

# New stove dramatically improves lung health in Mexican women

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Women in Central Mexico who used a vented stove instead of the traditional indoor open fire, experienced improved respiratory health on par with a pack-a-day smoker kicking the habit, according to a recent study.

The study, which analyzed the first year of data in an ongoing project examining the impact of the use of vented stoves over traditional indoor open fires, was reported in the October 1 issue of the [American Journal of Respiratory and Critical Care Medicine](#), published by the American Thoracic Society.

An estimated two billion people around the world rely on biomass fuel for cooking, typically over unvented indoor fires. These indoor fires generate high levels of pollutants such as carbon monoxide, [particulate matter](#) and [nitrogen dioxide](#). One recent analysis put exposure to indoor biomass smoke among the world's top ten environmental causes of mortality and morbidity.

The "Patsari" stove was designed to address this problem, and has been shown in previous research to reduce [indoor air pollution](#) concentrations by an average of 70 percent. However, until now, no research has directly evaluated the health effects on the women who use them.

"We wanted to know whether the Patsari stove would make a measurable difference in the health of people who were actually using it," said Horacio Riojas-Rodríguez, of the Instituto Nacional de Salud

Pública, and researcher on the study.

To do so, Dr. Riojas and colleagues followed women in more than 500 households from Central Mexico, who had been randomized to receive the new Patsari stove at the beginning of the study, or upon its conclusion. Each participant answered a symptom questionnaire at the outset of the study and every month thereafter for ten months. They also underwent an average of four spirometric tests during the study.

Fewer than a third of women assigned to receive the Patsari stove reported "mainly" using it, and another 20 percent reported that they used it in conjunction with the open fire, and fully half reported mainly using the traditional open wood fire, despite having been assigned to the intervention group.

While the intention-to-treat analysis did not demonstrate significant differences between the control and intervention groups, when the researchers analyzed those who used the Patsari stove versus those who did not, they found strong evidence that use of the Patsari stoves was associated with marked improvements in respiratory health.

"Over 12 months of follow-up, the use of the Patsari stove showed a protective effect on respiratory and other symptoms, and a trend to improve lung function that was comparable to smoking cessation," said Dr. Riojas.

In fact, women using the Patsari stove had half the decline in a key measure of lung function—forced expiratory volume in one second, or FEV1—than women using open wood fires. Among those who used the Patsari stove, the loss was 31 ml over a year, versus the 62 ml over a year for the open fire users, a similar effect as what is seen in tobacco cessation.

"These findings each help support the notion that stove intervention programs in the developing world can improve health when the women adhere to the intervention," wrote Luke Naeher, Ph.D., associate professor at the University of Georgia, in an accompanying editorial. He added that the study "helps to highlight both the tremendous potential of these programs in the developing world to improve health and the quality of life, and also the great need for continued research to help us understand how to best implement these programs."

Dr. Riojas and colleagues are currently investigating exactly that; ongoing work is increasing the adoption of the new stoves in study households. "According to the nongovernmental organization that works with these communities, the adherence has increased to more than 70 percent after the year covered when the study reported by this paper ended," said Dr. Riojas.

Source: American Thoracic Society ([news](#) : [web](#))

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