RECYCLING OF LEAD AND HUMAN EXPOSURE IN BRAZIL

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Abstract: Among the possible risks related to lead exposure, environmental contamination (soil, water and air) and also workplace contamination can be observed. More than 70\% of the usage of this metal in Brazil is connected to the manufacturing of lead-acid batteries, and there are no feasible substitutes in the medium or short-term. Although used or discharged lead-acid battery cells are considered dangerous residues, they are also used as raw material, presenting a high rate of recycling of their components (metal and polypropylene). In Brazil, until 1995, the demand for lead was supplied by primary and secondary production (internal recycling plus importing scrap). The period between 1995 and 1996 was a transition period, when the production of primary lead was terminated and the main secondary lead smelting plants in the country, based in the state of Sao Paulo, were closed or interdicted. At that time, the process of restructuring the production of the metal was intensified with the increase of outsourcing. As a consequence of this transition phase, the importation of used batteries, the increase of importing pure lead and the increase of recycling were observed. In 1999, the resolution 257 from the National Environmental Council (Brazil) was established, dealing with the collection and recycling of batteries. However, this resolution had very little impact on recycling in Brazil. In the period between 2000 and 2005, there was an expansion in the number of secondary small-sized metalurgies, including clandestine ones, outside the state of Sao Paulo. This state was the most demanding one regarding environmental licencing when compared to the other Brazilian states. Nowadays, in Brazil, the collection rate of batteries destined to recycling is of approximately 95\%. Considering that the recycling of batteries performed in a sustainable manner demands very high investments and therefore should not be able to be performed by small plants, the tendency in Brazil is to reduce these non-sustainable enterprises. This reflects directly on human exposure and adverse effects due to environmental and occupational exposure to lead in Brazil. Epidemiological investigations on lead exposure of children around industrial and mining areas have shown that lead contamination is an actual source of concern.