



EUROPE

THE ARTS
CHILD POLICY
CIVIL JUSTICE
EDUCATION
ENERGY AND ENVIRONMENT
HEALTH AND HEALTH CARE
INTERNATIONAL AFFAIRS
NATIONAL SECURITY
POPULATION AND AGING
PUBLIC SAFETY
SCIENCE AND TECHNOLOGY
SUBSTANCE ABUSE
TERRORISM AND
HOMELAND SECURITY
TRANSPORTATION AND
INFRASTRUCTURE
WORKFORCE AND WORKPLACE

This PDF document was made available from www.rand.org as a public service of the RAND Corporation.

[Jump down to document](#) ▼

The RAND Corporation is a nonprofit research organization providing objective analysis and effective solutions that address the challenges facing the public and private sectors around the world.

Support RAND

[Browse Books & Publications](#)

[Make a charitable contribution](#)

For More Information

Visit RAND at www.rand.org

Explore [RAND Europe](#)

View [document details](#)

Limited Electronic Distribution Rights

This document and trademark(s) contained herein are protected by law as indicated in a notice appearing later in this work. This electronic representation of RAND intellectual property is provided for non-commercial use only. Unauthorized posting of RAND PDFs to a non-RAND Web site is prohibited. RAND PDFs are protected under copyright law. Permission is required from RAND to reproduce, or reuse in another form, any of our research documents for commercial use. For information on reprint and linking permissions, please see [RAND Permissions](#).

This product is part of the RAND Corporation technical report series. Reports may include research findings on a specific topic that is limited in scope; present discussions of the methodology employed in research; provide literature reviews, survey instruments, modeling exercises, guidelines for practitioners and research professionals, and supporting documentation; or deliver preliminary findings. All RAND reports undergo rigorous peer review to ensure that they meet high standards for research quality and objectivity.

TECHNICAL REPORT

Analysis to support the Impact Assessment of the Commission's smoke-free initiatives

Amanda Scoggins, Han de Vries,
Annaliijn Conklin, Evi Hatziandreu

Prepared for the Directorate General for Health and Consumer Protection
(DG SANCO), European Commission

The research described in this report was prepared for the European Commission. The opinions expressed in this study are those of the authors and do not necessarily reflect the views of the European Commission.

The RAND Corporation is a nonprofit research organization providing objective analysis and effective solutions that address the challenges facing the public and private sectors around the world. RAND's publications do not necessarily reflect the opinions of its research clients and sponsors.

RAND® is a registered trademark.

© Copyright 2009 European Commission

All rights reserved. No part of this book may be reproduced in any form by any electronic or mechanical means (including photocopying, recording, or information storage and retrieval) without permission in writing from the European Commission.

Published 2009 by the RAND Corporation
1776 Main Street, P.O. Box 2138, Santa Monica, CA 90407-2138
1200 South Hayes Street, Arlington, VA 22202-5050
4570 Fifth Avenue, Suite 600, Pittsburgh, PA 15213-2665
Westbrook Centre, Milton Road, Cambridge CB4 1YG, United Kingdom
RAND URL: <http://www.rand.org>
RAND Europe URL: <http://www.rand.org/randeurope>
To order RAND documents or to obtain additional information, contact
Distribution Services: Telephone: (310) 451-7002;
Fax: (310) 451-6915; Email: order@rand.org

Executive summary

Introduction

This report aims to support the European Commission Directorate General for Public Health and Consumer Protection (DG SANCO) in assessing the need for and potential impact of an EU initiative on smoke-free environments. The initiative would aim to assist Member States in implementing comprehensive smoke-free laws in line with their obligations under the World Health Organization (WHO) Framework Convention on Tobacco Control—ratified so far by 26 Member States and the Community.

The report sets out a comprehensive description of the problem definition and context of the impact assessment of the Commission's smoke-free initiative. It then assesses the expected impacts of five policy options that are being considered by DG SANCO to achieve smoke-free environments across the EU-27 (Table 0.1).

Table 0.1: Description of policy options

| Policy options | Characteristics |
|--------------------------------|--|
| 1. No change from status quo | Leave legislation to individual countries |
| 2. Open method of coordination | Exchange information, experiences, best practices Develop common indicators Agree common targets |
| 3. Commission recommendation | Provide guidance and encouragement to Member States in introducing smoke-free legislation |
| 4. Council recommendation | As Commission recommendation, but originating from Member States |
| 5. Binding legislation | EU-wide ban on smoking in the workplace including bars/restaurants (self-employed workers excluded) |

By taking into account the health, economic, social, and environmental impacts, RAND Europe compares the strengths and weaknesses of the proposed policy options and supports the identification of a preferred policy option that will help achieve smoke-free environments. This report serves as an input into DG SANCO’s own Impact Assessment exercise.

In this remainder of this executive summary we summarise the findings of our study. They are based on estimates from existing literature, data provided by the European Commission and our own calculations. In the executive summary, we do not provide detailed references for every single estimate or fact. Instead, we kindly refer the reader to the appropriate sections of the main text of the report, in which we elaborate in more detail on the literature, our data and calculations.

The problem of environmental tobacco smoke

Environmental tobacco smoke (ETS), also referred to as secondhand smoke or passive smoke, is a diluted mixture of side-stream smoke, which is released from a burning cigarette between puffs, and mainstream smoke, exhaled by the smoker. ETS contains over 4,000 gaseous and particulate compounds, including 69 known carcinogens (Surgeon General 2006).

In the EU-27 there are huge differences in the prevalence of ETS exposure within and between Member States, and by setting (i.e. the venue where exposure takes places, such as indoor workplaces, bars, government buildings). The most recent estimates (based on 2006 Eurobarometer data) suggest on average 19 percent of EU citizens are exposed to ETS daily in indoor workplaces—either as workers or customers of these venues, and 39 percent in bars, cafes, and restaurants. Across the EU-27, the percentage of the population who are exposed to ETS daily in indoor workplaces varies from 2 percent in Ireland to 38 percent in Greece, and in pubs from 1 percent in Ireland to 63 percent in Greece (Table 0.2)¹.

Table 0.2: Percentage of population in the EU exposed to ETS for at least 1 hour daily

| Percentage of population | EU-27 average | Min. | Max. |
|-----------------------------|---------------|--------------|--------------|
| Indoor workplaces/offices | 19% | 2% (Ireland) | 38% (Greece) |
| Restaurants, pubs, and bars | 39% | 1% (Ireland) | 63% (Greece) |

Workers’ exposure to ETS is of particular concern given its involuntary and unavoidable nature. In the EU, 32 percent of citizens declare being exposed to ETS in indoor workplaces or offices daily. The duration of ETS exposure varies within and across Member States. In eight Member States more than 20 percent of staff are exposed to ETS for more than 1 hour per day, and 10 percent of staff are exposed for more than 5 hours

¹ All figures reported in this paragraph are taken from the report “Attitudes of Europeans towards Tobacco” (European Commission, 2007). The EU-27 averages are a population-weighted average estimated by RAND Europe using the data underlying this report and made available to RAND Europe by the European Commission

per day. Greece had the highest percentage of staff at 61 percent being exposed to ETS more than 1 hour a day. In comparison countries such as Ireland, Malta, Sweden, and Finland had relatively low or zero proportion of staff being exposed to ETS in indoor workplaces or offices, which is not surprising given they had implemented smoking bans prior to 2006.

Hospitality workers face disproportionate burden of ETS exposure; 68 percent² of staff working in bars/restaurants declare being exposed to tobacco smoke daily, and the duration of exposure in this group appears to be significantly longer than in other workplaces. As shown in Table 0.3, 29 percent of staff in bars/restaurants is exposed to ETS for more than five hours per day compared with 10 percent of staff working in other indoor workplaces/offices. Staff exposures to ETS in bars/restaurants vary greatly across Member States.

Table 0.3: Percentage of staff exposed to ETS daily in the EU

| | Indoor workplaces/offices | Bars/restaurants |
|-------------------|---------------------------|------------------|
| More than 5 hours | 10% | 29% |
| 1–5 hours | 9% | 18% |
| Less than 1 hour | 13% | 18% |
| Never | 66% | 34% |

The WHO, International Agency for Research on Cancer (IARC), the US Surgeon General’s, the US Environmental Protection Agency (EPA), and numerous scientific and medical bodies worldwide have documented the adverse effects of ETS on the respiratory and circulatory systems, its role as a carcinogen in adults, and its impact on children’s health and development. ETS has been shown to cause lung cancer and coronary heart disease (CHD), and probably to cause chronic obstructive pulmonary disease, stroke, and asthma in adults. There is also evidence to suggest ETS may worsen pre-existing conditions such as asthma and chronic obstructive pulmonary disease (COPD). Moreover, ETS may be harmful to children, and the cause of asthma, pneumonia, bronchitis, respiratory symptoms, middle ear disease, and sudden infant death syndrome (Surgeon General 2006).

For most of these effects the level of individual risk from passive smoking is low when compared with active smoking, but the fact that large numbers of people are exposed results in a substantial burden of disease among the population.

The most recent estimate (prior to this report) in *Lifting the Smokescreen* (Smokefree Partnership, 2006) for how many deaths may be attributable to passive smoke among non-smokers in the EU-25 showed that passive smoking accounted for around 19,000 deaths in

² This estimate is a population-weighted average estimated by RAND Europe using the data underlying the report “Attitudes of Europeans towards Tobacco” (European Commission, 2007), made available to RAND Europe by the European Commission.

2002. Of these deaths, ETS exposure at home accounted for around 16,000 and ETS at work accounted for 3,000.

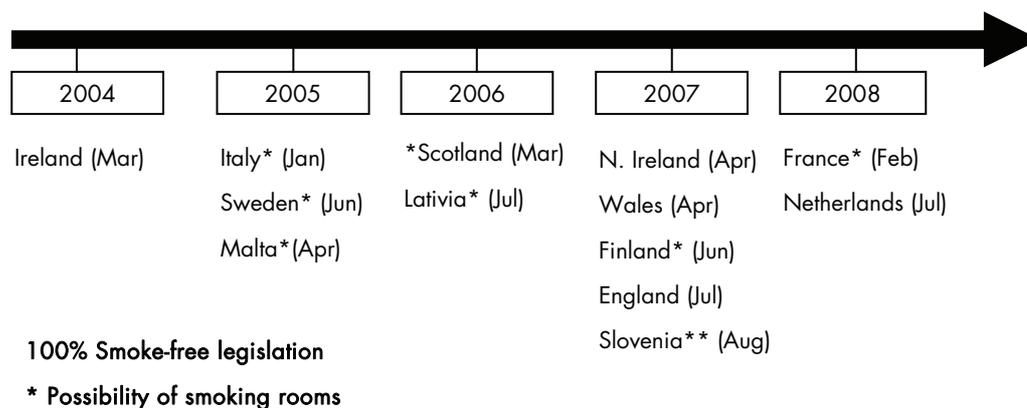
Few studies have attempted to estimate the costs of ETS in a systematic way, but in the single study that estimated the costs associated with premature mortality due to ETS, the cost was estimated at \$7.1 billion (Aligne and Stoddard, 1997). The estimated cost of treating ETS-related diseases ranges from \$700 million (Stoddard and Gray, 1997) to \$2.1 billion (Adams, Solanki and Miller, 1997) depending on the study and population.

Evidence on the effects of smoke-free policies

Lower ETS prevalence

Many countries that have implemented smoke-free policies report lower ETS prevalence figures. In 2004, Ireland became the first country in the world to implement a comprehensive smoking ban in indoor workplaces, including restaurants and bars. Scotland, Wales, Northern Ireland, and England have also implemented comprehensive bans; and more and more countries, states, and cities in Europe and overseas are taking similar action (Figure 0.1).

Figure 0.1: Implementation of smoke-free laws in the EU³



Improved air quality and population health

Smoke-free legislation is also highly effective in improving air quality and population health, as measured through changes in coronary events (for example heart attacks) and respiratory symptoms. Smoking bans might have an indirect effect on ETS exposure, as well as a direct effect. The indirect effect of smoking bans is the result of their influence on smoking behaviour, including smoking prevalence, smoking cessation, smoking uptake,

³ This figure is accurate as of June 2008.

youth smoking behaviour, and smoking at home. Based on a comprehensive review⁴ of the peer-reviewed and grey literature this report discusses the effects of smoke-free bans on these indirect aspects of smoking.

Reduced sales of cigarettes

Smoke-free legislation has also been shown to have economic effects on the tobacco and hospitality industries. Smoke-free bans may reduce the sale of cigarettes for the tobacco industry. The evidence on the effect on sales in the hospitality sector is more mixed. However, it is noteworthy that a 2008 update of the 2003 review by Scollo (2003) of the quality of the studies on the economic effects of smoke-free policies on the hospitality industry found that 47 of the 49 studies that are “best designed” report no negative impact on measures such as taxable sales (Scollo and Lal, 2008). Moreover, the US Surgeon General’s (2006) report concludes that “evidence from peer-reviewed studies shows that smoke-free policies and regulations do not have an adverse economic impact on the hospitality industry”.

Technological solutions for controlling ETS

In some countries indoor workplaces and bars/restaurants have employed technological strategies for controlling secondhand smoke, including designated smoking rooms equipped with ventilation systems, designated smoking areas with ventilation (not separated by walls), and smoking stations and cabins. The evidence is mixed as to the extent to which technological strategies are effective for controlling secondhand smoke. The US Surgeon General (2006) concluded that “establishing smoke free workplaces is the only effective way to ensure that secondhand smoke exposure does not occur in the workplace. Exposures of non-smokers to secondhand smoke cannot be controlled by air cleaning or mechanical air exchange.” A similar position is held by the WHO. On the other hand, evidence reported by producers of smoking cabins and stations seems to suggest that such technological solutions can reduce the investigated tobacco smoking compounds close to 100 percent. However, the scientific quality of such evidence must be demonstrated (i.e. by publishing the study results in the peer-reviewed literature) before the effectiveness of technologies strategies for controlling secondhand smoke is proven.

Assessing the impact of policy options

To assess the five policy options, RAND Europe used a combination of methods and collected data from a variety of sources.

The starting point for the analysis of impacts was an extensive literature review. This review focused on uncovering literature that provided an understanding of the links between the proposed policy measures and health, economic, environmental, and social outcomes. The following is an overview of the types of data we collected:

⁴ We report the findings (including references) of this review in detail in Chapter 8.

- prevalence of ETS (the number of staff exposed to ETS in indoor workplaces/offices and bars/restaurants) across all 27 Member States from the Eurobarometer survey
- two stakeholder consultation meetings (one with business organisations, and the other with civil society and social partners) to seek expert opinion on the expected effect of each of the policy options on ETS exposure
- relative risk estimates from the literature for four diseases for which ETS is a known risk factor: lung cancer, cerebrovascular diseases (stroke), ischaemic heart disease, and chronic lower respiratory diseases (including COPD and asthma)
- for each Member State, the annual number of deaths in the population of working age caused by each of the four diseases from Eurostat
- the medical and non-medical costs of the four diseases; where detailed Member State-specific cost estimates were not readily available we used indirect method of estimation
- tobacco and hospitality industry revenues and employment from Eurostat.

Using these data we carried out a quantitative analysis to estimate the effects of the policy option on various health, economic, environmental, and social impacts. Specifically, we estimated ETS prevalence in different settings for each of the 27 Member States and how it would change under each of the five policy options.

The rationale behind the assumptions for each of the policies are discussed in detail in the report. The smallest reduction in prevalence of ETS is expected for Policy 1 which takes into account the fact that several Member States are expected to implement smoke-free legislation over the next five years, even if the EC would take no further action. For policy 2 (Open Method of Coordination) and policy 3 (Commission recommendation), we assumed that the expected effects are likely to be similar and only slightly larger than Option 1 (“status quo”). The reasons for this are that: (1) implementation would be rather slow; (2) the OMC has never proved to be an effective policy measure in an evaluation; (3) the problem of ETS is mature and only real legislation is expected to have an effects; and (4) in an OMC the agreement is on objectives, but not on specific solutions. Policy 4 (Council recommendation) are expected to have a larger effect due to the ownership effect. Finally, the rationale for the expected reduction in ETS under Policy 5 is that a smoking ban has proven to be very effective in Member States where such regulation was implemented in the past. Therefore, Policy 5 can also be considered as the “maximum possible reduction” due to European legislation.

We then related ETS prevalence estimates (and changes therein) to mortality and costs using relative risk estimates from the literature for four diseases for which ETS is a known risk factor. Where quantitative impacts were difficult to calculate we provided a qualitative assessment of the expected impact based on the literature review. A summary of the expected impacts for each policy options is outlined below.

Comparing the policy options

Health impacts

The evidence relating the health impacts of ETS is fairly strong and precise. There is clear and mostly undisputed evidence that ETS exposure harms individual and public health. Table 0.4 shows the expected combined annual reduction in premature mortality from lung cancer, stroke, heart disease, and chronic lower respiratory disease under each of the five policy options. Binding legislation is expected to bring the largest reduction in annual deaths—up to 4,884 prevented deaths in office and hospitality workers, including 2,151 deaths among non-smoking employees⁵. This means around 80 percent of deaths due to ETS among employees would be prevented. The corresponding figures under Council recommendation (Policy 4) would be 1,550 and 646, respectively, which would prevent around 25 percent of staff deaths. The reduction in annual mortality under Policy 1 “no change from status quo” would bring the fewest reductions in ETS prevalence and related harm. The existing trend towards smoke-free environments could be expected to continue but at a slower pace.

Overall these estimates are probably conservative since they only include reduction of deaths associated with reduced ETS exposures among staff and exclude non-staff members, such as customers. In addition the estimates do not include settings other than bars/restaurants and indoor workplaces/offices where ETS exposures may occur, such as building sites.

It is important to note that the full effect of reduced exposure to ETS may take longer to be realised for some diseases (such as lung cancer) but may occur earlier for others (such as short term respiratory symptoms). Thus, the effects on mortality should be regarded as annual deaths prevented in the long run. Even though these expected effects will not fully materialise until a certain number of years have passed, the earlier the policy could be implemented, the larger the total benefits (over a series of years) will be. Other acute health benefits, such as reduction in respiratory symptoms and coronary events may accrue very rapidly.

⁵ It is likely that such legislation could also prevent deaths due to ETS exposure in offices and the hospitality industry among visitors (i.e. non-workers). However, we did not have access to reliable data on ETS exposure among visitors of these places, and therefore excluded visitors from our analysis.

Table 0.4: Summary of estimated mortality in 2008 and reduction in annual mortality for each policy option due to ETS exposure among staff

| | Non-smokers | | | Smokers | | | Smokers and non-smokers |
|----------------------------|---------------------------|------------------|----------------|---------------------------|------------------|----------------|-------------------------|
| | Indoor workplaces/offices | Bars/restaurants | Total | Indoor workplaces/offices | Bars/restaurants | Total | Total |
| Baseline 2008* | 1,714 (25%) | 786 (16%) | 2,500 (41%) | 2,694 (42%) | 813 (17%) | 3,507 (59%) | 6,007 |
| Reduction under Policy 1 | -110 | -51 | -161 | -173 | -53 | -225 | -386 |
| Reduction under Policy 2/3 | -221 | -101 | -323 | -346 | -105 | -451 | -774 |
| Reduction under Policy 4 | -443 | -203 | -646 | -693 | -210 | -904 | -1,550 |
| Reduction under Policy 5 | -1,487 | -664 | -2,151 | -2,046 | -687 | -2,733 | -4,884 |

NOTE: * The percentage of total (smokers and non-smokers) is shown in brackets
Policy 1 = No change from status quo; Policy 2 = Open method of coordination; Policy 3 = Commission recommendation;
Policy 4 = Council recommendation; Policy 5 = Binding legislation

In addition to the direct effect on exposure to tobacco smoke, the policies under consideration could also be expected to have an indirect effect on active smoking. Smoke-free policies have been reported to reduce tobacco consumption and encourage quit attempts among smokers, thus achieving a reduction in smoking prevalence⁶. These parallel impacts carry a substantial potential by contributing to the decrease in mortality and morbidity associated with smoking at the societal level. The largest reductions could be achieved with binding legislation and the smallest with the status quo options.

Economic impacts

Reduced medical costs

By reducing the prevalence of ETS exposure, an EU initiative can also be expected to reduce medical costs associated with major ETS-associated diseases (lung cancer, heart disease, stroke, and chronic lower respiratory diseases) and results in substantial cost savings. Medical costs include primary care, accident and emergency care, hospital inpatient care (including day cases and cardiac rehabilitation systems), outpatient care, and medications. Non-medical costs include informal care, productivity costs due to mortality and productivity costs due to morbidity (such as sickness absences).

⁶ Please see section 8.1.4 for a more elaborate description of the evidence (including references)

As shown in Table 0.5, a binding legislation (Policy 5) could be expected to bring the largest expected reduction in medical costs, up to €1 billion annually among smoking and non-smoking staff in indoor workplaces/offices and bars/restaurants, followed by the Council recommendation, with a potential €344 million reduction and open method of coordination and Commission recommendation. The reduction under the status quo option would be only modest in comparison.

Table 0.5: Summary of estimated medical costs in 2008 and annual reduction in medical costs for each policy option due to ETS exposure among smoking and non-smoking staff in EU-27 countries, € million

| | Non-smokers | | | Smokers | | | Smokers and non-smokers |
|----------------------------|---------------------------|------------------|--------------|---------------------------|------------------|--------------|-------------------------|
| | Indoor workplaces/offices | Bars/restaurants | Total | Indoor workplaces/offices | Bars/restaurants | Total | Total |
| Baseline 2008* | 427 (27%) | 139 (15%) | 566 (41%) | 636 (44%) | 134 (15%) | 770 (59%) | 1,336 |
| Reduction under Policy 1 | -27 | -9 | -36 | -41 | -9 | -49 | -85 |
| Reduction under Policy 2/3 | -55 | -18 | -73 | -81 | -17 | -99 | -172 |
| Reduction under Policy 4 | -110 | -36 | -146 | -163 | -35 | -198 | -344 |
| Reduction under Policy 5 | -369 | -118 | -486 | -473 | -113 | -587 | -1,073 |

NOTE: * The percentage of total (smokers and non-smokers) is shown in brackets
Policy 1 = No change from status quo; Policy 2 = Open method of coordination; Policy 3 = Commission recommendation;
Policy 4 = Council recommendation; Policy 5 = Binding legislation

Reduced non-medical costs

Non-medical costs include informal care, and productivity costs due to mortality and morbidity (such as sickness absences). As with the medical costs, a binding legislation (Policy 5) will have the largest expected reduction in non-medical costs, up to €893 million among smoking and non-smoking staff in indoor workplaces/offices and bars/restaurants, followed by a Council recommendation (Policy 4) with a potential of €290 million reduction and OMC/Commission recommendation (Table 0.6). In contrast, reduction under the status quo option would be only modest.

The estimated annual reductions in medical costs and non-medical costs are probably conservative since they exclude reduction of medical and non-medical costs associated with

reduced ETS exposures among non-staff members and in settings other than offices and bars/restaurants.

Table 0.6: Summary of estimated non-medical costs in 2008 and annual reduction in non-medical costs for each policy option due to ETS exposure among smoking and non-smoking staff in EU-27, € million

| | Non-smokers | | | Smokers | | | Smokers and non-smokers |
|----------------------------|---------------------------|------------------|--------------|---------------------------|------------------|--------------|-------------------------|
| | Indoor workplaces/offices | Bars/restaurants | Total | Indoor workplaces/offices | Bars/restaurants | Total | Total |
| Baseline 2008* | 353 (27%) | 124 (15%) | 477 (42%) | 529 (44%) | 119 (15%) | 647 (58%) | 1,124 |
| Reduction under Policy 1 | -23 | -8 | -31 | -34 | -8 | -42 | -73 |
| Reduction under Policy 2/3 | -45 | -16 | -61 | -68 | -15 | -83 | -144 |
| Reduction under Policy 4 | -91 | -32 | -123 | -136 | -32 | -167 | -290 |
| Reduction under Policy 5 | -302 | -105 | -407 | -385 | -100 | -486 | -893 |

NOTE: * The percentage of total (smokers and non-smokers) is shown in brackets
Policy 1 = No change from status quo; Policy 2 = Open method of coordination; Policy 3 = Commission recommendation;
Policy 4 = Council recommendation; Policy 5 = Binding legislation

Economic impacts for tobacco and hospitality industries⁷

The economic effects of smoking bans have been assessed for two different sectors: the tobacco industry and the hospitality industry.

The decrease in tobacco consumption as a result of comprehensive smoke-free legislation throughout the EU will have a direct effect on the size of the tobacco market. The revenue from tobacco sales across the EU-27 in 2007 is estimated at €67,089 million. For the entire EU-27, the expected loss in revenue under Policy 5 varies between €1,844 million and €4,696 million (Table 0.7). Assuming the ratio of employment/revenue to be constant in the longer run, binding legislation (Policy 5) would lead to a loss of at least 1,472 jobs in the tobacco industry in the longer run. This is a one-time overall shrinkage of the tobacco industry workforce and it is not the case the number of jobs decreases by 1,472 per year. The size of the tobacco industry workforce is expected to then stay at this reduced

⁷ We refer the reader to sections 13.1.7 and 13.2.7 for a detailed overview of the estimates reported in this section and the calculations they are based on.

size. Considering that the current EU-27 labour force contains 218 million workers, even the upper bound estimate on jobs lost would not represent more than 0.001 percent of the entire EU-27 labour force.

Table 0.7: Estimated lost revenues in tobacco sales and jobs due to EU-wide smoking ban (Policy 5)

| | 2007 estimate | Expected impacts | |
|----------------------|---------------|------------------|-------------|
| | | Lower bound | Upper bound |
| Annual lost revenues | €67,089 M | €1,844 M | €4,696 M |
| Lost jobs | 53,521 | 1,472 | 3,746 |

The revenue for bars/restaurants for EU countries with no smoking bans stands at €109 billion, and the number of staff employed in this sector is approximately 3 million. It is noteworthy that a 2008 update of the 2003 independent review by Scollo and Lal (2008) of the quality of studies on the economic effects of smoke-free policies on the hospitality industry found that 47 out of 49 studies that are best designed report no negative impacts on measures such as taxable sales⁸. Based on the comprehensive Scollo and Lal (2008) review it is expected that an EU initiative would have no major impact on the hospitality industry.

Other economic impacts for workplaces

Other potential economic impacts for workplaces include savings from a reduced number of smoking breaks, reduced cleaning maintenance and redecorating costs, and reduced costs in fire damage. It is anticipated that these savings will occur under each policy option, but binding legislation (Policy 5) would bring about the largest improvements since this would virtually eliminate ETS, followed by the Council recommendation and OMC/Commission recommendation while the status quo would bring only modest change.

There are various implementation and enforcement costs which may arise with an EU initiative, including the adoption, monitoring, and evaluation of smoke-free laws, smoking cessation support, public awareness measures, and so on. However these costs are likely to be minimal compared with the cost saving achieved through lives saved and morbidity savings⁹. The implementation and enforcement costs could be expected to be highest for binding legislation, which would impose binding minimum requirements throughout the EU, and continuous multi-tier cooperation under the open method of coordination.

Environmental impacts

The main environmental impact would be a significant improvement in indoor air quality (for example reductions in PM_{2.5}¹⁰). Based on the existing literature, it is anticipated that improvements in indoor quality will occur under each policy option, but binding

⁸ We refer the reader to section 8.2 for a summary of the findings of the other two studies.

⁹ We refer to section 14.3.5 for a more elaborate description.

¹⁰ Particulate matter with a diameter less than or equal to 2.5 microns

legislation (Policy 5) would bring about the largest improvements, followed by the Council recommendation and OMC/Commission recommendation while the status quo would bring only modest change.

Social impacts

An EU initiative is expected to have social impacts such as a reduction in socio-economic inequalities, a reduction of ETS exposure at home, and impact on attitudes.

An EU smoke-free initiative would have social impacts on socio-economic inequalities, attitudes, and ETS exposure at home. Socio-economic inequalities exist within and between countries in terms of smoking prevalence, smoking cessation rates, and exposure to secondhand smoke. Evidence suggests that comprehensive smoke-free policies have the potential to reduce socio-economic-related disparities in tobacco consumption and ETS exposure; however, smoking bans need to be linked with broader measures such as awareness-raising campaigns targeting special settings like the home and private cars where particular vulnerable groups have the most exposure and which do not fall under the scope of current smoke-free legislation. An indirect consequence of an EU smoke-free initiative could be a reduction in the prevalence of smoking at home. Studies from Scotland, Ireland, New Zealand, and the US have reported reductions in the prevalence of smoking at home after the introduction of smoking bans.

An EU initiative could be expected to help create awareness about the dangers of passive smoking and increase support for smoke-free policies. Attitudes towards smoking bans are diverse and vary between Member States; however, surveys of people's attitudes have shown that in many countries public support for smoke-free laws increase after they are introduced, for example in Ireland from 59 percent to 93 percent.

It is anticipated that all of the social impacts described above will occur under each policy option, but binding legislation would bring about the strongest change, followed by the Council recommendation and OMC/Commission recommendation while the status quo would bring only modest change.

Study Limitations

It is important to note that our study results should be interpreted with caution and are subject to substantial limitations. In particular, lack of data on some important model parameters required us to make certain assumptions which affect the reliability of our estimates. As such, the estimates we report are useful to *understand* the mechanisms through which various policy alternatives affect outcomes of interest and for comparisons between the different policy options, but should not be used for the purpose of obtaining *precise predictions* on future prevalences, costs or mortality. We elaborate in greater detail on the study limitations in section 13.4.

Furthermore, it is important to note that we chose "breadth" over "depth". I.e., the specific purpose of this study was to support the Impact Assessment of the Commission smoke-free initiative. Following the Commission's request, we opted to explore the problem definition (of ETS) from many different perspectives and assess a broad range of impacts. This

naturally limited the depth with which aspect of the problem definition and each of the impacts could be investigated. In this way, we believe our study adds value by providing:

- a comprehensive summary of the available evidence on ETS
- an exploratory quantitative analysis aimed to quantify the problem of ETS and the impacts of the proposed policy options as much as possible

Conclusions

In the previous sections we have provided detailed evidence based on the scientific literature, hard data, and subsequent exploratory analyses regarding the problem of ETS. We summarise our main conclusions as follows:

1. Environmental tobacco smoke (ETS) is a sizeable problem in Europe.
 - a. ETS exposure has been shown to increase the chance of certain medical conditions, such as lung cancer, heart disease, stroke, and asthma.
 - b. This leads to a substantial burden in terms of premature mortality and costs.
2. Exposure to ETS shows large variation depending on Member State and site.
3. A large part of the burden due to ETS is expected to be preventable.
 - a. Various policies exist and have proven to be effective in decreasing exposure to ETS.
 - b. Many countries still have no or only partial policies.
4. Europe-wide policies therefore have the potential to save many lives and costs.
5. Such policies are expected to potentially decrease revenue and employment in the tobacco industry.
6. It is expected that such policies on average have little or no effect on the hospitality industry.
7. How many lives and costs will be saved is expected to depend strongly on the type of action chosen.
8. Our research does not single out one policy option as superior to the others. The preferred option depends on how society is willing to trade off the principle of subsidiarity¹¹ and the preferences of citizens and governments of individual member states against the potential to save lives and cost, and other interests.

¹¹ The principle of subsidiarity is intended to ensure that decisions are taken as closely as possible to the citizen and that constant checks are made as to whether action at Community level is justified in the light of the possibilities available at national, regional or local level. Specifically, it is the principle whereby the Union does not take action (except in the areas which fall within its exclusive competence) unless it is more effective than action taken at national, regional or local level.