Invited Perspective: Eliminating Toxics to Prevent Disease: Asbestos Leads the Way

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Countries that have consumed more asbestos have historically had higher mortality rates from asbestos-related diseases (ARDs) than countries with lower asbestos consumption.1 A research letter in this issue by Rath et al. provides a 15-y update on evidence for this issue by Rath et al.2 We find their results convincing, and we agree with the urgent need to stop producing and using asbestos. For those who might be skeptical of this conclusion or who are considering how much weight to give this evidence, we offer this perspective as occupational/environmental epidemiologists.

On the one hand, one can imagine a member of the general public saying, “Well, isn’t this obvious? Asbestos is dangerous. The more you use, the more people will get sick and die.” And, in fact, that is what Rath et al. are saying.2 But studies purporting to show links between national death rates and crude measures of toxic chemical use are often discounted by experts for several sound reasons. First, epidemiologists would warn you of the “ecological fallacy”—just because one observes a trend across countries does not mean that the same will hold among individuals.1 There are many other risk factors that might well track with asbestos consumption to create spurious correlations. Second, occupational hygienists would point out that simply because asbestos is “consumed” by a country does not mean anyone has actually breathed any asbestos fibers. One might reasonably predict that wealthier countries or those with stronger public health systems could consume large amounts of asbestos with very little actual human exposure and therefore minimal ARD, while poorer countries would have many more heavily exposed workers who would sicken and die from the same asbestos “consumption.”

Rath et al. present clear evidence2 that cuts through the fog of these and other potential biases. Their findings may be explained by several factors from which broader lessons can be drawn. Asbestos causes its own distinct diseases: Asbestosis, by definition, has no other causes, and the vast majority of all mesotheliomas are caused by asbestos.2,4 This gives the asbestos death toll its own unique signature and makes it much easier to see the impact of asbestos consumption in national statistics than would be the case for most other toxic chemicals. The authors appropriately excluded deaths from lung cancer from their analysis (even though this is an important component of the asbestos death toll) because lung cancer has many other environmental causes and would not be expected to show a simple correlation with asbestos consumption.

The takeaway message here is one taught in every basic class in occupational health: The best way to control a hazard is to eliminate it.5 No matter how well designed, devices and practices aimed at reducing human exposures to chemicals during their use are never fully effective. Control technologies sooner or later will drift into failure through neglect or cost cutting and are thus, over the long term, an entirely unproductive cost on a firm’s balance sheet.6

The research letter by Rath et al.2 should be seen as a clear signal of the need to eliminate asbestos from all products and materials. This evidence from a global perspective supplements and confirms a very large body of high-quality epidemiological studies demonstrating the toxicity of asbestos even at very low levels of exposure.7,8

The strong link between asbestos and ARD mortality provides a rare opportunity for us to make inferences about the ecologic association observed by Rath et al.2 and provides yet another lesson. There is a large and rapidly growing number of toxic chemicals in commerce, including (for example) dozens, if not hundreds, of carcinogens.9 Plotting consumption statistics for these carcinogens, one at a time, against cancer rates will not help us identify chemicals to eliminate, because there are too many other causes and intervening factors in the causal pathways to cancer. But that does not mean these chemicals are not causing cancers (and other chronic diseases), only that we cannot easily see the patterns. The conclusion? Once again, the most effective way to prevent disease from toxic chemicals is to eliminate the chemicals without waiting for unimpeachable causal evidence.10

Although banning a chemical sounds drastic, it can be much better for business than trying, less effectively, to regulate it. Instead of spending money for controlling exposures (money that is a drag on profits), the development and production of less toxic alternatives can be highly profitable as it opens new markets and competitive advantage.6,11,12 A growing movement including industries, government regulators, and citizens’ groups is working toward this vision, framing it with terms like “sustainable chemistry”13,14 and a “cancer-free economy.”14 Let us hope that we will look back after another 15 y and see that a total worldwide asbestos ban was a critical step in the global transition to safer chemicals.

References


