Indicators and Biomarkers of NCDs: Evaluating the Health Benefits of Clean Cooking Adoption
The Global Alliance for Clean Cookstoves will create a thriving market for clean cookstoves and fuels.

**PROBLEM**

Every day, 3 BILLION PEOPLE (500 million households) rely on solid fuels to power their rudimentary stoves which leads to...

- > 4,000,000 deaths annually
- Wasted productivity
- Environmental degradation
- Health & economic burdens that disproportionately impact women & girls

**MISSION**

- SAVE LIVES
- IMPROVE LIVELIHOODS
- EMPOWER WOMEN
- PROTECT THE ENVIRONMENT

**GOAL**

100 MILLION HOUSEHOLDS ADOPT CLEAN AND EFFICIENT COOKSTOVES & FUELS by 2020.
Our market based approach is built on three core strategies …

**Strengthen Supply**
- Innovation
- Capacity Building
- Financing
- Inclusive Value Chain

**Enhance Demand**
- Awareness
- Accessibility
- Affordability

**Enable Markets**
- Standards & Testing
- Research
- Advocacy & Policy
...and is being pursued in three phases.

**Phase 1** (2012-14)
Launch global and in-country efforts to rapidly grow the sector  
*(Bangladesh, China, Ghana, Guatemala, India, Kenya, Nigeria, Uganda)*

**Phase 2** (2015-17)
Drive investments, innovation, and operations to scale

**Phase 3** (2018-20)
Establish a thriving and sustainable global market for clean cookstoves and fuels
The Alliance now has 1,000 partners actively supporting and growing the sector.

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<th>Donor Countries</th>
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**Donor Countries:**
- Canada
- Denmark
- Finland
- Germany
- Ireland
- Malta
- Netherlands
- Norway
- Spain
- Sweden
- United Kingdom
- United States

**Private Sector & NGO:**
- Shell
- Johnson & Johnson
- GE
- Caterpillar
- Deutsche Bank
- UN Foundation
- Baker & McKenzie
- Cemex
- World Lung Foundation

**UN & MFI:**
- ADB
- The World Bank
- UN Women
- UN Women
- UNICEF
- IDB
- WFP
- World Health Organization
- UNEP
- UNDP

**National Partners:**
- Afghanistan
- Bangladesh
- Burkina Faso
- Cambodia
- China
- Colombia
- Côte d’Ivoire
- El Salvador
- Ethiopia
- France
- Ghana
- Guatemala
- Honduras
- Indonesia
- Italy
- Kenya
- Laos
- Lesotho
- Liberia
- Malawi
- Mexico
- Mongolia
- Nepal
- Nicaragua
- Niger
- Nigeria
- Peru
- Poland
- Rwanda
- South Africa
- Sri Lanka
- Tanzania
- Uganda
- Vietnam
HAP is Among the Top Global Health Risk Factors

~ 4 M deaths per year
> 6% of global deaths

Main causes of death:
- Child pneumonia
- COPD
- Lung cancer
- Cardiovascular disease

Lancet, Dec 2012
HAP is Leading Risk Factor for NCDs in Developing Countries

- A major risk factor for NCDs among the poor in developing countries
  - HAP is the one major modifiable risk factor for NCDs shared by virtually 100% in the bottom billion, and nearly 100% in the bottom 3 billion
  - Although the fraction of world households that is exposed is slowly declining, the absolute number of people affected is still rising.
  - More people are exposed today than in any previous period of human history.

- The link between HAP and two major NCDs, chronic lung disease and lung cancer has been well established.
  - While cigarettes are the leading cause of chronic lung disease in developed countries, HAP is the leading risk cause of chronic lung disease among nonsmoking women in developing countries.
  - Recent evidence supporting a causal link between HAP from cooking with biomass (including wood and agricultural residues) augments a large body of evidence linking HAP from cooking with coal.
  - Needed: direct evidence for cardiovascular disease

- HAP increases the risk of having low birth weight babies, who are then at increased risk of developing NCDs.
Priority: How Clean Enough Do We Have To Be To Achieve Adult Health Benefits?

Ischaemic Heart Disease

LPG / Ethanol

Advanced Biomass

Stroke

LPG / Ethanol

Advanced Biomass

COPD

Lung Cancer

Burnett et al, 2014
Key Research and Evaluation Challenges

• Where are the ‘clean’ technologies being scaled up?

• What are the right ‘indicators’ to consider over a relatively short time frame?
  • What do we know from epidemiology of other combustion-source pollution?
  • Challenges of field-based epidemiology

• How should we consider competing risk factors?
  • Other sources of air pollution
  • Population susceptibility
  • Other behavioral risk factors
Indicators and Biomarkers of NCDs: Evaluating the Health Benefits of Clean Cooking Adoption

- Effects on NCDs: Evidence and Gaps
- Notes from Field
- Anticipating Future Health Benefits: Measuring biomarkers and indicators of NCDs
- Study Design Considerations
- Lessons from Other Combustion Risk Factors