Lead and Mercury in Colombia: A challenge for public health

Ministry of Health and Social Protection
Department of Promotion and Prevention
Environmental Health Health Division
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01 Colombian context

02 **Mercury** pollution related problems – health impacts

03 Activities in progress

04 **Lead** pollution related problems – health impacts

05 Challenges front Hg and Pb
Colombian Context
Colombia - 2017
Población: 49,067,981

Total: 11,530,976 [23.5%]
Mercury related problems

Mercury use in gold mining

Conducted research

Impacts

Fuente: https://www.las2orillas.co[colombia-mineria-tragedia-social/Minería ilegal
Foto: elespectador.com
Mercury related problems – Colombia

**Mercury importation**
2003-2013: **1020 tons**

**Smuggled mercury for illegal mining**
Aprox. **50 tons**

**Annual mean:** **95.1 tons**

**Annual estimated mining consumption:**
- 105 legal activity
- 88 illegal activity

**Fuente:** https://www.dnp.gov.co/Paginas/%E2%80%9CTambi%C3%A9n-tenemos-que-hacer-la-paz-con-la-naturaleza-porque-el-mercurio-sigue-causando-estragos%E2%80%9D-Sim%C3%B3n-Gaviria-Mu%C3%B1oz.aspx
Colombia mercury related problems

- Production of one gram of gold requires seven grams of mercury
- Colombian gold production: 58 ton/year
- **Estimated annual environmental release**: 75 ton
- Third country that releases more mercury in the world (1° China - 2° Indonesia)
- Greatest release per capita

Fuente: [https://www.dnp.gov.co/Paginas/%E2%80%9CTambi%C3%A1n-tenemos-que-hacer-la-paz-con-la-naturaleza-porque-el-mercurio-sigue-causando-estragos%E2%80%9D-Sim%C3%B3n-Gaviria-Mu%C3%B1oz.aspx](https://www.dnp.gov.co/Paginas/%E2%80%9CTambi%C3%A1n-tenemos-que-hacer-la-paz-con-la-naturaleza-porque-el-mercurio-sigue-causando-estragos%E2%80%9D-Sim%C3%B3n-Gaviria-Mu%C3%B1oz.aspx)
En promedio, por cada colombiano se liberan 1.6 gramos de mercurio cada año. (Promedio g/persona)

Mercury related problems – Colombia

Mercury use in gold mining → Environment release

Air dispersion
Water sources pollution
Soil pollution
Ecosystems impact
Fish and food contamination

Human exposition

Vapours inhalation
Food chain
Direct and indirect health effects
Areas with the highest mercury contamination

**CÓRDOBA**
- Puerto Libertador

**CHOCÓ**
- Lloró
- Tadó
- Unión
- Panamericana
- Condoto

**CALDAS**
- Marmato
- Manizales

**CAUCA**
- Suárez
- Buenos Aires

**NARIÑO**
- Los Andes
- Colón
- Mallama

**BOLÍVAR**
- Arenal
- Morales
- Barranco de loba
- San Martin de Loba

**ANTIOQUIA**
- Frontino
- Buriticá
- Segovia
- Zaragoza
- El Bagre
- Remedios
- Cáceres

*Fuente: Estudio de la Cadena del Mercurio, Universidad de Córdoba, 2014*
*https://imagenestotales.com/mapa-de-colombia/*
Mercury related problems – Colombia

Conducted research

State institutions
Universities
NGO

Evaluation of populations exposed to mercury in areas with and without influence of gold mining

• Determination of mercury levels in biological samples (blood - urine - hair )

• Occupational and environmental exposure assessment

• Determination of mercury levels in environmental samples (water - soil - sediment - fish)

• Evaluation of effects on human health
Areas in which human and environmental mercury assessment studies have been carried out

Study of the effects on health due to exposure to mercury in prioritized departments (Chocó, Vaupés and Nariño) with the presence of gold mining

MINSALUD – INS – UNICORDOBA

n = 1795 persons

General findings:

• **High mercury levels** in different biological matrices (values vary by location)

• Neurological alterations in groups with **high exposure**

• High levels of mercury in **some fish species**
### Epidemiological trend of mercury poisoning notification in Colombia 2013 - 2017

<table>
<thead>
<tr>
<th>Year</th>
<th>Notified poisonings by metals</th>
<th>Mercury cases</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>125</td>
<td>89</td>
<td>71.2</td>
</tr>
<tr>
<td>2014</td>
<td>839</td>
<td>780</td>
<td>93</td>
</tr>
<tr>
<td>2015</td>
<td>319</td>
<td>257</td>
<td>80</td>
</tr>
<tr>
<td>2016</td>
<td>946</td>
<td>900</td>
<td>95</td>
</tr>
<tr>
<td>2017</td>
<td>187</td>
<td>137</td>
<td>73</td>
</tr>
</tbody>
</table>

**2014 – 2016 increase**

Due to research studies on characterization of mercury levels on population and workers in resident in prioritized areas of the country.

Fuente: SIVIGILA – Instituto Nacional de Salud
Mercury related problems – Colombia

- Fish consumption from contaminated areas (risk according to species)
- Inhalation of vapors due to amalgam burning
  - Handling of mercury without personal protection
  - Residence near to areas of exploitation and benefit of gold
- Use of contaminated water sources - agriculture
- Chronic impact on the health of the population
Mercury related problems – Colombia

**Impacts**

- Weak surveillance, diagnosis and therapeutic capacity
- Difficulty in the application of prevention and intervention measures – Eg Limitation in relocation of polluted persons

**Costs**

(US $330,600,000) annual estimate cost for health impairment derived from mercury exposure (due to a decrease in the IQ that leads to a loss of labor productivity)

**Limitations**

- Weak surveillance, diagnosis and therapeutic capacity
- Difficulty in the application of prevention and intervention measures – Eg Limitation in relocation of polluted persons

**Fuente:** https://www.dnp.gov.co/Paginas/%E2%80%9CTambi%C3%A9n-tenemos-que-hacer-la-paz-con-la-naturaleza-porque-el-mercurio-sigue-causando-estragos%E2%80%9D-Sim%C3%B3n-Gaviria-Mu%C3%B1oz.aspx
Activities in progress
Normative actions

Mercury law (1538 de 2013)

Resolution for import and marketing control measures (2133 de 2016)

Dispositions for marketing, use, reduction and elimination

- Eradication of mercury use in mining (2018)
- Eradication of mercury use in all industrial and productive processes (2023)
Intersectoral management actions

Minamata convention
- Protection of human health and the environment from anthropogenic mercury emissions
  - Subscription: 2013
  - Ratification: 2018

Country mercury plan
- Programs and activities for the reduction and progressive elimination of the use of mercury

Health action plan
- Programs: Institutional strengthening, Management, Monitoring and evaluation
- Medical devices (Dx substitution – disposition GEF)
Lead related problems
High levels of Pb in decorative paints

• Use of lead in the production of decorative paints: **1385.9** tones / year

• National inventory: **53% of households paints with levels higher than 90 ppm**
Lead related problems – Colombia

High levels of Pb in decorative paints

Unawareness of blood lead levels prevalence in the population and their related health effects

Lack information of contaminated sites and areas of risk

Unawareness of current impact on public health

**Limited number of studies** to identify current level of contamination in the general population and children

**Unknown** real impact on public health
Actions
Actions toward lead

**Actions done**

- Normativity:
- Regulation of lead levels in gasoline (1995)
- Regulation of Pb levels in toys and tableware (2008)

**Actions to be taken**

- Regulation of levels of lead in decorative paints and school supplies
- Link to the WHO global alliance to eliminate lead Paint
LEAD PAINT MUST GO #BanLeadPaint

The Global Alliance to Eliminate Lead Paint says that all countries should ban lead paint by 2020

FACT: As of June 2016, only 1/3 of countries have legally binding controls on lead paint

KEY
Countries with legally binding controls on lead paint as of 30 June 2016
- Red: No
- Blue: Yes
- Light Blue: No Data
- White: Not Applicable

THAT’S WHY
Governments + Industry + Consumers

Must work together to ensure all paint is free from added lead by 2020

There is no safe level of lead exposure

World Health Organization
Challenges  Hg & Pb
Challenges to mercury and lead

**Mercury**
- Implementation of mercury plan
  - Reduce population exposure
- Optimize food safety

**Lead**
- Establish a population base line for blood lead levels
- Identify contaminated areas, sources of exposure and population at risk
- Issue standards of lead levels in decorative paints and school supplies
- Position problematic as a priority

- Strengthen risk communication
  - Intensify surveillance and diagnostic capacity
- Improve timely diagnosis and treatment of intoxicated
  - Estimation of related costs
Thanks

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Referencias

- Fundación para la educación y el desarrollo social FES. Evidencia científica, normativa y técnica sobre la problemática del mercurio en Colombia. Revisión sistemática de la literatura. Convenio de asociación con Minsalud. 2012
- https://www.dnp.gov.co/Paginas/%E2%80%9CTambi%C3%A9n-tenemos-que-hacer-la-paz-con-la-naturaleza-porque-el-mercurio-sigue-causando-estragos%E2%80%9D-Sim%C3%B3n-Gaviria-Mu%C3%B1oz.aspx