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.

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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 rage 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

Chronic respiratory dis.
Cancers
Cardiovascular diseases

Total NCDs

<table>
<thead>
<tr>
<th>Source</th>
<th>Women</th>
<th>Men</th>
<th>Total</th>
<th>Percentage</th>
<th>Women</th>
<th>Men</th>
<th>Total</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low-income countries</td>
<td>0.4 million</td>
<td>0.4 million</td>
<td>0.9 million</td>
<td>6%</td>
<td>0.07 million</td>
<td>0.09 million</td>
<td>0.16 million</td>
<td>6.5%</td>
</tr>
<tr>
<td>Lower-middle-income countries</td>
<td>2.6 million</td>
<td>3.6 million</td>
<td>6.1 million</td>
<td>41%</td>
<td>0.51 million</td>
<td>0.84 million</td>
<td>1.35 million</td>
<td>53.6%</td>
</tr>
<tr>
<td>Upper-middle-income countries</td>
<td>2.4 million</td>
<td>3.5 million</td>
<td>5.8 million</td>
<td>39%</td>
<td>0.36 million</td>
<td>0.52 million</td>
<td>0.88 million</td>
<td>35%</td>
</tr>
<tr>
<td>High-income countries</td>
<td>0.8 million</td>
<td>1.4 million</td>
<td>2.2 million</td>
<td>15%</td>
<td>0.04 million</td>
<td>0.08 million</td>
<td>0.12 million</td>
<td>4.9%</td>
</tr>
<tr>
<td>Total</td>
<td>6.2 million</td>
<td>8.9 million</td>
<td>15.0 million</td>
<td>100%</td>
<td>0.98 million</td>
<td>1.53 million</td>
<td>2.52 million</td>
<td>100%</td>
</tr>
</tbody>
</table>

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](http://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

Global net economic benefits from interventions to reduce air pollution, 2019-2023

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

Annex

1. Alternative age categories and data sources

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

<table>
<thead>
<tr>
<th></th>
<th>All air pollution</th>
<th>Household air pollution</th>
<th>Ambient air pollution</th>
<th>Second-hand smoke</th>
<th>Smoking</th>
<th>High sodium intake</th>
<th>Diet low in fruits</th>
<th>Low physical activity</th>
<th>Alcohol</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other NCDs</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>40,527</td>
<td>70,063</td>
<td>41,500</td>
<td>67,783</td>
<td>15,522</td>
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<tr>
<td>Chronic respiratory dis.</td>
<td>372,186</td>
<td>229,931</td>
<td>209,197</td>
<td>32,620</td>
<td>383,578</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<tr>
<td>Cancers</td>
<td>256,144</td>
<td>159,085</td>
<td>129,784</td>
<td>22,979</td>
<td>999,285</td>
<td>40,905</td>
<td>148,647</td>
<td>14,847</td>
<td>380,122</td>
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<tr>
<td>Cardiovascular diseases</td>
<td>1,886,439</td>
<td>961,737</td>
<td>1,151,746</td>
<td>210,244</td>
<td>1,596,154</td>
<td>866,684</td>
<td>1,061,317</td>
<td>378,211</td>
<td>479,917</td>
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<tr>
<td>Total NCDs</td>
<td>2,514,769</td>
<td>1,350,753</td>
<td>1,490,727</td>
<td>306,370</td>
<td>3,049,080</td>
<td>949,069</td>
<td>1,277,747</td>
<td>406,560</td>
<td>1,297,822</td>
</tr>
</tbody>
</table>

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).

### Figure 2 Description

The figure illustrates the attributable deaths from various NCDs due to different risks. Each risk category is color-coded and shown in millions. The categories include:

- **All air pollution**
- **Household air pollution**
- **Ambient air pollution**
- **Second-hand smoke**
- **Smoking**
- **High sodium intake**
- **Diet low in fruits**
- **Low physical activity**
- **Alcohol**

### Table 2: NCD Deaths by Risk Factor

<table>
<thead>
<tr>
<th>Risk Factor</th>
<th>Chronic respiratory dis</th>
<th>Cancers</th>
<th>Cardiovascular diseases</th>
<th>Total NCDs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other NCDs</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2,377,868</td>
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<tr>
<td>Chronic respiratory dis.</td>
<td>422,036</td>
<td>200,178</td>
<td>248,917</td>
<td>986,705</td>
</tr>
<tr>
<td>Cancers</td>
<td>227,197</td>
<td>93,139</td>
<td>156,123</td>
<td>1,213,445</td>
</tr>
<tr>
<td>Cardiovascular diseases</td>
<td>1,728,635</td>
<td>693,387</td>
<td>1,208,405</td>
<td>4,013,427</td>
</tr>
</tbody>
</table>

**Sources:** [2], data for 2016.