



**Where:** Puno, Peru

**Product:** Series 500 portable monitor, NO<sub>2</sub> sensor

**When:** November 2016, ongoing to 2019

**Result:** Improving the health of rural women by monitoring NO<sub>2</sub> from biomass cookstoves.

## THE CUSTOMER



Johns Hopkins University (JHU), founded in 1847, is an American private research university in Maryland, USA. JHU has the distinction of being America's first research university, and the leader in federal research and development funding every year since 1979.

The Johns Hopkins Bloomberg School of Public Health, Department of Environmental Health and Engineering is on a quest to discover, disseminate and apply new knowledge critical to understanding and mitigating the impact of the natural, built, and social environments on human health.

**“We have had a great experience using the Aeroqual Series 500 monitors for our field sampling of indoor air pollution. The devices have been reliable, durable, and easy for our field workers to use.” - Josiah Kephart**

## THE PROBLEM

Household air pollution (HAP) from biomass cookstoves is estimated to be responsible for 4.3 million deaths annually<sup>1</sup>. A transition from biomass to gas stoves has been proposed to reduce HAP and improve public health.

A randomized field intervention trial will assess the effects of switching to a gas stove (half switch for gas stoves, the other half remain with biomass stoves as controls) on HAP levels and cardiopulmonary outcomes among women who use the stoves. The study, performed by the Johns Hopkins Bloomberg School of Public Health, Department of Environmental Health and



<sup>1</sup> [http://www.who.int/phe/health\\_topics/outdoorair/databases/FINAL\\_HAP\\_AAP\\_BoD\\_24March2014.pdf](http://www.who.int/phe/health_topics/outdoorair/databases/FINAL_HAP_AAP_BoD_24March2014.pdf)

Engineering, the Johns Hopkins School of Medicine, and the Universidad Peruana Cayetano Heredia (with other collaborators) is taking place in rural areas outside of Puno, in the Altiplano region (3,850 meters ASL) of Peru. The remote location presents challenges for access and power for sampling equipment.

## THE SOLUTION

Using the Aeroqual Series 500 portable monitor, the study team is able to assess nitrogen dioxide (NO<sub>2</sub>) concentration in women's kitchens for 48 hrs. NO<sub>2</sub> is a known threat to human health. JHU specifically chose the Aeroqual portable monitors because of their ability to measure at low NO<sub>2</sub> concentrations (most other monitors are for industrial applications and can only detect higher levels).

In the image below, you can see the Series 500 monitor in the cage one of the study field workers is carrying. The monitors are placed into bird cages to hang from the ceiling at breathing zone level.



## EVALUATION

Data collection is ongoing, but the Aeroqual monitors are helping the researchers understand NO<sub>2</sub> levels from biomass cookstoves as well as changes in NO<sub>2</sub> concentrations after transitioning to a gas stove. More details about the study are available in this [publication](#).