

PostScript

LETTERS

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Adverse pregnancy outcomes around incinerators and crematoriums

Dummer and colleagues, research provides an important step towards establishing the evidence base around the adverse pregnancy outcomes associated with incinerators and crematoriums.¹ Investigating the possible adverse health effects from environmental hazards is a public health challenge that demands the use of systematic and reproducible research methods. We have some concerns regarding the study described by Dummer and colleagues.

The study focuses on selected "fatal" pregnancy outcomes. One key concern is that this excludes miscarriages, abortions, and non-lethal congenital anomalies. Excluding these outcomes may misrepresent and underestimate any possible association between the exposures under consideration and "pregnancy outcomes". Indeed, it is possible that the "fatal" pregnancy outcomes considered by the researchers may actually be inappropriate in relation to the chemicals released from incinerators and crematoriums. Studies on exposure to lead, for example, indicate that the most likely pregnancy related outcomes associated with high exposure are low birth weight, spontaneous abortion, and length of gestation.²

The measurement of exposure in this study is also unclear. The reason for this is that distance from an incinerator or crematorium is used as a surrogate measure of exposure and the pathway for the absorption of "toxic pollutants" is considered to be direct inhalation of pollutants or contact through food, soil or water contamination.

Actual pollution levels at the sites are not provided and there is no indication of whether these sites are located in isolation or located in close proximity to other industrial processes. Under these circumstances is difficult to see how the surrogate measure of distance could be used as a proxy for exposure to emissions from incinerators and crematoriums.

We question the robustness of any study conducted over such a long period. The margins of error, based around outcomes that will vary considerably with the diagnos-

tic and coding changes over this period, are likely to be great despite the adjustments for year of birth. In addition, as the authors note the stillbirth and neonatal death rates fell substantially over this period, for reasons other than the environmental exposure in question. However, the authors fail to consider whether or not this large fall in numbers may have influenced the ability to detect an effect in the later study periods when all the incinerators and crematoriums were open. Additionally there was no mention of whether any study size calculations were made.

The authors stratify the analysis by time period to correspond to the opening of incinerators and crematoriums over this study period and then draw conclusions based around comparing the results between each study period. As most of the confidence intervals for the "significant" odds ratios in the periods after the installation of incinerators and crematoriums overlap with the earlier periods, care should be taken in drawing conclusions regarding these "significant" odds ratios. We also question the robustness of conclusions drawn from studies with multiple significance testing, which increase the chances of a significant result arising by chance. We also question whether other key confounders should have been accounted for in the analyses.

A further point of relevance to this study is that tighter legislation on incinerator emissions means that emissions have reduced dramatically since the time of the study and further still in the past decade. For example between 1992 and 1998, most incinerator emissions reduced by a factor of over 95%.³ However, the health effects of incinerators and crematoriums are still issues of major concern to the public.

Unfortunately this report was misrepresented in the press as evidence for a link.⁴ The authors, of course, cannot be held responsible for press misquoting the findings, but it is important that research conclusions are very clearly stated and links to other types of waste disposal not used indiscriminately.

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- 1 Dummer TJB, Dickinson HO, Parker L. Adverse pregnancy outcomes around incinerators and crematoriums in Cumbria, north west England, 1956-93. *J Epidemiol Community Health* 2003;57:456-61.
- 2 World Health Organisation. *Inorganic lead*. Environmental Health Criteria, no 165. Geneva: WHO, 1995.
- 3 The National Atmospheric Emissions Inventory. <http://www.aeat.co.uk/netcen/airqual> (accessed 1 Jul 2003).
- 4 BBC. Incinerator protest "vindication". http://news.bbc.co.uk/1/hi/wales/north_east/2948034.stm (accessed 1 Jul 2003).

Authors' reply

Duffell *et al* have challenged the design and interpretation of the findings of our study of stillbirths and lethal congenital anomalies in the vicinity of crematoriums and incinerators in Cumbria.

While we share some of their concerns about the limitations of the study, they clearly have little appreciation of the complexity and difficulty of performing epidemiological studies of this nature.

We agree that it would be highly desirable to have included miscarriage, abortion, and non-lethal congenital anomalies in our study, but construction of such a dataset for the time period of the study would be impossible: there are no sources for this information—as we stated in our paper. We also agree that exclusion of these adverse pregnancy outcomes could have led us to underestimate any association with proximity of the site of interest—the fact that we did have significant findings is therefore surprising.

Duffell *et al* note that our choice of adverse outcomes may be "inappropriate" for the chemicals associated with incinerators and crematoriums, noting that studies on lead exposure indicate that possible adverse pregnancy outcomes include spontaneous abortion and low birth weight. However, as we state in the study, while the main pollutant from crematoriums is mercury, emissions from incinerators incorporate a complex mixture of dioxins, furans, particulates, heavy metals (including lead and chromium), and volatile organic compounds. However, there is little information concerning the effects on pregnancy outcomes of living near to sources of this varied range of pollutants.

Our surrogate measure of exposure was proximity to incinerators and crematoriums; we were unable to use actual pollutant or exposure measurements because these do not exist for the time scale of our study. While we acknowledge the limitations of such a surrogate measure, many previous studies have also relied on distance from pollution sites as an indicator of exposure because of a lack of detailed historical environmental monitoring data. Duffell *et al* indicate that we do not consider if any of the sites included in our study are located close to other sources of industrial pollution. However, we clearly note that the facilities in Barrow in Furness and Dalton in Furness are located close to industrial sites defined as hazardous by the Environment Agency. Hence we acknowledge that there is potential for confounding between our proximity measure and proximity to hazardous industrial facilities.

The fact that the confidence intervals on pre-operation and post-operation odds ratios overlap is not relevant to the interpretation of the odds ratios post-operation being significantly different from one.

We are well aware of the problems of multiple significance testing—which is why we were cautious in the interpretation of our findings and why we looked for consistency between time periods. The effects of our carefully modelling (using both linear and quadratic terms), within broad time strata, of the effect of year of birth is that pregnancies

with adverse outcomes were compared with all other pregnancies in the same year, thus minimising the possible bias due to diagnostic and coding changes over time.

Duffell *et al* also question whether key confounders may have been an explanation for our significant findings. While there is always the possibility of residual confounding, we did control carefully for both socio-economic factors and the changing underlying risk of the outcomes we considered. It is not immediately apparent what potential confounders could be associated with both adverse pregnancy outcome and proximity to the incinerator and crematorium sites that are not related to either social class or time period. Nevertheless the fact remains that our results, as we acknowledged in the paper, may be chance findings.

The investigation of the health consequences of potentially hazardous installations in the environment is difficult, especially historically; when emissions tended in general to be higher but environmental monitoring data are at best scant and often non-existent.

Information on health outcome is also difficult to assemble and it is of particular concern that access to such information at a population level is likely to get more rather than less restrictive. This is an important issue and one with which we should all be concerned: it is neither in the public interest, nor the patient interest.

The "full" study of all relevant health outcomes related to *actual* exposures are very seldom achievable in any context and studies such as ours have an important part to play, though we fully support the concerns of Duffell *et al* that they are often wrongly reported by the media. It is our concern that authors may not fully understand their responsibility in ensuring that any press release from the journal is a fair and accurate rather than sensationalised account of their findings and the extent to which they may be involved directly with the media in the period immediately after publication. In this case, as Duffell *et al* observed, our findings were misrepresented in the media to a certain extent despite our greatest efforts at every stage for this not to happen, though often sensationalised headlines were followed by more balanced text.

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Reference

- 1 Dummer TJB, Dickinson HO, Parker L. Adverse pregnancy outcomes around incinerators and crematoriums in Cumbria, north west England, 1956–93. *J Epidemiol Community H* 2003;**57**:456–61.

BOOK REVIEW

Community health advocacy

S Love, L S Lloyd, D O'Shea. (Pp 171; price not stated). Kluwer Academic/Plenum, 2003. ISBN 0-306-47390-9.

The concept of health advocacy is nowadays considered one of the main tasks of public health. Health professionals try to solve health problems with effective strategies. One of them is, specifically, community health advocacy. To act on health problems in the global context, participation and communitarian perspective is a choice. People need advocacy and empowerment to achieve health outcomes more than isolated health interventions assistance. Although the role of health services is important to promote and secure health, there are other issues that are important to guarantee people's health. Community, organisations, and institutions must advocate for health with the necessary tools and in the context of each society.

"Community health advocacy" is a reflection on the role of different issues in relation with an empowering view of public health. To conceptualise the subject, the authors define terms as community, needs, action, grassroots, or empowerment. They try to explain the actions of all social agents that are (or can be) involved in health advocacy. They also emphasise how to integrate values and ethics in health advocacy objectives.

The different chapters provide an approach of what strategies and efforts of advocacy are required. At the end of each chapter, a specific experience of health advocacy is included related to the issue discussed. Finally, there is a section with discussion questions to investigate the subject more deeply.

In chapters 1 and 2, the authors define the relation between community and public health. They also explain community characteristics and interests from the point of view of sociology, anthropology, or psychology. They question what community needs assessments are, and what are the causes that make a particular group of persons unable to achieve a better quality of life. Assessment is a process to provide people with the possibility to identify their own needs. This is a preliminary step for health advocacy.

In chapter 3 the authors investigate ways of organising the community. They define the grassroots approach as a "bottom up" strategy, and show how people can drive health programmes themselves to achieve health goals. This focus is a tool for social change, empowering people in their own decisions about health.

Chapter 4 explains the objective of building coalitions. To improve people's health by advocacy grassroots organisations can organise themselves into coalitions created at different levels. To secure society's health rights it is necessary to build networks to approach the different political situations. Advocacy efforts require relationships to be built to provide people with opportunities for collective problem solving.

In chapters 5 and 6, the authors review the role of legislative advocacy as a mechanism of health advocacy. This is a formal process that makes the rules that must be accepted by the people. If the legal system is on the side of community needs, it will be one of the most important strategies to improve their health. Also, the administrative agencies have an important role in the rule making process. Organisations and individuals can act as advocates in influencing the process of legislative building, or trying to change rules that do not contribute to the health improvement of the community.

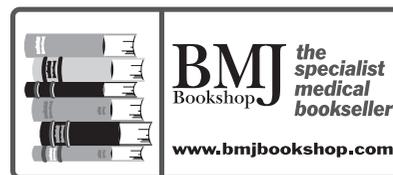
Chapter 7 explains the importance of the state court system and its capacity to be a framework for civil mobilisation.

In chapter 8, the authors explain the influence of the media as an advocate for health. An effective use of media can have an impact in society drawing attention to different health problems, the community action to solve it, or the role of politics. The information about health through media is influenced by different powers. For this reason, people must use the media as a support to advance in the solutions for health problems.

Chapters 9 and 10 are related with the evaluation of the advocacy action, and the conflicts that can result in the relation between advocacy and ethics. The authors emphasise the importance of evaluating the advocacy actions, to improve other activities in the future. People learn through their successes and failures. This is a formative perspective of monitoring and evaluation. Finally, health advocacy must act to secure health rights supporting people in *building their own history*. The main ethics consideration related to health advocacy is to respect people's problems and solutions and their point of view.

In my opinion, this book is an excellent tool to be used in different areas. For example, it could be useful as a support in the planning of community projects through social and political institutions. Different bodies have in this book an opportunity to learn of other organisational experiences. Finally, this book is a great guide for teaching public health, and also in the process of research in health promotion and health advocacy.

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