Karen M. Whitney
Vice Chancellor
Indiana University Purdue University Indianapolis
355 N. Lansing AO 112
Indianapolis, Indiana March 29, 2006

Dear Chancellor Whitney,

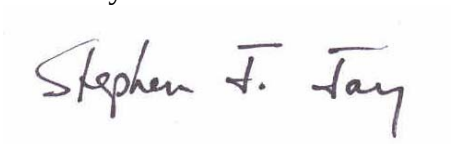
As we discussed recently in a planning committee of the IUPUI smoke free campus initiative, there is need for an evidence-based summary of the rationale for creating smoke-free environments to protect human health.

A science briefing regarding the adverse health effects of secondhand tobacco smoke (SHS) could be used by IUPUI leadership when communicating with faculty, students, staff, and administrators, as well with community leaders, public officials, and the media. Such reviews have been used effectively in a variety of settings, including universities and academic health center campuses, where policy changes regarding SHS were being planned and implemented.

The IUPUI faculty members who have authored the enclosed briefing have expertise in tobacco-related research, teaching, patient care, public health, and public policy regarding SHS.

We hope you will find this information helpful. If you need this information adapted for special audiences, we would be happy to review and edit the material for you as needed. Please let us know if we can provide additional support for your efforts to build a healthier smoke-free campus.

Sincerely Yours:



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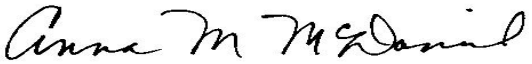

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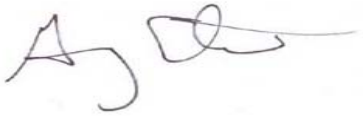

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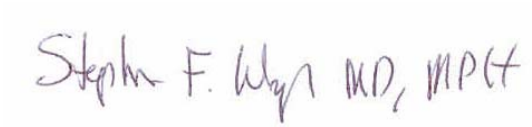

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A Report of the Health Effects of Secondhand Smoke Exposure

Submitted to IUPUI Office of the Chancellor

March 29, 2006

Summary

The scientific basis regarding the toxicity of second hand tobacco smoke (SHS) for humans is robust and has been endorsed by major science and health organizations in the world.

The majority of non-smoking Americans are chronically exposed to SHS in their homes, workplaces, social gatherings, and other public places.

Exposure of non-smokers to SHS is the third leading preventable cause of premature disease and death in the United States.

The elimination or significant reduction in exposure of non-smokers to SHS is a goal of major health science and professional health-related organizations in the United States.

Introduction:

The primary impetus for the development of smoke-free environments has come from a large body of scientific evidence accumulated over four decades that has confirmed a causal relationship between human exposure to secondhand tobacco smoke (1) (a.k.a. passive smoke; involuntary smoke, environmental tobacco smoke) and human disease. (2-9)

The purpose of this briefing is to provide an overview of the science and the consensus of federal agencies and national scientific, medical, and health organizations regarding the promotion of policies that protect human health through the creation of smoke-free environments.

Principles of Causation

The principles for causal inference regarding tobacco smoke and human disease were established in the 1964 report of the U.S. Surgeon General. These principles have been applied to SHS research and have formed the basis for research conclusions that SHS is a cause of human disease and death. Secondhand smoke research methodology based upon these principles has been refined through the years, extensively validated, and accepted by most researchers who publish their findings in peer-reviewed literature and by public health policy makers. (2)

Review of the Evidence

In 1972, U.S. Surgeon General Jessie L. Steinfeld summarized the science of “tobacco smoke pollution” for researchers, policymakers, and the public. Steinfeld concluded that the toxicity of SHS warranted that non-smokers be protected from SHS in certain public places. (10). Since that time, many science-based health agencies and organizations worldwide have reviewed the extensive body of research in this area and have made

policy recommendations for protecting the health of the public from exposure to SHS. In the United States, five major independent federal and private expert groups have reviewed the science of SHS and its effects on human health:

1. Surgeon General, U.S. Public Health Service, Department of Health and Human Services (DHHS)
2. U.S. Environmental Protection Agency (EPA)
3. National Research Council (NRC) (National Academies: National Academy of Sciences, National Academy of Engineering and the Institute of Medicine)
4. California Environmental Protection Agency (CA EPA)
5. National Toxicology Program (National Institute of Environmental Health Sciences of the National Institutes of Health (NIH) (NIEHS/NIH), Department of Health and Human Services (DHHS)

The science review processes of these organizations are highly structured. Preeminent researchers, clinicians and administrators from federal agencies, public and private universities, and the private sector are chosen to participate in the reviews. The reviews are based upon the best scientific evidence, and consensus is sought regarding findings, conclusions, and recommendations. Public input is received and incorporated into final reports. The reviews typically take several years to complete.

Conclusions of National Experts and Organizations

National authorities and organizations, including the five organizations above, have concluded that SHS is a highly toxic waste product of tobacco combustion and that there is a causal relationship between exposure of non-smokers to SHS and premature disease and death. Elimination of SHS or significant reduction in exposure to SHS improves health and decreases risks for disease and death.

Many other national science-based organizations have formally endorsed the research findings regarding the human health hazards of exposure to SHS. These include the National Academy of Sciences (NAS); Institute of Medicine (IOM); Centers for Disease Control and Prevention (CDC); National Institute of Occupational Safety and Health (CDC/DHHS); Occupational Safety and Health Administration (OSHA), U.S. Department of Labor. (11).

These conclusions have also been supported by major independent, non-federal, health organizations: American Heart Association (AHA), American Lung Association (ALA), American Cancer Society (ACS), American Medical Association (AMA), British Medical Association (BMA), American Public Health Association (APHA), American Thoracic Society (ATS), American College of Preventive Medicine (ACPM), American Academy of Pediatrics (AAP), and others. The World Health Organization (WHO) and other major international health and science-based organizations such as the International Agency for Research on Cancer (IARC), have endorsed the conclusions regarding the causal relationship between SHS and human disease. All these

organizations support public policy that eliminates or minimizes the exposure to SHS of persons in public places

Nature of the Scientific Evidence

Several thousand peer-reviewed articles have been published regarding SHS. The scientific evidence reveals that exposure of non-smokers to SHS is common in the United States and adversely affects the health of humans throughout the life cycle from embryogenesis and fetal development, to childhood, adulthood and old age. While SHS may adversely affect the health of all persons, subpopulations are often uniquely susceptible to its adverse effects, such as infants, children and adults with asthma, other respiratory diseases and various heart and cardiovascular disease. (6, 11) In addition many persons have adverse reactions to the noxious odor of tobacco smoke and its effects on mucus membranes of the eyes, throat and nasal passages.

There is no quantitative criterion for acceptable exposure to SHS—said in another way: there is no safe level of exposure to SHS. (12, 13) For this reason, authorities recommend that exposure of non-smokers to SHS exposure be eliminated or reduced to near zero exposure levels. (11)

Key conclusions of scientists and public health experts on the prevalence of secondhand smoke and its toxicity for humans:

1. Tobacco use and exposure to SHS are leading causes of preventable death in the U.S. and in Indiana.(14)
2. Between 950-1,690 Hoosiers die annually from exposure to SHS, approximately one tenth the number who die (9,700) from active smoking. (15, 16)
3. Indiana has the seventh highest adult smoking prevalence in the U.S. (17)
4. Secondhand smoke is the third leading cause of preventable death in the U.S. and kills 53,000 Americans each year. (5)
5. The U.S. Environmental Protection Agency (EPA) has classified secondhand smoke as a Group A carcinogen--proven to cause cancer in humans. (18)
6. In 1986, the U.S. Surgeon General concluded that exposure to SHS can cause disease, including lung cancer, in non-smokers; simple separation of smoker and nonsmoker within the same air space does not eliminate exposure of nonsmokers to secondhand smoke. (3)
7. In 1992, the EPA reported that secondhand smoke annually causes 8,000-26,000 new cases of asthma, 200,000 pediatric asthma attacks, and 150,000-300,000 cases annually of lower respiratory tract infections in children up to 18 months old. In adults, SHS causes 3,000 lung cancer deaths annually. (4)
8. In 1997, The National Cancer Institute estimated that exposure to SHS resulted in more than 10,000 annual cases of low birth weight and more than 2,000 cases of sudden infant death syndrome. (5)
9. In 2002, the U.S. Public Health Service's National Toxicology Program issued its 10th Report on Carcinogens, stating that SHS is a known human carcinogen, and that there is a cause and effect relationship between exposure and human cancer incidence. (19)
10. In 2002, the International Agency for Research on Cancer (IARC) stated that "epidemiological studies have demonstrated that exposure to SHS is causally associated with coronary heart disease" and estimated that "involuntary smoking increases the risk of an acute coronary heart disease event by 25-35%. (20)
11. In 2005, the California Air Resources Board reported a causal link between SHS exposure and pre-term delivery; asthma induction in adults; breast cancer in younger, primarily premenopausal women; and altered vascular properties. (6)
12. There is widespread exposure of Americans to SHS; 88% of non-smokers show detectable levels of cotinine (a metabolite of nicotine) in their blood. (21)
13. The Centers for Disease Control and Prevention (CDC) has determined that the risk of acute myocardial infarction and coronary heart disease associated with exposure to tobacco smoke is nonlinear at low concentrations of SHS, increasing rapidly at concentrations commonly experienced in public settings where smoking is allowed. The CDC has warned persons with an increased risk of coronary heart disease or known coronary artery disease to avoid indoor environments that permit smoking. (22)
14. Outdoor SHS concentrations, including fine particles (PM 2.5) and carcinogenic polycyclic aromatic hydrocarbons (PPAH) are detectable in outdoor environments at levels which are sometimes comparable to indoor concentrations of SHS. (6, 23, 24)

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