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Editorial

The development and regulation of occupational exposure limits in Asia

This special issue of *Regulatory Toxicology and Pharmacology* is devoted to a discussion of the development and regulation of occupational exposure limits (OELs) in Asia. OELs are the necessary links between the science of risk assessment and the management of risk as a result of occupational exposures. Ideally, OELs are based on the best available and most up-to-date information. The development processes of OELs and the ultimate values of the OELs themselves may vary considerably from country to country, influenced mainly by the philosophical objectives of the regulatory agencies and the economic state of affairs in that country. Even among countries using very similar methodologies and essentially the same datasets, OELs may still vary markedly. More recently, however, there is a tendency toward harmonization of OELs internationally. It is interesting to compare both differences and similarities across countries.

We have chosen Asia for this special issue because many Asian countries have now become the manufacturers of goods for other nations all over the world. China, in particular, is the new manufacturing powerhouse. According to the May 9, 2005, issue of *Newsweek*, China is now the world's largest producer of coal, steel, and cement. China has also put more clothes on more people all over the world than any other country. China manufactures two-thirds of the world's copiers, microwave ovens, DVD players, and shoes. China's exports to the United States have grown by 1600% over the past 15 years. In 2004, Americans bought $11 billion worth of clothes and another $185 billion worth of other goods from China. Wal-Mart alone imported $18 billion worth of goods from China in 2004. Of Wal-Mart's 6000 suppliers, 80% are in just one country—China. The same scenario, to a lesser extent, is also true for other Asian countries.

In essence, many Asian countries have now become the factories for more developed countries, such as the United States, Canada, Japan, and European nations. This fact has created a new twist in the management of workers' health risk resulting from occupational exposures to industrial hazards. With the globalization of the world's economy, the workers' health risk can now be transferred ("exported") from one country to another. According to a recent report in the March 17, 2006, edition of *Sing Tao Daily* (a major Chinese daily newspaper in Hong Kong), 36 workers at a cell phone factory in Zhuhai (a city in the southern province of Guangdong in China) were diagnosed with benzene poisoning within the previous few days as a result of overexposure to benzene-containing adhesives. The workers at the factory were Chinese, but the factory owner was Japanese. Unfortunately, this was not an isolated incident. There are quite a few similar episodes of industrial poisoning at factories in Asia that are owned by foreign investors. Can one not argue that some more developed countries not only import manufactured goods from less developed nations but also "export" occupational health risk to them? Can one not argue that, for financial gains, some investors in more developed countries take advantage of not only cheap labor but also less stringent regulations in less developed countries?

Obviously, in the new world of global economy, the traditional view of protecting workers' health within individual countries is too narrow and no longer valid. The rapid globalization of the world's economy puts even more emphasis on not only the harmonization of the development of OELs but also the uniformity and consistency of regulation of OELs worldwide. In this issue, we have invited experts who are either actively involved in or intimately familiar with the processes in their own countries or administrative regions to describe the development and regulation of OELs in China, Hong Kong, Japan, Korea, Malaysia, Taiwan, and Singapore (Liang et al., 2006; Tsin, 2006; Takahashi and Higashi, 2006; Paek and Park, 2006; Rampal and Jemoin, 2006; Shih et al., 2006; Tan et al., 2006). These seven reports will provide the readers with an overview of the development and regulation of OELs in these areas.

In addition to the seven reports, two papers discuss the impact of new regulations on workers' exposures to benzene and lead in China (Wang et al., 2006; Ye and Wong, 2006). In May 2002, the Chinese central government passed the new Occupational Diseases Prevention and Control Act of 2002 (ODPCAct 2002), which is regarded as the most significant and comprehensive legislature in occupational

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health in China (Liang et al., 2003; Wong, 2003). With the passage of the new ODPCAct 2002, new and updated OELs have been issued. Many OELs have been significantly lowered. For example, the newly adopted OELs for benzene are 10 mg/m^3 (3 ppm) as 15-min STEL and 6 mg/m^3 (2 ppm) as 8-h TWA, revised downward from the previous OEL of 40 mg/m^3. At the same time, the new legislature provides more authority to regulatory agencies in its enforcement. Non-compliance will result in mandatory remedial actions, stiff fines, and even criminal prosecutions. The effectiveness of the new regulation, however, is not measured by the fines collected or punishments imposed but ultimately measured by the reduction of workers' exposures. The last two papers in this special issue provide the readers with the first insights into the initial impact of the new ODPCAct 2002 on workers' exposures to benzene and lead in China and the results may surprise many readers.

I hope the readers will find the reports in this special issue of *Regulatory Toxicology and Pharmacology* both interesting and informative. At the same time, I hope these reports will stimulate discussion and collaboration among regulators internationally. Finally, I sincerely thank the authors of these reports for their valuable contributions.

References

Liang, Y., Su, Z., Wu, W., Lu, B., Fu, W., Yang, L., Gu, J., 2003. New trend in the development of occupational exposure limits for airborne chemicals in China. Regul. Toxicol. Pharmacol. 38, 112–123.

Liang, Y., Wong, O., Yang, L., Li, T., Su, Z., 2006. The development and regulation of occupational exposure limits in China. Regul. Toxicol. Pharmacol. 46, 107–113.

Paek, D., Park, D.Y., 2006. The development and regulation of occupational limits in Korea. Regul. Toxicol. Pharmacol. 46, 126–130.

Rampal, K.G., Jemoin, M.N., 2006. Developing regulations for occupational exposures to health hazards in Malaysia. Regul. Toxicol. Pharmacol. 46, 131–135.

Shih, T.S., Wu, K.Y., Chen, H.I., Chang, C.P., Chang, H.Y., Huang, Y.S., Liou, S.H., 2006. The development and regulation of occupational exposure limits in Taiwan. Regul. Toxicol. Pharmacol. 46, 142–148.

Takahashi, K., Higashi, T., 2006. The development and regulation of occupational exposure limits in Japan. Regul. Toxicol. Pharmacol. 46, 120–125.

Tan, K.T., Lee, H.S., Koh, D., 2006. The development and regulation of occupational exposure limits in Singapore. Regul. Toxicol. Pharmacol. 46, 136–141.

Tsin, T.W., 2006. The development and implementation of occupational exposure limits in Hong Kong. Regul. Toxicol. Pharmacol. 46, 114–119.

Wang, L., Zhou, Y., Liang, Y., Wong, O., Armstrong, T., Wu, Q., Fang, J., Ye, X., Schnatter, R., Irons, R., Fu, H., 2006. Benzene exposure in the shoemaking industry in China, a literature survey, 1978–2004. Regul. Toxicol. Pharmacol. 46, 149–156.

Wong, O., 2003. Regulation of occupational exposures in China. Regul. Toxicol. Pharmacol. 38, 109–111.

Ye, X., Wong, O., 2006. Lead exposure, lead poisoning and lead regulatory standards in China, 1990–2005. Regul. Toxicol. Pharmacol. 46, 157–162.

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