

# THE MURDERER IN THE KITCHEN

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## ABSTRACT

One important rationale for solar cooking is knowledge about the health hazards associated with the use of fossil fuels for cooking. Nearly three billion people continue to use biomass. The World Health Organization estimates that 1.6 million persons die annually from this hazard, one individual every 20 seconds. Women and small children are the major victims. Acute respiratory disease, the major killer of children, is highly associated with this problem of Indoor Air Pollution.

**Key words:** Indoor air pollution, smoke in the kitchen, biomass fuel for cooking

## 1. PURPOSE

The purpose of the paper is to raise awareness of the problem of Indoor Air Pollution (IAP) as a critical rationale for the wider adoption of solar cooking programs in developing nations of the world.

## 2. BACKGROUND

Who among us would knowingly allow family members, neighbors, or in fact, anyone at all, to enter and work in a kitchen in which a deadly poisonous substance is lying in wait to deliver injury or even death? The answer is, of course, none of us – but we are doing exactly that every day and year in which we do not successfully intervene in the use of fire for cooking with wood, charcoal, dung, and crop waste of many types. Nearly one third, perhaps even half, of all humans on earth still use fire with one or more of those biomass fuels to cook their food; the vast majority of the households cooking with fire are found in the poor world. This situation is only one more example of inequities in the world - poverty and the related lack of education and opportunity for adults and children are the major causal factor for the use of biomass, the killer with

free access to kitchens in poor countries. Given those facts, what are we, or can we, do to remove that killer from the worlds' kitchens? Not accidentally, but by virtue of long established gender roles, the killer principally targets women and their infants and small children, kept near them as they fulfill the vital household responsibility activity of feeding the family.

## 3. THIS PROJECT

First, a quick picture of the global situation regarding this killer. While all of us in the solar cooking community have long known that cooking with fire brings irritated eyes and persistent coughs, our major “talking point” for promotion of the technology that brings us together as a world gathering has been environmental, not health. We have stoutly argued that cooking with wood does play a role in the inexorable march towards global deforestation – found nearly everywhere except in the developed rich countries where even the poorest have moved up the energy ladder from wood, dung, waste, charcoal, and coal, to gas and electricity. In the poor world however, climbing the energy ladder is simply too expensive for the masses of poor households, and therefore does not happen. The killer continues to reside in the kitchen.

Global figures are seldom wholly reliable, and on this topic, sparse, perhaps because the situation is not seen as critical enough to warrant serious scientific or policy attention (who seriously cares about the kitchens of poor households anyway?) Data suggest that “the household sector is still the largest single energy consumer, and the poorer the country, the more likely this is.”<sup>1</sup> Therefore, fuel consumption in the household should be a major topic of concern in a world plagued by global warming • The countries affected, that is, those where biomass continues to be a major source of cooking fuel, are on all continents, but most of the more serious national situations are found in Asia and Africa. In numerous countries, over 75% of households suffer from the

problem of indoor smoke. Studies have been done in a large number of countries, but methodologies have not been standardized, so comparisons are not precise. Berkeley professor, Kirk Smith, perhaps the leading researcher in the field and his colleagues prepared and continue to manage a database called “the Indoor Air Pollution and Exposure Database: Household Pollution Levels in Developing Countries”<sup>2</sup> Their effort is not only to gather data on a worldwide basis but to encourage researchers to learn from one another. The initial database provided information on seventy-one studies, from 24 countries. Meta-analysis is not yet possible, but may be soon. This is an impressive beginning to learning more about this critical issue.

What is currently known about the effects on human beings of the phenomenon of IAP? Most of us are used to thinking of environmental pollution as an out-of-doors matter, and indeed, that appears to be largely true in developed nations. But that which is found indoors, in the developing world, is particularly vicious because it targets the poorest and most vulnerable, largely women and young children. While somewhere between one-third and one-half of households in the world use unprocessed solid fuels, the phenomenon is not randomly distributed. The proportion varies from close to zero in the developed world to as high as 80% in China and India and a number of African nations.

Simple stoves, often not vented to the outside, give off into the household atmosphere a wide range of pollutants, many of which are clearly harmful to health. The pollutants, readily breathed in, include carbon monoxide, toxic hydrocarbons, sulfuric compounds, and nitrogen, all dependent on the manner of combustion and characteristics of the fuel used. The pollutants can even affect the local area. Obviously, the fires are used with people present, usually females and children who are still of an age to be carried or watched carefully. Pollution in enclosed spaces is more readily inhaled than that found outdoors, and more damaging because it is concentrated. What the epidemiologist calls the “global burden of disease” is higher for IAP than for outdoor pollution. The most important impacts appear to be acute respiratory illness in children, and in adults, chronic lung disease of various types.

While not feasible here to do much other than to summarize, we all need to understand the serious implications for health – that killer lurking in poor women’s kitchens in many parts of the world. Measurement of the particles present in households has been made easier by technology, in which electronic devices can be set to record size and type of particulates at specific times of the day and night, in various places in the household, etc. The devices are, of course, not

cheap, but represent a major step forward in research on this topic. To date, relatively little research exists quantifying the problem in this detail, related to its expense and the expertise required. Lower technologies have been used but more is required, and now possible.

Given those difficulties what do we now know? Evidence is strong that acute respiratory infections (ARI) are the single most important cause of death in children under 5 years and account for about 2 million deaths globally annually. While not all is due to IAP, much is, and inevitably worsens the child’s situation. Few studies have actually measured pollution exposure but rather utilize proxies such as type of fuel and stove. A confounding factor is the level of malnutrition the children in developing nations may also have, another indication of the role poverty plays.

In adults, chronic lung diseases such as bronchitis, obstructive pulmonary diseases, emphysema, and heart failure, are linked to biomass fuel usage, much like cigarette smoking. Chronic bronchitis (with coughing and phlegm) is also associated with IAP.

Other diseases for which evidence is strong, but less well documented, include lung cancer, middle ear infections, asthma, tuberculosis, stillbirth, low birth weight, and early infant death. Eye irritation and cataracts are also suggested by some studies, while sore, red eyes and tears are widely reported with some evidence that vision may be impaired over time.

Many of the studies have methodological shortcomings, including lack of uniform definitions, use of proxies for actual measurement, frequent reliance on hospital data rather than household studies. Despite the limitations, however, the preponderance of evidence strongly suggests that the killer in the kitchen, while poorly identified and described, is at loose and aiming to harm householders in many poor nations of the world.<sup>3</sup> The above brief summary provides an overview only, with the electronic sources providing additional detail.

In summary of what are thought to be overall consequences of IAP to human health, the Shell Foundation newsletter, Breathing Space, states that “each year smoke from cooking in poorly ventilated homes claims the lives of 1.6 million people in poor countries – that’s a life lost every 20 seconds.”<sup>4</sup> Women and children are exposed to smoke at levels sometimes 100 times that of internationally agreed upon standards, with consequent deaths, illnesses, and disability adjusted life years (a concept which adds periods of disability to death statistics.) Without doubt, the health burden of exposure to pollutants from biomass and other solid fuels is a significant fact – the earlier mentioned “killer in the

kitchen". Further, the disastrous pattern will almost certainly continue for years to come – almost no one predicts that less than one billion people will continue the pattern of cooking described here into the foreseeable future, simply because they have no alternative.

While the available evidence could be stronger and clearer, more readily comparable, country to country, region to region, there is more than enough information available to us to demand action—interventions to circumvent the shadowy murderer from carrying out this new form of killing indefinitely.

What are the suggested interventions? Almost unnecessary to say, additional research and knowledge about the situation is critical. But far more important is ACTION – action on all our parts. One challenge is clearly to be certain that all our sisters in poor nations are alerted to the potential crime in the kitchen. How might this happen? Have we considered harnessing the enormous power of the networks of women which have national and international reach? Why not utilize other international networks, ROTARY INTERNATIONAL, Boy and Girl Scouts, associations of medical doctors and nurses and other health professionals? Can we harness the potential of mass media to spread this message?. Clearly, awareness of the issue is one major step – and one the organizations we represent here can undertake.

Another suggested intervention include is, of course, eliminating the source of the pollution, that is, shifting from current fuel sources to less polluting ones; here cost is always the major issue. Most users would shift if they could, for many reasons: many women and children continue to spend many hours daily in the collection of wood, hours which could surely be used more productively. As wood is more scarce, children are increasingly called on to aid in gathering fuel, hindering their education, as well as robbing them of childhood. Interventions in the house itself help – venting stoves would be useful clearly, as would better ventilation, such as windows. Improved wood stoves which burn quickly and use less fuel could be useful, particularly when venting is added. Drying wood, protecting children from the fire --- these and many other possibilities are only ameliorative, but would curtail the murderer partially.

Obviously, the problem could be lessened substantially if solar cooking, the particular special focus that has brought us together were to spread far more quickly and widely than has occurred to date. Cooking with the sun has zero pollution, zero IAP, and is, as we all know, of substantial benefit to the budget burden of the poor. You and I must see that the technology, equipment, training in usage, etc. required for adoption of solar cooking becomes far more widely available than is true today,

despite the advances of last decades. It would be less than honest to suggest that any thought whatsoever has been given in the halls of power in governments and environmental organizations anywhere to the potential of solar cooking as a way out of the dangers our sisters face as they undertake to serve their family well. This should be an urgent call to action for us all, as we begin to comprehend more fully the horrific dangers of that murderer who continues to lurk in kitchens serving food to nearly three billion people, and unknowingly serves along with dinner, the poisoning of Indoor Air Pollution, killing and disabling innocent children and their hard working, devoted mothers. Over 1.6 million human beings die each year, and at least two billion are at serious risk from this killer.

It is more than time for this group to join, whole heartedly, in the international effort to destroy that phantom killer lurking in kitchens in the poor world by redoubling our efforts to promote and train women to learn about and to access solar cooking -- the truly life saving technology that brings us together in this place on this day. Please think of this as a call to even greater effort in the years ahead.

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#### ENDNOTES

<sup>1</sup> Retrieved November 2005 from [http://who.int/environmental\\_information/Womenwomfuel.htm](http://who.int/environmental_information/Womenwomfuel.htm)

<sup>2</sup> Retrieved December 2000 from <http://ehs.sph.berkeley.edu/krsmith/t>

<sup>3</sup> Unpublished report. Washington Consultation on IAP, Household Energy, and Health, November, 2001. (Sponsored by the U.S. Agency for International Development, the World Health Organization, and the World Bank.

<sup>4</sup> Retrieved January 6, 2006 from <http://shellfoundation.org/index.php?newsID=10>