# IARC HANDBOOKS OF CANCER PREVENTION

**Tobacco Control** 



International Agency for Research on Cancer World Health Organization

Volume 13



IARC 2009

IARC HANDBOOKS OF CANCER PREVENTION

### **Tobacco Control**



International Agency for Research on Cancer World Health Organization

Volume 13

# Evaluating the Effectiveness of Smoke-free Policies

IARC 2009

#### International Agency for Research on Cancer

The International Agency for Research on Cancer (IARC) was established in 1965 by the World Health Assembly, as an independently funded organisation within the framework of the World Health Organization. The headquarters of the Agency are in Lyon, France.

The Agency conducts a programme of research concentrating particularly on the epidemiology of cancer and the study of potential carcinogens in the human environment. Its field studies are supplemented by biological and chemical research carried out in the Agency's laboratories in Lyon and, through collaborative research agreements, in national research institutions in many countries. The Agency also conducts a programme for the education and training of personnel for cancer research.

The publications of the Agency contribute to the dissemination of authoritative information on different aspects of cancer research. Information about IARC publications, and how to order them, is available via the Internet at: http://www.iarc.fr/en/publications/index.php.

This publication represents the views and opinions of an IARC Working Group on Evaluating the effectiveness of smoke-free policies which met in Lyon, France, 31 March - 5 April 2008.



Published by the International Agency for Research on Cancer, 150 cours Albert Thomas, 69372 Lyon Cedex 08, France

© International Agency for Research on Cancer, 2009

Distributed by

WHO Press, World Health Organization, 20 Avenue Appia, 1211 Geneva 27, Switzerland (tel: +41 22 791 3264; fax: +41 22 791 4857; email: bookorders@who.int).

Publications of the World Health Organization enjoy copyright protection in accordance with the provisions of Protocol 2 of the Universal Copyright Convention. All rights reserved.

The designations employed and the presentation of the material in this publication do not imply the expression of any opinion whatsoever on the part of the Secretariat of the World Health Organization concerning the legal status of any country, territory, city, or area or of its authorities, or concerning the delimitation of its frontiers or boundaries.

The mention of specific companies or of certain manufacturers' products does not imply that they are endorsed or recommended by the World Health Organization in preference to others of a similar nature that are not mentioned. Errors and omissions excepted, the names of proprietary products are distinguished by initial capital letters.

The authors alone are responsible for the views expressed in this publication.

The International Agency for Research on Cancer welcomes requests for permission to reproduce or translate its publications, in part or in full. Requests for permission to reproduce or translate IARC publications – whether for sale or for noncommercial distribution – should be addressed to WHO Press, at the above address (fax: +41 22 791 4806; email: permissions@who.int).

#### Format for Bibliographic Citation

IARC Handbooks of Cancer Prevention, Tobacco Control, Vol. 13: Evaluating the effectiveness of smoke-free policies (2009: Lyon, France)

#### IARC Library Cataloguing in Publication Data

Evaluating the effectiveness of smoke-free policies / IARC Working Group on the Evaluation of the Effectiveness of Smoke-free Policies (2008 : Lyon, France)

(IARC Handbooks of Cancer Prevention ; 13)

 Neoplasms – prevention & control 2. Program Evaluation 3. Public Policy
Smoking Cessation 5. Tobacco Smoke Pollution – legislation & jurisprudence I. IARC Working Group on the Evaluation of the Effectiveness of Smoke-free Policies II. Series

ISBN	978-92-832-3013-7	(NLM Classification QZ 39)
ISSN	1027- 5622	

# Table of Contents

List of participants	vi
Acknowledgements	viii
Preface	ix
Chapter 1 Overview of Handbook volume 13	1
Chapter 2 The health effects of exposure to secondhand smoke (SHS)	9
Chapter 3 The evolution of smoke-free policies	59
Chapter 4 Impact of smoke-free policies on businesses, the hospitality sector, and other incidental outcomes	75
Chapter 5 Public attitudes towards smoke-free policies – including compliance with policies	93
Chapter 6 Reductions in exposure to secondhand smoke and effects on health due to restrictions on smoking	135
Chapter 7 The effect of mandated smoking restrictions on smoking behaviour	163
Chapter 8 Home smoking restrictions: effects on exposure to SHS and smoking behaviour	209
Chapter 9 Summary	
Chapter 10 Evaluation	259
Chapter 11 Recommendations	263
Appendices	
References	
Working procedures	

### List of Participants

#### John P. Pierce (Chair)

Department of Family and Preventive Medicine Moores Cancer Center University of California, San Diego 3855 Health Sciences Drive, Room 3065 La Jolla, CA 92093-0901 USA

#### **Douglas Bettcher**

Tobacco Free Initiative World Health Organization 20, avenue Appia CH-1211 Geneva 27 Switzerland

#### Frank J. Chaloupka

University of Illinois at Chicago National Bureau of Economic Review 1747 W. Roosevelt, Room 558 Chicago, IL 60608 USA

#### **Richard A. Daynard**

Northeastern University School of Law Public Health Advocacy Institute 400 Huntington Avenue Boston, MA 02115 USA

#### Esteve Fernández

Tobacco Control Research Unit Cancer Prevention and Control Department Catalan Institute of Oncology Av. Gran Via 199-203 08907 L'Hospitalet Barcelona Spain

#### Elizabeth Gilpin

Cancer Prevention and Control Program Moores Cancer Center University of California, San Diego La Jolla, CA 92093-0901 USA

#### Sally Haw

Scottish Collaboration for Public Health Research and Policy (SCPHRP) MRC Human Genetics Unit Western General Hospital Crewe Road Edinburgh EH4 2XU Scotland

NHS Health Scotland Thistle House 91 Haymarket Terrace Edinburgh EH12 5HE Scotland

#### Andrew Hyland (not attending)

Department of Health Behaviour Roswell Park Cancer Institute Elm and Carlton Streets Buffalo, NY 14263 USA

#### Jennifer K. Ibrahim

Department of Public Health Temple University 1301 Cecil B. Moore Avenue Ritter Annex - 9<sup>th</sup> Floor - 004-09 Philadelphia, PA 19122 USA

#### Giovanni Invernizzi

Tobacco Control Unit National Cancer Institute/SIMG Via Venezian, 1 20133 Milan Italy

#### Karl E. Lund

Norwegian Institute for Alcohol and Drug Research PO Box 565 Centrum 0105 Oslo Norway

#### Armando Peruga

Tobacco Free Initiative World Health Organization 20, avenue Appia CH-1211 Geneva 27 Switzerland

#### Krzysztof Przewozniak

WHO Collaborating Centre Department of Cancer Epidemiology and Prevention Maria Sklodowska-Curie Memorial Cancer Center 5, Roentgena Street 02-781 Warsaw Poland

#### Jonathan Samet

Department of Epidemiology Bloomberg School of Public Health Johns Hopkins University 615 North Wolfe Street Baltimore, MD 21205-2179 USA

Michelle Scollo (not attending) School of Public Health A27 University of Sydney NSW 2006 Sydney Australia

#### Nick Wilson

Department of Public Health University of Otago, Wellington Box 7343 Wellington South New Zealand

#### Alistair Woodward

School of Population Health University of Auckland Private Bag 92019 Auckland 1142 New Zealand

#### **IARC Secretariat**

Paolo Boffetta (Group Head) Elisabeth Couto (Rapporteur) John Daniel (Editor, Plenary Session) Fabrizio Giannandrea (Rapporteur) María E. León (Responsible Officer) Kunnambath Ramadas Nualnong Wongtongkam (Post-Meeting)

#### Technical/Administrative Assistance

Latifa Bouanzi (Library) Rim Boudjema (Secretarial) Jennifer Donaldson (Editor) Roland Dray (Graphics) Sharon Grant (Library) Brigitte Kajo (Bibliography) Georges Mollon (Photography) Sylvia Moutinho (Secretarial) Stéphanie Royannais (Layout)

### Acknowledgements

The Working Group acknowledges the invaluable help provided in the data preparation presented in this Handbook by the following researchers: Elizabeth Khaykin (Johns Hopkins University, Baltimore, Maryland, USA), Anita Lal (The Cancer Council Victoria, Carlton, Victoria, Australia), Birgit Lehner (Tobacco Free Initiative, World Health Organization, Geneva, Switzerland), Luminita Sanda (Tobacco Free Initiative, World Health Organization, Geneva, Switzerland), Luminita Sanda (Tobacco Free Initiative, World Health Organization, Geneva, Switzerland), Shaheen Sultana (University of Auckland, Auckland, Australia), Edward Sweda (Public Health Advocacy Institute, Boston, Massachusetts, USA), and Barbara Zolty (Tobacco Free Initiative, World Health Organization, Geneva, Switzerland).

The IARC and WHO secretariat are grateful to Sylvia Moutinho (Lifestyle and Cancer Group, IARC) and Miriamjoy Aryee-Quansah (Tobacco Free Initiative, WHO) and to the staff of the Libraries at the International Agency for Research on Cancer, Lyon, France and the World Health Organization, Geneva, Switzerland.

# Preface

A key intervention in reducing the burden of disease attributable to tobacco use is protecting people from exposure to secondhand tobacco smoke (SHS). Volume 13 of the IARC Handbook series on Cancer Prevention presents the evidence on the effectiveness of measures enforced at the societal level to eliminate tobacco smoking and tobacco smoke from the environments where exposure takes place. This volume offers a critical review of the evidence on the economic effects and health benefits of smoke-free legislation and the adoption of voluntary smoke-free policies in households.

SHS contains nicotine, carcinogens, and toxins and the IARC (2004) concluded that exposure to SHS is carcinogenic to humans. Article 8 of the WHO Framework Convention on Tobacco Control (FCTC) recognises "that scientific evidence has unequivocally established that exposure to tobacco smoke causes death, disease and disability." It mandates Parties to this treaty to

"adopt and implement... effective legislative, executive, administrative and/or other measures, providing for protection from exposure to tobacco smoke in indoor workplaces, public transport, indoor public places and, as appropriate, other public places." (WHO, 2005). Guidelines adopted by the Conference of the Parties to assist Parties in meeting their obligation under this article of the treaty, clearly state that this requires "the total elimination of smoking and tobacco smoke in a particular space or environment in order to create a 100% smoke-free environment." (WHO, 2007a).

Today, 164 countries have ratified the WHO FCTC and more are expected to do so in the future. As a result, countries around the world are working towards designing, implementing, and enforcing legal measures aimed at creating 100% smoke-free environments in public and workplaces. The relevant content of this Handbook will serve as guiding principles to those countries.

The literature reviewed for this Handbook was published from 1990 mostly up to April 2008, when the meeting took place to conduct the evaluation of the gathered evidence. The Working Group drafting the volume acknowledged the need to document the enforcement and reach of smoke-free policies in many developing countries where smokefree legislation either does not exist or is not effective, translating into millions of people, particularly children, who are routinely exposed to SHS. Globally, about half of never smokers are exposed to tobacco smoke in different settings: work (including hospitality venues), home, cars, and other means of transportation. About 10-15% of lung cancers in never smokers may be attributed to SHS (Boyle & Levin, 2008). Comprehensive smoke-free legislation, as described in the auidelines of Article 8 of the WHO FCTC, will lead signing Parties towards removing this major cause of disease and death worldwide.