

Introduction:

Cottage industries are a subgroup of informal and outsourced work, including household members, and associated the exposure to hazardous substances¹.

The city of Limeira, in Brazil, is a production center of fashion jewelry, and part of the production is informal and home-based, including whole families and where fashion jewelry production and domestic routines are shared ².

OBJECTIVE: The aim of this study is to analyze the children exposure to PTE (Potentially Toxic Elements: Cr, Mn, Ni, Cu, Zn, As, Cd, Sn and Pb) in the informal and outsourcing jewelry production.

Methods:



Dust Samples



Blood Samples



ICP-MS

Blood Samples

14 exposed children (jewelry welders families) and 15 control children

Dust Samples

21 exposed families (jewelry welders) and 23 control families

Accumulated dust

Exposed wipes for approximately 14 days

Welders workstations dust

Welders' workstation cleaning wipe

Results:

Table 1. Sperman Correlations of PTEs in children's blood (0-11 years) and dust samples. Limeira, Brazil, 2019

	Accumulated dust Total (N=29 children)		Welders workstations dust Exposed (N=14 children)	
	Rho	p-value	Rho	p-value
Cr	0.40	< 0.05	-0.06	> 0.05
Mn	-0.11	> 0.05	0.05	> 0.05
Ni	-0.04	> 0.05	-0.46	> 0.05
Cu	-0.22	> 0.05	0.37	> 0.05
Zn	-0.43	< 0.05	-0.03	> 0.05
As	0.40	< 0.05	-0.05	> 0.05
Cd	0.80	< 0.05	0.08	> 0.05
Sn	0.22	> 0.05	-0.18	> 0.05
Pb	-	-	-0.43	> 0.05

PTE concentrations in dust samples were significantly higher in the exposed group.

The correlations between the PTE concentrations in the children's blood:

Accumulated Dust: moderate correlations for Cr (Rho 0.40), Zn (Rho -0.43) and As (Rho 0.40), and strong correlations for Cd (Rho 0.80) (p <0.05).

Welders workstations dust: Was not found significant correlations (p>0.05).

Pb was not detected above the limit of quantification in any dust sample collected in accumulated dust.

Conclusions:

Children from jewelry welders families are more exposed to PTE than families who are not part of the informal production of jewelry. Also, the accumulated dust in furniture can be an exposure route to Cr, As, and Cd to children, and classified as carcinogenic substances.

References:

¹ McCann M. Hazards in Cottage Industries in Developing Countries. Am J Ind Med. 1996; 30:125-9.

² Ferreira APSS, Pereira EC, Salles FJ, Silva FF, Batista BL, Handakas E, Olympio KPK. Home-based and informal work exposes the families to high levels of potentially toxic elements. Chemosphere. 2019; 218: 319 – 27