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Reducing Lead Exposure: The Impact of DMSA Chelation on Blood Lead Levels in Children from Kabwe, Zambia

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Take home message:

- Oral dimercaptosuccinic acid (DMSA) therapy was effective in reducing blood lead levels (BLLs) in children in Kabwe.
- The therapy was especially beneficial for children with baseline BLLs exceeding 65 µg/dL.
- These findings highlight the potential of DMSA as a key treatment for lead poisoning in this high-risk population.

Picture: Children playing in a highly lead contaminated area (© Böse-O'Reilly)

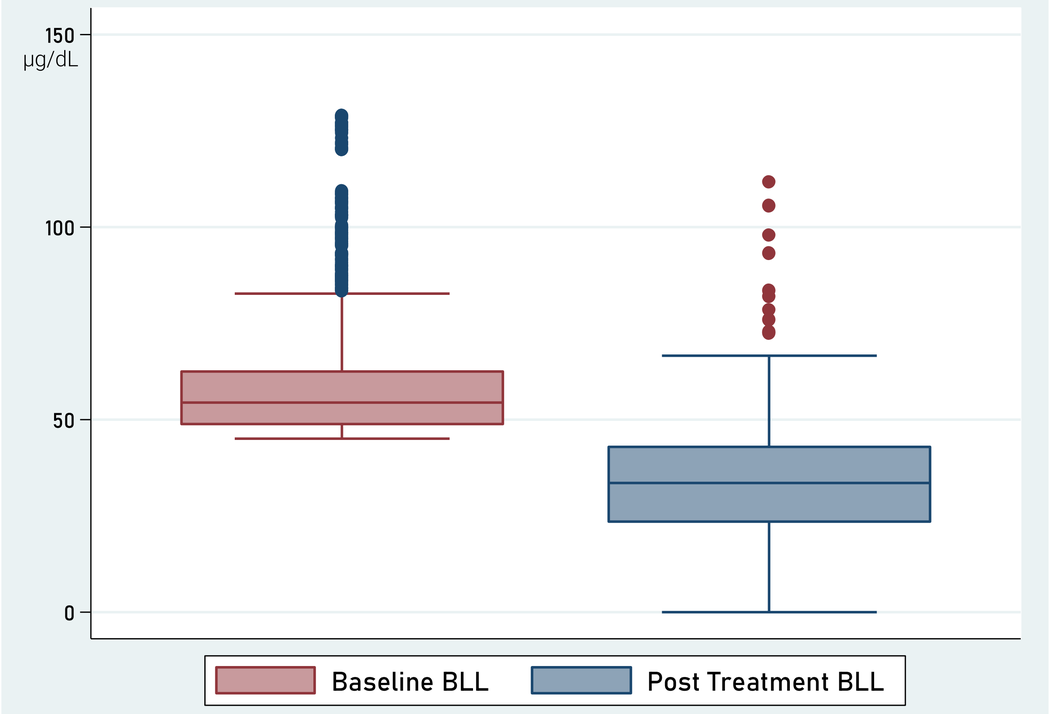

Figure: Pre-Treatment (Baseline) and Post Treatment Blood Lead Levels (BLLs) in the Children after 19 Day Course of DMSA (n=676)

Introduction

- Lead contamination in Kabwe, Zambia, endangers children's health.
- This study evaluated the effectiveness of Meso-2,3-Dimercaptosuccinic Acid (DMSA) chelation therapy in reducing blood lead levels (BLLs) in 676 children under 15 in four lead hotspot areas of Kabwe.

Methods

- The Zambian Ministry of Health and the local health authority implemented a lead screening and treatment program in Kabwe, focusing on four lead hotspot areas
- This study, conducted from April 2020 to August 2021, screened children's blood for lead in high-risk areas.
- It assessed the impact of DMSA treatment on BLLs by comparing pre- and post-treatment levels.
- The Zambia Mining Environmental Remediation and Improvement Project (ZMERIP) funded the chelation.

Results

- DMSA was effective as a chelating agent for children with BLL > 45 µg/dL, reducing BLL by up to 36.3% after 19 days of treatment.
- Higher post-treatment BLLs were associated with higher baseline BLLs and low height for age.
- After 19 days of treatment, about 5.6% of children had higher post-chelation BLLs.
- Nutritional supplementation did not significantly reduce BLLs in children.
- No serious side effects were observed.