DEMONSTRATING THE BENEFITS OF CLEAN COOKING ON CHILD SURVIVAL

WORKSHOP REPORT

MARCH 28-29, 2015 / KATHMANDU, NEPAL

Household air pollution causes:

- **500,000 child deaths** each year from acute lower respiratory infections, including pneumonia.
- **A 90-gram decrease in birth weight**

In March 2015, the Global Alliance for Clean Cookstoves (Alliance) and Johns Hopkins University brought together an all-star team of the world's leading public health experts to share the most recent evidence on how clean cooking impacts children's health. Alliance-funded researchers shared promising preliminary results from ongoing studies in Ghana, Nepal, and Nigeria which are evaluating how clean cooking can improve birth outcomes and reduce pneumonia.

PROMISING EARLY RESULTS FROM ALLIANCE-SUPPORTED CHILD SURVIVAL STUDIES

Studies currently underway in Ghana, Nepal and Nigeria seek to better understand the health impacts of clean cook-stoves and fuels. The studies, two of which leverage ongoing NIH-funded studies, are some of the first in which truly clean technologies are being evaluated. They measure impacts on birth outcomes, including low birth weight, and pre-term birth, as well as the incidence of severe respiratory illness, including pneumonia and other acute lower respiratory infections (ALRI) in children under five.

> ***"While our results are still preliminary, the rate of ALRI among children under 3 years after their household had received an improved biomass stove was lower than when using the traditional opening burning stove."***
>
> **Dr. James Tielsch,** Chair of the Department of Global Health at George Washington University

Study results, which will be released starting this summer and into 2016, will have far reaching implications for the global development and health communities. These studies will help lay the foundation for a clear base of evidence that will allow policy makers to make a clear link between fuel switching, reduction in air pollution, and public health. The Alliance also plans to leverage the expected results in its market development efforts, particularly in its focus countries of Bangladesh, China, Nigeria, Ghana, Guatemala, India, Kenya, and Uganda.

DESCRIPTION OF STUDIES

GHANA

The Ghana Randomized Air Pollution and Health Study is evaluating the impact of adopting clean cooking (BioLite stoves or LPG) during pregnancy on birth weight and childhood pneumonia. This study seeks to determine the respiratory pathogens responsible for pneumonia infections in a sample of physician diagnosed severe pneumonia cases. This will shed important new light on which respiratory pathogens are most responsive to household energy interventions.

Principal Investigators
D Jack, Columbia U and KP Asante, Kintampo Health Research Center

Sample Size
1415

Technologies Assessed
Open fire, BioLite stove, LPG

Outcomes Measured
Birthweight, childhood pneumonia

NEPAL

The Nepal Cookstove Replacement Trial is a large, stepped wedge cluster randomized trial to assess the impact of replacing traditional open burning biomass stoves with an "improved" stove or LPG on the incidence of ALRI and adverse reproductive outcomes in a rural population in southern Nepal.

Principal Investigators
J Tielsch, Johns Hopkins U and S Khatry, Nepal Nutrition Intervention Project

Sample Size
4200 Envirofit in Phase 1;
1900 LPG in Phase 2
(randomized from Envirofit group)

Technologies Assessed
Open fire, Envirofit chimney stove, LPG

Outcomes Measured
Adverse pregnancy outcomes, ALRI

NIGERIA

The Nigeria study is a randomized controlled trial to assess the impact of replacing either traditional biomass stoves or kerosene with ethanol on birth outcomes. This study occurs in an urban population where the majority of women use kerosene as their primary cooking fuel. Because this study evaluates open burning, kerosene, and ethanol, it will have the ability to establish a dose-response relationship between measured pollutants (PM and CO) and birth outcomes.

Principal Investigators
S Olopade, U Chicago and O Ojengbede, University College Hospital, Ibadan

Sample Size
300

Technologies Assessed
Open fire, kerosene, ethanol

Outcomes Measured
Birthweight, intrauterine growth restriction

KEY FINDINGS

Initial Results Point to Increased Adoption, Reduced Exposure, and Likely Health Benefits

Preliminary findings presented at the Child Survival Workshop in Nepal show that study participants are willingly adopting new stove technologies:

- Women in the studies prefer to cook with cleaner stoves and fuels.
- When clean stoves and fuels meet cooking needs, there is little need for continued use of open fires.
- Study participants are willingly displacing traditional stoves with cleaner stoves and fuels.
- Studies report high rates of study compliance, and solid evidence – supported by Stove Use Monitors (SUMs), which indicate when a stove is in use – that participants use the intervention stoves almost exclusively.
- Over 80% of the intervention participants in the Nigeria study gave away their kerosene stoves, and now rely exclusively on their clean-burning ethanol stove to meet their daily cooking needs.

Results also indicate substantial reductions in exposure associated with the adoption of cleaner cookstoves and fuels.

- While studies cannot 'break' randomization at this point, major shifts in the distribution of exposures to air pollution have been observed.

Measurable child benefits of adopting clean cookstoves and fuels are expected.

- Preliminary results indicate significant improvements in children's health indicators and outcomes, even after controlling for major covariates like changes in vaccine coverage.

The workshop gave leading public health experts and advocates a chance to discuss preliminary results and policy implications.

"When you get this many committed researchers together working on the same topic, there's an incredible amount of learning taking place. ***After seeing the preliminary results of the many ongoing studies, I think we're making significant progress on how much switching to a clean cookstove or fuel can improve a child's health."***

Dr. Sola Olopade, Professor of Medicine at University of Chicago and Principal Investigator of the Nigeria research trial

"Clean cooking will likely emerge as the next cost-effective intervention to promote child survival. *Preliminary results are promising, particularly given high levels of adoption and low levels of air pollution achieved. Study results should illuminate the positive impacts that clean cookstoves and fuels can have on children's health."*

Dr. Sumi Mehta, Director of Research, Global Alliance for Clean Cookstoves

"Harnessing each other's ***strength through partnerships is required,*** *so that we accelerate more on reduction of household air pollution."*

Dr. Pravin H Khobragade, Health Specialist UNICEF

Participants work on HAP and child survival in the following countries: **Bangladesh, Ghana, Guatemala, India, Kenya, Malawi, Nepal, Nigeria, Rwanda**

WORKSHOP GROUP VISITS BIOGAS SITE

A highlight of the trip included a site-visit to a biogas and child health study being conducted by Nepal National Tuberculosis Center in collaboration with University of California, Berkeley. As part of the trip, researchers met with local residents who described their use of bio-digesters and how switching to biogas had impacted their day-to-day activities. Attendees also observed how stove use and air quality were being monitored in households that were relying on both open fires and biogas stoves for cooking. Local health workers and field staff described the positive changes they had observed while monitoring children's health and exposure levels.

Workshop attendees visit households where traditional cooking fires andbio-gas stoves are being used.

List of Attendees

Amanda Northcross
The George Washington University

Amod Pokhrel
University of California, Berkeley

Archana Patel
Lata Medical Research Foundation

Darby Jack
Columbia University

Dhiraj Pokhrel
LEADERS, Nepal

Donee Alexander
Global Alliance for Clean Cookstoves

James Tielsch
The George Washington University

Joanne Katz
Johns Hopkins University

Kip Patrick
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Kirk Smith
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Kristin Aunan
Center for International Climate and Environmental Research

Laxman Shrestha
Trbhuvan University, Kathmandu, Nepal

Lisa Thompson
University of California, San Francisco

Michael Bates
University of California, Berkeley

Miles Kirby
London School of Hygiene and Tropical Medicine

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Subarna Khatry
Nepal Nutrition Intervention Project-Sarlahi

Sumi Mehta
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Talat Islam
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Thomas Clasen
Emory University

William Checkley
Johns Hopkins University

Presentations from the workshop can be found **here**.

The Alliance's child survival research portfolio is supported by:

WORLD LUNG FOUNDATION

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GLOBAL ALLIANCE FOR CLEAN COOKSTOVES

The Global Alliance for Clean Cookstoves is a public-private partnership hosted by the United Nations Foundation that seeks to save lives, improve livelihoods, empower women, and protect the environment by creating a thriving global market for clean and efficient household cooking solutions.The Alliance's 100 by '20 goal calls for 100 million households to adopt cleaner and more efficient cookstoves and fuels by 2020. The Alliance is working with its public, private and non-profit partners to accelerate the production, deployment, and use of clean cookstoves and fuels in developing countries.

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