

Electrolysis: Electrolysis is a process that uses electricity to kill bacteria and other harmful microorganisms in water. Electrolysis is a safe and effective method of disinfection, but it is not as common as chlorination or UV irradiation.

The choice of water disinfection method in Belarus depends on a number of factors: the quality of the water source, the cost of the method, and the level of disinfection required [2].

In Syria, chlorination is mostly used due to the limited resources. The choice of water disinfection method in Syria depends on a number of factors, including the quality of the water source, the cost of the method, and the level of disinfection required. In addition to these methods, there are a number of other things that are being done to improve water quality in Syria. These include: repairing damaged water infrastructure, protecting water sources from contamination, raising awareness about the importance of safe water hygiene practices [3].

Despite these efforts, the water crisis in Syria remains a serious problem. Millions of people still lack access to clean water, and waterborne diseases are a major public health threat. More needs to be done to address this crisis and ensure that all Syrians have access to safe water.

A comparison of water-disinfecting methods in Syria and Belarus reveals that Belarus generally has more effective practices in place. This is due to the country's better-developed water infrastructure and its use of more advanced disinfection methods. However, both countries face challenges in ensuring the safety of their drinking water supplies.

Conclusion

Water disinfection is an essential tool for preventing waterborne diseases and improving public health. In Syria and Belarus, there is a need to invest in infrastructure, strengthen governance, and promote community-based programs to improve water disinfection practices. With international assistance and a focus on innovation, these countries can make significant progress in ensuring that their citizens have access to safe drinking water.

LITERATURE

1. Water disinfection // CDC yellow book 2024 mode of access – <https://wwwnc.cdc.gov/travel/yellowbook/2024/preparing/water-disinfection>. – Date of access: March.02.2024
2. Development of water infrastructure in Syria / ACSAD . mode of access The Syrian Ministry of Water Resources and ACSAD/ cooperation | ACSAD.ORG. – Date of access March.02.2024
3. Water, sanitation and hygiene // UNICEF . mode of access <https://www.unicef.org/syria/water-sanitation-and-hygiene> – Date of access March.02.2024 .
4. Belarus summer report / UNECE mode oof access https://unece.org/sites/default/files/2022-06/Belarus_summary_report_5th_cycle_20Apr22_ENG.pdf – Date of access March.02.2024 .

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PREVALENCE OF AIR POLLUTION AND ITS IMPACT ON HUMAN HEALTH

Introduction

Air pollution, a complex mixture of particulate matter, gases, and biological molecules, presents a significant threat to public health and the environment. The World Health Organization (WHO) has identified air pollution as a critical risk factor for a range of diseases, including respiratory infections, heart disease, stroke, and lung cancer [1]. Recent studies have further elucidated the profound impact of air pollutants on human health.

For instance, research from the Harvard T.H. Chan School of Public Health has revealed that long-term exposure to fine particulate matter not only exacerbates the incidence of hospitalisation for Alzheimer’s disease but also accelerates its progression [2]. The US Environmental Protection Agency (EPA) emphasises the heightened vulnerability of certain populations, such as children, the elderly, and those with pre-existing health conditions, to the deleterious effects of air pollution [3]. The WHO also highlights the near-universal exposure to air pollution, with 99% of the global population breathing air that exceeds its guideline limits, leading to about 7 million premature deaths annually. This underscores the urgent need for comprehensive strategies to mitigate air pollution and safeguard public health. In light of these findings, it is imperative to understand the sources of air pollution, its mechanisms of action, and the policies that can effectively reduce exposure. By synthesizing evidence from recent studies and WHO reports, we can gain a clearer picture of the challenges posed by air pollution and the steps necessary to address this pervasive health threat.

Goal

This study is dedicated to a thorough examination of air pollution’s historical and potential health impacts, the relationship between pollution levels and health, aiming to clarify pollutants’ direct and indirect effects. The project also anticipates future air pollution trends and their health consequences, offering insights for environmental and health policy development.

Material and methods of research

The research methodically assesses air pollution’s health effects by analysing data and studies, using statistics to find trends. Reviews of literature and policies place our findings in context, while GIS mapping shows pollution’s effects, informing our mitigation recommendations. This method helps us understand and address air pollution’s health risks.

The results of the research and their discussion

The escalation of air pollution, fuelled by industrial activities, transportation, and agricultural practices, has led to significant health and environmental challenges [3]. Microscopic pollutants can infiltrate our respiratory and circulatory systems, harming our lungs, heart, and brain. The health implications are extensive, ranging from respiratory and cardiovascular diseases to cancer, with acute effects resulting in increased hospitalizations for a variety of conditions. Long-term exposure weakens the immune system, heightening susceptibility to infections and chronic diseases. The environmental impacts are just as critical, contributing to climate change, acid rain, and biodiversity loss [4]. This complex issue necessitates a multifaceted approach, including policy reform, technological innovation, and public education, to protect vulnerable populations and address the far-reaching consequences of air pollution. The need for ongoing research and strategic public health measures is imperative to mitigate these effects and ensure the well-being of communities in high-pollution areas (figure 1, 2) [4, 5].

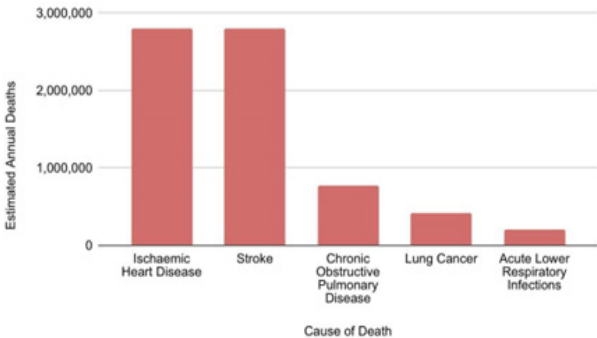


Figure 1 – Causes of Death due to Air Pollution

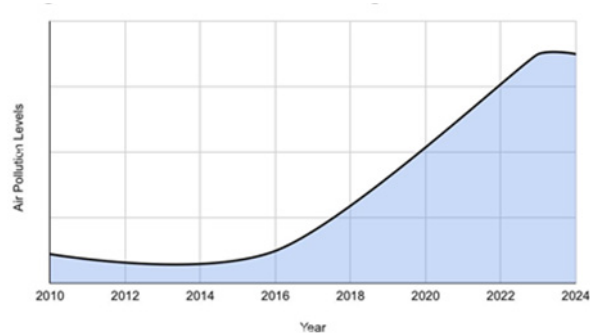


Figure 2 – Air Pollution Levels throughout the Decade

The Environmental Protection Agency (EPA) of the United States has documented in its “Our Nation’s Air” report for the year 2021 a notable enhancement in the nation’s air quality, tracing back to the 1970s. This period has witnessed a significant abatement in key atmospheric contaminants, evidenced by a 73% reduction in Carbon Monoxide (CO) and a 91% diminution in Sulfur Dioxide (SO₂) since 1990. Despite these strides, the report concedes that phenomena such as wildfires and dust storms, compounded by the effects of climate change, present ongoing challenges to the preservation and further improvement of air quality [6]. Internationally, air pollution ranks as the fourth-largest contributor to premature mortality. The “State of Global Air” report for 2020 attributes approximately 4.5 million fatalities annually to ambient air pollution and an additional 2.2 million to household air pollution. Notably, China and India experience the most substantial health impacts from air pollution, a reflection of the extensive industrial and urban development within these nations [7]. Environmental research concluded that, fine particulate matter, denoted as PM_{2.5}, is associated with an escalation in breast cancer occurrences [8]. Furthermore, the World Health Organization (WHO) curates an extensive database on air pollution, offering disease burden estimations linked to air pollution. This emphasizes the profound and widespread health implications of both ambient and domestic air pollution. Recent global environmental events have significantly degraded air quality, affecting health and climate. Australian bushfires in 2019–2020 emitted pollutants, impacting local and distant air quality. Health effects include respiratory and cardiovascular problems, with ongoing assessment of long-term ecological damage. New York City, despite air quality improvements, still battles with high levels of PM_{2.5} and ozone. Conflicts in Israel-Palestine and the Russia – Ukraine war exacerbate air pollution through military actions and infrastructure damage, raising NO₂ and PM_{2.5} levels, with broader climate implications. The trajectory of air pollution is alarming, with predictions indicating a rise in levels if current trends persist. Health impacts are a major concern, as exposure to pollutants like PM_{2.5} can lead to serious cardiovascular diseases. Climate change is expected to intensify these issues, with more frequent natural disasters contributing to air quality degradation. Air pollution, closely tied to climate change, is largely fuelled by fossil fuel combustion. Mitigating air pollution not only benefits health but also combats climate change, with the Paris Agreement’s goals potentially saving a million lives annually by 2050 [9]. The WHO notes that the lack of visible smog is not an indication of healthy air. Many cities and villages around the world experience toxic pollutants that exceed the average annual values recommended by WHO’s air quality guidelines. To combat this, the WHO, along with other organizations, has developed tools like an online pollution metre and has convened conferences to rally the world towards major commitments to fight air pollution. Urbanization further compounds the problem, increasing emissions from vehicles and industries [9]. To combat these challenges, world leaders are enforcing stricter air quality regulations, investing in renewable energy, and promoting public awareness. International agreements like

the Paris Agreement aim to curb greenhouse gas emissions, while technological advancements in cleaner energy and transportation are being pursued.

Conclusion

Investigations reveal that the aggravation of air pollution, driven by industrial growth, transport systems, and farming techniques, is causing significant health and environmental challenges. The spectrum of health consequences is extensive, with a range of pathologies from respiratory and cardiac conditions to oncological diseases, precipitating an uptick in medical consultations and a compromised immune system. Concurrently, the environmental degradation manifests in climatic shifts, acidification of rain, and a decline in species diversity. A multi-faceted approach is imperative, encompassing legislative overhaul, technological innovation, and educational outreach, to shield vulnerable populations and mitigate the pervasive effects of atmospheric contaminants. In light of a sombre prognosis, international leaders are mobilising through the enforcement of stringent environmental standards, the adoption of sustainable energy sources, and the promotion of electric mobility to enhance air quality and curtail emissions. The exigency for collective and sustained efforts to maintain the trajectory of progress and safeguard both human health and environmental sanctity is paramount. The immediacy of action and the continuity of vigilance are indispensable in the global endeavour to combat air pollution.

LITERATURE

1. Air pollution – World Health Organization (WHO). – Mode of Access: <https://www.who.int/health-topics/air-pollution>. – Date of Access: 28.02.24
2. Harvard Medicine – How Air Pollution Affects Our Brains. – Mode of Access: <https://www.harvardmagazine.com/2024/02/harvard-panel-air-pollution>. – Date of Access: 28.02.24
3. EPA – Research on Health Effects from Air Pollution. – Mode of Access: <https://www.epa.gov/air-research/research-health-effects-air-pollution>. – Date of Access: 01.03.24
4. Harvard Health Publishing – Even low-level air pollution may harm health. – Mode of Access: <https://www.health.harvard.edu/blog/even-low-level-air-pollution-may-harm-health-202202212692>. – Date of Access: 01.03.24
5. American Lung Association – Health Impact of Air Pollution. – Mode of Access: <https://www.lung.org/research/sota/health-risks>. – Date of Access: 01.03.24
6. EPA – Our Nation’s Air – Trends through 2020. – Mode of Access: <https://gispub.epa.gov/air/trendsreport/2021/>. – Date of Access: 04.03.24
7. State of Global Air Report 2020. – Mode of Access: <https://www.stateofglobalair.org/resources/report/state-global-air-report-2020>. – Date of Access: 04.03.24
8. NIH – High levels of particulate air pollution associated with increased breast cancer incidence. – Mode of Access: <https://www.nih.gov/news-events/news-releases/high-levels-particulate-air-pollution-associated-increased-breast-cancer-incidence>. – Date of Access: 04.03.24
9. How Air Pollution is Destroying our Health - World Health Organization (WHO). – Mode of Access: <https://www.who.int/news-room/spotlight/how-air-pollution-is-destroying-our-health>. – Date of Access: 08.03.24

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PREVALENCE OF DIABETES MELLITUS AMONG THE MEDICAL UNDERGRADUATES AND GRADUATES

Introduction

Diabetes mellitus is a chronic metabolic disorder, a global health concern characterized by a high blood sugar level and impaired metabolism of carbohydrates, lipids, and proteins due to insufficient insulin secretion and/or insulin action. Hyperglycaemia (elevation of blood glucose concentration) is a common effect of uncontrolled diabetes, and over time, this leads to damage