



Household Air Pollution and Health

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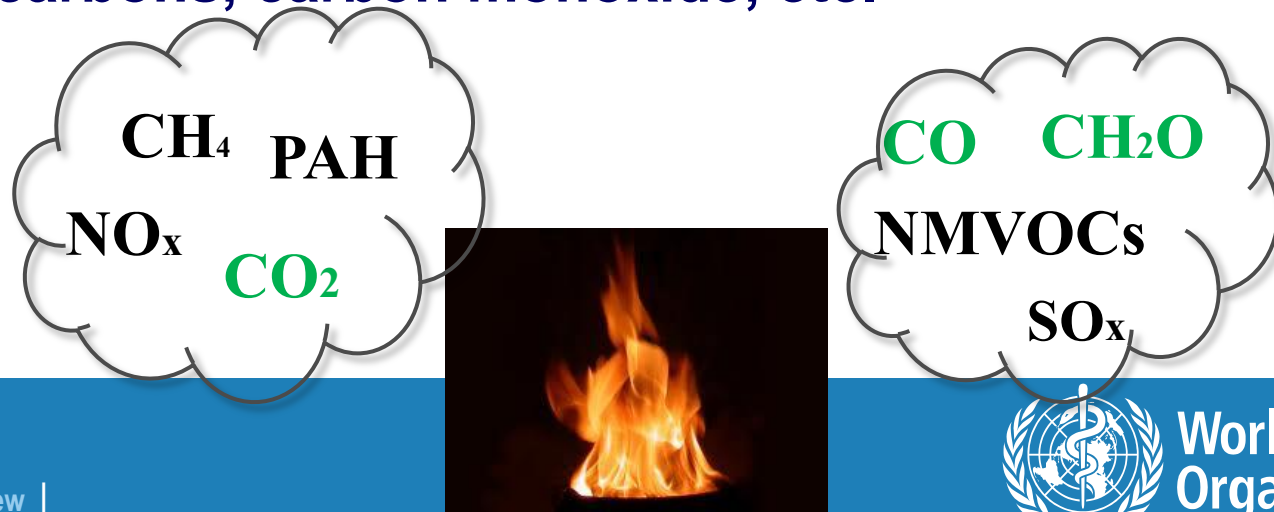
Household Air Pollution & Impacts on Health



Health Impacts: Household Air Pollution Background

Products of incomplete combustion

- **CO₂ emissions are not a direct problem for health - rather it is a mixture of pollutants that are released during incomplete combustion of household fuels that have direct impacts on health.**
- **The products of incomplete combustion (PICS) include but are not limited to methane, poly-aromatic hydrocarbons, carbon monoxide, etc.**



Health Impacts: The most important household air pollutant

Particulate Matter (PM)

Particulate matter (PM) is a complex mixture of chemical components that have diverse chemical & physical characteristics that can impact health such as size, particle core chemistry, metals, biogenic origin etc.

The harmful effects of PM arise from the particle's presence on biological tissues, to the actions of chemical constituents, including adsorbed components or a combination of these factors.

These toxic effects include:

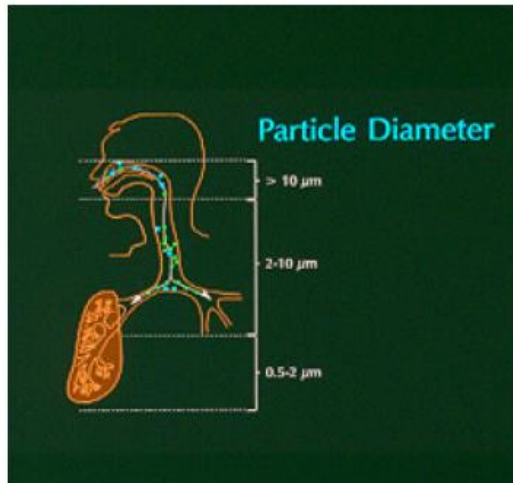
- **bronchial irritation**
- **inflammation,**
- **genotoxic events (i.e. carcinogenic)**
- **reduced macrophage response**



Health Impacts: Particulate Matter

Size makes a difference

PARTICLE SIZE AND DEPOSITION



PM₁₀ – Coarse

PM_{2.5} - Fine

PM_{<1} – Ultrafine



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- A major cause on NCDs:
 - **30% of COPD deaths**
 - **18% of ischaemic heart disease dths**
 - **almost 10% of lung cancer dths**



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- Exposure has been linked with other health outcomes including:
 - **Stroke**
 - **Other cancers** (e.g. cervical, upper-aerodigestive)
 - **Adverse pregnancy outcomes,**
 - **Cataract**
 - **Tuberculosis**
 - **Cognitive development**
- **Burns & poisonings** – **95%** of burn-fire related deaths occur in developing countries where simple stoves and solid fuels are commonly used for cooking, heating & lighting (Mills, 2012)



Other Health Impacts: Safety & Other

Burns, scalds, violence, poisonings & injury



- Health risks from household air pollution extend beyond those direct respiratory and other systemic effects
- Women & children are at more risk for attack and injury (e.g. snake bites, land mine explosions) during fuel collection
- **16%** of the disease burden to **outdoor air pollution** can be attributed to the household air pollution “leaking” outdoors.
- Additional health impacts from climate change can be expected from changes in precipitation cycles, drought, temperatures as seen with an increase in risk for vector-borne diseases like malaria.



WHO's Air Pollution Program:
Ensuring health benefits from clean home energy solutions

How WHO is working on household air pollution & health?

- Gathering data & raising awareness

- Global database on household air pollution & solid fuel use in the home
- Field research on the health impacts of various interventions (e.g. “improved” cookstoves)
- Assessing practical solutions for home energy needs
- Looking at the health effects of other domestic energy needs (e.g. lighting, heating)



How WHO is working on household air pollution & health?



- Normative work & support to countries
 - ***WHO Indoor air quality guidelines for household fuel combustion*** – will provide guidance on policies and the impact of different fuels/technologies (for cooking, heating & lighting) on health
 - Building capacity in-country and various settings for the implementation of WHO Guidelines to better ensure sustained adoption and improving health

How WHO is working on household air pollution & health?



- Connecting WHO's AP work to other home energy initiatives, sustainable development & climate
 - *Global Alliance for Clean Cookstove*
 - UN Secretary General's *Sustainable Energy for All initiative*
 - *Climate & Clean Air Coalition on Short-Lived Pollutants*
 - *UN Energy*—post-2015 Sustainable Development Discussions

Cleaning up the air through improved home energy is good for health !!



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