

AN INNOVATIVE APPROACH TO ASSESSING INTEREST IN LIFE SAFETY

Ryszard PUKALA, ORCID 0000-0002-2943-8482, Researcher ID N-4753-2018¹

Oleksandr PYVOVAROV, ORCID 0000-0002-6062-9949²

¹*State University Of of Applied Sciences in Jarosław, Poland*

²*Kharkiv National Medical University, Kharkiv, Ukraine*

Corresponding author: Oleksandr Pyvovarov, email: jakov09@meta.ua

Abstract. Growing risks in the world affect the increase in the level of interest in the issue of life safety and other dangers. Martial law in the country and the increase in global risks pose new tasks for researchers to measure the components of the definition of life safety. The goal is to use an innovative approach to assessing interest in life safety, social dangers and the development of an innovative society. The methodology is to use the online resources of the Google Trends search engine, which allows you to determine the interest of Google users and target groups in the specified topics, analyze search activity in a certain direction, track trends on certain topics in certain periods of time. The assessment was carried out from 2004 to the present of search activity on the topics “life safety” and “social dangers” in the Ukrainian language in Ukraine, which has a stable growth, especially in the last three years of martial law, with regard to social dangers, interest has a low volatility. Interest in the topic of social dangers and innovative society in English in the world is steadily growing, a list of leading countries is highlighted. The applied modern information online search resource Google Trends is effective and practical in use for determining interest and assessing interest in the topics of life safety, social dangers, issues of development of innovative society and other relevant topics. The novelty lies in the further development of comparative analysis of different topics over a long period of measuring trends in different regions and countries in different languages.

Keywords: life safety, innovative society, social dangers, Google Trends, assessment of interest

Author Contributions

The authors performed the work independently.

Disclosure Statement

The authors have no competing financial, professional, or personal interests from other parties.

INTRODUCTION

The increasing level of interest in the issue of life safety is relevant in accordance with the growing risks in the world. Gradually, all countries of the world carefully measure risks in various spheres of life. Martial law and the increase in global risks pose new tasks for researchers to determine the directions, methods, and technologies for assessing life safety. The analysis of foreign and domestic scientific sources shows that innovative approaches are actively being introduced into educational practice (Holomb, L., Rogachevskyi, O., Karbovanets, O., Senkevych, O., & Vivsyanuk, V., 2022). Employers should play a more active role in shaping educational programs, as is customary in leading countries of the world, to ensure the safety of life. It is further proposed (Hothersall E. J., Mahrlamova K., 2023) to consider the opportunities that will be created in the future and will contribute to the development of an innovative society to enhance life safety, prevent the formation of harmful habits, and integrate into the global educational and scientific community. Based on the results of a joint

study (collective monograph, 2024), scientists summarized the interdisciplinary aspects of the innovative development of society in the context of the phenomenon of permanent crisis, which can be chosen as a basis for further research by the author of current trends in social security transformations arising from changes in global risks and paradigms of innovative development.

THEORETICAL REVIEW

The use of tools to assess the level of interest in certain topics, in particular, innovations using the Google Trends search engine through queries in different languages is presented in the study of a group of authors ((Kliuiev O. and co-author., 2020). Interest was shown in the terms: innovations, startups, innovative entrepreneurship, business incubator. It is shown that the Google Trends search engine has broad opportunities for determining the level of user interest in the main trends in the economy and other areas of public life. A similar approach was used by the author (Pyvovarov O., 2025) to determine the level of interest in the topics of social risks, gaming addiction, life safety, which was characterized by high volatility with an increase in the level in the last two years. According to the results of the analysis of data from the Google Trends search resource for the studied period, there is a certain affinity and unidirectionality of trends in the level of interest in the indicated topics.

The use of neural networks is effective for assessing risk and hazards (Pukala R., 2016). A wide generalized list of innovative methods for risk management is presented in another study using the example of startups (Pukala R., 2021).

The need for the development of new tools has been identified by a group of researchers (Parish, S.T., Aschner, M., Casey, W., Corvaro, M., Embry, M.R., ... & Boobis, A., 2020) who aim to increase the capacity to test pharmaceuticals and other chemicals for potential adverse effects on human health and the environment to ensure the safety of life based on scientific information presented in scientific reports on toxicity testing and risk assessment. To enhance the search for innovative approaches, this multi-stakeholder group of industry, academic and regulatory experts has developed a framework that presents a consistent set of criteria that are universal across all initiatives. The aim of this framework is to support greater coherence between existing and future initiatives by providing a framework for collecting relevant information to build confidence that will accelerate, facilitate and encourage the development of new tools that can ultimately be used in appropriate regulatory contexts.

In other areas of safety assurance life, which is multifaceted, governments can take the initiative by clarifying that expectations for occupational health and safety extend to threats in other areas (Recommendations, 2025) and local governments can use their innovative power to reform their procurement processes for social benefit with the application of ESG factors.

The editorial (Petrova M. & Pukala R., 2024) noted the relevance of creating a space for discussions and information exchange, creating systems for making management decisions in conditions of uncertainty, risk, danger, instability and crisis to ensure the implementation of sustainable and viable innovation projects.

Polish researchers (Keplin, J., Pruchniak, J., & Bluhm, M., 2024) presented the results of a study on the implementation of an innovative approach to assessing life safety based on the SafeTy program, which is a tool for exchanging information and identifying threats to public safety and order. In Poland, there are innovative tools that force relevant services to respond in the field of public safety and order. The spatial analysis of the distribution of local threats itself focused on the development of threat maps. Thanks to technical development, spatial autocorrelation appeared, which is used by the SafeTy application. It allows you to visualize areas of concentration of threats in local space or their absence.

The article (Faber, M.H., Smrensen, J.D., & Vrouwenvelder, A.C.W.M., 2015) addresses the issue of the appropriate choice of metrics for assessing risks related to life safety and health in a regulatory context, taking into account the impact of temporal and spatial scales for their consistent quantification and comparison across different societal sectors, industries and applications, which remains relevant

given the constant change in criteria and factors. The typical averaging of individual risks over time and space can negatively affect the effectiveness of the assessment of activities and applied technologies, requiring researchers of the application of various methods of measuring risks, as well as the search for innovative approaches.

The development of directions and methods of social protection to ensure life security is often carried out through social insurance instruments (Vnukova N.M., Kuzminchuk N.V., 2020), which should be strengthened.

The purpose of the article is to use an innovative approach to assessing interest in life security, social dangers and the development of an innovative society.

METHODOLOGY

To conduct a study on the search for innovative approaches to risk assessment to ensure life safety in an innovative society through assessing the awareness of subjects on these issues, information resources of the online search engine Google Trends were used, which allows you to determine the interests of Google users and target groups, analyze search activity in a certain direction, track trends, and estimate the number of queries in Google from different regions of the world for certain keywords and topics in certain periods of time [Google Trends]. The priority feature of Google Trends is to provide users with both quantitative and qualitative queries. The level of requests is measured in relation to the total mass of queries in Google for different countries and their regions, which allows you to isolate the international component of queries from the state of interest in the development of an innovative society. The author (Pyvovarov O., 2023, 2025) used the Google Trends search resource to determine interest in medical education, social dangers in the context of health care. Taking into account the fluid, changing interest in different topics of the study of the level of interest in certain topics, it is possible to assess the demand for the topics of life safety, social security and innovative society using modern innovative Google technologies, in particular Google Trends tools. This study was carried out using a comparative analysis of search queries in Ukraine for the topics of life safety, social dangers and innovative society for the entire period of recording queries since 2004 in both Ukrainian and English.

RESULTS AND DISCUSSION

At the first stage of the research and analysis, the words “life safety”, “social dangers” in Ukrainian were used for the period from 2004 to 2025 (June 1), which are provided by the Google Trends system, as shown in Fig. 1.

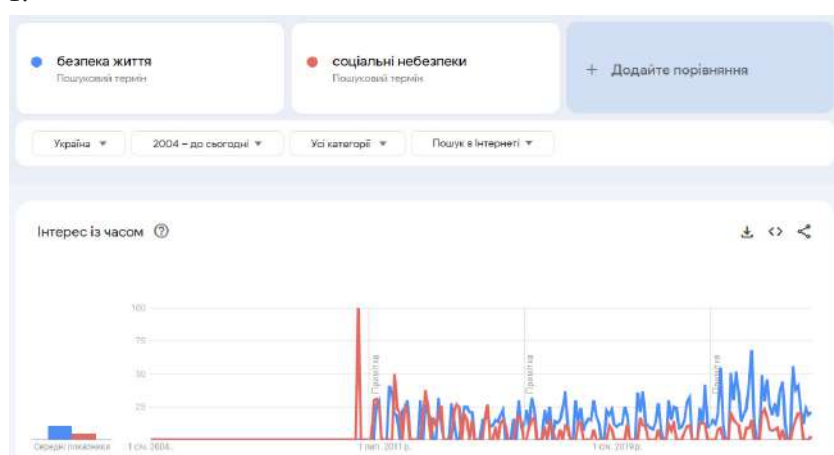


Fig.1 Dynamics of queries on the topics «life safety» and «social dangers» in Ukraine in the Ukrainian language since 2004

Source: created by the authors

As can be seen from Fig. 1, the average trend of interest in the topic of life safety tends to increase on average from 25 points at the beginning of the period to 50 at the end of the selected period, especially in the last years of martial law in Ukraine. Meanwhile, it became statistically significant for queries only after 2010 during the period of information collection. The demand for the topic of social dangers is volatile, but almost does not change around the average, which requires additional research.

Fig. 2 shows the regional distribution of interest in the topics of life safety and social dangers in Ukraine, provided by Google Trends.



Fig. 2. Regional distribution of topics of life safety (blue field) and «social dangers» (red field) on the date of the query (June 1, 2025) in dynamics since 2004
Source: created by the authors

As can be seen from Fig. 2., interest in life safety is observed throughout the territory of Ukraine, regions are highlighted where Google users, along with high demand for this topic, are also highlighted in terms of demand for the topic of social dangers, these are the leaders - Khmelnytskyi, Zaporizhia and Kirovohrad regions.

Regarding further analysis, the author set the task of determining the level of interest for comparison specifically with the topic of “social dangers” (“social dangers”) in the world, which was carried out in English for the period since 2004, as well as the topic of “innovative society”. The search results are given in Fig. 3.

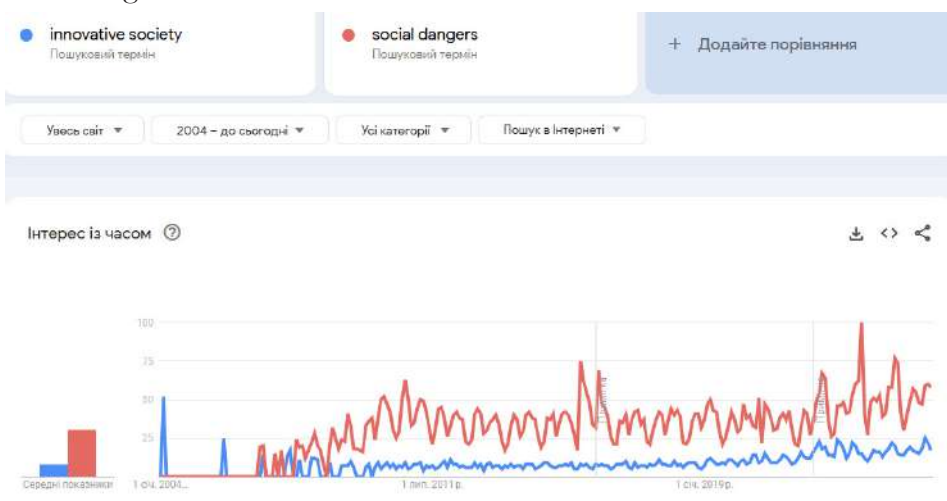


Fig.3. Dynamics of queries on the topics of “social dangers” and “innovative society” in the world in English since 2004

Source: created by the authors

As can be seen from Fig. 3, interest in the topic of social dangers in the world, unlike Ukraine, is growing rapidly, reaching peak values of 100 points in recent years, which requires additional research into the factors of influence. Against the background of the growth of general social anxiety, which can negatively affect the implementation of innovations, most likely a slowing process is taking place, but the topic of an innovative society (“innovative society”) still has a slow, stable trend towards growth, especially in the last three years.

Analysis of search queries for “innovative society” in English showed that the highest interest in this topic over the entire observation period was in the Philippines, Nepal and Kenya. 52 countries were included in the statistically significant ones. Ukraine is on the 37th place in the ranking, which is a certain result that needs to be further studied and developed. Regarding social dangers, the leaders in terms of the level of queries in English are South Africa, France and the United Kingdom, and Ukraine is next to Kazakhstan, Italy and Turkey in terms of demand for this topic.

By user groups, a certain contradiction is caused by the group associated with computers and electronics, which is almost not interested in the topic of an innovative society, but is highly interested in social dangers. It is possible that for these groups there could be a high correlation between the topics, which turned out to be the opposite.

Considering that Poland was among the countries where the topic of social dangers is statistically significant, therefore, for comparison, an analysis of the level of interest in the specified topics of social dangers, innovative society and life safety in Polish and social dangers in English in this country was carried out. The results of the dynamics of requests, starting from 2004 for Poland are presented in Fig. 4.

As can be seen from Fig. 4, interest in the specified topics in Poland is statistically significant, volatile without pronounced trends, at a low level. The largest number of requests is on the topic of “innovative society”, which is promising in terms of emphasis on the relevance of the topic. There are certain differences in regional distribution. The leader for all topics together is the Opole Voivodeship, but the topic of innovative society is statistically highlighted in the metropolitan Masovian Voivodeship, where state policy is formed, the topic of social dangers in Polish is more pronounced on the border with Ukraine in the Precarpathian Voivodeship, and social dangers in English in the central Kuyavian-Pomeranian and Masovian Voivodeships, and the leadership in queries for the topic of “danger to life” is in the Podlaskie and Lublin Voivodeships. In general, the priority for all the indicated topics covers all 16 voivodeships of Poland.

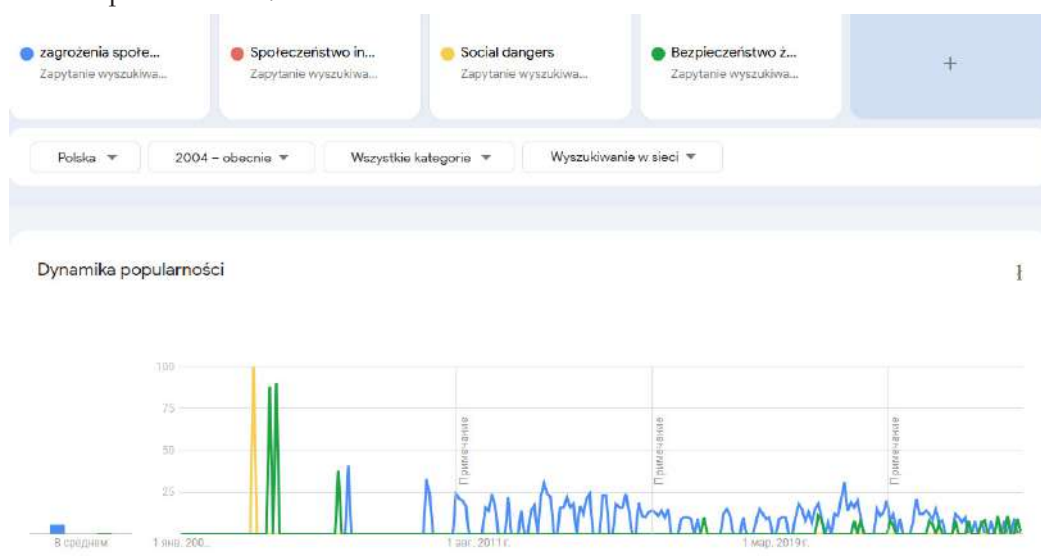


Fig. 4. Dynamics of queries on the topics of “social dangers”, “innovative society”, “life safety” in Polish and English in Poland since 2004

Source: created by the authors

The applied innovative approach allows to quickly identify the topics that are in the greatest demand in society, especially in terms of territorial priority, and further to shape the directions of innovation and social policy in the country. A similar assessment can be carried out in other EU countries both for comparative analysis and for joint actions. It is also possible to investigate the level of interest in the specified or other topics in cross-border regions, in particular, Poland and Ukraine.

The assessments conducted showed that there is a certain basis for the development of topics related to life safety, social dangers and an innovative society, which should create a basis for the development of modern approaches to ensuring security. Meanwhile, the level of their perception by those who live in Ukraine and in the world is different, which requires further research. The proposed innovative approach based on the use of modern information capabilities of search engines allows you to quickly investigate changes occurring in different regions of the world, compare them, and develop solutions to improve life safety.

CONCLUSIONS

The applied modern information tool online search resource Google Trends is attractive and practical to use for determining interest and assessing interest in life safety, social dangers, issues of development of innovative society and other topical topics. The conducted assessments provide the necessary quantitative basis for analysis. The goal of the study of using an innovative approach to assessing interest in certain topics is presented through its practical application. The approach has received further development in terms of comparative analysis from different spheres and industries of research over a long period of measurement in different regions and countries in different languages.

The article summarizes the interdisciplinary aspects of innovative development of society through the security component, the assessment of interest in which was measured by an online search resource taking into account the context of global crises. It is possible to clearly discuss the main modern trends of social security transformations. The applied innovative approach can determine a new dimension of modern social security processes of life.

Further research will focus on deepening the search for factors that influenced the identified multidirectional trends and additional analysis of topics related to life safety, which provides the opportunity to conduct online searches using Google and other modern information resources.

REFERENCES

- Faber, M.H., Sørensen, J.D., & Vrouwenvelder, A.C.W.M. (2015). On the regulation of life safety risk. 12th International Conference on Applications of Statistics and Probability in Civil Engineering, ICASP12 Vancouver, Canada, July 12-15. <https://open.library.ubc.ca/media/stream/pdf/53032/1.0076169/3>.
- Holomb, L., Rogachevskiy, O., Karbovanets, O., Senkevych, O., Vivsyannuk, V. (2022). Modernization of theoretical and practical aspects of the development of higher medical education in Ukraine. *Amazonia Investiga*, 11(55), 163–171. <https://doi.org/10.34069/AI/2022.55.07.17>.
- Hothersall, E. J., Mahrlamova, K. (2023). The future of medical education in Ukraine: making opportunities to modernise. Publishing House «Baltija Publishing». P. 28-30. <https://doi.org/10.30525/978-9934-26-318-7-9>.
- Як користуватися сервісом Google Trends? <https://adwservice.com.ua/uk/yak-korystuvatysya-servisom-google-trends>.
- Keplin, J., Pruchniak, J., & Bluhm, M. (2024). Identyfikacja zagrożeń bezpieczeństwa i porządku publicznego na poziomie gminy przy wykorzystaniu aplikacji mobilnej SafeTy. *Przegląd Policyjny*, 152, 72-93. <https://doi.org/10.5604/01.3001.0054.3597> [in Polish].
- Kliuiev, O., Vnukova, N., Hlibko, S., Brynza, N., Davydenko, D. (2020). Estimation of the Level of Interest and Modeling of the Topic of Innovation Through Search in Google In: *Proceedings of the 4th International*

- Conference on Computational Linguistics and Intelligent Systems*, 23-24 April, COLINS. Pp. 523-535. <http://repository.hneu.edu.ua/handle/123456789/23306>.
- Parish, S.T., Aschner, M., Casey, W., Corvaro, M., Embry, M.R., Fitzpatrick, S., ... & Boobis, A. (2020). An evaluation framework for new approach methodologies (NAMs) for human health safety assessment. *Regulatory Toxicology and Pharmacology*, 112, 104592. <https://www.sciencedirect.com/science/article/pii/S0273230020300180> <https://doi.org/10.1016/j.yrtph.2020.104592>.
- Petrova, M., Pukala, R. (2024). Editorial. *ACCESS Journal: Access to Science, Business, Innovation in Digital Economy*, 5(1), 5-6. [https://doi.org/10.46656/access.2024.5.1\(0\)](https://doi.org/10.46656/access.2024.5.1(0)).
- Pukala, R. (2016). Use of neural networks in risk assessment and optimization of insurance cover in innovative enterprises, *Engineering Management in Production and Services*, Vol. 8, Issue 3, 43 – 56. <https://doi.org/10.1515/emj-2016-0023>.
- Pukala, R. (2021). Ubezpieczenia w zarządzaniu ryzykiem start-upów, CeDeWu, Warszawa. 312 p. <https://cedewu.pl/Ubezpieczenie-w-finansowaniu-skutkow-ryzyka-start-upow-p2973?pdf=#> [in Polish].
- Pyvovarov, O.V. (2025). Zakhyst vid sotsialnykh ryzykiv v aspekti zdoroviazberezhennia ta bezpeky zhyttia. *Tsyvilnyi zakhyst v umovakh viiny*: zbirnyk tez dopovidei I Mizhnarodnoi naukovopraktychnoi konferentsii. (Lviv, 17-18 kvit., 2025 roku). Lviv: LDU BZhD, 241-243. <https://repo.knmu.edu.ua/handle/123456789/36151> [in Ukrainian].
- Pyvovarov, O.V. (2023). Otsiniuvannia zasobamy GOOGLE zatsikavlenosti medychnoi osvitoiu. *Zabezpechennia yakosti osvity u vyshchii medychnii shkoli*: naukovometodychna mizhuniversitytetska konferentsiia z mizhnarodnoi uchastiu. (Odesa, 18-20 sich. 2023 roku) / za red. V.H. Marichereda. Odesa: ONMedU, 640-642. <http://repo.knmu.edu.ua/handle/123456789/32320> [in Ukrainian].
- Saving Lives Beyond (2025). Taking Further Steps Recommendations of the Academic Expert Group for the 4th Global Ministerial Conference on Road Safety *Commissioned by the Swedish Transport Administration* January R. 84 <https://www.diva-portal.org/smash/get/diva2:1936696/FULLTEXT01.pdf>.
- The Paradigm of Innovative Development in the Conditions of Permanent Crisis (2024). *Collective monograph* / edited by Carmen Jambrino Maldonado, Grygoriy Starchenko, Tetiana Stroiko. Universidad de Málaga. Málaga – Chernihiv: REICST, 280 p. I: <https://doi.org/10.54929/monograph-12-2024>.
- Vnukova, N.M., Kuzmynchuk, N.V. (2004). Sotsialne strakhuvannia: konspekt lektsii. Kharkiv: Vyd-vo KhDEU. 216 p. [in Ukrainian].

ІННОВАЦІЙНИЙ ПІДХІД ДО ОЦІНЮВАННЯ ЗАЦІКАВЛЕНOSTІ БЕЗПЕКОЮ ЖИТТЯ

Анотація. Зростаючі ризики у світі впливають на збільшення рівня інтересу до питання безпеки життя та інших небезпек. Воєнний стан в країні і збільшення глобальних ризиків висуває перед дослідниками нові завдання із вимірювання складових визначення безпеки життя. Мета спрямована на використання інноваційного підходу до оцінки зацікавленості безпекою життя, соціальними небезпеками та розвитком інноваційного суспільства. Методологію є використання он-лайн ресурсів пошукової системи Google Trends, яка дозволяє визначити зацікавлення користувачів Google та цільових груп зазначеними темами, проаналізувати пошукову активність у визначеному напрямі, відстежити тренди за певними темами у визначені періоди часу. Оцінювання здійснено з 2004 року до теперішнього часу пошукової активності щодо тем «безпека життя» та «соціальні небезпеки» українською мовою в Україні, яка має стабільне зростання особливо в останні три роки воєнного стану, щодо соціальних небезпек зацікавленість має низький волатильний характер. Зацікавленість темою соціальних небезпек і інноваційного суспільства англійською мовою у світі є стабільно зростаючою. Виділено перелік країн лідерів. Застосований сучасний інформаційний он-лайн пошуковий ресурс Google Trends є ефективним і практичним у користуванні для визначення інтересу та оцінки зацікавленості темами безпеки життя, соціальних небезпек, питанням розвитку інноваційного суспільства та інших актуальних тем. Новизна полягає у подальшому розвитку порівняльного аналізу різних тем довгому періоді вимірювання трендів у різних регіонах і країнах різними мовами.

Ключові слова: безпека життя, інноваційне суспільство, соціальні небезпеки, Google Trends, оцінка зацікавленості

INNOVATIVE APPROACH TO ASSESSING INTEREST IN LIFE SAFETY

Abstract. Growing risks in the world affect the increase in the level of interest in the issue of life safety and other dangers. Martial law in the country and the increase in global risks pose new tasks for researchers to measure the components of determining life safety. The goal is to use an innovative approach to assessing interest in life safety, social dangers and the development of an innovative society. The methodology is to use the online resources of the Google Trends search engine, which allows you to determine the interest of Google users and target groups in the specified topics, analyze search activity in a certain direction, track trends on certain topics in certain periods of time. The assessment was carried out from 2004 to the present time of search activity on the topics “life safety” and “social dangers” in the Ukrainian language in Ukraine, which has a stable growth especially in the last three years of martial law, interest in social dangers has a low volatility. Interest in the topic of social dangers and innovative society in English in the world is steadily growing, a list of leading countries is highlighted. The applied modern information online search resource Google Trends is effective and practical in use for determining interest and assessing interest in the topics of life safety, social dangers, issues of development of innovative society and other relevant topics. The novelty lies in the further development of comparative analysis of different topics over a long period of measuring trends in different regions and countries in different languages.

Keywords: life safety, innovative society, social dangers, Google Trends, assessment of interest

Reference to the article: Pukala, R., Pyvovarov, O. (2025). An innovative approach to assessing interest in life safety. *Law and Innovative Society*, 1(24), 47-54. doi: [https://doi.org/10.37772/2309-9275-2025-1\(24\)-4](https://doi.org/10.37772/2309-9275-2025-1(24)-4).