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Opinions

These cheap, clean stoves were supposed to save millions of lives. What happened?

By **Marc Gunther** October 29

About 3 billion of the world's poorest people burn wood, charcoal or dung in smoky, open fires to cook their food and heat their homes. Millions die annually from lung and heart ailments caused by cooking with solid fuels, according to [the World Health Organization](#).

With that in mind, Hillary Clinton, as secretary of state, launched a public-private partnership called the [Global Alliance for Clean Cookstoves](#) in 2010. By creating a global market for “clean and efficient household cooking solutions,” the alliance would “save lives, improve livelihoods, empower women and protect the environment.” Providing poor women with clean cookstoves, Clinton said at the annual gathering of the Clinton Global Initiative in New York, “could be as transformative as bed nets or even vaccines,” which have saved tens of millions of lives.

It hasn't worked out that way, despite the best efforts of the alliance, which operates as a project of the U.N. Foundation in Washington.

The alliance has accomplished a great deal, given its staff of a few dozen and a modest budget, about \$10 million a year. It has focused attention on the problem of household air pollution; promoted international cookstove standards; attracted more than \$413 million in government, foundation and corporate funding to the sector; and enlisted 1,300 partners, it says in a new five-year [progress report](#). With actress Julia Roberts and chef José Andrés as its global ambassadors, the alliance has helped drive more than 28 million cookstoves into the field, well on its way to the target set by Clinton: 100 million by 2020.

But “clean” is a nebulous term. Of those 28 million cookstoves, only 8.2 million — the ones that run on electricity or burn liquid fuels including liquefied petroleum gas (LPG), ethanol and biogas — meet the health guidelines for indoor emissions set by the WHO. The vast majority of the stoves burn wood, charcoal, animal dung or agricultural waste — and aren't, therefore, nearly as healthy as promised. Although these cookstoves produce fewer emissions than open fires, burning biomass fuels in them still releases plenty of toxins. “As yet, no biomass stove in the world is clean enough to be truly health protective in household use,” says Kirk Smith, a professor of

global environmental health at the University of California at Berkeley and the leading health researcher on cookstoves.

That's not the only problem with the stoves. Some perform well in the lab but not in the field. Others crack or break under constant heat. The best cookstoves burning clean fuels won't protect poor families from disease if those who use them continue to cook over open fires as well — which many do. “They're not the big solution, unfortunately, that we thought they were going to be,” says Rema Hanna, a Harvard economist who led [“Up in Smoke,”](#) the most extensive field study to date on this subject. Perhaps more research could apprehend what actually works, but for now it makes no sense to “push more stoves into the world that people aren't going to use.”

The alliance agrees that more research is needed. It has commissioned more than 40 studies, including a handful of field trials designed to evaluate the health benefits of biomass stoves by looking at [birth weights](#) and incidence of respiratory disease. Preliminary results are encouraging, but nothing has been published yet. Meanwhile, recent evidence linking household air pollution to cardiovascular disease indicates that the health effects of such pollution are worse than previously thought. That led the WHO to increase its estimate of premature deaths caused by cooking over open fires from 1.9 million to 4.3 million several years ago. Household air pollution from solid-fuel combustion is now thought to be [the world's leading environmental cause](#) of death and disability.

While engineers have been designing cookstoves to replace open fires since the 1950s, they haven't always focused on health. Cookstoves were first seen as a way to reduce deforestation caused by cutting down trees for firewood. Since then, they have been advanced as a climate-change solution; as a tool to empower women, who are often the ones selling them locally; and as a way to save poor people time and money that they no longer have to spend gathering or buying fuel that is burned inefficiently. “The blessing and the curse of the issue is that it touches on so many things — climate, women, health, deforestation, job creation,” says Jacob Moss, a career civil servant who oversaw a small cookstove program at the Environmental Protection Agency and helped start the global alliance.

Whatever the intent, cookstoves have been a tough sell with their target audience of poor women. Even if people are aware of the health risks of cooking over open fires (and many are not), they are reluctant to abandon cooking methods embedded in their culture. “Three decades of efforts to promote both modern fuels and improved biomass stoves have seen only sporadic success,” says a 180-page World Bank [report](#) published last year. A notable exception was a government program in China that got more than 100 million cookstoves into people's homes, according to another World Bank [study](#). “With their system of government, they can kind of dictate what

happens,” notes Jim Jetter, a senior research engineer who tests cookstoves for the EPA.

When journalist Meera Subramanian visited a village in northern India that had been declared “smoke-free” after a nonprofit distributed biomass cookstoves there, she found that women had stopped using the stoves because they didn’t like the design or because the stoves broke, burned more wood (not less, as intended) or didn’t get foods hot enough. “I couldn’t find a single stove operating in any condition resembling what its designers had intended,” she writes in her new book, [“A River Runs Again,”](#) about India’s environmental crises. The Appropriate Rural Technology Institute, which gave away the stoves, took a survey two years later and found that only 20 percent were still in use. “Why are they cheating us by giving us things that break so early?” one woman complained to the agency. “Why don’t they give us something more substantial like LPG or toilets or jobs for children?”

Indian women [surveyed](#) by the Stockholm Environment Institute said they prefer to cook roti, a flatbread eaten with every meal, in a clay oven using a mix of firewood and cow dung because they can both fry and bake the bread and the fuels improve the taste — much like some American cooks like the flavor of meat grilled over charcoal.

Affordability also remains a fundamental challenge. Though dirtier biomass cookstoves sell for \$25 or less, the more complex stoves that run on electricity or burn liquid fuels typically cost more and require access to a steady and cheap supply of fuel, which often isn’t available in rural villages. “This is where stoves have always struggled,” says Kevin Starr, who as the director of the Mulago Foundation, which focuses on global poverty, has been pitched numerous cookstove projects. “The affordable ones are inadequate, and the good ones are unaffordable.”

To further cloud the picture, women who adopt improved cookstoves frequently continue to cook over open fires as well, a common phenomenon known as stove stacking. Several studies have found that “the exclusive use of new stove technologies in homes has been rare,” [according to researchers](#) Michael Johnson of the Berkeley Air Monitoring Group and Ranyee Chiang of the cookstove alliance.

Radha Muthiah, a former executive at CARE International, has wrestled with these challenges since becoming chief executive of the cookstove alliance in 2011. Governments, led by Britain, the United States and Norway, provide about 65 percent of its funding, with the rest coming from foundations and businesses. Muthiah says that the alliance intends to focus more on clean cookstoves and fuels “that we know will achieve the health benefits,” but that it cannot abandon the poorest of the poor who lack access to clean fuels. “Where people can have access

quickly to LPG or [electric] induction stoves, that's what we're pushing. But we have to be pragmatic," she says. "Large segments of the population aren't going to have access to these cleaner fuels for another 10 years or more."

Those people deserve improved biomass cookstoves, she says: "There may not be the greatest health benefit, but there's certainly a good environmental benefit, and it will save them more time" and create "livelihood and empowerment opportunities."

Some experts say that's the wrong approach. "We know what works," says Kirk Smith, the Berkeley professor, who has worked on cookstoves for 35 years. "It's gas or electricity or both. Why are we pushing these strange new gadgets that we never use here? It's an ethical issue." He praises the alliance's work on research and standard-setting but says it should be trying to make clean fuels such as gas and electricity more accessible, not trying to clean up fuels such as wood and dung.

Another critic of the alliance is Eric Reynolds, the former chief executive of outdoor-gear company Marmot, who moved to Rwanda five years ago to start a cookstove company called [Inyenyeri](#). His company is deploying a low-emission stove from a Chinese manufacturer that Reynolds says is the cleanest-burning biomass stove available. "To continue to distribute and promote . . . stoves that we know will kill people is unethical," he says.

But Inyenyeri's stoves cost more than \$50 apiece, and the company thinks that, to eliminate open fires, most customers will need two or three, the way standard Western ranges have four burners. So Inyenyeri leases them at a nominal cost (about \$7 a year) and intends to make money by selling biomass fuel pellets to its customers and carbon emissions credits in rich countries. It's a cookstove version of giving away a razor to sell blades, but it remains small and unproven.

The same, alas, could be said of the cookstove sector as a whole. It's been five years since Hillary Clinton proclaimed: "Today, we can finally envision a future in which open fires and dirty stoves are replaced by clean, efficient and affordable stoves and fuels all over the world." That future remains a long way off.

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