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EMPIRICAL POTENTIAL OF THE SOCIOLOGICAL SURVEY METHOD IN MEDICAL RESEARCH: ANALYTICAL ADVANTAGES AND INSTITUTIONAL LIMITATIONS

The overarching objective of this analytical scholarly work is to undertake a comprehensive evaluation of the potential and inherent limitations of sociological surveys as a methodological instrument in medical research, particularly with regard to the collection of valid biostatistical data and the in-depth analysis of social and behavioural determinants of population health in the context of the global epidemic of non-communicable diseases (NCDs)¹. This assessment is conducted with due consideration of contemporary challenges confronting health-care systems in both Ukraine and European countries, where NCDs are recognised as the principal cause of morbidity, disability, and premature mortality².

1 World Health Organization. (2025). Nations High-Level Meeting: Report. WHO Regional Office for Europe. URL: <https://www.who.int/europe/publications/i/item/WHO-EURO-2025-12445-52219-80271>.

2 Eurostat. (2025). 1.1 million deaths linked to avoidable conditions. European Commission. URL: <https://ec.europa.eu/eurostat/web/products-eurostat-news/w/ddn-20250630-1>; Organisation for Economic Co-operation and Development. (2023). Health at a glance 2023: OECD indicators. OECD Publishing. URL: https://www.oecd.org/en/publications/health-at-a-glance-2023_7a7afb35-en/full-report/chronic-conditions_2dfe9bb5.html.

Within medical research, the application of sociological methods is generally regarded as a substantive and methodologically justified approach to the identification of social risks, behavioural patterns, and health inequalities. Such an approach is fully consistent with modern public health paradigms and the fundamental principles of evidence-based medicine³.

At the same time, the application of this method in the medical sciences is characterised by the presence of a number of methodological limitations, which necessitates its critical appraisal as well as a well-reasoned and conscious use. These issues constitute the subject of the subsequent scholarly discussion.

In this context, it is appropriate, first and foremost, to note that sociological surveys in contemporary medical and socio-medical research are regarded as a systematised empirical method for collecting primary sociological data. This method involves addressing respondents through a standardised set of questions (questionnaire or interview) with the aim of obtaining subjective information on their views and attitudes towards their own health, perceptions of medical services, habits and behaviours that shape a healthy lifestyle, as well as respondents' social characteristics (age, sex, education, occupation, social status, place of residence, and marital status)⁴.

The principal advantage of the sociological survey method lies in its capacity to cover large population groups, which makes it possible to carry out description (descriptive analysis) or explanation (exploratory and explanatory analysis) of social phenomena and patterns in the fields of health, health care, and medical services⁵.

Nevertheless, the use of sociological surveys in medical research is also associated with a range of methodological constraints. This circumstance underscores the need for their critical reflection and for a substantiated,

3 Bowling, A. (2014). *Research methods in health: Investigating health and health services* (4th ed.). Open University Press. URL: <https://library.strathmore.edu/Record/316501>.

4 Questionnaire use and development in health research. (2024). *Survey Methods in Public Health*, 5(2), 65. URL: <https://www.mdpi.com/2673-8392/5/2/65>; Collins, A., & Stockton, C. (2023). Methodological and practical guidance for online qualitative surveys in public health research. *Health Promotion International*, 39(3), daae061. URL: <https://academic.oup.com/heapro/article/39/3/daae061/7699342>; Methodological and strategic insights for online survey studies. (2024). *Survey Practice*, 17(1), 12–28. URL: <https://www.sciencedirect.com/science/article/pii/S2445147924000456>.

5 Questionnaire use and development in health research. (2024). *Survey Methods in Public Health*, 5(2), 65. URL: <https://www.mdpi.com/2673-8392/5/2/65>; Dvornyk, M., Lazorenko, B., Larina, T., Hromova, H., Pohorilska, N., Savinov, V., & Hundertailo, Y. (2024). Healthy lifestyle of Ukrainians during war: Primary analysis of survey data. *Psychological Prospects Journal*, 43, 80–102. <https://doi.org/10.29038/2227-1376-2024-43-dvo>; Standardizing survey data collection to enhance reproducibility. (2025). *Journal of Medical Internet Research*, 27(1), URL: <https://www.e63343>. <https://www.jmir.org/2025/1/e63343>.

deliberate application, which will form the focus of the following scientific exposition.

At the same time, the application of the sociological survey method in the medical sciences is characterised by the presence of a number of methodological limitations, which necessitates its critical appraisal and a substantiated, deliberate use. These considerations will constitute the subject of the subsequent scholarly exposition.

In this context, it is appropriate to note that, in contemporary medical and socio-medical research, sociological surveys are regarded as a systematised empirical method for collecting primary sociological data⁶.

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The principal advantage of the sociological survey method lies in its capacity to cover large population groups, which makes it possible to carry out the description (descriptive analysis) or explanation (exploratory and explanatory analysis) of social phenomena and patterns in the fields of health, health care, and medical services⁸.

In medical research, the sociological survey method is employed to assess social determinants of health, including behavioural, demographic, and educational factors⁹; to collect data on the attitudes of patients and medical personnel towards specific aspects of health-care provision, such as accessibility,

6 Stephanie Coffey, Olga Maslovska, Cameron McPhee (2024) "Recent Innovations and Advances in Mixed-Mode Surveys," *Journal of Survey Statistics and Methodology*, Volume 12, Issue 3, June 2024, pages 507–531, <https://doi.org/10.1093/ssam/smae025> <https://academic.oup.com/jssam/article/12/3/507/7690907?login=false>; Wen Zhi Ng et al. (2025) Increasing Rigor in Online Health Surveys Through the Reduction of Fraudulent Data. *J Med Internet Res* 27, doi: 10.2196/68092. URL: <https://www.jmir.org/2025/1/e68092/citations>.

7 Perkins, J., Nelson, S., Birley, E., et al. (2024) Is qualitative social research in global health fulfilling its potential?: a systematic mapping of evidence from point-of-care testing studies in low- and middle-income countries. *BMC Health Serv Res* 24, 172. URL: <https://doi.org/10.1186/s12913-024-10645-5>. URL: <https://link.springer.com/article/10.1186/s12913-024-10645-5>; Teresa A. Kolek, Caitlin Dreisbach, Chen Zhang, Susan Grayson, Maichou Lor, Zhirui Deng, Alex Conway, Peter D. R. Higgins, Suzanne Bakken (2024) User Guide for the Social Determinants of Health Survey Data from the All of Us Research Program, *Journal of the American Medical Informatics Association*, Volume 31, Issue 12, December 2024, p. 3032–3041, <https://doi.org/10.1093/jamia/ocae214>. URL: <https://academic.oup.com/jamia/article/31/12/3032/7742789>.

8 White, B.K., Wilhelm, E., Ishizumi, A., et al. (2024) Informative analysis of social networks for public health: a cross-sectional survey of experts. *Arch Public Health* 82, 1. <https://doi.org/10.1186/s13690-023-01230-z>. URL: <https://link.springer.com/article/10.1186/s13690-023-01230-z#citeas>.

9 World Health Organization. (2023). *Social determinants of health: Global monitoring framework*. WHO. URL: <https://www.who.int/publications/i/item/9789240062368>; Solar, O., & Irwin, A. (2021). *A conceptual framework for action on the social determinants of health* (Updated ed.). WHO. URL: <https://www.who.int/publications/i/item/9789240038387>.

quality, and satisfaction¹⁰; and to estimate the probable prevalence of risk factors or habitual behaviours within different population groups¹¹.

According to international review evidence, within the domains of public health and health-care management, between P=50% and P=80% of empirical studies integrate the findings of sociological surveys. This proportion reflects the pivotal subjective role of social determinants of health and the structural nature of interactions between the population and the health-care system¹².

In studies devoted to non-communicable diseases, sociological survey instruments assume particular significance, as up to P=70% of NCD-related risks are attributable to modifiable behavioural and social determinants influencing the health status of individuals or population cohorts. This circumstance necessitates a systematic examination of lifestyle patterns, accessibility of preventive interventions, patient motivation to adopt healthy behaviours, and the reduction of barriers to treatment adherence¹³.

In contemporary clinical research, patient-centred instruments, commonly referred to as Patient-Reported Outcomes (PROs), are increasingly employed to assess quality of life, adherence to therapy, and subjective symptoms. A large-scale analysis of n= 475,844 registered clinical trials conducted between 2008 and 2023 demonstrated that the proportion of interventional trials involving adult populations that incorporated PRO measures increased from P=12.7% in 2008 to p=23.5% in 2023¹⁴.

Similarly, among n= 4,033 clinical studies registered in China between 2010 and 2020, only P=20.3% incorporated PRO instruments¹⁵, whereas in a systematic review of oncology randomised controlled trials conducted between 2013 and

10 World Health Organization. (2022). *Quality of care: Measuring patient experiences*. WHO. URL: <https://www.who.int/publications/i/item/WHO-UCN-SDS-2022.1>

11 Ayanian, J. Z., & Markel, H. (2021). Donabedian's enduring framework for assessing health care quality. *New England Journal of Medicine*, 384(3), 205–207. URL: <https://www.nejm.org/doi/full/10.1056/NEJMp2031169>; World Health Organization. (2022). *WHO STEPwise approach to noncommunicable disease risk-factor surveillance (STEPS)*. WHO.

12 Baah, F. O., Brawner, B. M., Teitelman, A. M., Ruger, J. P., & Riegel, B. (2023). A mixed-methods study of social determinants and self-care in adults with heart failure. *Journal of Cardiovascular Nursing*, 38(6), E59–E71. <https://doi.org/10.1097/JCN.0000000000000999>.

13 Khanpoor, H., Alizadeh, A., Khosravizadeh, O., Amerzadeh, M., & Rafiei, S. (2025). A mixed-methods model for healthcare system responsiveness to public health: Insights from Iranian experts. *Health Research Policy and Systems*, 23, 24. <https://doi.org/10.1186/s12961-025-01295-y>; Turon, H., et al. (2023). Dissemination of public health research for the prevention of noncommunicable diseases: A systematic review. *BMC Public Health*, 23, 757. <https://doi.org/10.1186/s12889-023-15622-x>.

14 Kuharic, M., Yu, J., Joshi, M., Nazari, J., Zecic, F., Cella, D., & Pickard, A. S. (2025). Patient-reported outcome measures in clinical trials: An analysis of trends from 2008–2023. *Value in Health. Advance online publication*. <https://doi.org/10.1016/j.jval.2025.10.017>.

15 Zhou, H., Yao, M., Gu, X., Liu, M., Zeng, R., Li, Q., Chen, T., He, W., Chen, X., & Yuan, G. (2022). Application of patient-reported outcome measurements in clinical trials in China. *JAMA Network Open*, 5(5), e2211644. <https://doi.org/10.1001/jamanetworkopen.2022.11644>.

2022, the proportion of industry-sponsored RCTs including PRO measures was $P=16\%$ ¹⁶.

These biostatistical findings provide compelling evidence that the use of sociological surveys and PRO methodologies in clinical research is increasing. Nevertheless, they continue to occupy a secondary or supportive role in the majority of interventional trials, underscoring the need for their systematic integration to enable a comprehensive assessment of the effectiveness of medical interventions.

In recent years, mixed methodological approaches (“Mixed Methods”), which combine quantitative/biostatistical and qualitative tools—sociological, behavioural, interview-based, and focus group methods—have been increasingly employed¹⁷.

Such a scientific and methodological approach in research enables the integration of objective data with the subjective experiences of patients and healthcare personnel, as well as organisational and managerial aspects, thereby ensuring a comprehensive understanding of the effectiveness and practical relevance of medical interventions, particularly in the field of non-communicable diseases and the organisation of healthcare services¹⁸.

Moreover, mixed methods make it possible to combine statistical analyses (survival outcomes, biomarkers, complication rates) with qualitative sociological assessments (interviews, surveys), thereby generating recommendations for healthcare management and medical care that are more robust and practically relevant¹⁹.

At the same time, in medical research practice, experienced investigators are routinely confronted with the question of why the sociological survey method does not always ensure the expected level of completeness and reliability of biostatistical information, which substantially limits the possibilities for multifactorial analysis and the interpretation of the data obtained.

16 Mordin, M., et al. (2023). PCR74 Trends in the inclusion of patient-reported outcomes in oncology clinical trials: Analysis of ClinicalTrials.gov (2013–2022). *Value in Health*, 26(6 Suppl.), S325. <https://doi.org/10.1016/j.jval.2023.03.1852>.

17 Tariq, S., & Woodman, J. (2013). Using mixed methods in health research. *JRSM Short Reports*, 4(6), 2042533313479197. <https://doi.org/10.1177/2042533313479197>. URL: <https://pubmed.ncbi.nlm.nih.gov/23885291>.

18 Khanpour, H., Amerzadeh, M., Alizadeh, A., et al. (2024). Developing a community-responsive research model in the health care system: A mixed-method study. *BMC Medical Research Methodology*, 24, 119. <https://doi.org/10.1186/s12874-024-02250-1>; Smith, M. Y., Davis, R., Bahri, P., et al. (2025). Using mixed methods to evaluate risk minimization programs in Europe and the United States. *Drug Safety*, 48, 821–838. <https://doi.org/10.1007/s40264-025-01533-w>.

19 Khanpoor, H., Alizadeh, A., Khosravizadeh, O., et al. (2025). A mixed-methods model for healthcare system responsiveness to public health: Insights from Iranian experts. *Health Research Policy and Systems*, 23, 24. <https://doi.org/10.1186/s12961-025-01295-y>.

In our view, this is attributable to the dependence of sociological research outcomes on methodological design, the quality of the instruments employed, sample representativeness, and adherence to data quality control procedures²⁰, issues that will be discussed in greater detail and substantiated further in the subsequent sections.

At the same time, it is appropriate to acknowledge the scientifically substantiated fact that, in comparison with biomedical or epidemiological studies, the sociological survey method does not always provide the full range of biostatistical indicators required; nevertheless, the results obtained through this approach are capable of forming a sufficient and valid information base for conducting multifactorial analyses²¹.

In the context of the foregoing considerations, we deem it necessary to delineate a systematic characterisation of the degree of completeness and reliability of biostatistical information obtained from sociological surveys, as well as to identify the risks associated with its potentially insufficient validity.

First, the methodological boundaries of sociological research conducted using survey-based techniques are determined by the fact that questionnaires rely on respondents' self-reports; accordingly, the completeness and reliability of biostatistical information depend on their level of sincerity, the accuracy with which events are recalled, the adequacy of their understanding of the questions, and their willingness to provide truthful answers.

Under such conditions, objective biomedical indicators (clinical data, laboratory results) cannot be obtained directly²²; recall bias, subjectivity, and social desirability of responses may occur²³, while control over external variables remains substantially limited²⁴. As a result, the biostatistical information obtained through sociological surveys is generally of an indirect nature.

Second, the researcher should be aware that the biostatistical dataset formed on the basis of sociological questionnaires or interviews primarily encompasses

20 Pouzes, K., Revilla, M., Asensio, M., Schwarz, H., & Weber, W. (2021). Measurement quality of 67 common social science questions across countries and languages. *Survey Research Methods*, 15(3), 235–256. <https://doi.org/10.18148/srm/2021.v15i3.7816>.

21 Loedi, N., Coletti, P., Wambua, J., et al. (2023). Longitudinal analysis of social contact data: Findings from two years of data collection in Belgium during the COVID-19 pandemic. *BMC Public Health*, 23, 1298. <https://doi.org/10.1186/s12889-023-16193-7>.

22 Teh, W. L., Abidin, E., PV, A., et al. (2023). Measuring social desirability bias in a multi-ethnic cohort sample. *BMC Public Health*, 23, 415. <https://doi.org/10.1186/s12889-023-15309-3>.

23 Khalili, P., Nadimi, A. E., Baradaran, G. R., et al. (2021). Validity of self-reported substance use: Research settings versus primary care settings. *Substance Abuse Treatment, Prevention, and Policy*, 16, 66. <https://doi.org/10.1186/s13011-021-00398-3>.

24 Stone, A. A., Schneider, S., Smith, J. M., et al. (2024). Participation rates and self-selection bias in surveys. *Current Psychology*, 43, 2074–2090. <https://doi.org/10.1007/s12144-023-04426-2>.

respondents' basic demographic characteristics, their subjective assessments of health status, behavioural patterns, experiences of interaction with the healthcare system, and information suitable for strengthening statistical modelling and analytical conclusions²⁵.

Such a set of biostatistical data is sufficiently broad; however, its informational value is determined by the self-reported nature of the collected information, which imposes certain limitations on the application and interpretation of the data, as outlined in Table 1.

Table 1

Main types of biostatistical information obtained using the sociological survey method

Nº	Category of sociological data	Content / examples of indicators	Degree of completeness or limitation
1	2	3	4
1.	Demographic and structural variables ²⁶	Sex, age, marital status Type of settlement Socio-economic characteristics	Generally sufficiently complete and reliable, as they do not require specialised medical knowledge.
2.	Subjective assessments of health and behaviour ²⁷	Self-assessment of health Presence of chronic conditions (as reported by the respondent) Frequency of medical consultations Adherence to treatment, compliance Health-preserving practices	Data vary in accuracy and depend on the respondent's honesty, knowledge, and memory.
3.	Indicators of accessibility and quality of medical care ²⁸	Level of satisfaction with interventions Barriers to access Experience of interaction with the healthcare system	Information is generally complete, but interpretation remains entirely subjective.

25 Rosendahl, H., et al. (2022). Validity of self-reported diseases compared with registry data in Denmark. *European Journal of Public Health*, 32(Suppl. 3). <https://doi.org/10.1093/eurpub/ckac129.426>; Bakker, E. A., Hartman, Y. A. W., Hopman, M. T. E., et al. (2020). Validity and reliability of subjective methods for assessing sedentary behavior in adults. *International Journal of Behavioral Nutrition and Physical Activity*, 17, 75. <https://doi.org/10.1186/s12966-020-00972-1>.

26 Qi, M., Santos, H., Pinheiro, P., McGuinness, D. L., & Bennett, K. P. (2023). Socioeconomic determinants of access to care. *PLoS ONE*, 18(11), e0290692. <https://doi.org/10.1371/journal.pone.0290692>

27 Zajacova, A., & Dowd, J. B. (2011). Reliability of self-rated health in U.S. adults. *American Journal of Epidemiology*, 174(8), 977–983. <https://doi.org/10.1093/aje/kwr204>

28 Ferreira, D. C., Vieira, I., Pedro, M. I., Caldas, P., & Varela, M. (2023). Patient satisfaction with healthcare services. *Healthcare*, 11(5), 639. <https://doi.org/10.3390/healthcare11050639>; Bradács, A. I., Voiță-Mekeres, F., Daina, L. G., Davidescu, L., & Hozan, C. T. (2025). Assessing patient satisfaction with hospital services. *Healthcare*, 13(7), 836. <https://doi.org/10.3390/healthcare13070836>.

Continuation of table 1

1	2	3	4
4.	Potential for biostatistical modelling ²⁹	Correlation matrices Regression models Factor structures Stratified (conditional) risk estimates Predictive models of behavioural/ social factors	These models allow the identification of patterns; however, they do not replace objective biomedical measurements.

Third, the completeness of biostatistical information obtained from sociological research using survey methods is evaluated taking into account its methodological limitations and the potential for data collection, as presented in Table 2.

Table 2

Potential of sociological research outcomes in the formation of biostatistical information

Nº	Level of completeness	Capabilities or limitations	Degree of verification of data / information elements
1	2	3	4
1.	Complete – NO	Sociological survey results do not provide complete biostatistical information ³⁰ .	Clinical verification of diagnoses is not possible Laboratory and instrumental indicators are not obtained Biomedical markers of intervention effectiveness are not measured
2.	Sufficient – YES	Sociological survey results generate extensive data for analysis and modelling, and also allow for verification ³¹ .	• Demographic characteristics (age, sex, education, occupation, social status, place of residence, marital status) • Subjective assessments of health status and satisfaction with medical services, which can be verified (by comparison with medical records) • Behavioural patterns and healthy lifestyle factors, which can be partially verified • Representative population trends and socio-epidemiological analyses • Behavioural and systemic factors affecting health, which are subject to statistical verification

29 González-Ferrer, V., González-Ferrer, Y., & Ramírez Marino, M. (2017). Statistical modeling in health research. *MEDICC Review*, 19(2–3), 12–17. <https://doi.org/10.37757/MR2017.V19.N2-3.12>.

30 Pelgrims, I., Devleeschauwer, B., et al. (2021). Validity of self-reported data on cardiometabolic risks. *European Journal of Public Health*, 31(Suppl. 3). <https://doi.org/10.1093/eurpub/ckab164.750>

31 Młynarczyk, D., Armero, C., Gómez Rubio, V., & Puig, P. (2021). Bayesian analysis of population health data. arXiv.<https://arxiv.org/abs/2102.01612>; Manna, A., Koltai, J., & Karsai, M. (2023). Social inequalities and epidemic spread. arXiv. URL: <https://arxiv.org/abs/2307.04865>.

It should be noted, however, that the results of sociological surveys and interviews do not provide complete biostatistical information, as they do not include clinical verification of diagnoses, laboratory or instrumental indicators, or biomedical markers of the effectiveness of medical interventions.

At the same time, sociological research using survey methods allows for the formation of a sufficiently extensive dataset encompassing demographic, behavioural, and social characteristics, provides a representative reflection of population trends, serves as a source for socio-epidemiological analysis, and complements medical research in the field of behavioural and systemic factors.

Thus, while sociological questionnaires do not provide complete biostatistical information, they offer a sufficient level of data for analytical and research purposes.

Fourth, the optimal approach to generating biostatistical information from sociological research using survey methods is the integration of biostatistical and sociological techniques. The most complete and representative information is provided by combined research designs that integrate sociological surveys, medical records, and clinical measurements³²; the application of mixed methods, incorporating both quantitative and qualitative approaches³³; as well as the integration of various databases, such as eHealth registries, patient registries, and empirical panels³⁴.

The use of the aforementioned scientific and methodological approaches in sociological research allows for the collection of biostatistical information that closely approximates reality, yet remains far from complete verification by methods establishing causal relationships between independent variables ($n=1,2,3,\dots$) and a dependent variable ($n=2$).

In elucidating the essence of the sociological survey method, its importance for the researcher should be emphasised in the context of mitigating the impact of non-communicable diseases, which remain a leading threat to public health in Ukraine and Europe, as well as for the development of effective preventive strategies based on the data obtained.

32 Crull, E., O'Brien, E. C., Antiporovitch, P., et al. (2025). Concordance between survey and EHR data. *JMIR Formative Research*, 9, e58097. <https://doi.org/10.2196/58097>

33 Tsiampalis, T., et al. (2023). Methodological issues of EHR use in epidemiology. *BMC Medical Research Methodology*, 23, 180. <https://doi.org/10.1186/s12874-023-02004-5>

34 Wagaw, F., Okoro, C. A., Kim, S., et al. (2018). Linking health survey and EHR data. *Preventing Chronic Disease*, 15, E09. <https://doi.org/10.5888/pcd15.170085>; Ferreira, D. C., Vieira, I., Pedro, M. I., Caldas, P., & Varela, M. (2023). Patient satisfaction with healthcare services: A systematic literature review and bibliometric analysis. *Healthcare*, 11(5), 639. <https://doi.org/10.3390/healthcare11050639>.

In this context, it should be emphasised once again that, according to the World Health Organization (WHO), NCDs claimed the lives of at least $n=43$ million people worldwide in 2021, accounting for approximately $P=75\%$ of all non-pandemic-related deaths. In the European region, their share exceeds $P=80\%$, with cardiovascular diseases, diabetes mellitus, chronic respiratory diseases, and cancers representing a substantial proportion of the projected mortality³⁵.

In Ukraine, non-communicable diseases also remain the leading cause of death, particularly among the working-age population and older adults, underscoring the need for systematic monitoring, prevention, and assessment of risk factors³⁶.

It follows that, in the context of non-communicable diseases, sociological research using survey or interview methods remains highly relevant, as it enables the identification of behavioural patterns, social determinants of health, and population groups at increased risk of developing NCDs³⁷.

At the same time, it should be noted that the ability to establish causal relationships between respondents' subjective assessments and the actual health status or its components, based on sociological research, remains limited. These limitations are attributable to a number of methodological factors, which can be outlined in the following key points:

- 1) *The nature of the sociological data obtained is subjective, as*, according to Bayramov, A., & Edwards, D. J. (2025), surveys capture respondents' perceptions, self-assessments, and personal behavioural attitudes, but do not reflect objective biomedical processes³⁸. Similarly, observations by Gutiérrez, S., and colleagues (2025) indicate that respondents' opinions regarding potential risks (for example, "I often feel stressed" or "I have low

35 World Health Organization. (2023). Noncommunicable diseases. WHO. URL: https://www.who.int/health-topics/noncommunicable-diseases#tab=tab_1.

36 Щорічний звіт про стан здоров'я населення України та епідемічну ситуацію за 2022 рік. (2023). Київ: МОЗ України. URL: <https://moz.gov.ua/storage/uploads/d8718889-1326-4060-a2fe-5f7e6359426f/Щорічн-звіт-про-стан-здоров'я-та-епідемічну-ситуацію-за-2022-рік.pdf>.

37 Ковтонюк, М. В., Слабкий, Г. О., & Лехан, В. М. (2023). Поведінкові фактори ризику неінфекційних захворювань серед дорослого населення України: результати STEPS 2019. (Kovtoniuk, M. V., Slabkyi, H. O., & Lekhan, V. M. (2023). Behavioural risk factors for non-communicable diseases among the adult population of Ukraine: Results of STEPS 2019. *Ukrainian Journal of Public Health*, 5(1), 22–31.) Український журнал громадського здоров'я, 5(1), 22–31. URL: https://phc.org.ua/sites/default/files/users/user90/2019_STEPS_summary_ukr.pdf; Vichitkunakorn, P., Bunyanukul, W., Apiwan, K., Tanasanchonakul, D., & Sittisombut, M. (2025). Prevalence of non-communicable disease risk factors and their association with economic status: Findings from the 2021 health behaviour of population survey in Thailand. *Global Health Action*, 18(1), 2485689. <https://pubmed.ncbi.nlm.nih.gov/40401792/>.

38 Bayramova, A., Edwards, D. J. (2025) A study of objectivity and subjectivity in research methodology selection. *Quality & Quantity*. <https://doi.org/10.1007/s11135-025-02517-9>.

physical activity”) cannot serve as a reliable basis for establishing causal inferences³⁹.

- 2) *The design of sociological research is uncontrolled*, because, unlike randomised clinical trials, surveys do not involve randomisation or investigator-directed interventions⁴⁰. The lack of control over confounders, as confirmed by Fernie, P., et al. (2024), and supported by the findings of Lauer, D. J., and colleagues (2024), makes it impossible to reliably determine whether a factor preceded an outcome and to exclude the influence of hidden variables that may bias results and complicate the establishment of causality⁴¹.
- 3) *A statistically significant association* in sociological research between subjectively assessed risks (independent variables, $n = 1, 2, 3...$) and the established dependent variable ($n = 2$) reflects only a correlation between the variables and is not sufficient to confirm a causal relationship, as evidenced by the study of Filippo d’Amico, Marilena Marmier, and colleagues (2025)⁴². As noted by Bispo Júnior, H. P. (2022), the observed associations are purely descriptive and demonstrate correlation rather than causal interaction⁴³.

It is also pertinent to understand that observed correlations in observational studies are, according to Zaniletti and colleagues (2022), often misinterpreted as causal, since they may arise due to chance, reverse causation, or confounding, and do not provide sufficient grounds for causal inference without an appropriate study design and supplementary analytical methods⁴⁴.

- 4) *The possibility of cognitive and behavioural biases* in sociological research arises from the fact that respondents may tend to overestimate or underestimate certain risk factors, interpreting them through the lens of their existing health status, as noted by Salmen, K., et al. (2023)⁴⁵, meanwhile,

39 Gutierrez S, Glymour MM, Davey Smith G. Evidence triangulation in health research. *Eur J Epidemiol.* 2025, 40, 743–757. <https://doi.org/10.1007/s10654-024-01194-6>

40 Hess D. R. (2023). Observational Studies. *Respiratory care*, 68(11), 1585–1597. <https://doi.org/10.4187/respcare.11170>.

41 Ferney, P., Cohen, A. A., Murray, E., et al. (2024). Rethinking the advantages and disadvantages of randomized controlled trials and observational studies in the era of big data and advanced methods: A panel discussion. *BMC Proceedings*, 18(Suppl 2), 1. <https://doi.org/10.1186/s12919-023-00285-8>; Lauer, D. J., Russell, A. J., Lynch, H. N., et al. (2024). Triangulation of epidemiological evidence and risk of bias evaluation: A proposed framework and applied example using formaldehyde exposure and risk of myeloid leukemias. *Global Epidemiology*, 7, 100143. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC11039339/>.

42 Filippo D’Amico, Marilena Marmier, Martina Fonti, Mariarita Battaglia (2025) Association does not mean causation, when observational data were misinterpreted as causal: The observational interpretation fallacy. *Journal of Evaluation in Clinical Practice*, 31(1), e14288. <https://doi.org/10.1111/jep.14288>

43 Bispo Júnior, J. P. (2022). Social desirability bias in qualitative health research. *Revista de Saúde Pública*, 56, 101. <https://doi.org/10.11606/s1518-8787.2022056004164-56>.

44 Zaniletti, I., Larson, D. R., Lewallen, D. G., Berry, D. J., & Maradit Kremers, H. (2022). How to distinguish correlation from causation in orthopaedic research. *Journal of Arthroplasty*, 38(4), 634–637. <https://doi.org/10.1016/j.arth.2022.11.019>.

45 Salmen, K., Ermark, F. K., & Fiedler, K. (2023). The influence of pragmatic, constructive, and reconstructive memory on hindsight bias. *Psychonomic Bulletin & Review*, 30, 331–340. <https://doi.org/10.3758/s13423-022-02158-1>.

researchers Gross, J., and Bayen, U. (2022) corroborate with their findings the view that this leads to the emergence of hindsight bias⁴⁶, which substantially limits the ability to draw causal inferences.

- 5) *Sociological data are predominantly of an auxiliary nature*, as noted by Dean L. T. and Sakakibara K. (2024), since they are informative primarily for delineating probable risk trajectories, formulating scientific hypotheses, conducting early screening of behavioural models, and assessing the influence of relevant environmental factors⁴⁷.

At the same time, as argued by Xia K., Zheng Y., and co-authors (2024), the establishment of causal relationships is possible only through the integration of sociological findings with epidemiological cohort studies, clinical data, biomedical indicators, and analytical models of causal inference⁴⁸.

In view of the above, although the sociological research method in medical science constitutes an important instrument for monitoring both non-communicable and other diseases, as well as the components of health status within relevant population cohorts, Ollier I., Zhang Y., Liang X., and Wolovitz V. (2023) contend that the results of such studies, when considered in isolation, do not allow for definitive conclusions regarding causal relationships between subjectively identified independent variables ($n = 1, 2, 3...$) and the defined dependent variable ($n = 2$)⁴⁹.

In this context, it is appropriate to note that the data obtained merely delineate probable associations, which require further validation through rigorous analytical models and methods for verifying causal relationships—approaches that, at present⁵⁰, have not yet been implemented in medical science in Ukraine.

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46 Groß, J., & Bayen, U. J. (2022). Older and younger adults' hindsight bias after positive and negative outcomes. *Memory & Cognition*, 50, 16–28. <https://doi.org/10.3758/s13421-021-01195-w>.

47 Dean, L. T., & Sakakibara, K. (2024). Exploring the landscape of social epidemiologic research: a scoping review of AJE publications. *American Journal of Epidemiology*, 194(2), 543–551. <https://doi.org/10.1093/aje/kwae211>.

48 Xia, Q., Zheng, Y., Fong, M.-C., Wiewel, E., & Torian, L. (2024). Social determinants of health analysis makes causal inference and requires analytic epidemiology methods. *Social Medicine*, 360, Article 7986. <https://doi.org/10.1016/j.socmed.2024.7986>; Howards, P. P. (Ed.). (2022). *Causal inference challenges and new directions for epidemiologic research on the health effects of social policies*. *Current Epidemiology Reports*, 9, 22–37. <https://doi.org/10.1007/s40471-022-00288-7>.

49 Ollier, I., Zhan, Y., Liang, X., & Volovici, V. (2023). *Causal inference and observational data*. *BMC Medical Research Methodology*, 23, Article 227. <https://doi.org/10.1186/s12874-023-02058-5>.

50 Moccia, C., Moirano, G., Popovic, M., et al. (2024). Machine learning in causal inference for epidemiology. *European Journal of Epidemiology*, 39, 1097–1108. <https://doi.org/10.1007/s10654-024-01173-x>.