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Economic analysis of legal support of the One Health policy

Abstract: The One Health (OH) concept aims to balance and integrate the health of humans, animals and ecosystems through six main activities: surveillance, risk assessment and management, policy implementation, governance and coordination of OH sectors. Legal support for this concept should consider the country's socio-economic, organisational and political characteristics. The study object is the legal support of the single health concept. The study subject is the methodological principles of economic analysis of the legal support of the single health policy. The study aims to identify relevant economic analysis methods of the OH's legal support, with regard to international experience. To achieve the purpose of the study and solve the tasks set, the methods of interdisciplinary research, economic and legal analysis, welfare economics, risk analysis, cost and benefit analysis, etc. were used. The use of interdisciplinary research methods, financial and law analytics, risk and cost-benefit analysis is key to the development of effective legal provisions. The discussion focuses on hazard identification and methods of prevention, like on human life value. The conclusions emphasise the importance of developing optimisation models of legal regulation in the OH.

Keywords: economic analysis of law, One Health, cost-benefit analysis, veterinary policy, sustainable development.

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Економічний аналіз правового забезпечення політики Єдиного здоров'я

Анотація: Концепція Єдиного здоров'я (ЄЗ) спрямована на збалансування та оптимізацію здоров'я людей, тварин та екосистем через шість основних напрямків діяльності: відстеження загроз, оцінку і управління ризиками, реалізацію політики, врядування та координацію галузей ЄЗ. Правове забезпечення цієї концепції повинно враховувати соціально-економічну та організаційно-

політичну специфіку країни. Об'єктом дослідження є правове забезпечення концепції єдиного здоров'я. Предметом дослідження є методологічні принципи економічного аналізу правового забезпечення політики єдиного здоров'я. Метою роботи є визначення релевантних методів економічного аналізу правового забезпечення концепції єдиного здоров'я. Для досягнення мети дослідження і вирішення поставлених завдань були використані методи міждисциплінарних досліджень, економіко-правової аналітики, економіки добробуту аналізу ризиків, аналізу витрат і вигід тощо. Використання методів міждисциплінарних досліджень, економіко-правової аналітики, аналізу ризиків та витрат і вигід є ключовим для розробки ефективних правових норм. Дискусія зосереджена на визначенні факторів шкідливого впливу та методів їх запобігання, а також на визначенні цінності людського життя. Висновки підкреслюють важливість формування оптимізаційних моделей правового регулювання ЄЗ.

Ключові слова: економічний аналіз права, Єдине здоров'я, аналіз витрат і вигід, ветеринарна політика, сталий розвиток.

Abbreviation:

AHHME is the Agriculture Human health Micro-Economic model;

AMR is antimicrobial resistance;

DCFTA is deep and comprehensive free trade area;

OH is One Health (concept);

SEGRA is a scientific expert group on risk assessment.

Introduction

As a system of views, the OH concept aims to sustainably balance and optimise human, animal, and ecosystem health. It covers a wide range of goals, methods, and tools, which include six main areas of activity for its implementation: OH threat tracking, OH risk assessment and management, the ability to implement OH policies, and the management and coordination of OH and OH industries.

Legal support for implementing the national OH policy is based not only on generally recognised conceptual norms but also should consider the socio-economic, organisational and political specifics of the country's economic activities. Considering this, the definition of relevant tools for analysing the legal support of the OH concept is of primary significance in developing and implementing rules and regulations for regulating activities in public health, animal health and environmental protection.

The study's object is the legal support of the OH concept.

The study's subject is the methodological principles of economic analysis of the legal support of the OH policy.

The study aims to identify relevant methods of economic analysis of the legal support of the OH concept.

Based on the purpose of the study, the following tasks were set:

- define the conceptual framework of the OH;
- summarise international experience in implementing the OH policy;
- identify promising methods for analysing the legal support of the OH policy.

To achieve the research goal and solve the tasks set, interdisciplinary research methods, economic and legal analytics, welfare economics, risk analysis, cost-benefit analysis, etc., were used.

OH concept

The OH concept is not new; it has only recently acquired a new definition. The understanding that human health, wild and domestic animals, and natural living systems are linked and closely interlinked has existed for centuries (*Evans & Leighton, 2014*). The modern term was preceded by the definition of "Unified Medicine", which was introduced by William Osler (*Dukes, 2000*) and completely reinterpreted by Calvin Schwabe, a veterinarian and parasitologist in public health, who recognised the close systemic interaction of humans and animals in matters of nutrition, life and health (*Cardiff et al, 2008*; *Schwabe, 1984*). In the early 2000s, the term was replaced by OH. Individual initiatives outlined the principles of the OH concept. At the One World, One Health Symposium in 2004, 12 Manhattan principles were adopted that call for recognising the relationship between human, animal, and wildlife health, considering the environmental implications of decisions, integrating wildlife health science into global disease control strategies, limiting wildlife trade, increasing investment in health infrastructure and education, and promoting collaboration between different sectors to preserve biodiversity and improve the health of the planet (*Wildlife Conservation Society, 2004*). These principles were updated at the 2019 Berlin Conference "One Planet, One Health, One Future". The "Berlin Principles of One Health" were approved, which contributed to the revival and systematisation of a concept based on the concepts of ecosystem health and integrity, like solving new problems such as the spread of pathogens, climate change and antimicrobial resistance (*Gruetzmacher et al., 2021*; *WHO…, 2019*).

The term took on a new interpretation after the COVID-19 pandemic, which outlined the need for increased attention to the risks associated with zoonoses for the population, which is complicated by the growing resistance of microorganisms to antimicrobial agents, climate change, migration of wild animals, and reduced biodiversity. The risk of increasing the number of new and recurrent infectious diseases exists not only for humans (and the food supply and economy), but also for the fauna and flora that support the viability of the ecosystem (*Streichert et al., 2022*). A group of independent experts created through the so-called Quadrilateral Partnership on OH with the participation of four international organisations: FAO, WHO (formerly OIE), and the United Nations Environment Programme proposed a new definition of the term (*Mettenleiter et al., 2023*): "One Health is a comprehensive, unifying approach aimed at achieving an optimal level of human, animal and ecosystem health and ensuring a sustainable balance between these three components. This approach recognises the close relationship and interdependence between human health and the health of domestic and wild animals, plants and the environment (including ecosystems). This approach is based on mobilising different sectors, disciplines and communities at different levels of society to work together to strengthen well-being and combat threats to health and ecosystems while simultaneously meeting collective needs for clean water, clean energy sources and clean air, safe and nutritious food, and taking action to combat climate change and promote sustainable development."

A new and essential element in the proposed definition is a clear reference to the methodology and approach that can effectively implement the concept's main objectives.

International regulation

A strategic document that identifies ways to solve global problems at the intersection of the human-animal-ecosystem system is the "Joint Action Plan for One Health", published at the end of 2022 (*FAO…, 2022*). Its goal is to support the implementation of the OH concept at the international level and ensure cooperation between sectors and regions, identify synergies and avoid duplication to improve coordination and mobilise investment to optimise resource use (*Barton Behravesh, 2019*). The proposed approach also meets key needs for achieving the UN Sustainable Development Goals and provides guidelines for policymakers, academics and practitioners. The plan identifies six interdependent areas of action to strengthen health systems, reduce the risk of zoonotic epidemics and pandemics, control and eliminate endemic zoonotic, forgotten tropical and vector-borne diseases, strengthen assessment, management and awareness of risks to food safety, curb the "silent" antimicrobial resistance pandemic, and integrate the environment into an OH. To support the implementation of the joint approach to the implementation of the OH concept at the national level, in December 2023, the Quadrilateral Initiative presented practical recommendations on governance, sector integration and awareness-raising with OH "Guide to Implementing the Joint Action Plan for the Maintenance of One Health at the National Level" (*FAO…, 2023*).

In the policy of the European Union, the OH approach has evolved from its perception exclusively as a link between human and animal health without considering the health of the environment to a direct reference to the OH concept in the European Green Course adopted in 2019 (*European Commission, 2017*). During the transition period, the EU's OH Action Plan against AMR was launched in 2017, which changed approaches to this problem and laid new foundations for its comprehensive solution (*European Commission, 2017*). For the first time, this document introduces a legal definition of the OH concept. It emphasises the need to consider a broad concept that includes environmental factors and defines sustainability as one of the problems to which the OH concept is worth applying.

Following the formal approval of the principles of the OH concept, several policy strategies were introduced within the framework of the European Green course, including the Biodiversity Strategy until 2030 (*European Commission, 2020b*), the Zero Pollution Action Plan (*European Commission, 2021*), the Field-to-Table Strategy (*European Commission, 2020a*), the Chemical Sustainability Strategy (*European Commission, 2020c*) and the Pharmaceutical Strategy for Europe (*European Commission, 2020d*). The latter is directly related to the plan to combat antimicrobial resistance. In addition, the approved policy documents point to other important aspects of "unified health", including pandemic prevention, loss of biodiversity, chemical pollution, and sustainability of food systems. The principles governing EU policy are implemented through legislation. Integrating knowledge from public health, veterinary medicine, ecology, and social sciences is applied to a comprehensive analysis of the legal provision of OH, and collaboration with experts from various fields is used to develop holistic legal strategies. With the development of the concept itself, the normative approach has also changed, reflecting the state of the current public discussion and the way issues are resolved.

Economic analysis of law in forming the National OH Programme

Due to the introduction of administrative and legal norms, forecasting costs and benefits are within the competence of a relatively new area of Interdisciplinary Research-Economic Analysis of law. The economic analysis of law defines a significant difference between politics as a set of goals, methods and tools of purposeful influence on specific aspects of public interaction and the law that monitors compliance with politics. Legal requirements impose certain obligations on individual structures of society that behavioural rationality does not impose. The law forces various structures of society to monitor their activities more closely. They will refrain from taking action when the cost of complying with the law is lower than the benefits of illegal actions, considering the risk of evading responsibility. Formal institutions change behaviour even when the requirements of the law coincide with typical behaviour. Considering the costs of enforcement of legislative norms and the consequences of their implementation, the formation of legal support for policies should be based on obtaining the expected positive effects. Using economic tools for modelling human behaviour and analysing the impact of formal institutions allows us to predict, to a certain extent, the possible costs individuals will be forced to spend due to regulatory norms and the social benefits of such regulation. Such considerations generally justify introducing a mandatory assessment of the regulatory impact (so-called ODS) of adopting regulatory legal acts in a number of developed countries of the world.

The legal support of human and animal health is based on the provisions of the Ukrainian Constitution, the law of Ukraine "Fundamentals of Legislation of Ukraine on Health Protection" dated November 19, 1992, the law of Ukraine on the public health system dated September 06, 2022, No. 2573-IX, and the law of Ukraine "On Veterinary Medicine" dated February 04, 2021.

The fundamentals of Ukraine's healthcare legislation establish the legal, organisational, economic, and social principles of healthcare in Ukraine. The law aims to eliminate factors that negatively affect health, prevent and reduce morbidity, disability, and mortality, and improve heredity.

The law on the public health system establishes the legal, organisational, economic and social foundations for the functioning of the public health system in Ukraine. Its goal is to promote public health, prevent diseases, improve quality and increase life expectancy. The law regulates public relations in public health and sanitary and epidemic well-being, defines the rights and obligations of state bodies, local self-government, legal entities and individuals in this area, and also establishes the legal and organisational basis for state supervision (control) in areas of economic activity that may threaten the sanitary and epidemic well-being of the population.

The Law on Veterinary Medicine defines the legal and organisational basis for activities in animal health protection and welfare, veterinary practice, production, circulation, and use of veterinary drugs (including antimicrobial agents), including the circulation of animal by-products.

Despite the stated goals, legal support tools and methods do not always have an optimal structure due to the likelihood of incorrect estimates of costs and benefits from the introduction of administrative regulations. Restrictions and barriers in the form of mandatory licensing, certification, sanitary standards, hygiene requirements, and the establishment of maximum

permissible standards for pollutants usually restrain business activity and shift significant costs to society, limiting competition and incentives for economic growth.

The RIA applies as a criterion the introduction of administrative regulations regulating the ratio of direct regulatory costs and the public benefits from preventive tools to prevent possible harm.

From the point of view of the economic analysis of law, it is necessary to single out cases when, under any conditions, there will be a threat to people's lives. This concerns preventing and treating diseases, particularly infectious diseases common to humans and animals. An example is the recent events related to the COVID-19 pandemic, when at the beginning of the virus circulation, the risk to the life and health of the general population was high, and the available vaccines did not pass large-scale and comprehensive testing.

More complex cases for analysis will be those associated with excessive overestimation of individual parameters of the OH system. This can apply to both the parameters of the OH's final goals and intermediate (instrumental) goals. The goals of stimulating the development of certain branches of agricultural production may contradict the goals of ensuring environmental protection and Environmental Protection. Another example is excessive attention to the value of human life, such as treating rare genetic diseases, which requires excessive expenditure of limited resources. These resources are usually reallocated from other OH programmes, which in poor countries can significantly reduce the social level of society and, for example, become a factor in the spread of other diseases (tuberculosis, helminthiasis, etc.).

The third significant problem of direct regulation is the incorrect selection of tools that do not ensure the implementation of goals or contradict them. This situation will almost always arise in the context of the spread of rent-oriented behaviour, lobbying, political entrepreneurship and corruption. It should be noted that the lack of clearly defined and theoretically justified methodological tools for forming administrative and legal support can encourage the development of irrelevant legal norms or the import of formal institutions.

The world experience of Applied Analysis of legal support for human and animal health protection has formed several descriptive, predictive and normative models. An example is the AHHME model, which allows you to calculate the cost-benefit ratio (in terms of human health) and cost-benefit ratio (in terms of the agricultural sector, labour productivity, and health care costs) of any interventions during the maintenance of productive animals (*Emes et al., 2023*). This toolkit also contains epidemiological models for humans and productive animals based on polygamous models using differential equations to model the transition between health conditions. A significant element is the adaptation of models to specific conditions, using regional demographic, production, economic and epidemiological data and considering the political context and local priorities. A holistic understanding of the problem contributes to an informed choice of administrative and legal regulation tools.

Legal support of environmental protection and environmental protection is based on the provisions of the Constitution of Ukraine, laws of Ukraine on Environmental Protection of 25.06.1991 № 1264-xii, on flora dated April 09, 1999, No. 591-XIV, on fauna dated December 13, 2001, No. 2894-III defines relations in protection, use and reproduction of the animal world, on the protection of animals from ill-treatment dated February 21, 2006, No. 3447-IV, which are aimed at regulating relations in the field of protection, use and reproduction of natural

resources, ensuring environmental safety, preventing and eliminating the negative impact of economic and other activities on the environment, preserving natural resources, the genetic fund of wildlife, landscapes and other natural complexes, unique territories and natural objects related to historical and cultural heritage.

This area of analysis requires an assessment of legal norms and the legal decision-making process from the point of view of economic efficiency. This case is characterised by a broad interpretation of the efficiency criterion from the strict definition of V. Pareto to the Kaldor-Hicks criteria and Tibor de Scitovsky's double criterion. The latter determines changes in the welfare of society as a result of the implementation of state environmental policy measures effective if the benefits from the increase in the welfare of those who won exceed the losses in the welfare of those who lost, as well as additional analysis in the opposite direction in the case of applying the double Skitovsky criterion.

Such a broad interpretation of the effectiveness criterion forms the appropriate field of research. The analysis of available publications allows us to identify many methodological problems that either continue Coaseэs research to a certain extent or are within the framework of the subject problem of the theory of Public Choice. These include ways of market transactions for the effective distribution of property rights, opportunities for internalisation of environmental externalities, conditions and methods of unitisation for the limited use of public resources, methods of environmental sanctions by society and promotion of environmental values, as well as analysis of political feasibility in the context of the established organisational and political structure of society (*Heyes, 2001*).

Modern research pays special attention to the applied aspects of environmental protection and the ability of economists and lawyers to influence regulatory policies, tools, and methods. Among such methods, the right of environmental responsibility is distinguished as a particular system of rules that determine the conditions and amounts of compensation for losses caused by externalities. Thus, from the viewpoint of welfare economics, the law of environmental responsibility aims to internalise external effects (*Labenko, 2023*).

The economic analysis of law defines three regimes of Environmental Responsibility: economic, administrative and criminal. According to the principles of ODS, the criterion for choosing tools (Coase negotiations, taxes and fees for Pigou, fines and lawsuits, criminal proceedings) is to minimise public costs associated with applying legal norms. Developing optimisation models of social punishments should include quantitative and qualitative parameters, environmental uncertainty and risk, and monetary and non-monetary sanctions. Environmental uncertainty and risk are divided according to the principles of ex-ante and ex-post. In the first case, the risk of origin (generation risk), due to the uncertainty of pollution parameters due to an environmental incident, and the risk of Impact (impact risk), are introduced separately due to the uncertainty of environmental consequences. The second case is characterised by the complexity of determining strict causal relationships between an environmental incident and environmental damage (*Bartsch, 1998*; *Endres & Rübbelke, 2022*; *Siebert, 1998*).

Unitising and internalising environmental externalities requires significant transaction costs, and their organisation is a commodity of public consumption. That is why the choice of legal regulation tools must meet the criteria of economic efficiency (feasibility, awareness, stability of

the balance, long-term nature of the formed incentives, etc.). The application of environmental liability law allows managing two types of environmental externalities and using the tools of court decisions to shift environmental costs to the culprit. However, in the case of established (regular) environmental externalities, the transaction costs of legal regulation may be high (*Siebert, 1998*).

Environmental responsibility law regimes are defined using the following characteristics:

- liability rules, which include negligence-based liability and strict liability;
- the scope of liability, which includes the definition of potentially dangerous activities that fall under the liability regime, like the legal definition of the losses caused by them that must be compensated;
- legal identification of the responsible person (operator), which can be the company's owner, the "parent" corporation, or credit institutions (borrowers).

Legal support for food safety

In 2014, with the signing of the DCFTA agreement with the EU, Ukraine began modernising the food safety system, committing to bring its legislation closer to EU requirements. Legal support of food safety is implemented through the introduction of the laws of Ukraine "On Fundamental Principles and Requirements for Food Safety and Quality", "On State Control over Compliance with Legislation on Food Products, Feed, Animal By-Products, Animal Health and Welfare", "On Information for Consumers Regarding Food Products", "On Basic Principles and Requirements for Organic Production, Handling and Labelling of Organic Products", and other regulatory legal acts.

The law of Ukraine "On Basic Principles and Requirements for Food Safety and Quality" has the ultimate goal of protecting the life, health and interests of consumers and defines ways to achieve this goal based on the principle "from field to table" and declares the application of necessary measures based on risk assessment, based on existing scientific justifications, international standards, instructions or recommendations. Suppose international standards, instructions or recommendations are absent or insufficient. In that case, measures are developed based on risk assessment, according to the methods established by international organisations, and should be based on the principles of independence and objectivity.

Coordinating work on conducting an independent, objective, transparent, scientific risk assessment is provided by an independent structural division of the competent Food Safety Authority (Derzhprodspozhivsluzhby) – the risk assessment sector. The sector initiates the formation of SEGRA of hazards in the food chain to provide scientific and technical support in the form of a report indicating conclusions and recommendations for managing identified risks for decision-making by risk managers of the competent authority. The risk assessment results can be qualitative or quantitative, depending on the available resources (time, data, etc.), and must necessarily include an explanation of the sources of uncertainty. Conducting a risk assessment allows you to get information for making informed decisions on risk management at the level of state authorities on the formation of administrative and legal tools.

Since the responsibility for food safety is assigned to market operators, including through the obligation to implement management systems based on the hazard analysis principles, according to the ex-ante regulatory principle, entrepreneurs are responsible for compliance with the provisions of current regulations and minimising risks on their initiative. The final result

depends on the manufacturer's competence, desire and ability to comply with current requirements. Risk management decisions are based on enterprise-specific conditions based on hazard analysis. However, quantifying risks requires the manufacturer to collect and analyse significant amounts of data, which is almost impossible, so companies can rely on government agencies, international bodies, or trade organisations that can provide data such as dose-response dependence, baseline levels of pathogen prevalence, toxicity and other adverse effects of food contaminants, consumption patterns, and consumer demographics. These general data can be combined with data about a specific product or enterprise, such as ingredient sources, processing parameters, distribution systems, and product expiration date, to obtain a risk assessment that supports the development of hazard analysis systems (*Buchanan & Whiting, 1998*). The hazard analysis determines control measures necessary to prevent contamination, unacceptable increase in pollutants or their reduction to acceptable levels.

Methodological problems of optimising the legal support of the unified health policy

The excess of information costs over the benefits of applying regulatory norms while at the same time, a low level of compliance with legislation is one of the key problems in the formation of optimisation models in the economic analysis of administrative law in general and the economic analysis of the legal support of OH policy in particular.

The main focus of such models should be on the incentives of participants in legal regulation, namely, the violator chooses the commission of an offence, victims – regarding the filing of complaints, and administrative authorities – regarding the consideration of cases. The low cost of filing complaints and the obligation of administrative authorities to respond to each complaint increases the number of open cases and reduces the likelihood of punishment in the event of significant damage to OH.

Discussion

Further areas of interdisciplinary research on the legal support of the unified health policy will be the determination of circumstances and factors of harmful impact on the OH system, criteria for their detection, and the search for optimal methods and tools for their prevention. Identifying obstacles to implementing the OH policy and ways to overcome them can be the subject of Applied Analysis to ensure the OH policy. Also debatable are the ways of adapting formal institutions of developed countries in countries that are reforming the system of social, organisational, political and socio-economic interaction.

Defining the value of human life and forming the unified health policy's normative target function requires a wider range of specialists in general philosophical, social, political, economic, biological, environmental, and veterinary areas. This will allow for a more relevant determination of all the value parameters and establish relationships between them.

Conclusion

The methodological principles of economic analysis of the legal support of EU policy formulated by us can form optimisation models of administrative and Legal Regulation methods that will ensure the minimisation of public costs in implementing target priorities. Using methods and tools for cost-benefit analysis allows us to attract qualitative influence parameters and consider the National specifics of public interaction.

In this context, it is worth noting that state failures can be overcome in countries that are reforming the system of public interaction through the active formation of public control structures (consumer protection societies, trade unions of doctors, veterinarians, environmentalists, public organisations for Environmental Protection, etc.). This will allow for continuous public monitoring of compliance with EU principles.

Conflict of interest

The authors declare that there is no conflict of interest.

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