**Rapid Marketplace Screening in Bangladesh**

**BACKGROUND**

Pure Earth has conducted Rapid Marketplace Screening (RMS) with support from GiveWell in 12 countries including Bangladesh. Pure Earth developed and followed a sampling protocol based on a Desk Review Report (DRR) which summarized published literature on known lead exposure sources to inform initial sampling and analysis of products, commodities, and substances that may contain lead.

The trained investigators of Pure Earth conducted the formative research (FR) with the information presented in the DRR, entered the markets, and determined what lead-containing products to sample.

**OBJECTIVE**

- To identify sources of lead exposure and prioritize countries for future interventions.
- This formative research is to guide a larger, more formal and comprehensive sampling and testing of selected ‘lead-positive’ products.

The investigators visited a total of 15 markets in four districts, collected 367 samples which were potential sources of lead as identified during the desk review.

**List of Markets**

**Dhaka City:**
1. Mirpur Co-operative Market
2. Mirpur Shah Ali Market
3. Mohammadpur Town Hall Market
4. Mirpur Capital Tower Market
5. Mohammadpur Bazar
6. Mohammadpur Shattola Bazar
7. Chowk Bazaar

**Khulna Division:**
1. Boro Bazar
2. Prantik Market
3. New Market

**Rajshahi Division:**
1. Shaheb Bazar
2. New Market

**Barishal Division:**
1. Shagordi Market
2. New Market

**METHODOLOGY**

- Train the investigators on project goals, procedures, data entry process in SurveyCTO, and operating XRF instrument.
- Identify Markets
- During the market visit: Collect samples, fill out market-level questions, vendor-level questions, and product questions
- Level the samples with a Unique ID
- Level the sample photo and photo ID
- Analyze the samples via XRF
- Send selected samples for laboratory testing
- Upload the data using SurveyCTO

**XRF TESTING ON SAMPLES**

The samples were tested with a ThermoFisher NITON hand-held portable X-ray Fluorescence Heavy Metal Analyzer (Olympus Vanta Model). Samples were purchased and tested off-site.
In the first phase, a total of 163 samples of 11 types of items were screened; lead is found in 40 samples of 9 types of items' category.

**Dhaka city, phase 01, samples:**
- Spices - 13 samples
- Pottery - 6 samples
- Ceramics - 3 samples
- Medicines - 14 samples
- Cosmetics - 46 samples
- Toys - 7 samples
- Paints - 11 items
- Other foods - 21 samples
- Other non-food items - 22 samples
- Other non-food items (pigment) - 11 samples
- Cookware from recycled aluminum - 9 samples

**Lab Test Result:**
- Vegetables, Fresh Turmeric 17922 PPM
- Vegetables, Cauliflower 3998 PPM

The preliminary findings show that 96 samples are lead-positive among 367 samples, where the major sources were aluminum cookware, ceramic foodware, local paints, toys, amulets, pigments, and other non-food items.

**Comments**
- Need to explore the exposure route of lead contamination through qualitative investigation
- Need to prioritize the lead exposure issue to conduct a national-level analysis of potential lead sources
- Many consumer and food products do not have reference values/standards for using lead in the products. Need to standardize the use of lead
- Strict monitoring and enforcement of the law and regulations are required to prevent using lead arbitrarily
- Public awareness raising and capacity building of the relevant authority on lead issue is crucial to prevent the sources of lead exposure

**REFERENCE LEVELS**
- Decorative Paint - 90 ppm (UNEP, Bangladesh)
- Toys - 90 or 100 ppm for paint or coatings (US Consumer Product Safety Commission)
- Rice & cereals - less than 0.1 mg/kg) as defined by WHO/FAO
- Major Starch - 0.1-0.5 ppm (US FDA; WHO/FAO)
- Raw & processed turmeric - 2.5 ppm (mg/kg). (BSTI)
- Spices other than turmeric - 2mg/kg (QCVN 8-2:2011/BYT)
- Cosmetics & Vermilion (Sindoor) - 10 ppm for lipstick; 20 ppm for other types (FDA)
- Metal foodware: 100pmm
- Ceramic foodware: 100ppm
- Plastic foodware: 100ppm
- Herbal/traditional medicines: 10ppm (WHO)