VULNERABILITY OF CHILDREN. MESOTHELIOMA DEATHS

Particular risk to children. Precautionary approach

1. For at least forty years warnings have been given to successive Governments that children are more at risk from asbestos than adults. They have been told that very low levels of asbestos exposure can cause mesothelioma, but as knowledge was not complete preventative measures have to be taken in schools to prevent the release of asbestos fibres and the exposures of the staff and children.

2. Dr Rudd is a leading mesothelioma specialist consultant, he and other colleagues explained how all exposures to asbestos have a cumulative effect that can lead to the development of mesothelioma. They stated as expert witnesses:

   "Mesothelioma can in theory be caused by a single fibre acting to create a mutation of a cell from which a malignant tumour may develop. …all exposures up to 10 years before the appearance of symptoms is relevant, for two reasons; first, any inhalation may cause mutation...; secondly, the inhalation of asbestos is now known to have an adverse effect on the body's natural ability…to deal with potentially mutating or mutated cells before a malignant tumour develops….Later exposure adds to earlier exposure. All exposures, other than in the last ten years before the emergence of symptoms, is cumulative and contributes to the risk of and the development of a tumour."[1]

3. More than forty years ago it was known that mesothelioma could be caused by low levels of exposure to asbestos. The Factories Inspectorate report of 1965 stated:

   "Mesothelioma has been shown to be associated in some cases with exposures to asbestos dating back 20 or more years previously and sometimes of astonishingly slight degree." [2]

4. In 1967 Dr Lloyd-Davies, the Chairman of the Government's Advisory Committee on Asbestos, wrote to the Department for Education warning of the risks from low levels of asbestos exposure and stressing that children are particularly at risk. He stated:

   "The important point to me is that you are dealing with children…

   My advisory panel on the hazards of asbestos have suggested that wherever practicable, the exposure to asbestos should be restricted to persons of 40 years or over. …

   Considering the problem of asbestos in schools, it all depends what form of asbestos is used, and the amount of dust given off.

   I must admit that you have a difficult problem, because of the youth of the persons exposed. The more I see of asbestos, the more I dislike it." [3]

   Because he accepted that knowledge was not complete, he advised that a precautionary approach should be taken, particularly in schools. His advice was not heeded.

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[1] (Jeffrey Burke QC Edgson v Vickers plc (QBD) Dr Rudd, Dr Hugh Jones, Dr Britton p524 1994)
[2] Annual report of H.M Chief Inspector of Factories on Industrial Health 1965 p 82 Sep 1966
[3] Letter Dr Lloyd Davies Head Medical Officer Factories Inspectorate Ministry of Labour/Department of Education 6 Mar 1967

5. The Factories Inspectorate report of 1966 also acknowledged that more research and epidemiological studies had to be undertaken over many years before many of the answers could be provided about asbestos. They gave a warning that in the interim a precautionary approach had to be adopted by taking preventative actions. The report stated:

"*Of necessity, preventative action must precede absolute proof of the relative hazards of different sorts of asbestos…….. Only epidemiological studies extending over many years can provide the answers. While such studies are proceeding the only safe course is to eliminate the escape of asbestos dust into the air."*[4]

6. In 1979 the Government's Advisory Committee on Asbestos again highlighted to the Government that children were more likely to be at risk from asbestos, and stressed the necessity to prevent the release of asbestos fibres, by stating :

"Children might be more at risk than adults because they have more chance to be affected by carcinogens with long latencies and because, in the young, susceptibility may be increased. It is therefore especially important that the presence of asbestos containing materials in any environment to which children are exposed should be identified so that steps can be taken where necessary to prevent dust release." [5]

7. In 1980 the US Congress took evidence on the risks of asbestos in buildings. Their findings led to stringent laws on the management of asbestos in schools. They stated:

"*Medical evidence suggests that children may be particularly vulnerable to environmentally induced cancers."* [6]

8. In 1987 the American Academy of Pediatrics stated:

"Mesothelioma risk is proportional to a power of time since first exposure, and calculated risk escalates rapidly when time since first exposure exceeds about 40 years. Early childhood exposure, even at very low levels, thus becomes a significant factor when estimating risk, because it allows for such long latent periods.

In addition to their long life expectancy, children in school exposure settings are a particular concern because, compared with adults, they are more active; they breath at higher rates and more often by mouth; they spend more time close to the floor, where sedimented dust and fibers accumulate; and they are more likely to seek direct contact with deteriorating surfaces out of curiosity or mischief. These factors must be considered when potential childhood exposures are estimated."[7]

9. In 1989 Professor Peto highlighted that although knowledge was not complete it was probable that the risks to children were substantially greater than for adults. He stated:

"The effects of childhood exposure cannot be predicted. The models described above imply a roughly fourfold increase in risk for mesothelioma, but not for lung cancer, when exposure begins soon after birth rather than age 20, reflecting the cubic residence time assumption. Such

[4] 1966 Annual report of HM Chief Inspector of Factories on Industrial Health. Ministry of Labour P60 August 1967
[5] (HSE Education Department "Asbestos in Educational Establishments – Position Paper." ESAC/WG3/2C HSE Education NIG p1 September 1983)
[6] (US Congressional statement of findings and purpose. Title 20> Chapter 49> 3601 14 Jun 1980)
[7] American Academy of Pediatrics Asbestos Exposures in Schools Pediatrics 5/94 vol79 No 2 Feb 1987 p301-305

an age-related effect would be expected for any carcinogen which initiates the induction of multi-stage cargcinogenic process;

but this prediction takes no account of the possibility that children are particularly susceptible to carcinogenesis by virtue of factors such as stem cell expansion during growth and development. The risks caused by exposure in childhood may therefore be substantially greater than those predicted for both mesothelioma and lung cancer." [8]

10. In 1991 a paper written by the Chairman of the US Committee on Environmental Hazards wrote:

"Children constitute a population at potentially high risk of exposure to asbestos in place. We need to remember our children's future as we consider the hazards of the large amounts of asbestos in place in buildings in this country….

Why is there so much asbestos in buildings today? How was it allowed to get there? What failure of preventive medicine, what failure of public policy, allowed this to happen?"[9]

11. In 1999 Southern Ireland took the policy decision to survey all their schools for asbestos and then because of the particular vulnerability of children they decided to remove the asbestos even in circumstances where it would not normally be considered necessary. The Irish Government's asbestos briefing document states in relation to their schools:

"Based on risk assessments and the result of surveys done by asbestos professionals, it (OPW) is making decisions on how and when the asbestos needs to be removed. It is important to remember that if asbestos is in good condition, it poses no threat to health, but because of the proximity of children to this material, the decision is being made to remove asbestos, even if this would not normally be considered necessary."[10]

12. In 2001 during the consultation process for the new Control of Asbestos Regulations (CAWR) there was criticism in Parliament and in the press that the regulations were going to far. HSE rebutted this criticism and emphasised the importance of taking a precautionary approach towards controlling asbestos exposure. They stated:

"What makes asbestos unique amongst recognised carcinogens is the amount of all forms of the mineral permanently present in the workplace, and the relative ease by which fibres can be released…..This makes it imperative that a precautionary approach is taken towards the control of exposure to all types of asbestos".[11]

13. In 2004 the HSE Head of Asbestos Policy gave a presentation to the Local Authorities Forum about a campaign HSE intended to launch to improve the asbestos management in schools. The need for the campaign had become evident following a series of asbestos incidents in schools which had led to widespread contamination, exposure of contractors, staff and pupils and the subsequent disruption of school life. All of which had highlighted the fact that some authorities had ineffective systems of asbestos management, and because HSE recognised the particular risk to children they considered that the campaign was a priority. The HSE lecture notes state:

"A number of factors exist which have led HSE to regard education as a priority:

[8] (Fibre Carcinogenesis and Environmental Hazards, J Peto IARC 90 1989 p463)
[9] A Population of Children at Risk of Exposure to Asbestos in Place Llandrigan Annals New York Academy of Sciences 1991 p-283-286
[10] European Agency for Safety and Health at Work. Asbestos Briefing Republic of Ireland Office of Public Works (undated)
[11] HSE position statement on the risks from white asbestos (chrysotile) 2001

In recent years there have been a number of high profile incidents where maintenance activities carried out in schools has resulted in widespread exposure to asbestos. Local authorities and school managers have been subjected to serious criticism in the media, and in many cases education activities have been significantly disrupted.

Whilst the main risks of exposure to asbestos in schools will be to building and maintenance workers, there will always be the possibility of pupils being put at risk. Due to their physical immaturity they are at greater risk of suffering from asbestos related disease than adults, and will live long enough for any disease to develop.

Parents often have a heightened sense of awareness of the risks of asbestos exposure, and any failure to manage risks properly could result in the authority losing the confidence of their local communities. It can also lead to pressure on governing bodies to remove asbestos unnecessarily, leading to increased risks of exposure.

Whilst many authorities have been managing their asbestos effectively for many years, HSE believes a significant minority have still not established complete control of asbestos in their premise. Therefore HSE intends to launch an initiative to highlight the issues of asbestos in schools and to encourage LAs and others to manage these risks correctly.

HSE has set up a project team, which will prepare a series of initiatives designed to promote the effective management of asbestos in schools

Although the project will be aiming to reduce exposure dramatically over the next few years, initially we will be concentrating on achieving a 20% reduction in current exposure levels. "[12]

This was a most frank admission that some local authorities were not managing their asbestos and that by inference because of that staff and pupils in schools were being exposed to asbestos. The initial aim of a 20% reduction in exposure levels would in itself be an acknowledgement that the exposure levels were significant, however the ultimate aim of a "dramatic" reduction in exposures clearly shows the scale of the problem.

Despite HSE considering that the campaign was an important priority it was dropped a year later before the first meeting had taken place so that the resources could be reallocated to reducing asbestos exposure for building maintenance workers.[13] The asbestos incidents, contamination and exposures continued in schools, two years after the campaign should have started reducing the exposures in schools the problem with asbestos release in system schools was rediscovered. Remedial measures could have been implemented two years earlier than they have been had the campaign gone ahead.

(The term "dramatic" was deleted from later transcripts of the presentation, including in a Ministerial briefing. A paper "Flawed Government Policies" examines the decision the drop the campaign and will be released later in the year)

14. A recent HSE study[14] highlighted that:

[12] HSE Head of Asbestos Policy briefing to Local Authority Forum, Asbestos Management in Schools. Asbestos in Education LAFORUM/04 Nov 2004)

[13] E-mail HSE Trevette/DfES Daniels HSE Asbestos campaign Education sector- An Exit strategy 23 Aug 2005

[14] HSE Occupational, domestic and environmental mesothelioma risks in Britain. 2009 . IMIG Congress Abstract 25-27 Sep 2008

"*The British mesothelioma death–rate is now the highest in the world*" which it concludes is because "*Britain was the largest importer of amosite, and there is strong although indirect evidence that this was a major cause of the uniquely high mesothelioma rate*."

15. The study also concludes that "*Mesothelioma risk is determined largely by asbestos exposure before age 30,"* which is particularly relevant to schools as exposure as a child starts the process and allows a lifetime for the disease to develop, with any later exposures being cumulative and adding to the likelihood of a tumour developing. It also emphasised that amongst men and women who are unaware of their exposure the British mesothelioma rate is *four times* greater than elsewhere in the world,

    "*Suggesting that mesotheliomas were caused by unsuspected asbestos exposure in a wide range of occupational and non-occupational settings."*

    Of course by their very nature it is difficult to be definitive where such exposures took place but the report speculates that the possible sources of exposures include building construction, maintenance and industrial activities and also a possibility of exposure from the "*release of asbestos from buildings due to normal occupation and weathering*." Most schools contain asbestos, much is amosite, all of it is old and much is deteriorating. In some schools it is being regularly disturbed so that it releases fibres in a manner that teachers would invariably be unaware of their exposure and it is highly unlikely that children would be aware of their exposure. In other words the exposures fit precisely into the pattern of the mesotheliomas from unknown exposures that are four times more prevalent in Britain than elsewhere in the world.

16. At a meeting of the Government's advisory committee meeting on science, WATCH, the increased risks from exposure to asbestos at a young age were discussed. It was stressed how childhood exposure to asbestos was likely to be an important factor in mesothelioma developing in later life. The minutes record:

    "A WATCH member asked Professor Peto for further insights into the relationship between age, asbestos exposure and cancer risk. Professor Peto commented that first exposures to asbestos before the age of 30 were much more critical in terms of cancer risk than first exposures that occurred after 30. If first exposures occurred after the age of 40, the risks of developing cancer were relatively low.

    However, limited insights could be gained from age alone; time since first exposure was a more critical determinant of risk than the actual age at which exposures took place. This implied that exposure to asbestos in childhood would be an important factor in determining the appearance of cancer in later adult life."[15]

    It should be noted that Professor Peto's expert opinion on childhood asbestos exposure given to the Government's Advisory Committee in 2007 is almost identical to that of Dr Lloyd Davies, the Chairman of the Government's Advisory committee on Asbestos given to the Government in 1967, some forty years before. It is precisely for these reasons that the Government has been asked to assess the risks to the occupants of schools with particular emphasis on the risks to children.

17. Although there was an acknowledgement that there are increasing numbers of people dying from "background ambient" exposures, the WATCH committee have so far been were unable to precisely quantify the level of risk for low level exposures. What was not in question is that there

[15] WATCH committee minutes. Assessing the risks arising from exposure to low level exposure to asbestos 7 Nov 2007

is widespread agreement that there is no known threshold of asbestos exposure below which there is no risk. The present DCSF asbestos guidance for schools states:

As there is no known threshold level for exposure to asbestos below which there is no risk, it is important always to take whatever steps are necessary to reduce exposure from any form of asbestos to the lowest reasonably practicable level."[16]

This benchmark is advocated in the HSE Statistics Branch Hodgson and Darnton paper. The paper is generally acknowledged as being the most definitive work on the risks from asbestos exposure, with the risk model being used as a basis for the Regulatory Impact Assessments for the 2002 CAWR and the 2006 CAR and the subsequent Regulations. They state:

"Taking this evidence together we do not believe there is a good case for assuming any threshold for mesothelioma risk."[17]

18. In summary; More than forty years ago it was accepted that knowledge was not complete therefore because of the particular risk to children, a precautionary approach was advised. Regrettably successive Governments have not treated schools as a special place and have not taken a precautionary approach, consequently asbestos continued to be used extensively in the construction of schools for twenty more years. Throughout this time they have failed to implement policies to prevent the release of asbestos fibres into the classrooms. All of the asbestos is now old and deteriorating, vandalism, botched maintenance and a lack investment coupled with ineffectual or non-existent asbestos management systems have resulted in raised background asbestos fibres levels and high peak levels. There is an increasing number of deaths from mesothelioma among people who have not worked in high risk occupations and have no recorded history of asbestos exposure. It is inevitable that far too many of these people had their first asbestos exposure while they were children at school.

19. In 1991 the Chairman of the US Committee in Environmental Hazards wrote:

" We are the inheritors of history and our children are the inheritors of our mistakes and our failures. We have failed in the past. The result of our collective failure is reflected in the fact that asbestos is widespread in schools and other buildings today.

Our task now is to do what we can to blunt the third wave of asbestos disease, which already is beginning and which inevitably will be much worse if exposure to asbestos in schools and other buildings is not reduced."[18]

This statement was made just few years after the ILEA tests discovered that there was a serious problem with asbestos exposures in System built schools in the UK. The warnings were given, but they were not heeded then and they are not heeded now. Schools have not been treated as a special place so that over the intervening twenty years our teachers and children have continued to be exposed to asbestos. Despite the warnings, despite the evidence the Government has the temerity to deny there is a risk or there ever has been a risk. How much more proof do they need, how many more people will die before they listen.

[16] DfES Admin Memo 3/86. Welsh Office Admin Memo1/86. The use of Asbestos in Educational Establishments p1. Aug 1985

[17] The Quantitative Risks of Mesothelioma and Lung Cancer in Relation to Asbestos Exposure *Ann. occup. Hyg.*, Vol. 44, No. 8, pp. 565–601, 2000 Hodgson and Darnton Is there a threshold? P593

[18] Llandrigan A population of Children at Risk of Exposure to Asbestos in Place. Annals of New York Academy of Sciences 1991 p283 - 286

Mesothelioma statistics.

Children

20. The inevitable result of raised background levels and periodic high peak levels is that the occupants of schools have developed mesothelioma.

21. Everyone is exposed to asbestos and yet everyone doesn't develop mesothelioma. At the relatively low levels of exposure experienced by the occupants of schools few people will develop the disease, however amongst any group of people exposed to the same levels some will develop the disease whereas others will not. The problem is that it not known what makes some people susceptible and others not.

22. Because of the long latency, there are no mesothelioma statistics for children who have been exposed at school, as they develop the disease and die many years later, their deaths being recorded under the occupation they had at the time of their deaths. Because typical exposures in schools are low level and normally intermittent, the latencies are likely to be long. Latencies for mesothelioma from first exposure to first symptoms have been recorded from less than 10 years to over 60 years, with a mean of about 35 years. Large exposures can have a shorter latency and there is evidence that environmental exposures can have a longer latency, with a couple of studies showing that those exposed to low levels from birth on average develop the disease some 50-56 years later, [19] and another study shows the latency for domestic exposure was 52 years.[20] Consequently many of the deaths from asbestos exposure at school are likely to have the longer latencies with their deaths on average occurring more than fifty years after the first exposure, which if that started at the age of five, the mesothelioma deaths would occur from the age of fifty five. Statistics show that in Britain the mesothelioma deaths from this age and higher are inexorably rising.

23. In 1980 an estimate was made in the USA of how many children could be expected to die of asbestos exposure at school. A report from the American Academy of Pediatrics states:

    "In 1980, the EPA provided a quantitative risk estimate for asbestos-containing materials in US schools. The EPA estimated that more than 8,500 schools in the nation had friable asbestos and that approximately 3,000,000 students (and more than 250,000 teachers, maintenance workers, and other adults) were potentially exposed. Using available field studies to estimate airborne asbestos levels and assuming a 30-year life expectancy for schools with asbestos, the EPA report concluded that:
    A total of approximately 100 to 7,000 premature deaths are anticipated to occur as a result of exposure to prevalent concentrations of asbestos in schools containing friable asbestos materials over the next 30 years. The most reasonable estimate is approximately 1,000 premature deaths. About 90% of these deaths are expected to occur among persons exposed as school children."[21]

[19] Asbestos exposures in malignant mesothelioma of pleura; a survey of 557 cases Bianchi Industrial health 2001,39, 161-167 . Malignant mesothelioma due to environmental exposure to asbestos: follow up of a Turkish cohort living in a rural area. Chestp2228. Metintas

[20] Mesothelioma: cases associated with non-occupational and low dose exposures Hillerdal Occup Environ Med 1999:56:505-513

[21] American Academy of PediatricsAsbestos Exposure in schools Pediatrics vol 79, no 2 Feb 1987 p301- 305 Reaffirmed May 1994 .Support document for the proposed rule on friable asbestos-containing materials in school buildings EPA report 560/12-80-003

Note: The above estimates of mesothelioma deaths was based on an incorrect assumption of the number of schools that contained asbestos. Subsequently a nationwide audit was carried out when every school was required by law to carry out an asbestos survey. The number of schools that actually contained asbestos was found to be four times higher than originally thought. [22]

24. In 1986 stringent laws were introduced in the USA specifically for schools, for it was acknowledged that because of the increased vulnerability of children schools had to be treated as a special place. Resources were allocated, people were trained and systems introduced so that the asbestos was rigorously managed, and staff and parents were kept informed of the asbestos in their schools and the system of management.[23] The problem was addressed, and although it has not solved it, it has kept it reasonably well under control for the last twenty years. In contrast in this country no such laws existed until the 2004 CAWR duty to manage. The particular vulnerability of children has not been taken into account and schools in the UK are not treated as a special place.

25. 98% of asbestos fibres counted in sampling tests in schools in the USA were chrysotile. In the UK most school contain asbestos and many contain large quantities of amosite which is 100 times more dangerous than chrysotile. Some contain, or have contained, crocidolite which is 500 times more dangerous. A review also estimated that the average airborne asbestos concentration in US buildings, including schools, was 10-100 times less than in Britain.[24] It is therefore a reasonable assumption that proportionately the number of deaths among staff and children in UK schools will be higher than in the USA.

26. Despite requests, no official estimate has been published in the UK of the number of children who could subsequently die of mesothelioma caused by asbestos exposure at school.

27. As has been seen the campaign to dramatically reduce the asbestos exposures for staff and children in schools was dropped so that the resources could be reallocated to reducing asbestos exposure of the people in the building maintenance trades. It would not be disputed for one minute that a campaign should be directed at the maintenance trades for they are indeed at risk, however measures to improve their safety should not be at the expense of children. The decision to reallocate the resources was based on mesothelioma occupational statistics which record the persons occupation at death, including those in the building maintenance trades. A 2008 Department for Schools letter confirms this and states:

    "Schools are not the only buildings where asbestos is present and HSE is committed to preventing exposure to all those people who may be at risk. HSE's interventions are intelligence led and targeted at those most at risk. Analysis of mortality data based on last occupation has directed HSE's current effort towards maintenance trades….The HSE does not propose to have an asbestos in schools campaign."[25]

28. What HSE and the Department for Schools fail to take into account is that there are far more children in schools than there are plumbers and carpenters. But unlike the plumbers and carpenters there are no statistics that give the "mortality data" for children who were exposed to asbestos at school and subsequently have developed mesothelioma and died as a result many years later. For their deaths are recorded under whatever occupation they had at the time. There are no death statistics and the UK Government refuse to estimate how many children are

[22] EPA Fact sheet AHERA 1986 Statement EPA Administrator 23 Oct 1986
[23] AHERA US code: title 15,2643. EPA regulations Chapter 53. EPA Fact sheet AHERA 1986 Statement EPA Administrator 23 Oct 1986
[24] Toxicological profile for asbestos . US Department of Health and Human Services. Potential for human exposure. Sep 2001 para 6.4.1 p 163
[25] Letter Department Children, Schools and Families /R.Lees 27 Mar 2008

likely to die because of asbestos exposure at school. It is therefore a very easy step for them to deny that there is a problem.

29. Everyone is not a carpenter or plumber, however every single person attends school as a child for at least twelve years. In the United Kingdom approximately 1/6th of the population at any one time are at school, either as a pupil or as a teacher or support staff. There are approximately 9,700,000 children in UK schools.[26]

30. There are frequent asbestos incidents in schools that release significant levels of asbestos fibres, and as the asbestos deteriorates the background levels are raised where the asbestos is not in good condition. Children are more vulnerable to asbestos exposures than adults, and will live longer for mesothelioma to develop. Because they are more at risk it is probable that a significant number have, and will subsequently develop the cancer many years later and will die as a result of their asbestos exposures at school.

    Governments have failed to take measures to assess the extent of the problem and because there are no specific statistics that show how many children have been exposed and died, they have failed to address the problem. Given all the evidence that indicates there is a significant problem, it is inexcusable that over the last forty years successive Governments have failed to take a precautionary approach.

Michael Lees
2nd November 2009

[26] Statistics of Education England 2008. National Statistics. Education and Training Statistics forthe United Kingdom: 2008 (Internet only)