,580	1,297,822

Sources: [2], data for 2016.