

# Improving Health and Reducing Carbon Emissions from Biomass Cookstoves



RTI International is applying our technical knowledge, in-country experience, and collaboration skills to better understand and solve the critical health and environmental problems created by indoor use of biomass cookstoves in developing countries. Working with the scientific community and U.S. federal agencies, and investing our own funds, we are tackling the technical, economic, and societal challenges that make this issue so complex.

The World Health Organization estimates that more than 3 billion households in developing nations use crude biomass-fueled cook stoves indoors to prepare daily meals. Toxic emissions produced by these stoves contribute more than 18 percent of the black carbon emitted worldwide. They also contribute to more than 2 million deaths each year, making indoor biomass smoke a leading cause of death in the developing world—especially in the poorest countries.

Owing to their traditional societal roles in developing countries, women and infants are exposed to a disproportionate share of these toxins and suffer adverse health effects in greater numbers. In India alone, more than 500,000 women and children die prematurely each year from biomass smoke exposure.

Cleaner burning stoves can improve maternal and child health in developing nations and significantly reduce global carbon emissions. Data are needed to show that improved stove designs will substantively reduce exposure levels, decrease mortality rates, and lower atmospheric emissions in real-world settings.

## Vision

Motivated by the United Nations' Millennium Development Goals to reduce child mortality and improve the health of mothers in developing nations, RTI is applying the full range of our skills to address this multifaceted problem.

Working with the scientific community and U.S. federal agencies, we are tackling the technical, economic, and societal challenges and investing internal funds to accelerate the efforts underway with funding from global governments and NGOs.

Our vision for sustainable solutions that will foster positive trends demands both better cookstoves and integrated thinking; social and economic factors must be understood and addressed. New stove designs must gain user acceptance, microfinancing is needed to make the stoves affordable, and community and national leaders must understand the policy changes needed to sustain results.

## Why RTI?

RTI is a multidisciplinary research and development organization. We have the technical knowledge, in-country experience, and collaboration skills necessary to address complex health and environmental problems that demand global solutions.

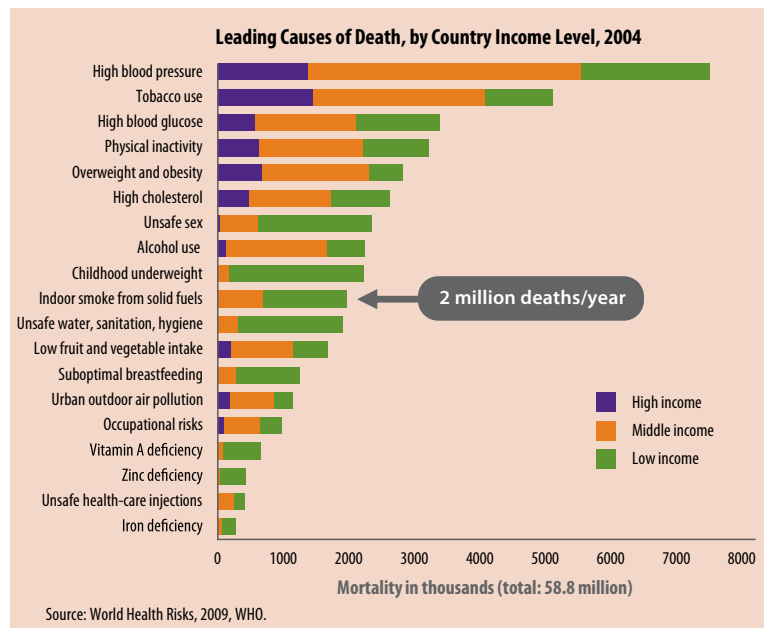
## Our Goals

- Identify social and economic realities in developing nations that have inhibited implementation of new cook stove designs and work with experts in government and NGOs to find more effective paths forward.
- Identify the technology gaps and mechanisms for commercializing improved designs.
- Devise better cookstove technologies that enhance the probability of acceptance and long-term usage by people in developing countries.
- Develop the tools and policies needed to sustain and socialize this effort and speed diffusion of new technologies in developing nations.

## Project Status

RTI has already committed more than \$200,000 to develop tools and information that are critical to an integrated solution. Efforts under way include the following:

- **Analyzing environmental health risk and biomass stove use** – Working with a researcher from the Sri Lanka National Institute of Health, we are studying respiratory diseases and stove use in Sri Lanka, with an emphasis on ethnic, gender, urban, and rural differences.
- **Designing a better biomass stove** – We are working to improve combustion efficiency of and lower personal exposure from existing stove designs. In particular, we are examining the links between stove design and operating conditions.
- **Monitoring and characterizing exposure** – Using RTI-developed instruments and methods, we are studying personal exposure to carbon emissions from biomass stoves. We are also collecting and examining dried blood spots from finger pricks to determine what exposure levels cause adverse health effects.



We intend to fund additional efforts in the coming years and are building partnerships with government agencies, universities, and NGOs that can contribute toward new thinking and integrated solutions. Discussions with U.S. federal agencies already playing key roles—including the U.S. Environmental Protection Agency, National Institutes of Health, National Institute of Environmental Health Sciences, Centers for Disease Control and Prevention, the UN Foundation, and U.S. Agency for International Development—are moving forward.

Our integrated approaches will rely heavily on the breadth of technical leadership across RTI's senior scientific staff, as well as our established partnership with programs focused on maternal and children's health and global climate change.

## More Information

Charles E. Rodes, PhD  
Senior Fellow  
919.541.6749  
charlesr@rti.org

RTI International  
PO Box 12194, 3040 Cornwallis Road  
Research Triangle Park, NC 27709-2194 USA

RTI 6345 R3 1110



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RTI International is a trade name of Research Triangle Institute.