Georgian Geographical Journal 2023, Vol.3 (2)

Management of the Health and Safety of Medical Personnel Considering Geographic Characteristics

Nino Ratiani[1], Sophio Gugeshashvili[2*]

Abstract

Health geography is the application of geographical information, perspectives, and methods to the study of health, disease, and health care. Medical geography, a subdiscipline of or sister field of health geography, focuses on understanding spatial patterns of health and disease as related to the natural and social environment. Conventionally, there are two primary areas of research within medical geography: the first deals with the spatial distribution and determinants of morbidity and mortality, while the second deals with health planning, help-seeking behaviour, and the provision of health services. Occupational health and safety specialists collect and analyse data about work environments and procedures. They inspect and evaluate workplace environments to judge safety standards based on policy. Specialists prepare reports, evaluate health and safety, and educate employers on best practices. They take samples and observe a workplace to determine health, safety, comfort, and performance. A specialist will lead a team of technicians and employees in making necessary changes to the work environment. Part of their job is to examine the work environment. The purpose of the article is an analysis of laboratory studies in the seven regions of Georgia, which reveals the variations in the health status of the populations in different regions. To protect the lives and health of employees and fulfil the requirements of medical and occupational safety, it is necessary for medical regulations and guidelines to ensure the safest and healthiest working conditions in every workplace. Specifically, these regulations should aim to connect the safety and health of employees with the geographic characteristics of the workplace to prevent geographic disparities in health and be proactive in addressing emergencies.

Keywords: Health geography, laboratory health and safety

Introduction

Medical geography, as a branch of integral geography, explores the impact of various components of the environment on human health and diseases.

The health status of an individual is closely related to various factors, including their workplace environment. In many cases, the right to life and health is considered a fundamental human right, and employers are obligated to create a safe working environment to ensure the well-being and health of their employees. Specifically, it is essential to minimise risks to the life and health of employees working in the most hazardous and vulnerable work environments. As a result, it is crucial to consider and address workplace-related factors that affect an individual's health and safety.

For instance, significant factors associated with workplace risks to an individual's health and well-being include hazardous air quality, noise, water quality, occupational hazards, and other related factors. Ensuring a safe and healthy workplace is a fundamental responsibility, and it is essential to consider all potential risks and factors associated with an individual's health and well-being in the workplace.

The geography of health services is concerned with spatial aspects of access to health care, health care delivery, and the planning of health services. It spans the biological, environmental, and social sciences and uses both quantitative and qualitative methodologies [1].

In the context of medical-geographical research, we can analyse the impact of geographical factors on public health conditions and correspondingly develop preventive measures. It would be interesting to provide an example of medical-geographical analysis regarding the population's health status based on the geographical location.

The term "medical geography" as a distinct field of study was established in 1949 during the 16th International Geographical Congress in the city of Lisbon. The purpose of this Congress was to define new methods and objectives for geographical research in the context of medicine and science [2].

[1] Department of Labor Safety and Emergency Management/Mining and Geology Faculty, Georgian Technical University, Tbilisi, Georgia, n.ratiani@gtu.ge

[2] Department of Labor Safety and Emergency Management/Mining and Geology Faculty, Georgian Technical University, Tbilisi, Georgia,

* Corresponding author: gugeshashvili.sopio22@gtu.ge

As a subdiscipline of human geography, medical geography addresses human-environment interactions and the influence these interactions have on public health. Geography and health are intrinsically linked. Health geographers use modern spatial analysis tools to map the dispersion of health [3].

Spatial location plays a major role in shaping environmental risks as well as many other health effects. Environmental health is a branch of public health that addresses all aspects of the broader environment that can affect human health. The World Health Organisation has defined environmental health as aspects of human health and diseases that are dependent on environmental factors. Environmental health also refers to the assessment and control of environmental factors that can potentially affect health [4]. For the effective development of public health policies, we need to consider not only factors related to disease risks but also their interconnectedness with the broader societal context.

The World Health Organisation (WHO) estimates that 24% of the entire global disease burden and 23% of all deaths are attributable to environmental factors [5]. Health geography views health from a holistic perspective encompassing society and space, and it conceptualises the role of place, location, and geography in health, well-being, and disease [6–8]. Spatial scale, globalisation, and urbanisation Concern with scales of organisation is crucial to health service provision and public health implementation [9]. Place and geographic context are recognised as important influences on health.

Current developments in health geography include a stronger focus on health inequalities and the impact of spatial and social marginalisation on health, as well as a more explicit exploration of the nature of health change [10].

Environmental factors had an impact on the occurrence and spread of diseases and infections, according to a report by the World Health Organisation in 2015. Medical geography primarily serves to analyse the cause-and-effect relationships between the environment and health within a given region.

Methods and Materials

Literary source analysis, statistical analysis, and sociological methods were used in the research. The materials were presented with the statistical data from the "Medical Centre CITO" and the relevant literature on medical geography. In addition, meetings were held with healthcare professionals working in various regions, whose opinions were reflected in the article.

Results

"Medical Center CITO" is a leading laboratory in the country, encompassing clinical chemistry and immunology, clinical diagnostics, clinical microbiology, and PCR laboratories.

The laboratory certification guarantees the quality and safety of operations, which must be regularly conducted by professionals in the respective field. "Medical Center CITO" has successfully completed the process of accreditation by the "ANAB" for international accreditation. "CITO" has received the national accreditation certificate ISO 15189, issued by the accreditation center, GAC Georgia, which is the only national body for accreditation in Georgia. It has also obtained the international certificate ISO 9001 for quality management and, in 2015, the ISO 15189 certification for medical laboratory quality. "CITO" has been undergoing successful audits since 2005, with recertification taking place every two years and constantly evaluating risks and safety measures.

"Medical Center CITO" has medical centers and Lab Express services in 7 regions of Georgia: Batumi, Kutaisi, Zugdidi, Senaki, Gori, Samtredia and Telavi.

Table 1. Medical centre Batumi

	Analysis	Quantity
1	Complete Blood Count	1366
2	Coagulogram	443
3	General analysis of urine	552
4	TSH - Thyroid-Stimulating Hormone Blood Test	775
5	Vitamin D - (25 OH)	777
6	Fe - Iron Blood Test	350
7	GLUC - Glucose Blood Test, both fasting and postmeal	304
8	Lipid Profile (CHOL, HDL, VLDL, TG, LDL)	362
9	FT4 - Free Thyroxine Blood Test	361
10	Ferritin Blood Test	301

Table 2. Lab Express - Kutaisi

	Analysis	Quantity
1	Complete Blood Count	380
2	Determination of Ca calcium in the blood	114
3	General analysis of urine	122
4	TSH - Thyroid-Stimulating Hormone Blood Test	194
5	Vitamin D - (25 OH)	217
6	Lipid profile (CHOL, HDL, VLDL, TG, LDL)	84
7	Coagulogram	95
8	FT4 - determination of free thyroxine in the blood	93
9	Ferritin - determination of ferritin in blood serum	80
10	Examination of urine for sterility - aerobic and facultative anaerobic microorganisms	88

Table 3. Lab Express - Zugdidi

	Analysis	Quantity
1	Complete Blood Count	842
2	Coagulogram	198
3	General analysis of urine	296
4	TSH - Thyroid-Stimulating Hormone Blood Test	359
5	Vitamin D - (25 OH)	186
6	CREA determination of creatinine in blood serum	164
7	CRP - determination of C-reactive protein in blood serum	106
8	Lipid profile (CHOL, HDL, VLDL, TG, LDL)	108
9	Determination of PT prothrombin (thromboplastin) time in blood or plasma	112
10	FT4 - determination of free thyroxine in the blood	144

Table 4. Lab Express - Senaki

	Analysis	Quantity
1	Complete Blood Count	311
2	Coagulogram	120
3	General analysis of urine	132
4	TSH - Thyroid-Stimulating Hormone Blood Test	154
5	Vitamin D - (25 OH)	184
6	Determination of Ca calcium in the blood	96
7	CREA determination of creatinine in blood serum	83
8	Lipid profile (CHOL, HDL, VLDL, TG, LDL)	110
9	International normalised ratio (INR)	82
10	Determination of D-dimer (fibrin degradation products)	91

Table 5. Lab Express - Gori

	Analysis	Quantity
1	Complete Blood Count	231
2	Coagulogram	83
3	General analysis of urine	75
4	TSH - Thyroid-Stimulating Hormone Blood Test	89
5	Vitamin D - (25 OH)	80
6	Determination of Ca calcium in the blood	41
7	CREA determination of creatinine in blood serum	55
8	GLUC Determination of glucose in blood and blood serum	51
9	Lipid profile (CHOL, HDL, VLDL, TG, LDL)	41
10	CRP - determination of C-reactive protein in blood serum	33

Table 6. Lab Express - Samtredia

	Analysis	Quantity
1	Complete Blood Count	409

2	Coagulogram	98
3	General analysis of urine	129
4	TSH - Thyroid-Stimulating Hormone Blood Test	98
5	Vitamin D - (25 OH)	94
6	Determination of Ca calcium in the blood	76
7	CREA determination of creatinine in blood serum	60
8	CRP - determination of C-reactive protein in blood serum	57
9	Fe - Iron Blood Test	54
10	FT4 - determination of free thyroxine in the blood	53

Table 7. Lab Express - Telavi

	Analysis	Quantity
1	Complete Blood Count	165
2	Coagulogram	49
3	General analysis of urine	41
4	TSH - Thyroid-Stimulating Hormone Blood Test	96
5	Vitamin D - (25 OH)	79
6	Determination of Ca calcium in the blood	34
7	CREA determination of creatinine in blood serum	30
8	Fe - Iron Blood Test	38
9	FT4 - determination of free thyroxine in the blood	31
10	Ferritin Blood Test	30

Conclusion

- Managing the health and safety of medical personnel in different geographic settings requires careful planning, risk assessment, and adaptation to local conditions. Some key considerations for managing health and safety in various geographic characteristics should be considered:
- Assessment of Geographic Characteristics: Understand the specific geographic characteristics of the area where medical personnel will be working. Consider factors such as terrain, climate, altitude, and accessibility.
- Risk Assessment: Conduct a comprehensive risk assessment to identify potential hazards and risks associated with geographic characteristics. This should include natural disasters, weather and local disease patterns.
- Provide medical personnel with training and education specific to the geographic area.
- Collaborate with local authorities, healthcare facilities, and organisations to gain local knowledge and support. They can provide valuable insights into regional health and safety challenges.
- Implement measures to protect medical personnel from local health risks, such as vaccination programs and others.
- Continuously collect and analyse data on health and safety incidents in the specific geographic area to inform ongoing improvements in protocols and procedures.

It is important to implement a system for documenting incidents, near misses and safety issues and then review them regularly. Managing the health and safety of medical personnel in diverse geographic characteristics requires a proactive and context-specific approach.

Competing interests

The authors declare that they have no competing interests.

Authors' contribution

N.R. and S. G. conceived of the presented idea. N.R. and S. G. performed the analytic calculations. All authors provided critical feedback and helped shape the research, analysis and manuscript.

References

[1] J. Winston, M. Emch. (2013). Medical Geography. Oxford University Press, 1(2). doi.org/10.1093/OBO/9780199874002-0034

[2] The Geographical Journal (1949). International Geographical Congress, Lisbon, 1949. The Geographical

Journal, 76-82. doi.org/10.2307/1789991

[3] Murray, Emily T.; Shelton, Nicola; Norman, Paul; Head, Jenny (2022)., Measuring the health of people in places: a scoping review of OECD member countries, Health & Place, 73. doi.org/10.1016/j.healthplace.2021.102731

[4] Morand S., Lajaunie C. (2017). Biodiversity and Health Linking Life, Ecosystems, Societies (1-14)

[5] Mbuligwe S.E. (2019). Environmental Health Engineering: Rationale, Technologies and Practices for Various Needs. /Encyclopedia of Environmental Health (Second Edition) Biodiversity and Health Linking Life, Ecosystems, Societies (486-495)

[6] Meade M, Earickson R. Medical geography. New York: Guilford Press; 2000

[7] Mayer JD. Geography, ecology and emerging infectious diseases. Soc Sci Med 2000; 50:937-52. doi: 10.1016/s0277-9536(99)00346-9

[8] Lanchava O, Gugeshashvili S (2023), Occupational Health and Safety Risk Management in the Field of Laboratory Medicine, https://5wwwww.easychair.org/publications/preprint/Zf2l

[9] Trevor J.B. Dummer (2008) Health geography: supporting public health policy and planning. CMAJ 178(9). doi: 10.1503/cmaj.071783

[10] Asthana S, Curtis S, Duncan C, et al. (2002) Themes in British health geography at the end of the century: a review of published research 1998–2000. Soc Sci Med. doi: 10.1016/s0277-9536(01)00211-8