

# GLOBAL PANORAMA ON MESOTHELIOMA 2008

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## 1. Introduction

Malignant mesothelioma is an “orphan” disease that in most of the world goes undiagnosed and unreported. There is little doubt that the national incidence of mesothelioma is linked to historical asbestos consumption. In 2004, Dr. Antti Tossavainen reported that “170 tons of produced and consumed asbestos will cause at least one death from mesothelioma, most often as a consequence of occupational exposure.”<sup>1</sup> In March 2007, Takahashi et al. confirmed the “clear and plausible” correlation between the amounts of national asbestos consumption in 1960-69 and the incidence of asbestos-related mortality in 2000-2004; for each additional 1 kg of asbestos used per capita yearly in a county, there was a 2.4-fold increase in mesothelioma.<sup>2</sup> In November 2007, further research by Takahashi et al was presented at an international conference in Japan. It revealed that countries with increasing trends in pleural mesothelioma mortality substantially outnumber those with decreasing trends. The highest period mortality rates for 1996-2005 were recorded in Northern European and Oceania:<sup>3</sup>

- the worst affected countries were: New Zealand (21.2 deaths/million/year), Italy (16.3), Belgium (15.3), Finland (12.3), Norway (11.3), Germany (11.2) and the UK (10.8);
- there were statistically significant increases in mortality in: Greece, Czech Republic, Japan, Italy and the UK and marginally significant increases in 5 other countries;
- only the Netherlands recorded a statistically significant decrease and Iceland a marginally significant decrease.

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<sup>1</sup> Tossavainen A. *Global Use of Asbestos and the Incidence of Mesothelioma*. Int J Occ Env Health, Jan/Mar. 2004, pp 22-25. “In Western Europe, Scandinavia, North America, and Australia the manufacture and use of asbestos products peaked in the 1970s. Current incidences of mesothelioma range from 14 to 35 cases/million/year in 11 industrialized countries that had used asbestos at 2.0 to 5.5 kg/capita/year about 25 years earlier. A significant linear correlation ( $r=0.80$ ,  $p<0.01$ ) exists between the two variables. Accordingly, about 170 tons of produced and consumed asbestos will cause at least one death from mesothelioma, most often as a consequence of occupational exposure.” See also Appendix A.

<sup>2</sup> Lin R, Takahashi K, Karjalainen A et al. *Ecological Association between Asbestos-related Diseases and Historical Asbestos Consumption: an International Analysis*. The Lancet. March 10, 2007. Vol 369 844-849.

<sup>3</sup>An *International Comparative Approach to the Global Asbestos Epidemic*, a paper presented by Dr. Ken Takahashi on November 23, 2007 at the International Conference on Asbestos in Yokohama, Japan. This paper has been submitted for publication.

## 2. Information Vacuum

In themselves, these figures are grounds for concern but what is equally as worrying, if not more so, is the lack of mesothelioma data:

“Reliable figures on the incidence/mortality of/from mesothelioma are available for about 15% only of the world population. In particular, mesothelioma epidemiology is scarcely known for a majority of the big asbestos producer/consumer countries. Where data are available, marked variations in incidence are observed. During the last decades mesothelioma incidence showed a progressive increase in various industrialized countries... The mesothelioma wave consequent on the very high world asbestos consumption (which) occurred in the 1970s has yet to be seen.”<sup>4</sup>

In some countries the lack of mesothelioma data is an intentional oversight, in others it is due to a lack of political will and/or medical capacity. It is beyond strange that in a developed country such as Canada which has, for over 100 years been one of the world leaders in asbestos mining, there is neither a national cancer registry nor a national mesothelioma registry. Canadian observers maintain that this “oversight” is part of a political strategy of “plausible deniability.” In other words, what the public doesn’t know can’t impinge on the federal government’s support for the national asbestos industry. In India, a country which has a seemingly unquenchable thirst for asbestos, mesothelioma is almost never diagnosed; even if it were, there are no procedures for collecting data on this or any other occupational disease.

## 3. A Case Study: India

The absence of epidemiological data on the incidence of mesothelioma in India is used by the Government to justify the continued use of asbestos, a substance banned or strictly regulated by most developed countries. According to data collected by the U. S. Geological Survey, in 2006 consumption of asbestos in India was 373,931 metric tons; since 2004, asbestos imports to India have almost doubled increasing from 172,398 metric tons to 354,308 metric tons.<sup>5</sup> Dr. Tushar Kant Joshi, Director of the Center for Occupational and Environmental Health in New Delhi, is concerned about the repercussions of hazardous exposures being experienced by up to 1 million workers in India every day. He has good reason to be worried:

“studies by the National Institute of Occupational Health (NIOH), an Ahmedabad-based autonomous government scientific body, have found lung impairment and radiological abnormalities in asbestos milling workers (54.8 per cent) and miners (19.5 per cent). The workplace asbestos fibre concentration in milling facilities was

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<sup>4</sup> Bianchi B. *Geography of Mesothelioma: An Overview*. Abstract to Global Asbestos Congress 2004; website:<http://park3.wakwak.com/~gac2004/>

<sup>5</sup> There is some domestic asbestos mining in India. In 2006, this was estimated at 20,000 metric tons. The vast majority of fiber used, however, is imported. According to UN trade statistics, from 2004-2006 asbestos imports to India mainly came from Russia (47%), Canada (20%), Brazil (12%) and Kazakhstan (12%). Data obtained from the Canadian government in 2007, revealed that India is now the biggest market for Canadian chrysotile, absorbing 48% of all Canadian exports; sales of chrysotile to India were worth \$25,196,357 for the period January-August 2007.

found to be 33 times higher than the Indian standard for chrysotile asbestos of 2 f/cm<sup>3</sup>...

Indian researchers have reported numerous instances of high exposure levels to asbestos fibres in the workplace, which indicates a potential epidemic-like situation of asbestos-related diseases in the coming years.”<sup>6</sup>

In 2007, the Indian Government commissioned new “research” on the hazards of chrysotile use in India. Seventy-four per cent of the funding for the proposed study came from the Department of Chemicals and Petrochemicals and 26% came from the (Indian) asbestos industry. Independent scientists have described this “research” exercise as: “a waste of valuable resources,” having “serious methodological shortcomings, non-conventional data presentation, and interpretations,” and being “methodologically incomplete and (having) insufficient evidence with misinterpreted data.”<sup>7</sup> The fact that industry stakeholders have been involved in this project from the beginning and that trade unions, environmental NGOs and public health campaigners have been excluded is revealing. Whatever spin the Government puts on the final report, there is little doubt that this is nothing more than a propaganda exercise intended to justify the Government’s 3<sup>rd</sup> veto of UN action on chrysotile asbestos.<sup>8</sup> In India, in Canada and in other countries with profitable asbestos sectors, the human tragedy of the asbestos-injured is overlooked for the “good” of national economies and matters of political expediency.

#### **4. Ban Asbestos Mobilization**

In India, where there is no official recognition of or compensation for asbestos-related disease, grass roots organizations have been working with injured workers to raise awareness of the consequences of hazardous exposures. Groups like Ban Asbestos India, Toxics Link and The Other Media initiate local projects to support workers and bring court cases to expose the government’s collusion with the asbestos industry. Similar actions are on-going around the world. Using the internet and innovative outreach programs, civil society in countries such as Japan, Brazil, Korea and Indonesia has succeeded in raising public and professional awareness of asbestos issues. Increasing collaboration amongst asbestos victims’ groups, trade unions, international agencies, global labor federations and other bodies has succeeded in maximizing the effectiveness of the ban asbestos campaign.<sup>9</sup>

#### **5. Asbestos Use in the Eastern Mediterranean (EM) Region**

Reliable information on consumption of asbestos in the EM region has proved elusive. Nevertheless, some data on EM imports have been obtained for the years 2003 and 2006

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<sup>6</sup> Krishna G. *The Plight of Asbestos Victims in India*. Presentation at the Global Asbestos Congress. Tokyo 2004.

<sup>7</sup> Dutta M. *Briefing Note on Asbestos*. February 1, 2007. Private Communication.

<sup>8</sup> *Chrysotile Asbestos: Hazardous to Humans, Deadly to the Rotterdam Convention*. IBAS, BWI publication 2006. [http://ibasecretariat.org/chrys\\_hazard\\_rott\\_conv\\_06.pdf](http://ibasecretariat.org/chrys_hazard_rott_conv_06.pdf)

<sup>9</sup> For more information on the work of these activists, see the International Ban Asbestos Secretariat website: [www.ibasecretariat.org](http://www.ibasecretariat.org)

(see table 1).<sup>10</sup> Although all of the countries listed in table 1 are members states of the International Labor Organization, not one of them has signed has ratified *ILO Convention No. 162, Concerning Safety in the Use of Asbestos*.<sup>11</sup> This suggests that even the most minimal health and safety precautions for protecting workers from hazardous exposures are likely to be lacking.

**Table 1: Chrysotile Asbestos Imports for EM Region (tonnes)<sup>12</sup>**

Country	2003	2006	% Change
Iran	75,852	52,776	-30%
United Arab Emirates	9112	19,713	+116%
Egypt	2382	64	-97%
Pakistan	3129	6,991	+123%
Syrian Arab Republic	1209	1,858	+54%
Morocco	1478	1,944	+32%
<b>Total</b>	<b>93,181</b>	<b>85,947</b>	<b>-8%</b>

Calculations were done which showed the following:

- dramatic increases in consumption in the majority of countries; the average increase exceeded 80%;
- decreases in only 2 countries with an average decrease of 63.5%;
- an overall decrease in EM consumption of 8%.

There is no way this is a definitive or scientific analysis; much more information is required before an accurate assessment of the EM mesothelioma risk can be made. Let us, for the moment, however, use these figures to calculate the mesothelioma incidence which could be expected from such levels of consumption. At the current rate of usage annual mesothelioma deaths in these countries could, in 40 years, be around 500.<sup>13</sup>

<sup>10</sup> As there is no asbestos mining in the EM region, asbestos imports equal the level of national consumption.

<sup>11</sup> <http://www.ilo.org/ilolex/english/convdisp1.htm>

<sup>12</sup> The data in tables 1 & 2 come from statistics compiled by the United States Geological Survey.

<sup>13</sup> The annual incidences of mesothelioma which could be expected based on the consumption figures for 2006 are calculated using the figure suggested by Dr. Antti Tossavainen; see page 1.

**Table 2: Chrysotile Asbestos Imports for EM Region (tonnes)**

<b>Country</b>	<b>1960</b>	<b>1970</b>	<b>1975</b>	<b>1980</b>
Iran	1246	11,197	24,814	23,392
United Arab Emirates	---	---	2000	4631
Egypt	6583	6609	5477	4387
Pakistan	---	---	7000	10,679
Iraq	450	2000	1482	---
Saudi Arabia	---	---	10,405	52,225
Syrian Arab Republic	---	---	3391	4076
Morocco	2676	3551	7160	6770
Lebanon	2258	6418	---	---
<b>Total</b>	<b>13,213</b>	<b>29,775</b>	<b>61,729</b>	<b>106,160</b>

To predict the number of EM mesothelioma fatalities in 2015, we divided 1975 EM consumption of 61,729 metric tons by 170 and produced an estimate of 363; using the same method, the predicted mesothelioma incidence for 2010 is 175.<sup>14</sup> Putting these figures into context, Dr. Tossavainen commented:

“The population of these 9 countries is about 350 million which means that currently the average incidence would be around one case/million/year. Please note that the per capita use of asbestos is rather low in this region (about 0.2 kg/year/inhabitant) due to their low stage of industrial development.

Certainly all the above calculations are rough estimates but they give a reasonable estimate on the magnitude of the problem.”<sup>15</sup>

Of course, mesothelioma is not the only disease caused by exposure to asbestos. When fatalities from asbestos-related lung cancer, asbestosis and other conditions are added, the regional asbestos death toll is substantially increased.

## **6. Wait a Minute!**

Having ruminated on these figures, I decided to conduct a back-of-the-envelope attempt to corroborate these predictions by comparing them with the UK experience. Assuming a latency period for mesothelioma of 40 years as we have done earlier,<sup>16</sup> I ascertained that British asbestos consumption in 1965 was 175,000 tons. Using Tossavainen’s figure of 170 tons consumed/1 mesothelioma, the predicated level of British mesothelioma deaths

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<sup>14</sup> There is a very important qualification that should be noted. Tossavainen’s figure of 170 tons/mesothelioma was based on data from Europe where some regulations on asbestos use and exposures had been introduced. In countries where no such regulations were in place, it is logical to believe that the tonnage per mesothelioma would be somewhat lower.

<sup>15</sup> See Appendix A.

<sup>16</sup> The latency period for mesothelioma is usually given as 30-50 years.

in 2005 would be 1029. The actual mesothelioma incidence was 2037,<sup>17</sup> more than double that suggested by the AT calculations.<sup>18</sup>

The true impact of asbestos use in the Eastern Mediterranean region will only be known when accurate data is available and when the conditions which prevailed in the EM region about occupational, environmental and domestic asbestos exposures are known.

## 7. The Way Ahead

When the problems which remain in the industrialized world from its asbestos past are considered, it is inexplicable that decision makers in EM countries continue to allow the use of this acknowledged toxin. Current asbestos exposures will lead to higher health costs, lost productivity and increasing mortality from a range of asbestos-related diseases. Incorporating even more asbestos into national infrastructures will only worsen an already deadly situation. Contaminated buildings and transport systems constitute a risk to all who use, work in or maintain them; over time, the presence of asbestos will attract higher maintenance bills as governments mandate stricter regulations for minimizing hazardous exposures. And, in the end, any asbestos used will have to be removed and dumped as hazardous waste, incurring yet more avoidable costs

The mesothelioma epidemic which has already killed so many in the West is coming to the EM; judging by figures produced by Drs. Rabab Gaafar and Nelly Aly Eldin it has already arrived in Egypt.<sup>19</sup> Where asbestos prohibitions have been enacted, consumption reduces twice as fast as in non-ban countries.<sup>20</sup> Although Saudi Arabia and Egypt have bans, historical consumption and increasing use by some EM countries suggest that mesothelioma and other asbestos-related diseases will be a growing problem in the future. Banning the use of asbestos throughout the EM is a vital component of a regional health strategy.

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<sup>17</sup> The 2,037 British mesotheliomas in 2005 are just part of the country's asbestos-related death toll. The Health and Safety Executive postulates a total of 4,134 asbestos-related deaths (including mesothelioma, lung cancer and asbestosis); postulated because the vast majority of asbestos-related lung cancer cases remain unrecognized.

<sup>18</sup> As a side note, it is interesting to note that a graph showing the correlation between UK asbestos consumption and male mesothelioma deaths which was part of the paper *Continuing increase in mesothelioma mortality in Britain* by Peto J, Hodgson JT, Matthews FE, Jones JR (1995) *Lancet* 345: 535-539 is a very good fit; it shows 1900 male mesothelioma deaths in 2005; the actual figure was 1955.

<sup>19</sup> Gaafar R. M., Aly Eldin N. H. *Epidemic of Mesothelioma in Egypt*. *Lung Cancer* (2005) 4951, 517-520.

<sup>20</sup> *An International Comparative Approach to the Global Asbestos Epidemic*, a paper presented by Dr. Ken Takahashi on November 23, 2007 at the International Conference on Asbestos in Yokohama, Japan. This paper has been submitted for publication.

**Correspondence from Dr. Antti Tossavainen**<sup>21</sup>

An email received from Dr. Tossavainen clarified several issues behind the figure of 170 tons of asbestos consumption per mesothelioma. He wrote:

“The number comes from the correlation between the annual use of asbestos about 40 years ago and the current annual incidence of mesothelioma (cases/year/million). It means that all exposures related to industrial asbestos products are accounted for, including production, manufacture, use and environmental pollution from all occupational, nonoccupational and domestic sources.

Exposures from natural sources (unrelated to industrial production or use, and therefore not included in the use values) are not significant for the mesothelioma incidence except in some very limited areas, e.g. in Turkey, Greece or China. Although the national incidences cover all mesotheliomas, this natural exposure is of minimal importance at national level or in comparison to occupational exposures. Since year 1980 over 1000 mesotheliomas have been registered as occupational diseases in Finland and not a single case has been attributed to exposure to natural sources (please note that over 2000 mesotheliomas were recorded in our cancer registry).

For your preliminary calculations for EM region countries, you must use the ANNUAL estimate for the asbestos use in the 1960s for the estimation of current incidence (or the use of asbestos in 2006 for the incidence estimate in 2046). This means that the use of 61729 tons in 1975 would induce 360 mesotheliomas in 2015 (or 85947 tons in 2006 equaling about 500 mesotheliomas in 2046).

The population of these 9 countries is about 350 million which means that currently the average incidence would be around one case/million/year. Please note that the per capita use of asbestos is rather low in this region (about 0.2 kg/year/inhabitant) due to their low stage of industrial development.

Certainly all the above calculations are rough estimates but they give a reasonable estimate on the magnitude of the problem.”

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<sup>21</sup> Received by Laurie Kazan-Allen on February 1, 2008.