is based on statistical models that predict job-, time-, and region-specific exposure levels of asbestos. Fiber years (ff/ml-years) were calculated for each subject by linking SYN-JEM with individual occupational histories. Unconditional logistic regression models were used to estimate odds ratios (OR), 95% confidence intervals (CI), and trends. **Results.** The OR for the highest quartile of cumulative asbestos exposure (>2.8 ff/ml-years) was 1.38 (95%CI 1.27-1.50) in men and 1.22 (95% CI 0.84-1.78) in women. In men, increasing lung cancer risk was observed with increasing exposure to asbestos in all smoking categories, and for all major subtypes of lung cancer. In women, the asbestos related lung cancer risk was increased for all subtypes in current smokers only, with ORs approximately 2-fold. The interaction between asbestos exposure and smoking was more than additive among men and women for all lung cancer types, although not statistically significant for all combinations of subtype and gender. **Conclusions.***Our results in men showed an excess risk of lung cancer and its subtypes at low levels of cumulative asbestos exposure.*

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FUTURE CANCER MORTALITY FROM PAST AND CONTINUING WORLDWIDE ASBESTOS USE

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ОЖИДАЕМАЯ СМЕРТНОСТЬ ОТ РАКА НА ОСНОВАНИИ ИСПОЛЬЗОВАНИЯ АСБЕСТА В ПРОШЛОМ И НАСТОЯЩЕМ. **Пето Дж., Гилхам К., Рейк К.** Лондонская школа гигиены и тропической медицины, ул. Кеппел, Лондон, Великобритания, UK, WC1E 7ht

Key words: *asbestos; cancer; epidemiology*
Ключевые слова: *асбест; рак; эпидемиология*

Mesothelioma rates in the population reflect the effects of asbestos exposure 30 to 70 years ago, so future deaths caused by asbestos exposure before 1980 can be predicted for countries included in WHO mortality statistics. However, the delay between asbestos exposure and mesothelioma risk is so long that the effects of asbestos exposure since the 1980s cannot be predicted from current death-rates. The only way to predict future risks from current exposure is therefore by estimating the percentage reduction in asbestos exposure that has occurred (people exposed multiplied by average level of exposure). If dose-response is approximately linear the future cancer risk due to current asbestos exposure will fall below the current risk caused by past exposure by a similar percentage. Changes in asbestos exposure can be estimated from occupational and environmental measurements of airborne asbestos levels now and in the past, trends in the amount of asbestos used per year, and asbestos concentrations in the lungs of people born 20, 40 and 60 years ago. Chrysotile is less dangerous than the amphiboles (mainly crocidolite and amosite), probably because it disappears from the lung more rapidly. Changes in exposure to each type of asbestos must therefore be considered separately. Trends in mesothelioma death-rates in different countries recorded by the WHO were analysed to predict lifetime mesothelioma rates in each country for people born between 1930 and 1965. We also conducted a study in Britain of asbestos concentration in the lungs of mesothelioma patients and of the general population born between 1940 and 1990. Mesothelioma deaths are close to or past their peak in West Europe and North America, where asbestos use declined sharply after 1975 and ended by about 1990. Death rates are much lower in East Europe, where amphibole use was lower. The UK has the highest mesothelioma rate worldwide. The lifetime mesothelioma risk in the whole UK population will fall from about 1 in 100 in men and 1 in 500 in women born in 1940 to about 1 in 10,000 in men and women born after 1980. Occupational exposure has been greatly reduced, and environmental exposure, presumably from older buildings that contain asbestos, is now the main risk. Most mesotheliomas in Britain were caused by amphiboles, mainly amosite and crocidolite. The risk from chrysotile is much lower and cannot be estimated reliably. Chrysotile disappears rapidly from the lung, and most people were exposed to amphiboles as well as chrysotile. The main hazard from chrysotile, the only type of asbestos still being used, is lung cancer. This can be studied in chrysotile mine and factory workers, but most asbestos-related cancers will be in people who use asbestos products. Most lung cancers are caused by smoking and the contribution of asbestos is difficult to estimate in population-based studies, so future numbers of asbestos-related lung cancers in countries where chrysotile is still used are likely to be large but cannot be predicted reliably. Chrysotile use should therefore be ended as soon as possible. Further research cannot predict the risk reliably, and countries that have replaced asbestos with safer alternatives have suffered no economic damage.

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TOWARDS THE ELIMINATION OF OCCUPATIONAL CANCERS IN THE RUSSIAN FEDERATION: CANCER RESEARCH FOR CANCER PREVENTION

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ОБ УСТРАНЕНИИ РАКА, ОБУСЛОВЛЕННОГО ПРОФЕССИОНАЛЬНЫМИ ВРЕДНОСТЯМИ, В РОССИЙСКОЙ ФЕДЕРАЦИИ: ИССЛЕДОВАНИЕ РАКА ДЛЯ ЕГО ПРОФИЛАКТИКИ. **Шуц Дж., Олссон А.** Международное агентство по исследованиям рака, ул. Кур Альбер Тома, 150, Лион СЕДЕКС 08, Франция, 69372

Key words: *occupational cancer; prevention; epidemiology*
Ключевые слова: *рак, обусловленный профессиональными вредностями; профилактика; эпидемиология*

Several chemicals, metals, dusts, fibres, and occupations have been established to be causally linked to an increased risk of cancer. The annual global burden of occupational cancer deaths is estimated to be between 300,000 to 600,000, based on current knowledge, but with large uncertainty. Many carcinogenic risks at the workplace appear to be modifiable and the cancers therefore preventable. Given the long induction period of many cancers, prevention measures have to be implemented at the earliest possible stage. The Russian Federation, with its sizable population and high degree of industrialisation, provides ample opportunities for applied occupational cancer prevention; in particular regarding monitoring of the occupational cancer burden, implementing prevention, as well as cancer research into suspected but not confirmed carcinogenic agents. We propose setting up a country-wide system for the surveillance of occupational cancers. This makes use of existing excellent documentation of occupational exposures, but also requires systematically measuring incident outcome through disease registration and, importantly, a legal and technical framework for accurate record linkage between data sources. Developing such framework can be informed by experiences collected through a recent study on chrysotile miners and millers conducted by the Izmerov Research Institute of Occupational Health and the IARC in Sverdlovsk oblast. Such registry of occupational cancers complementing population-based cancer registries will allow specific evaluation of the success of reducing the occupational cancer burden in Russia. We propose a multi-cancer population-based case-control study in selected heavily industrialized oblasts with respective work force and cancer documentation, to enhance scientific evidence on occupational cancers and prevention potential. This complements research mainly conducted in Western Europe and the North Americas but taking into account the local work conditions, exposure levels, and protection measures, in addition to lifestyle and living differences, allowing much more targeted prevention but informing the global knowledge with scientific outcome from a different geographical setting. We propose an active prospective follow up of cancer incidence in chrysotile miners and millers with additional questionnaires on work life and lifestyle with collection of biological samples in a subset, to better disentangle possible effects of parallel and competing and perhaps interacting exposures.