

Environmental tobacco smoke research published in the journal *Indoor and Built Environment* and associations with the tobacco industry

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In the late 1980s, the international tobacco industry assisted in the establishment of the International Society of the Built Environment, which published the journal *Indoor and Built Environment*. Using evidence from tobacco industry documents, we examine the industry associations of the Society's executive, the journal's editor and board, and the extent to which the journal publishes papers on environmental tobacco smoke that would be deemed favourable by the tobacco industry. The society's executive has been dominated by paid consultants to the tobacco industry: all six members in 1992 and seven of eight members in 2002 had financial associations through industry lawyers. 67% of the editorial board in 1992 and 66% in 2002 had histories of financial associations with the tobacco industry. 61% (40/66) of papers related to environmental tobacco smoke published in *Indoor and Built Environment* in the study period reached conclusions that could be judged to be industry-positive. Of these, 90% (36/40) had at least one author with a history of association with the tobacco industry. The executive of the International Society of the Built Environment and the editorial board of *Indoor and Built Environment* are in large part consisted of people with histories of consultancies to the tobacco industry. On the basis of the evidence presented in this paper, there is a serious concern the tobacco industry may have been unduly influential on the content of the journal.

In March, 1987, tobacco industry personnel from the UK, Germany, Japan, and the USA met to consider how to "improve the industry's position" on passive smoking because "vigorous denial [was] not a satisfactory defensive strategy".¹ The meeting concluded that "more industry sponsored research [was] needed"¹ and noted the "difficulty . . . in getting science published, if that science seems 'pro' ETS [environmental tobacco smoke]".² Hopes of rapid publication were discussed by "setting up an ETS journal, finding sympathetic editors, co-ordinated presentations at symposia".² In June, 1987, senior management at Philip Morris USA considered the same matter and a programme dubbed "Project Down Under" outlined a comprehensive plan to curtail the global movement to restrict smoking in indoor public spaces. Among many strategies proposed was to "Establish a genuine scientific journal on indoor air quality . . . At the same time, we should consider popularizing the complexities of science by feeding simplified stories to media".³ Other research has documented the tobacco industry's global programme of attacking the science of environmental tobacco smoke^{4–7} and the use of regional consultants to further this objective and oppose the regulation of second-hand smoke.^{8,9}

In 1989, the International Society of the Built Environment was established, founded initially as Indoor Air International. Its research journal *Indoor and Built Environment* was first released in May, 1991, under the title *Indoor Environment*, with a publication date of Jan 1, 1992. The launch of the journal appears to have taken place at the May, 1991, meeting organised by Indoor Air International—International Conference on Priorities for Indoor Air Research and Action—in Montreux, Switzerland, at which "many [industry] consultants"

presented papers that were planned for publication in *Indoor Environment*.¹⁰

The evolution of the journal can be traced back to the founding body of Indoor Air International, the Associates for Research on Indoor Air,¹¹ a Philip Morris initiative coordinated through its law firm Covington and Burling (C&B; figure).^{12–16} Associates for Research on Indoor Air was promoted as a team of scientists "independent of the industry"¹⁴ but it was "tobacco money . . . funding the exercise".¹⁴ The Philip Morris model for developing "independent" organisations involved "A small nucleus of committed, trusted and capable scientists shall form the executive level . . . and act as 'locomotives'".^{17,18} Indoor Air International was registered in Switzerland in 1990^{19,20} with a Brussels-based director.^{19,21} Dr D F Weetman, who had a direct relationship with Philip Morris,²² was appointed editor,¹⁹ with an attorney from another Philip Morris law firm, Shook, Hardy, and Bacon (SH&B) advising:

"There is a grave risk that IAI [Indoor Air International] members may be compromised if they have a direct relationship with Philip Morris S&T [Science and Technology]. The best example would be Dr Weetman. Dr Weetman is obviously a critical leader in the C&B consultant program and IAI, and his potential usefulness could be jeopardized by his direct consulting relationship with S&T."²²

A 1990 C&B report on its European environmental tobacco smoke consultancy programme noted plainly the part played by industry consultants in the formation of the International Society of the Built Environment:

"Our consultants have created the world's only learned scientific society addressing questions of indoor air quality [IAQ]. The society (Indoor Air International) . . . will also have its own scientific journal . . . in which IAQ

issues will again be addressed . . . The society will sponsor meetings and conferences, such as the one scheduled for Switzerland in 1991, and thus can serve as an independent and accepted source of ideas and research regarding IAQ to the public and the scientific community. It should be a major vehicle for reaching a variety of different audiences on IAQ issues. We are of course including Asian and American consultants in the society, so as to provide worldwide coverage of IAQ issues.²¹

The International Society of the Built Environment and *Indoor and Built Environment* websites, and the printed journal, make no disclosures about any connections with the tobacco industry, and the journal's instructions to authors contain no requirement to declare competing interests. The society's website states that "Corporate members are drawn from companies, trade associations and other industry groups interested in any aspect of the indoor and built environment", but none of these is named. Instead, a visitor to the sites or the printed journal might accept at face value that the International Society of the Built Environment was simply "founded in 1989 by a group of medical scientists, hygienists, chemists, architects, engineers and others" and that it publishes a journal containing peer-reviewed research overseen by an editorial board drawn from distinguished independent indoor air quality experts.^{23,24} *Indoor and Built Environment* for 2003 has an impact factor of 0.525, ranking 81 of 89 among journals in the Institute for Scientific Information's public, environmental, and occupational health category.

In its early years, *Indoor and Built Environment* developed a reputation for having strong links with the tobacco industry.²⁵ Our main aim is to examine the extent to which the International Society of the Built Environment and *Indoor and Built Environment* are run or advised by individuals with histories of associations with the tobacco industry and whether the journal publishes papers on environmental tobacco smoke that advance the industry's argument that this smoke poses little or inconclusive health risks and that smoking should therefore not be banned in indoor areas. We review the papers published on environmental tobacco smoke in *Indoor and Built Environment* since its inception in January, 1992, until February, 2004, for the extent to which they report results and perspectives that would be deemed favourable to the tobacco industry's policies and whether authors associated with the industry disclosed any competing interests (albeit that they were not required to do so by the journal's disclosure policy at the time).

Information retrieval

One of the terms of the 1998 US Master Settlement Agreement was that the tobacco industry agreed to place in the public domain previously confidential internal documents.²⁶ These documents are available through searchable websites maintained by the tobacco companies

until June 30, 2010.²⁷ As of July 7, 2004, there were 7044466 documents online.

Executive and board

We obtained the names of the executive of the International Society of the Built Environment and the editorial board of *Indoor and Built Environment* from the first issue of the journal and, for comparison, from the internet in August, 2002.²⁸ The seven tobacco industry document websites²⁹ and secondary industry document collections³⁰⁻³² served as the main data sources. We also searched glossary of names data files.^{30,33-35} Documents naming these individuals were examined for evidence of any association every person might have had with the tobacco industry or third parties acting for the industry (principally the legal firm C&B). The editorial board and the publisher of the journal changed in 2003.²⁴

Categorisation of reports

We reviewed all reviews, original research articles, and conference reports (n=484) published in *Indoor and Built Environment* from January, 1992, to February, 2004, inclusive. Papers were classified as belonging to one of three categories of focus on environmental tobacco smoke: none, minor, or principal. The first category contained papers in which either the topic was entirely unrelated to environmental tobacco smoke or it was only mentioned in a range of indoor air pollutants with no further discussion. Reports with a minor focus on environmental tobacco smoke described it as one among other indoor air contaminants, with at least a brief discussion on it. Papers with a principal focus on environmental tobacco smoke examined the issue in detail as a primary objective of the review or study.

We excluded papers with no focus on environmental tobacco smoke from our review. Those with either minor or principal focus were examined for their results and conclusions. These papers were then allocated into one of four categories: (1) those concluding that environmental tobacco smoke constitutes a health hazard or is a significant indoor pollutant; (2) those with conclusions that environmental tobacco smoke is not a significant health hazard, that other estimates of hazard have been inflated, that other factors seriously confound the relation of environmental tobacco smoke exposure to health, that

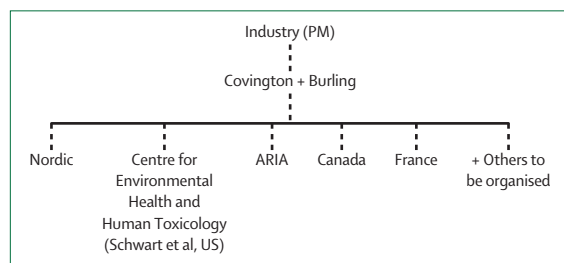


Figure: Chart prepared by British American Tobacco outlining the structure of Philip Morris initiatives¹⁴

exposure to environmental tobacco smoke or one of its components is minimal, or that exposure can be adequately controlled by ventilation; (3) those concluding that more research is needed before any firm conclusions on the harms of environmental tobacco smoke can be agreed; and (4) those making no conclusion on the health risks of environmental tobacco smoke (typically measurement studies).

Papers allocated to category 1 were deemed to represent conclusions that were unfavourable to the tobacco industry and those in categories 2 and 3 were judged to represent those that would be regarded as favourable to the industry's argument that the risks of environmental tobacco smoke were either insignificant, unknown, or equivocal, and therefore that policies restricting exposure to smoke were unwarranted. The tobacco industry regarded findings concluding more research was needed as useful, and sometimes incorporated the implications of such material into its public communications—eg, "Since all the difficulties of carrying out good research have clearly still not been overcome, further research is certainly needed",³⁶ and "the epidemiological data about the possible health effects of ETS on non-smoking adults is at best equivocal".³⁷ Appendix 1 (<http://tobacco.health.usyd.edu.au/site/gateway/docs/pdf/ISBE.pdf>) shows the allocation of papers to each of these four categories.

Internal tobacco industry documents were searched for any evidence of a history of association between the author or authors of a report and the tobacco industry.^{29–32} Appendix 4 (<http://tobacco.health.usyd.edu.au/site/gateway/docs/pdf/ISBE.pdf>) shows the results of this research.

Determining industry association

In 1991, Philip Morris' recommended policy on its consultants on environmental tobacco smoke was to have many of them managed through its lawyers and to "avoid direct involvement with consultants actively working with either C&B or SH&B. Work with these consultants should be thru the respective law firm."³⁸ Having consultants work through lawyers could allow legal "filtering" of the consultants work to "eliminate areas of sensitivity".³⁹ We defined association with the tobacco industry as meaning that evidence was found for one or more of: being named in a tobacco industry document or recorded in the Philip Morris, Lorillard, or R J Reynolds privilege log glossaries of names^{33–35} as a "consultant"; being paid professional fees or having expenses reimbursed by the industry or by agencies (eg, lawyers) acting on their behalf to attend meetings, conferences, or other events, including membership fees for Indoor Air International; receiving research grants from the industry or an agency funded by the industry, including from industry lawyers, C&B; or having worked for the tobacco industry. Each of these criteria satisfies the International Committee of Medical Journal Editors' statement of what constitutes "the most important conflicts of interest." Conflict of interest exists

when a participant in the peer review and publication process—author, reviewer, and editor—has ties to activities that could inappropriately influence his or her judgment, whether or not judgment is in fact affected. Financial relations with industry—eg, through employment, consultancies, stock ownership, honoraria, expert testimony—either directly or through immediate family, are usually judged to be the most important conflicts of interest.⁴⁰

Funding from the Center for Indoor Air Research has been classified as an association whereby projects were awarded based on recommendations from tobacco industry executives.⁴¹ Employees of Covance (formerly known as Corning Hazelton) were not classified as having an association even though they were commissioned by the industry to undertake research. However, we have included employees of Theodor Sterling & Associates⁴² and P N Lee Statistics and Computing Ltd⁴² as having associations because both these institutions had histories of major, enduring financial associations with the tobacco industry.

In summarising evidence of individuals' associations with the tobacco industry, we have not listed all source documents located but have selected indicative examples that establish that every person had at least one instance of association with the tobacco industry.

The tobacco industry is known to have destroyed an unknown but very large number of internal documents because of general "housekeeping".^{43,44} What remains publicly accessible on the Master Settlement Agreement document sites is therefore an unknown cross-section of all documents ever produced by the companies. Furthermore, there is limited access to British American Tobacco documents because they were not required to make their documents available on the internet.⁴⁵ The evidence we have located might therefore present a conservative picture of the extent of the involvement of the named individuals with the tobacco industry. For the same reason, evidence of the apparent beginning and duration of a consultant's engagement with the industry and the total amounts received in payments or reimbursements might also be conservative.

Associations of the Society's executive and journal's editorial board

In 1992, all six members of the International Society of the Built Environment's inaugural executive had histories of being paid consultants to the tobacco industry, all via C&B. In 2002, seven of eight members had these associations. In 1992, 29 of 43 (67%) members of the editorial board of *Indoor and Built Environment* had financial associations with the tobacco industry. In 2002, the proportion was little different, with 21 of 32 (66%) board members having financial associations. A summary of evidence for every individual's associations with the tobacco industry is provided in Appendix 2 (<http://tobacco.health.usyd.edu.au/site/gateway/docs/pdf/ISBE.pdf>).

All the Asian⁸ and most of the European consultants were paid through C&B, many via George Leslie, a member of the executive of the International Society of the Built Environment and a key Philip Morris recruiter of consultants³⁹ (see Appendix 3; <http://tobacco.health.usyd.edu.au/site/gateway/docs/pdf/ISBE.pdf>).

Industry associations of authors of reports on environmental tobacco smoke

From the first issue of *Indoor and Built Environment* in 1992 through to February, 2004, 484 papers were published (table). Of these, 66 (14%) had either a minor or principal focus on environmental tobacco smoke. Of these, 17 (26%) concluded that this smoke is hazardous in some way; 32 (48%) concluded that environmental tobacco smoke is not a significant hazard; eight (12%) concluded that more research is needed; and nine (14%) were predominantly technical reports that did not discuss whether or not this smoke is a hazard or was significantly present in indoor environments. The table summarises these findings, and Appendix 1 (<http://tobacco.health.usyd.edu.au/site/gateway/docs/pdf/ISBE.pdf>) details the published research in each of these categories.

After removing the nine measurement-oriented papers that did not make any comments or draw conclusions on the harmfulness of environmental tobacco smoke or on levels of exposure, we then calculated the rate ratio of a report reaching an industry-favourable conclusion if it had at least one author with an industry association. Of the 42 papers drawing any conclusions, 36 (86%) drew conclusions that the tobacco industry would have regarded as favourable. Of 15 reports from authors with no industry funding, four (27%) presented outcomes favourable to industry. The rate ratio of a paper with at least one author with industry associations reaching an industry-favourable conclusion was 3.2 (95% CI 1.4–7.5).

Of the 66 reports, the Institute for Scientific Information reported citation data for 34 (59 citations in total, mean 1.74). 25 of the 59 citations (42%) were self-citations.

Appendix 4 (<http://tobacco.health.usyd.edu.au/site/gateway/docs/pdf/ISBE.pdf>) provides evidence from tobacco industry documents of an author's involvement with the tobacco industry and includes a summary table of financial associations. When there was no evidence of payments being made or received by an author but there is evidence of another linkage, this is noted.

Tobacco industry strategy

After publication of Hirayama's much publicised study of lung cancer in non-smoking wives of smoking Japanese men,⁴⁶ the 1980s saw greatly increased research interest in the hypothesis that environmental tobacco smoke could harm non-smokers.⁴⁷ The tobacco industry (and Philip Morris in particular) sought to counter the increasing concerns of the medical, scientific, and general community about environment tobacco smoke with the primary objective of preventing the imposition of smoking restrictions.^{48–50} This strategy had scientific, media, and political arms, and included exposure of purported weaknesses in the scientific arguments used by anti-smoking agencies, sponsoring a research programme hoping to prove that environmental tobacco smoke did not pose a significant threat to non-smokers,⁴ and promotion of ventilation as a solution to the perceived problem of poor indoor air quality. To achieve these aims, Philip Morris made available an initial budget of 2.5 million Swiss Francs⁴⁸ (US\$2.044 million in 2004 rates) per year to recruit and enter into contracts with research laboratories, scientists and engineers.⁵¹ Contrary to its stated claim of funding independent research, the tobacco industry used its lawyers to select the projects that would be funded.⁵² Contributing to the establishment of Indoor Air International and its associated journal *Indoor Environment*, and the near saturation particularly of the executive of this organisation with its paid consultants, would appear to have been part of this strategy.⁵³

Philip Morris was critical of the initial lack of cooperation and commitment by other tobacco companies in agreeing to be part of this strategy.⁵⁴ British American Tobacco later accepted Philip Morris' strategy, at least in Latin America, and they joined forces through the coordination of C&B (the "Latin Project"), which received 40% of its funding from Philip Morris and 60% from British American Tobacco.⁵⁵

Independence from the tobacco industry of the Society and journal

It is clear from the evidence located that the claimed independence of the International Society of the Built Environment and its journal *Indoor and Built Environment* in matters of environmental tobacco smoke science and policy is heavily compromised by the extensive histories of financial associations with the tobacco industry of many of the Society's executive and the journal's editorial board.

Conclusions about ETS (%)	Tobacco industry funding acknowledged	Papers that have author(s) with tobacco industry associations but no industry funding acknowledged	Total papers by authors with tobacco industry associations	Total papers by authors with no tobacco industry associations
ETS hazardous, or exposure significant n=17 (26%)	1	5	6 (35.3%)	11 (64.7%)
ETS not hazardous, or exposure minimal n=32 (48%)	14	14	28 (87.5%)	4 (12.5%)
More research needed n=8 (12%)	3	5	8 (100%)	0
No conclusions n=9 (14%)	3	3	6 (66%)	3 (33.3%)
Total n=66	21	27	48 (72.7%)	18 (27.3%)

Table: Summary of papers on environmental tobacco smoke (ETS) published in Indoor and Built Environment from January, 1992, to February, 2004

The absence of any declarations of competing interests by any of the executive or the editorial board constitutes a plain breach of the International Committee of Medical Journal Editors guideline on this matter: "Participants in peer review and publication should disclose their conflicting interests, and the information should be made available so that others can judge their effects for themselves."⁴⁰

Is *Indoor and Built Environment* a journal that publishes a disproportionate number of papers on environmental tobacco smoke by authors with financial associations with the tobacco industry? And do these papers draw conclusions that support the tobacco industry's global objective of promoting the view that the harms caused by environmental tobacco smoke are insignificant? 32% of papers on environmental tobacco smoke published in the journal between January, 1992, and February, 2004, were funded directly by the tobacco industry or its agents. Moreover, in 73% of environmental tobacco smoke-related papers, at least one author had links or financial associations with the tobacco industry. It is not known how many papers on this topic were submitted to *Indoor and Built Environment* in the study period, and nothing reliable can be said about whether this apparent concentration of papers on environmental tobacco smoke by authors with tobacco industry financial associations over-represents the ratio of industry funded to non-industry funded research on this topic that was ever undertaken during the study period, because no study register listing all such studies exists.

61% (40/66) of papers related to environmental tobacco smoke that were published in *Indoor and Built Environment* in the study period reached conclusions that could be judged to be industry-positive. Of these, 90% (36/40) had at least one author with a history of association with the tobacco industry. These figures can be compared with Barnes and Bero's study of 68 articles on environmental tobacco smoke randomly selected from MEDLINE published between 1980 and 1994, which found 76.5% concluding environmental tobacco smoke to be "harmful",⁵⁶ and the same authors' analysis of 106 reviews of this same topic, which found that 74% of reviews concluding environmental tobacco smoke was not harmful were written by authors with tobacco industry affiliations.⁵⁷ When article quality, peer review status, article topic, and year of publication were controlled, the only factor associated with the conclusion that passive smoking was not harmful was whether an author was affiliated with the tobacco industry (odds ratio 88.4).⁵⁷

On the basis of the evidence presented in this paper, there is a serious concern that the tobacco industry may have been unduly influential on the content of the journal. The industry and its lawyers expected that the establishment of the International Society of the Built Environment would publish "overall results [which] will be positive and important".²¹ It appears to be the case that its expectations were in large part fulfilled.

Contributors

D Garne researched and wrote the section of the article dealing with the associations of the executive of the association and board of the journal. M Watson researched and wrote the section of the paper dealing with the research published in the journal and associations of the authors. S Chapman conceived of the study, supervised its conduct, verified all judgments about association, and assisted in writing all drafts and coordinating the revision. F Byrne participated in the collection and review of industry documents to include additional data requested by the reviewers and the preparation of the references. All authors have seen and approved the final version.

Conflict of interest statement

SC is a member of the Board of Action on Smoking and Health, Australia and editor of *Tobacco Control*. All other authors declare no conflict of interest.

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