Environmental Science & Technology

Addition/Correction

pubs.acs.org/est

Correction to Pb Particles from Tap Water: Bioaccessibility and Contribution to Child Exposure

Elise Deshommes*,[†] and Michèle Prévost[†]

[†]Ecole Polytechnique de Montreal, NSERC Industrial Chair on Drinking Water, CGM Department, C.P. 6079 succ. A, Montreal (QC) H3C 3A7, Canada

Environ. Sci. Technol. **2012**, *46*, 6269−6277 DOI: 10.1021/es2045585

This is to correct an error previously published in Deshommes and Prévost.[1] The IEUBK simulations performed at the end of the paper erroneously applied the relative bioavailability (RBA) instead of the absolute bioavailability (ABA) to dust and particulate Pb in tap water. Indeed, RBA is the bioavailability relative to that of soluble Pb, therefore it has to be multiplied by 50% (absorption fraction of soluble Pb) to obtain the absorption fraction (ABA, or absolute bioavailability) that is applied as input in IEUBK:

$$\mathrm{ABA}_{\%} = 0.5 \times \mathrm{RBA}_{\%} = 0.5 \times (0.878 \times \mathrm{IVBA}_{\%} - 0.028)$$

Therefore, The equations applied to the integration of particulate Pb absorption fraction in IEUBK in the Materials and Methods section should be replaced by

$$\mathrm{Pb}_{\mathrm{total},\mu\mathrm{g}\cdot\mathrm{L}^{-1}} = \mathrm{Pb}_{\mathrm{dissolved},\mu\mathrm{g}\cdot\mathrm{L}^{-1}} + \left(\mathrm{Pb}_{\mathrm{particulate},\mu\mathrm{g}\cdot\mathrm{L}^{-1}} \times \frac{\mathrm{ABA}_{\mathrm{particulatePb},\%}}{50_{\%}}\right)$$

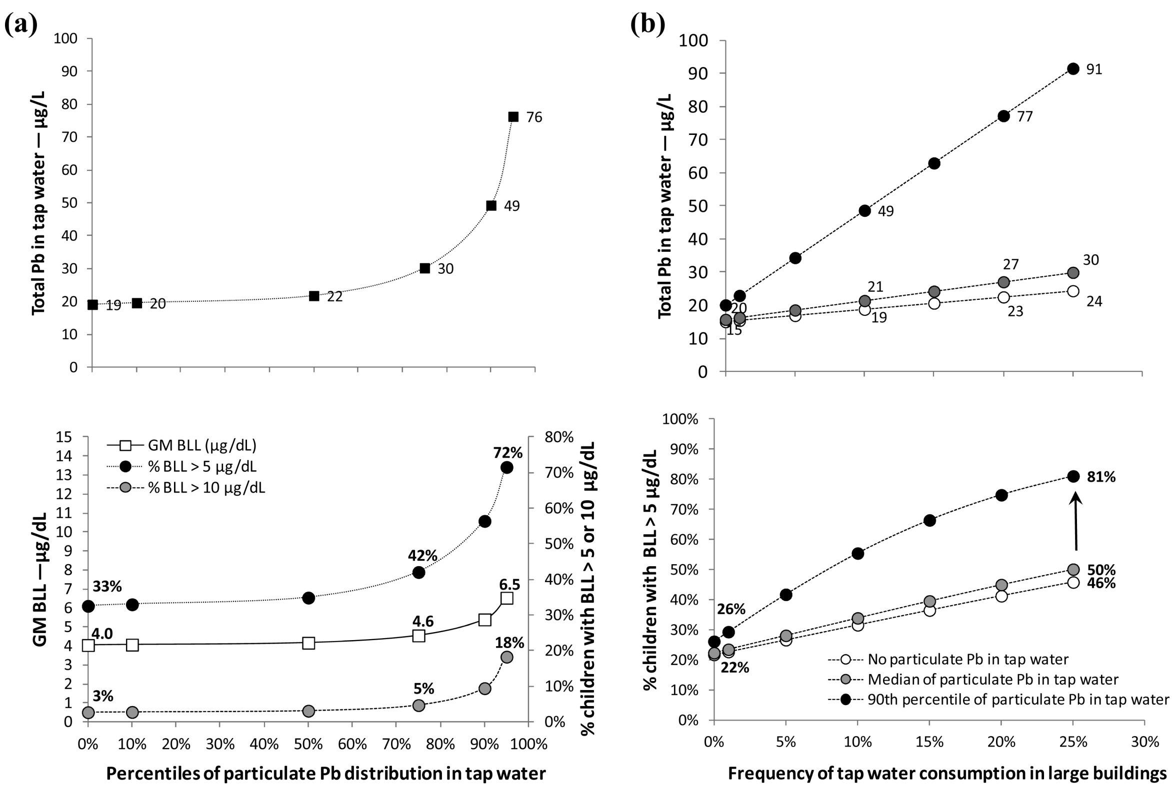

Figure 6. IEUBK simulations considering exposure from soil, dust, diet, air, and tap water. (a) Pb concentrations in tap water considered for exposure are a weighted mean of 70% RDT & 20% 5 min-flushing concentrations from homes with an LSL, and 10% 1st flush concentrations from large buildings−median dissolved Pb levels are applied (fixed), and particulate Pb is progressively increased from 0 to the 95th percentile of its distribution in tap water samples (*x*-axis)−resulting total Pb concentrations (dissolved Pb median plus particulate Pb) are indicated on the top; (b) Results with progressive increase of consumption frequency in large buildings (0−25%) considering exposition to median dissolved Pb levels in tap water samples plus: (i) no particulate Pb in tap water; (ii) the median of particulate Pb distribution in tap water samples; and (iii) the 90th percentile of particulate Pb distribution in tap water samples−when increasing the frequency of consumption in large buildings, the ratio of consumption frequency between RDT and 5 min-flushing concentrations is kept constant.

Published: November 27, 2012

$$0.5 \times Pb_{total,\mu g \cdot L^{-1}} = 0.5 \times Pb_{dissolved,\mu g \cdot L^{-1}} + (Pb_{particulate,\mu g \cdot L^{-1}} \times ABA_{particulatePb,\%})$$

The median absorption fraction for particulate Pb (ABA), deduced from the measured median *in vitro* bioaccessibility (IVBA), is therefore equal to half of the median RBA (33%), which is 17%.

The ABA and the Pb concentration for dust, deduced from (i) the 62% bioaccessibility (IVBA) data and (ii) from the 63 μg Pb bioaccessible/g dust data published in Rasmussen et al.,[2] and presented in Table 1, are therefore:

$$\text{concentration}_{Pb,dust} = \frac{63}{0.62} = 101.61 \mu g_{Pb}/g_{dust}$$

$$\begin{aligned} ABA_{\%,dust} &= 0.5 \times RBA_{\%,dust} \\ &= 0.5 \times (0.878 \times IVBA_{\%,dust} - 0.028) \\ &= 26\% \end{aligned}$$

Table 1 which summarizes the IEUBK inputs should also be revised. RBA should be replaced by ABA, and the values for dust and particulate Pb enunciated above should be replaced. The ABA for soil (30%), diet (50%), and soluble Pb from tap water (50%) still remain the same, as they were default values from IEUBK, and not estimated from bioaccessibility (IVBA) data.

Finally, the IEUBK simulation results presented in the two subfigures at the bottom of Figure 6 are modified following these changes. The revised figures are illustrated in this revised Figure 6, and are essentially the same. The references to these values cited in the results and discussion section must also be revised. Geometric mean (GM) values of blood lead levels (BLLs) vary from 4.0 to 4.6 μg/L (75th) and 6.5 μg/L (95th) rather than previous estimates of 4.6, 5.6, and 9.2 μg/dL. The corresponding fraction of children estimated with a BLL >10 μg/dL decreases from 5 to 3% without particulate Pb, and from 11−43% to 5−18% for the 75−95th percentiles. With a reference BLL of 5 μg/dL, the fraction exceeding the threshold is decreased from 42−90% to 33−72%. The BLL estimate for no consumption in large buildings, and cited only in the text, decreases from 4.1 to 3.5 μg/dL. Similarly, estimates of the fraction of children with BLLs >5 μg/dL for varying water consumption and particulate Pb scenario in large buildings globally change from 31−94% to 22−81%.

This error does not affect the trends and still fully support the discussion and conclusions. We maintain our conclusions regarding the contribution of particulate Pb to child exposure.

■ AUTHOR INFORMATION

Corresponding Author

*Phone: (+1) 514-340-4711 (2236); e-mail: elise.deshommes@polymtl.ca.

■ REFERENCES

(1) Deshommes, E.; Prévost, M. Pb particles from tap water: bioaccessibility and contribution to child exposure. *Environ. Sci. Technol.* **2012**, *46* (11), 6269−6277.

(2) Rasmussen, P. E.; Beauchemin, S.; Chenier, M.; Levesque, C.; MacLean, L. C. W.; Marro, L.; Jones-Otazo, H.; Petrovic, S.; McDonald, L. T.; Gardner, H. D. Canadian house dust study: Lead bioaccessibility and speciation. *Environ. Sci. Technol.* **2011**, *45* (11), 4959−4965.