Child Health Cohort Study. "Bruminha project"

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BACKGROUND/AIMS:

On the 25 January 2019, a tailings dam at the Córrego do Feijão iron ore mine in Brumadinho city, Minas Gerais State, Brazil collapsed. The tailings mud caused hundreds of deaths, destroyed communities, compromised water supply, and the viability of the Paraopeba river. Tailings mud removal from the riverbed by land transport and the water and food contamination can contribute to short and long-term heavy metal exposure. Children are more vulnerable groups to the effects of these toxicants due to their small size and their hand-to-mouth habits, which put them at risk of exposure. This study aims to evaluate the potential heavy metals effects exposure on the neurological, respiratory, and immunological functions of children enrolled in the Longitudinal Study of Child Health in Brumadinho (Bruminha Project).

METHOD

This is a prospective cohort study whose study population will be comprised of 200 children aged 0 to 4 years from Córrego do Feijão and Parque da Cachoeira areas (both affected by the tailings mud), and the community of Coronel Eurico and Mello Franco, (unaffected areas) during 2021 to 2024.

Partnerships between researchers and Family Health Unit (FHU) professionals in the areas studied (especially community health agents that provide preventive and primary health care to every resident in the area covered by the specific FHU have been established to:

a) Use of FHU structure to conduct the project;

b) Explain the research study to potential participants by door-to-door visits performed by the community health agents;

c) Clarify that participation will be voluntary, and any collected information will be kept confidential;

The activities developed by the research team (comprised of researchers, interviewers, pediatric physicians, and physiotherapists) during the four waves of the cohort study are described in table 1.

EXPECTED RESULTS

- Identification of arsenic, cadmium, mercury and lead biological concentrations in children living in the areas affected by the Brumadinho Disaster;
- Advancing the knowledge about a potential role for heavy metals on neurological, respiratory, and immunological functions;
- Our study may also shed light on the potential effects of heavy metals on inflammatory biomarkers levels;
- We will have the opportunity to follow the study population for additional research to expand on the body of knowledge regarding the effects of heavy metals on relevant child health endpoints.

An Issue under discussion: Opportunity to investigate the combined effects of Covid-19 on health outcomes and inflammatory biomarkers proposed in this project.

	Wave 1 (2021)	Wave 2 (2022)	Wave 3 (2023)	Wave 4 (2024)
Parents questionnaire	X			
Parent's perception questionnaire		X	X	X
Children questionnaire	X	X	X	X
Medical examination and anthropometry	X	X	X	X
Denver Development Screening Test	X	X	X	X
Urine collection	X	X	X	X
Blood collection			X	X