Article

Development of the “National Asbestos Profile” to Eliminate Asbestos-Related Diseases in 195 Countries

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Abstract: Worldwide, 230,000+ people die annually from asbestos-related diseases (ARDs). The World Health Organization (WHO) recommends that countries develop a National Asbestos Profile (NAP) to eliminate ARDs. For 195 countries, we assessed the global status of NAPs (A: bona fide NAP, B: proxy NAP, C: relevant published information, D: no relevant information) by national income (HI: high, UMI: upper-middle, LMI: lower-middle, LI: low), asbestos bans (banned, no-ban) and public data availability. Fourteen (7% of 195) countries were category A (having a bona fide NAP), while 98, 51 and 32 countries were categories B, C and D, respectively. Of the 14 category-A countries, 8, 3 and 3 were LMI, UMI and HI, respectively. Development of a bona fide NAP showed no gradient by national income. The proportions of countries having a bona fide NAP were similar between asbestos-banned and no-ban countries. Public databases useful for developing NAPs contained data for most countries. Irrespective of the status of national income or asbestos ban, most countries have not developed a NAP despite having the potential. The global status of NAP is suboptimal. Country-level data on asbestos and ARDs in public databases can be better utilized to develop NAPs for globally eliminating ARDs.

Keywords: asbestos; policy; World Health Organization; International Labor Organization; National Asbestos Profile; prevention; mesothelioma

1. Introduction

A recent Global Burden of Disease (GBD) study estimated that each year more than 230,000 people die from diseases caused by occupational exposure to asbestos [1]. In 2006, the World Health Organization (WHO) declared that the most efficient way to eliminate asbestos-related diseases (ARDs) is to stop using all types of asbestos [2]. The following year, the WHO and the International Labor Organization (ILO) jointly formulated the National Program for the Elimination of Asbestos-Related Diseases (NPEAD) [3,4] to assist countries in establishing their respective national programs.
The National Asbestos Profile (NAP) was annexed to the NPEAD as a template to support the development of country profiles consisting of 18 items related to legislation, asbestos use, ARD status and risk assessment. As such, the NAP is an internationally standardized instrument that is designed to define the baseline situation of a country and measure its progress towards eliminating ARDs. In 2014, the WHO reiterated the 2006 declaration and published the NAP for the second time. Of the 18 NAP items, four and six items are related to the status of asbestos use and ARDs, respectively. Information and data related to asbestos use and ARDs are thus essential for countries to develop a NAP.

Asbestos use is declining at the global level, but national situations range from “totally banned” to “mining and exporting raw asbestos,” or “manufacturing and/or using asbestos-containing products.” Almost 70 countries/territories have adopted asbestos bans to date [5], but this is skewed towards developed (i.e., higher-income) countries. Many developing (i.e., lower-income) countries have been slow to reduce, let alone ban, the use of asbestos [6]. When countries use asbestos, their country-level volume and rate of use correlate well with the subsequent disease burden and rates of ARD [7,8].

The national situations of ARDs also vary, with some countries having no data while others report data of irregular quality. Based on data reported by 83 member states of the WHO, the worldwide age-adjusted mortality rate of mesothelioma increased 5.4% annually from 1994 to 2008 [9]. An updated analysis continued to show a general increase of the age-adjusted mortality rate, based on data judged to be “reliable” from 59 member states [10]. A GBD study estimated an 82% increase in global mesothelioma deaths from 1990 to 2016 [11]. However, reliable data on mesothelioma are not available from developing countries that continue to use large amounts of asbestos [12].

The development of NAPs will not only enable countries to monitor progress towards ARD elimination but also encourage countries to learn from each other’s experiences and collectively promote the global elimination of ARDs. However, at present, there is no information on the global status of NAPs, let alone factors that encourage countries to develop (or inhibit countries from developing) their NAPs. Thus, the objective of this study was to assess the extent to which countries developed NAPs, or had the potential to do so, in relation to baseline factors such as national income status, asbestos bans and the availability of public data that can be used to develop a NAP.

2. Materials and Methods

We analyzed the status of information and data for 195 countries comprising 193 United Nations (UN) Member States [13] and two regional entities, Taiwan and Hong Kong. In our search of NAPs and related information, we explored the World Wide Web using English, German, French and Spanish. We also communicated with contacts of the coauthors, which included the current and former staff of international organizations, governments and non-government organizations. To determine the status of NAPs that corresponded to the countries, we applied the following criteria, which were ordinally categorized and mutually exclusive (Table 1):

| Country Category | Document Category | Document Description |
|------------------|-------------------|----------------------|
| A                | “bona fide NAP”   | a single document that describes the national situation of asbestos and asbestos-related diseases (ARDs) in adherence to the NAP format published by the WHO/ILO |
| B                | “proxy NAP”       | a single document or multiple documents that describe the national situation of asbestos and ARDs but does (do) not satisfy the criterion for a bona fide NAP; * includes government statements and/or decrees, scientific articles and third-party organization reports |
C “relevant published information” information that does not satisfy the criteria for a *bona fide* or proxy NAP but refers to asbestos and/or ARDs; includes online information on asbestos as part of wider occupational health and safety policies, toxic chemical waste management policies, ARD case studies and media releases on asbestos and/or ARDs

D “no relevant information” status that lacked any of the above

* A proxy NAP was defined to be compatible in content with a *bona fide* NAP without satisfying the criterion of adhering to the NAP format published by the WHO/ILO.

When a document was identified as a *bona fide* NAP, a copy was obtained by downloading or requesting it from the concerned parties.

Two authors (DA, KT) rated the NAP statuses and thereby grouped the countries into four categories: A (country that has a *bona fide* NAP), B (country that does not have a *bona fide* NAP but has a proxy NAP), C (country that has neither a *bona fide* nor proxy NAP but has relevant published information) and D (country that has no relevant information). A disagreement between the two raters was reconciled by rechecking their ratings and, if the disagreement persisted, having a third author (SF) act as the tiebreaking rater to establish the final rating (there were three instances).

As basic characteristics, we grouped the analyzed countries as high income, upper-middle income, lower-middle income and low income based on the Income Classification of the World Bank [14]. Regions were based on the WHO region designation [15]. Regarding the status (banned or no-ban) and year of asbestos ban, we referred to the list of Current Asbestos Bans on the website of the International Ban Asbestos Secretariat [5].

To assess the availability of data that can be used to develop a NAP, we used the following: two sources of asbestos-related data, namely, (1) consumption of raw asbestos in the United States Geological Survey database (USGS) [16] and (2) import of asbestos-containing material, textiles and friction material in the United Nations International Trade Statistics Database (UN Comtrade) [17]; and four sources of disease-related data, namely, (1) reported mortality of mesothelioma or asbestosis in the WHO Mortality Database (MDB) [18], (2) estimated incidence of mesothelioma in the GBD studies [1], (3) estimated mortality of mesothelioma in the WHO Global Health Estimates database (GHE) [19] and (4) reported or estimated mortality of mesothelioma in the WHO Global Cancer Observatory (GCO) [20].

All data sources were publicly available. Microsoft Excel Version 16 (Microsoft Corporation, Washington DC, USA) was used to compile and analyze all data.

### 3. Results

Table 2 shows the basic characteristics of 195 countries grouped by NAP status. Of them, 14 (7%) had a *bona fide* NAP (category A), 98 (50%) did not have a *bona fide* NAP but had a proxy NAP (category B), 51 (26%) had neither a *bona fide* nor proxy NAP but had other relevant published information (category C), and 32 (16%) had no relevant published information (category D). Of the 14 countries that had a *bona fide* NAP (category A), most were LMI countries (n = 8), followed by UMI countries (n = 3) and HI countries (n = 3), as per the national income status. In terms of region, seven, four and three countries were in the Western Pacific, South East Asia and Europe, respectively. In terms of asbestos ban status, five countries had bans, while nine did not. The NAP categories with the highest proportion of countries by income status were B (52%), C (33%) and D (41%) in the HI, UMI, LMI and LI categories, respectively. Of the 32 countries that had no relevant published information (category D), the greatest proportion corresponded to LI countries, followed sequentially by LMI, UMI and HI countries.
| Country Category | Number of Countries | Income Category | Region | Status of Asbestos Ban |
|------------------|---------------------|----------------|--------|------------------------|
|                  |                     | HI  | UMI | LMI | LI | Western Pacific | South East Asia | Europe | Americas | Africa | East Mediterranean | Banned | No-ban |
| A: Countries that have bona fide NAP | 14 | 3 | 3 | 8 | 0 | 7 | 4 | 3 | 0 | 0 | 0 | 5 | 9 |
| B: Countries that do not have bona fide NAP but have proxy NAP | 98 | 49 | 28 | 15 | 6 | 17 | 4 | 39 | 14 | 12 | 12 | 51 | 47 |
| C: Countries that have neither bona fide nor proxy NAP but have other relevant published information | 51 | 10 | 14 | 16 | 11 | 2 | 2 | 8 | 13 | 19 | 7 | 9 | 42 |
| D: Countries with no relevant published information | 32 | 1 | 9 | 10 | 12 | 1 | 1 | 4 | 8 | 16 | 2 | 0 | 32 |
| All countries | 195 | 63 | 54 | 49 | 29 | 27 | 11 | 54 | 35 | 47 | 21 | 65 | 130 |

1 HI: high income; UMI: upper-middle income; LMI: lower-middle income; LI: low-income based on the World Bank Income Classification. 2 See text for exact definition of bona fide NAP. 3 See text for exact definition of proxy NAP.
Of the 195 countries, 65 (33%) countries had asbestos bans and 130 (67%) countries did not. In the group of 65 asbestos-banned countries, 5 (8%) had a *bona fide* NAP, 51 (78%) had no *bona fide* NAP but had a proxy NAP, and 9 (14%) had neither a *bona fide* nor proxy NAP but had other relevant published information. No asbestos-banned country lacked relevant published information. In the group of 130 no-ban countries, 9 (7%) had a *bona fide* NAP, 47 (36%) had no *bona fide* NAP but had a proxy NAP, 42 (32%) had neither a *bona fide* nor proxy NAP but had other relevant published information, and 32 (25%) had no relevant published information.

Figure 1 shows 14 countries with a *bona fide* NAP by their year of NAP publication and national income category. The embedded table supplements information on the region, the status and year of asbestos ban, and the authoring group/organization. (Table 3) All NAPs were published in the 2010 decade. The five NAP-published countries that banned asbestos were Australia, Japan, Bulgaria, Germany and North Macedonia. Of them, North Macedonia published their NAP in the year of their asbestos ban; the other four countries published their NAPs 8–14 years after their ban. Multiple stakeholders (*n* = 9) were the most frequent authoring group, followed by government (*n* = 8) and non-government (*n* = 6) organizations (the total exceeds 14 due to some countries being counted in multiple categories). All NAPs were written in English or had an English version except for the NAP of North Macedonia, which did not have an English version.
Table 3. Countries that published a National Asbestos Profile, Along With Publication Year and Other Characteristics.

| Country          | NAP Publication Year | National Income Category | Region | Asbestos Ban | Authors |
|------------------|----------------------|--------------------------|--------|--------------|---------|
| Australia        | 2017                 | HI                       | WP     | 2003         | G       |
| Bangladesh       | 2016                 | LMI                      | SEA    | No-ban       | NG      |
| Bulgaria         | 2015                 | UMI                      | EUR    | 2005         | G       |
| Cambodia         | 2019                 | LMI                      | WP     | No-ban       | G, MS   |
| Germany          | 2014                 | HI                       | EUR    | 2005         | G       |
| India            | 2017                 | LMI                      | SEA    | No-ban       | NG      |
| Indonesia        | 2015                 | UMI                      | SEA    | No-ban       | NG, MS  |
| Japan            | 2013                 | HI                       | WP     | 2007         | NG, MS  |
| Laos             | 2017                 | LMI                      | WP     | No-ban       | G, MS   |
| North Macedonia  | 2014                 | UMI                      | EUR    | 2014         | NG, MS  |
| Mongolia         | 2012                 | LMI                      | WP     | No-ban       | G, MS   |
| Nepal            | 2016                 | LMI                      | SEA    | No-ban       | NG, MS  |
| Philippines      | 2013                 | LMI                      | WP     | No-ban       | G, MS   |
| Vietnam          | 2013                 | LMI                      | WP     | No-ban       | G, MS   |

1 HI: High Income; UMI: Upper-Middle Income; LMI: Lower-Middle Income; 2 WPR: Western Pacific; SEAR: South-East Asia; EUR: Europe; 3 G: Government; NG: Non-Government; MS: Multiple Stakeholders.

Table 4 shows the relationship between the NAP category and the availability of data that can be used for a NAP. Asbestos data were available from two data sources: (1) the USGS database on raw asbestos consumption; and (2) the UN Comtrade data on asbestos-containing materials. The overall data availability was 85% (165/195) and 92% (179/195) of all countries, respectively. When stratified by NAP category, USGS data on raw asbestos consumption were available for 100% (14/14), 93% (91/98), 90% (46/51) and 88% (28/32) of category A, B, C and D countries, respectively. Similarly, UN Comtrade data on asbestos-containing materials were available for 100% (14/14), 93% (91/98), 90% (46/51) and 88% (28/32) of category A, B, C and D countries, respectively.

Table 4. Availability of data that can be used for NAPs in public databases.

| Country Category | Data Availability | Asbestos Data | Disease Data |
|------------------|-------------------|---------------|--------------|
|                  | Consumption of Raw Asbestos <USGS > (Row %) | Reported Mortality of Mesothelioma or Asbestos <WHO MDB > (Row %) | Estimated Incidence of Mesothelioma <WHO GBD > (Row %) | Estimated Mortality of Mesothelioma <WHO GHE > (Row %) | Reported or Estimated Mortality of Mesothelioma <WHO GCO > (Row %) |
| A (n = 14)       | 14 (100%)         | 7 (50%)       | 14 (100%)    | 14 (100%)    | 13 (93%)   |
| B (n = 98)       | 83 (85%)          | 63 (64%)      | 91 (93%)     | 87 (89%)     | 77 (79%)   |
| C (n = 51)       | 43 (84%)          | 49 (96%)      | 47 (92%)     | 27 (53%)     |            |
| D (n = 32)       | 25 (78%)          | 7 (22%)       | 32 (100%)    | 30 (94%)     | 17 (53%)   |
| All countries (n = 195) | 165 (85%) | 96 (49%) | 186 (95%) | 178 (91%) | 134 (69%) |

1 From the United States Geological Survey, Asbestos Statistics and Information: available data for 1920–2017 used. 2 The UN International Trade Statistics Database was tabulated for available data for asbestos-containing materials, Comtrade code 681,140 (asbestos cement; articles thereof; years available 2017–2019) or Comtrade code 6812 (fabricated asbestos fibers; mixtures with a basis of asbestos or of asbestos and magnesium carbonate; articles of such mixtures or of asbestos; years available 1996–2018) or Comtrade code 681320 (friction material and articles thereof not mounted; for brakes, clutches or the like, with a basis of asbestos; years available 2007–2018); available data for timeframe 1996–2019 used. 3 From the WHO Mortality Database: available data for ICD-10 Code C45 Mesothelioma or ICD-10 Code J61 Pneumocystis due to asbestos and other mineral fibers (asbestosis) and available data for timeframe 1994–2017 used. 4 From the Global Burden of Disease studies: available data for 2017 used. 5 From the WHO Global Health Estimates: available data for 2016 used. Countries with poor quality data were counted as countries with available data. See GHE website for a
Disease data were available from four data sources: (1) the MDB data on reported mortality of mesothelioma or asbestosis; (2) the GBD data on the estimated incidence of mesothelioma; (3) the GHE data on estimated mortality of mesothelioma; and (4) the GCO data on reported or estimated mortality of mesothelioma. The overall data availability was 49% (96/195), 95% (186/195), 91% (178/195) and 69% (134/195) of all countries, respectively. When stratified by NAP category, data availability was generally better for categories A and B and worst for category D. For example, the MDB data on reported mortality of mesothelioma or asbestosis were available for 50% (7/14), 64% (63/98), 37% (19/51) and 22% (7/32) of countries in categories A, B, C and D, respectively. Table A1 lists the 14 bona fide NAPs and their references. Table A2 summarizes the data availability for each country across all six databases. Table A3 outlines the original NAP according each item (I-1 to I-18) to public data sources that can be utilized. Data for legislation-related items (I-1, I-15, I-16) were generally not available from international sources and thus needed to be sought from national sources. Data for asbestos-related items (I-2 to I-5) were generally available from the international databases mentioned above. Data for disease-related items (I-9 to I-12) were available from the international databases mentioned above. Although data for I-17 were generally not available from any source for most countries, data for I-18 were available in PubMed. Data for risk assessment (I-6 to I-8, I-13, I-14) were sometimes available from national sources.

4. Discussion

A total of 14 (7% of 195) countries developed bona fide NAPs (category A). The development of a bona fide NAP showed no gradient by national income: LMI countries comprised the highest proportion (16%) of countries that published a bona fide NAP, followed by UMI (6%) and HI (5%) countries, with no bona fide NAP developed by an LI country to date. At the opposite extreme, 32 (16% of 195) countries had no relevant published information (category D), and this showed a gradient with the national income category: LI countries comprised the highest proportion with no relevant published information, followed sequentially by LMI, UMI and HI countries. Furthermore, a comparatively poorer status of NAPs (i.e., categories C and D combined) correlated with lower national income. Therefore, our study demonstrated that although the NAP status was generally related to the national income status, the development of a bona fide NAP was unrelated to the national income status in all but LI countries.

Ninety-eight (50% of 195) countries did not have a bona fide NAP but did have a proxy NAP (category B). As a proxy NAP was defined as being compatible in content with a bona fide NAP, they should be similar in their resources and information. It is thus reasonable to assume that the 98 countries (in category B) had the full potential (i.e., resources and information) to develop a bona fide NAP. A further 51 (26% of 195) countries had neither a bona fide nor proxy NAP but had other relevant published information (category C) and thus could have had some potential to develop a bona fide NAP. In effect, a combined 149 (76% of 195) countries had some or full potential to develop a NAP.

Two sources of data for asbestos and four sources of data for ARDs were available to develop a NAP. Importantly, these sources contained data for most of the countries, and there was a minimal gradient of data availability across the NAP categories (Table 4). A notable exception was the WHO MDB; this database compiles data reported by countries, and fewer than 50% of the countries were covered for mesothelioma mortality. However, estimated data can compensate for the lack of reported data, provided that a country indicates the nature of data that are incorporated in the NAP. The low number (n = 14) and proportion (7%) of all countries that had developed a bona fide NAP should thus be viewed in consideration of the wide availability of country-level data on asbestos and ARDs.
Mesothelioma is widely accepted as an indicator disease caused by asbestos exposure, with at least 80% specificity [21]; it is thus a key item for a NAP. Although more than 50% of the countries did not report mesothelioma deaths to the WHO, estimates are currently available for more than 90% of the countries in the two data sources (Table 4). Although many lower-income countries started to consume asbestos recently, some of them may not have reached the generally accepted latency period of 30–40 years for mesothelioma [21]. Moreover, many lower-income countries have not yet acquired the technology/infrastructure to diagnose and report mesothelioma and thus may be “missing” the disease burden. It is important for countries lacking mesothelioma data to utilize these estimates; that said, it is also important that they understand the method of imputation to derive the estimates (e.g., asbestos use is commonly imputed) as well as their limitations [10].

The regional distribution of the 14 NAP-published countries was skewed, with the majority situated in Asia (seven in the Western Pacific and four in South-East Asia), three in Europe and none in the Americas, Africa or Eastern Mediterranean (Table 3). The regional preponderance may have been caused by a combination of “pull” and “push” factors. Possible pull factors are that Europe is the known current center of the ARD burden [22], and Asia has been implicated as the future “center” [23] of this burden due to its current heavy use of asbestos. Possible push factors include the WHO/ILO partnerships (e.g., the 2010 Parma Declaration on Environment and Health specified establishment of NPEAD for the member states of WHO-Europe [24]) and grass-roots initiatives on advocacy and technology transfer (e.g., the Asian Asbestos Initiative) [25]. On the other hand, pro-asbestos lobbies influence asbestos use in industrializing countries [6] and may present “opposing” factors. All these factors will impact the development (or lack thereof) of a NAP.

In terms of the relationship between the NAP category and asbestos-ban status, the proportion of countries having a bona fide NAP was similarly low in asbestos-banned (8% or 5/65) and no-ban (7% or 9/130) countries. The lack of association between the status of NAP and asbestos-ban is a positive finding because the acceptance of a NAP should not be limited to either asbestos-banned or no-ban countries. The NAP is an effective tool to outline the national situation on asbestos and ARDs. The development of a NAP benefits no-ban countries by informing the progress towards the adoption of an asbestos ban and benefits asbestos-banned countries by informing the progress in reducing exposure to in situ asbestos and transitioning to an asbestos-free society.

Most (56 [86%] of 65) of the asbestos-banned countries had either a bona fide NAP or a proxy NAP (i.e., categories A and B combined), while more than half (74 [57%] of 130) of no-ban countries had neither of the two (i.e., categories C and D combined). Asbestos-banned countries may build a “knowledge base” of experience, information and data, which accumulate over the various phases of asbestos use, ban and post-ban. This knowledge base is likely to be documented in various forms, including laws, regulations, advisories, status reports and official statistics. These countries can thus capitalize on the abundant experience and resources to develop their NAPs. In contrast, no-ban countries may have a less extensive “knowledge base”, fewer resources and less experience.

For the 14 existing NAPs, multiple stakeholder authorship was common, and government representatives were often involved, with others or on their own. This finding corroborates the importance of employing multidisciplinary expertise with government representation in developing a NAP. Governments routinely collect information on industry and the labor force and collect (albeit to a lesser extent) surveillance data on asbestos and ARDs. General information on industry and the labor force constitutes baseline information and may be documented in the NAP to provide a national context. However, the highest priority should be given to incorporating national surveillance data on asbestos and ARDs. It is also important to observe that an equal disease incidence in men and women, rather than higher incidence in men due to occupational exposure to asbestos, could also alert countries to potential environmental exposure. Future studies are needed to review the use of ARD database information from this perspective.
The major limitations of this study are as follows: (1) We assessed the global status of the development of NAPs, not their utilization. For example, the NAP can be used to further develop a national action plan. Such a theme, however, is fundamentally different and warrants a separate study. (2) We cannot rule out the possibility that we missed identifying an existing bona fide NAP. (3) Our authors were involved in developing several NAPs (SF for the NAP of Japan; PT for the NAP of Australia; KT for the NAPs of Japan, Vietnam and Australia); although this experience may have added perspective and insight to the present work, we may not have been able to eliminate bias in judging a NAP as bona fide or not. The scope of this study is limited to mesothelioma and asbestosis and databases that use reported and/or estimated mortality. We highlight usable data sources from credible organizations that can be used to help and inform future NAPs. Despite being useful as an indicator of the asbestos burden, any database that uses estimates or country-level proxy data as a method has limitations. A strength of this study is that we were able to analyze the status of NAP development for most countries of the world and offer a framework for more countries to develop a NAP.

5. Conclusions

In conclusion, the global status of NAPs is suboptimal. Irrespective of the status of national income or asbestos ban, most countries of the world have not developed a NAP despite having the potential (i.e., resources and information) to do so. Among the few countries that have developed a bona fide NAP, LMI and UMI countries outnumber HI countries. Country-level data on asbestos and ARDs in public databases can be utilized to develop a NAP. All countries should develop their NAP and use it to monitor progress towards eliminating ARDs, learn from the experience of other countries and contribute to promoting the global elimination of ARDs.

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### Appendix A

**Table A1. List of *bona fide* National Asbestos Profiles and their References.**

| Country      | Reference                                                                                                                                            |
|--------------|------------------------------------------------------------------------------------------------------------------------------------------------------|
| Australia    | Asbestos Safety and Eradiation Agency. 2017. *National Asbestos Profile for Australia*. Available online: https://www.asbestossafety.gov.au/sites/default/files/documents/2017-12/ASEA_National_Asbestos_Profile_interactive_Nov17.pdf (accessed on 11 January 2021). [26] |
| Bangladesh   | Bangladesh Occupational Safety, Health and Environment Foundation. 2016. *National Asbestos Profile of Bangladesh*. Obtained via personal communication: 20 April 2020. [27] |
| Bulgaria     | Vangelova K.; Dimitrova S.; Dimitrova I. 2015. *National Asbestos Profile of Bulgaria*. Available online: https://ncpha.government.bg/files/National%20Asbestos%20Profile_Bulgaria_2015-en.pdf (accessed on 11 January 2021). [28] |
| Cambodia     | Ministry of Labor and Vocational Training. 2019. *Cambodia National Asbestos Profile*. Personal Communication, 2020. [29] |
| Germany      | Federal Institute for Occupational Health and Safety. 2014. *National Asbestos Profile for Germany*. Available online: [30] |
|              | https://www.baua.de/EN/Service/Publications/Report/Gd80.pdf?__blob=publicationFile&v=8 (accessed on 11 January 2021). [30] |
| India        | People’s Training & Research and Centre. 2017. *India: National Asbestos Profile*. Available online: https://amrc.org.hk/sites/default/files/NAP%20India.pdf (accessed on 11 January 2021). [31] |
| Indonesia    | Indonesia Ban Asbestos Network. 2017. *National Asbestos Profile Indonesia*. Obtained via personal communication: 28 April 2020. [32] |
| Japan        | Furuya S, Takahashi K, Mohaved M, Jiang Y. 2013. *National Asbestos Profile of Japan*. Available online: https://www.researchgate.net/publication/237839114_National_Asbestos_Profile_of_Japan_Based_on_the_National_Asbestos_Profile_by_the_ILO_and_the_WHO (accessed on 11 January 2021). [33] |
| Laos         | Laos Ministry of Industry and Commerce. 2017. *National Asbestos Profile of Laos*. Personal Communication, 2020. [34] |
| North Macedonia | Institute of Occupational Health of the Republic of Macedonia. 2014. *National Asbestos Profile for the Republic of Macedonia*. Personal Communication, 2020. [35] |
| Mongolia     | Health Sciences University of Mongolia. 2012. *National Asbestos Profile of Mongolia*. Personal Communication, 2020. [36] |
| Nepal        | Sah R.C. 2016. *National Asbestos Profile of Nepal*. Available online: http://anroev.org/aban/wp-content/uploads/2016/10/National-Asbestos-Profile-of-Nepal.pdf (accessed on 11 January 2021). [37] |
| Philippines  | Republic of Philippines, Environmental and Occupational Health Office. 2013. *National Asbestos Profile Philippines*. Available online: https://www.informea.org/en/national-asbestos-profile-philippines (accessed on 11 January 2021). [38] |
| Vietnam      | Pham V.H.; Tran T.N.L.; Le G.V.; Movahed M.; Jiang Y.; Pham N.H.; Ogawa, H; Takahashi, K. Asbestos and asbestos-related diseases in Vietnam: In reference to the International Labor Organization/World Health Organization National Asbestos Profile. *Saf Health Work*. 2013, 4, 117–121. doi: 10.1016/j.shaw.2013.04.002. [39] |
Table A2. Availability of Asbestos and Asbestos-Related-Diseases Data by Country and NAP Country Category.

| Countries ¹ | World Bank Income Group ² | Asbestos Ban Status ³ | NAP Country Category ⁴ | Asbestos Data | Disease Data |
|-------------|---------------------------|-----------------------|------------------------|--------------|-------------|
|             |                           |                       |                        | Consumption of Raw Asbestos (USGS)⁵ | Reported Mortality of Mesothelioma or Asbestosis (WHO MDB) ⁷ | Estimated Incidence of Mesothelioma (GBD) ⁶ | Estimated Mortality of Mesothelioma (WHO GHE)⁹ | Reported or estimated Mortality of Mesothelioma (WHO GCO)¹⁰ |
| 1           | Afghanistan               | LI                    | No-Ban                 | Yes          | No          | No          | Yes         | Yes         | Yes         |
| 2           | Albania                   | UMI                   | No-Ban                 | Yes          | Yes         | No          | Yes         | Yes         | Yes         |
| 3           | Algeria                   | LMI                   | Ban                    | Yes          | Yes         | No          | Yes         | Yes         | Yes         |
| 4           | Andorra                   | HI                    | No-Ban                 | No           | Yes         | No          | Yes         | No          | No          |
| 5           | Angola                    | LMI                   | No-Ban                 | Yes          | Yes         | No          | Yes         | Yes         | Yes         |
| 6           | Antigua and Barbuda       | HI                    | No-Ban                 | Yes          | Yes         | No          | Yes         | No          | No          |
| 7           | Argentina                 | UMI                   | Ban                    | Yes          | Yes         | Yes         | Yes         | Yes         | Yes         |
| 8           | Armenia                   | UMI                   | No-Ban                 | Yes          | Yes         | Yes         | Yes         | Yes         | Yes         |
| 9           | Australia                 | HI                    | Ban                    | Yes          | Yes         | Yes         | Yes         | Yes         | Yes         |
| 10          | Austria                   | HI                    | Ban                    | Yes          | Yes         | Yes         | Yes         | Yes         | Yes         |
| 11          | Azerbaijan                | UMI                   | No-Ban                 | Yes          | Yes         | No          | Yes         | Yes         | Yes         |
| 12          | Bahamas                   | HI                    | No-Ban                 | Yes          | Yes         | Yes         | Yes         | No          | No          |
| 13          | Bahrain                   | HI                    | Ban                    | No           | Yes         | Yes         | Yes         | Yes         | Yes         |
| 14          | Bangladesh                | LMI                   | No-Ban                 | Yes          | Yes         | No          | Yes         | Yes         | Yes         |
| 15          | Barbados                  | HI                    | No-Ban                 | Yes          | Yes         | Yes         | Yes         | Yes         | No          |
| 16          | Bangladesh                | LMI                   | No-Ban                 | Yes          | Yes         | No          | Yes         | Yes         | Yes         |
| 17          | Belgium                   | HI                    | Ban                    | Yes          | Yes         | Yes         | Yes         | Yes         | Yes         |
| 18          | Belize                    | UMI                   | No-Ban                 | Yes          | Yes         | Yes         | Yes         | Yes         | No          |
| 19          | Benin                     | LMI                   | No-Ban                 | Yes          | Yes         | No          | Yes         | Yes         | Yes         |
| 20          | Bhutan                    | LMI                   | No-Ban                 | Yes          | Yes         | No          | Yes         | Yes         | No          |
| 21          | Bolivia                   | LMI                   | No-Ban                 | Yes          | Yes         | Yes         | Yes         | Yes         | Yes         |
| 22          | Bosnia and Herzegovina    | UMI                   | No-Ban                 | Yes          | Yes         | Yes         | Yes         | Yes         | Yes         |
| 23          | Botswana                  | UMI                   | No-Ban                 | Yes          | Yes         | Yes         | Yes         | Yes         | No          |
| 24          | Brazil                    | UMI                   | Ban                    | Yes          | Yes         | Yes         | Yes         | Yes         | Yes         |
| 25          | Brunei                    | HI                    | Ban                    | Yes          | Yes         | Yes         | Yes         | Yes         | No          |
| 26          | Bulgaria                  | UMI                   | Ban                    | Yes          | Yes         | Yes         | Yes         | Yes         | Yes         |
| 27          | Burkina Faso              | LI                    | No-Ban                 | No           | Yes         | No          | Yes         | Yes         | Yes         |
| No. | Country               | Region | Ban Status | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|-----|----------------------|--------|------------|------|------|------|------|------|------|
| 28  | Burundi              | LI     | No-Ban     | D    | Yes  | Yes  | No   | Yes  | No   |
| 29  | Cambodia             | LMI    | No-Ban     | A    | Yes  | Yes  | No   | Yes  | Yes  |
| 30  | Cameroon             | LMI    | No-Ban     | D    | Yes  | Yes  | No   | Yes  | No   |
| 31  | Canada               | HI     | Ban        | B    | Yes  | Yes  | Yes  | Yes  | Yes  |
| 32  | Cape Verde           | LMI    | No-Ban     | C    | No   | Yes  | No   | Yes  | No   |
| 33  | Central African Republic | LI | No-Ban | D | No | Yes | No | Yes | No |
| 34  | Chad                 | LI     | No-Ban     | C    | Yes  | No   | No   | Yes  | No   |
| 35  | Chile                | HI     | Ban        | B    | Yes  | Yes  | Yes  | Yes  | Yes  |
| 36  | China                | UMI    | No-Ban     | B    | Yes  | Yes  | No   | Yes  | No   |
| 37  | Colombia             | UMI    | Ban        | B    | Yes  | Yes  | Yes  | Yes  | Yes  |
| 38  | Comoros              | LMI    | No-Ban     | D    | No   | Yes  | No   | Yes  | No   |
| 39  | Congo – Brazzaville  | LMI    | No-Ban     | D    | Yes  | Yes  | No   | Yes  | Yes  |
| 40  | Congo – Kinshasa (DR Congo) | LI | No-Ban | C | Yes | No | No | Yes | No |
| 41  | Costa Rica           | UMI    | No-Ban     | B    | Yes  | Yes  | Yes  | Yes  | Yes  |
| 42  | Côte d’Ivoire        | LMI    | No-Ban     | C    | Yes  | Yes  | No   | Yes  | Yes  |
| 43  | Croatia              | HI     | Ban        | B    | Yes  | Yes  | Yes  | Yes  | Yes  |
| 44  | Cuba                 | UMI    | No-Ban     | C    | Yes  | Yes  | Yes  | Yes  | Yes  |
| 45  | Cyprus               | HI     | Ban        | B    | Yes  | Yes  | Yes  | Yes  | Yes  |
| 46  | Czech Republic       | HI     | Ban        | B    | Yes  | Yes  | Yes  | Yes  | Yes  |
| 47  | Denmark              | HI     | Ban        | B    | Yes  | Yes  | Yes  | Yes  | Yes  |
| 48  | Djibouti             | LMI    | Ban        | C    | Yes  | No   | No   | Yes  | No   |
| 49  | Dominica             | UMI    | No-Ban     | D    | Yes  | Yes  | No   | Yes  | No   |
| 50  | Dominican Republic   | UMI    | No-Ban     | D    | Yes  | Yes  | Yes  | Yes  | Yes  |
| 51  | Ecuador              | UMI    | No-Ban     | B    | Yes  | Yes  | Yes  | Yes  | Yes  |
| 52  | Egypt                | LMI    | Ban        | B    | Yes  | Yes  | Yes  | Yes  | Yes  |
| 53  | El Salvador          | LMI    | No-Ban     | D    | Yes  | Yes  | Yes  | Yes  | No   |
| 54  | Equatorial Guinea    | UMI    | No-Ban     | D    | No   | No   | No   | Yes  | No   |
| 55  | Eritrea              | LI     | No-Ban     | D    | Yes  | No   | No   | Yes  | Yes  |
| 56  | Estonia              | HI     | Ban        | B    | Yes  | Yes  | Yes  | Yes  | Yes  |
| 57  | Eswatini Swaziland   | LMI    | No-Ban     | C    | Yes  | Yes  | No   | Yes  | No   |
| 58  | Ethiopia             | LI     | No-Ban     | C    | Yes  | Yes  | No   | Yes  | Yes  |
| 59  | Fiji                 | UMI    | No-Ban     | B    | Yes  | Yes  | Yes  | Yes  | No   |
| 60  | Finland              | HI     | Ban        | B    | Yes  | Yes  | Yes  | Yes  | Yes  |
| 61  | France               | HI     | Ban        | B    | Yes  | Yes  | Yes  | Yes  | Yes  |
| 62  | Gabon                | UMI    | Ban        | C    | Yes  | Yes  | No   | Yes  | No   |
| 63  | Gambia               | LI     | No-Ban     | C    | No   | Yes  | No   | Yes  | No   |
| No | Country     | Region | Ban Type | Ban Status | Domestic  | Export  | Re-Export | Domestic  | Export  | Re-Export |
|----|-------------|--------|----------|------------|------------|---------|-----------|------------|---------|-----------|
| 64 | Georgia     | UMI    | No-Ban   | C          | Yes        | Yes     | Yes       | Yes        | Yes     | Yes       |
| 65 | Germany     | HI     | Ban      | A          | Yes        | Yes     | Yes       | Yes        | Yes     | Yes       |
| 66 | Ghana       | LMI    | No-Ban   | B          | Yes        | Yes     | No        | Yes        | Yes     | Yes       |
| 67 | Greece      | HI     | Ban      | B          | Yes        | Yes     | Yes       | Yes        | Yes     | Yes       |
| 68 | Grenada     | UMI    | No-Ban   | C          | No         | Yes     | Yes       | Yes        | No      | No        |
| 69 | Guatemala   | UMI    | No-Ban   | C          | Yes        | Yes     | Yes       | Yes        | Yes     | No        |
| 70 | Guinea      | LI     | No-Ban   | D          | Yes        | Yes     | No        | Yes        | Yes     | No        |
| 71 | Guinea-Bissau| LI    | No-Ban   | D          | No         | Yes     | No        | Yes        | Yes     | No        |
| 72 | Haiti       | LMI    | Ban      | C          | Yes        | No      | No        | Yes        | Yes     | Yes       |
| 73 | Honduras    | LMI    | Ban      | C          | Yes        | Yes     | No        | Yes        | Yes     | Yes       |
| 74 | Hong Kong   | HI     | No-Ban   | B          | Yes        | Yes     | No        | Yes        | No      | No        |
| 75 | Hungary     | HI     | Ban      | B          | Yes        | Yes     | Yes       | Yes        | Yes     | Yes       |
| 76 | Iceland     | HI     | Ban      | B          | Yes        | Yes     | Yes       | Yes        | Yes     | Yes       |
| 77 | India       | LMI    | No-Ban   | A          | Yes        | Yes     | No        | Yes        | Yes     | Yes       |
| 78 | Indonesia   | UMI    | No-Ban   | A          | Yes        | Yes     | No        | Yes        | Yes     | Yes       |
| 79 | Iran        | UMI    | No-Ban   | B          | Yes        | Yes     | Yes       | Yes        | Yes     | Yes       |
| 80 | Iraq        | UMI    | Ban      | B          | Yes        | No      | Yes       | Yes        | Yes     | Yes       |
| 81 | Ireland     | HI     | Ban      | B          | Yes        | Yes     | Yes       | Yes        | Yes     | Yes       |
| 82 | Israel      | HI     | Ban      | B          | Yes        | Yes     | Yes       | Yes        | Yes     | Yes       |
| 83 | Italy       | HI     | Ban      | B          | Yes        | Yes     | Yes       | Yes        | Yes     | Yes       |
| 84 | Jamaica     | UMI    | No-Ban   | B          | Yes        | Yes     | Yes       | Yes        | Yes     | Yes       |
| 85 | Japan       | HI     | Ban      | A          | Yes        | Yes     | Yes       | Yes        | Yes     | Yes       |
| 86 | Jordan      | UMI    | Ban      | B          | Yes        | Yes     | Yes       | Yes        | Yes     | Yes       |
| 87 | Kazakhstan  | UMI    | No-Ban   | B          | Yes        | Yes     | Yes       | Yes        | Yes     | Yes       |
| 88 | Kenya       | LMI    | No-Ban   | B          | Yes        | Yes     | No        | Yes        | Yes     | Yes       |
| 89 | Kiribati    | LMI    | No-Ban   | B          | No         | Yes     | No        | Yes        | No      | No        |
| 90 | Kuwait      | HI     | Ban      | C          | Yes        | Yes     | Yes       | Yes        | Yes     | Yes       |
| 91 | Kyrgyzstan  | LMI    | No-Ban   | D          | Yes        | Yes     | Yes       | Yes        | Yes     | Yes       |
| 92 | Laos        | LMI    | No-Ban   | A          | Yes        | Yes     | No        | Yes        | Yes     | Yes       |
| 93 | Latvia      | HI     | Ban      | B          | Yes        | Yes     | Yes       | Yes        | Yes     | Yes       |
| 94 | Lebanon     | UMI    | No-Ban   | B          | Yes        | Yes     | No        | Yes        | Yes     | Yes       |
| 95 | Lesotho     | LMI    | No-Ban   | B          | No         | Yes     | No        | Yes        | Yes     | Yes       |
| 96 | Liberia     | LI     | No-Ban   | B          | Yes        | No      | No        | Yes        | Yes     | Yes       |
| 97 | Libya       | UMI    | No-Ban   | B          | Yes        | Yes     | No        | Yes        | Yes     | Yes       |
| 98 | Liechtenstein| HI    | Ban      | B          | No         | No      | No        | No         | No      | No        |
|   | Country       | Region | Status | Ban | History | Law | Sanitation | Water Source | Waste Management | Air Quality |
|---|---------------|--------|--------|-----|---------|-----|------------|--------------|------------------|-------------|
| 100 | Lithuania     |        |        |     |         |     |            |              |                  |             |
| 101 | Luxembourg    |        |        | Yes |         |     |            |              |                  |             |
| 102 | Madagascar    |        |        | Yes |         |     |            |              |                  |             |
| 103 | Malawi        |        |        | Yes |         |     |            |              |                  |             |
| 104 | Malaysia      |        |        | Yes |         |     |            |              |                  |             |
| 105 | Maldives      |        |        | Yes |         |     |            |              |                  |             |
| 106 | Mali          |        |        | Yes |         |     |            |              |                  |             |
| 107 | Malta         |        |        | Yes |         |     |            |              |                  |             |
| 108 | Marshall Islands |      |        | Yes |         |     |            |              |                  |             |
| 109 | Mauritania    |        |        | Yes |         |     |            |              |                  |             |
| 110 | Mauritius     |        |        | Yes |         |     |            |              |                  |             |
| 111 | Mexico        |        |        | Yes |         |     |            |              |                  |             |
| 112 | Micronesia    |        |        | Yes |         |     |            |              |                  |             |
| 113 | Moldova       |        |        | Yes |         |     |            |              |                  |             |
| 114 | Monaco        |        |        | Yes |         |     |            |              |                  |             |
| 115 | Mongolia      |        |        | Yes |         |     |            |              |                  |             |
| 116 | Montenegro    |        |        | Yes |         |     |            |              |                  |             |
| 117 | Morocco       |        |        | Yes |         |     |            |              |                  |             |
| 118 | Mozambique    |        |        | Yes |         |     |            |              |                  |             |
| 119 | Myanmar       |        |        | Yes |         |     |            |              |                  |             |
| 120 | Namibia       |        |        | Yes |         |     |            |              |                  |             |
| 121 | Nauru         |        |        | Yes |         |     |            |              |                  |             |
| 122 | Nepal         |        |        | Yes |         |     |            |              |                  |             |
| 123 | Netherlands   |        |        | Yes |         |     |            |              |                  |             |
| 124 | New Zealand   |        |        | Yes |         |     |            |              |                  |             |
| 125 | Nicaragua     |        |        | Yes |         |     |            |              |                  |             |
| 126 | Niger         |        |        | Yes |         |     |            |              |                  |             |
| 127 | Nigeria       |        |        | Yes |         |     |            |              |                  |             |
| 128 | North Korea   |        |        | Yes |         |     |            |              |                  |             |
| 129 | North Macedonia |      |        | Yes |         |     |            |              |                  |             |
| 130 | Norway        |        |        | Yes |         |     |            |              |                  |             |
| 131 | Oman          |        |        | Yes |         |     |            |              |                  |             |
| 132 | Pakistan      |        |        | Yes |         |     |            |              |                  |             |
| 133 | Palau         |        |        | Yes |         |     |            |              |                  |             |
| 134 | Panama        |        |        | Yes |         |     |            |              |                  |             |
| 135 | Papua New Guinea |      |        | Yes |         |     |            |              |                  |             |
| Country                  | Region | Ban   | HI     | Yes | Yes | Yes | Yes | Yes | Yes | No  |
|-------------------------|--------|-------|--------|-----|-----|-----|-----|-----|-----|-----|
| Paraguay                | UMI    | No-Ban| C      |     |     |     |     |     |     |     |
| Peru                    | UMI    | No-Ban| B      | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Philippines             | LMI    | No-Ban| A      | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Poland                  | HI     | Ban   | B      | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Portugal                | HI     | Ban   | B      | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Qatar                   | HI     | Ban   | B      | Yes | Yes | No  | Yes | Yes | Yes | Yes |
| Romania                 | HI     | Ban   | B      | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Russia                  | UMI    | No-Ban| B      | Yes | Yes | No  | Yes | Yes | Yes | Yes |
| Saint Kitts and Nevis   | HI     | No-Ban| C      | No  | Yes | No  | No  | No  | No  | No  |
| Saint Lucia             | UMI    | No-Ban| C      | No  | Yes | Yes | Yes | Yes | Yes | No  |
| Saint Vincent and Grenadines | UMI | No-Ban| D      | Yes | Yes | No  | Yes | No  | No  | No  |
| Samoa                   | UMI    | No-Ban| B      | Yes | Yes | No  | Yes | No  | Yes | No  |
| San Marino              | HI     | No-Ban| B      | No  | Yes | No  | No  | No  | No  | No  |
| São Tomé and Príncipe   | LMI    | No-Ban| C      | No  | Yes | No  | Yes | No  | Yes | No  |
| Saudi Arabia            | HI     | Ban   | B      | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Senegal                 | LMI    | No-Ban| C      | Yes | Yes | No  | Yes | Yes | Yes | Yes |
| Serbia                  | UMI    | Ban   | B      | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Seychelles              | HI     | Ban   | C      | Yes | Yes | No  | Yes | Yes | No  | No  |
| Sierra Leone            | LI     | No-Ban| D      | Yes | Yes | No  | Yes | Yes | No  | No  |
| Singapore               | HI     | No-Ban| B      | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Slovakia                | HI     | Ban   | B      | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Slovenia                | HI     | Ban   | B      | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Solomon Islands         | LMI    | No-Ban| B      | No  | Yes | No  | Yes | Yes | No  | No  |
| Somalia                 | LI     | No-Ban| D      | No  | No  | No  | Yes | Yes | Yes | Yes |
| South Africa            | UMI    | Ban   | B      | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| South Korea             | HI     | Ban   | B      | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| South Sudan             | LI     | No-Ban| B      | No  | Yes | No  | Yes | Yes | Yes | Yes |
| Spain                   | HI     | Ban   | B      | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Sri Lanka               | LMI    | No-Ban| B      | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Sudan                   | LI     | No-Ban| C      | Yes | Yes | No  | Yes | Yes | Yes | Yes |
| Suriname                | UMI    | No-Ban| D      | Yes | Yes | Yes | Yes | Yes | No  | No  |
| Sweden                  | HI     | Ban   | B      | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Switzerland             | HI     | Ban   | B      | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Syria                   | LI     | No-Ban| C      | Yes | Yes | No  | Yes | Yes | Yes | Yes |
| Taiwan                  | HI     | Ban   | B      | Yes | No  | No  | Yes | No  | No  | No  |
172 Tajikistan LI No-Ban B Yes Yes No Yes Yes No
173 Tanzania LMI No-Ban C Yes Yes No Yes Yes No
174 Thailand UMI No-Ban B Yes Yes Yes Yes Yes Yes Yes
175 Timor-Leste LMI No-Ban B No Yes No Yes Yes No
176 Togo LI No-Ban C Yes Yes No Yes Yes Yes
177 Tonga UMI No-Ban B No Yes No Yes Yes No
178 Trinidad and Tobago HI No-Ban C Yes Yes Yes Yes Yes No
179 Tunisia LMI No-Ban C Yes Yes Yes Yes Yes Yes
180 Turkey UMI Ban B Yes Yes Yes Yes Yes Yes
181 Turkmenistan UMI No-Ban D Yes Yes No Yes Yes Yes
182 Tuvalu UMI No-Ban B No Yes No No No No
183 Uganda LI No-Ban B Yes Yes No Yes Yes Yes
184 Ukraine LMI No-Ban B Yes Yes No Yes Yes Yes
185 United Arab Emirates HI No-Ban B Yes Yes No Yes Yes Yes
186 United Kingdom HI Ban B Yes Yes Yes Yes Yes Yes
187 United States of America HI No-Ban B Yes Yes Yes Yes Yes Yes
188 Uruguay HI Ban C Yes Yes Yes Yes Yes Yes
189 Uzbekistan LMI No-Ban C Yes Yes Yes Yes Yes Yes
190 Vanuatu LMI No-Ban B Yes Yes No Yes Yes No
191 Venezuela UMI No-Ban B Yes Yes Yes Yes Yes Yes
192 Vietnam LMI No-Ban A Yes Yes No No Yes Yes
193 Yemen LI No-Ban D Yes Yes No No Yes Yes
194 Zambia LMI No-Ban C Yes Yes No Yes Yes Yes
195 Zimbabwe LMI No-Ban B Yes Yes No Yes Yes Yes

Total (Yes) 165 179 96 186 178 134

1 193 UN Member States plus two regional entities (Taiwan and Hong Kong) are included in this list. Note that not all databases listed here contain data for the listed countries; 2 World Bank Income Groups as per Fiscal Year 2021: HI: High Income; UMI: Upper-Middle Income; LMI: Lower-Middle Income; LI: Low Income; 3 Asbestos bans as reported by the International Ban Asbestos Secretariat July 2019 update; 4 NAP country categories are: A (country that has bona fide NAP), B (country that does not have bona fide NAP but have proxy NAP), C (country that has neither bona fide or proxy NAP but has relevant published information), D (country that has no relevant information). See text for definition of document category; 5 USGS: United States Geological Survey; Asbestos Statistics and Information. Availability of data for 1920-2017 used; 6 UN Comtrade: UN International Trade Statistics Database. Tabulated for availability of data for asbestos-containing materials, Comtrade code 681140 (asbestos cement; articles thereof; years available 2017-2019) or Comtrade code 6812 (fabricated asbestos fibres; mixtures with a basis of asbestos or of asbestos and magnesium carbonate; articles of such mixtures or of asbestos; years available 1996-2018) or Comtrade code 681320 (friction material and articles thereof not mounted; for brakes, clutches or the like, with a basis of asbestos; years available 2007-2018). Availability of data for timeframe 1996-2019 used; 7 WHO MBD: WHO Mortality Database. Availability of data for ICD-10 Code C45 Mesothelioma or ICD-10 Code J61 Pneumoconiosis due to asbestos and other mineral fibres (asbestosis). Availability of data for timeframe 1994-2017 used; 8 WHO GBD: WHO Global Burden of Disease studies. Availability of data for 2017 used; 9 WHO GHE: WHO Global Health Estimates. Availability of data for 2016 used. Countries with poor quality data were counted as countries with
available data. See GHE website for description of poor-quality data; WHO GCO: WHO Global Cancer Observatory. Availability of data for 2018 used. Note that historical data not available due to difference in estimation method.

Table A3. Availability of Data in International and National Sources in Relation to Each NAP Item.

| Theme                  | Items of National Asbestos Profile | International Sources          | National Sources, etc.                                      |
|------------------------|-----------------------------------|--------------------------------|-------------------------------------------------------------|
|                        |                                   | Asbestos Data | Disease Data |                                                                 |
|                        |                                   |                |              |                                                                 |
|                        |                                   | Consumption of Raw Asbestos (USGS) | Reported Mortality of Mesothelioma or Asbestosis (WHO MDB) |                                                                 |
|                        |                                   | Asbestos-Containing Material (UN Comtrade) | Estimated Incidence of Mesothelioma (GBD) | Estimated Mortality of Mesothelioma (WHO GHE) | Reported or estimated Mortality of Mesothelioma (WHO GCO) |
| Legislation            | I-1. Current regulations on the different forms of asbestos | I-1, I-15, I-16: Existing government laws and regulations |
|                        | I-15. National enforceable occupational exposure limits for chrysotile asbestos |
|                        | I-16. The system for inspection and enforcement of the exposure limits |
| Asbestos               | I-2. Import and consumption of asbestos per year (total and per major uses and forms) | I-2, I-4 | I-3, I-5 |
|                        | I-3. Import of asbestos-containing materials |
|                        | I-4. Domestic production of asbestos (if applicable) |
|                        | I-5. Domestic production of asbestos-containing materials |
| Diseases               | I-9. Estimate of the burden of diseases related to asbestos: disability adjusted life years and deaths attributable to asbestos exposure | I-9 (reported deaths) | I-9, I-10, I-11, I-12 deaths, (DALY) | I-9, I-12 (reported a/o estimated deaths) |
|                        | I-10. Prevalence of asbestosis – national data, a breakdown by industries if available |
|                        | I-11. Incidence of lung cancer among workers exposed to asbestos |
|                        | I-12. Incidence of mesothelioma |
|                        | I-17. Estimated economic losses due to |

I-2, I-3: National trade statistics; I-4: National mining statistics; I-5: National manufacturing statistics

I-10: National compensation statistics; I-12: National/Regional Cancer Registry data; I-18: PUBMED
asbestos-related diseases
I-18. Major studies on epidemiology of asbestos-related diseases in the country
I-6. Estimated total number of workers exposed to asbestos in the country
I-7. Full list of industries where exposure to asbestos is present in the country and list of industries with the largest numbers of workers potentially exposed to asbestos
I-8. Industries with high risk of exposure (where overexposure is documented as exceeding occupational exposure limits)
Risk Assessment
and estimated total number of workers at high risk
I-13. Estimates on the percentage of house stock and vehicle fleet containing asbestos
I-14. Total number of workers eligible for compensation for asbestos-related diseases, such as asbestosis, lung cancer and mesothelioma (per year) and the numbers of individuals compensated yearly

1 United States Geological Survey, Asbestos Statistics and Information. Availability of data for 1920-2017 used; 2 UN International Trade Statistics Database. Tabulated for availability of data for asbestos containing materials, Comtrade code 681140 (asbestos cement; articles thereof; years available 2017-2019) or Comtrade code 6812 (fabricated asbestos fibres; mixtures with a basis of asbestos or of asbestos and magnesium carbonate; articles of such mixtures or of asbestos; years available 1996-2018) or Comtrade code 681320 (friction material and articles thereof not mounted; for brakes, clutches or the like, with a basis of asbestos; years available 2007-2018). Availability of data for timeframe 1996-2019 used; 3 WHO Mortality Database. Availability of data for ICD-10 Code C45 Mesothelioma or ICD-10 Code J61 Pneumoconiosis due to asbestos and other mineral fibres (asbestosis). Availability of data for timeframe 1994-2017 used; 4 Global Burden of Disease studies. Availability of data for 2017 used; 5 WHO Global Health Estimates. Availability of data for 2016 used. Countries with poor quality data were counted as countries with available data. See GHE website for description of poor-quality data; 6 WHO Global Cancer Observatory. Availability of data for 2018 used. Note that historical data not available due to difference in estimation method.
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