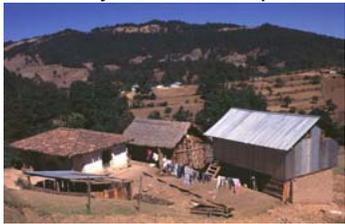


Background

CRECER is a continuation of the first ever randomized controlled trial of biomass smoke and respiratory health in children. The first study, called RESPIRE, focused on child pneumonia, the chief killer of children in developing countries, comparing the incidence in children up to 18 months of age in two groups: one continuing to use the open woodfire traditionally used for cooking indoors in this community (control), the other using a *plancha* chimney stove (intervention). The pilot work for this study began in Guatemala in the early 1990s and results will be available in the fall of 2006. CRECER continues to follow these children to understand the influence of the smoke on another important child disease, asthma.

Study Site

The study area encompasses approximately 20 communities in the San Marcos region of rural highland Guatemala. The majority of the indigenous population speaks a Mayan



language, Mam. This district is one of the poorest in this poor country and both infant mortality and pneumonia rates are among the highest in the world. Asthma and allergy rates are unknown in this population. The site is approximately 5 hours by car from Guatemala City.

Objectives of the CRECER Study

CRECER will follow the children for 4 years to document the development of chronic respiratory disease and associated physiological effects. This will help reveal the effects on longer term respiratory health caused by difference in exposure the critical early period in child development of 0-18 months.

We are studying the incidence and prevalence of respiratory symptoms, growth of lung function, development of allergies, airway responsiveness,

and body growth in childhood. We will also continue to monitor the amount of air pollution generated indoors and outside participating homes.

How we plan to collect this information:

Health Assessments

- Quarterly home visits – Fieldworkers visit participants every 3 months and administer a short questionnaire regarding the child's health
- Biannual clinical evaluations – every 6 months participants meet with the study nurse to assess current health status
- Broncho-dilator responsiveness – lung function is measured every 6 months to test for asthma
- Skin Testing – testing every 6 months to examine whether children are developing allergies
- Anthropometry – height, weight, arm circumference and leg length are measured at 6-month intervals to assess growth

Exposure Assessments

Levels of exposure to indoor air pollutants from biomass burning are assessed for each study child periodically. Although small particles (PM) are thought to be the best indicator of the health risk of combustion smoke, because of the practical difficulties of using cumbersome air sampling pumps on very small children, we measure carbon monoxide (CO) exposures as a proxy for small-sized PM (particulate matter) exposure using a small tube clipped to the child's clothing. For a sub-sample we use state-of-the-art equipment to conduct more detailed measurements on the personal and indoor levels



of PM and CO, as well as time-activity patterns of the mother and child.

In addition to health and exposure assessments, information on time-activity patterns of householders, quality of life indicators, fuel use patterns, and women's respiratory health is also collected.

Participants

Since this is a continuation of the RESPIRE – Guatemala study, participants are now between 2 and 4 years of age. An additional subsample of new households was recruited to increase the size of the cohort. New households were recruited based on age criteria and the use of an open fire as the only cooking source.



Over a dozen different survey forms and questionnaires that are used in the project were translated into Spanish and back-translated into English. The questionnaires were then translated into the local Mam dialect and pilot tested before use. Since many of the terms such as "wheeze", "asthma" and "chest indrawing" are not easily translated into Mam, focus groups were used to identify appropriate words in Mam. All data are double-entered for quality control and assurance.

Providing Health Care

Any time a participating child is ill they can visit the study nurse who will evaluate the child and provide appropriate treatment in consultation with the consulting physician, a referral to the San Lorenzo Health Center physician or, in case of serious illness, referral to San Marcos Hospital. Children admitted to the hospital are followed up so that the study team can provide a continuum of care for study participants.