International Chrysotile Association

For environmental
occupational health
safe and responsible use

Science Must Prevail

2015

NO DETECTABLE HEALTH RISKS WHEN CHRYSOTILE ONLY IS USED IN COMPLIANCE WITH LOW EXPOSURE LIMITS (≤1F/CC)

ICA
International Chrysotile Association

For environmental, occupational health, safe and responsible use

Margaret Chan
General Director WHO

Subject: New version (2014) of the WHO Fact Sheet on asbestos

Dear Mrs Chan,

I am writing you in my capacity of Chairman of the International Chrysotile Association (ICA).

ICA is fully supportive of WHA Resolution 60.26 regarding the elimination of asbestos-related diseases and therefore our association defends and promotes the responsible use of the chrysotile fibre, through the adoption and application of appropriate prevention and control measures regulations, standards, work practices and techniques for its safe use.

I have noticed that the WHO Media Centre has just released (July 2014) a new version of the Fact Sheet Nº 343 on asbestos.

Apart from the disputable statement that (QUOTE) « *more than 107 000 people die each year from asbestos-related lung-cancer, mesothelioma and asbestosis* », the above mentioned Fact Sheet indicates that WHO works towards the elimination of asbestos-related diseases : (QUOTE) « *by recognizing that the most efficient way to eliminate asbestos-related diseases is* ***to stop the use of all types of asbestos*** ».

This statement contradicts the letter and the spirit of the WHA Resolution 60.26 where no mention to an asbestos ban is made and it makes clear that a (QUOTE) « *differentiated approach to regulating its various forms* » is necessary. Unfortunately, since many years, similar contradictory and inconsistent statements have been made by some WHO officials.

As a qualified representative of the civil society in this matter, I would like to address my complaint against those public statements of any kind made by WHO officials (Media Center, interviews, speeches, presentations in seminars, etc.) which do not support WHA decisions and I request that –unless the statements are made on a personal capacity- when acting on behalf of the WHO any WHO representative or person working for the organization fully respect the WHA resolutions.

Sincerely yours,

Jean-Marc Leblond
Chairman - ICA

THE WORLD HEALTH ORGANIZATION (WHO) AND THEIR PRESENT AND EXTRAORDINARY ASBESTOS STORY ABOUT MORE THAN 100,000 DEATHS EACH YEAR RELATED TO ASBESTOS

This is the time now for WHO authorities to listen to others than the anti-asbestos family and to take their responsibilities, to stop controversial presentations at international seminars or interviews posted on YouTube, that unfortunately seems to be a strong support of WHO to the vested interest of questionable lobbies. Too often, data used by some WHO activists are misleading, based on unsubstantiated evidence oriented for the best interests for a world ban of chrysotile, and do not address a safe and responsible approach to protect the health of workers and of the general population.

This is not in the best WHO's interest. Bias should have no place at WHO. Only science should prevail in all times.

A careful examination of recent scientific studies shows that this extraordinary asbestos story about more than 100,000 deaths is grossly misleading, represents only selective parts of the scientific info, and does not take into consideration many other important aspects of this very complex subject.

ON THE USE AND MISUSE OF STATISTICS

Over the last decades, the world has been bombarded with statistics. A "tsunami of statistics", that has been compiled on all sorts of subjects. Some have called this assault "the tyranny of numbers".

There are inescapably all kinds of statistics: a simple count of population in a country, or a city; the number of vehicles passing over a bridge in one year, etc. Other statistics are about trends over months or years of some evolving process. We just take notice.

Other kinds (currently published) of statistics are truly disquieting, and beg for action by responsible authorities. For instance, in November 2006, the US National Academies stated that inadequate drinking water is a leading cause of death in children and today, this situation has not really changed.

"Inadequate drinking water is the second-leading cause of death among children worldwide, according to a new report from the United Nations Development Program. Almost 2 million children die from unsanitary water every year. Globally, about 1.1 billion people do not have access to clean water, and 2.6 billion lack adequate sanitation, according to the report. Although many countries are improving access to water, drainage systems and the number of households with toilets (these) are not keeping pace (with demand), leading to the spread of disease."
(http://nationalacademies.org/headlines/20061127.html)

The Economic and Social Council (ECOSOC) of the United Nations meets each year alternatively in New York and Geneva. The ECOSOC receives the reports of activities of the UNICEF, the FAO, the WHO, the ILO among others. According to the statistics published

for 2007, 36 million persons died of hunger or following its immediate consequences. Additionally seven million other persons died following lack of safe potable water and from exposure to polluted water. The United Nations Development Programme (UNDP) states that: "More than a billion people lack access to clean drinking water and over 2.4 billion lack access to proper sanitary facilities. The result is that there are more people in the world's hospitals today suffering from water-borne diseases than any other ailment. Some two million children die every year – 6,000 a day – from such infections." (Mark Malloch Brown, Administrator of UNDP)

One cannot escape the disturbing reality of these numbers. A ban of chrysotile fibres is not in WHO's mandate or at least, it should not be.

Finally, there are also other statistics that need to be carefully evaluated. For instance, in order to support one's particular views, one can quote **only parts** of the available numbers. An example was used by some ideologues who carefully **selected parts** of a document prepared for the World Health Organization (WHO Assembly Resolution 58.22 on cancer prevention and control, 2005), citing a WHO publication (Concha-Barrientos et al., 2004), stating that:

"Currently about 125 million people in the world are exposed to asbestos at the workplace. According to global estimates at least 90,000 people die each year from asbestos-related lung cancer".

Unfortunately, few people would bother to scrutinize the validity and completeness of such numbers. But a careful examination of the Concha-Barrientos report shows that the above statements and statistics are grossly misleading, in that they represent only the selected parts of the report, which suited the intention of some ideologues. Here are the facts and the complete conclusions of the Concha-Barrientos report.

First, the Concha-Barrientos et al. report acknowledges that there is a difference in risk between chrysotile and the amphibole varieties of asbestos. In chapter 21, p. 1687, the authors state:

"Currently, about 125 million people in the world are exposed to asbestos at the workplace. According to global estimates at least 90,000 people die each year from asbestos-related lung cancer." ***But the authors also add:*** *"In 20 studies of over 100,000 asbestos workers, the standardized mortality rate ranged from 1.04 for chrysotile workers to 4.97 for amosite workers, with a combined relative risk of 2.00. It is difficult to determine the exposures involved because few of the studies reported measurements, and because it is a problem to convert historical asbestos measurements in millions of dust particles per cubic foot to gravimetric units.* ***Nevertheless, little excess lung cancer is expected from low exposure levels."***

The Concha-Barrientos report echoes the benchmark publication by Hodgson and Darnton (2000), in which the specific risk of cancer death is addressed. These authors calculated the risks for mesothelioma on the assumption that exposure commenced some time between the ages of 20 and 45 years and ceased at age of 65 years. Assuming **a mixed fibre type**, the lifetime risk of cancer death is approximately 100/100,000 fibre.year per ml. This combined estimate is based on best estimates of risk for different cumulative exposures categories. For cumulative exposures of between 10 and 100 f/ml.years, the risks are: **400 deaths per 100,000 exposed for each f/ml.year of cumulative exposure for crocidolite, 65/100,000 for amosite and 2/100,000 for chrysotile.**

For cumulative exposures of 0.1 f/ml.years, the risks are respectively 100 deaths per 100,000 exposed for crocidolite; 15 deaths per 100,000 exposed for amosite and "probably insignificant" for chrysotile. (Hodgson and Darnton, 2000, Table 11).

The official decision taken:

WORLD HEALTH ORGANIZATION -
WORLD HEALTH ASSEMBLY
FINAL RESOLUTIONS – PAGE 86, ITEM 10
2007

"WHO will work with Members States to strengthen the capacities of the ministries of health to provide leadership for activities to workers' health, to formulate and implement policies and action plans, and to stimulate intersectoral collaboration. Its activities will include global campaigns for elimination of asbestos-related diseases; **bearing in mind a differentiated approach to regulating its various forms;** in line with relevant international legal instruments and the latest evidence for effective interventions."

Furthermore, to find wording about specific needs and conditions in the text of Outline on page 2: *"Countries can use this document according to the specific national and local conditions and available resources."*

WHA
http://apps.who.int/gb/ebwha/pdf_files/WHA60-REC3/A60_REC3-en.pdf

REVIEW

of the differences between chrysotile and amphibole asbestos

"Asbestos" is not a mineral in itself. It is a collective term given to a group of minerals whose crystals occur in fibrous forms. The term "asbestos" was adopted for commercial identification.

The six minerals commonly referred to as asbestos come from two distinct groups of minerals. One group is known as serpentines (chrysotile, white asbestos); while the other group is the amphiboles (amosite, brown asbestos; crocidolite, blue asbestos; anthophyllite; tremolite; and actinolite). While both are all silicate minerals, the two groups are chemically and mineralogically distinct.

CHRYSOTILE

Chrysotile is a sheet silicate which is formed as a very thin rolled sheet as illustrated in Figure 1. The sheet is about 8 angstroms thick (0.8 nanometers thick). It is composed of a sandwich of magnesium and silica. In the lung, the acid environment of the macrophage scavenger cell quickly breaks apart the sheet structure causing the fiber to decompose into small pieces (Figure 2). These pieces can then be readily cleared from the lung. If the fiber is swallowed and ingested it is attacked by the even stronger acid environment (hydrochloric acid, pH 2) in the stomach.

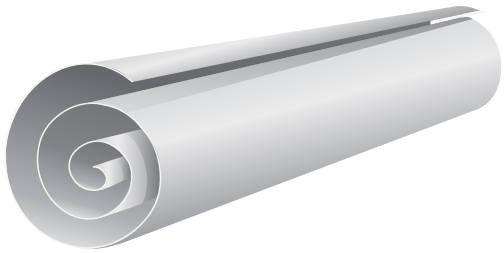


Figure 1 - Chrysotile

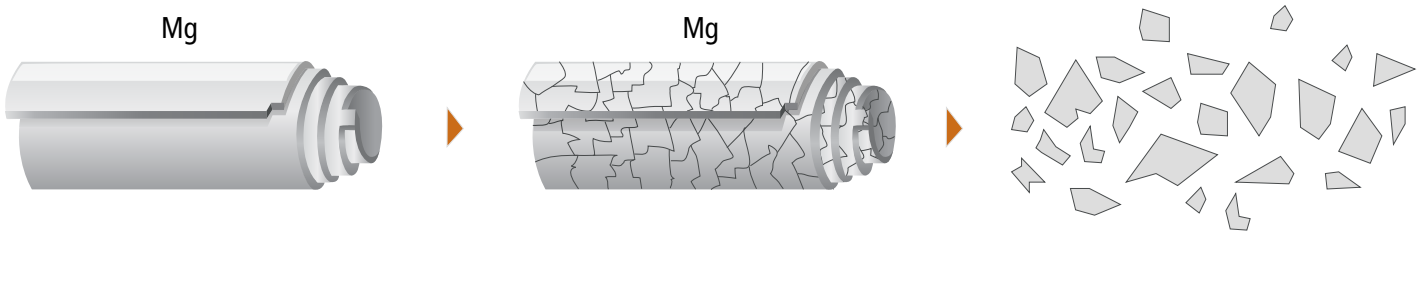


Figure 2 - Chrysotile Fiber Disintegration

AMPHIBOLE ASBESTOS

This is in contrast to the amphibole asbestos fibers which are formed as solid rods/fibers as illustrated in Figure 3. The structure of an amphibole is a double chain of silicate tetrahedral which makes it very strong and durable. The external surface of the crystal structures of the amphiboles is quartz-like, and has the chemical resistance of quartz. The amphibole fibers have negligible solubility at any pH that might be encountered.

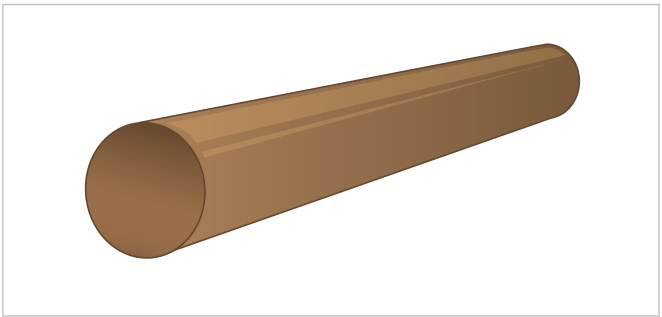


Figure 3 - Amphibole asbestos (e.g. amosite)

THE KEY FACTORS THAT DETERMINE FIBER TOXICITY:
Mineral fiber toxicology has been associated with three key factors:

- DOSE
- DIMENSION AND
- DURABILITY

DOSE

The dose is determined by the fiber's physical characteristics/dimensions, how the fibrous material is used and the control procedures that are implemented. In addition, the thinner and shorter fibers will weigh less and thus can remain suspended in the air longer than thicker and longer fibers. Most asbestos fibers are thinner than commercial insulation fibers, however, they are thicker than the new nano-fibers which are currently being developed.

DIMENSIONS

The fiber dimensions govern two factors, that of whether the fiber is respirable and secondly if it is respirable the dimensions are also a factor in determining their response in the lung milieu once inhaled. Shorter fibres of the size which can be fully engulfed by the macrophage will be cleared by mechanisms similar to those for non-fibrous particles. These include clearance through the lymphatics and macrophage phagocytosis and clearance. It is only the longer fibers which the macrophage can not fully engulf which if they are persistent can lead to disease.

The importance of fiber length in asbestos toxicity was first addressed in studies by Vorwald et al. (1951). Subsequently, dose, dimension and durability have been shown to be important determinants for synthetic mineral fibers (Hesterberg et al. 1998 a& b; Miller et al. 1999; Oberdoester, 2000; Bernstein et al. 2001 a&b). The importance of durability in differentiating asbestos fiber toxicity between the serpentine mineral fiber chrysotile and the amphibole mineral fibers such as amosite and crocidolite has been addressed more recently (Bernstein & Hoskins, 2006).

DURABILITY

This leads to the third factor, that of durability. Those fibers whose chemical structure renders them wholly or partially soluble once deposited in the lung are likely to either dissolve completely, or dissolve until they are sufficiently weakened focally to undergo breakage into shorter fibres. The remaining short fibres can then be removed though successful phagocytosis and clearance.

CHEMICAL STRUCTURE AND BIOPERSISTENCE:

The relationship of chemical composition with dissolution and subsequent breakage was first reported by Hammad (1984). Synthetic mineral fibers <5 µm in length had the longest retention in the lung following short-term inhalation, with longer fibers clearing more rapidly and fibers >30 µm in length clearing very rapidly. He proposed that clearance of mineral wools is a result of biological clearance and the elimination of fibers by dissolution and subsequent breakage. However, there was no relationship of these phenomena to long-term toxicological effects.

Early chronic inhalation studies of fibers were often performed without consideration of the respirability of the fibers in the rat and without preserving the length distribution of the fibers. In addition, they were often performed at very high total particle/fiber exposure concentrations. As mineral fibers often occur in bundles of long strands, investigators would grind the fibers to produce a more respirable fraction instead of separating the fibers from the bundles. This process frequently pulverized the rat respirable long fiber fraction producing excessive particles and shorter fibers, sufficient to cause lung overload in the rats.

In 1988, a series of chronic inhalation studies on synthetic mineral fibers (SMF) were performed which took into account the respirability of mineral fibers in the rats and the importance of fiber length in both the preparation of the fibers and the exposure techniques (Hesterberg et al., 1993, 1995; Mast et al., 1995a, 1995b; McConnell et al., 1994, 1995). The results of the studies indicated that the more soluble fibers tested showed little or no pathogenic response, while less soluble fibers showed more response. To further investigate this, a 5-day inhalation protocol was developed for the evaluation of the biopersistence of SMF (Musselman et al., 1994; Bernstein et al., 1994) with numerous fibers analyzed using this protocol (Bernstein et al., 1996; Hesterberg et al., 1998). This 5-day inhalation exposure was proposed by the U.S. Environmental Protection Agency (EPA, 1996) for evaluating the pathological response and biopersistence of inhaled fibers.

The biopersistence protocol was also incorporated by the European Commission (European Chemicals Bureau "Ispra Protocols", EUR 18748 EN, 1999) as part of the European Commission's synthetic fiber directive (European Commission, 1997).

RELATIONSHIP OF BIOPERSISTENCE TO CARCINOGENIC POTENTIAL:

In the series of SVF chronic inhalation studies performed at RCC in the 1980s the relation of the more durable fibers to disease became more apparent and resulted in the design of the inhalation biopersistence study as described above. The importance of fiber length on the potential of a fiber to produce a pathogenic effect was well documented (Lippmann, 1990: McClellan et al., 1992; WHO, 1988; Goodglick & Kane, 1990).

In an analysis that provided the basis for the European Commission's Directive on synthetic mineral fibers, Bernstein et al. (2001 a&b) reported on the correlation between the biopersistence of fibers longer than 20 µm and the pathological effects following either chronic inhalation or chronic intraperitoneal injection studies. As summarized in Table 1, this analysis showed that it was possible using the clearance half-time of the fibers longer than 20 µm as obtained from the inhalation biopersistence studies to predict the number of fibers longer than 20 µm remaining following 24 month chronic inhalation exposure; the early fibrotic response (collagen deposition) observed after 24 months of exposure in the chronic inhalation toxicology studies; and the number of tumours and fiber dose in the chronic intraperitoneal injection studies. These studies, however, only included synthetic mineral fibers.

Table 1 Summary of the correlation between the biopersistence of fibers longer than 20 µm and the pathological effects following either chronic inhalation or chronic intra-peritoneal injection studies. (Bernstein et al., 2001a&b).

THE BIOPERSISTENCE OF FIBERS LONGER THAN 20 µm	CORRELATES WITH:
	• The number of fibers L> 20 µm remaining in chronic inhalation toxicology studies following 2 years of exposure. • The early fibrotic response (collagen deposition) observed after 24 months of exposure in the chronic inhalation toxicology studies. • The number of tumours and fiber dose in the chronic intraperitoneal injection studies.

Recent studies on the serpentine asbestos chrysotile have shown that it is not very biopersistent in the lung. As serpentine is a naturally occurring mined fiber, there appears to be some differences in biopersistence depending upon from where it is mined. However, chrysotile lies on the soluble end of this scale and ranges from the least biopersistent fiber to a fiber with biopersistence in the range of glass and stonewools. It remains less biopersistent than ceramic and special purpose glasses and more than an order of magnitude less biopersistent than amphiboles. The 90 day sub chronic inhalation toxicity study of chrysotile in rats shows that an exposure concentration 5,000 times greater than the US-Threshold Limit Value of 0.1 f(WHO)/cm^3, chrysotile produces no significant pathological response.

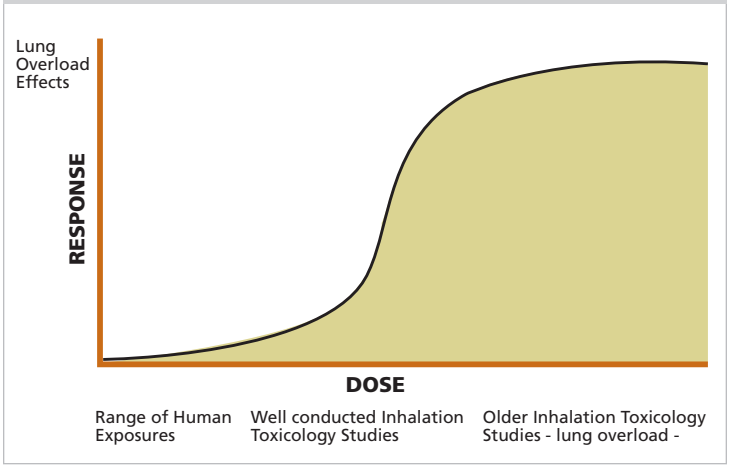
DIFFICULTIES IN INTERPRETING INHALATION TOXICOLOGY STUDIES:

While many chronic inhalation toxicology studies of fibers ranging from amphibole asbestos, to soluble glass fibers and to organic fibers have been performed their design and subsequent interpretation are often confounded by the fiber size distribution and the ratio of longer fibers to shorter fibers and non-fibrous particles. In many of these studies the exposures often approach and exceed that which has been shown to produce what is now termed 'lung overload' in the rat. Thus, it can become very difficult to compare the effects of such a study with those of another. In most chronic inhalation studies on asbestos, the fiber exposure concentration was determined based upon a gravimetric concentration of 10 mg/m^3 without regard for fiber number or size.

High concentrations of insoluble dusts when administered by inhalation in the rat have been shown to overload the lung by compromising the clearance mechanisms, which can result in inflammation and a tumorigenic response (Bolton et al., 1983; Muhle et al., 1988; Morrow, 1988&1992; Oberdorster, 1995 a&b).

As illustrated in Figure 4, inhalation toxicology studies are generally performed above the levels at which humans have been exposed. However, when the exposure level is elevated to levels 100,000s times human exposure as occurred in most older fiber inhalation studies with chrysotile and amphibole asbestos, lung overload occurs.

Figure 4 - Dose Response Fiber Toxicology Studies



While well-designed chronic inhalation toxicology studies of synthetic mineral fibers have been performed, nearly all chronic inhalation toxicology studies of asbestos have not been designed in a similar fashion. McConnell, et al. (1999) reported on perhaps the only well designed multiple-dose study on any asbestos where amosite particle and fiber number and length chosen to be comparable to the SVF exposure groups. In this hamster inhalation toxicology study the amosite aerosol concentration ranged from 10 to 69 f/cm^3 longer than 20 µm and were chosen based upon a previous, multi-dose 90-day subchronic inhalation studies (Hesterberg et al., 1999). No chronic inhalation toxicology studies of chrysotile using similar fibers selection techniques and without exceeding lung over low doses have been performed.

ARE THERE OTHER FIBERS THAT BEHAVE AS CHRYSOTILE?

At acidic pH chrysotile becomes less stable which leads to the clearance/disintegration of the long chrysotile fibers. Kamstrup et al. (2001) described a similar process for long HT fibers which are highly soluble at pH 4.5. The HT fiber has been evaluated in well designed chronic inhalation toxicology study as well as in a chronic intraperitoneal injection study and found to be not carcinogenic. The inhalation biopersistence clearance half-time for this fiber is less than 10 days and has been classified as not carcinogenic by the European Commission and is allowed for use in the United States.

DIFFICULTIES IN INTERPRETING EPIDEMIOLOGY STUDIES:

As fiber related disease in humans takes 30 or more years to develop, the workers evaluated in most asbestos epidemiology studies were exposed from the 1940's to the 1960's. With few exceptions little or no sampling was conducted prior to the 1950s when exposure concentrations were thought generally to be higher than those monitored more recently, due to lack of use of dust control equipment at the time and procedures to reduce dust levels that were introduced only later. For many studies, therefore, early exposures had to be estimated by extrapolation from later measurements.

In a recent analysis of available epidemiological data on the different asbestos types, Berman and Crump (2003) have summarised the various limitations that could influence the epidemiological evaluations and that had to be addressed. These included:

- limitations in air measurements and other data available for characterizing historical exposures;
- limitations in the manner that the character of exposure (i.e., the mineralogical types of fibers and the range and distribution of fiber dimensions) was delineated;
- limitations in the accuracy of mortality determinations or incompleteness in the extent of tracing of cohort members;
- limitations in the adequacy of the match between cohort subjects and the selected control population; and
- inadequate characterization of confounding factors, such as smoking histories for individual workers.

In mixed chrysotile and amphibole asbestos epidemiology studies, the epidemiologists would try to factor the effect of each based upon studies with amphibole alone. However, none of these extrapolations have taken into account the difference in potency of longer amphibole fibers compared to shorter fibers. Thus, if the amphibole study had a larger percentage of longer fibers and the amphibole in the mixed (chrysotile and amphibole) had fewer longer fibers, then the extrapolation would grossly overestimate the contribution from chrysotile.

These factors make it very difficult to assess effects using mixed exposure studies as even a relatively small exposure to long fiber amphibole could account for all the tumorigenic response. It is interesting to note that all epidemiology studies where only exposure was chrysotile have shown no effect.

AGAINST BANNING CHRYSOTILE

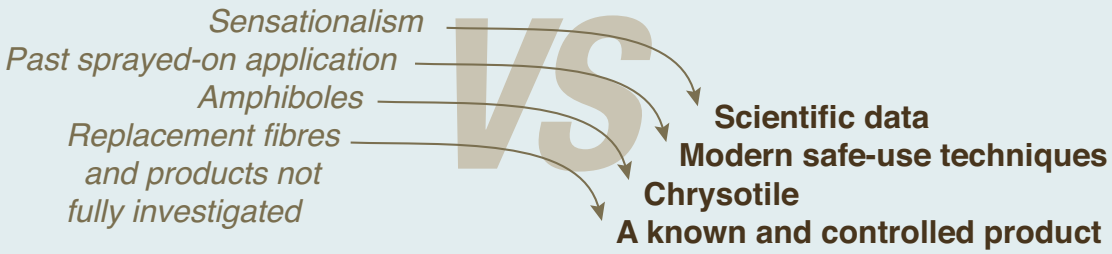
The WHO's mos senior authority, the World Health Assembly (WHA), decided in 2007 **AGAINST banning chrysotile** or white asbestos. To this day, and contrary to a well-organized propaganda, this resolution remains the official standing policy of both the WHA and the WHO.

This anomaly is due to a significant number of WHO employees, notably within its Department of Public Health and Environment, who are systematically pursuing what can only be described as a parallel agenda, to campaign for a total worldwide ban on chrysotile by passing off the working documents of their 2007 resolution as if a total BAN was the official policy and they promote that 107,000 workers will die each year from asbestos related disease and, secondly, that the bulk of these deaths are from exposure to chrysotile (white asbestos) and the products made with it.

The extraordinary dimension of this story is, that without any explanation or supporting science, this group has not only ignored the 2007 WHA official resolution against a total ban on chrysotile but also the policy the WHO accepted at the WHA Assembly. Peer reviewed recent studies and definitive research into the toxicology of all types of asbestos fibre concluded that mesothelioma, the main asbestos killer that accounts for an estimated 95% of all asbestos related mortality and cancers, cannot have exposure to chrysotile fibre as its causation. It also concluded that chrysotile cement products have almost NO measurable risk to health (Chrysotile cement makes up 90% of all asbestos containing products worldwide and in many countries it is 100%). This conclusion has been confirmed by many independent research papers published since 1996.

Asbestos: The cause of ***100,000 Deaths...*** yearly ?

MYTH OR REALITY?



Few other natural resources have been the subject of more research than chrysotile asbestos. Nevertheless, in spite of all the scientific data accumulated on the health effects of chrysotile and other fibres and, in spite of measures taken by the industry, the workers and their labor organization, a climate of uncertainty persists among the public. Today, chrysotile is not the devastating threat to the population, to the world and to the workers, as it is widely alleged by some activists who too often manipulate statistics. The chrysotile world, through the years, has answered and argued with logic and common sense. Rational response and explanations have been given, and the potential risk that this natural fibre may present has been addressed.

Thus, over three decades there has been consistent published evidences that chrysotile can be used under an efficient controled use program — with no real measurable risk to health. Many examples of its being used successfully have been noted. In fact, using chrysotile within the parameters of the regulated exposure limit and respecting the good work practices in place will insure that it is being used safely.

The good news is that the practical implementation of the safe and controlled use of chrysotile remains simple.

"Statistics are no substitutes for judgment."

Henry Clay, American Statesman

THE DIFFERENCE BETWEEN MYTH AND REALITY

- Between partial and extrapolated statistics and the modern reality of the chrysotile industry, there exists a whole world of misperception and exaggerated fears fed by activists for a total ban of all asbestos fibres without distinction and always without taking into account the scientific studies of the last decade.

SENSATIONALISM VERSUS SCIENTIFIC INFORMATION

- Certain statistics illustrate reality:
  - 1.1 billion people do not have access to drinking water, causing the death of some 2 million children a year;
  - 2.6 billion people cannot count on basic sanitary installations such as toilets, sewers, drains, etc.;
  - In 2007, 36 million people died of hunger and the result of malnutrition added to the 7 million people who died because they lacked clean drinking water.
- However, statistics can be used as propaganda when:
  - They are used to give a scientific aspect to an ideological vision
  - They are given in reference in a partial and dramatic way
  - They are somewhat truncated and extrapolated with the intention to provoke fear rather than to inform

THE MISLEADING USE OF THE CONCHA-BARRIENTOS REPORT (2004)

- An incomplete quote:
  - "125 million are exposed to asbestos at the workplace. According to estimates, at least 90,000 people die each year from asbestos-related cancer".
- What the propaganda forgot:
  - "In 20 studies of over 100,000 asbestos workers, the mortality rate (SMR) ranged from 1.04 for chrysotile workers to 4.97 in the case of amosite".

Some supporters of the complete ban of all types of asbestos, including chrysotile, deliberately neglect to entirely quote the conclusion of the Concha-Barrientos report: ***"Nevertheless, little excess lung cancer is expected from low exposure levels".***

ALARMING PREDICTIONS BASED ON MISLEADING FOUNDATION

- Often, alarming predictions are based on approximation:
  - that combine fibres and include some that have a higher level of risk than chrysotile and have been prohibited from commercialization for at least two decades (crocidolite and amosite)
  - from higher levels of exposure than the standard of 1 fibre/cc which prevails for chrysotile today.

"100,000 DEATHS"...
TWO WORDS TO DESTROY THE CHRYSOTILE INDUSTRY

Perception	Reality
Asbestos kills more than 100,000 people a year	Propaganda ignores three key factors 1- Type of asbestos 2- Level of exposure 3- Modern safe practices 4- Lack of real science (published scientific studies) to support this assertion There are several types of asbestos fibres and they do not have the same risk level as only chrysotile is being used.
	Controlled exposure in the workplace: or less one fibre/cc
	90% of chrysotile being used consists of cement where fibre is encapsulated. Safe packaging techniques and practices are used to comply with standards of dustiness.

- For propaganda to be effective it should:
  - Look like it's based on scientific information, thus difficult to refute;
  - Be eye catching;
  - Summarize into a simple formula that may seem true when repeated often enough...

A FEW PREDICTIONS FROM JULIAN PETO

- Julian Peto is an epidemiologist from the UK who in 1995 made a statistical estimation on the number of asbestos-related deaths, based on data that carried a lot of confusion but alarmed the whole world.
- It includes all fibres within the same assessment without taking into account the risk level of chrysotile, established as being undetectable at1 f/cc or less.

IN RESPONSE TO PREDICTIONS

- In 2000, Hodgson and Darnton, two prominent UK epidemiologists, established, from studying exposed workers the risks of three different types of asbestos.

- The relative risk for **mesothelioma** was estimated at:
  - 1 for chrysotile
  - 100 for amosite
  - 500 for crocidolite

- The relative risk for **lung cancer** was estimated at:
  - 1 for chrysotile
  - 10 for amosite
  - 50 for crocidolite

Hodgson J.T. and Darnton A. (2000). *The Quantitative Risks of Mesothelioma and Lung Cancer in Relation to Asbestos*, Ann. Occup. Hyg. 44(8) : 565-601

107,000 ALLEGED DISEASES BECAUSE OF CHRYSOTILE ASBESTOS

In numerous occasions, some WHO activists supporting a global ban of chrysotile have said that there are about 107,000 deaths per year related to asbestos.

This statement is certainly the most important springboard in their crusade since many years.

In many occasions, competent authorities of many countries have requested that the WHO authorities explain how they can confirm such assertion based on reliable scientific data and the most recent scientific published studies. Time after time, such reasonable request has been addressed to the WHO. The WHO has refused to answer letters and questions and has ignored the demand for providing information and answers on where to find WHO burden of alleged diseases estimates and methods.

WHO authorities including their international civil servants must not abuse their authority or use their power or position in a manner that is offensive, humiliating, embarrassing or intimidating to another person under the standards of conduct of UN civil servants. UN civil servants must also comply with human rights (of the standards of conduct of UN civil servants), among which belong equal treatment and right to be heard of course.

Should WHO and its anti-asbestos sheerleaders conduct be considered as an abuse of right under ther standards of conducts of UN civil servants (namely: compliance with the WHO's differentiated approach policy)? The answer is of cause, yes.

This enabled the chrysotile world to look into the WHO database of references, on methods of estimation from the WHO references. A document entitled "Health Statistics and Health Information Systems" was publicly known but unfortunately the statistics and so-called recent publications referred to oblige to conclude that WHO failed to confirm that 107,000 people will actually die each year from chrysotile asbestos exposure. One can imagine that these kinds of information were very far from the crucial question … and about chrysotile fibres….

Statistics that were widely used and peddled by some WHO activists and powerful lobbies were evidently badly twisted and not based on real science (recent scientific published studies).

References were mostly commentaries, opinions, suggestions, arbitrary estimates or extrapolation and very far from scientifically based data. In fact, the number of more than 100,000 people that will die each year worldwide was nothing else than pure questionable estimate and still the case nowadays.

It is important to recall that on this specific subject at the 95th session of the ILO in June 2006, the representative from the United States of America asked the following question:

PREAMBULAR, PARAGRAPH 3

332. "The Government member of the United States asked if the figure of 100,000 deaths a year could be justified.

http://www.ilo.org/public/english/standards/relm/ilc/ilc95/pdf/drafrep-css.pdf

The response to this question to date lacks fundamental explanation, lacks scientific basis and in no way validates this number, reported ad nauseam, by militants and the anti-asbestos lobby. Furthermore, nowhere is it taken into account that there is a difference between the asbestos fibre types (amphiboles & serpentine), yet this difference exists (Hodgson JT, Darnton A. *The quantitative risks of mesothelioma and lung cancer in relation to asbestos exposure. Ann. Occup. Hyg. 200, Dec. :44(8):565-601).*

With a little investigative work, one can pretty well find the exact origin of this 100,000 deaths statement. In an Editorial, published in 2004 by Treasure (Dr. J. Peto, co-author) in the BMJ, it is stated that *"In the developed world alone 100,000 people alive now will die from it."* This is in reference to asbestos, all types of asbestos and the people living at that time would eventually die. **It is not a statement on chrysotile or annual deaths.**

For the first time at the "Dresden Declaration on the Protection of Workers Against Asbestos Conference", a presentation by Mr. J. Takala, a well-known anti-asbestos activist, using statistics from Finland mentions this number of 100,000 deaths/year worldwide.

"Finland has an estimated 209 lung cancer fatalities caused by asbestos (no differenciation made between fibre types) every year and 42 cases of mesothelioma. On average, this means 9.9 cases of lung cancer and 2 cases of mesothelioma per 100,000 workers. If we use these rates and apply them to other rather well developed OSH systems and to developing countries we would come to estimated numbers of death caused by asbestos, shown in the table below.

Estimated deaths – 100 000"

However, Mr. Takala adds – and this confirms that it is only an extrapolation on his part:

"In total, there could be some 100,000 work-related deaths caused by asbestos. **These figures are not recorded cases but estimates".**

Since this conference was held, the number of 100,000 deaths/year has been used in the crusade by anti-asbestos activists who promote a global ban of asbestos – including chrysotile.

You will note the well-planned evolution of the use of this number. At the beginning, it is estimated that 100,000 people from industrial countries over the years could die of an asbestos related disease, which then evolves into being **100,000 deaths per year** worldwide **because of asbestos**, and now they want this number to apply to chrysotile. Science does not appear to be involved in this evolution, and for cause because antis are in the field of pure extrapolation here.

It appears to us that the responsible action by the WHO should be to identify the published scientific studies which have been peer reviewed and which demonstrate with precision and exactness the validity of their statistics, taking into account the difference between the amphiboles and serpentine (chrysotile). If the WHO is aware or has in its possession a study or studies which scientifically prove that a person having an occupational exposure to chrysotile (of 1.00 f/cc and below) and carries a measurable risk, they should not refuse or hesitate to disseminate this information.

Moreover, WHO authorities are certainly aware that in fact many scientific studies, peer reviewed and published, consulted and analyzed indicate that at such a low level of exposure, the risk is so low as to be non-measurable. Since the anti-asbestos movement is attempting to prove that there is no acceptable level of exposure to asbestos and have claimed to be speaking officially for the WHO organization, we urge the WHO to us publish now pertinent and relevant information they have on this, in order to confirm their pretention or the one from the propaganda and the assertions of their activists.

MORE RECENTLY THE WHO HAS ISSUED A DOCUMENT ENTITLED:

“Elimination of asbestos related diseases.”

A group of well-known scientists have reviewed this WHO document that aimed to provide the scientific basis for the WHO statement that there are about 107,000 deaths related to asbestos each year. (See the scientific – “Evaluation of the scientific basis for the WHO’s statement on asbestos”)

It is crystal clear again that this evaluation of the WHO scientific basis is just not convincing

WHO must admit that it does not have the necessary scientific data that prove without reasonable doubt that 107,000 people will die each year because of chrysotile exposure. One must conclude that WHO’s statement is based on speculation, extrapolation or well selected data, resulting to an arbitrary position.

The truth has to be known and the chrysotile world is entitled to receive explanations because it is a well known reality speculation, extrapolation, crusade and/or propaganda are not going well with real science.

It is reasonable to come to the only acceptable conclusion that WHO knows very well that chrysotile fibre is not responsible for mesothelioma and regarding lung cancer, WHO knows also well that it is a question of dose (controlled use) and nothing else.

WHO must agree with the fact that science must prevail.

The WHO activists and the asbestos litigation business emotional campaign claims to be saving the lives of, not only workers, but also their wives and children. The truth of the matter is that NO lives will be saved from their policies but substantial sums are lost in spurious claims that should have gone to genuine victims exposed to blue and brown asbestos before the present regulations came into force.

The WHO is seen as a credible and honest organization. Its emplyees that are refusing to recognize real science and to answer the many verbal and written requests and to provide any explanation for this extraordinary issue will possibly tarnish WHO's reputation and it should be for all a matter of great concern.

Let's repeat loud and clear again: WHO does not have in its possession scientific data that demonstrate or support its pretention. The chrysotile, as used nowadays is not and will not be responsible for 107,000 deaths per year as often repeated by it's anti-asbestos loud-speakers. It is simply not the case.

EVALUATION OF THE SCIENTIFIC BASIS FOR THE WHO'S STATEMENT ON ASBESTOS

The World Health Organization (WHO) has issued a document entitled "Elimination of asbestos related diseases[1]" which provides the scientific basis for the WHO statement that there are about 107,000 deaths related to asbestos. The WHO web site[2] states that "According to WHO estimates, more than 107,000 people die each year from asbestos-related lung cancer, mesothelioma and asbestosis resulting from occupational exposures."

The implication in this document as well as in the WHO document "Model National Programme for Elimination of Asbestos-Related Diseases"[3], is that chrysotile as used today is largely responsible for these deaths.

The document states that the WHO estimated the number of deaths related to asbestos in their document by Ezzati et al. (2004) entitled "Comparative Quantification of Health Risks: Global and Regional Burden of Disease Attribution to Selected Major Risk Factors". They cite the chapter by Concha-Barrientos, et al. in Volume 2, Chapter 21: "Selected occupational risk factors" of this document in support of their statement:

"Asbestos is one of the most important occupational carcinogens causing about half of the deaths from occupational cancer"

However, in the entire document by Ezzati et al. (2004), the word chrysotile appears one time on page 1687 in the following statement:

"In 20 studies of over 100,000 asbestos workers, the standardized mortality rate ranged from 1.04 for chrysotile workers to 4.97 for amosite workers, with a combined relative risk of 2.00. It is difficult to determine the exposures involved because few of the studies reported measurements, and because it is a problem to convert historical asbestos measurements in millions of dust particles per cubic foot to gravimetric units. Nevertheless, little excess lung cancer is expected from low exposure levels."

The WHO Ezzati et al. (2004) document cites a review by Steenland et al. (1996) entitled "Review of Occupational Lung Carcinogens". The Steenland et al. paper summarized 20 studies of asbestos workers exposed 20 to 50 years earlier with no assessment or differentiation of whether there was exposure to amphibole asbestos in those studies listed as chrysotile. The Ezzati et al. (2004) document, however, further states that little excess lung cancer is expected from low exposure levels, without mentioning asbestos fiber type.

[1] *http://www.who.int/occupational_health/publications/asbestosrelateddisease/en/*

[2] *http://www.who.int/mediacentre/factsheets/fs343/en/*

[3] *http://www.who.int/occupational_health/publications/elimasbestos/en/*

Steenland et al. (1996) summarized the relative risk for a number of lung carcinogens as follows:

TABLE IX. Summary of Relative Risks from Selected Studies of Occupational Lung Carcinogens and Estimated Number of Workers Exposed

Agent	Relative risk	Number of exposed workers in early 1980s	Proportion of workforce aged 20-65 (126 million)[a]
Cadmium	1.49	258,000 (69% male)	0.20%
Nickel	1.56	147,000 (78% male)	0.12%
Arsenic	3.69	58,000 (78% male)	0.04%
Chronium	2.78	551,000 (83% male)	0.43%
Diesel fumes	1.31	1,350,000 (96% male)	1.07%
Silica	1.33	1,700,000 (90% male)[b]	1.35%
Beryllium	1.49	44,000 (95% male)	0.03%
Asbestos[c]	2.00	700,000 (90% male)[b]	0.50%

[a] Estimated to be 61 million men, 65 million women.

[b] Data on exposure by sex not available, estimated 90% male.

[c] For asbestos, number of attribuable lung cancer cases taken from Nicholson et at. (1982).

The relative risk for asbestos is listed as 2 based on how it was used 20 to 50 years ago (without differentiating whether it was chrysotile or amphibole asbestos). It is also interesting to note that arsenic and chromium have higher relative risks and that none of the other agents listed are banned.

THE WHO ALSO CITES THE MORE RECENT PUBLICATION BY DRISCOLL ET AL. (2005) IN SUPPORT OF THE STATEMENTS ENTITLED:

Driscoll T, Nelson DI, Steenland K, Leigh J, Concha·Barrientos M, Fingerhut M, Prüss-Ustiln A: The global burden of non-malignant respiratory disease due to occupational airborne exposures. Am J Ind Med. 2005, 48;432-45,
In the paper by Driscoll et al. the authors cite the more recent and considerably more complete publication by Hodgson and Darnton (2000) on asbestos risk which differentiates chrysotile from amphibole asbestos and not the older paper by Steenland et al. (1996).

DRISCOLL ET AL. STATES THAT:

"This combined estimate is based on best estimates of risk of 400 per 100 000/fibre.year per ml for crocidolite, 65 per 100 000/fibre. year per ml for amosite and 2 per 100 000/fibre. year per ml for chrysotile, and the changing mixture of amphiboles and chrysotile that has characterised exposure 20 and 50 years ago [Hodgson and Darnton, 2000]."

IN ANOTHER PUBLICATION FROM THE WHO ENTITLED:

Prüss-Ustiln A, Vickers C, Haefliger P, Bertollini B. Knowns and unknowns on burden of disease due to chemicals; a systematic review. Environmental Health. 2011, 10:9."

THE AUTHORS STATE:

"The global burden of disease attributable to asbestos has been estimated to amount to 107,000 deaths and 1,523,000 DALYs for the three mentioned diseases in 2004."
Prüss-Ustiln et al. (2011) cite three references in support of this statement. These include the Concha-Barrientos, et al. (2004) publication discussed above which clearly does not attribute the effect to chrysotile; the publication by Driscoll et al. (2005) which also clearly differentiates chrysotile effects from those from amphibole asbestos; and the WHO 2009 report entitled "Global health risks: mortality and burden of disease attributable to selected major risks " which does not ever mention the word chrysotile.

In the paper by Prüss-Ustiln et al. (2011), chrysotile is also not ever mentioned in the text. Any possible relationship of the "107,000 deaths" to chrysotile is certainly not supported by this paper. The references cited by Prüss-Ustiln et al. (2011) for the 107,000 deaths per year are the same as mentioned above and are based upon the exposure to all types of asbestos (amosite, crocidolite and chrysotile asbestos) at the exposure concentrations that occurred 20 to 50 years ago.

From the publication by Hodgson and Darnton, 2000, based upon exposure levels 20-50 years ago and the analysis of studies as “chrysotile” which actually had exposures to amphibole asbestos (Bernstein et al., 2013), the calculated mesothelioma risk for chrysotile is 2 per 100 000/ fibre.year per ml. As explained by Bernstein et al. (2013), with the elimination of amphibole use today and under the controlled use employed which greatly reduces potential exposure, the risk for mesothelioma today would be very low. Similarly, Ezzati et al. (2004) stated that: “little excess lung cancer is expected from low exposure levels”.

In addition the most recent evaluation of scientific evidence performed by the International Agency for Research on Cancer (IARC Monograph 100c) which stated that all forms of asbestos (chrysotile, crocidolite, amosite, tremolite, actinolite and anthophyllite) are carcinogenic to humans (Group 1) was also based upon exposure concentrations that occurred 20 to 50 years ago using studies as chrysotile only in which there was amphibole asbestos exposure. The IARC classification is a hazard classification based upon whether any study has reported an effect at any time and at any exposure concentration. It does not provide an assessment of risk today from exposure to chrysotile alone (with no amphibole asbestos) at exposure concentration that occur with controlled use.

The documents put forward by the WHO clearly do not support the statement that the 107,000 deaths per year are occurring today and provide no basis for attributing these to chrysotile.

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20 August 2014

REFERENCES

Bernstein D, Dunnigan J, Hesterberg T, Brown R, Velasco JA, Barrera R, Hoskins J, Gibbs A. 2013 Health risk of chrysotile revisited. Crit Rev Toxicol. 2013 Feb;43(2):154-83.

Broeck, J.; Brestoff, J. R.; Kaulfuss, C. (2013). "Statistical Estimation". Epidemiology: Principles and Practical Guidelines. p. 417.

Driscoll T, Nelson DI, Steenland K, Leigh J, Concha·Barrientos M, Fingerhut M, Prüss-Ustiln A: The global burden of non-malignant respiratory disease due to occupational airborne exposures. Am J Ind Med. 2005, 48;432-45.

Ezzati, M, Lopez, AD, Rodgers, A and Murray, CJL. Editors. 2004. Comparative Quantification of Health Risks Global and Regional Burden of Disease Attributable to Selected Major Risk Factors Volume 2, World Health Organization.

Hodgson J, Darnton A (2000). The quantitative risks of mesothelioma and lung cancer in relation to asbestos exposure. Annals of Occupational Hygiene, 44:565-601.

Prüss-Ustiln A, Vickers C, Haefliger P, Bertollini B, Knowns and unknowns on burden of disease due to chemicals; a systematic review. Environmental Health. 2011, 10:9.

Steenland K, Loomis D, Shy C, Simonsen N (1996) Review of occupational lung carcinogens. American Journal of Industrial Medicine, 29:474–490.

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REVIEW ARTICLE

Health risk of chrysotile revisited

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Abstract

This review provides a basis for substantiating both kinetically and pathologically the differences between chrysotile and amphibole asbestos. Chrysotile, which is rapidly attacked by the acid environment of the macrophage, falls apart in the lung into short fibers and particles, while the amphibole asbestos persist creating a response to the fibrous structure of this mineral. Inhalation toxicity studies of chrysotile at non-lung overload conditions demonstrate that the long (>20 μm) fibers are rapidly cleared from the lung, are not translocated to the pleural cavity and do not initiate fibrogenic response. In contrast, long amphibole asbestos fibers persist, are quickly (within 7 d) translocated to the pleural cavity and result in interstitial fibrosis and pleural inflammation. Quantitative reviews of epidemiological studies of mineral fibers have determined the potency of chrysotile and amphibole asbestos for causing lung cancer and mesothelioma in relation to fiber type and have also differentiated between these two minerals. These studies have been reviewed in light of the frequent use of amphibole asbestos. As with other respirable particulates, there is evidence that heavy and prolonged exposure to chrysotile can produce lung cancer. The importance of the present and other similar reviews is that the studies they report show that low exposures to chrysotile do not present a detectable risk to health. Since total dose over time decides the likelihood of disease occurrence and progression, they also suggest that the risk of an adverse outcome may be low with even high exposures experienced over a short duration.

Keywords

Amphibole asbestos, cement products, chrysotile, epidemiology, health risk, inhalation toxicology, mining

History

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SCAN CRITICAL REVIEWS IN TOXICOLOGY

WHO PUBLISHED A BULLETIN IN 2011 ENTITLED:

"Global mesothelioma deaths reported to the World Health Organization between 1994 and 2008"

As far as this WHO bulletin may be understood, here are some following comments based upon database ICM-10.

Comments on 'Global mesothelioma deaths reported to the World Health Organization between 1994 and 2008' (Delgermaa et al. 2011)

If there is further information available from the Who, we will be pleased to receive and analyse it.

1. SUMMARY:

Examination and analysis of the ICM-10 WHO database clearly contradict the conclusions reported by the WHO authors that "Our analysis shows that the disease burden is still predominantly borne by the developed world. However, since asbestos use has recently increased in developing countries, a corresponding shift in disease occurrence is anticipated."

The database shows that in the developed world the incidence is no longer increasing but decreasing. In addition, the results presented by income group show no statistically significant relationships for Middle and low income workers who would be largely working with chrysotile in developing countries.

The ICM-10 database which has data through 2012 shows that for men, the number of total mesothelioma cases from all classifications worldwide has decreased in men from a maximum of 12,758 cases to 6,070 cases in 2011 and to 1,281 cases in 2012. For women, the number of cases has decreased from a maximum of 3,327 cases to 1,405 cases in 2011 and to 365 cases in 2012.

The ICM-10 database which shows that for all classifications of mesothelioma for all countries worldwide, has decreased from a maximum of 16,055 cases to 7475 cases in 2011 and to 1646 cases in 2012.

2. INTRODCUTION

The article by Delgermaa et al. 2011, that appeared in the Bulletin of the World Health Organization provides a superficial presentation of the data in the WHO database.

The database that the WHO used for analysis has since been updated by the WHO on their web site is referred to as Mortality, ICD-10 and is available at:

http://www.who.int/healthinfo/statistics/mortality_raw-data/en/

The database has 4342 entries for mesothelioma for 103 country over 19 years from 1994-2012. The disease codes used in the database were specified in the International Statistical Classification of Diseases and Related Health

Problems 10th Revision, which is available at: *http://apps.who.int/classifications/icd10/browse/2010/en*

3. MESOTHELIOMA CLASSIFICATIONS IN THE WHO DATABASE

For mesothelioma, there are 6 subdivisions of the disease code as follows:

C45 Mesothelioma (Site not reported)

C45.0 is a specific ICD-10-CM diagnosis code
C45.0 Mesothelioma of pleura

C45.1 is a specific ICD-10-CM diagnosis code
C45.1 Mesothelioma of peritoneum

C45.2 is a specific ICD-10-CM diagnosis code
C45.2 Mesothelioma of pericardium

C45.7 is a specific ICD-10-CM diagnosis code
C45.7 Mesothelioma of other sites

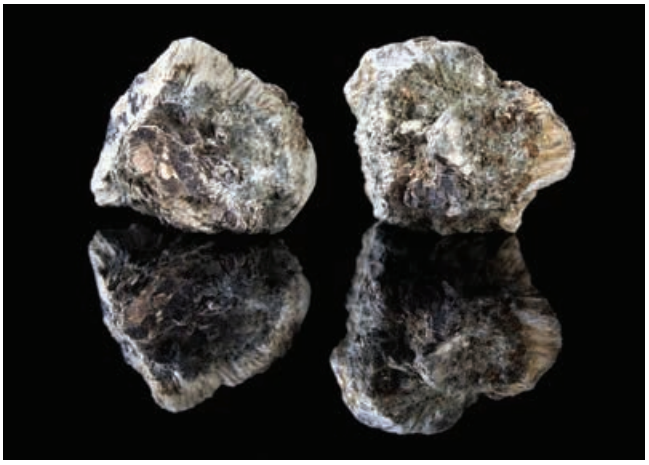
C45.9 is a specific ICD-10-CM diagnosis code
C45.9 Mesothelioma, unspecified

4. TOTAL NUMBER OF DEATHS BY MESOTHELIOMA IN THE WHO DATABASE

In the WHO report the authors present in Table 1 of the report (not shown here) at total of 92,253 mesothelioma deaths in the mortality database of the World Health Organization, worldwide, 1994–2008 (14 years).

In the updated database, over the 19 years of the database, the total number of cases of mesothelioma (from all the above classifications) was 169,537. This amounts to an average of 8,923 cases of mesothelioma (from all the above mesothelioma classifications) per year for all 103 counties in the database.

As shown in Table 1 below, most cased of mesothelioma appear to be classified as C45.9 Mesothelioma, unspecified.



5. CASES OF 'PLEURAL' AND 'PERITONEAL' MESOTHELIOMA IN THE WHO DATABASE

In their report, the authors present numerous figures purporting to show the relationship between of the evolution of the number of deaths from mesothelioma over time as illustrated in Figures 1 and 2 (Figures 6 and 7 from the WHO report) shown below. In these figures, it should be noted that the authors do no present the number of actual deaths but rather an "Age adjusted mortality rate (per millions of population)". They state that the diameter of the circles are proportional to the size of the population at risk. There is no mention of what the actual sizes are of these populations. However, more important there is no presentation of the standard deviations of the means and whether the data show enough statistical power to make these associations.

In addition, the authors state that these are the results for 'pleural' and 'peritoneal' mesothelioma. When only these two mesothelioma codes were selected in the database, even fewer cases are reported.

The actual data on which these figures were based are summarized in Table 3 below. For 'pleural' and 'peritoneal' mesothelioma, there were a total of 73,375 deaths over 19 years for all countries or an average of 3,862 deaths per year worldwide. The largest number of deaths from 'pleural' and 'peritoneal' mesothelioma was reported for Germany as 16,044 over 19 years or an average of 844 deaths per year. Thus, the presentation of the figures in the WHO report is very misleading as there is no presentation of the actual number of cases on which these presentations were based.

However, even more important as shown in Figure 1 below (reproduced from Fig. 6 of the WHO report) are the findings that All Mesothelioma deaths; Male deaths and Female deaths are steadily decreasing in rate and number (size of circles) for the last 3 time points presented.

The ICM-10 database which has data through 2012 shows that for men, the number of total mesothelioma cases from all classifications worldwide has decreased in men from a maximum of 12,758 cases to 6.070 cases in 2011 and to 1,281 cases in 2012. For women, the number of cases has decreased from a maximum of 3,327 cases to 1,405 cases in 2011 and to 365 cases in 2012.

The ICM-10 database which has data through 2012 shows that for all classifications of mesothelioma for all countries worldwide, has decreased from a maximum of 16,055 cases to 7475 cases in 2011 and to 1646 cases in 2012.

6. WHO REPORT: REGRESSION ANALYSIS CARRIED OUT USING THESE DATA TO CHARACTERIZE THE TIME TREND IN THE AGE-ADJUSTED MORTALITY RATE

In the WHO report the authors present as shown in Table 4 (Table 2 from the WHO report) a summary of the findings of the regression analysis carried out using the data, from 46 countries which reported deaths due to mesothelioma for more than 5 years, to characterize the time trend in the age-adjusted mortality rate.

The authors stated that:
"For all mesothelioma deaths, the age-adjusted mortality rate increased significantly at an annual rate of 5.37%. The annual increase in men, at 5.85%, was more than 60% greater than in women, at 3.48% (Fig. 6). When data were analysed by the anatomical site of the mesothelioma, the increasing trend was most apparent for the category of unspecified sites, for which the annual increase was 7.80%. The second most rapid increase was for pleural mesothelioma, at 5.20%, followed by peritoneal mesothelioma, at 2.78% (Fig. 7). Analysis of the trend in different continents showed a significant annual increase of 3.67% in Asia and of 3.44% in Europe (Fig. 8; available at: http://www.who.int/bulletin/volumes/89/10/11-086678). In addition, there was a significant annual increase of 5.54% in high-income countries, but no significant increase in middle and low-income countries (Fig. 9). Finally, analysis of data from selected countries identified a significant annual increase of 3.46% in Japan and a significant annual decrease of 0.84% in the United States (Fig. 10)."

However, as shown in yellow in Table 4 (annotated Table 2 WHO report), many of the reported relationships were not statistically significant.

- By Continent: the America and Oceania showed no statistically significant relationships.
- By Country income group: Middle and low showed no statistically significant relationships.
- By Selected Countries: United Kingdom of Great Britain and Northern Ireland and South Africa showed no statistically significant relationships.

As mentioned in the WHO text, the relationship for the United States of America significant annual decrease of 0.84%.

These findings seem to be very contradictory to the conclusions presented by the authors that "Our analysis shows that the disease burden is still predominantly borne by the developed world." The results presented by WHO show that in the developed world the incidence is no longer increasing but decreasing.

In addition, the authors state that "However, since asbestos use has recently increased in developing countries, a corresponding shift in disease occurrence is anticipated." However, the results presented by income group show no statistically significant relationships for Middle and low income workers who would be largely working with chrysotile in developing countries. Chrysotile is victim of a ban crusade and this must end.

A case example of threat when deviating from rigorous and recent scientific evidence that is possibly influenced by many other interests or matters other than health issues.
What is the logic being applied.

It is evident that something is wrong with WHO's story on chrysotile.

N.B.
If there is any further information available from WHO (The World Health Organisation) competent authorities, we will be pleased to receive and analyse them in full detail.

NOTES

ICA
International Chrysotile Association

For environmental
occupational health
safe and responsible use