

# Prevention of Asbestos Risks in the Construction Sector

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## **Abstract**

*Thirty years after cessation of asbestos use in Sweden some 100 male pleural mesotheliomas occur annually of which 20-25% are in construction workers. Excess incidence of pleural mesotheliomas is seen in several construction sectors indicating substantial exposure to asbestos in the past in connection with installation of products containing asbestos. After successive annual declines in incidence during the last decade rates have increased again in groups where exposure has occurred later, e.g. in the removal of earlier installed asbestos containing products. In Swedish males, asbestos-caused malignant disease annually kills 2-3 times as many as fatal work accidents and this applies also to the more accident prone construction sector.*

*Banning of asbestos containing construction materials took place only recently in some European Union countries although in others one to two decades earlier. More coordinated efforts have been made all over Europe to prevent upcoming asbestos exposure in the repair and demolition of existing buildings. Experiences of different administrative and technological approaches have recently been compiled and shared in a pan-European conference held in Dresden, Germany in 2003. Additional legal improvements are in preparation on the EU-level.*

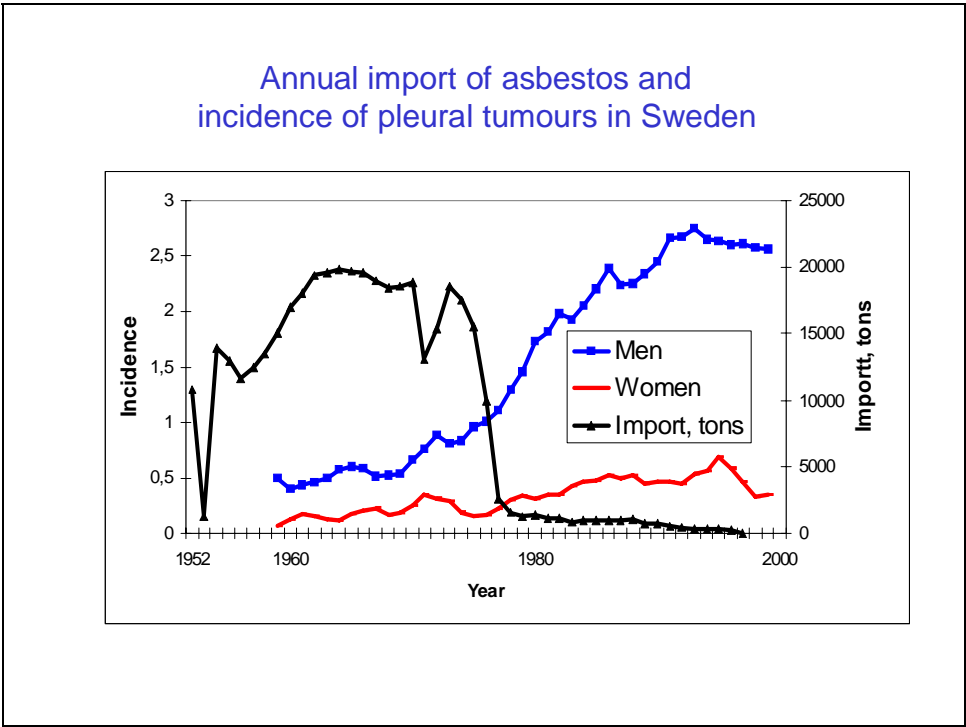
*Asian countries are today the major asbestos importers and users; the majority of the asbestos imported by countries that still use asbestos is for use in construction materials. Tight safety procedures cannot be applied so rigorously in construction sites as in established workplaces such as factories. Accordingly, even in the absence of domestic data on asbestos caused ill health among construction workers in these countries, there is no reason to believe that their risk is less than that found in Swedish surveillance programs. There are accordingly strong reasons for Asian countries to follow the recommendations of the Dresden declaration even with regard to a cessation of use of asbestos.*

By far the majority of asbestos used today is for building and construction material purposes. In particular, asbestos is added to cement based products in order to achieve reinforcement of the structure of a pipe or sheet product. In the past also large amounts went into floor covering products in order both to reinforce the structure and to give resistance to the alkaline nature of the underlying surface. Paints and plastering material used to contain asbestos as a toxicotropic component. Finally of course different heat insulation materials were asbestos based, mostly applied by spraying – which by the way was a technique used for acoustic purposes as well. This list of applications indicates the great variety of construction workers that were exposed in the past when they were handling and installing these materials – construction labourers, painters, plumbers and insulators just to mention a few. Others, like

floor layers and electricians, were not likely to be exposed in the initial, new phase but rather later on when they were drilling, scraping and grinding such material already installed, for their particular purposes of new wiring or exchanging an old carpet for a new one.

**Asbestos consumption**

In the Europe of today almost all new use of asbestos has been banned and by 2005 the total ban enters into effect. However, it has been made obvious to everyone that the problem doesn't disappear by a ban on new installations but the majority of problems remain and have to be dealt with in the repairing and demolition phase. Let me illustrate the development over time in a country like my own as a guide to the prevention discussion. Import has been the only source of asbestos in Sweden but the import was modest compared to many other European countries. A level of 10,000 tons annually in the mid 50s was a rather low level compared with many other countries and so was the subsequent increase during the 60s to some 20,000 tons annually. The peak import occurred in the early 70s, although a decrease occurred in 1973 – due to political discussions in parliament leading to prohibition of asbestos spraying. Obviously the effect was short and new applications took over as the import reached the previous levels again. Another decline in 1976 was sharp and persistent and within a period of less than half a year all import had almost disappeared. Intensive public debate upon the identification of mesothelioma cases in Swedish manufacturing industry started the decline but its successful completion was in particular due to the immediate cessation of use of asbestos containing products in the Swedish construction industry. With lack of demand there was no market for production and hence no more import. The minor volume of import left was for brake lining, gaskets etc., whereas the major use had been for the construction industry. The disease burden of mesotheliomas, however, lags behind substantially and the number rises.



In fact, many new installation procedures like putting pipes or sheets of asbestos cement in place could probably be done with limited dust emission if good equipment and techniques are used. The problem is that no good techniques are applied and thus exposure occurs even

in such situations. These conditions are indeed likely if neither contractors nor their employees are well informed and no regulators monitor their field behaviour. The construction industry is well known for less thoroughly trained workers and less careful contractors when it comes to safety and health issues and most likely this is even more pronounced in rural areas in developing regions. In this respect, as the Asian regions are the major importers and users of the world production of asbestos today, uncontrolled handling under unsafe conditions will build up a major problem for the future decades as it has already done in the Western hemisphere nations that were big users in the past. Prevention starts with awareness of a problem and the question will be how to create that awareness.

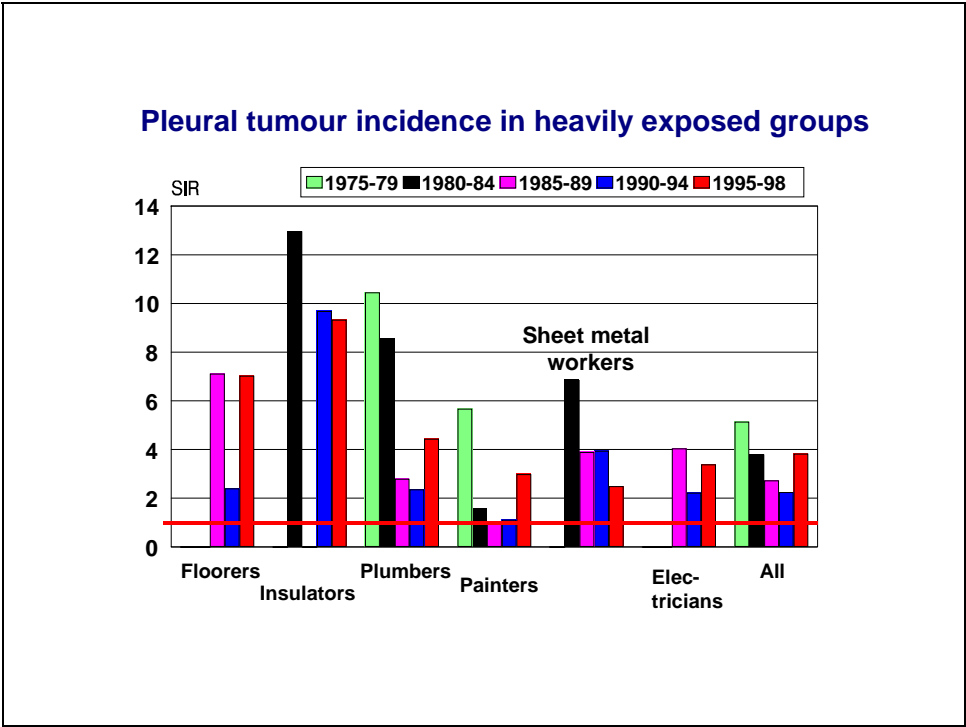
**The awakening of awareness of the seriousness of the problem**

Let me describe the magnitude and the urgency of the problem in order to convince you that there is an asbestos problem in the construction sector. Traditional scientific reports on asbestos hazards have dealt with risks for miners, shipyard workers, textile workers and of course the insulators. When attempts were made to assess future mesothelioma trends in the UK, concern was expressed over the past neglect of the construction industry as a major risk sector [1]. I will illustrate how right they were by sharing with you some data from a Swedish construction worker cohort that has been followed for more than a quarter of a century. All construction companies in Sweden had established a joint occupational health and safety service, BYGGHALSAN, which was in operation between 1969 and 1993. There was a joint management involving all employers and unions in the construction sector including affiliated trades like painting, plumbing, electrical work etc – in all covering some 150,000-200,000 workers at a given time. Its expert advisers included a medical staff of some 200 people and a part of the medical program was health surveillance examinations at regular intervals applicable to the different trades and thus hazards. All medical record keeping was computerised and the database has since been used for different epidemiological surveillance purposes [2].

<b>Incidence in 370,000 Bygghälsan examinees</b>						
	<b>Pleural tumours</b>			<b>Lung cancer</b>		
	<b>Obs</b>	<b>Exp</b>	<b>SIR</b>	<b>Obs</b>	<b>Exp</b>	<b>SIR</b>
<b>Heavily exposed</b>	<b>92</b>	<b>28.9</b>	<b>3.18</b>	<b>693</b>	<b>608.3</b>	<b>1.14</b>
<b>Other professions</b>	<b>123</b>	<b>102.2</b>	<b>1.20</b>	<b>2312</b>	<b>2298.2</b>	<b>.99</b>
<b>All examinees</b>	<b>215</b>	<b>131.1</b>	<b>1.64</b>	<b>3005</b>	<b>2906.4</b>	<b>1.03</b>

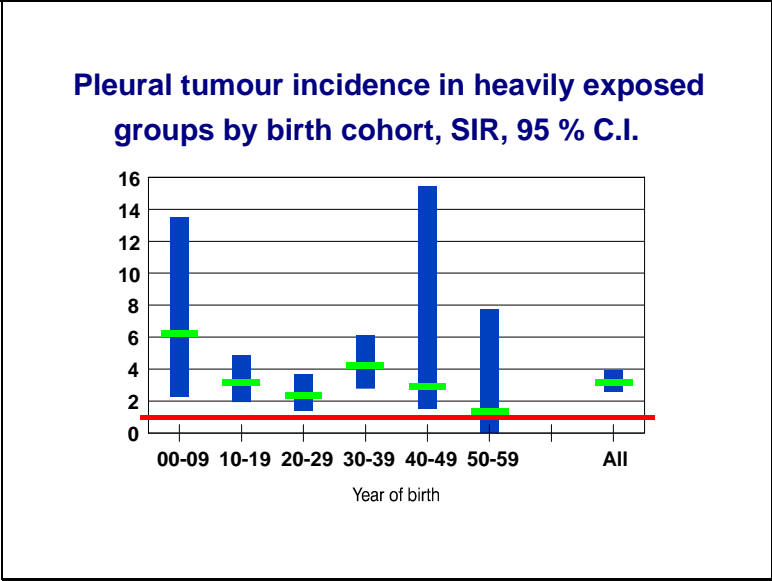
Special emphasis was put on asbestos and silica exposure from the beginning. In this respect it is worth mentioning that among the 135,000 first examined workers in the early 1970s an extremely small proportion (15%) of the workers who later over time have developed mesotheliomas had reported the handling of and thus exposure to asbestos products. They were not aware of what the materials and products they handled contained and it is likely that the small contractors were even worse informed. Only when brand names like Eternite were mentioned were they aware of handling that product brand. Most probably the majority of these mesothelioma cases had been exposed to asbestos in their work [3].

Follow up in the national cancer registry until 1998, which means for up to more than 25 years, of a total of 370,000 construction workers examined between 1971-92 has revealed 215 cases of pleural mesothelioma in the total group which constitutes a 1.6 fold excess compared to Swedish males in general. However, for the six most heavily exposed job categories the excess rate is 3.2 while the remaining jobs have a SIR of 1.20. There is also a moderate but significant excess lung cancer incidence in these six job categories (SIR 1.14) but not for the other construction workers (SIR 0.99). The six job categories are the traditional insulators and plumbers but also painters, sheet metal workers and in more recent follow up periods during the mid and late 1990s even electricians and floor layers. There seems to be an increasing incidence in the most recent follow up period while the incidences had been continuously declining over the years before 1990. During four additional years of follow up for this construction worker cohort until and including 2002 another 88 new cases of pleural mesotheliomas have been reported to the cancer registry. Of these recent cases of mesothelioma every second has occurred among men below the retirement age of 65 and 10% before 50 years of age.

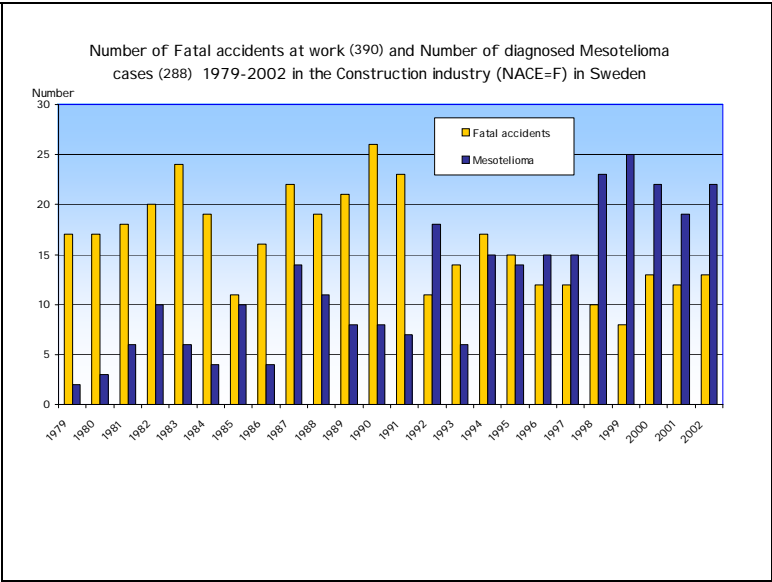


Another surprising feature is that the highest incidences are in the birth cohorts of late 30s and the 1940s. A similar birth cohort pattern for pleural mesotheliomas has also been reported for all Swedish males [4]. For lung cancer there is no such pattern among the construction workers but rather a steadily declining rate with younger birth cohorts. It is worth mentioning

that the exposure levels have not been high enough to cause asbestosis to a high degree on the population level – some single cases annually today.



It was also pointed out in the mentioned paper that the annual number of male pleural mesotheliomas in Sweden over the last ten years, which has been around 100, was twice the annual number of fatal accidents at work during that same period which was around 50-60. With the likely number of asbestos caused lung cancer cases added to the mesothelioma number the asbestos caused cancer burden is at least three times the number of fatal work accidents. Remarkably, even in such a high accident risk trade as construction, the annual number of pleural mesotheliomas in Sweden during 1998-2002 has been around 20, which is twice as many as the 8-12 fatal work accidents annually. To this should be added the lung cancer cases caused by asbestos exposure, which is between 50-100% of the mesotheliomas. To find fatal occupational accidents in the Swedish construction industry of the same magnitude as the mesothelioma cases of today we have to go as far back as a quarter of a century ago. The total number of fatal work accidents over the period 1979-2002 adds up to 390 which is not too different from the total number of pleural mesotheliomas over the same period (288) and in particular not from the sum of these mesotheliomas and the number of lung cancers likely caused by asbestos.



## **Cessation of new use**

How did the immediate cessation of asbestos use in the Swedish construction industry come about, as it contrasts strongly to the slow proceedings in most other countries? My personal belief is that the existence of the common comprehensive occupational safety and health service enabled necessary, objective information about the hazards of asbestos to reach decision-makers among employers and unions alike in this end-user industry. Both parties were well aware of the hazards as known scientifically but also – and as a reinforcement – they had learnt about the fate of their employees or peers through the surveillance program of BYGGHALSAN.

All previous asbestos research and the actions taken based on that research had concerned factory-type establishments, where the employment records were stable and could be traced and where the exposure conditions could be monitored. Unfortunately, there was limited interest from those producers to convey concerns about health hazards related to their products to their clients as that would negatively influence sales. There were ample examples in Sweden in the first half of the 70s of intensive information – not to say lobbying – from British asbestos companies supporting their Swedish agents who were selling to the construction industry to argue for an opinion to the contrary. Without objective consumer advisers to the end-user industry – and at best supported by scientific data on such groups in particular – the lesson is that it would have been difficult to create the climate necessary for real preventive actions.

## **European Union program to combat asbestos hazards**

The greatest problem today in all of the European Community rests in the repairing and demolishing of buildings containing asbestos material. However, cohorts of such workers will be difficult to define and follow as they frequently constitute transient workforces. The situation is in no way different in the new member countries of the European Union with the exception that it is several times more severe due to the heavy use of Russian asbestos during the years of Soviet Union export. In the report of a project that involved the four member countries France, Spain, Sweden and United Kingdom (2001) proposals have been made on how to improve the health and safety conditions in this type of work with increased demands on both owners of buildings and entrepreneurs. Such steps are:

- Assessment of where asbestos might exist in an existing construction object to be dealt with for repairing or demolishing purposes (owner of building).
- Appropriate technology in the stripping process itself like wet stripping instead of dry (contractor) and with certification and approval of contractors (government authority).
- Efficient face-fitting and other aspects of appropriate PPE arrangements (regulators).
- Improvement of health surveillance of asbestos exposed workers including beyond the period of employment (government authorities).

A conference was convened in Dresden, Germany in autumn of 2003 by the European Commission and ILO to follow up on this report and to address the subject as a whole[5].

## Conclusion

This is indeed the story about a simple and cheap product – often chosen just because of that – which turned into the most expensive you could imagine both in terms of human suffering and in tremendous cost to handle the product safely towards the end of its “lifecycle”. Lesson: Consider the whole lifecycle cost of a product from the beginning!

My first slide showed you the picture of the fatal disease burden in Sweden still 25 years after the major cessation of asbestos import to the country and the end to handling of new asbestos containing material in the Swedish construction industry. Imagine the consequences of the 20 and more years of delay of world use of asbestos compared to Sweden and that most of it has been used for construction industry purposes. Even worse, imagine the future consequences where there is still ongoing use of asbestos containing asbestos materials which is in large parts of the less economically developed world including parts of Asia. Indeed, there is no reason to believe that the health consequences should be less in these countries than in a country like my own. Rather the opposite is true, as safety precautions to suppress dust exposure have probably been less extensive, both because of less awareness and of a different safety culture.

## References

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