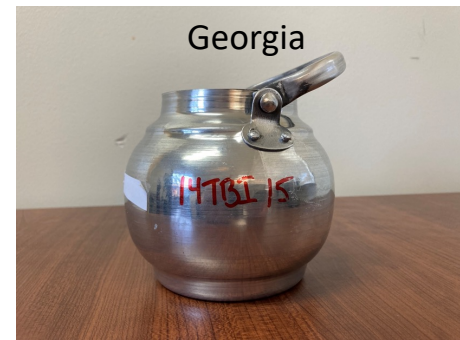
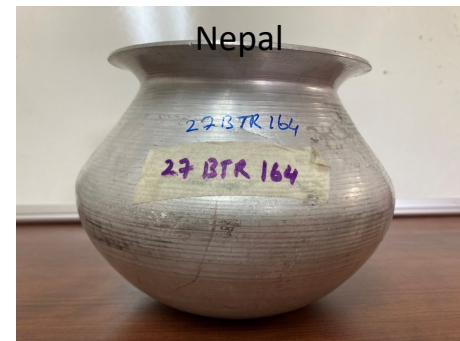


RMS Laboratory Leaching Program for Aluminum Pots

September 5, 2023 - Pure Earth Global Staff Meeting



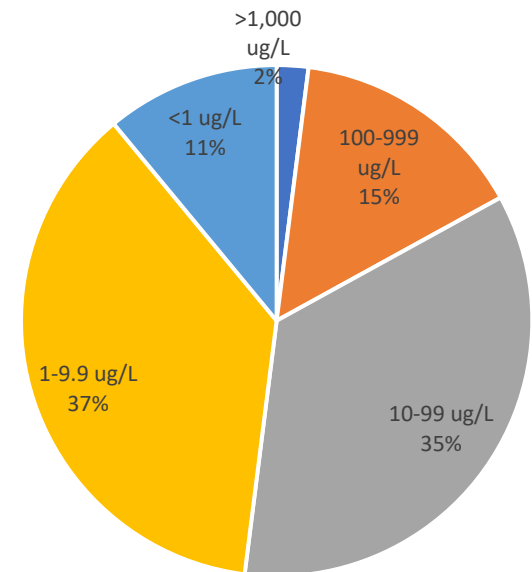
Purpose , Procedures, and Scope

- *Purpose:* (1) Evaluate potential for aluminum (Al) pots to be a source of lead (Pb) exposure; (2) Evaluate relationship between XRF and Pb in lead that may be released from pots during cooking; (3) Refine a practical and reproducible test method
- *Procedures:* Pots were filled with water containing acetic acid (vinegar) and boiled for two hours to simulate cooking, then water (leachate) was analyzed in the laboratory for Pb and Al
- *Scope:* To date 92 pots from 23 countries and 5 geographic regions



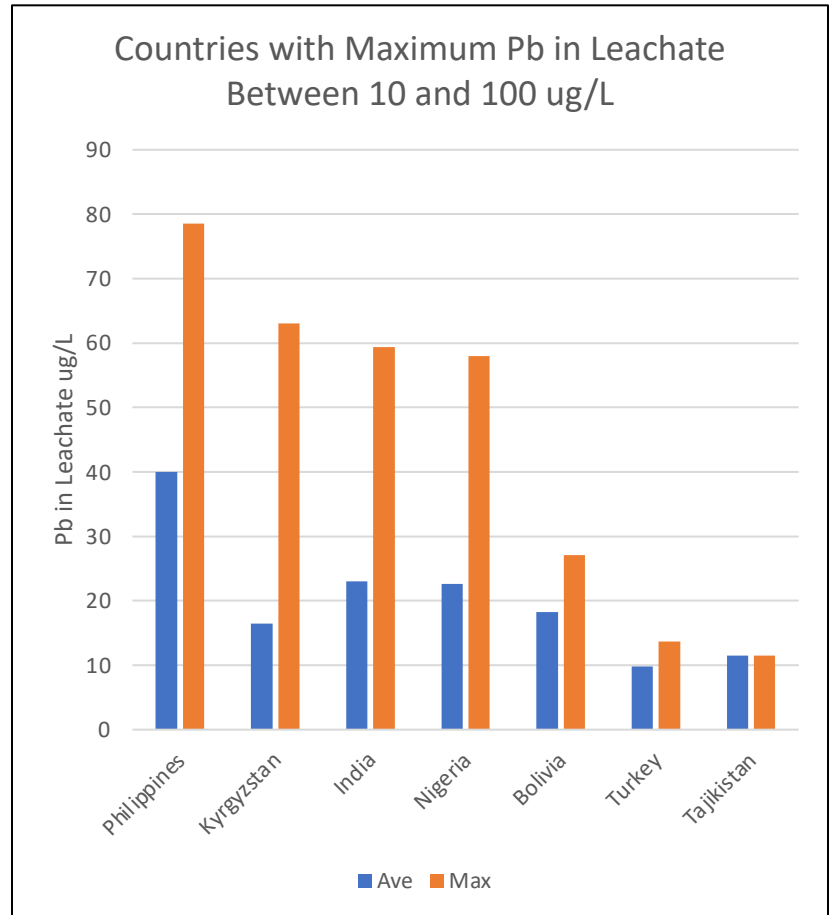
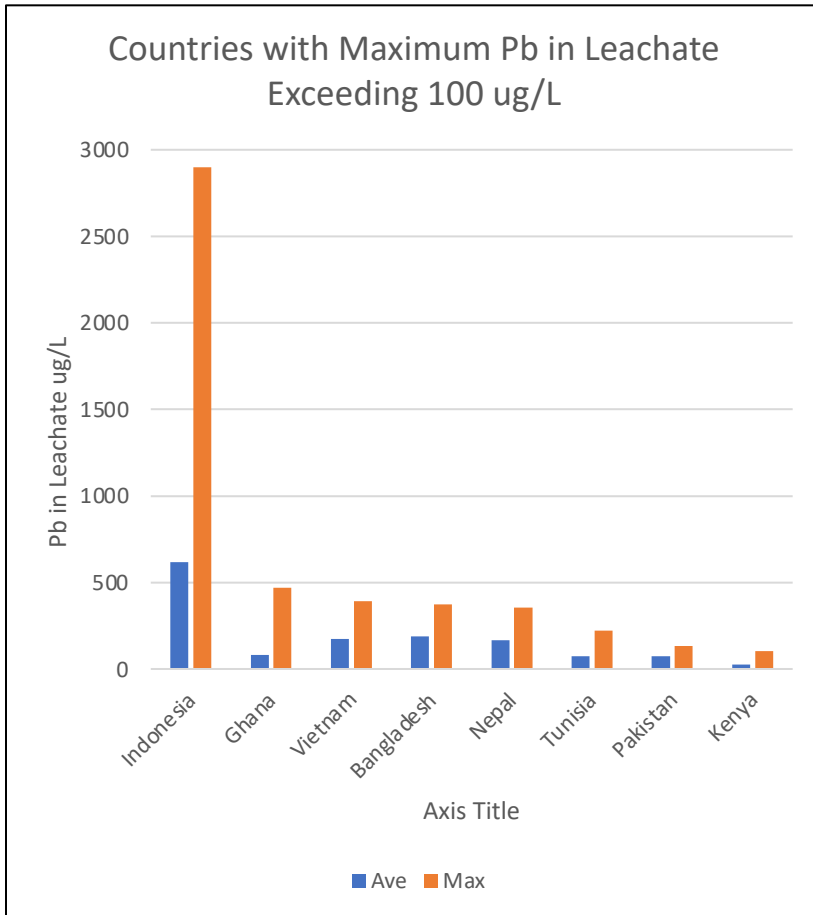
Findings

- 52% of the pots tested leached lead in concentrations greater than our reference level of 10 ug/L
- 20% of the pots tested **in theory** could result in an appreciable BLL increase in children (>3.5 ug/dL), if food is consumed from them on a daily basis
- Leaching from pots varies by region and country, but in general is highest where pots are locally made from scrap materials – South and Southeast Asia and Africa
- XRF is a reasonable screening tool for predicting whether a pot may leach above our Pb reference level
- Repeat, consecutive leaching “boils” in pots in general resulted in lower lead in leachate, although lead remained above the 10 ug/L reference level in most cases

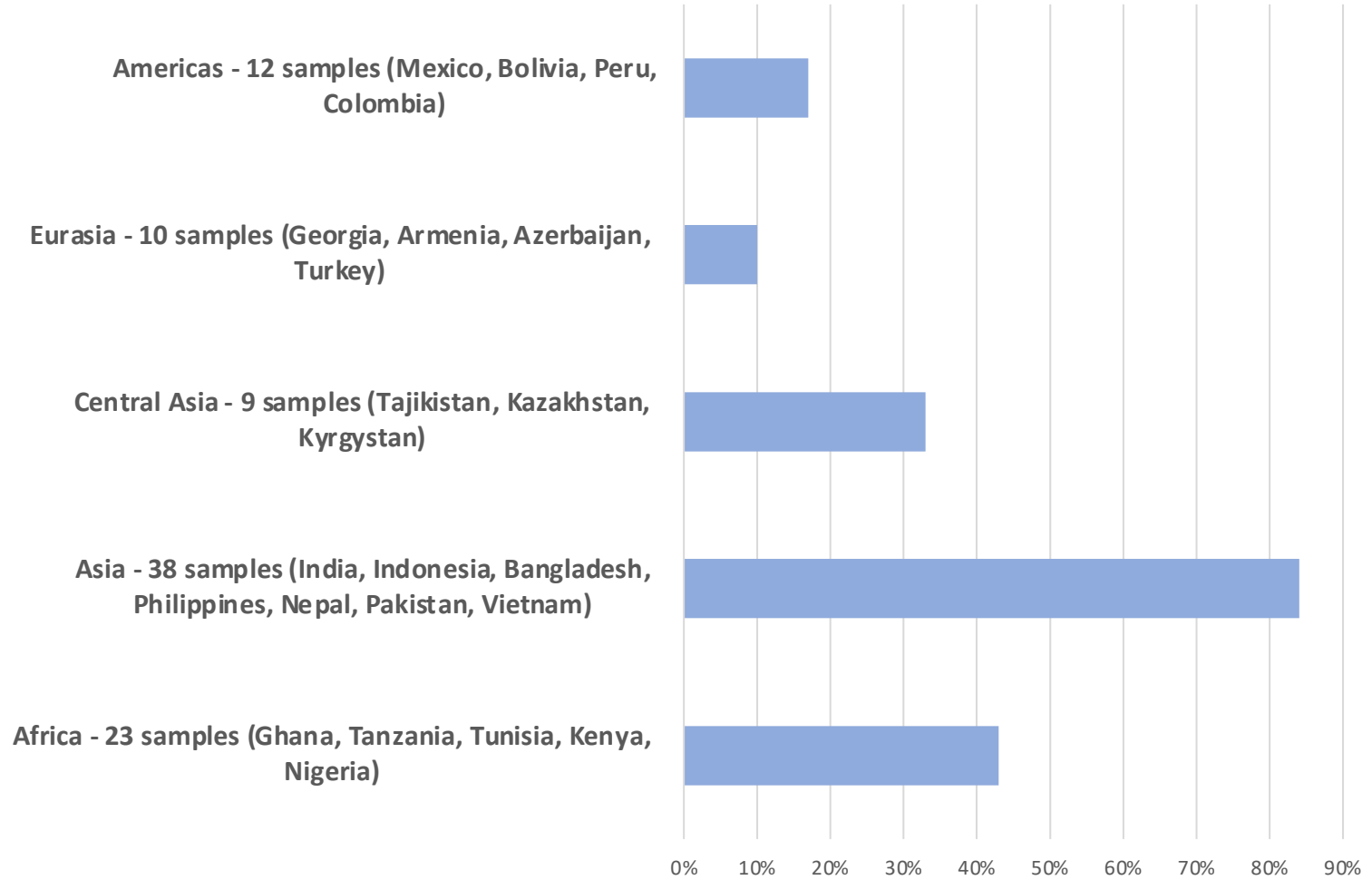


Maximum and Average Leachate Concentrations by Country

(Maximum < 10 ug/L for Colombia, Kazakhstan, Georgia, Armenia, Mexico, Peru, Tanzania, Azerbaijan)



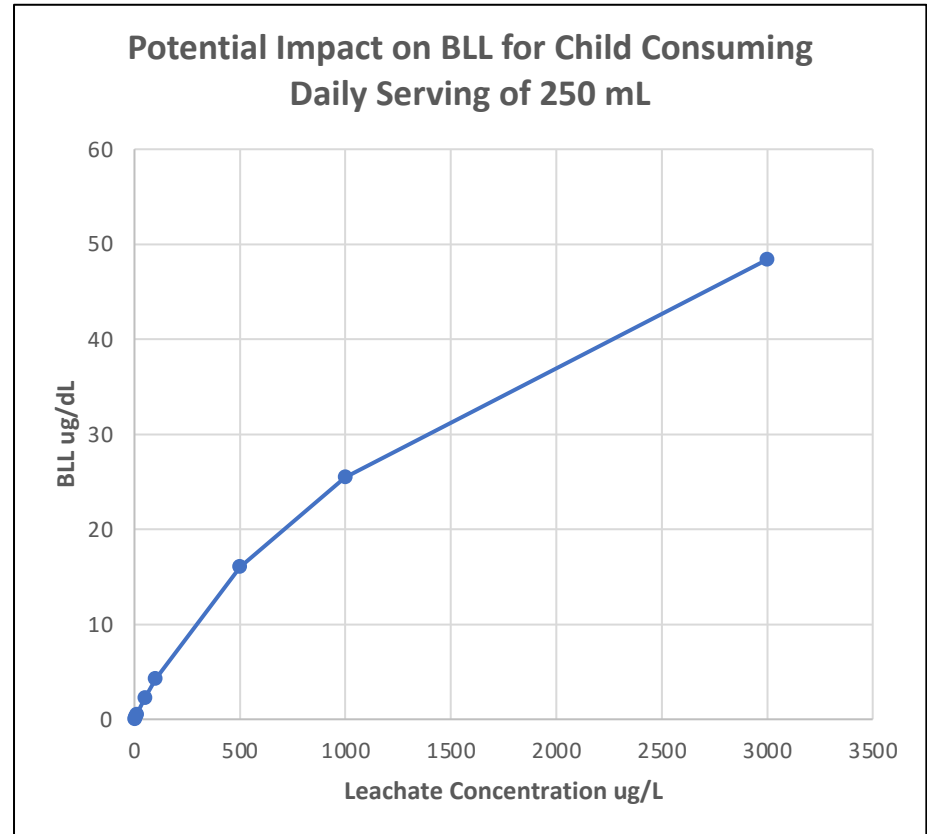
Percent of Samples Exceeding 10 ug/L Pb Reference Level in Leachate by Region



Potential Impact on Blood Lead Levels

(IEUBK computations by Dr. Jack Caravanos, DrPH, CIH, Clinical Professor, NYU) – Assumes daily consumption of 250 mL or grams from pot

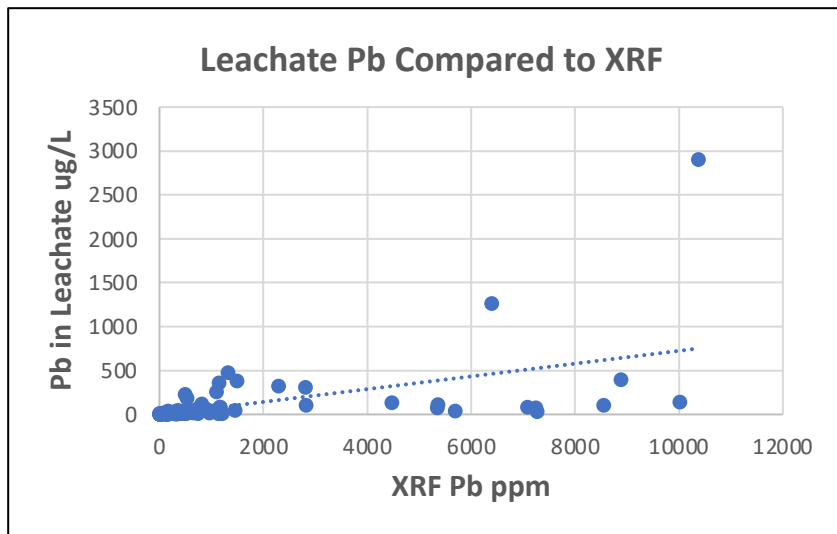
Leachate Concentration ug/L	BLL ug/dL for Child 0-7 years
1	0.03
5	0.23
10	0.47
50	2.24
80	3.45
100	4.27
500	16.04
1,000	25.47
3,000	48.39



WHO: BLL of 3.5 ug/dL or greater may be associated with health impacts in children

Comparing XRF and Lead in Leachate

- There is not a strong linear relationship: Pb distribution in Al alloy is not uniform; rough and curved surfaces affect XRF reliability and reproducibility.
- Total XRF lead below 100 ppm is a good indicator that the pot would leach less than the 10 ug/L reference level.



Consecutive Repeat Boils

- Repeat, consecutive leaching “boils” in pots in general resulted in lower lead in leachate.
- In 5 of 7 pots Pb in the last boil was greater than reference level.
- Testing does not take into account scratching or scrubbing that would occur with repeat use at home.

