



INTERNATIONAL CONFERENCE ON  
MOUNTAINS AND CLIMATE CHANGE

## Indoor Pollution and Health

A.Cogo

University of Ferrara



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# Pollution and Health

Air pollution is a significant cause of morbidity and mortality from many diseases.

Indoor air pollution is a major global public health threat. Approximately half the world's population and up to 90% of rural household in developing countries use **biomass fuels in the form of wood, dung and crop residues** often associated with a bad ventilation in the houses.

The health danger is related to

Pollutant concentration + the Time of exposure

# Pollution and Diseases

The diseases linked to pollution exposure involve respiratory system (respiratory tract infections, chronic obstructive pulmonary disease (COPD)\*, lung cancer, exacerbations of lung inflammation); eye disease (cataracts); cardiovascular events (arteriosclerosis, hypertension, ischemic heart disease, arrhythmia).

\* COPD = persistent airflow limitation, usually progressive, caused by the inhalation of noxious particles

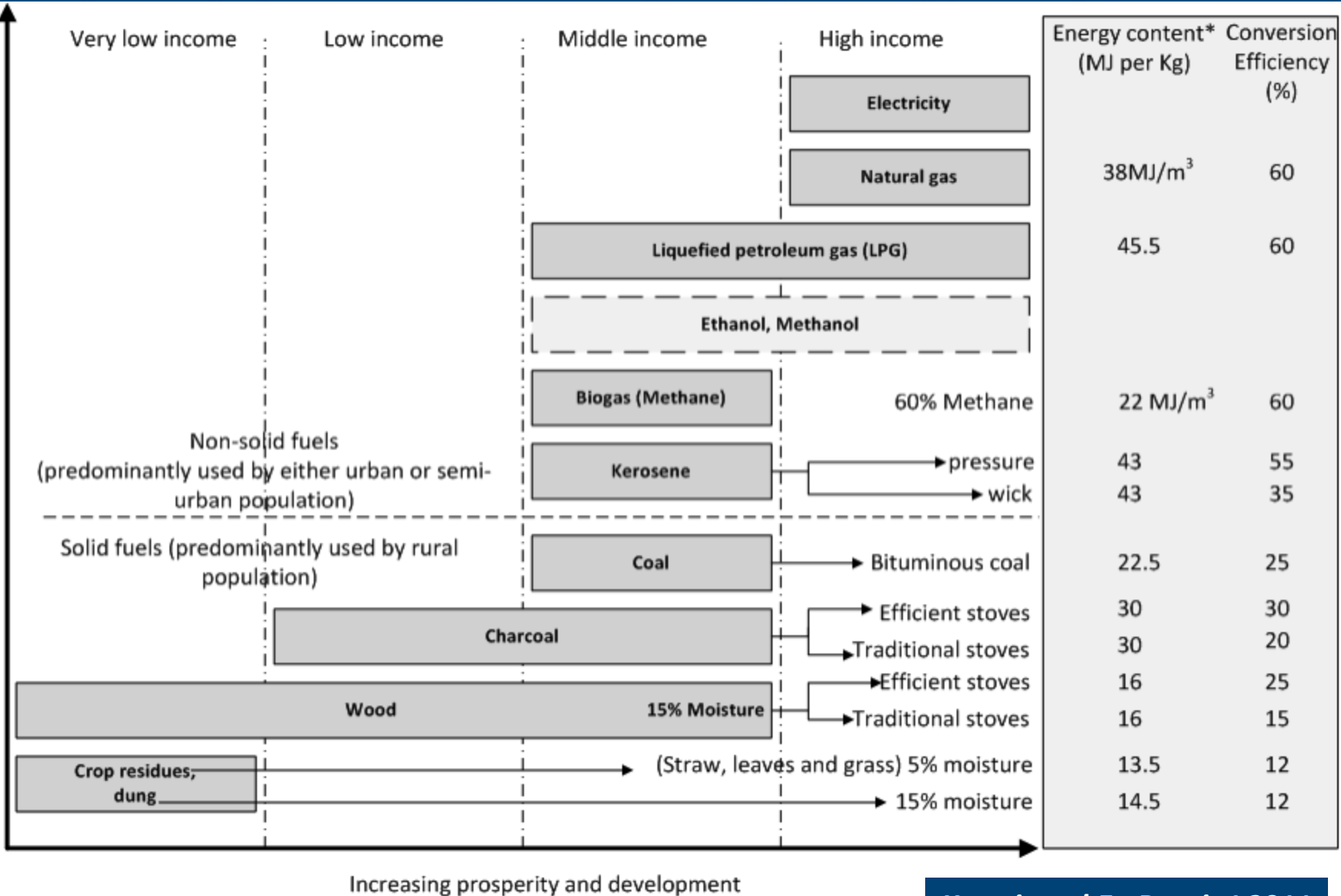
# Risk Factors



## Emissions (g kg<sup>-1</sup>) of pollutants from different domestic fuels

Pollutant	Wood	Crop residues	Dung
CO	78.8	71.3	73.8
<u>PM</u>	8.36	8.8	22.1
<u>SO<sub>2</sub></u>	0.34	0.24	5.77
<u>NO<sub>x</sub></u>	2.16	2.08	6.49

Increasing use of cleaner fuels with higher efficiency and more convenient for cooking



*Kurmi et al Eu Respir J 2011*

# SHARE-EVK2CNR Project

We study a particular sample of population  
living in the Khumbu Valley in Nepal.

In this valley there are **no roads, no industries**

**(= no traffic and industry pollution),**

**very low smoke habit (3%)**

**(= no confounding factors)**

but the population uses biomass fuels for  
home heating and cooking and many

houses have no chimney

**(= very high indoor pollution).**



# AIM

- To assess the prevalence of COPD, of early marker of bronchial obstruction (spirometry) and early endothelial impairment.
- To evaluate the ventilation inside the houses, the type of fuel, the presence of chimneys .
- To measure environmental CO and exhaled CO as indirect marker of pollution exposure.
- 2 villages located at different altitudes in the Khumbu Valley (Phadking 2600m, Pangboche 3900m) and 2 villages in a side valley (Thame 3900m, Thamo 3500m).





# Conclusions

**In non smokers subjects living in bad ventilated buildings and only exposed to indoor pollution, the prevalence of COPD and Early bronchial obstruction and the prevalence of endothelial function impairment (the first step of atherosclerosis)**

**is > expected without any significant difference between M and F.**

**Improving indoor ventilation and the use of stove pipes/electric stove reduces the respiratory risk (both COPD and Early bronchial obstruction)**



THANKS