

# Rapid Marketplace Screening in Bangladesh

**04** districts: Dhaka, Khulna, Rajshahi, and Barishal were the part of the Rapid Marketplace Screening study

**367** samples of market products collected and analyzed

**96** samples were found lead-positive including aluminum cookware, ceramic foodware, local paints, toys, amulets, pigments, and other non-food items.

## 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.*



*In the first phase, the Rapid Marketplace Screening (RMS) was conducted in **Dhaka city**, and in the second phase in three more districts: **Khulna, Rajshahi, and Barishal**.*

### 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. Mohakhali Kacha Bazar
6. Mohakhali Bazar
7. Mohakhali Shattola Bazar
8. 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.

**XRF ANALYSIS  
SAMPLES WITH  
HIGH LEVEL OF  
LEAD (Pb)**

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

**RMS RESULT PHASE 01 at DHAKA CITY**



**AMULETS**

- Amulets: 252000 PPM



**CERAMICS**

- Tea Mug: 3718 PPM



**ALUMINIUM COOKWARE**

- Spatula - 2054 PPM
- Pan - 1738 PPM
- Pan - 1081 PPM
- Pitcher - 622 PPM
- Saucepan - 403 PPM



**PIGMENTS**

- Deep Yellow Pigment: 153000 PPM



**OTHER NON-FOOD ITEMS**

- Orange color Mug - 3387 PPM
- Sweetener container - 3050
- Plastic box - 1931 PPM



**TOYS**

- Duck - 722 PPM
- Ring - 277 PPM

**RMS RESULT PHASE 02 at KHULNA, RAJSHAHI, BARISHAL DIVISIONS**

In the second phase, a total of 204 samples were screened; lead is found in 56 samples.

**Khulna, Rajshahi, Barishal, Phase 02, samples:**

- Aluminium cookwares: 47
- Toys - 31
- Spices - 49
- Paints- 30
- Rice - 13
- Cosmetics - 34



**ALUMINIUM COOKWARE & FOOD WARES, CERAMIC FOOD WARES**

- Khulna: 853 PPM
- Rajshahi: 2118 PPM
- Barisal: 1310 PPM



**TOYS**

- Khulna - 606 PPM
- Rajshahi - 1814 PPM
- Barisal - 755 PPM



**LOCAL PAINT: YELLOW PIGMENTS**

- Khulna: 31360 PPM
- Rajshahi: 28902 PPM
- Barisal: 12230 PPM

**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: 100ppm
- Ceramic foodware: 100ppm
- Plastic foodware: 100ppm
- Herbal/traditional medicines: 10ppm (WHO)

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



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