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Study Determines Mercury Pollution Cost Over a Million Dollar in Lost Learning Potential in Indonesia

First ever peer-reviewed study on the economic burdens of mercury exposure near sources named in the Minamata Convention

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Jakarta, 1 June 2017 - Indonesia are losing more than IDR 12–24 billion (approx. US\$961,000 - US\$1,630,000) in earning potential in mining communities every year due to mercury contamination, according to a new study published in *The Journal of Environmental Management*.¹ The analysis, led by noted researcher Dr. Leonardo Trasande, MD, MPP, is the first peer-reviewed study to estimate economic losses due to diminishing IQ resulting from mercury contamination in Indonesia and 14 other countries.

The study evaluated mercury concentrations in hair samples from 236 participants from 17 sites in 15 countries, and estimated an annual loss of \$77 - \$130 million USD to these specific communities. All study participants lived near highly toxic mercury sources named in the Minamata Convention, the international treaty that obligates parties to take actions to minimise and eliminate mercury pollution to protect human health and the environment. On May 18th, the Convention reached the 50-country ratification milestone and will become international law August 16th.

BaliFokus Foundation, a public interest Indonesian non-governmental organisation, contributed to the global study, collecting hair samples from participants living near small scale gold mines, a source specifically named in the Minamata Convention on Mercury, which obligates governments to take actions to minimise and eliminate mercury pollution to protect human health and the environment. Researchers collected samples around Sekotong, West Lombok and Poboaya, Central Sulawesi. Miners at both sites amalgamate gold using mercury, then burn off the mercury to leave gold. Processing occurs in the backyards of residences or near rice fields. Miners process contaminated tailings further, using cyanide leaching, or dump wastes directly into rivers.

“This study gives us just a small sample of the extent of the damage that is happening throughout similar sites in Indonesia. The intangible costs of mercury pollution in form of poor quality of life, unhealthy living environment, and less socio-economic opportunities are very high,” said Yuyun Ismawati of BaliFokus. “Indonesia need to ratify the Minamata Convention soon, ban the use and trade of mercury, and implement the National Action Plans to prevent lost earning potential in Indonesia and the future generation of the country.”

Hair samples in all participants from the two sites had mercury levels greater than a 0.58 parts per million (ppm) standard, the reference dose standard proposed in light of data suggesting harmful effects of mercury at low levels of exposure. Levels ranged .82 parts per million to 13.3 ppm.

“Mercury pollution comes with a steep price tag,” said Joe DiGangi, PhD, IPEN Science and Technical Advisor, and a co-author of the study. “That’s why the Minamata Convention needs to be ratified and fully implemented to prevent the tragic health impacts and lost earning potential in thousands of communities like the ones in this study. Mercury is a serious global threat to human health and this study shows that it also imposes additional burdens on the economy.”

Sixty-one percent of study participants had mercury levels greater than 1 part per million (ppm), the US Environmental Protection Agency (EPA) reference dose.² The proportion of people with high mercury levels increased to nearly three out of four participants (73 percent) when analysed using a 0.58 ppm standard, which has been proposed in light of data suggesting harmful effects of mercury at even lower levels of exposure.³

“This study reveals the importance of biomonitoring mercury pollution,” said David Evers, PhD, Executive Director at Biodiversity Research Institute and a study co-author. “This is the first time a globally coordinated, standardised analysis of these particular sites was conducted to determine the severity of the problem. It is critical that we continue biomonitoring efforts in order to track the potential impacts on local communities and on the environment.”

Mercury exposure damages the nervous system, kidneys, and cardiovascular system. Developing organ systems, such as the foetal nervous system, are the most sensitive to the toxic effects of mercury, although nearly all organs are vulnerable. Human exposure to mercury occurs primarily through the consumption of contaminated fish, although rice and direct exposure to mercury vapour can also be sources.

References:

¹ *Trasande L, DiGangi J, Evers D, Petrlik J, Buck D, Samanek J, Beeler B, Turnquist MA, Regan K (2016) Economic implications of mercury exposure in the context of the global mercury treaty: hair mercury levels and estimated lost economic productivity in selected developing countries, Journal of Environmental Management 183:229 - 235, doi: 10.1016/j.jenvman.2016.08.058*
<http://www.ncbi.nlm.nih.gov/pubmed/27594689>

² *Daily intake below the Reference Dose is assumed to be without appreciable risk of harmful effects during a lifetime.*

³ *Grandjean P, Budtz-Jorgensen E. Total imprecision of exposure biomarkers: implications for calculating exposure limits. Am J Ind Med. 2007;50(10):712–719. doi: 10.1002/ajim.20474*

Hair samples for the study were collected through a standardised hair sampling protocol by public interest organisations in the IPEN network in participating countries. BaliFokus has been a member of IPEN since 2005. Biodiversity Research Institute (BRI) Mercury Laboratory provided the analysis of the samples.

[BaliFokus](http://www.balifokus.asia) is an Indonesian non-governmental organisation working to improve community's capacity, quality of life and advocating a toxics-free environment together with all stakeholders in sustainable way. www.balifokus.asia

[IPEN](http://www.ipen.org) is a network of non-government organisations working in more than 100 countries to reduce and eliminate the harm to human health and the environment from toxic chemicals. www.ipen.org

[Biodiversity Research Institute \(BRI\)](http://www.briloon.org) is a nonprofit ecological research group whose mission is to assess emerging threats to wildlife and ecosystems through collaborative research, and to use scientific findings to advance environmental awareness and inform decision makers. www.briloon.org