



# Unseen Threats: Hospital-Based Evidence of Pediatric Lead Exposure in a Non-Industrial Area of Indonesia

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## Introduction

Lead exposure remains critical public health concern, particularly among children under five, leading to irreversible neurological, cognitive, and physical disorders. This study aimed to examine the relationship between blood lead levels (BLLs) and growth and development disorders, anaemia, and lead-related clinical diagnoses in children 1 to 5 years old.

## Method

Conducted as a cross-sectional study in Rumah Sakit Islam Jakarta Pondok Kopi, data were collected through caregiver interviews, physical examinations, review of secondary medical records, and venous blood lead level (BLL) testing using Inductively Coupled Plasma–Atomic Emission Spectroscopy (ICP-AES).

## Results

We included 105 hospitalized children in the study. No cases acute lead poisoning was identified, 45.7% were classified as having possibly lead-related clinical diagnoses. Anaemia was prevalent in 44.8% of the cohort, while malnourishment affected 17.1%. The mean BLL was 2.0 µg/dL, with values ranging from <0.228 to 10.1 µg/dL. Twenty percent had levels above 5.0 µg/dL, and two children had a level above 10.0 µg/dL. Female children and those with less-educated mothers showed higher odds of elevated BLLs, though findings were not statistically significant.

Table 1. Blood Lead Levels in Children

Blood Lead Level	Number	Percentage
Undetectable (<0.228µg/dL)	75	71.4
0.228 – 5 µg/dL	8	7.6
>5-10 µg/dL	20	19.0
>10 µg/dL	2	1.9

Table 2. Relationship Between Blood Lead Levels and BMI, PDSQ, Diagnosis, and Anemia |

	Body Mass Index (BMI)				
	Underweight/Malnourished	OR	95% CI	p Value	
<b>BLL</b>	No	Yes			
<5µg/dL	70 (84.3)	13 (15.7)	1		
≥5 µg/dL	18 (81.8)	4 (18.2)	1.197	0.348-4.113	0.776
	PDSQ Deviant/Questionable				
<b>BLL</b>	No	Yes			
<5µg/dL	48 (57.8)	35 (42.2)	1		
≥5 µg/dL	13 (59.1)	9 (40.9)	0.9	0.365-2.467	0.915
	Lead-Related Diagnosis				
<b>BLL</b>	No	Yes			
<5µg/dL	39 (81.2)	9 (18.8)	1		
≥5 µg/dL	44 (77.2)	13 (22.8)	1.280	0.494-3.320	0.611
	Anemia				
<b>BLL</b>	No	Yes			
<5µg/dL	44 (53.0)	39 (47.0)	1		
≥5 µg/dL	14 (63.6)	8 (36.4)	0.645	0.244-1.700	0.375

## Conclusion

This finding is particularly important as it provides a picture of BLL in children living in non-industrial areas or regions distant from used lead-acid battery (ULAB) recycling activities. It serves as a valuable reference for policymakers in determining priorities and management strategies for lead exposure in Indonesia, particularly across regions with varying sources of lead exposure in children.

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### Conflict of Interest

The authors declare no competing interests. This study was conducted independently from the author's institutional responsibilities.

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