

WATCH COMMITTEE PAPER		WATCH/2008/3	
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## WATCH COMMITTEE

### The risks of lung cancer and mesothelioma from relatively low-level exposures to different forms of asbestos

#### Proposal for progressing this issue

#### Issue

1. Progression of the exploration of what is known of the dose-response relationships for lung cancer and mesothelioma caused by exposure to different forms of asbestos.

#### Timing Considerations

2. No particular timing issues.

#### Recommendation

3. WATCH is invited to consider the proposals in this cover paper and to respond to the action in paragraph 29.

#### Background

4. At the WATCH meeting on 7 & 8<sup>th</sup> November 2007 WATCH made an initial exploration of what is known of the dose-response relationships for lung cancer and mesothelioma caused by exposure to different forms of asbestos. The ultimate aim is to identify what can (and can't) be discerned reliably about the risks at relatively low-level exposures.

5. As recorded in the draft minutes (WATCH/Min/2007/3) from the November meeting :

“WATCH indicated that in its view there were substantial concerns about the reliability of some aspects of the data within the occupational epidemiological studies included in the key assessments made by Hodgson & Darnton and Berman & Crump. The major concern was the quality of the asbestos fibre exposure data presented in many of these studies.

WATCH considered that further work was needed before statements about dose-response relationships and/or the level of risk for different fibre types and different cancers can be made with confidence.

A number of approaches (*see below*) were suggested for how the issue of characterising what can be said about the levels of risk involved in low level exposure to asbestos could be taken further forward by WATCH.”

6. An action was placed on HSE to formulate a plan for taking the issue of estimating the risk involved in low level exposure to asbestos further forward at WATCH, the plan needing to incorporate the key points that emerged from the discussion at the November 2007 meeting. This paper outlines the proposed plan.

## **Argument**

7. The HSE team engaged on this work proposes the following plan to take this issue forward according to 4 approaches that emerged from the discussion at the November 2007 WATCH meeting, as described in the draft minutes (WATCH/Min/2007/3).

### **Approach 1 - Strengthening the evidence about historical exposures in cohorts**

8. "There was scope for looking more closely at the individual occupational epidemiological studies included in the Hodgson and Darnton (and Berman and Crump) reviews, with a view to distinguishing those which are of better quality (and hence contain more reliable information) from those which have identifiable serious deficiencies in respect of exposure data quality. Any overall analysis might then lean more heavily on the more reliable data."

9. The HSE team proposes that the studies most critical to the Hodgson and Darnton model should be given priority and that it may not be necessary to consider every study. Consideration will be given to the quantity of measurements taken and to the time the exposure measurements/estimates were made in comparison to the principal period in which the majority of the cohort were actually exposed.

10. It is hoped that we can discern reasonably accurate absolute levels of exposure for certain key studies, and that these data points can be combined with knowledge of relative exposure levels between cohorts to inform conclusions on the quantitative dose-response relationships.

11. In addition to the extent of the likely degree of uncertainties in data from cohorts, as estimated by Berman and Crump, it is proposed that the most likely 'direction' in which exposure estimates may be incorrect should be assessed. It was also noted that some studies have lung fibre content data not used by Hodgson and Darnton that might provide a useful cross-check of the credibility of air concentrations.

12. It is anticipated that this work could be completed in time for the WATCH meeting in June 2007.

## **Approach 2 – Revising the overall summary analysis of cohorts**

13. “Given that the Hodgson and Darnton analysis was performed almost a decade ago, there might be merit in revisiting it. In doing so, alternative approaches to viewing and utilising the data from the original epidemiology studies could be considered, for example, using uncertainty analysis techniques such as those applied by Berman and Crump in their analysis. “

14. The HSE team considers that the Berman and Crump paper includes some approaches that could be utilised in the Hodgson and Darnton model. For example, assessing the likely extent of sources of uncertainty in addition to statistical uncertainty (this will already have been addressed in Approach 1 for exposure data).

15. The impact on the Hodgson and Darnton model resulting from any re-assessments of the exposure data from Approach 1 would need to be considered. It is proposed that the model could be rerun to ascertain how sensitive it is to certain exposure data points.

16. It is also proposed that additional data points available from cohorts since the original analysis was carried out should be included: the Libby studies as used within the Berman and Crump analysis and the later studies, not included in the either the Berman and Crump or Hodgson and Darnton models, of those environmentally exposed in the proximity of the Wittenoom and Quebec mines.

17. It is anticipated that some of this work could be completed in time for an update to be provided at the June WATCH meeting.

## **Approach 3 – Assessment of specific occupational circumstances**

18. “As an alternative or supplementary approach to extrapolation from higher-level exposure, it might be possible to identify better the risks involved in lower-level asbestos exposure by investigating directly such “lower-level” occupational exposure scenarios. One example might be to explore the situation for carpenters who have worked with amosite asbestos insulation board. If any exposure data are available for such work, these could be compared with the data we have on mesothelioma and lung cancer occurring in this workforce.”

19. The HSE team notes that HSL has some exposure data for asbestos insulation board (AIB) manufacture and finishing processes and may be able to access and / or assess further typical airborne concentrations for carpenters, although this is unlikely to include duration of exposure. A review of published data on work with AIB ceiling tiles and panel is proposed to establish the range and duration of exposures and the quality / robustness of information. Other bodies / organisations may also have relevant manufacturing exposure information collected at a time when the exposures were being experienced by those now appearing in the mortality statistics.

20. It is proposed that estimates of exposure could be made from a detailed job profile; other bodies / organisations may be able to provide some help in both the estimation of exposure and relevant descriptive information. It might also be

appropriate to conduct further testing to measure typical exposures from cutting and fitting AIB.

21. Lifetime risk estimates for certain trades, such as carpenters, could be estimated based on data from the Peto mesothelioma case-control study. If cumulative exposure for these specific jobs could be estimated from other sources (as described above) then this would provide further data points to help verify the dose-response relationships in the available models.

22. The feasibility of using hygiene measurements for certain factories in the HSE Asbestos Survey to examine the relationship between estimated exposures for certain subgroups and asbestos-related cancer should be considered, particularly if exposures predominantly to amosite can be identified (eg Cape Boards at Uxbridge).

23. It is anticipated that results from some of this work might be available by the Autumn WATCH meeting.

**Approach 4** – “Reality checks” of Hodgson and Darnton models for various population subgroups

24. “During the discussion (*at the November 2007 meeting*) it was stated that there is an indication that the incidence of ‘non-attributable’ mesothelioma has increased in the general population; this *might* be causally associated to past asbestos exposures in the general air, particularly near to sites of asbestos use. Further work could be carried out to investigate the apparent relationship between the data for environmental air asbestos levels (historically and currently) and the risk of mesothelioma in the general population. Any apparent relationship so derived might then be “reality checked” against predictions for this exposure scenario that would be made by extrapolating from data relating to higher levels of asbestos exposure. “

25. The HSE team needs more time to consider how this might be taken forward and notes that this work would be dependent on the estimates of the extent of the increases in “environmental” cases.

### **Link to HSC Strategy**

26. This work relates directly to HSC/E’s statutory responsibilities in relation to asbestos; it also has potential relevance for the asbestos strand of the Cancer Project within HSE’s Disease Reduction Programme.

### **Consultation**

27. There has been no external consultation on this paper. [The ad hoc members contributing to the debate on ‘The risks of lung cancer and mesothelioma from relatively low-level exposures to different forms of asbestos’ at the WATCH meeting in November 2007 and who are not planning to attend the February 2008 WATCH meeting.]

### **European Context**

28. The regulatory framework for asbestos is EU-wide and it is possible that the output of this work might have some EU applicability.

### **Action**

29. WATCH is invited to consider and offer its thoughts on the proposed plan

### **Contact:**

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