



ELSEVIER

Contents lists available at ScienceDirect

## Environmental Research

journal homepage: [www.elsevier.com/locate/envres](http://www.elsevier.com/locate/envres)

### Letter to the Editor, “Assessment of mercury exposure in human populations: A status report from Augusta Bay (southern Italy)”

We carefully read comments from SMJ Mortazavi, Ghazal Mortazavi and Maryam Paknahad about our article (Bonsignore et al., 2016) published in Environmental Research (doi:10.1016/j.envres.2016.01.016). Mortazavi et al. underlined that the absence of a specific evaluation of the dental amalgam fillings on the Hg concentration in blood, hair and urine of the studied human population could affect the accuracy of the findings in a negative way. Actually, the inhalation of elementary mercury ( $\text{Hg}^0$ ) and the ingestion of methylmercury (MeHg), mainly through a seafood diet, are the most important sources of human exposure to mercury (WHO, 1990, 1991, 2003). Generally, among non-occupational exposure and in industrialized countries,  $\text{Hg}^0$  released from dental amalgam fillings is a major source of mercury in human population (Clarkson, 2002; Apostoli et al., 2002), resulting in an impact on [Hg] in human biological media, primarily in urine (WHO, 1997). This is the reason why urinary mercury measurements are widely used for assessment of exposure to inorganic Hg (mainly  $\text{Hg}^0$ ) in humans (Barregard, 1993, 2006).

In the first step of our investigation, we have considered the presence of many confusing factors, including the presence and the number of those amalgam fillings on the levels of Hg on the different biomarkers (hair, blood and urine). Nevertheless, when included in the multiple regression analysis, the “presence/absence of dental amalgams” resulted definitively meaningless from a statistical point of view ( $p \gg 0.05$ ) and, therefore, unnecessary in terms of reliable interpretation of the outcomes. Moreover, the lack of any considerable [Hg] anomalies in the urine samples demonstrated the absence of significant and alternative sources of Hg in the form of IHg. That, reasonably, supported the decision to rule out the presence of amalgams and other specific minor confusing factors from our evaluation of Hg exposures in the studied system and, consequently, to focus our data analysis on the more statistically reliable and accurate study of the impacts of organic mercury and associated pathways on the investigated population.

### References

- Barregard, L., 1993. Biological monitoring of exposure to Hg vapor. *Scand. J. Work Environ. Health* 19, 45–49.
- Barregard, L., Horvat, M., Mazzolai, B., Sällsten, G., Gibicar, D., Fajon, V., Di Bona, S., Munthe, J., Wängberg, I., Eugensson, M.H., 2006. Urinary mercury in people living near point sources of mercury emissions. *Sci. Total Environ.* 368, 326–334.
- Bonsignore, M., Andolfi, N., Barra, M., Madeddu, M., Tisano, F., Ingallinella, V., Castorina, M., Sprovieri, M., 2016. Assessment of mercury exposure in human populations: A status report from Augusta Bay (southern Italy). *Environmental Research, Special Issue: Human biomonitoring*, In Press, Corrected Proof, Available online 19 January. <http://dx.doi.org/10.1016/j.envres.2016.01.016>.
- Clarkson, T.W., 2002. The three modern faces of mercury. *Env. Health Perspect.* 110, 11–23.
- WHO, 1990. Environmental health criteria 101, methylmercury. IPCS. Geneva, Switzerland7 World Health Organization.
- WHO, 1991. Environmental health criteria 118, Inorganic mercury. IPCS. Geneva, Switzerland7 World Health Organization.
- World Health Organisation. Consultation on Dental Amalgam and its Alternatives. Geneva: WHO, 1997.
- WHO (World Health Organization), 2003. Expert committee on food additives, Sixty-first meeting, Rome, 10–19 June 2003.

Maria Bonsignore, Mario Sprovieri\*

*Institute for Coastal and Marine Environment (IAMC – CNR), Via del Mare, 3, 91021 Torretta Granitola, Campobello di Mazara, TP, Italy*  
E-mail address: [mario.sprovieri@iamc.cnr.it](mailto:mario.sprovieri@iamc.cnr.it) (M. Sprovieri)

Nunzia Andolfi, Anselmo Madeddu, Francesco Tisano,  
Vincenzo Ingallinella, Maria Castorina  
*Laboratory of Public Health – ASP of Syracuse, Corso Gelone, 17,  
96100, Syracuse, Italy*

Marco Barra  
*Institute for Coastal and Marine Environment (IAMC – CNR), Calata  
Porta di Massa, Interno Porto di Napoli, 80133 Naples, Italy*

Received 5 April 2016

11 May 2016

17 May 2016

\* Corresponding author.