



Original article

The Szopienice community's response to the consequences of lead exposure in the 1970s – attitudes and knowledge (humanistic perspective)

Lucyna Sadzikowska

University of Silesia in Katowice, Faculty of Humanities, Institute of Literary Studies, Uniwersytecka str 4, Katowice, 40-007, Poland

E-mail address: lucyna.sadzikowska@us.edu.pl

ORCID iD: <https://orcid.org/0000-0002-5509-4513>

ABSTRACT

In the 1970s, in the Szopienice district of Katowice, Poland, symptoms of long-term lead poisoning were identified in children living in the vicinity of the Non-Ferrous Metal Works „Szopienice”. Publicly available documents state that approximately 5,000 children were initially examined in secret by the authorities of the People's Republic of Poland. The aim of this study was to determine whether selected living representatives of the group that suffered from lead poisoning in the 1970s, as well as their family members, were aware that the health effects of exposure to harmful environmental factors occurred after a long period. During pilot field research, an attempt was made to gather information that would enable an assessment of the community's knowledge of basic environmental medical issues. Special attention was paid to the attitudes of the selected group (those with lead poisoning from the 1970s in Szopienice) towards lead poisoning. The respondents demonstrate limited knowledge regarding the effects of lead poisoning. Consequently, there is a clear need to implement educational initiatives, particularly in the areas of health prevention and awareness-raising about the consequences of lead exposure. Notably, the respondents express a positive attitude toward the diagnostic capabilities offered by environmental medicine, including approaches focused on individualized patient care.

KEY WORDS: cultural heritage, environmental humanities, lead poisoning, environmental pollution, metallurgy, health geography

ARTICLE HISTORY: received 13 June 2025; received in revised form 30 October 2025; accepted 7 November 2025

1. Introduction

Between 1990 and 2016, lead (Pb) emissions in Poland decreased by only 13%, compared to a 93% reduction across the European Union (EU). In the majority of EU member states, lead emissions declined by more than 80%. Poland alone accounts for over one-quarter of the EU's total emissions of this element (EEA, 2024). Moreover, Poland is considered the largest emitter of lead, cadmium, and mercury among the countries of the European Economic Area (EEA), which includes the EU and the European Free Trade Association (EFTA), excluding Switzerland (European Environment Agency). Considering the

reduction in lead emissions, Romania performs the worst in terms of lead emission reduction, recording a net increase of 40%. Poland ranks second to last in progress toward reducing lead emissions. In contrast, Hungary, Latvia, Lithuania, and the Czech Republic have significantly addressed the problem. In Poland, 28,61% of lead emissions fall into industrial processes unrelated to combustion, such as mineral extraction or metal processing, as well as activities in the service sector related to using paints and solvents.

Upper Silesia is the region of Poland with the highest environmental pollution from heavy metals (GODZIK ET AL., 1993). Historically, the area has been associated with intensive industrial activities,

including metallurgy, as well as the mining and processing of non-ferrous metal ores. The long-term operation of these economic sectors has resulted in environmental contamination by metals, including lead (DZIUBANEK ET AL., 2012; BARANYAI ET AL., 2015; PELC ET AL., 2016). Historically, one of the largest emitters of heavy metals in Upper Silesia was the Non-Ferrous Metal Works „Szopienice”, which adopted its name in 1972.

Previously, the Bergwerksgesellschaft Georg von Giesches Erben company launched the "Wilhelmina" Zinc Works in Szopienice (JEDYNAK, 2006). In 1863, the Lead Works were established (GRZEGOREK ET AL., 2017). The operations were expanded in 1948 with the creation of the Copper Refinery Department (OCHODEK, 1998). The name "Szopienice Non-Ferrous Metals Foundry" was adopted in 1972. Six years later, the Copper Strip Rolling Mill was inaugurated. After several decades, on September 26, 2008, the Extraordinary General Meeting of Szopienice Non-Ferrous Metals Foundry SA decided to dissolve the company.

It is worth noting that in 1954, Poland's first prophylactic semi-sanatorium was opened for employees of the plant, providing treatment for workers at risk of lead exposure during three-week stays. In 1958, a polyclinic was established to serve as both the plant's semi-sanatorium and occupational health clinic (DZIADUL ET AL., 1983; GRZEGOREK ET AL., 2017). On July 14, 1974, a child with suspected mucopolysaccharidosis was brought to the clinic in Zabrze, headed by Prof. Bożena Hager-Małecka, the then provincial consultant for paediatrics (HAGER-MAŁECKA ET AL., 1977). Prof. Hager-Małecka noted symptoms in the patient that did not fit the profile of the disease (NORSKA-BORÓWKA, 1994; KARCZEWSKA, 2016). However, certain symptoms corresponded to lead poisoning (FARR ET AL., 2008). The description of symptoms resembled a case of lead poisoning in a child presented at a conference in Switzerland attended by the consultant. The efforts of Prof. Hager-Małecka and Dr. Jolanta Wadowska-Król (SADZIKOWSKA, 2023), a physician from the Szopienice clinic, facilitated the documentation of mass lead intoxication in this Katowice district. Not only were the children treated, but many families were also relocated to areas far from the industrial source of contamination, and finally, the technology causing the dramatic epidemiological situation was eliminated.

Information provided by Dr Jolanta Wadowska-Król, an active participant in the interviews which form the basis of the article, indicates that out of a group of 3,000 children residing in the clinic's

jurisdiction where the doctor worked, a thousand were severely affected (lead levels in their blood exceeded the norm of 30 micrograms per deciliter) (the remaining sick children lived in the area of the second, adjacent clinic) (FOSU, 1989; GUAGLIARDO, 2004). The issues raised in the title pertain to two related subdisciplines: medical geography and health geography (PHILLIPS, 2000; BAGHERI, 2009; CASAS ET AL., 2010; COMBER ET AL., 2011; ARPEY, 2017).

The article presents the results of categorized responses obtained during diagnostic surveys. The collected material includes opinions and views of the group of Szopienice residents affected by lead poisoning, individual stories of those who fell ill in the 1970s, and information about the current well-being of the respondents. An attempt was made to record the attitudes that characterize this group, focusing on the occurrence of lead poisoning among Szopienice residents in the 1970s, living near the then Szopienice Non-Ferrous Metals Foundry, i.e., residents of Burowiec and Dąbrówka Mała (KRZYSZTOFIK ET AL., 2024). The research results can be generalized and related to social groups residing in other industrialized areas where heavy metals, such as lead, are present in the soil, for example, Miasteczko Śląskie or Księża Góra in Radzionków (SPYCHAŁA ET AL., 2019; DULIAS, 2018) or abroad (WHO, 2019; ZARTARIAN ET AL., 2023). The analysis of the interviews lays the foundation for future research, particularly of a comparative nature, including international studies – for example, comparative studies of the health, social, legal and cultural situation even in places distant from Poland, such as Colombia, Indonesia, Kyrgyzstan, Maharashtra, India, and Peru. An estimated 292 million lead-poisoned children live in Colombia, India, Indonesia, Kyrgyzstan, Maharashtra (India), and Peru. Today, 1 in 3 children – 800 million – have enough lead in their blood to cause permanent neurological, cognitive, and physical harm (*Strengthening Health Systems...*, 2025).

2. Research methods

The research presented in this article was conducted in Szopienice, a district of Katowice, located in Upper Silesia (Fig. 1). This region covers a relatively small area of 12,300 km², accounting for 3.9% of Poland's total territory, and is inhabited by 4.4 million people, which corresponds with high population density (357 people/km² in 2021) (CENTRAL STATISTICAL OFFICE, 2022).

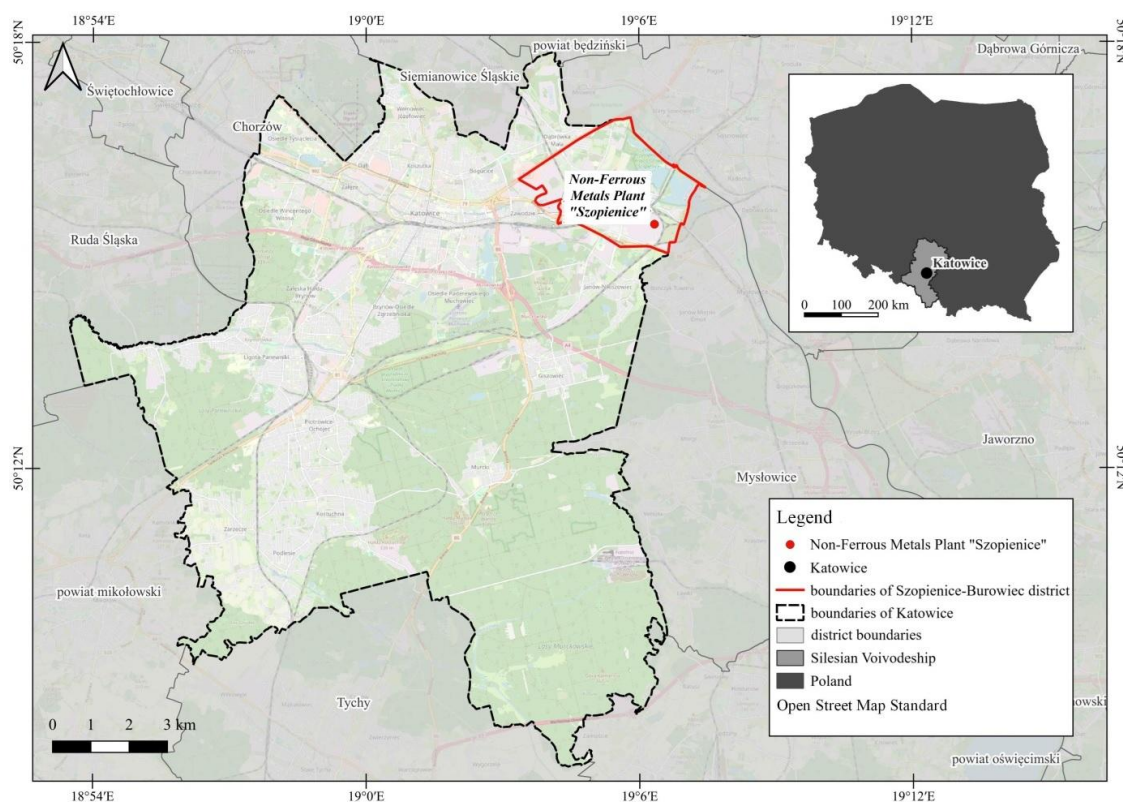


Fig. 1. Research area – Administrative area

Historical and archival data (private archival notes of dr Jolanta Wadowska-Król, a draft of doctoral dissertation, photocopies of official documents concerning the decision of the committee that decided on the resettlement of families from the immediate vicinity of the steelworks) were compared to materials found in The State Archives in Katowice and the documents located in The Archives of Modern Records in Warsaw. For the purpose of this article, updated street names were assigned (changes in street names between 1974 and 2025). Cartographic studies were conducted with the use of the open-source software QGIS (Quantum GIS). The author's findings are particularly significant because, until now, the knowledge of the Szopienice community regarding the effects of lead poisoning experienced by some underage residents of this Katowice district in the 1970s has not been researched or published in scientific literature. The presented research was of a pilot nature.

The article employs two basic groups of research methods. The first group was based on analyzing the knowledge contained in existing socio-humanistic materials, historical in the fields of geography and medicine. Various research perspectives, such as health geography (DUŚ ET AL., 1992; MICHALSKI, 2010)

or medical humanities (CHOJNACKA-KURAŚ, 2019; PORZUCZEK, 2020; DAUKSZA, 2021) may serve as a form of cultural response to the experience of human confrontation with the processes of industrialization, medical services in particular regions, and, ultimately, as a set of practices (*Framework of Analysis...*, 2014), which problematizes the experience of functioning in a degraded and contaminated environment (KEARNS, 1993; MICHALSKI, 2018). The latter method recognizes that the socialist political system in the Polish People's Republic promoted expansive economic growth, often at the expense of the individual. Any information about the risks to human health posed by environmental pollution resulting from industrialisation was withheld and deliberately concealed. The social, human, and cultural capital was not analysed (MOHAN ET AL., 2002). It was only through political and systemic transformations, the growing environmental awareness of society, and the discussions surrounding the post-industrial heritage that enabled a deeper reflection on the evaluation of profit and economic development at the expense of environmental degradation and the resulting threats to human health and life (BRIFFA ET AL., 2020).

Figures 2 and 3 contain data obtained from studying documents found in the private archive of doctor Jolanta Wadowska-Król. The literature on the subject states that Jolanta Wadowska-Król conducted research on approximately 5,000 children. Figure 3 presents data preserved in the doctor's private archive. Table 1 presents the basic parameters characterizing the children's examinations conducted

in the fourth quarter of 1974 by Dr. Jolanta Wadowska-Król during the first phase of the study, which was concealed from the authorities of the Polish People's Republic. Dr. Wadowska-Król instructed the examination of children who lived in the immediate vicinity of the Non-Ferrous Metal Works "Szopienice".

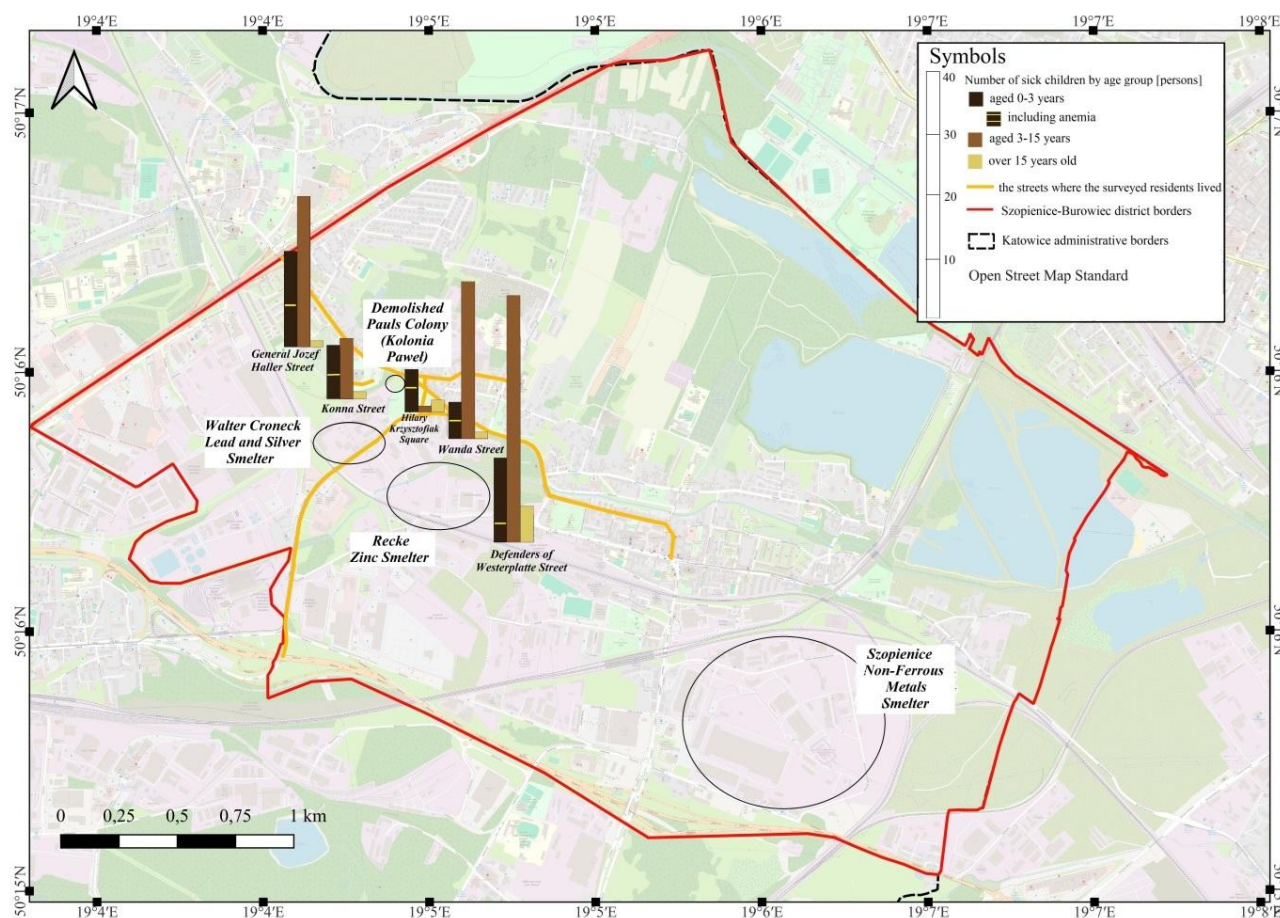


Fig. 2. Location of the study area

The study included a small sample of former young patients of Jolanta Wadowska-Król, M.D., together with their closest relatives (first-degree relatives), comprising 30 people aged between 45 and 75 (26 former patients and four people from the respondents' immediate environment). The diagnostic survey method was applied with the elements of a non-directive interview. The data obtained was analysed with the use of a case study method. The problem was examined on a micro scale and subjectively from a social, humanistic and medical perspective (the material was mainly subjected to qualitative analysis, and to a lesser extent quantitative analysis).

The study was conducted from September 10, 2021, to October 26, 2022. Each interview involved

a maximum of four people and a minimum of three: two interviewers, a person suffering from lead poisoning, and possibly their relative (usually the mother). Data were collected using a diagnostic survey method with the utilization of a nondirective interview. The study included 30 individuals aged 45–78. Participation in the survey was voluntary, and responses from participants were recorded using a voice recorder. Subsequently, transcriptions and anonymization of the interviews were carried out.

Respondents answered questions in the metric part, as well as questions assessing the general knowledge of the events related to the diagnosis of lead poisoning in Szopienice children, including the respondents, since 1974. Non-directive interviews,

to which all participants agreed, focused on their knowledge of the most common effects of lead poisoning, methods of diagnosis, and the attitudes of the respondents towards the issue of lead poisoning in Szopienice and their self-awareness.

The knowledge and attitudes of the respondents were analyzed as specific case studies. The obtained

information aimed to build a humanistic picture of individuals who suffered from lead poisoning, thus revealing the microhistory of their lives. The findings presented in the article may serve as material for analyses in the field of medical geography in Upper Silesia.

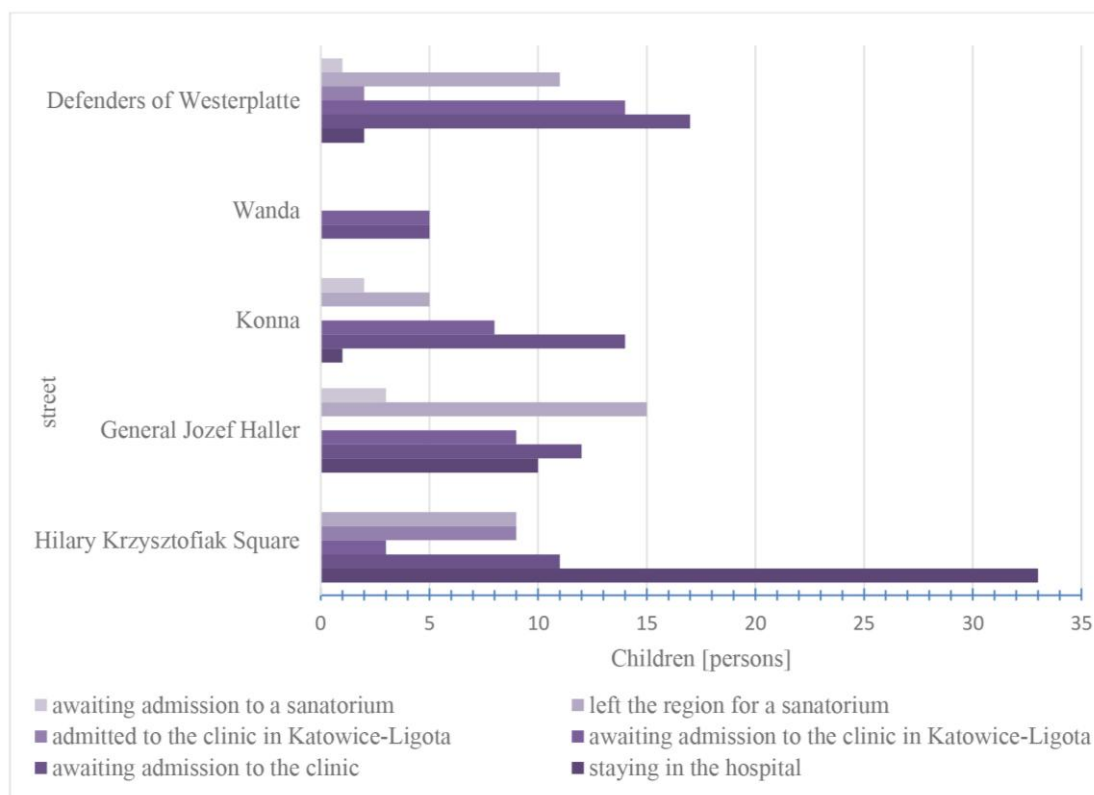


Fig. 3. Hospital and clinic statistics on children living in the vicinity of the Non-Ferrous Metal Works "Szopienice" 1974. Children undergoing care in selected medical facilities in 1974 (Source: compiled on the basis of archival data of doctor Jolanta Wadowska-Król) Explanations: The category "Children in hospital" includes data on the number of children in hospital in Sosnowiec from Konna Street and Gen. J. Haller Street – there were 6 and 8 patients respectively

Table 1. Characteristics of the number of children examined who lived in the vicinity of the Non-Ferrous Metal Works "Szopienice" in 1974 [persons] (Source: a field survey conducted by Dr. Jolanta Wadowska-Król in the fourth quarter of 1974)

Street*	Children on lists	The number of examinations	Temporarily left – not examined	
			Total	In sanatorium
Hilary Krzysztofiak square	73	73	0	0
Gen. J. Haller	93	91	3	1
Konna	51	50	1	1
Wandy	47	47	0	0
Westerplatte Defenders	115	106	9	4
Total	379	367	13	6

* Explanations: Contemporary street names (as of 6 May 2025). Street name changes between 1974 and 2025: ul. Rzemieślnicza → Hilary Krzysztofiak square, ul. Zjednoczenia Partii → ul. Gen. Józef Haller, ul. A. Makarenki → ul. Konna

3. Medical geography in Poland

Medical geography in Poland, also known as health geography, social medical geography, geomedicine, epidemiological geography and health demography, is a scientific subdiscipline that continues to develop and refine its tasks and research directions.

In Poland, the definition of medical geography, focusing on its practical significance and linking its creation to colonialism, was formulated by Krzywicki. The main area of interest in medical geography is the impact of climate, nutrition and geological structure on the human body, as well as the resistance of different human races to disease (KRZYWICKI, 1959). According to Góra, research into the impact of the geographical environment on the health of the population, conducted by non-geographers, can be referred to as the geography of disease (GÓRA, 2020: 138–149). After World War II, the participation of geographers in this scientific discipline slowly increased. At the turn of the 1950s and 1960s, as well as the 1980s and 1990s, there was a noticeable increase in the intensity of research in this field. Medical geography in Poland did not develop evenly (ŁĘCKA, 2004). At the turn of the 20th and 21st centuries, geographers began to take a greater interest in health issues. The work *Research issues of medical geography – the contemporary situation and prospects* (MAZURKIEWICZ & WRÓBEL, 1990) was significant for the development of medical geography in Poland. It contains definitions of medical geography, specifies its research tasks and future directions of development. The authors identified two main research approaches in medical geography: ecological, which aims to describe the distribution of diseases (mainly chronic, non-communicable) in relation to natural environmental conditions, and social, which focuses on the spatial organisation of health services, the characteristics of the population served by this system, and the issue of optimising its territorial structure. It should be added that Mazurkiewicz defined research tasks and defined medical geography as the science of "environmental determinants of human health, dealing with research on the spatial distribution of demand for health services; spatial morbidity of the population in relation to the use of medical services, and the optimal distribution of the health service network based on the identified spatial demand for these services" (MAZURKIEWICZ, 1993: 281). The relationships and connections between environmental pollution and the health of the Polish population,

especially with regard to the ecological and spatial variation of cancer and cardiovascular diseases in Poland, are reflected in the works of, among others, ANDRYSZKA (1990). The complex issue of the relationship between quality of life and health is presented by SĘK (1993), who focuses on the relationship between health and quality of life. Works on the geography of disease can be divided into those that examine the impact of the environment on the health status of the population and those that focus on the diversification of the health status of the population. In the first case, we refer to the impact of the natural environment, with varying degrees of degradation, on the health of the population. This topic has been explored in depth (PONIŻY, 2006; GÓRA, 2020: 138–149). Other publications concern the impact of the social environment and infrastructure on the health situation of the population (MAZURKIEWICZ, 1993; PANTYLEY, 2008; KRETOWICZ, 2010). Several publications have been published focusing on the impact of the natural and social environment on the health of the population, including certain aspects of human biological pathology as a consequence of the degradation of the ecological value of industrial districts, certain aspects of human ecology, and an analysis of structural changes in the human geographical environment as a result of industrial impact, with particular emphasis on elements of nosogeography (GÓRA 2020, 138–149; ZEMŁA ET AL., 1992; MICHAŁSKI, 2010). A separate group of studies, described in detail in scientific works, are those concerning the perception of environmental threats in the context of the perception of one's own health (DUŚ, 1993; MAGDA-ŻABIŃSKA, 1997). Among contemporary researchers addressing issues of medical geography in Poland, T. Michalski, I. Łęcka, and K. Magda-Żabińska should be mentioned (SĘK, 1993).

4. Results

Primarily, from the interviews, it is evident that the residents of Szopienice became aware of the lead poisoning issue only when they realized that children were also becoming sick (WADOWSKA-KRÓL & SADZIKOWSKA, 2021; PRZYBYLSKI, 1981). Among the factory workers, significantly elevated levels of lead in the blood and disturbing disease symptoms were noted. Individuals with such symptoms were moved to other plant departments, dealing, for example, with cadmium processing every few months.

The shocking revelation for the Szopienice community was that children were also falling ill. As the respondents repeated, "people found out about the issue from each other. Some believed it was true, while others thought it was an 'inflated balloon' harming the foundry and its workers" [materials available in the author's private archive]. One of the interviewees honestly admitted that he learned about lead poisoning not from an official source, "only secretly. And that's how it spread around the foundry. I was told: if you have the opportunity, move out of Szopienice quickly with a small child." Michał Jędryka, the author of the autobiographical report "Lead Children: The Forgotten Epidemic," attempted to tell the story, as he called it, of the "Polish Chernobyl" (JĘDRYKA, 2020). Both the interviews conducted during the study and non-fictional forms of conveying the history of lead poisoning in Szopienice children show that the threats associated with exposure to heavy metals in the immediate human environment were not a past but still a current and widespread problem, described for years not only in professional literature for a professional audience.

Chronic exposure to lead, even at low concentrations results in irreversible damage to the central nervous system in children, a decrease in IQ, learning difficulties, behavioral disorders and concentration problems, additionally it may lead to speech and hearing disorders (SHETTY ET AL., 2023; ZHENG, ET AL., 2023; WHO, 2023).

The study involved 30 respondents (Table 2), with women (7 with lead poisoning and four relatives of patients) constituting 37% of the group. Those aged 65–75 accounted for 13%, while the majority fell in the 44–64 age group (87%).

Table 2. Division by age and gender of respondents

Gender	Age range	
	45–64	65–70
Female patient	7	3
Male patient	16	0
Female relative of the patient	1	3
Male relative of the patient	0	0

All respondents indicated Katowice as their place of residence (a city with over 280,000 inhabitants). According to 1/4 of the respondents (26%), their current health problems are related to saturnism, as explained to one respondent by a medical intern during a medical interview, who concluded that it is a fatal disease.

In the conducted study, the awareness of respondents regarding the knowledge of the Szopienice community in the 1970s about the effects of lead poisoning was analyzed. No statistically significant dependencies were found between the gender and age of the respondents and the answers provided by them. The knowledge of the participants can be described as limited. During the study, it was observed that respondents represented various attitudes, from cautious distance and friendliness, through understanding, to a willingness to help reconstruct the history, experiences, and events. Some interlocutors revealed a strong need for conversation, sometimes on various topics not always directly related to the study. There were also those who expected medical advice and suggestions on proceeding with official, legal, and medical matters.

Not all respondents willingly shared their stories; some individuals felt no ethical or moral need to discuss their experiences. Several started the meeting by declaring, "I don't remember anything," although this statement did not find confirmation in the facts during the study. People in the group studied can be characterized as reserved, introverted, cautious, distant, and unresponsive to the interest shown to them due to their illness, but also warm and willing to help in reaching other former patients, reconstructing events from the 1970s, and outlining the health consequences of exposure to lead. The readiness of these people to talk did not arise from their need to leave a private history for posterity or from an awareness that they must testify to events that cast a shadow over the future life of the respondents, the existence of those suffering from lead poisoning, but precisely from the innate kindness of these individuals and a kind of wonder that someone's attention may focus on issues such as the length of stay of respondents in a sanatorium or hospital, the concentration of lead in their blood, potential compensation from the foundry, and sanitary and local conditions in the occupied tenement.

Almost all respondents (95%) believed that Szopienice Non-Ferrous Metals Foundry was a source of pollution. Similarly, nearly all (90%) claimed that in the past, they could not counteract negative factors and thus take care of their health and life situation. Only one family, where the mother took decisive steps, including legal action against the foundry's management, seemed convinced of their agency. Over 2/3 of the respondents admitted that they do not know what health consequences lead poisoning may have. However, respondents

mentioned coping with respiratory and nervous system disorders, consequences of immune system damage, and allergies. Some responses vividly described the self-assessment of the health status of the respondents. One respondent stated: "Honestly, I'm in pain all the time. I have terrible problems with my legs. I recently had tests – foot ultrasound. The doctor said I don't have any bones that would be similar to bones. There are growths on all the ones that are deformed. My joints are dislocated. My bones crack, and I wake up at night in pain. Pain, pain, and pain. I also have problems with my pancreas, and I have a stone in my gallbladder. A month ago, I ended up in the hospital with severe pain." It seems that the lead poisoning of the respondents occurred directly or partially as a result of exposure to environmental factors. Knowledge about the types of diseases and disorders caused by high lead levels in the blood substantiates such a claim.

The awareness that the effects of exposure to harmful environmental factors occur after a long time was limited among respondents. In the opinion of most former children with lead poisoning, their current health problems are not unequivocally linked to childhood exposure to environmental factors, i.e., lead poisoning. Only one respondent claimed that his diseases fall into the category of diseases with a postulated connection to exposure to environmental factors. Two mothers of affected children linked the current health status of their offspring to the consequences of environmental exposure; one woman's daughter suffers from bronchial asthma and allergies, while the youngest son of the other woman struggles with health issues and diseases that doctors consider in the context of the consequences of his exposure to environmental factors. The sudden deterioration in the health of the eldest son of this woman, who died in Germany at the age of 57, was initially not associated with the consequences of lead poisoning in childhood and the possibility of toxic damage to parenchymal organs. The respondent, the mother of the child with lead poisoning, reported, "He died in Germany. His legs and kidneys attacked him. Doctors in Germany didn't know why he was so sick; they couldn't diagnose him. He died in 2017 at the age of 57. At that time, no one thought about lead poisoning, and it didn't occur to me that it might be the result of it." A cursory review of the registry of diseases and ailments complained of by respondents, and their comparison with the catalogue of categories of environmental disorders, ensures that the consequences of environmental diseases are

not limited only to allergies; the only consequences mentioned by the respondents due to lead poisoning.

Respondents were far from thinking in a cause-and-effect manner; that is, they did not seek the sources of their current situation in the past in suffering from lead poisoning. For the respondents, but also probably for the majority they represent, the disease experienced in childhood has nothing to do with their current life situation. The childhood stage of life is definitively closed in their assessment, and the individuals who participated in the study do not build a bridge between what happened yesterday and what is happening today.

The attitude of respondents towards the challenges of environmental medicine can be described as positive. As many as 75.5% of respondents declared that if they had the opportunity to undergo preventive or control examinations, they would decide to do so.

It is concerning that fewer than half of the respondents could name at least one complication after having lead poisoning, and about 60% admitted that they do not know the long-term effects of this disease. Due to the high practical significance of knowledge about the consequences of environmental diseases, this issue should be included in the planning of public health education (more broadly, prevention of post-industrial diseases in heavily industrialized areas).

Society, as revealed by pilot studies, has little knowledge about the effects of environmental factors on human health. Therefore, education on factors that increase the risk of the most common environmental diseases is necessary. Respondents displayed positive attitudes towards medical diagnostics and health prevention. It can be assumed that expanding the knowledge of respondents in this area will translate into increased comfort and quality of their lives. Consequently, it will allow for the reduction of complications of diseases and lower the mortality threshold among those who suffered from lead poisoning in childhood.

5. Discussion

In recent decades, due to significant economic and systemic changes, the emission of heavy metals into the environment in the Szopienice area has been reduced. However, as in other post-industrial sites, the concentrations of these metals, especially in soil, remain significantly elevated, due to the tendency of soil to accumulate metal compounds (BRIFFA ET AL., 2020; WIECZOREK ET AL., 2020). The socio-economic

issues faced by the Szopienice community stem from the economic transformation that took place in the 1990s, which was associated with the liquidation of large industrial plants. Environmental medicine is confronted with significant challenges (PHILLIPS, 2000; BAGHERI, 2009; CASAS ET AL., 2010; ARPEY, 2017). According to literature sources, environmental factors are responsible for up to 23% of deaths worldwide and 22% of disability-adjusted life years (DALYs) lost by the global population due to premature death or disability. Due to their persistence, bioaccumulation potential, and toxic and carcinogenic effects, heavy metals especially lead represent a serious global health threat, with children being particularly vulnerable (BOISA, 2013; NIEĆ ET AL., 2013; KICIŃSKA ET AL., 2018; MOSKALENKO ET AL., 2020). It is estimated that up to 26% of all deaths among children under the age of five could be prevented by eliminating all environmental hazards. The theses formulated and the research results obtained on the basis of the Szopienice case, an unprecedented and peculiar case of lead poisoning that occurred in Poland and even in Europe in the second half of the 20th century, are still not thoroughly developed. The case of Szopienice is exceptional for several reasons. First and foremost, it involves a unique, well-preserved source material that forms the basis for the research material that has not survived in any other analogous cases. Subsequent research and scientific findings (DZIUBANEK ET AL., 2025) refer to medical, geological, sociological results (NAWROCKI, 2024). Yet they are effectively not implementing any scheme for extending monitoring of lead concentration in blood, which is crucial for understanding the current prevalence and severity of lead exposure, especially among children in environments that have been contaminated with heavy metals for decades. In research articles, it is emphasised that the public health policy should aim at monitoring the current exposure of the local population to lead and educating it on effective preventive methods to minimise the risk for environmental health. I believe that an in-depth assessment and analysis should be carried out for each local environment, using medical geography and knowledge of the history of medicine and the history of industrial development in a given area, and that the community should be divided into two groups: those who have suffered from post-industrial diseases in the past (as in the case of former patients suffering from lead poisoning) and those who live in a heavily contaminated post-industrial

area but have not suffered from lead poisoning. For the first group, it is crucial not only to monitor but also to develop a prevention program that encompasses legal, social, medical, and societal aspects (KOLLMORGEN, 2013; PIEKUT 2019). It appears that local authorities should be responsible for developing and implementing such measures. For the first and second groups, targeted efforts should be made to provide comprehensive education not only on effective preventive measures to reduce heavy metal exposure but, above all, to inform and empower populations that are marginalized and unaware of the health consequences associated with such exposure (MARAMBA ET AL., 2006). It is important to remember about the ageing process of this group and the effects of the process in European post-communist countries (DARÓCZI, 2007; KÁČERKOVÁ ET AL., 2015; MICHALSKI ET AL., 2021). While many researchers emphasise the discourse surrounding post-industrial heritage, they often overlook that this legacy, though significant in interpreting socio-economic and environmental transformations, is not the primary or dominant element (ODOJ, 2014: 210–222; GOLINOWSKA, 2021). The admiration for selected post-industrial sites is justified, but it should be remembered that the tangible and intangible legacy of these places also includes areas where the soil is heavily contaminated with heavy metals. The everyday reality of residents in these regions is not only about tracing a continuum between the extractivism of the late 19th and early 20th centuries and today's environmental devastation, manifesting as climate change or socio-geographical shifts. It is also, and perhaps most importantly, about existing in a state marked by danger, toxicity, and long-term epistemological transformations (MILLER, 2021). Heavy metal contamination of the local environment is a source of exposure for a large population (GÓRALCZYK ET AL., 2018; MATHIARASAN ET AL., 2021) and future generations. The groups most at risk to their health in society are children and residents with the lowest socio-economic status.

6. Conclusions

The aim of this study was to determine whether selected living representatives of the group that suffered from lead poisoning in the 1970s, as well as their family members, were aware that the health effects of exposure to harmful environmental factors occurred after a long period. During pilot field research, an attempt was made to gather information

that would enable an assessment of the community's knowledge of basic environmental medicine tasks. Special attention was paid to the attitudes of the selected group (those with lead poisoning in the 1970s in Szopienice) towards lead poisoning. The results of the study allowed us to determine at least a few conclusions. Firstly, the respondents demonstrate limited knowledge regarding diseases and health disorders resulting from environmental risk factors, with lead exposure being the most prominent among them. In the Szopienice area, health risk groups and disease outbreaks caused by environmental factors are known and well-recognized in the doctors' community. They are based on epidemiological analysis or direct medical examinations of the population. Residents have limited knowledge about health risk groups and do not demonstrate conscious attitudes to counteract environmental diseases. It is recommended and advisable to implement short- and long-term health education plans, especially those designed for post-industrial areas. In minimising the impact of environmental hazards on the health of children and adolescents, cooperation between local authorities, environmental protection institutions, and ecological organizations appears to be essential, particularly in developing policies for health promotion and environmental protection in post-industrial areas, such as Szopienice or Miasteczko Śląskie. The attitudes and knowledge of the Szopienice community regarding the effects of lead poisoning in the 1970s serve as an interesting case study, as they confirm that the consequences of heavy metal contamination are not solely an environmental issue, but they are also long-term and burdensome in social and health contexts.

Founding

Funded by the National Science Centre, Poland under the OPUS call in the Weave programme UMO-2023/51/1/HS2/01809.

References

- Andrzejczyk C. 1990. Zróżnicowanie przestrzenne sytuacji zdrowotnej kraju. *Resortowy program badawczo-rozwojowy RPBR MZ. IV. Optymalizacja opieki zdrowotnej i społecznej*. Akademia Medyczna w Łodzi, Łódź.
- Arpey N.C., Gaglioni A.H., Rosenbaum M.E. 2017. How Socioeconomic Status Affects Patient Perceptions of Health Care: A Qualitative Study. *Journal of Primary Care and Community Health*, 8, 3: 169–175.
- Bagheri N., Holt A., Benwell G.L. 2009. Using Geographically Weighted Regression to Validate Approaches for Modelling Accessibility to Primary Health Care. *Applied Spatial Analysis and Policy*, 2: 177–194.
- Baranyai N., Lux G. 2015. Upper Silesia: The revival of a traditional industrial region in Poland. *Regional Statistics*, 4, 2: 126–144.
- Boisa N. 2013. *Bioaccessibility of Potentially Harmful Elements (PHEs) from Environmental Matrices and Implications for Human Health*. Doctoral Dissertation, Northumbria University, London.
- Briffa J., Sinagra E., Blundell R. 2020. Heavy metal pollution in the environment and their toxicological effects on humans. *Heliyon*, 6, 9: e04691.
- Casas I., Delmelle E., Varela A. 2010. A Space-Time Approach to Diffusion of Health Service Provision Information. *International Regional Science Review*, 33, 2: 134–156.
- Central Statistical Office. 2022. *Śląskie Voivodship in figures 2022*. Urząd Statystyczny w Katowicach, Katowice.
- Chojnacka-Kuraś M. (ed.) 2019. *Medycyna narracyjna. Opowieści o doświadczeniu choroby w perspektywie medycznej i humanistycznej*. Wydawnictwo Uniwersytetu Warszawskiego, Warszawa.
- Comber A.J., Brunsdon C., Radburn, R. 2011. A spatial analysis of variations in health access: linking geography, socio-economic status and access perceptions. *International Journal of Health Geographics*, 10: 44.
- Daróczy E. 2007. Ageing and health in the transition countries of Europe – the case of Hungary. *Working Papers on Population, Family and Welfare Demographic Research Institute Hungarian Central Statistical Office*, 9.
- Dauksza A. 2021. Humanistyka medyczna: o leczeniu (się) w patosystemie. *Teksty Drugie*, 1: 38–58.
- Dulias R. 2018. *Geografia fizyczna Wyżyny Śląskiej*. Wydawnictwo Uniwersytetu Śląskiego, Katowice.
- Duś E. 1993. Negatywne skutki przekształcenia środowiska geograficznego w świadomości mieszkańców wybranych obszarów w Polsce. *Sborník referátů 10. Severnomoravského Demografického Kolokwia. Mezinárodní kolokvium kotázám demografického vývoje frýdecko-místeckého okresu a euroregionu Szlesko*. Okresní Úřadve Frýdku-Místku, Frýdek-Místek: 280–285.
- Duś E., Magda-Żabińska K. 1992. The awareness of the inhabitants of the Upper Silesian industrial region of environmental pollution problems. [in:] P. Migula, T. Sławek (eds), *Proceedings of the international conference "Determinants of ecological awareness in various scientific disciplines"*. University of Silesia Centre of Human and Environmental Studies, Katowice: 75–79.
- Dziadul J., Chrobak H. 1983. Zamknąć fabrykę. Rozmowa z inż. Henrykiem Chrobakiem, Okręgowym Inspektorem Pracy w Katowicach. *Tak i Nie. Tygodnik społeczno-kulturalny*, 18: 5.
- Dziubanek G., Baranowska R., Oleksiuk K. 2012. Heavy metals in the soils of Upper Silesia - A problem from the past or a present hazard? *Journal of Ecology and Health*, 16, 4: 169–176.
- Dziubanek G., Furman J., Rogala D., Gut-Pietrasz K., Cwiągł-Drabek M., Rusin M., Domagalska J., Piekut A., Baranowska R., Niesler A. et al. 2025. Health Risk for Non-Dietary Children's Exposure to Heavy Metals in Postindustrial Areas in Upper Silesia, Poland. *Toxics*, 13, 5: 377.
- EEA. 2024. *European Union emission inventory report 1990–2022 – UNECE Convention on Long-range Transboundary Air Pollution (the Air Convention)*. EEA Report 08/2024, European Environment Agency, Copenhagen.

- Farr A.C., Ames N. 2008. Using diffusion of innovation theory to encourage the development of a children's health collaborative: A formative evaluation. *Journal of Health Communications*, 13, 3: 75–88.
- Fosu G.B. 1989. Access to health care in urban areas of developing societies. *Journal of Health and Social Behavior*, 30: 398–411.
- Framework of Analysis for Atrocity Crimes – A tool for prevention*. 2014. United Nations.
- Godzik S., Szdzuj J., Poborski P. 1993. Environmental pollution in south Poland. Sources and effects. *Folia Medica Cracoviensis*, 34, 1–4: 9–18.
- Golinowska K. 2021. *Paradoksy dziedzictwa. Postindustrialne przestrzenie w optyce kulturoznawczej*. Wydawnictwo Nauk Społecznych i Humanistycznych UAM, Poznań.
- Góra D. 2020. Pojęcie, przedmiot i zadania geografii medycznej ze szczególnym uwzględnieniem Polski i Ukrainy. *Annales Universitatis Paedagogicae Cracoviensis. Studia Geographica*, 15: 138–149.
- Góralczyk M., Panasiuk E., Przybyła M. 2018. *Śląskie Voivodship statistically. History and Present*. Central Statistical Office in Katowice, Katowice, Poland.
- Gryglewicz E. 1946. Zagadnienie profilaktyki ołowicy zawodowej w śląsko-dąbrowskim hutnictwie cynkowym i ołowiowym – wskazania na przyszłość. *Śląska Gazeta Lekarska*, 6: 317–320.
- Grzegorek G., Fruzyński A., Rygus P. 2017. *Kopalnie i huty Katowic*. Wydawnictwo Prasa i Książka, Katowice.
- Guagliardo M.F. 2004. Spatial accessibility of primary care: Concepts, methods and challenges. *International Journal of Health Geographics*, 3: 1–13.
- Hager-Matecka B., Sroczyńska M., Sychłowy A., Sońta-Jakimczyk D., Dziuba P., Król J. 1977. Przewlekła ołowica u rodzeństwa z mukopolisacharydozą Sanfilippo. *Pediatrica Polska*, 6: 659–663.
- Jedynak Z. 2006. Dzieje hutnictwa na terenie Katowic do połowy XIX wieku. [in:] A. Barciak (ed.) *Katowice w minionej rzeczywistości. Katowice w 140 rocznicę uzyskania praw miejskich*. Societas Scientiarum Favendis Silesiae Superioris – Instytut Górnośląski, Urząd Miasta Katowic, Muzeum Historii Katowic, Katowice.
- Jędryka M. 2020. *Ołowiane dzieci. Zapomniana epidemia*. Wydawnictwo Krytyki Politycznej, Warszawa.
- Káčerková M., Ondačková J. 2015. The process of population ageing in countries of the Visegrad Group (V4). *Erdkunde*, 69, 1: 49–68.
- Karczewska K. 2016. Profesor zw. dr hab. n. med. dr h.c. Śląskiej Akademii Medycznej Bożena Hager-Matecka. *Pediatrica Polska*, 91: 392–394.
- Kearns R. 1993. Place and health: towards a reformed medical geography. *The Professional Geographer*, 45, 2: 139–147.
- Kicińska A., Bożęcki P. 2018. Metals and Mineral Phases of Dusts Collected in Different Urban Parks of Krakow and Their Impact on the Health of City Residents. *Environmental Geochemistry and Health*, 40, 1: 473–488.
- Kollmorgen R. 2013. Theories of postcommunist transformation. Approaches, debates, and problems of theory building in the second decade of research. *Studies of Transition States and Societies*, 5, 2: 88–105.
- Kretowicz P. 2010. The influence of socio-economic factors upon public health on the example of Podkarpackie Voivodeship. *Bulletin of Geography. Socio-Economic Series*, 14: 63–78.
- Krzysztofik R., Boroń P., Dragan W., Grudniewski J. 2024. Shaping a model of transformation in a huge centre of zinc and lead smelting: case study of Szopienice district in the city of Katowice (Poland). *Bulletin of Geography. Socio-economic Series*, 63: 17–32.
- Krzywicki L. 1959. *Geografia medyczna, jej znaczenie i powstanie. Dzieła. T. 3. Artykuły i rozprawy 1886–1888*. PWN, Warszawa: 339–350.
- Łęcka I. 2004. *Powolny rozwój geografii medycznej*. Wydawnictwo Uniwersytetu Marii Curie-Skłodowskiej, Lublin.
- Magda-Żabińska K. 1997. *Zróźnicowanie przestrzenne świadomości zagrożeń dla zdrowia mieszkańców wybranych miast województwa katowickiego*. Wydawnictwo Uniwersytetu Śląskiego, Katowice.
- Maramba N.P., Reyes J.P., Francisco-Rivera A.T., Panganiban L.C., Dioquino C., Dando N., Timbang R., Akagi H., Castillo M.T., Quitarano C., Afuang M., Matsuyama A., Eguchi T., Fuchigami Y. 2006. Environmental and human exposure assessment monitoring of communities near an abandoned mercury mine in the Philippines: a toxic legacy. *Journal of Environmental Management*, 81, 2: 135–145.
- Mathiarasan S., Hüls A. 2021. Impact of Environmental Injustice on Children's Health – Interaction between Air Pollution and Socioeconomic Status. *International Journal of Environmental Research and Public Health*, 18, 2: 795.
- Mazurkiewicz L. 1993. Uwarunkowania niektórych chorób na obszarze województwa stołecznego. *Przegląd Geograficzny*, 65, 3–4: 279–287.
- Mazurkiewicz L., Wróbel A. 1990. *Przestrzenne problemy zdrowotności. Materiały konferencyjne*. Instytut Geografii i Przestrzennego Zagospodarowania PAN, Warszawa.
- Michalski T. 2010. *Sytuacja zdrowotna w europejskich krajach postkomunistycznych w dobie transformacji*. Wydawnictwo Uniwersytetu Gdańskiego, Gdańsk.
- Michalski T. 2018. History and main research currents in Polish medical geography. *Quaestiones Geographicae*, 37, 2: 27–37.
- Michalski T., Stępień J. 2021. Ageing in European post-communist countries – is it a threat to the welfare system? *Environmental & Socio-economic Studies*, 9, 2: 63–71.
- Miller C.E. 2021. *Extraction Ecologies and the Literature of the Long Exhaustion*. Princeton University Press, Princeton & Oxford.
- Mohan G., Mohan J. 2002. Placing social capital. *Progress in Human Geography*, 26, 2: 91–210.
- Moskalenko O., Marchwińska-Wyrwał E., Piekut A., Gut K., Ćwieląg-Drabek M. 2020. Lead in human teeth dentine as a bio-indicator of environmental exposure to lead. *Medycyna Środowiskowa*, 23, 1–4: 33–38.
- Nawrocki T. 2024. "It Was Normal": Environmental Contamination in the Collective Memory of the Inhabitants of Szopienice. *Polish Sociological Review*, 225, 1: 49–68.
- Nieć J., Baranowska R., Dziubanek G., Rogala D. 2013. Narażenie środowiskowe dzieci na metale ciężkie zawarte w glebach z placów zabaw, boisk, piaskownic i terenów przedszkoli z obszaru Górnego Śląska. *Journal of Ecology and Health*, 17, 2: 55–62.
- Norska-Borówka I. 1994. Pediatric problems in Upper Silesia-region of ecological disaster. *Toxicology Letters*, 72, 1–3: 219–225.
- Ochodek S. (ed.). 1998. *Szopienice wczoraj i dziś*. Fundacja „PRO-EKO Szopienice”, Katowice.

- Odoj G. 2014. Postindustrialne dziedzictwo kultury materialnej w procesie rewitalizacji (na przykładzie górnośląskich osiedli patronackich). *Studia Etnologiczne i Antropologiczne*, 14: 210–222.
- Pantyley V. 2008. Kierunki badań w geografii medycznej w Polsce i na Ukrainie. *Annales Universitatis Mariae Curie-Skłodowska*, vol. LXIII, 15: 257–271.
- Pelc W., Pawlas N., Dobrakowski M., Kasperczyk S. 2016. Environmental and socioeconomic factors contributing to elevated blood lead levels in children from an industrial area of Upper Silesia. *Environmental Toxicology and Chemistry*, 35, 10: 2597–2603.
- Phillips R.L. Jr., Kinman E.L., Schnitzer P.G., Lindbloom E.J., Ewigman B. 2000. Using geographic information systems to understand health care access. *Archives of Family Medicine*, 9: 971–978.
- Piekut A., Gut K., Ćwieląg-Drabek M., Domagalska J., Marchwińska-Wyrwał E. 2019. The relationship between children's nonnutrient exposure to cadmium, lead and zinc and the location of recreational areas - Based on the Upper Silesia region case (Poland). *Chemosphere*, 223: 544–550.
- Poniży L. 2006. Jakość środowiska przyrodniczego w aspekcie zachorowalności na wybrane choroby cywilizacyjne. *Regionalne Studia Ekologiczno-Krajobrazowe, Problemy Ekologii Krajobrazu*, 16/2, 361–373.
- Porzuczek S. 2020. *Mapowanie bólu. Lektura, spojrzenie, afekt*. Universitas, Kraków.
- Prüss-Üstün A., Mathers C., Corvalán C., Woodward A. 2003. *Assessing the environmental burden of disease at national and local levels: introduction and methods*. World Health Organization (Environmental Burden of Disease Series No. 1), Geneva.
- Przybylski T. 1981. Wyrok z terminem odroczenia. *Echo*, 17(1291): 5.
- Sadzikowska L. 2023. Jolanta Wadowska-Król (27 czerwca 1939–18 czerwca 2023). Niepokorna Matka Boska Szopienicka z familoków. *Environmental Medicine*, 26(3–4): 2024.
- Sęk H. 1993. Jakość życia a zdrowie. *Ruch Prawniczy, Ekonomiczny i Socjologiczny* z. 2.
- Shetty S.S., Sonkusare S., Naik P.B., Madhyastha H. 2023. Environmental pollutants and their effects on human health. *Heliyon*, 9: e19496.
- Spychała A., Klita W., Gut K. 2019. Narażenie pozażywnościowe dzieci i młodzieży na metale ciężkie zawarte w glebach terenu rekreacyjnego województwa śląskiego – Księża Góra w Radzionkowie. *Medycyna Środowiskowa*, 22, 3–4: 65–70.
- Strengthening Health Systems to Reduce Lead Exposure*. 2025. <https://reduceleadexposure.org/reports-and-publications/> [Access 12.06.2025].
- Wadowska-Król J., Sadzikowska L. 2021. „Po prostu pracowałam”. Z Jolantą Wadowską-Król rozmawia Lucyna Sadzikowska. *Narracje O Zagładzie*, special issue. University of Silesia Publishing House, Katowice, Poland: 17–40.
- WHO. 2019. *Environmental Health Inequalities in Europe. Second Assessment Report*. World Health Organization, Regional Office for Europe.
- WHO. 2023. *Exposure to Lead: A Major Public Health Concern. Preventing Disease Through Healthy Environments*. World Health Organization: Geneva, Switzerland.
- Wieczorek K., Turek A., Szczesio M., Wolf W.M. 2020. Comprehensive evaluation of metal pollution in urban soils of a post-industrial city. A case of Łódź, Poland. *Molecules*, 25, 18: 4350.
- Zartarian V.G., Xue J., Gibb-Snyder E., Frank J.J., Tornero-Velez R., Stanek L.W. 2023. Children's lead exposure in the U.S.: Application of a national-scale, probabilistic aggregate model with a focus on residential soil and dust lead (Pb) scenarios. *The Science of The Total Environment*, 905, 5: 167132.
- Zemła B., Zielonka I., Skalska-Vorbrodt J., Wołosza Z., Banasik R. 1992. Rak płuca wśród autochtonów i migrantów Górnego Śląska a palenie tytoniu, narażenia w mikro-środowiskach pracy i zanieczyszczenia atmosfery. *Wiadomości Lekarskie*, 45, 9–10: 349–353.
- Zheng K., Zeng Z., Tian Q., Huang J., Zhong Q., Huo X. 2023. Epidemiological evidence for the effect of environmental heavy metal exposure on the immune system in children. *The Science of The Total Environment*, 868: 161691.