Ending Childhood Lead Poisoning in Georgia

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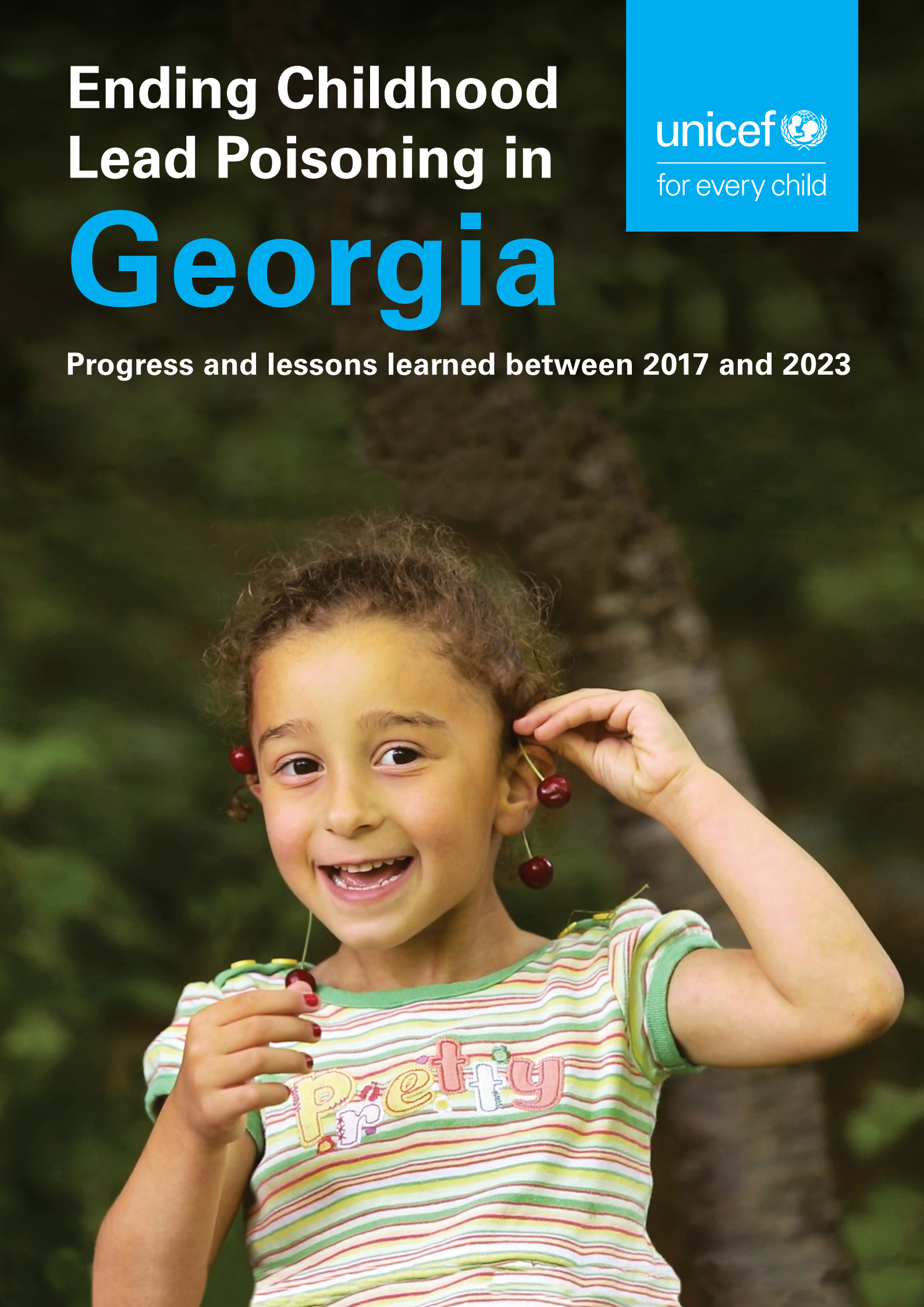
for every child

Progress and lessons learned between 2017 and 2023



The Government of Georgia and the UNICEF Multiple Indicator Cluster Survey (MICS) revealed in 2018 that 41 per cent of children in Georgia had elevated blood lead levels (BLLs).[1] The Government responded decisively by taking immediate actions to address the problem and is following through by implementing a sustainable long-term strategy to assess the situation. Over the last five years, Georgia has significantly upgraded its institutional capabilities, laboratory and surveillance capacity, front line services, regulatory action, enforcement and accountability mechanisms. The Government continues its efforts to identify the exact sources of lead exposure, based on numerous assessments of the potential sources of lead exposure in children.

This case study captures the story to date, documents the key factors contributing to the successes, and provides some lessons learned on how countries can assess and take targeted action to ensure lasting results.

Lead poisoning in children

Around one in three children – up to an 815 million globally – have lead poisoning, indicated by BLLs at or above 5 micrograms per decilitre (µg/dL). Lead is a potent neurotoxin that is widely used in many industries and commercial products. The neurological effects of lead exposure – even at very low levels – are especially hazardous to children.

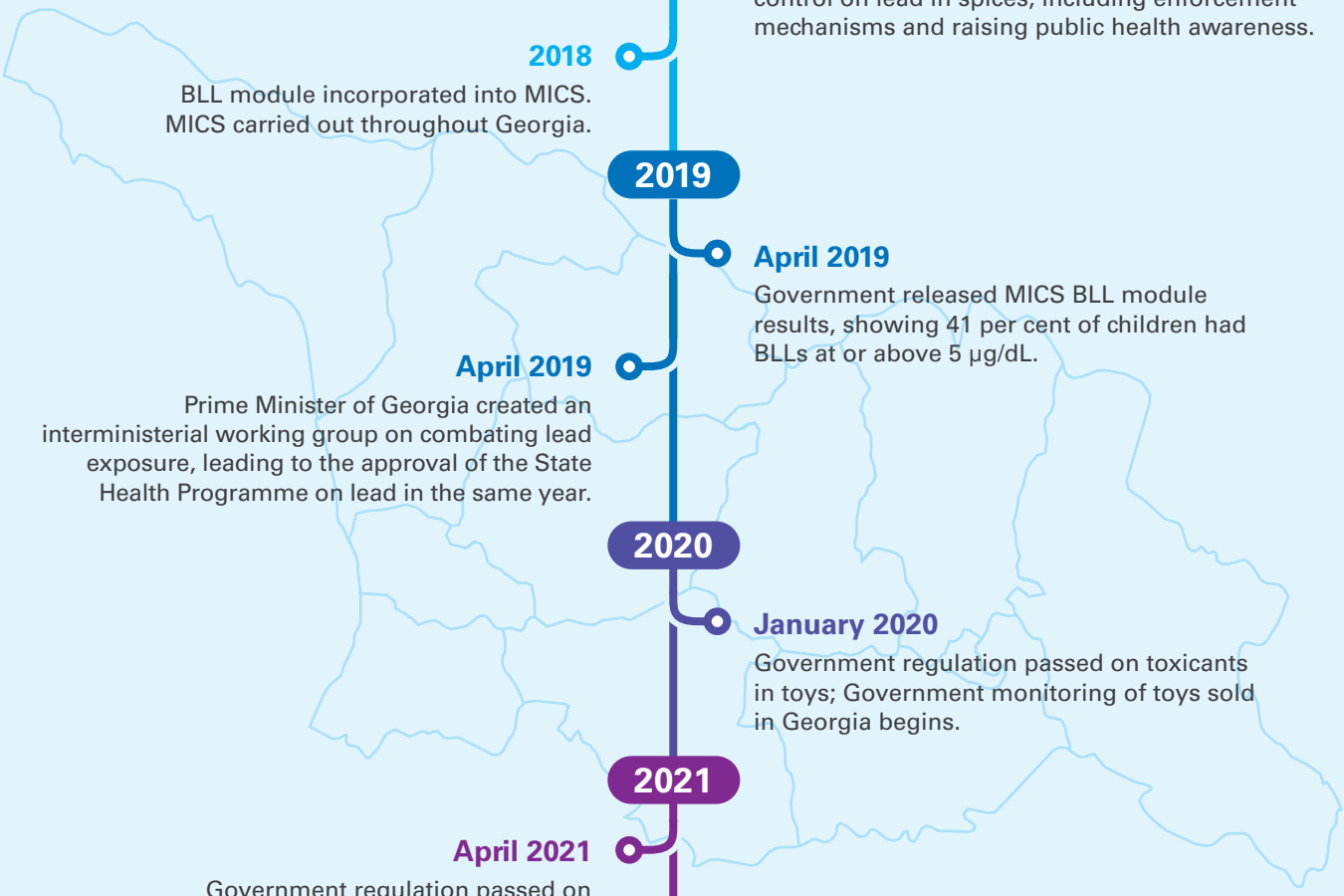
The danger of lead is widely recognized but the scale of global lead exposure is not. Lead is pervasive in children's environments, being found in a range of consumer products – including spices, paints, and glazes – and spread by emissions from unsafe battery recycling and environmental contamination. Most of the children impacted by lead poisoning live in low- and middle-income countries, where significant sources of lead remain.

Lead poisoning is preventable, with most cases of lead exposure resulting from sources with safe and available alternatives. Lead exposure must urgently be eliminated to prevent brain and other organ damage in children and to protect the potential of entire generations of children.

> "UNICEF has partnered with the Government of Georgia for over 30 years to save children's lives and to help them fulfil their potential. I commend the Government of Georgia for taking decisive steps to address childhood lead poisoning. UNICEF advocacy, technical assistance, resources from Clarios Foundation and other donors, and partnerships have enabled Georgia to be better equipped in addressing the problem. The recently launched Lead Surveillance System will ensure routine tracking of blood lead levels in children and the sources of exposure. UNICEF is committed to pursuing a lasting solution to this challenge towards ensuring that every child in Georgia has the right to a clean, healthy and sustainable environment."
>
> **Jesper Moller**
> UNICEF Representative, Georgia

[1] A measurement of 5 micrograms per decilitre (µg/dL) of whole venous blood is the reference level at or above which WHO recommends initiating public health actions.

Timeline of key events



2017

Summer 2017
UNICEF advocacy on combating lead exposure.

2018

February 2018
Government regulation passed to increase control on lead in spices, including enforcement mechanisms and raising public health awareness.

2018
BLL module incorporated into MICS. MICS carried out throughout Georgia.

2019

April 2019
Government released MICS BLL module results, showing 41 per cent of children had BLLs at or above 5 µg/dL.

April 2019
Prime Minister of Georgia created an interministerial working group on combating lead exposure, leading to the approval of the State Health Programme on lead in the same year.

2020

January 2020
Government regulation passed on toxicants in toys; Government monitoring of toys sold in Georgia begins.

2021

April 2021
Government regulation passed on lead in varnishes.

July 2021
Chemical Risk-Factor Research Laboratory at NCDC fully equipped and laboratory staff trained.

2022

December 2022
Government endorsed the Environmental Health (lead) Surveillance System.

2023

August 2023
Environmental Health (lead) Surveillance System launched, with a pilot programme in Adjara Autonomous Republic and Imereti.

Identifying the problem

Between 2015 and 2017, anecdotal reports were accumulating in Georgia to indicate high levels of lead exposure. In 2015, results from a small survey of 254 children aged 2–5 years conducted by NCDC and the United States Centers for Disease Control and Prevention in Tbilisi found that 33 per cent of the children had BLLs at or above 5 µg/dL, raising concern of a national public health problem. In December 2015, 30 per cent of a small sample of 46 children aged 4–6 years in Bolnisi and Dmanisi rayons were found to have BLLs at or above 5 µg/dL.

In 2016, the International Pollutants Elimination Network (IPEN) sampled 37 branded paints from markets across Georgia and found that 12 of the paint samples contained high levels of lead.[i] IPEN also conducted a study on toys in Georgia which found that, in a sample of 104 toys from neighbouring countries, 75 had lead concentrations above 100 mg/kg. Three other studies investigated the lead content of toys available on the Georgian market and found they all contained lead.[ii] In 2017, the Center for Strategic Research and Development of Georgia reported that toys sold in Georgia contained high levels of lead and other harmful metals. In March 2018, a survey of paint and toys tested in schools and kindergartens in Tbilisi and Rustavi – even those that were recently constructed – showed high levels of lead.

Studies conducted by the Tbilisi State University in Bolnisi and Dmanisi showed that the contamination of soil with lead, mercury and cadmium had increased in the period between two surveys conducted in 2014 and 2017. Routine monitoring data collected by the National Environmental Agency between 2017 and 2018 showed that out of 485 soil samples analysed, 22 per cent had lead concentrations above the acceptable level according to Georgian regulations.[iii]

At the same time, evidence was accumulating across Georgia to strongly implicate spices as a dominant source of lead exposure.[iv] To increase sales, producers and vendors often added lead chromate to spices to enhance their colour and to add weight. In 2011, 2015 and 2017, the New York City Department of Health and Mental Hygiene found high levels of lead in Georgian spices and in the blood of Georgian expatriates living in New York City.[v] In 2015, in partnership with the Georgian Consulate, the Department of Health and Mental Hygiene in New York City developed, and posted on their website, a warning against the consumption of Georgian spices, as these were more likely to contain high levels of lead.

As a result of the warnings against Georgian spices in the United States of America, in 2017, Georgia's National Food Agency tested spices in the country. In February 2018, the Government passed a regulation introducing a two-year ban on the production and sale of spices by individual sellers and obliged business owners to sell only sealed and labelled spices. The Government also developed its enforcement capacity and raised public health awareness.

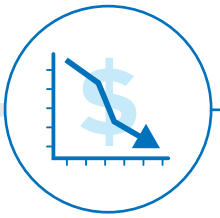
To accurately measure lead prevalence in children scientifically, UNICEF strongly advocated for the inclusion of a BLL module in the 2018 national MICS. As a result, the National Center for Disease Control and Public Health (NCDC) requested that UNICEF design and integrate a nationally representative study measuring BLLs among children across Georgia into the MICS.

Multiple Indicator Cluster Survey (MICS) Programme

The global MICS Programme was developed by UNICEF in the 1990s as an international multi-purpose household survey to support countries in collecting internationally comparable and representative data on a wide range of indicators about children and women. MICS measures key indicators that allow countries to generate data for use in policies, programmes, and national development plans, and to monitor progress towards the Sustainable Development Goals and other international commitments.

Generating evidence

Three factors were key in the decision to incorporate a BLL module into the 2018 MICS in Georgia:

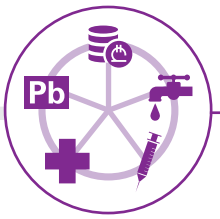


1. Substantial cost savings

Incorporating the BLL module into MICS yielded a significant reduction in the financial resources required to collect the data.

2. Increased efficiency

Inclusion of the BLL module negated the need to approve a separate BLL survey, execute another campaign involving venous blood samples from young children, and share additional information.



3. Data cross-pollination

Conducting the BLL study within the larger survey allowed for analysis of relationships between indicators of human biomonitoring modules, such as lead prevalence, and standard MICS indicators such as water quality, wealth index, etc.

For the first time globally, a module to measure BLL in children was integrated into MICS. The challenges to testing BLLs in most low- and middle-income countries include lack of awareness regarding the impact of pollution on children's health, and a lack of resources – especially laboratory capacity – for testing and monitoring BLLs in country.

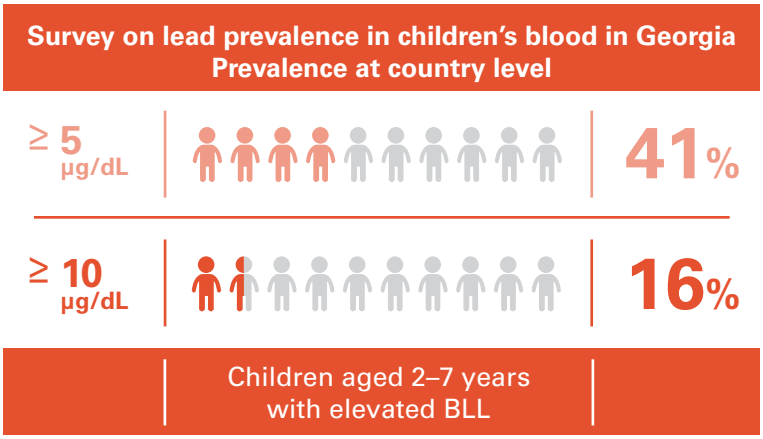
UNICEF, with the support of nine[2] donor organizations, assisted the Government of Georgia – specifically the National Statistics Office (GeoStat) and the NCDC – to carry out the MICS. UNICEF mobilized resources and provided technical and financial support for the survey. Before the MICS was conducted, UNICEF, GeoStat and NCDC launched a first round of preparatory regional meetings with the public to inform households of the survey, with particular focus on the importance of collecting blood samples from children to test for lead prevalence.

The MICS was conducted between September and December 2018; as part of the survey, venous blood samples were collected from 1,578 randomly selected children aged 2–7 years across Georgia. These blood samples were sent to the laboratory at the Italian National Institute of Health, one of the leading public health institutions in Europe, where they were analysed, free of charge, using inductively coupled plasma mass spectrometry, the most accurate 'gold-standard' method for lead testing. The Institute also supported efforts to identify potential sources of lead with the provision of stable isotope ratio analysis, which provides initial clues to potential sources of BLL detection.

[2] United States Agency for International Development (USAID), World Bank (WB), United Nations Population Fund (UNFPA), Swedish International Development Cooperation Agency (SIDA), French Development Agency (Agence Française de Développement (AFD), Swiss Agency for Development and Cooperation (SDC), Italian National Institute of Health (Istituto Superiore di Sanità (ISS)), United Nations Development Programme (UNDP) and World Health Organization (WHO).

MICS BLL results

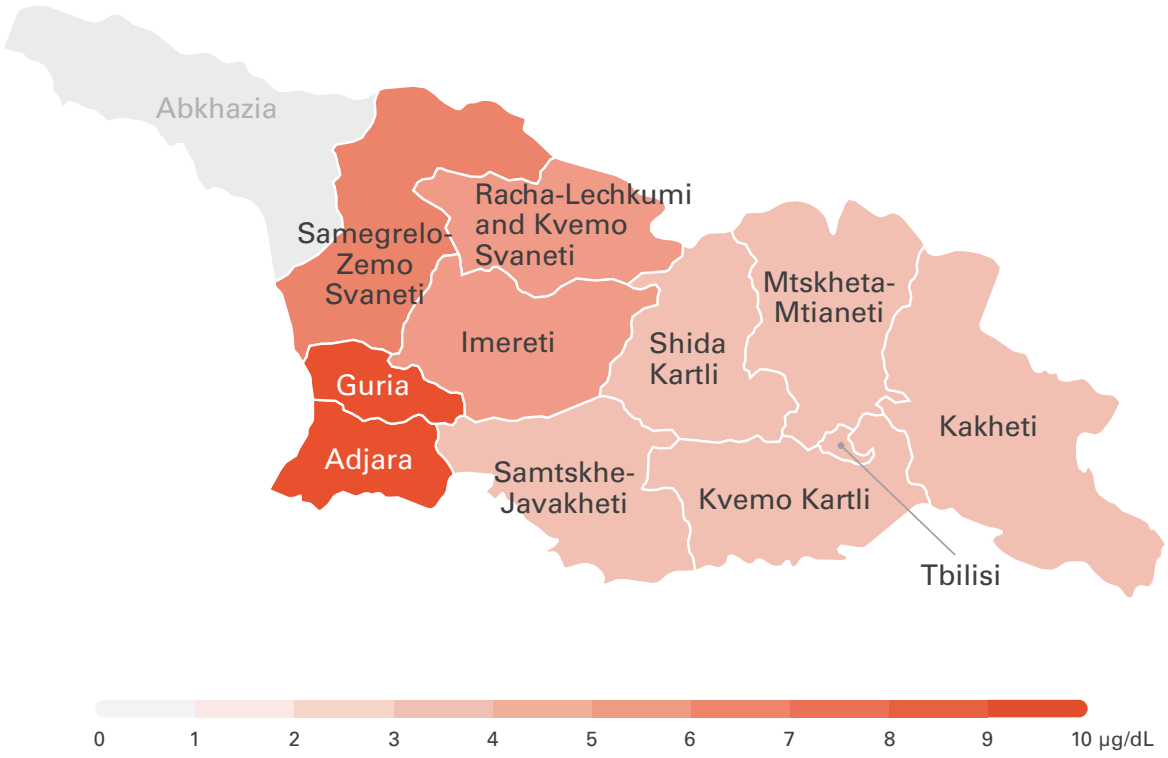
In April 2019, the Government released the data on lead prevalence in children's blood collected during the MICS. The BLL results revealed that 41 per cent of children in Georgia had BLLs at or above 5 µg/dL. In comparison, less than 3 per cent of children in the United States had a BLL at or above 5 µg/dL.[vi]



Source: MICS 2018.

The results showed that regions in western Georgia had a much higher lead prevalence compared with the eastern regions of the country. In one of the regions in western Georgia, 85 per cent of children had elevated BLLs.

Figure 1: **Median BLLs (µg/dL) according to region of residence in Georgia**



Region	Median BLL (µg/dL)
Adjara	9.9
Guria	9.4
Samegrelo-Zemo Svaneti	7.0
Imereti, Racha-Lechkumi and Kvemo Svaneti	5.7
Samtskhe-Javakheti	3.8

Region	Median BLL (µg/dL)
Mtskheta-Mtianeti	3.3
Kvemo Kartli	3.2
Tbilisi	3.2
Kakheti	3.1
Shida Kartli	3.0

Source: MICS 2018.

The Government of Georgia took decisive action to address the problem

The Government of Georgia responded positively by adopting a sustainable and systematic approach to address the high levels of lead prevalence found in children. As soon as the BLL results from MICS became available, the Government acknowledged and took ownership of the problem and undertook a strong commitment to resolve the issue.

Immediate response

Creating a working group on combating lead exposure

Immediately following the release of the BLL results, the Prime Minister of Georgia created a working group on combating lead, consisting of the Ministries of Health, Environment, and Economy, as well as several other agencies responsible for food and product safety. UNICEF supported the working group with the development of a comprehensive, intersectoral, multi-year strategy and action plan to measure, minimize and ultimately eliminate lead poisoning in Georgia.

Raising awareness on the toxic effects of lead

In 2018, before the results of the BLL survey were made available, UNICEF and NCDC began giving presentations, holding press conferences and sharing information through social media and other official channels to raise consumer awareness regarding the harmful impact of lead and potential sources of lead exposure, and to share recommendations for households with children with elevated BLLs. The Government and UNICEF also used International Lead Poisoning Prevention Week – held in October annually – to raise awareness of the dangers of lead.

To position the issue and optimize media coverage, the Government released the results of the BLL survey earlier than the full MICS results. The release of the BLL results led to intense media coverage in Georgia. In a second round of regional meetings with the public, UNICEF and NCDC disseminated the BLL results: the increased public awareness of the toxic effects of lead helped to spur the Government into taking further action.

The Government sent letters to inform the families of children tested for BLLs of their child's result, and to provide parents with recommendations on how to reduce lead exposure within households, including dietary advice to help reduce BLLs. Where children had elevated BLLs, parents were advised to take the child to a paediatrician to assess physical and mental development and iron deficiency, and – in some cases – to follow paediatrician's advice for further testing. The children who had elevated BLLs and who had participated in MICS were provided with medical services free of charge. Written and verbal communication targeted at individual households, together with home visits to the most exposed, were key components in the effective reduction of BLLs in children.[vii]

Establishing a state health programme

The Georgian National Environmental Health Action Plan 2018–2022 provided a general strategic framework to ensure healthy environments for children and youth. Under this framework, in May 2019, the State Health Programme was launched to tackle the problem of lead exposure. Based on recommendations from the U.S. Centers for Disease Control and Prevention and the American Academy of Pediatrics, the Ministry of Health in Georgia approved clinical protocol of the 'Early Identification of Toxic Effects of Lead in Children and Management Measures' which aimed at prevention of the harmful effects of lead, timely identification of lead level alleviation and efficient management of cases.

In 2019, within the Early Disease Detection and Screening component of the State Health Programme, all the children who had participated in the MICS survey and had elevated BLLs, members of their family up to 18 years of age and pregnant women were offered free follow-up testing, treatment and relevant recommendations. Paediatricians assessed physical and mental development of children, evaluated nutritional status including vitamins, calcium and iron intake, and provided information about possible sources of lead exposures along with international recommendations. If the child's BLL was at or above 5 µg/dL, the child was provided with iron and calcium supplements and multivitamins.[viii]

Under the State Health Programme, family doctors, paediatricians and public health specialists were trained in early detection and management of lead exposure. In August 2019, the Iashvili Children's Hospital started follow-up BLL testing of children found by the MICS to have elevated BLLs. If a child's BLL had reduced, there was no further follow-up, but those children with BLLs at or above 10 µg/dL were tested up to four times.[ix]

In 2021, a study was conducted to perform an initial assessment of the State Health Programme's interventions. The data used for the study was taken from 423 MICS participants who were less than 18 years of age and who had been tested in the State Health Programme during 2019. The study found a significant reduction in BLLs in children over a relatively short period of time. Between the 2018 MICS and the first stage of intervention in August 2019, a median reduction of 2.5 µg/dL was observed; between the 2018 MICS and the BLL results from December 2019, the median reduction was 2.8 µg/dL.[x] Despite design limitations, the study showed that a targeted lead intervention programme – based on promoting awareness of lead exposure and harm, as well as behaviour change – may have contributed to a reduction in children's BLLs in a relatively short period of time.

Locating the sources of lead exposure

In 2019, a UNICEF consultant led a preliminary study on lead exposure sources. The study reviewed previous research, used the MICS data to analyse venous blood specimens of children collected nationwide, and analyzed from multiple sources including the results of the stable isotope ratios of blood lead analysis conducted in partnership with the Italian National Institute of Health, spatial associations, and socio-economic, industrial, environmental and biological information to investigate the potential sources responsible for blood lead exposure in children. The geospatial analysis allowed the research team to observe the geographic distribution of BLLs in Georgia and to determine whether potential sources of lead exposure tended to appear near lead prevalence hotspots. The study concluded that the lead exposure sources which should be taken into special consideration for deeper investigation were spices, ores, coal production, metallurgy, gasoline-derived lead (bioaccumulated) and toys.

> The MICS data on lead prevalence triggered an immediate Government response, mainly through the NCDC-led state health programme providing free testing, consultations and supplements to children with elevated blood lead levels. As part of the government strategy, UNICEF supported the establishment of a chemical risk factor laboratory allowing analysis of toxic elements in various specimens and the introduction of the Lead Surveillance System to monitor lead prevalence and investigate sources of lead exposure. The holistic approach and joint efforts of the authorities, donors and other stakeholders is crucial for the success in combating lead exposure.

Ekaterine Adamia

Deputy Director,
National Center for Disease Control and Public Health (NCDC)

Based on global evidence that informal used lead acid battery (ULAB) recycling is a common source of lead exposure, in Georgia, a preliminary list was drawn up of the 18 sites where ULAB collection, separation and/or recycling are reported. Additionally, according to the data collected from the Business Registrar for Georgia and the Ministry of Environmental Protection and Agriculture, there are other possible industrial sources of lead pollution in Georgia which need to be investigated, namely auto services, the chemical industry, waste treatment and incineration plants, wastewater treatment facilities, landfills and thermal power plants.

In 2019, a team comprised of NCDC, United States Centers for Disease Control and Pure Earth conducted a limited study of 25 Georgian homes and three bazaars across four regions (Adjara, Guria, Imereti and Shida Kartli) of Georgia. Sixteen of the homes were selected on the basis of having a child with a BLL greater than 30 µg/dL, while nine homes were selected based on having children with a BLL greater than 5 µg/dL. The study examined a range of media including, soil, dust, paint, water, spices, toys and cookware, to identify the sources of lead exposure in children. Spices were found to have highly elevated concentrations of lead. All other media were found to be within internationally accepted guidelines. The study concluded that lead-adulterated spices posed a public health risk across Georgia, but in the western region,[xi] where spices are more heavily used in cooking, the risk of lead exposure from spices was found to be more pronounced. In comparison, the study assessed 207 paint samples, but no evidence was found of lead-based paints in the 25 homes sampled. The study found only one toy – imported from overseas – that had high lead levels.[xii]

In 2020, Pure Earth initiated a more detailed study to identify the most prominent sources of lead pollution in Georgia which included a detailed inventory of spices. The Pure Earth team in Georgia interviewed spice farmers and wholesale retailers involved in the distribution of imported spices, and gathered data on soil conditions, the use of chemicals and the production process. The Pure Earth analysis of 77 spice businesses and 264 products – as well as discussions with local government – found that most of the lead in spices came from processing by large spice importers and wholesale retailers, where lead chromate was added to spices to enhance the colour.

Overall, the high blood lead prevalence in children revealed by the 2018 MICS accelerated efforts to investigate the sources of lead exposure in Georgia. Over the last decade, many studies into potential sources of lead exposure have taken place, but most were small and did not produce statistically significant results. The evidence to date suggests that children in Georgia are exposed to a range of lead sources. Additional investigations, household visits and follow-ups on child BLL testing are needed to further evaluate spices, contaminated sites and other potential lead sources, and their correlation with elevated BLLs.

Human interest story

In Kvatsikhe, four-year-old Barbare is strutting around her living room wearing her fluffy bunny slippers. She wants to put on some children's lipstick and nail polish but her mother, Giuli, refused her request, cautious about her daughter using makeup or any other product that could contain lead. Barbare was one of the 1,578 children who participated in the 2018 MICS survey. Barbare's reading of 13.2 µg/dL was well above the minimum threshold for concern of 5 µg/dL. Giuli said that Barbare started talking quite late and that her son was born with cerebral palsy. She said "I was scared when I was told that (lead) hinders development."

Nutsa, right, has bi-monthly check-ups with doctors to monitor her blood lead levels.

In the Adjara Autonomous Republic region, where around 85 per cent of children had lead levels at or above 5 µg/dL and half had levels at or above 10 µg/dL, nine-year-old Nutsa also participated in the study and had an even higher lead level - at 37.2 µg/dL. Dr. Irma Chikvaidze, a paediatrician at a clinic in Batumi, the capital of Adjara, says that little was known about the problem when the results first came out. "We had some theoretical knowledge, that was all," she says, adding that the findings may shed light on the high number of unresolved cases of slow childhood development she has seen. As part of the national strategy, Dr. Chikvaidze and other medical personnel were provided with additional training to hone their understanding of the problem – including how to identify and respond to potential cases – and to encourage knowledge sharing among colleagues. "Children with developmental issues are now being referred for lead tests," Dr. Chikvaidze says. "Everyone I know [has] wanted to get tested."

After receiving the results of the study, both Barbare and Nutsa received comprehensive medical assistance free of charge. As a result, Barbare's BLLs have decreased to 7.9 µg/dL, while Nutsa's have more than halved. "I think we were lucky to be part of this survey because now we are receiving special care," says Giuli. She says that other mothers at her daughter's kindergarten now come to her for advice on how to protect their children.

Medium- to long-term response (2020–2030)

Expanding the Early Disease Detection and Screening component of the State Health Programme

In 2020, the Early Disease Detection and Screening component of the State Health Programme was expanded to allow paediatrician or general practitioners to refer children under 7 years of age to be tested for lead poisoning. Children with BLLs at or above 5 µg/dl received medical services and medications; members of their families up to 18 years of age and pregnant women were tested, treated and given relevant recommendations.

Preventing market circulation of lead-contaminated products and materials

UNICEF provided technical support to the Government to develop its strategy to combat lead poisoning; the strategy included the development of regulations – based on European Union (EU) directives – to control lead and other pollutants in products and materials, which were developed by the Government with EU assistance. In January 2020, a regulation on toxicants in toys was enacted and the government started testing toys sold in the country. In April 2021, a resolution on the technical regulation of lead in varnishes was adopted.

Capacity building for lead testing in Georgia (including the Chemical Risk-Factor Research Laboratory)

NCDC's Chemical Risk-Factor Research Laboratory is central to the implementation of the lead surveillance system to detect lead in children's blood and to identify the sources of exposure. UNICEF has provided the bulk of the resources used to strengthen the capacity of the Laboratory.

In April 2020, with UNICEF support, four X-ray fluorescence analysers – portable handheld devices which allow testing of toxic metal content in different kinds of specimens – were delivered to NCDC. In July 2020, with financial support from donors, UNICEF procured an atomic absorption spectrometer – used to determine concentrations of different chemicals such as lead, mercury, cadmium or arsenic in specimens such as blood, water or food – for NCDC.

In July 2021, UNICEF and partners contributed to the development of the Chemical Risk-Factor Research Laboratory by procuring a triple quadrupole inductively coupled plasma mass spectrometer – which allows isotope ratio analysis crucial for the identification of sources of lead exposure – along with a gas chromatograph and a liquid chromatograph. This procurement included installation and training services as well as capacity building for laboratory personnel for the precise analysis of lead and other elements in various specimens.

The fully equipped Chemical Risk-Factor Research Laboratory provides Georgia with the infrastructure to test BLLs and other human and environmental specimens within its borders, which is an important step towards the sustainability of environmental health monitoring and the elimination of lead poisoning in children. In February 2022, UNICEF helped leverage external support from the Israeli Embassy in Georgia and Israel's Agency for International Development Cooperation, which arranged for four leading Israeli scientists to assist in training the local team on blood lead testing and share their experience with local partners.

UNICEF continues to support quality assurance activities of the NCDC Laboratory by facilitating their collaboration with international reference laboratories. The Laboratory has applied for accreditation for testing blood and other samples.

UNICEF's partnership with the Parliamentary Council of Health Promotion and Disease Prevention

In 2022, UNICEF further developed its partnership with the Parliamentary Council of Health Promotion and Disease Prevention at the Committee of Health Care and Social Issues to upscale the importance of combating lead exposure through active oversight of the interventions by the executive branch of Government – in particular, the implementation of the lead surveillance system. The Parliamentary Council oversees the prevention of lead exposure in Georgia and focuses on simplifying logistics to streamline the process of lead surveillance and ensure its sustainability. To monitor progress, the Parliamentary Council plans to convene hearings on combating lead three times a year. To inform parliamentarians, in January 2023, UNICEF organized a workshop on lead exposure and invited a toxicologist from Emory University to speak on the problem of lead exposure, diagnoses and treatments (including chelation), the role of nutritional interventions in mitigating poisoning and the benefits of surveillance as a primary prevention measure.

Developing the Environmental Health (Lead) Surveillance System

The foundation of the Government's strategy to tackle lead poisoning in children is the Environmental Health (Lead) Surveillance System, which will provide the evidence upon which policy recommendations can be based. The establishment of the Environmental Health (Lead) Surveillance System will allow for scientific collection and analysis of data that will help identify sources of lead exposure, systematic monitoring of products and environmental contamination, sustainable measurement of BLLs and lead levels in environmental and household samples at the NCDC Chemical Risk-Factor Laboratory, and follow–up with children who have high BLLs.

To support the Government in the institutionalization of this surveillance system, UNICEF commissioned The University of Tromsø' (UiT), who – together with the National Public Health Institute of Quebec – designed the Environmental Health (Lead) Surveillance System for Georgia. UiT remains committed to the project through surveys and technical assistance and has partnered with UNICEF and the Government to provide services free of charge. Moreover, UiT is investing funds for the development of a technical document and electronic lead module for the implementation of the surveillance system as well as for technical support throughout the preparation and implementation phase.

In December 2022, the Government endorsed the Environmental Health (Lead) Surveillance System which was launched in August 2023 with a pilot programme in two regions of Georgia – Adjara Autonomous Republic and Imereti – with plans to expand throughout the country by the end of 2025. In August 2023, a new methodology was introduced for blood sample collection, which requires only microvolumes of capillary blood to be collected from a finger prick. This methodology is less invasive and stressful for young children and easier to manage, logistically, because it does not require trained phlebotomists nor does it require special storage or transportation, as dried blood can be stored at room temperature. The novel methodology for blood collection will facilitate large-scale surveillance. With UNICEF support, additional equipment was purchased for the NCDC Laboratory and associated training of laboratory personnel for the new method of blood collection and analysis.

Key takeaways from Georgia's experience

Addressing the data gap: The inclusion of the BLL module in MICS enabled scientific evidence to be generated through nationwide sampling, and for the first time highlighted the scale of the problem of lead poisoning in children in Georgia. The BLL results from the MICS led to a firm commitment from a wide range of partners and stakeholders towards the elimination of lead exposure within Georgia. The MICS data has been used as a baseline by other surveys/studies.

Political will: The Government of Georgia prioritized its response in dealing with the crisis of lead poisoning in children, and all branches of Government worked collaboratively towards a successful outcome. In responding to the BLL results, the Government applied best practices and lessons learned from its experience responding to the hepatitis C public health emergency in 2015, which was given high priority by the Government and was deemed to be a success.

The numerous alerts from the Department of Health and Mental Hygiene in New York City played an important role in catalysing the Government of Georgia to implement regulatory action in 2018 to prevent the sale of adulterated spices.

Holistic, systematic approaches: The scale of the crisis demanded a multipronged, multiscale approach, combining an immediate response with a long-term strategy incorporating the development of national regulatory, enforcement and surveillance capabilities. In Georgia, a holistic, systematic approach with treatment and exposure prevention action plans was adopted.

Balancing short- versus long-term responses: The elimination of lead poisoning is a long-term process, but important tractable steps can be taken in the short term. In Georgia, the State Health Programme offered free treatment, follow-up testing, and relevant recommendations to reduce lead exposure. Regulations were implemented regarding spices, toys and varnishes to prevent further health impacts from lead poisoning. Some interventions, such as the removal of lead from spices is highly tractable at relatively low cost. Quick, low-cost spot enforcement can provide opportunities for drastic curtailment over a relatively short time.

With a focus on sustainability and capacity building, the Government and UNICEF focused on the development and implementation of a surveillance system for lead, and potentially for other toxicants. The Environmental Health (Lead) Surveillance System is a primary prevention measure, compliant with WHO recommendations, providing a framework for the Government to address and eliminate lead poisoning in children throughout Georgia.

In-country partnerships key to success: A strong partnership between the Government and UNICEF and other key partners and donors provided a solid foundation, upon which the Government was able to respond when the widespread issue of lead poisoning in children came to light.

Next steps

The Environmental Health (Lead) Surveillance System will be expanded from a pilot programme to cover the whole country by the end of 2025. The Surveillance System will provide the evidence upon which targeted policy and legislation to reduce and ultimately eliminate lead poisoning in children can be based. A strong coordination mechanism involving all relevant state agencies and stakeholders will be required. There will also be further discussions regarding an electronic lead module to allow stakeholders to carry out real-time analysis.

As the sources of lead exposure are identified, regulations and strong control measures will need to be developed and implemented to address the problem of legacy contamination as well as lead exposure, generally. The Government of Georgia will need to strengthen the capacity of its agencies involved in market surveillance, customs and trade, food, technical and construction industries, and the environment to routinely monitor lead during their proactive and reactive inspections and to penalize violators. The management of hazardous waste and hazardous sites – such as disused mines, landfills and metallurgy-related sites – will require strengthening. There are also plans to implement the EU's New Approach Directives.

Effective advocacy, stakeholder engagement and grassroots mobilization will be essential components in raising awareness regarding lead poisoning. The involvement of the informal sector is crucial, and policies should be developed to promote safe recycling and waste management. Alongside this, communication campaigns on the protection of children from lead exposure for frontline workers and communities must be conducted to raise awareness on the risks of lead exposure and the importance of preventive measures.

The State Health Programme will be further developed for case management of impacted children and their families. Based on the successes of the State Health Programme's interventions thus far, further targeted interventions based on evidence should be designed and implemented once key lead sources have been identified.

> The Parliamentary Council of Health Promotion and Disease Prevention at the Health Care and Social Issues Committee actively supports the prevention of lead poisoning throughout Georgia. Identification and elimination of lead exposure sources requires long-term commitment and resources. Therefore, the Council and the Committee closely monitor implementation of the state lead surveillance system, which should be sustainable, well-resourced and easily accomplishable. Based on the evidence collected through the surveillance, respective legislative interventions will be planned and carried out to improve the environmental health of children in Georgia.

Zaza Lominadze

Chair of the Health Care and Social Issues Committee, Parliament of Georgia

UNICEF in Georgia

UNICEF has been supporting the Government of Georgia for 30 years in realizing children's rights and meeting its obligations under the Convention on the Rights of the Child. UNICEF's goal is to protect and foster greater social inclusion of the most vulnerable children and to reduce disparities and inequities affecting children and their families. UNICEF's country programme of cooperation with the Government contributes to the realization of national priorities for children and implementation of the related Sustainable Development Goals. The priority areas of the country programme are:

- Improving health services for mothers and children
- Addressing environmental hazards to children's health
- Increasing access to inclusive and quality preschool and general education
- Strengthening social protection programmes for children and families
- Addressing violence against children
- Supporting child-friendly justice reform

UNICEF works in partnership with the Government and civil society partners as well as international development partners to influence systemic changes to improve the lives of children; to amplify the voices of young people; to build capacity of professionals in child rights; to develop model programmes; and to generate data and use this information to inform advocacy and programmes.

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> Lead exposure is a top-tier impediment to global health, education and economic development; it robs children of their ability to learn and thrive, and deprives adults of years of healthy life.[xiii]

The Working Group on Understanding and Mitigating the Global Burden of Lead Poisoning

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