GENERAL REMARKS

This ninety-fifth volume of *IARC Monographs* considers household use of solid fuels for heating and cooking, a practice that can generate substantial quantities of indoor air pollution. The World Health Report 2002 identified indoor smoke from solid fuels as one of the top ten risks in terms of the global burden of disease (WHO, 2002). This health burden occurs almost exclusively in low-to-medium-resource countries, as solid fuels (e.g. wood, other biomass, and coal) are typically used only when other fuels are not available or not affordable.

An Advisory Group on priorities for future evaluations had recommended that IARC review indoor air pollution with high priority (IARC, 2003). This was reaffirmed and refined by a subsequent Advisory Group convened to plan a series of *Monographs* on air pollution. The first two volumes of this series, Volume 92 on polycyclic aromatic hydrocarbons and Volume 93 on low-solubility low-toxicity particles, evaluated these two major components of emissions from household use of solid fuels, and this volume builds on those reviews.

Some epidemiological studies of household solid-fuel use also reported data on cooking methods as a potentially confounding factor. Because many of these studies were conducted in countries where common cooking practices include stir-frying, deep-frying, and pan-frying, the results provide a basis for evaluating the potential carcinogenic hazard of high-temperature frying. Accordingly, this volume includes a second *Monograph* on the subject. High-temperature frying occurs in a wide range of populations living in low-, medium-, and high-resource countries.

Emissions from household use of solid fuels are complex mixtures containing thousands of chemical compounds at varying concentrations, and these may be admixed and adsorbed to particulate matter of widely varying dimensions. Accordingly, careful consideration must be given in using the available studies to make inferences about risks in other exposure circumstances. For example, do the results on household use of coal apply only to the specific sources of coal that were studied, or does other information make it reasonable to apply these results to other types of coal or even to other types of fuel? In making these determinations, it is necessary to consider the degree of similarity of the varying emissions mixtures, with respect both to composition and to biological activity. The Working Group spent much time discussing how narrowly or broadly to interpret the available studies. In doing this, data on the composition and the genetic toxicity of various mixtures were important in different ways.

The adverse health effects caused by household practices considered in this volume may be attributable primarily to products of incomplete combustion. In addition, the emissions from these solid-fuel stoves contain many chemical components known or likely to cause cancer in humans. Some of these are known to cause cancer outside the respiratory tract (e.g., benzene is causally associated with an increased risk of leukaemia). As the available epidemiological studies on household use of solid fuels did not examine these other cancers, the full burden of disease is not yet known and merits further investigation.

It is curious that although the most commonly used solid fuels are wood and other biomass, few epidemiological studies and cancer bioassays have investigated their potential cancer risks. The utility of further research is magnified by the high concentrations of emissions that can occur and by data showing that wood smoke is mutagenic in exposed humans.

A summary of the findings of this volume appears in *The Lancet Oncology* (Straif *et al.*, 2006).

References

IARC (2003) Report of an *Ad-Hoc IARC Monographs* Advisory Group on Priorities for Future Evaluations. Lyon, International Agency for Research on Cancer, Internal Report No. 03/001 [available at http://monographs.iarc.fr/ENG/Publications/internrep/03-001.pdf]

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