the screening for asbestosis and asbestos-related pleural disease, he remains concerned about the high level of false readings and supports the use of HRCT examinations for confirmation in cases with lung lesion profusion >1/1.

Responding in 2005 to a report of widespread pleura thickening amongst workers at an asbestos factory in Nakornsithammarat, Thailand, researchers designed and carried out a cross-sectional survey which established that amongst the 40 workers who participated in the study, there were 9 cases of pleural thickening.[37] Almost all those affected were: older than 50, had a history of smoking, had worked in the factory for more than 25 years and had spent time in the asbestos bag opening department, the stripping and mold department, the asbestos mixing department or the rod mill.

It is ironic that a substance as deadly as asbestos was widely used in hospitals in Thailand. In a cross-sectional descriptive study conducted in March 2006 at Buddhachinaraj Hospital,[38] Dr. Nopadol Suchat found asbestos in asbestos-cement roofing materials and sewage pipelines. He recommended that when these materials are removed, a wet process should be used and workers should be provided with personal protective respiratory protection.

Representatives from Thai Ministries speaking at an international asbestos conference in July 2006 agreed that doing nothing about the increasing use of asbestos would exacerbate the predictable epidemic of asbestos-related disease, incur increased medical and compensation costs, alarm the public, strain the economy and compromise the national reputation. To persuade policy-makers of the need for an asbestos ban, a concerted effort is needed, they said, to encourage government agencies to cooperate on initiatives to raise asbestos awareness, collect data and initiate health screening and surveillance of at-risk groups. Thai civil servants stressed the importance of working with local asbestos manufacturers on the transfer to non-asbestos technologies. One Thai doctor proposed that a higher tax be introduced for asbestos products to increase the cost advantage of safer alternatives. Although the best way to protect Thai society from the asbestos hazard is to ban asbestos, until the Government is ready or able to take this step, serious measures need to be adopted and enforced to protect workers and the public from hazardous exposures.

The Department of Labor Protection and Welfare (Thailand) has issued regulations, carried out inspections, undertaken training, developed guidelines and provided information to those working in or administering the asbestos industry. Thai regulations which protect occupational health and safety include the: Working Environment Regulation (1977), Harmful Chemicals Regulation (1991), Physical Examination Regulation (2004) and Safety Officer and Safety Committee Regulation. The Government is taking steps to tackle the asbestos hazard by: lowering the threshold limit value from 5 fibers/cc to 2 fibers/cc, setting up criteria to limit hazardous asbestos exposures, providing health surveillance and dust monitoring in small and medium-sized companies and improving the criteria for the diagnosis and compensation of asbestos-related diseases. The ratification of ILO Occupational Health and Safety Resolutions by Thailand will take place in the near future (2007/2008) but *ILO Resolution 162: Convention Concerning Safety in the Use of Asbestos (1986)* will not be considered at that time.

Vietnam

A conflict between economic development[39] and public health can forestall action by pro-ban governments.[40] Although Vietnamese delegates to the GAC 2004 confirmed their Government's commitment to an asbestos ban, this goal has not been achieved;[41] in fact, Vietnam's asbestos consumption increased 32% over the period 2000-2004 (Appendix A). From the 1970s, asbestos imported from Russia, Canada, China and Zimbabwe has been used in Vietnam principally for the manufacture of asbestos-cement (ac) roofing tiles, insulation and friction materials. Nearly 10,000 workers at 37 facilities in 21 provinces manufacture 60 million m^3 of ac roofing tiles every year; these relatively cheap tiles are popular amongst poor people in rural, mountain, coastal areas and in the Cuu Long River Delta. Thirty-two of the ac roofing tile factories in Vietnam were built between 1995 and 2000; the majority of these factories are owned by the state.

The adverse effects of occupational asbestos exposure in Vietnam have been studied since 1996. Medical examinations of more than 1,000 asbestos-exposed workers from 12 ac companies have revealed that hazardous occupational exposures have resulted in a high level of lung disease amongst this cohort of workers. Research conducted by officials from the National Institute of Labor Protection (NILP) in 2000 at a factory producing asbestos roofing materials recorded levels of asbestos exposure from 33.7 f/cm^3 by the grinding machine to 1.8 f/cm^3 by the mixing machine. The fact that levels were reduced to 11.7 f/cm^3 and 0.7 f/cm^3 within nine months does not disguise the fact that the situation remains unsatisfactory. Research (2002) following up on the initial survey at 23 ac roofing factories revealed that: "most of the stud-

ied enterprises are polluted by asbestos dust. The reasons are:

- no knowledge and understanding about harmfulness and hazard of the asbestos dust among the workers;
- no dust treatment and exhaust system;
- inadequate attention to OSH (Occupational Safety and Health) from employers."

Other steps taken by the Government to quantify and categorize the adverse impact of asbestos use on occupational and public health include:

- in 1990, NILP staff were sent to Australia for training on asbestos analytical techniques;
- in 2002, NILP undertook a study: *Assessment of Current Environmental Status at Asbestos-Cement Roofing Tile Enterprises and its Influence on Workers' Health – Proposal of Solutions;*
- a recent survey to assess levels of environmental pollution by asbestos-consuming factories found that 9 out of 23 (40%) recorded maximum concentrations ranging from 2.22-4.2 f/cm^3;
- medical examinations of 1,032 workers in 12 companies showed that 98% had normal X-rays, however, 907/1,032 (88%) reported health problems ranging from difficulty in breathing to chronic nasal inflammation.

Despite a government decision in 2004 to phase-out the use of asbestos-cement roofing materials,[42] the transition period has been prolonged due to uncertainty over the existence and cost implications of safer alternatives such as ceramic, glass, stone, quartz, natural organic and/or man-made mineral fibers. During the current phase, regulations have been tightened so that:

- asbestos-using enterprises are prohibited from exploiting, manufacturing and importing amphibole asbestos; the use of chrysotile asbestos is permitted;
- all asbestos-using enterprises must register plans for technological modernization which include systems of environmental controls; enterprises must conduct environmental monitoring and periodic medical check-ups of workers;
- training courses will be organized for all workers in asbestos-cement roofing tile companies;
- government agencies will increase supervision to ensure compliance with occupational safety and health regulations.

"Asbestos kills, whether it's blue, brown or white – it is deadly. Choosing between chrysotile and amphibole asbestos is like deciding between the electric chair and a lethal injection."

Fiona Murie, BWI

Calls for the elimination of asbestos use in Vietnam were aggressively countered by industry stakeholders who maintained the substance was indispensable for the country's development. In response to these claims, a government research program focusing on the replacement of chrysotile by para-aramid, polyvinyl alcohol (PVA) or cellulose fibers was initiated. Laboratory studies and industrial experiments established that PVA-cement roofing tile production and the transition from asbestos to non-asbestos technology were feasible.

Indonesia

In the global rankings, Indonesia is the world's 8th largest importer, processor, consumer and exporter of asbestos and asbestos materials;[43] during the period 2000-2004, consumption rose by 20%. Throughout Indonesia, asbestos sheeting is readily available and, as one of the cheapest materials, remains the building product of choice for many customers. More than 7,700 workers are employed by asbestos-processing industries; one case of mesothelioma has been identified. The majority of chrysotile asbestos, which is imported from Canada, Brazil and Russia, is used in the manufacture of asbestos-cement roofing materials.[44]

A well-resourced national asbestos lobby aggressively counters potential threats to the industry. In February 2006, the Fiber Cement Manufacturers Association, supported by the International Chrysotile Association and the Canadian Embassy, held a so-called "International Scientific Symposium" in Jakarta which was little more than a propaganda exercise to promote the "safe use" use of chrysotile. On the cover of the symposium program the logos of the International Chrysotile Association, the Government of Canada and the Chrysotile Association were prominently displayed. An attempt to invite Australian pathologist Dr. Douglas Henderson, a leading asbestos expert and adviser to the World Trade Organization on the case Canada brought against the French asbestos ban, to speak at this meeting was rejected out of hand by the event organizers. One year on, things had improved marginally with the participation of trade unionist Fiona Murie at a "Ban on Asbestos Panel" discussion during a National Working Meeting in Jakarta. Whilst the other speakers in this session[45] extolled the virtues of industry's "controlled use" philosophy, Ms. Murie said:

"Since 1989, the Building and Woodworkers International (BWI) has had a clear policy to actively campaign for a global ban on all kinds of asbestos, mainly used in building materials. The reason is clear – asbestos kills, whether it's blue, brown or white – it is deadly. Choosing between chrysotile and amphibole asbestos is like deciding between the electric chair and a lethal injection...

The BWI has heard the oft-repeated 'safe use' refrain from so-called 'asbestos experts,' whose research has been commissioned by the industry or who are paid consultants to the industry; we give no credence to their spurious findings or to the propaganda which makes use of it. The BWI prefers to rely on the opinions of the independent scientific community, such as the World Health Organization, the International Agency for Research on Cancer, the International Programme on Chemical Safety, the Collegium Ramazzini, the International Social Security Association, the International Labour Organization, the Senior Labour Inspectors' Committee and many more independent organizations which enjoy international credibility and are not in the pay of the asbestos industry. They agree that the use of asbestos is hazardous and that the best way to protect humanity from the asbestos scourge is to ban asbestos."

Pakistan

In Pakistan, widespread contamination by both imported and locally sourced asbestos endangers both public and occupational health.[46] A range of tests including geological, air and product sampling from various deposits, mines, mills, factories and residential areas, carried out by Geologist Dr. Noor Jehan from Peshawar University over recent years, revealed that all the samples contained:

"different types of respirable chrysotile, tremolite and anthophyllite. The exposure level was hundreds and thousands times greater than the permissible exposure limit in the indoor and outdoor environment as specified by the WHO and OSHA."[47]

Residents living in close proximity to small-scale asbestos-using production units or in typical houses containing uncoated asbestos doors, windows and sidings as well as students/teachers using asbestos tables and other furniture and patients/staff in hospitals with as-