LEGAL SECURITY AND PUBLIC HEALTH: THE ROLE OF THE PLITHOGENIC IADOV METHOD IN THE FORMULATION OF A PENAL REFORM PROPOSAL IN ECUADOR

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ABSTRACT
This research aimed to craft a legislative proposal to amend Ecuador's Comprehensive Organic Criminal Code, with the dual purpose of classifying crimes against public health and safeguarding the right to legal security. To accomplish this goal, the study undertook an extensive bibliographic review alongside a comparative legal analysis of statutes from other jurisdictions, seeking to identify deficiencies and potential improvements in the current criminal legislation. The bibliographic review offered a comprehensive understanding of Ecuador's existing legal framework and the multifaceted challenges it faces regarding public health offenses. Concurrently, the comparative examination facilitated the exploration of successful legislative models and approaches adopted by countries with similar legal systems. By synthesizing insights from both the literature and comparative law analysis, the research was able to formulate a draft bill designed to close existing legal gaps and establish explicit norms aimed at effectively addressing crimes against public health. The proposed legislative framework was subsequently validated using the Plithogenic IADOV method, which fostered an inclusive dialogue among experts in law, public health, civil society organizations, and governmental authorities. This methodological approach not only ensured the robustness of the proposal but also enriched it through diverse perspectives. The primary conclusions drawn from this study suggest that the proposed draft bill marks a significant advancement in the protection of public health and the assurance of legal security during health crises. The careful classification of crimes against public health, coupled with the establishment of proportionate sanctions, emerges as a crucial strategy for confronting potential future pandemics. Moreover, these measures underscore the importance of maintaining citizens' rights and legal integrity in the face of emerging public health challenges.

KEYWORDS: Draft bill; legal security; IADOV method; sanctions, citizens' rights.

MSC: 03B52, 91D10, 68T37, 93A30, 62P25

RESUMEN
Esta investigación tuvo como objetivo elaborar un proyecto de ley para enmendar el Código Orgánico Integral Penal de Ecuador, con el fin de tipificar los delitos contra la salud pública y garantizar el derecho a la seguridad jurídica. Para alcanzar esta meta, se llevó a cabo una exhaustiva revisión bibliográfica junto con un análisis comparativo de la legislación de otros países, con el propósito de detectar deficiencias y oportunidades de mejora en la normativa penal vigente. La revisión bibliográfica proporcionó una visión integral del marco legal existente en Ecuador y de los complejos desafíos que enfrenta en materia de delitos contra la salud pública. Simultáneamente, el análisis comparativo permitió explorar modelos legislativos exitosos y enfoques adoptados por naciones con sistemas jurídicos afines. La integración de los conocimientos extraídos tanto de la literatura como del estudio comparativo posibilitó la formulación de un proyecto de ley diseñado para subsanar vacíos legales y establecer normas claras orientadas a enfrentar eficazmente los delitos contra la salud pública. Posteriormente, la propuesta legislativa fue validada mediante el método Plitogénico IADOV, creando un espacio de diálogo inclusivo entre expertos en derecho, salud pública, organizaciones de la sociedad civil y autoridades gubernamentales. Este enfoque metodológico no solo aseguró la solidez del proyecto, sino que también lo enriqueció con perspectivas diversas. Las principales conclusiones de este estudio indican que el proyecto de ley propuesto representa un avance significativo en la protección de la salud pública y en la garantía de la seguridad jurídica durante crisis sanitarias. La minuciosa clasificación de los delitos contra la salud pública, junto con el establecimiento de sanciones proporcionales, se revela como una estrategia fundamental para enfrentar futuras pandemias. Además, estas medidas subrayan la importancia de preservar los derechos de los ciudadanos y la integridad jurídica frente a los desafíos emergentes en el ámbito de la salud.
PALABRAS CLAVE: Proyecto de ley; seguridad jurídica; método IADOV; sanciones; derechos de los ciudadanos.

1. INTRODUCTION

The study embarks on a critical examination of the electronic voting process through the innovative lens of the neutrosophic Delphi method, a subject that resonates deeply in contemporary discussions about democratic integrity. Given the increasing reliance on digital platforms for electoral procedures, understanding the uncertainties and subjective nuances behind voter perceptions has become paramount. The significance of this research lies not only in its technical contributions but also in its potential to inform policy decisions that shape electoral trust and security [1]. Through this exploration, the research addresses a gap in existing literature, blending advanced mathematical frameworks with the human elements of decision-making.

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Historically, the evolution of voting systems from manual to digital forms reflects a broader technological and social transformation that has swept across societies worldwide. In earlier times, the analog nature of elections presented its challenges, but as technology advanced, new problems emerged, such as cybersecurity threats, digital disenfranchisement, and the erosion of voter confidence. This historical progression underscores the necessity of adapting methodological approaches to suit new realities [2]. Previous decades have seen numerous attempts to reconcile technology with democratic ideals, yet only a handful of studies have attempted to systematically capture the nuances of voter sentiment amidst technological change. As electronic voting systems proliferate, they bring with them complexities that have often been glossed over by technical assessments alone. These systems do not operate in a vacuum; they interact with human behaviors, perceptions, and societal norms that can be unpredictable and fluid. The interplay between the rigid structures of technology and the fluid nature of human opinion creates a landscape ripe for in-depth analysis. This dynamic environment accentuates the urgency of developing robust tools capable of handling indeterminacy and ambiguity in public opinion [3]. Scholars have long argued that ignoring these human factors could lead to flawed policy implementations and erode trust in electoral systems [4]. The core conceptual framework of this study draws from a blend of social science and mathematical theory, seeking to bridge the gap between qualitative human insight and quantitative rigor. The neutrosophic Delphi method, at the heart of this research, offers a unique perspective by incorporating degrees of truth, indeterminacy, and falsity into the analysis. This approach is particularly well-suited to handle the uncertainties that traditional models struggle with, allowing for a more nuanced understanding of expert opinions and voter behavior [5]. By weaving together diverse strands of theory, the study situates itself at an interdisciplinary crossroads that promises richer insights into the electoral process. Despite technological advances, a significant gap remains in integrating human perception with technical evaluation in electronic voting systems. The central problem this research confronts is the lack of a holistic framework that seamlessly incorporates both the technical intricacies of digital voting and the complexity of human attitudes toward these systems. How can we ensure that security measures and transparency protocols in electronic voting not only function flawlessly but also resonate with the varied and often uncertain perceptions of the public? This question underpins the investigation, drawing attention to an area that has been underexplored in previous research [6].

By posing this question, the study highlights the magnitude and multifaceted nature of the challenge. Evaluating the effectiveness of electronic voting cannot be reduced to binary outcomes or simple metrics; it demands an approach that can navigate shades of opinion and varying degrees of certainty. The problem spans technical, psychological, and sociopolitical domains, making it complex and significant. The integration of neutrosophic methods into this realm seeks to capture this multifarious reality, moving beyond traditional models that oversimplify human judgment. The objectives of the study emerge clearly from this complex landscape. Primarily, the research aims to assess the applicability and efficacy of the neutrosophic Delphi method in evaluating electronic voting systems. By doing so, it seeks to encapsulate the inherent uncertainties present in voter perceptions and expert opinions. Additionally, the study strives to provide actionable recommendations that could enhance the security and transparency of electronic voting, informed by a deep understanding of public sentiment and technical feasibility [7, 8]. These objectives align seamlessly with the central research question, carving a path forward for both academic inquiry and practical policy-making. The methodological innovation promised by the neutrosophic Delphi method not only addresses the intricacies of the problem but also sets the stage for future investigations into related areas of electoral integrity. Through this work, the study endeavors to contribute meaningfully to the fields of political science, computer science, and public policy, opening new avenues for research and development in the assurance of democratic processes.

2. METHOD

The Plithogenic [9] IADOV Method is an advanced evaluation technique that integrates plithogenic logic and neutrosophic analysis to assess satisfaction levels while accounting for contradictions and uncertainties in expert opinions. By employing a structured linguistic evaluation system and aggregation operators, this method provides a comprehensive framework for measuring and interpreting complex perceptions in legal and policy analysis. A brief explanation of the approach is the following

-Definition of Plithogenic Set

Establishes the fundamental concept of a plithogenic set, extending classical, fuzzy, intuitionistic fuzzy, and neutrosophic sets. It defines the key components: set (P), attributes (a), value range (V), membership degree (d), and contradiction degree (c).

-Linguistic Evaluation System

Implements a linguistic scale adapted to plithogenic modeling and assigns satisfaction categories and translates them into neutrosophic values for expert evaluations.

-Survey Design and Expert Evaluation

Develops a structured questionnaire with closed and open-ended questions to measure expert opinions on legal reforms. Iut ses a neutrosophic scale to assess truth, falsity, and indeterminacy.

-Computation of the Neutrosophic Plithogenic Global Satisfaction Index (NPGSI)

Aggregates expert evaluations using plithogenic operations such as union (OR), intersection (AND), and aggregation functions based on t-norm and t-conorm.

-Contradiction Evaluation and Aggregation

In this part the contradiction degree between attribute values is calculated. It is applied to modify aggregation functions. Indeed, a contradiction function (c) is used to determine consistency in responses.

-Neutrosophic Plithogenic Intersection and Union

Defines intersection and union functions to handle membership, non-membership, and indeterminacy. It ensures comprehensive representation of expert evaluations.

-Resolution and Decision Matrix Construction

Computes the median of plithogenic numbers to generate a decision matrix. So, it establishes a unique decision model incorporating truth, indeterminacy, and falsehood components.

The steps are depicted in Figure 1.

Figure 1. Flowchart of the Plithogenic IADOV Method for Satisfaction Evaluation
Source: Own Elaboration.

Plithogenic logic allows for the inclusion of indeterminacy and contradiction in the evaluation of sets and systems. To understand the extension of the method to a plithogenic environment [10,15], it is necessary to define what a plithogenic set is:

Plithogenic set [11,16]: An extension of classical, fuzzy, intuitionistic fuzzy, and neutrosophic sets. A plithogenic set is defined as (P, a, V, d, c), *w*here:

a) "P" is a set, "a" is an attribute (multidimensional in general), "V" is the range of values of the attribute, "d" is the degree of membership of the attribute value of each element x to the set P for some given criteria $(x \in P)$, and "d" means "d_F" or " d_{IF} " or "d_N", when it is a degree of fuzzy membership, an intuitionistic fuzzy membership, or a degree of neutrosophic membership, respectively, of an element x to the plithogenic set P;

b) "c" means "c_F" or "c_{IF}" or "c_N", when it is a fuzzy attribute value contradiction degree function, intuitionistic fuzzy attribute value contradiction degree function, or neutrosophic attribute value contradiction degree function [12,17], respectively.

c) Functions are defined according to the applications that experts need to solve. $d(\cdot,\cdot)$ and $c(\cdot,\cdot)$, the following notation is used: $x(d(x,V))$, where $d(x,V) = \{d(x,v), \text{for all } v \in V\}, \forall x \in P$. The attribute value contradiction degree function is calculated between each attribute value with respect to the particular dominant attribute value (denoted by), and also for other attribute value v_D.

Thus, the Plithogenic IADOV method allows for addressing the complexity of respondents' perceptions. This requires a linguistic evaluation system adapted to the plithogenic model to accurately capture the opinions of experts (see Table 1). This system and its equivalents on a plithogenic scale are defined as the score function *T* of a neutrosophic number according to the formula proposed by Basset, as per equation (1) [13,19].

$$F(T) = \frac{T + F - I}{2} \quad (1)$$

Linguistic term of the plithogenic IADOV	**SVNN**	$\mathcal{S}([\mathrm{T,I,F}])$	**IADOV Neutrosophic Equivalent**
Extremely satisfied (ES)	(1,0,0)	0.50	Clearly satisfied
Very Very satisfied (VVS)	(0.95,0.15,0.14)	0.47	-
Very satisfied (VS)	(0.85,0.25,0.24)	0.42	-
Satisfied (S)	(0.75,0.35,0.34)	0.37	More satisfied than dissatisfied
Moderately satisfied (MDS)	(0.65,0.45,0.44)	0.32	-
Indefinite (I)	(0.55,0.55,0.54)	0.27	Not defined (I)
Moderately Dissatisfied (MDD)	(0.45,0.65,0.64)	0.22	-
Dissatisfied (D)	(0.35,0.75,0.74)	0.17	More dissatisfied than satisfied
Very Dissatisfied (VD)	(0.25,0.85,0.84)	0.12	
Very Very Dissatisfied (VVD)	(0,0.95,1)	0.03	Clearly dissatisfied
Contradictory (C)	(1,0,1)	1.00	Contradictory

Table 1: Evaluation System for Experts.

Source: Own Elaboration

The term *I* in Neutrosophic is interpreted as a unit of indeterminacy. Another inherent component of the method is the IADOV Logical Table, which assigns numerical values to three closed questions applied to the experts. If necessary, open questions can be included in the surveys. Among the questions used in this study are:

I. Do you believe that the sanctions proposed in the penal reform for public health are proportional to the severity of the crimes?
II. What aspects of the penal reform for public health do you consider most beneficial to ensure legal security and protect public health?
III. Do you think the penal reform includes adequate preventive measures to avoid crimes against public health?
IV. Do you agree that the penal reform should promote alternative approaches to penal sanction, such as education and mediation, for certain crimes against public health?
V. From your perspective, what improvements could be incorporated into the reform proposal to strengthen its effectiveness in preventing and sanctioning crimes against public health?

To calculate the Neutrosophic Plithogenic Global Satisfaction Index (NPGSI) of the respondents, the H_N^P aggregation operator was used, taking into account the evaluations of each element *X* to the plithogenic set *P;* $x \in Pd_F\, d_{IF}\, d_N$. This was done to obtain the NPGSI from the sum of the elements analyzed within the evaluated plithogenic subset (S_i^P) (see Equation 2).

$$H_N^P\left(S_{1,}^P S_2^P, \ldots, S_n^P\right) = \sum_{i=1}^{n} \left[w_j\, , S_i^P\right] \quad (2)$$

Among the Plithogenic Operators to be used in the study are: union (OR), intersection (AND), and other aggregation operators that combine attribute values based on t_{norm} and t_{conorm}. Linear and non-linear aggregation operations can be created [14,18].

Calculation of contradiction and aggregation: The contradiction function *c* evaluates the contradiction between attribute values. This influences how the t_{norm} and t_{conorm} are applied to create aggregation operators.

If the t_{norm} is applied to the dominant attribute value denoted by v_D, and the contradiction between v_D and v_2 is $c(v_D, v_2)$, then it is applied to the attribute value v_2 in the following manner:

$$[1 - c(v_D, v_2)] \cdot (v_D \wedge_F v_2) + c(v_D, v_2) \cdot (v_D \vee_F v_2), \quad (3)$$

Neutrosophic Plithogenic Intersection and Union: They are defined in such a way that for membership, one criterion is applied, and for non-membership, the opposite is applied, while for indeterminacy, the average is taken.

$$(a_1, a_2, a_3) \wedge_P (b_1, b_2, b_3) = \left(a_1 \wedge_F b_1, \frac{1}{2}[(a_2 \wedge_F b_2) + (a_2 \vee_F b_2)], a_3 \vee_F b_3\right) \quad (4)$$

Resolution and Decision Matrix: Formulas are used to calculate the median of plithogenic numbers, allowing the construction of a unique decision matrix for all experts.

$$median_{i=1}^{m}\{PN_i\} = (median_{i=1}^{m}\{T(PN_i)\}, median_{i=1}^{m}\{I(PN_i)\}, median_{i=1}^{m}\{F(PN_i)\}), \quad (5)$$

where the analyzed elements constitute plithogenic numbers. Here the components of truth, indeterminate components, and components of falsehood are visualized. In other words, it means that the median of a set of plithogenic numbers is defined as the plithogenic number of the medians of its components $PN_i, T(PN_i), I(PN_i)$ and $F(PN_i)$.

2.1. Proposal for a Draft Bill to Amend the Comprehensive Organic Criminal Code to Typify Crimes against Public Health in Order to Guarantee the Right to Legal Security.

General Objective:

The objective of this bill proposal is to carry out a comprehensive reform of the Comprehensive Organic Criminal Code (COIP) in order to include a specific section that typifies and effectively sanctions crimes against public health. The purpose is to guarantee the right to legal security for all citizens, protect their lives, integrity, and health, and provide a clear and adequate legal framework to address health crises such as pandemics.

Statement of Reasons:

Public health is a legal good of utmost importance, as the spread of infectious diseases can have serious consequences for the general population. The global COVID-19 pandemic has highlighted the need for clear and effective penal regulations to sanction those who put public health at risk.

Currently, the COIP does not have a specific section that comprehensively addresses crimes against public health, which has led to the application of sanctions through states of exception or health emergencies. This lack of specific regulation generates legal uncertainty and hinders the proper protection of citizens' health.

It is essential to establish a solid and clear legal framework that allows for the proportional and effective sanctioning of those who fail to comply with health measures or spread infectious diseases. To this end, it is advisable to take as a reference the legislation of other countries, such as the Colombian Penal Code, which has a specific section on crimes against public health.

Law Proposal:

Article 1: A section will be added to Chapter Three - Crimes against the Rights of Good Living, which will address Crimes against Public Health.

Article 2: Violation of health measures. It is established that any person who deliberately violates the health measures adopted by the competent authority to prevent the introduction or spread of infectious diseases will be sanctioned with imprisonment of three to five years. This penalty may be increased in the case of recidivism or when the violation of measures seriously endangers the health of the population.

Article 3: Spread of infectious diseases. Any person who, intentionally, spreads infectious diseases, either by concealing their condition as a carrier, failing to comply with mandatory quarantines, or endangering the health of others, will be sanctioned with imprisonment of five to eight years. The penalty may be increased if the spread causes serious damage to public health or causes the death of people.

Article 4: Spread of diseases with aggravating factors. Aggravating factors will be established for those cases where the spread of infectious diseases is carried out by health professionals, public officials, individuals with prior knowledge of their carrier status, or organized groups with the intention of causing harm to the population. The penalties in these cases may be increased by one-third of the maximum penalty provided for each crime.

Article 5: Complementary measures. In addition to imprisonment, complementary measures such as fines, disqualification from practicing certain professions or activities, and community service may be applied. These measures will seek to ensure a comprehensive and proportional sanction to the gravity of crimes against public health.

Article 6: Inter-institutional coordination. The creation of an inter-institutional committee for the prevention and control of infectious diseases will be established. This committee will be comprised of representatives from the health, justice, and education sectors, and other related organizations, and will aim to design joint strategies to prevent, control, and sanction crimes against public health.

General Provision:

The reformed section relating to Crimes against Public Health will be incorporated into the Comprehensive Organic Criminal Code.

Final Provision:

This Draft Reform Bill will come into effect from its promulgation and publication in the Official Register.
Given and signed in the Plenum of the National Assembly of Ecuador on the __ day of _____, 202__.

2.2. Validation of the Proposal through the Plithogenic IADOV Method.

Once the draft bill amendment to the COIP is presented, the next step is to present and determine the level of acceptance by the various stakeholders involved, such as legal professionals, public health experts, representatives of civil organizations, and government authorities. To determine if the draft bill is acceptable and recognized for its contribution to society, the Plithogenic IADOV method is applied. For the development of the method, it is necessary to define the plithogenic set, the elements that influence the acceptance of the draft bill, and their degrees of membership (Plithogenic GSI) (see Table 2).

Plithogenic set	Evaluation of penal reform focused on public health in Ecuador, $\forall P_{S_n} = \{S_{V_1}, S_{V_2}, \dots, S_{V_n}\}$
Plithogenic subset	Review and acceptance phase of the preliminary project (S_1).
Attributes	Acceptance elements, $\forall S_{V_{1n}} = \{S_{V_{11}}, S_{V_{12}}, S_{V_{13}}\}$
Variable	Level of acceptance for implementing the draft bill to amend the COIP.
Factor (F)	Classification of crimes against public health in Ecuador.
Measuring scale	Plithogenic linguistic term (See Table 1).

Table 2: Characteristics of the Plithogenic Set.

Source: Own Elaboration.

For this study, only this subset within the plithogenic set is analyzed since it is in a fundamental stage in the implementation of the regulations. To this end, work was conducted with different stakeholder groups involved in the penal reform, such as legislators, criminal law experts, public health professionals, and representatives of civil society.

By using the Plithogenic IADOV method, the perceptions and expectations of the subset (S_1) regarding the proposed reform are evaluated. This analysis focuses on identifying areas of consensus, divergence, and contradiction among the groups. Among the points to be evaluated are:

- Aspects of the penal reform with a high degree of acceptance or support among the analyzed subset.
- Areas where there is uncertainty or a lack of clear consensus among the groups.
- Elements of the penal reform that face significant opposition or rejection.

The sampling procedure of 60 participants determines the distribution for the population, allowing for the direct and explicit selection of subjects considered most accessible and likely to offer the most information. Subsequently, five questions, three closed and two open, are applied to capture the diversity of opinions on penal reform. The closed questions focus on specific aspects of the proposal, while the open questions seek to obtain qualitative insights. Among the acceptance elements defined by the experts and evaluated by the Plithogenic IADOV are:

- Proportional sanctions (A1).
- Prevention measures (A2).
- Alternative approaches (A3).

The results obtained through the Plithogenic IADOV reflect the following outcomes identified in Figure 2. It illustrates the GSI calculated for each of the questions, providing a clear visualization of the areas of satisfaction and opportunities for improvement in the reform proposal. This visual analysis facilitates the identification of priorities and decision-making for the optimization of penal reform in Ecuador.

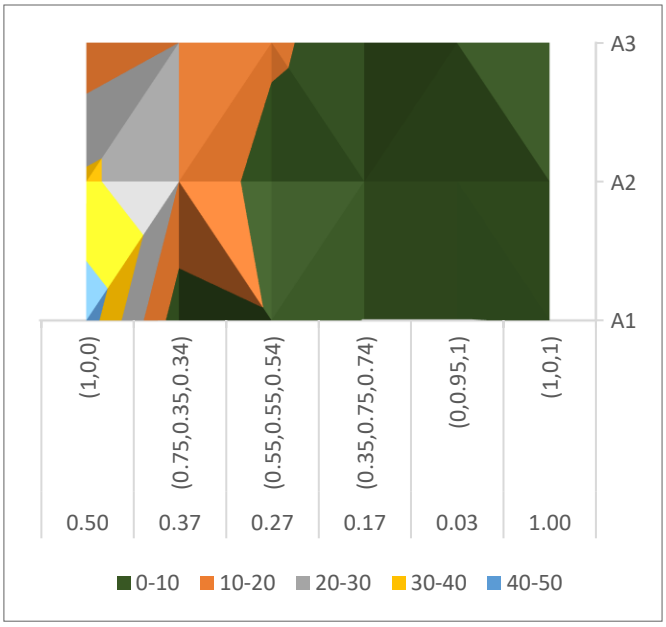

Figure 2: Segment of the plithogenic set of acceptance of the draft bill to amend the COIP.
Source: Own Elaboration.

The results obtained regarding the draft bill to amend the Comprehensive Organic Criminal Code reflect for: *Proportional sanctions* (A1) that the majority of respondents are between *Clearly satisfied and More satisfied than dissatisfied*, with a tendency towards clearly satisfied (see Table 3). This conclusion is reached because 40 to 50 people fall within the classification (1, 0, 0). Whereas, for other intermediate levels, the trend is towards the acceptance of the draft concerning element A1, and therefore a reduction in contradictions is visualized.

Linguistic term	SVNN	Scoring	Frequency	F*S	(F*S)/n
Clearly satisfied	(1,0,0)	0.50	46	23	0.38
More satisfied than dissatisfied	(0.75,0.35,0.34)	0.37	4	1.48	0.02
Undefined	(0.55,0.55,0.54)	0.27	9	2.43	0.04
More dissatisfied than satisfied	(0.35,0.75,0.74)	0.17	0	0	0.00
Clearly dissatisfied	(0,0.95,1)	0.03	0	0	0.00
Contradictory	(1,0,1)	1.00	1	1	0.02
Group Satisfaction Index					**0.47**

Table 3: Calculation of the GSI for element (A1).
Source: Own Elaboration.

Regarding element A1, an $H_N^P = 0.47$ was obtained, resulting in a plithogenic classification of Very *Very Satisfied (VVS)* for the respondents with a value of (0.95, 0.15, 0.14), supporting the interpretation of graph 1.
For *preventive measures* (A2): the majority of respondents are in various plithogenic areas from beyond undefined to satisfied. The trend is towards the levels of *Clearly Satisfied* and *More Satisfied than Dissatisfied* (see Table 4). This trend suggests there are significant concerns about the effectiveness or sufficiency of the preventive measures included in the reform. It indicates that respondents are less satisfied with the reform's ability to prevent crimes against public health, pointing out a key area for improvement. While for lower criteria, participation is low within a range of 0 to 10 people.

Linguistic term	SVNN	Scoring	Frequency	F*S	(F*S)/n
Clearly satisfied	(1,0,0)	0.5	32	16	0.27
More satisfied than dissatisfied	(0.75,0.35,0.34)	0.37	twenty	7.4	0.12
Undefined	(0.55,0.55,0.54)	0.27	5	1.35	0.02
More dissatisfied than satisfied	(0.35,0.75,0.74)	0.17	1	0.17	0.00
Clearly dissatisfied	(0,0.95,1)	0.025	1	0.025	0.00
Contradictory	(1,0,1)	1	1	1	0.02
Group Satisfaction Index					**0.43**

Table 4: Calculation of the GSI for element (A2).

Source: Own Elaboration.

To support the identified plithogenic trend, the GSI for this element was evaluated, where an $H_N^P = 0.43$. was obtained. The obtained classification represents an evaluation close to the plithogenic criterion of *Very Satisfied (VS)* with a value of (0.85, 0.25, 0.24). Therefore, it reinforces the acceptance of this plithogenic trend and defines a criterion within the evaluated levels.

As for *alternative approaches* (A3): The respondents consider it would be beneficial to incorporate monitoring and review mechanisms into the draft bill, consider human rights aspects, and promote a comprehensive approach that combines sanctions with preventive strategies. This generalized criterion by the respondents focuses on a suggestion or proposal for inclusion. Thus, the respondents accept and support the draft bill (action X) and, at the same time, indicate a suggestion or condition (action Y). Therefore, in the plithogenic area, 10 to 33 people are defined as being in the areas of *Clearly Satisfied* and *More Satisfied than Dissatisfied*, which supports action X. Whereas 0 to 20 people support action Y. In addition, a small minority of people with indeterminate and contradictory criteria in this element is observed.

Linguistic term	SVNN	Scoring	Frequency	F*S	(F*S)/n
Clearly satisfied	(1,0,0)	0.5	13	6.5	0.11
More satisfied than dissatisfied	(0.75,0.35,0.34)	0.37	twenty	7.4	0.12
Undefined	(0.55,0.55,0.54)	0.27	12	3.24	0.05
More dissatisfied than satisfied	(0.35,0.75,0.74)	0.17	4	0.68	0.01
Clearly dissatisfied	(0,0.95,1)	0.025	10	0.25	0.00
Contradictory	(1,0,1)	1	1	1	0.02
Group Satisfaction Index					**0.32**

Table 5: Calculation of the GSI for element (A3).

Source: Own Elaboration.

To support the indeterminate plithogenic trend, the GSI is evaluated and defined to what point it is oriented. Therefore, the modeling for this element obtained an $H_N^P = 0.32$.. The GSI of this element orients the trend towards a plithogenic criterion of *Moderately Satisfied (MDS)* with a value (0.65, 0.45, 0.44). In order to achieve a higher level of plithogenic satisfaction, it is necessary to incorporate monitoring and review mechanisms.

The obtaining of plithogenic GSIs allows for defining the neutrosophic membership degree d_N of the attribute value of each element x to the set P for the established elements (A1, A2, and A3). However, with the coexistence of indeterminate and opposing criteria to the levels of satisfaction, it is proposed to perform an intersection between the predominant criteria like the element (A3). For this, it is proposed to analyze and define the criteria between legislators and professionals to determine the level of contradiction between the criteria and obtain an evaluation of the element from the following plithogenic intersection:

- Plithogenic intersection between legislators ($A3_1$) and public health professionals ($A3_2$) (see Tables 6 and 7).
- Define the scope of the consensus area: Obtain conformity with international standards and the implementation of preventive measures. In addition, to achieve mutual recognition of the importance of aligning legislation with Ecuador's international commitments and including preventive strategies within the legal framework.

$A3_1$	$A3_2$
S (0.75, 0.35, 0.34)	MDS (0.65, 0.45, 0.44).

Table 6: Evaluations between the elements $A3_1$ and $A3_2$.

Source: Own Elaboration.

Neutrosophic Plithogenic Intersection	S_N	Contradiction: $v(A3_1; A3_2)$	Assessment
$(a_1, a_2, a_3) \wedge_p (b_1, b_2, b_3)$ = (0.66,0.40,0.44)	0.35	0.05	It is located in a sublevel between *Satisfied* and *Moderately Satisfied*.

Table 7: Plithogenic Neutrosophic Intersection between the elements $A3_1$ and $A3_2$.

Source: Own Elaboration.

Therefore, given that the contradiction is low and an area of consensus among the criteria of the different stakeholders was defined, an evaluation of *satisfaction with a certain degree of dissatisfaction* is achieved. This

low degree of dissatisfaction focuses on improving some aspects of the draft bill, such as strengthening the effectiveness of the draft by considering preventive measures and consultations by health and law experts. It is also suggested to incorporate monitoring and review mechanisms that combine sanctions with preventive strategies.

To conclude the analysis, the GSI of elements A1, A2, and A3 was determined, with a plithogenic value that is close to a sublevel near *Very Satisfied (MS) to Satisfied (S)*. Thus, a satisfactory index value in the plithogenic segment was observed, reflecting acceptance and recognition of its utility. This translates into the legislators and criminal law experts issuing criteria where they demonstrated their satisfaction with the contribution of the draft bill to amend the COIP. Additionally, to achieve the implementation of the draft bill to amend the comprehensive organic criminal code based on plithogenic intersections of the elements, the following strategies are proposed:

- Multidisciplinary dialogues: Organize dialogue tables that bring together representatives of each interest group to discuss and jointly refine the key aspects of the reform, based on the identified areas of consensus.
- Legislative analysis and adjustments: Use the plithogenic intersections as a guide to making specific adjustments to the draft, ensuring it effectively responds to the concerns and suggestions of the different stakeholder groups.
- Promotion of inter-sectorial collaboration: Encourage ongoing collaboration between the legal and public health sectors, as well as with civil society, for the effective implementation and monitoring of the reform once approved.

3. CONCLUSIONS.

The primary findings of this research indicate that the proposed criminal reform for public health in Ecuador has garnered a high degree of approval among various stakeholders, with satisfaction levels ranging from "Very Satisfied" to "Satisfied." This consensus not only highlights a favorable reception but also points to the necessity of integrating monitoring and reviews mechanisms, as well as a holistic approach that pairs punitive measures with preventive strategies. Employing the Plithogenic IADOV method allowed for a nuanced breakdown and analysis of the reform from diverse critical perspectives, effectively managing uncertainties and contradictions through intersection operators to identify agreed-upon actions and overcome potential challenges. The practical significance of these results lies in their capacity to guide the implementation of a robust and equitable legislative framework aimed at safeguarding public health and ensuring legal security. By synthesizing areas of convergence among interest groups and promoting a balance between sanctioning offenses and preventive measures, this study offers clear directives for lawmakers and policymakers. Consequently, the findings present opportunities to enhance legal responses to public health crimes, particularly during crises, while ensuring that the resulting regulations are both effective and socially acceptable. Notably, the study contributes an innovative methodological approach by incorporating the Plithogenic IADOV technique into legislative reform analysis. This flexible and dynamic method not only serves as a valuable tool for deconstructing complex legal issues but also advances the field by demonstrating how to integrate varied perspectives and handle indeterminate factors in policy formulation. Such an approach paves the way for replicable models in similar legislative contexts and broadens the scope of applying advanced techniques in evaluating and crafting public policies.

Nonetheless, certain limitations are apparent. For instance, the draft law requires refinements in terminological precision and clearer definitions of key concepts, indicating that some aspects remain open for improvement. Furthermore, while stakeholder approval is promising, it does not guarantee a seamless implementation; the true effectiveness of the proposal will depend on how well the diverse inputs are managed and incorporated during execution. Looking ahead, it is advisable to explore complementary methods alongside Plithogenic IADOV, such as fuzzy analysis or artificial intelligence techniques, which might enrich the evaluation of complex legislative reforms further. Moreover, deepening consultations with experts in health and law, and establishing ongoing monitoring and evaluation mechanisms, will be crucial to ensure the law's adaptability and relevance. Expanding research to encompass different contexts and populations can help validate and generalize these findings, ultimately ensuring that legal reforms evolve effectively to meet society’s emerging needs.

RECEIVED: AUGUST, 2024.
REVISED: DECEMBER, 2024.

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