

Short communication

BULGARIA: LESSONS LEARNT FROM IMPLEMENTING ACTIONS FOR PREVENTION OF ASBESTOS RELATED DISEASES

Katya Vangelova, Irina Dimitrova

National Center of Public Health and Analyses, World Health Organization Collaborating Centre for Occupational Health, Sofia, Bulgaria

Corresponding author: Katya Vangelova (email: k.vangelova@ncpha.government.bg)

ABSTRACT

Bulgaria is a country in south-eastern Europe. It banned the import, production and use of all types of asbestos in 2005, but was still producing and using asbestos products in the last 3–4 decades of the last century. The country implemented a requirement for health surveillance of asbestos-exposed workers in 1973 and, despite difficulties related to economy transition, has been implementing limits for asbestos exposure following examples of good practice of more developed countries, including a ban on crocidolite and amosite asbestos in 1992. Asbestos-related diseases are recognized as occupational, but are underreported, according to the National Cancer Register of Bulgaria. Mesothelioma cases are increasing in Bulgaria, but the incidence rate is much lower compared with industrialized countries, most probably due to comparatively low overall asbestos consumption and a more recent start for asbestos use, as well as preventive actions, especially enforcement of exposure limits.

Keywords: ASBESTOS, MESOTHELIOMA CASES, MESOTHELIOMA INCIDENCE RATE, OCCUPATIONAL EXPOSURES, PREVENTIVE ACTIONS

BACKGROUND

Asbestos is a well-established human carcinogen; according to global estimates, at least 107 000 people die annually from mesothelioma, other types of asbestos-related cancer and asbestosis (1, 2). The World Health Organization has repeatedly called on countries to stop using asbestos (3) and thus prevent asbestos-related diseases (ARDs). In response, many countries have banned asbestos, but the burden of ARDs is causing concern even in countries that imposed the ban in the early 1990s (4–6).

Bulgaria is a country in south-eastern Europe that totally banned the import, production and use of asbestos in 2005, but was still producing and using asbestos products in the last 3–4 decades of the last century. Compared with industrialized countries, Bulgaria started using asbestos later (in around 1960) and, despite difficulties related to economic transition, has implemented preventive actions. The aim of this paper was to follow the impact of

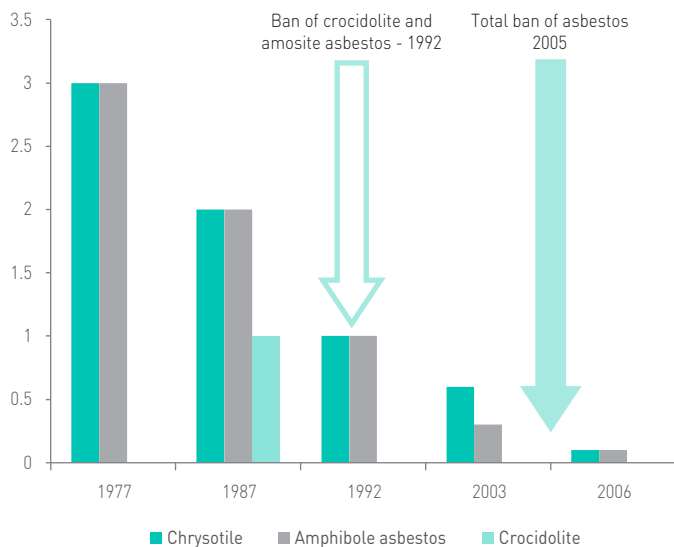
preventive actions on health outcomes related to asbestos exposure in Bulgaria.

IMPLEMENTATION OF PREVENTIVE ACTIONS

Preventive actions for ARDs were initiated in 1973 (about 1 decade after asbestos use started), with the establishment of health surveillance of asbestos-exposed workers. The second step was made in 1977 with a legislative requirement for a limit value for the average shift concentration of respirable asbestos fibres, initially set to 3 f/cm³ and further reduced to 1 f/cm³ in 1992 (Fig. 1). In 1992, a ban was introduced on the import and use of the most hazardous types of asbestos (crocidolite and amosite) and of products containing them, and the use of asbestos-containing materials and products in the building of hospitals, children's institutions, schools, houses and sport premises. Measurement of fibre concentrations in work

environments and in asbestos-containing products was required and capacity was built to ensure this.

FIG. 1. THRESHOLD LIMIT VALUES FOR ASBESTOS IN BULGARIA, 1977–2006



In 2001, a national programme for the gradual reduction and phasing out of asbestos use (2001–2008) was introduced, including the following actions:

- harmonization of Bulgarian legislation on asbestos with European Union (EU) legislation;
- improving the protection of workers from hazards related to asbestos; and
- prevention and reduction of environmental pollution by asbestos.

Bulgaria banned the import, production and use of all types of asbestos fibres in 2005 and harmonized Bulgarian legislation on asbestos with EU legislation by introducing amendments in the Health Act (2004) (7), Law on Health and Safety at Work (2008) (8), Environmental Protection Act (2002) (9) and Waste Management Act (2003) (10), as well as setting up processes to ensure compliance with this legislation. In 2006, measures to protect workers from risks related to asbestos exposure at work were defined as: introducing a permit system for removing asbestos-containing thermal insulation and for demolishing buildings and other structures; limiting the concentration to 0.1 asbestos fibres/cm³ air and controlling levels of contamination after asbestos handling; implementing

risk assessment; implementing health surveillance; informing workers about health risks; and providing suitable protective equipment.

ASBESTOS EXPOSURE IN THE PAST

Precise numbers of workers at risk of asbestos exposure in the past are unavailable; however, an overall number of 27 000 is estimated for the 1973–2012 period, while 1188 individuals were exposed to asbestos in 2012, according employer statements (11).

During 1977–1989, the average shift concentration of respirable asbestos fibres exceeded the limits for dust-releasing operations at nearly all major asbestos processors in Bulgaria, in some workplaces, by 10–15 times (11); however, after 1993 most workplaces studied met the requirements. By 2000, raw asbestos mining and production, asbestos cement and asbestos textile production, and the use of asbestos-containing products had greatly diminished in Bulgaria.

ARDs

During 1980–2000, the number of new cases of asbestosis, pleural plaques and pleural thickening was reported to vary from 131 to 201 annually (12), but the study found no evidence of malignant ARDs. Data from the Bulgarian Occupational Diseases Register (National Social Security Institute) show between one and four newly registered cases of asbestosis annually over the last 10 years (13), but reports of investigations into the occupational etiology of malignant ARDs have not yet been submitted. Nevertheless, malignant ARDs are included in the list of occupational diseases in Bulgaria (14).

The National Cancer Register of Bulgaria shows that cases of lung cancer (all causes) are increasing (15, 16), but there are no data on how many cases were investigated for asbestos etiology. Malignant mesothelioma is almost exclusively attributable to previous asbestos exposure (4), and mesothelioma incidence in Bulgaria increased from five cases in 1993 to 58 in 2013, with 666 new cases during the 1993–2013 period (17). This is unsurprising because asbestos has been used recently in Bulgaria and high levels

of occupational asbestos exposure were recorded during the 1977–1989 period (11). Several studies have provided evidence that the extent of asbestos use/ asbestos exposure is linked to incidence and mortality rates for ARDs at the national level (18–20). Data on age-standardized mortality rates for mesothelioma and asbestosis in Bulgaria have been reported by Kameda et al. (18).

Data from the National Cancer Register show that both the number of registered mesothelioma deaths and the mortality rate remain much lower compared with the number of new mesothelioma cases and the incidence rate, even though 93% of all newly diagnosed patients survive for no more than two years (17). We therefore consider that the mesothelioma incidence rate provides a better description of the asbestos burden in the country.

A comparison of the mesothelioma incidence rate among EU countries (Table 1) for the period 2003–2007 shows that the rate in Bulgaria remains lower than in industrialized countries (18). Bulgaria started to use asbestos in about 1960, and asbestos consumption over the 1971–2000 period was calculated to be 1.31 kg/capita/year, which is lower than in many EU countries (20). Bulgaria has also been implementing asbestos exposure limits, including a ban on the import and use of crocidolite and amosite in 1992, a ban on all types of asbestos fibres in 2005, and controlling workplace exposure.

Health surveillance is required for asbestos-exposed workers in Bulgaria, but there are no special requirements for health screening after retirement or upon changing workplace. Delgermaa et al. reported that all forms of mesothelioma predominantly affect elderly individuals (4), and the increase in mesothelioma cases in Bulgaria mainly involves individuals over 60 years old (17). Data from the National Cancer Register show that, more recently, the number of unstaged cases of mesothelioma has been decreasing but that more cases are diagnosed at both early and late disease stages (Fig. 2). These findings indicate a need to establish a national ARD register and to monitor asbestos-exposed workers after retirement or upon changing workplace.

FIG. 2. PERCENTAGE OF REGISTERED MESOTHELIOMA CASES BY STAGE, 1993–2012



Source: Data provided by the National Cancer Register.

RECENT DEVELOPMENTS

In 2015, the National Asbestos Profile of Bulgaria was developed, following the structure proposed by the World Health Organization, to provide information and define baseline levels for eliminating ARDs, identifying populations at risk from current and previous asbestos exposure, and implementing a system for the inspection and enforcement of asbestos exposure limits, with the main objective eliminating ARDs (11). Information from regional control authorities showed that the permit system for the removal/demolition of asbestos materials and structures and legislative requirements concerning asbestos were followed, but some inconsistencies were found (11). Measures suggested for improving prevention of asbestos-related risks include strengthening controls against asbestos exposure, establishing a national register for asbestos-exposed workers, organizing health surveillance of asbestos-exposed workers after retirement, improving the capacity of health and safety-at-work professionals, and raising awareness in the population about asbestos-related health risks and possible asbestos exposures.

CONCLUSIONS

The mining, production and use of asbestos and asbestos-containing materials in Bulgaria have now stopped. For years, a permit system for working with

TABLE 1. ASBESTOS CONSUMPTION AND MESOTHELIOMA INCIDENCE RATES IN BULGARIA AND SEVERAL EU COUNTRIES, 2003–2007

Country	Asbestos consumption (kg / capita / year)		Mesothelioma incidence rate (per 100 000), 2003–2007			
	1920–1970	1971–2000	Male		Female	
			Crude rate	Age standardized incidence	Crude rate	Age standardized incidence
Austria*	1.17	2.09	0.9–1.6	0.6–1.1	0.4–0.7	0.2–0.3
Belgium	3.08	3.02	4.0	2.2	0.8	0.4
Bulgaria	0.14	1.31	0.7	0.4	0.3	0.2
Croatia	0.78	3.57	2.4	1.5	0.5	0.3
Cyprus	6.41	2.36	1.6	1.1	0.6	0.3
Czech Republic	0.82	1.85	0.8	0.5	0.4	0.2
Denmark	2.16	1.97	3.1	1.8	0.6	0.3
Estonia	0.07	0.06	0.4	0.3	0.2	0.1
Finland	1.49	0.86	2.7	1.5	0.7	0.3
France*	1.08	1.44	1.1–4.4	0.6–2.5	0.2–1.3	0.1–0.5
Germany*	1.17	2.18	1.3–12.4	0.6–6.0	0.5–2.0	0.2–0.8
Iceland	1.29	0.30	1.2	0.6	0.3	0.3
Italy*	0.83	1.61	0.9–15.1	0.5–5.6	0.2–4.0	0.1–1.3
Ireland	-	1.57	1.2	1.0	0.3	0.2
Latvia	0.26	0.66	0.7	0.5	0.6	0.3
Lithuania	0.05	0.14	0.4	0.3	0.2	0.1
Netherlands	0.84	0.87	3.0–5.0	1.8–3.0	0.6–0.7	0.3–0.4
Norway	0.98	0.36	2.9	1.7	0.6	0.3
Poland*	0.39	1.79	0.4–1.0	0.3–0.6	0.2–0.8	0.1–0.4
Slovakia	1.52	3.01	0.6	0.4	0.3	0.2
Slovenia	1.70	6.78	2.2	1.4	0.8	0.4
Spain*	0.51	1.35	0.3–2.3	0.2–1.2	0.0–1.1	0.0–0.6
Sweden	1.20	0.51	2.2	1.2	0.5	0.2
United Kingdom*	1.92	1.03	4.9–8.8	2.7–4.2	0.6–1.6	0.3–0.7

* Mesothelioma incidence rate is presented as a range for countries presented by regions in IARC Scientific Publication (19)

Sources: data on asbestos consumption are extracted from Kameda et al. (18) and on mesothelioma incidence rates in Bulgaria and several EU countries (2003–2007) are extracted from country reports in Forman et al. (19).

asbestos-containing materials during demolition or removal of asbestos-containing structures has been in place, along with strict control of respirable asbestos fibre concentrations and preventive actions to minimize health risks. However, problems related to phasing out

asbestos use and to asbestos-related morbidity and mortality will probably remain for decades.

Although data from the National Cancer Register show an increasing number of mesothelioma cases in

Bulgaria, the mesothelioma incidence remains lower than in industrialized countries. This is probably due to comparatively low overall asbestos consumption and a more recent start for asbestos use, as well as limiting asbestos exposure by following good working practice, as implemented in more developed countries.

The lack of an efficient registration system for occupational diseases in Bulgaria currently masks the magnitude of the occupational burden of ARDs, as shown by the number of registered mesothelioma cases in the National Cancer Register. It is necessary to investigate whether bronchial carcinoma cases are asbestos related and to improve registration of occupational diseases, including ARDs.

LESSONS LEARNT

1. The most effective action for prevention of ARDs is eliminating or limiting asbestos exposure via an immediate and total ban on the use of all types of asbestos fibres and strict control of exposure during the removal/demolition of asbestos-containing thermal insulation, buildings and structures to limit the number of exposed workers and the number and magnitude of exposures per worker.
2. Health surveillance of exposed workers and long-term follow-up at the national level are needed to ensure the early detection of ARDs. Retired workers should be included because of the long latency period before development of malignant ARDs.

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