

COLOMBIA

A.	Regulation on sources	2
B.	International Agreements	3
C.	Blood lead-level monitoring programs	3
D.	Inventory of toxic sites (Toxic Sites Identification Program (TSIP), Pure Earth)	4
E.	Scientific papers on lead exposure	8
F.	Blood testing in National Health Surveys	13

A. Regulation on sources

Source of lead	Relevant legislation/regulation	Government agencies	Data source
1. Lead in paint	<ol style="list-style-type: none"> 1. Law Number 2041, July 27th, 2020: Law limiting the use of lead paint, particularly in items used by children; right to develop physically and intellectually in a lead-free environment. 2. Prohibits the use, manufacture, import, or marketing of articles that contain lead exceeding 99 ppm. It calls for blood tests in children to determine their level of lead exposure, sets out national responsibilities for treating exposure cases. 	a. Ministry of Environment	<ol style="list-style-type: none"> 1. Law Number 2041, Colombia 2. Colombia Limits Lead Paint in Children's Items
2. Lead in glass and ceramics	<ol style="list-style-type: none"> 1. Resolution Number 00001893, July 16th, 2019: Regulates the migration of lead and cadmium from glass and ceramics that come into contact with food. 2. For ceramic and porcelain pitchers with a volume greater than 3 liters, for example, the set migration limit for lead is ≤ 2.5 mg/L and for cadmium is ≤ 0.25 mg/L. A full list of the set limits by material and article type are provided within the SGS article. 	a. Ministry of Health and Social Protection	<ol style="list-style-type: none"> 1. Resolution Number 00001893, Colombia 2. Colombia Regulates heavy metals in glass, ceramics
	No other standards found at this time for lead.		

B. International Agreements

Agreement	Year Ratified
1. Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal	1996
2. Rotterdam Convention on the Prior Informed Consent Procedure for certain hazardous Chemicals and Pesticides in international trade	2008
3. Minamata Convention on Mercury	2019
4. Stockholm Convention on Persistent Organic Pollutants	2008
5. ILO C170 - Chemicals Convention, 1990 (No. 170) Convention concerning Safety in the use of Chemicals at Work	1994
6. ILO C174 - Prevention of Major Industrial Accidents Convention, 1993 (No. 174)	1997

C. Blood lead-level monitoring programs

Details	Data source
<ol style="list-style-type: none"> Blood testing for children to determine their level of lead exposure. No other details of a national or regional level structured program for blood lead level testing found. However, published studies point to some presence of testing programs at the local level. 	<ol style="list-style-type: none"> Colombia Limits Lead Paint in Children's Items Refer to section E on scientific papers that perform blood lead-level sampling

D. Inventory of toxic sites (Toxic Sites Identification Program (TSIP), Pure Earth)

Site	Province/Region	Details (all data comes from the TSIP website)
Municipio de Chocontá Aledaño Río Bogotá y Curtiembres	Cundinamarca	<p>Historically, in the municipality of Chocontá, tanning activities of animal skins have been carried out, due to dumping and discharges, some illegal, and exceeding the permitted concentrations has affected the quality of the soil and water of the Bogotá River. It is important to mention that this body of water is used in some parts of its route as a source of irrigation for the cultivable areas of vegetables, vegetables and fruits produced by the municipality.</p> <p>The sampling was carried out in public areas near the unloading points of tanning business areas.</p> <p>The research addressed the identification of Hexavalent Chromium in the recovered samples, a substance used in tanning processes; However, during field measurements, Total Chromium results were obtained up to 5.09% and Pb was identified up to 32 ppm, however, the samples recovered and sent to the laboratory for Hexavalent Chromium measurement yielded results lower than 4 ppm and The presence of Pb was identified in all the samples recovered up to 9 ppm.</p>
Tannery waste reatova - Villapinzón	Cundinamarca	<p>In the Reatova village of the Villapinzón municipality (Cundinamarca), one of the predominant economic activities are tanneries, the site currently stores residues of this activity, in this site at the time of the visit there are animals (cows and chickens) feeding. This site is located a few meters from the Bogotá River in which unpleasant odors persist and its waters are dark and cloudy.</p>
Choconta - Tannery waste	Cundinamarca	<p>The municipality of Chocontá has a large number of tanning companies. It is known that in 2019 less than 70% of these companies were certified and established under the law. For this reason, various governmental and non-governmental institutions have the objective of guiding all these companies so that they are formally established and in this way achieve a conscious and environmentally responsible production. It should be noted that the operation of these companies without the permits and established policies contributes to the contamination of the Bogotá river, especially Chromium pollution, which is the most widely used heavy metal in this industry and which is known to be a toxic element that generally affects the respiratory tract of people but also in its form Chromium (VI) can become carcinogenic.</p>

Site	Province/Region	Details (all data comes from the TSIP website)
Tannery waste in store - Villapizón	Cundinamarca	This site is located in the municipality of Villapinzón (Cundinamarca), on the site there is an inhabited house and a store frequented by the inhabitants of the sector, outside there is a pasture where cows and chickens are raised, in this pasture they are deposited Also tannery residues, there are no crops or bodies of water on the site.
Tiquiza, Chía - Agricultural field with lead contamination	Cundinamarca	Tiquiza is a neighborhood of Chia Cundinamarca that has a large population and also crops that are treated with pesticides that can affect the health of nearby people and contaminate nearby bodies of water.
Gualí wetland industrial park (Funza)	Cundinamarca	It is known that the Gualí wetland and the Meandro del Say wetland is being affected by the dumping of industrial parks in the area. Although wetlands have water treatment plants for discharges from industries, high levels of pollution that are affecting wetlands and their surroundings have been identified, mainly pollution is caused by high levels of lead and copper dating of research done previously.
La Calera: Industrial Chemical Plant, Cundinamarca	Cundinamarca	The study site is surrounded by the La Calera wastewater treatment plant and chemical industry. This site was studied because unrecognized substances appearing the nearest body of water, presuming that they come from one or both of the activities carried out near the study site. Sampling at the site found Lead and Copper.
Cement Plant, La Siberia	Cundinamarca	The Siberia cement plant, owned by the company Cemex, is located 2.5 kilometers from the municipal capital of La Calera, in the district of Buenos Aires. This plant was founded in 1933 and in 1997 limestone mining and cement manufacturing activities. Approximately 200 meters north of the plant, a workers' citadel was built (apartments, houses, a recreational park with pigs to develop sports such as soccer). Currently, all the structures built are uninhabited, some in ruins and others completely surrounded by vegetation. According to the municipal PBOT, Agreement No. 011 of 2010, the soils where the plant is located are of Rural-Suburban-Residential category. Confluence of rural housing, water margin, conservation of water resources and soil of traditional agriculture. During the visit, the surroundings of the plant were identified in its entirety in green areas, with a single access road and on the western side the community of the Granadillo sector with around 50 inhabitants who carry out farming and ranching activities on small plots.
Torca River at Bogota	Distrito Especial	A river in Bogota is contaminated with lead, allegedly from a used-lead acid battery plant.
Lead-Acid Battery Recycling Facility - Bogota, Distrito Especial, Colombia	Distrito Especial	High concentrations of lead emissions from a Lead-Acid Battery recycling facility are contaminating the air in nearby residential communities. Residents are exposed to the lead via inhalation/ingestion and dermal contact.

Site	Province/Region	Details (all data comes from the TSIP website)
Parque tecnológico ambiental de la sabana TECNIAMSA y Planta de arena DOBLE A INGENIERÍA	Cundinamarca	An environmental technology park has incineration plants, pre-treatment pools and safety cells for the final disposal of industrial, hospital and hydrocarbon waste. The main pollutant is the lead coming from the incineration plants and present in the waste that is taken to the facilities. Lead is spread by wind and heavy machinery and is deposited on the ground. The routes of exposure of the workers of the place are the absorption by the skin, inhalation and / or ingestion of dust of lead. Additionally, in a sand plant of a neighboring asphalt company, lead was found in an area where waste was apparently available.
Ecotambores & Industrial Area Soacha	Cundinamarca	The Site Ecotambores was selected to be assessed by the environmental agency "CAR", given to the evidence of malpractice of their procedures during the cleanse and recondition of used metallic drums. The Site is surrounded by other industries, but during the investigation it was evident that social interest housing has exposed to this industrial area. The activities of the industrial area include: smelting, fireworks production and chemical storage. The laboratory results taken on the boundary of the industrial area do NOT exceed the Recommended Levels for soil residential use for any of the metals analyzed (As=12mg/kg, Cd=14mg/kg, Pb=400mg/kg). Showing that soil outside the boundary of the industrial area is not impacted by the presence of As, Cd and Pb. The composite sample collected inside of Ecotambores exceeds the recommended level for industrial soil (1200mg/kg). The sample almost doubles the recommended level (XRS01M04= 2052 mg/kg).
Vereda Panama Soacha	Cundinamarca	Visit to the village of Panama, which is listed as an area of "invasions". We visit the Industrial and residential areas. In the industrial part are several illegal industries of smelters, recoveries of metals, pyrotechnics, resulting in lead leaching into water and soil, which can reach humans through ingestion or inhalation.
Presunta contaminación por desbordamiento del rio Cauca en los barrios La Playita, Puerto Nuevo, Brisas del Cauca y Alfonso Lopez 3 etapa.	Valle del Cauca	The Caucana River Jarillon is a barrier created along the Cauca river pass, to mitigate the overflow to the city, however there is a population that has settled before this protective fence, which is why they are vulnerable to flooding and therefore to probable conditions caused by the presumed levels of pollutants of the river. It is also the scene of 14 large slag heaps that deformed the Cauca riverbed. The places that were selected to make the measurements correspond to areas where the river has arrived due to its overflow during the rainy season. The migration route into the body is through inhalation or ingestion of fish from water. Lead is known to be present in the area. Possible exposure can come from direct dermal contact, inhalation/ingestion of lead dust and water.

Site	Province/Region	Details (all data comes from the TSIP website)
Lead smelting in Parcelación La Dolores, Palmira, Valle del Cauca	Valle del Cauca	Industries that smelt lead in the plots La Dolores, in the city of Palmira, Valle del Cauca, emit considerable amounts of particulate material and air vapors that are believed to contain lead and can affect the population through inhalation and dermal contact. The community uses rainwater that apparently contains particulate material for household chores (laundry, bathroom and animal consumption). Does not include water consumption since they have the municipal aqueduct of the city of Cali EMCALI.
Presunta contaminación por basuras en Punta Icaço, Buenaventura.	Valle del Cauca	Presumed contamination of the inhabitants of the area known as Punta Icaço by accumulation of solid waste in the streets and under the houses, said accumulation is the result of the poor disposal of waste by the inhabitants of the sector and product of the dragging of garbage through the Pacific Ocean, because the population is located on the shores of this ocean. In addition, in this street or area there is a fuel warehouse (Gasoline and ACPM) and for the supply or exit of these, the transit of tank cars is constant.
Willard -PIMSA Malambo - Atlántico	Atlántico	Willard is a legal manufacturer of lead batteries operating at Malambo Industrial Park (PIMSA) along with other large industrial wineries. The company's workers are the most affected due to their prolonged exposure to the contaminant that is present in the assembly of the battery elements. It enters the body through inhalation and direct contact. The wind blows the lead out of the factory chimney to the surrounding area.
La Bonga - Malambo Atlántico Fundidoras de Plomo Abandonadas	Atlántico	The three lead smelters from RECICLAL, METCARIBE and RECUPERACIONES DEL CARIBE batteries are located in the LA BONGA Sector south of the Municipality of Malambo, neighboring houses and urban expansion soils. There are documented records of an investigation carried out by the Municipal Health Department to a family whose lead was found in the blood, then the death of two people, a child and an elder. Environmental factors such as wind help the dispersion of lead present in the air and soil of the smelters that ends up being inhaled and ingested by the inhabitants of the area.
El Carmen - Malambo	Atlántico	In the village of Carmen is the abandoned lead smelter RECUPERACIONES DEL CARIBE, whose waste and slags are distributed over vast stretches of the path, some residents used these slag as a foundation for the construction of their homes, the effects of rain and wind allows lead dust to move, polluting the air and food-growing soil (cassava) and entering the human body via inhalation/ingestion.
Antigua Fundidora y Actual Recicladora de Plomo Acumuladores del Caribe - Malambo Atlántico	Atlántico	After performing an XRF analysis in the Recycler, it was found that in the surroundings there are large amounts of lead which can cause serious damage to the surrounding population by inhalation and ingestion. Lead is scattered by the wind to houses and workers in the recycler have direct contact with this pollutant.

Site	Province/Region	Details (all data comes from the TSIP website)
Antigua Fundadora de plomo Inactiva JYG Malambo, Atlántico	Atlantico	The old lead smelter from car batteries has been abandoned and inactive since May 2014. The remaining lead in the melting furnace is scattered to the environment by the wind and deposited on the ground. The inhabitants of the place eat of vegetables planted in the contaminated soil, being the ingestion its route of contamination. It currently functions as a farm for food crops.
Plomo en Colegios de Cartagena	Bolivar	Based on the research of Professor Olivero carried out in different schools in the city of Cartagena, concentrations of lead in the blood have been detected that exceed the allowed limit. It is presumed that the route of migration of the pollutant is the air that by wind action disperses and enters the nostrils due to human respiration.
Illegal mining on Farm the Paraguay Finca la Paraguay	Antioquia	The Paraguay Farm is located approximately 8.5 kilometers from the urban area of the municipality of Caucaasia, department of Antioquia, has an area of 1,400 hectares. The predominant activities on the Paraguay farm correspond to extensive livestock raising and illegal mining; This last activity occupied 40% of the land. The pollutant of interest, Mercury, was defined by the mining activities that were carried out on the site; however, during the field visit and with the results of the XRF equipment measurements lead was determined to be the key pollutant, followed by Mercury.

E. Scientific papers on lead exposure (Please contact info@gahp.net for information on studies not in the public domain)

Topic	Authors	Year	Title	Abstract/ description
Blood lead levels	Ortega, Neda; Gallardo, Karina; Verbel, Jesus	2017	Low blood lead levels impair intellectual and hematological function in children from Cartagena, Caribbean coast of Colombia	Abstract: Lead produces numerous biochemical and physiological changes in humans, including hematological disorders, toxic effects on the central nervous system and in the function of several organs. The aim of this study was to determine blood lead levels (BLL) in children from Cartagena, Colombia, associating those with hematological and liver damage markers, the intelligence quotient (IQ), as well as with gene expression of the aminolevulinatase dehydratase (ALAD), superoxide dismutase 1 (SOD1), gamma interferon (INF- γ), tumor necrosis factor (TNF) and tumor protein (p53). To achieve this purpose, 118 blood samples were collected from children 5–16 years old, with their respective informed consent from their parents. BLL was measured by atomic absorption; hematological

Topic	Authors	Year	Title	Abstract/ description
				<p>parameters were obtained with automated systems; plasma was utilized to analyze hepatic toxicity markers, alanine aminotransferase (ALT), gamma-glutamyltransferase (γ-GT) and alkaline phosphatase (ALP); the Kaufman Brief Intelligence Test (K-BIT) was administered to measure the IQ; and gene expression was quantified from blood RNA. The mean BLL was 1.7 ± 0.3 $\mu\text{g}/\text{dL}$. A low proportion of the children (3.4%) had BLL above the CDC recommended limit (5 $\mu\text{g}/\text{dL}$). BLL were correlated weakly, but negatively with child age, weight, height, body mass index, platelets wide distribution, mean platelet volume, γ-GT and IQ. There were not significant changes in the expression of evaluated genes. These results support the hypothesis that BLL below 5 $\mu\text{g}/\text{dL}$ may still be a detrimental factor on children's cognitive abilities, development and hematology, in line with recent concerns that there is no safe level of pediatric lead exposure.</p>
	Filigrana, Paola; Mendez, Fabian	2012	Blood Lead Levels in Schoolchildren Living Near an Industrial Zone in Cali, Colombia: The Role of Socioeconomic Condition	<p>Abstract: This study aimed to determine Blood Lead Levels (BLL) in schoolchildren 6–14 years old exposed to industrial sources of lead and evaluated the role of socioeconomic condition. A cross-sectional study was conducted in an area likely to be exposed to industrial pollutants in northern Cali (i.e., distance and wind direction) and in a “non-exposed” area. In children in two schools of corresponding study areas, venous samples (5 ml) were collected to determine BLL by graphite furnace absorption spectrometry. Using regression models, we evaluated the association between risk factors to BLL and the effect of modification with variables of socioeconomic condition. We enrolled 350 schoolchildren. Schoolchildren in the exposed area had higher prevalence of BLL of ≥ 5 $\mu\text{g}/\text{dl}$ (44.2 vs. 8.2 %, $p = 0.000$) than those in non-exposed area. A positive association was found between exposure and BLL of ≥ 5 $\mu\text{g}/\text{dl}$ (prevalence ratios (PR), 6.68; 95 % confidence interval (95 % CI), 3.95, 11.29). Demographic characteristics and socioeconomic condition such as age (PR, 1.45; 95 % CI, 1.03, 2.04), sex (PR, 1.84; 95 % CI, 1.30, 2.60), race (PR, 2.32; 95 % CI, 1.39, 3.89) and socioeconomic position (SEP; PR, 2.02; 95 % CI, 1.35, 3.04) were statistically significant and independently associated with BLL. There was a synergistic interaction between exposure to the industrial zone and SEP for higher BLL (coefficient, 0.80; 95 % CI, 0.17, 1.43). Residence in the northern urban area of Cali exposed to pollutants of an industrial zone</p>

Topic	Authors	Year	Title	Abstract/ description
				is associated to an increased risk of higher BLL, especially among children from low SEC who are at greater risk of exposure and susceptibility.
	Verbel-Olivero, Jesus; Duarte, Diana; Echenique, Marlin; Guette, Jorge; Johnson-Restrepo, Boris; Parsons, Patrick	2007	Blood lead levels in children aged 5–9 years living in Cartagena, Colombia	<p>Abstract: During June–August 2004, blood lead (BPb) levels and various hematological parameters were evaluated in children aged 5–9 years old at ten primary schools located in eight neighborhoods in Cartagena, Colombia. The schools selected for this study are attended mainly by children from families of low income. A total of 189 subjects participated in the survey. The arithmetic mean \pm standard error BPb level was 5.49 ± 0.23 $\mu\text{g}/\text{dL}$ (range < 1.0–21.0 $\mu\text{g}/\text{dL}$). The geometric mean was 4.74 $\mu\text{g}/\text{dL}$ (95% CI: 4.29–5.18). A proportion of the children (7.4%) had BPb levels above the US Centers for Disease Control and Prevention's threshold of concern (10 μg Pb/dL). BPb levels were correlated weakly, but significantly and positively, with red blood cell count (RBC), and negatively with child body size, age, mean corpuscular volume (MCV), and mean corpuscular hemoglobin (MCH). BPb levels did not differ significantly between boys and girls but significant differences were observed between neighborhoods ($P < 0.001$). Activities such as metal melting-related processes and fishing net sinker production are the main sources of Pb exposure in Cartagena.</p>
	Bustamante, O; Uribe, ME; Trujillo, SM; Varon, JE; Parra, GE	2001	Correlation of protoporphyrin zinc with lead in blood in workers of the car batteries industry in Bogota, Colombia	<p>Objective: To determine the usefulness of zinc protoporphyrin in blood (PPz) as an indicator of lead exposure in workers of the homemade car battery industry.</p> <p>Material and methods: A cross-sectional study was performed in 116 workers of the car battery industry in Bogotá, Colombia. Data on general, occupational, and health variables were collected by interview. Two categories of PPz values were established: Those below the cutoff value (70 micrograms/dL) and those above it. A linear regression analysis was performed to measure the correlation between logarithm values of PPz (> 70 micrograms/dL) and lead in blood (PbB) (> 38 micrograms/dL).</p> <p>Results: A semi-logarithmic correlation coefficient of $r = 0.54$ was found, and statistically significant associations between high levels of PPz and direct exposure to lead were observed (OR: 3.35, 95% IC 1.02-11.91; $p: 0.02$); for workers who often use lead as a raw material (OR: 7.80, 95% IC</p>

Topic	Authors	Year	Title	Abstract/ description
				<p>2.96-21.03; $p < 0.01$), as well as for workers who do not change work clothes often (OR: 3.55, 95% IC 1.17-11.01; $p < 0.01$).</p> <p>Conclusions: PPz may be a useful diagnostic indicator for lead poisoning; it may also be used as a screening test for surveillance programs in the biological monitoring of workers exposed to lead.</p>
Concentrations of lead	Becerra, LC; Gomez, NI; Herrera, MF; Atuesta, AE; Salas, MA; Berrio, JA	2020	Concentrations of cadmium and lead in particulate matter in an industrial municipality of Boyacá, Colombia and its health implications	<p>Objective: To determine cadmium and lead concentrations in particulate matter in urban area of Nobsa, Boyacá, identifying their possible health implications.</p> <p>Methodology: For four continuous days (24 hours each), in five points of urban area of Nobsa, PM monitoring was carried out, using Gil Air 3 personal sampling pumps in addition to real-time portable particle monitoring (Airbeam) equipment less than 2.5 microns (PM2.5). Concentrations of lead and cadmium were determined using Graphite furnace atomic absorption spectroscopy, by analyzing PM filters, which were obtained from the personal sampling pumps. Health implications were assessed by comparing file concentrations of the pollutants, against air quality guidelines of World Health Organization (WHO), in addition to estimate toxicity- hazard ratio for each metal.</p> <p>Results: The daily average concentration of lead, cadmium and PM2.5 were 0,002 $\mu\text{g}/\text{m}^3$ (SD: $\pm 0,002$), 0,213 ng/m^3 (SD: $\pm 0,168$) and 9,01 $\mu\text{g}/\text{m}^3$ (SD: $\pm 2,91$) respectively, for PM2.5 the highest hourly values were in the time slot from 4:00 to 8:00 am.</p> <p>Conclusions: Daily values of lead, cadmium and PM2.5 did not exceed the annual standard established by WHO, however in the time slot from 0:00 to 8:00 a.m. the annual standard for PM2.5 was exceeded. Toxicity- hazard ratio did not present a risk from daily exposure to the two metals, however, a medium or long-term effect is not ruled out.</p>
Lead exposure	Lopez, Liliana; Ortega, Neda; Gallardo, Karina;	2021	Biomonitoring of Lead Exposure in Children from Two	Abstract: Lead (Pb) exposure is a growing concern in developing countries, especially in vulnerable children. The objective of this study was to evaluate blood lead levels (BLL) in children from two fishing populations at Northern

Topic	Authors	Year	Title	Abstract/ description
	Montes, Audreis; Verbel, Jesus		Fishing Communities in Northern Colombia	Colombia, Loma de Arena and Tierrabomba, as well as their association with morphometric parameters, markers of hematological status, liver function, and mRNA expression of genes related to Pb toxicity. A total of 198 blood samples were collected from participants aged 5–16 years old. The mean (\pm standard error) BLL for the studied sample was $3.6 \pm 0.3\mu\text{g/dL}$, and the 97.5th percentile was $21.0\mu\text{g/dL}$. The participants of Loma de Arena and Tierrabomba presented BLL of 3.9 ± 0.5 and $2.9 \pm 0.3\mu\text{g/dL}$, respectively. Children born preterm had greater BLL than those born at full term. Boys had greater BLL than girls, which also occurred for participants between 12 and 16 years old, compared with those aged 5–11 years old. The BLL were negatively correlated with body mass index in children from Loma de Arena, but an opposite behavior was observed for Tierrabomba. In Loma de Arena, the mRNA expression of interferon gamma, a pro-inflammatory cytokine, increased with the BLL, but that of δ -aminolevulinic acid dehydrogenase, a sensor for Pb poisoning, decreased. In Tierrabomba, gene expression did not change with BLL. These results show that in fishing communities, lead exposure promotes different health impacts depending on age, sex, and other site-specific factors. In any case, appropriate educational and intervention programs should be carried out to minimize Pb exposure in children.
Lead in paint	Garcia, A; Bonilla, J.P.	2014	Presence of lead in paint of toys sold in stores of the formal market of Bogotá, Colombia	Abstract: Lead (Pb) is a non-essential metal. Exposure to lead has been associated with adverse health effects in both children and adults. Lead content in paint used in toys or children's products has been identified as both a potential and preventable source of childhood lead exposure. Twenty-four stores located in Bogotá (Colombia) were selected by cluster sampling to participate in the study. A random sample of 96 toys was purchased at these stores. Since one toy can have different paint colors, a total of 116 paint samples from 96 toys were analyzed for lead content. Paint samples were prepared by microwave digestion and lead was quantified using ICP-OES. For quality control purposes of the analytical method, spike samples and a certified reference material (NIST SRM 2582) were used. The lead content in paint ranged from below the method detection limit (5 ppm) to 47,600 ppm, with an average Pb concentration of 1024 ppm and a median concentration of 5 ppm. Eight (8) paint samples removed from five toys had lead concentrations exceeding the US

Topic	Authors	Year	Title	Abstract/ description
				regulatory limit for total lead content (90 ppm). Brown paint and toys manufactured in Colombia were significantly associated with high concentrations of lead in paint. Furthermore, a statistically significant interaction between these two variables was also found. The results suggest that there is a potential risk of lead exposure from paint of toys sold in the formal market of Bogotá. Therefore, the implementation of a national surveillance program of lead content in children products is urgently needed. The risk of children's lead exposure identified in this study, which is completely preventable, could be present also in other developing countries.
Lead poisoning	Garces, Juan Bernardo; Artuz, Rafael Ignacio	2012	Lead poisoning due to bullets lodged in the human body	Abstract: With the increased violence and use of firearms in Colombia, we may see more cases of lead poisoning in our environment, and must be prepared to diagnose and treat them. Subtle signs and symptoms as unexplained anemia, gastro-intestinal discomfort and abdominal cramps, as well as severe signs such as changes in behavior and neurological status, nephropathy, and unexplained death, may be associated with a history of gunshot wounds and bullets in the human body. We must offer the patient knowledge and management strategies of pathology.

F. Blood testing in National Health Surveys

National Health Survey	Non-Communicable Diseases Risk-Factors Surveillance	Source
Purpose	To establish the demographic changes of the Colombian population that have occurred in the last 5 years (2010-2015), and to obtain updated information on the knowledge, attitudes and practices in Sexual Health and Reproductive Health of women and men in fertile age.	Encuesta Nacional de Salud Pública , Colombia

Sample size	Women (13 to 69 years old), and men (13 to 69 years old).	
Blood sample testing	Prostate antigen.	
Latest round	2015	
Next round	-	