The disease burden from indoor air pollution results in an estimated 4 million premature deaths per year, disproportionately impacts women and young children and is a significant driver of poor health across the world (Lim et al., 2013). While deteriorating outdoor air quality is a growing concern, the burning of solid biomass materials such as wood and dung within homes for cooking and heating is the primary source of the hazardous air pollution burden (Smith et al., 2012). This issue is particularly severe in Ethiopia, which ranks 172nd out of 178 countries in household air quality (EPI, 2014).

In response, significant resources have been mobilized to search for ways to reduce biomass fuel use and indoor air pollution, as open-fire cooking is both a health hazard and cause of forest degradation. Improved cookstove technologies that increase fuel efficiency and reduce emissions are often recommended as affordable substitutes and connect to Sustainable Development themes of Energy Provision and Access; Development and Climate Change; and Water, Sanitation, and Health. However, while laboratory-based estimates exist, little is known about the actual health benefits of improved cookstoves in realistic home environments.

We present results on the health impacts of the Mirt stove from a three-year randomized controlled trial of 504 households in rural Ethiopia. Mirt is an inexpensive, durable, and locally produced type of improved cookstove designed for baking the Ethiopian staple injera and widely adopted in our study.

Our simultaneous measurement of child growth, acute symptoms, physical functioning, stove use, and airborne particulate matter suggest there are significant gains from reduced air pollution for children under the age of 3, but older children and adult cooks do not benefit. This pattern is consistent with the early period in a child's life where health interventions have their largest benefit along with risks of accumulated exposure in older individuals. While health improvements appear only for young children, the results represent meaningful impacts given the link between early life health and later life education, cognition, health, and earnings, and serve as important considerations for programs targeted at technology adoption, reduced deforestation, air pollution, and improved health.