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## Paid volunteers needed for smoke inhalation health study

**8** Aug, 2016  
by Anne Ju Manning

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How clean is clean enough?

[CSU Energy Institute](#) researchers want to know – and they need your help.

The question refers to air pollution from wood or coal-burning cookstoves, the main form of household energy used by about 3 billion people worldwide, every day. The past several decades have seen progress in the design of cleaner-burning stoves. Less clear, though, is whether these more efficient stoves will improve human

## More information and how to volunteer:

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health, in terms of short- and long-term exposure to cookstove air pollution.

“Imagine having to wake up every day and light a campfire in your kitchen in order to provide light, heat, and food for your family – that’s a lot of smoke to breathe on a daily basis, and it adds up over a lifetime,” said Jennifer Peel, professor of epidemiology in the Department of Environmental and Radiological Health Sciences. In collaboration with John Volckens, professor of mechanical engineering, Peel and a multidisciplinary research team are gearing up for an extensive, volunteer-based human study funded by the National Institutes of Health.

Their aim is to provide insight into what levels of cookstove air pollution, and which stove technologies, if any, show reduced health effects, compared with pollution levels from a stove similar to an open campfire. They also want to test if any stove technologies are similar to clean air. Modern cookstoves burn pretty clean, thanks to technological advances – but how clean is clean enough?

## Wanted: 50 volunteers

The researchers are seeking 50 volunteers to participate in a study, which they’re aiming to launch this fall at the Powerhouse Energy Campus at CSU. They’re calling their study STOVES – Subclinical Tests on Volunteers Exposed to Smoke. It is the latter half of a two-part project looking at cookstove emissions and their health effects.

“The first phase of the project is coming to completion this summer, and is strictly testing the stoves in the lab to characterize the complex mixture of pollutants emitted from cookstoves that we collectively call ‘smoke,’” explained Tom Cole-Hunter, a postdoctoral researcher in epidemiology working on the STOVES study.

Volckens likened this second phase to trying to quantify the difference between a two-pack-a-day smoker, versus a four-cigarette-a-day smoker. Everyone knows smoking is unhealthy, but is the four-cigarette-a-day smoker measurably healthier than the heavier smoker, and if so, to what extent?

“What if I make a stove that’s 90 percent less polluting?” Volckens said. “Ninety percent might not be good enough. We don’t know how clean we have to get. We want to define that gray area.”

## Equivalent to a weekend of camping



Study participants will breathe varying amounts of smoke inside a Simulated Environmental Testing (SET) facility at the Powerhouse Energy Campus. They'll spend about eight hours at the Powerhouse, two hours of which will be spent in the SET. Then, they'll return for about one hour the following day. Each of these study periods will be repeated six times, spread over 12 weeks.

The maximum amount of pollution volunteers will breathe is approximately equivalent to what one would experience around a campfire for one weekend.

The study has received approval from the university's Internal Review Board for human research ethics to ensure maximum possible safety and comfort of the participants. For example, the SET features built-in safety mechanisms, including auto-shutoff of smoke and immediate flushing of filtered air in the unlikely event that smoke levels are higher than expected. As an extra precaution, medical personnel will be on hand in case of any concern from a participant. Volunteers will also be generally healthy people without a history of chronic disease.

The researchers will measure short-term changes inside the body generated by varying levels of smoke, including blood pressure, heart rate, blood vessel health and analysis of blood samples.

## Compensation

Participants will be compensated up to \$1,275 for their participation, or about \$175 per study period completed. It is highly desirable for participants to stay committed through the duration of the study (completing six study periods), for which they will be awarded an additional \$225, making the maximum compensation \$1,275.

Kristen Fedak, a graduate student in epidemiology also working on the study, said she is motivated by the potential impact of their work. "We know household air pollution is causing a large burden of disease worldwide, and with a little more information, we could contribute some insight regarding potential solutions," she said.

For information on how to volunteer: [erhs\\_stove\\_study@mail.colostate.edu](mailto:erhs_stove_study@mail.colostate.edu) or 970-491-4709.



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