

MGI

Master Degree Program in
Information Management

*Examining the Public Discourse on Femicide in Ecuador: A Social Media
Analysis from 2020 to 2023*

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Master Thesis

presented as partial requirement for obtaining the Master Degree in Information Management

NOVA Information Management School
Instituto Superior de Estatística e Gestão de Informação

Universidade Nova de Lisboa

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**Examining the Public Discourse on Femicide in Ecuador: A Social Media Analysis from 2020
to 2023**

by

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Master Thesis presented as partial requirement for obtaining the Master's degree in
Information Management, with a specialization in Knowledge Management and Business
Intelligence

Supervised by

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July, 2024

STATEMENT OF INTEGRITY

I hereby declare having conducted this academic work with integrity. I confirm that I have not used plagiarism or any form of undue use of information or falsification of results along the process leading to its elaboration. I further declare that I have fully acknowledged the Rules of Conduct and Code of Honor from the NOVA Information Management School.

[Lisbon, 15th of July 2024]

DEDICATION

This thesis is dedicated to the women of Ecuador and aims to shed light on their suffering.

ACKNOWLEDGEMENTS

This journey of academic research has been an apprenticeship in the truest sense. Understanding and learning the different tools of this master's has been both challenging and rewarding. I am proud to research this for my country to increase awareness and promote social change. At the forefront of this experience, I am grateful to my supervisor whose patience and insightful feedback honed my skills and helped me navigate the complexities of this field.

Heartfelt gratitude to my family and friends for their unwavering support throughout this intellectual odyssey. Their patience during late nights spent buried in research and their steadfast belief in my ability to succeed were a constant source of strength, helping me navigate the weighty topics of my research without succumbing to its challenges.

ABSTRACT

This study delves into the alarming issues of femicide in Ecuador, focusing on the public discourse surrounding gender-based violence. Analyzing the discourse around femicide is crucial to understanding societal attitudes and potential solutions. Social media, with its ability to empower victims, activists, and communities, becomes a critical platform for sharing experiences, mobilizing support, and raising public awareness. This research paper aims to analyze public discourse on femicide in Ecuador from 2020 to 2023, a period marked by a sharp rise in femicide cases. By examining discourse on social media platform X, the study will explore the relationship between discussion volume and the number of cases. The analysis will employ text-mining models to understand themes and sentiments over the years. Additionally, it employs an analysis of the feminist activism hashtags used in Mexico. The results show the prevalence of words such as “femicidio” and “mujer”, and highlight the discussion of specific femicide cases, as well as showcase a rejection of the topic altogether.

KEYWORDS

Text Analysis; Femicide; Social Media Analysis; Gender-based violence.

Sustainable Development Goals (SDG):



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LIST OF ABBREVIATIONS AND ACRONYMS

INEC	National Institute of Statistics and Censuses, official statistic entity from Ecuador.
WHO	World Health Organization
UN Women	United Nations Entity for Gender Equality and the Empowerment of Women
CEPAL/ECLAC	United Nations Economic Commission for Latin America and the Caribbean
VAW	Violence Against Women
Web 2.0	Web 2.0 refers to a shift in web design and use that emphasizes user-generated content, collaboration, and social interaction. This contrasts with earlier static web pages where users consumed content.
Brandwatch	Software for social media listening and digital consumer intelligence.
SVM	Support Vector Machine
DTM	Document-Term Matrix
LDA	Latent Dirichlet Allocation
NLP	Natural Language Processing

1. INTRODUCTION

Violence against women, particularly femicide, is a global epidemic with devastating consequences (Stephanie et al., 2023). Femicide is the intentional killing of women and girls because of their gender (D'Ignazio et al., 2022). In Ecuador, this issue is especially concerning, due to a high prevalence of femicide cases. While the legal recognition of femicide as a crime is relatively recent in Ecuador, it's crucial to acknowledge that this act of violence falls within a larger historical context of systematic violence against women.(Narváez, 2022)

The Feminist Alliance for Mapping Femicides reported a horrifying reality in Ecuador of 321 femicide cases in 2023. This figure exposes the pervasive gender-based violence women endure in the country. Of these cases, 128 were intimate femicides, committed by partners or ex-partners. Another 172 femicides occurred in criminal settings, often involving firearms and gang-controlled areas. There has been a notable increase in femicide cases in the last few years, and these numbers paint a grim picture of the deeply entrenched gender inequality and violence.

While the statistics reveal the extent of the problem, understanding the underlying discourse requires a closer examination of societal attitudes and responses (Narváez, 2022). Previous studies explain the gaps in policies and laws established by the government, however, femicide is also categorized in a sociocultural theory, where sociopolitical forces endorse male dominance and control over women at various societal levels (Finkel & Eckhardt, 2011). In this sense, social media analysis offers a vital tool to further understand the related content, due to these platforms empowering those who might not have a voice in traditional media. Victims, activists, and community members use these platforms to share their experiences and mobilize support (Jean-Pierre, 2022). The new wave of feminist activism seeks to raise public consciousness and amplify its influence through these new mediums (Rovira-Sancho & Morales-i-Gras, 2022).

We can find research articles from other countries in Latin America with comparable femicide indicators, such as Mexico, Argentina, and Colombia where it explored social media information to identify related content and generate strategies for awareness. Comparatively, Ecuador has a reduced number of studies to showcase these circumstances.

This study aims to understand the public discourse of Femicide in Ecuador from January 2020 to December 2023, due to the exponential increase in Femicide cases. The data will be collected from X, anticipated the rise of it in the digital age (Xue et al., 2023), to understand the user behavior and the relationship between the volume of discussions and the increase in cases. It analyzes the main topics, by exploring latent topics, common bigrams, and trigrams, identifying the frequent hashtags, and performing a comparison analysis with the main hashtags used for Mexican feminist activism, a country with cultural similarities. Furthermore, it analyzes how the sentiments change over time, especially when X has a high volume of discussion.

2. LITERATURE REVIEW

2.1. VIOLENCE AGAINST WOMEN

Violence against women is a health crisis, often described as a silent global epidemic (Senda et al., 2024). According to the World Health Organization (WHO), violence against women, especially intimate partner violence and sexual violence, is acknowledged as a significant public health issue and a violation of women's human rights (World Health Organization, 2022).

In the context of gender-based violence, the term 'violence against women' is defined as “any act of gender-based violence that results in, or is likely to result in, physical, sexual, or psychological harm or suffering to women.”. It includes the direct acts and threats of such acts, coercion, or arbitrary deprivation of liberty (*Declaration on the Elimination of Violence against Women Proclaimed by General Assembly Resolution 48/104 of 20 December 1993*, 1993). This understanding of violence against women was also adopted in America by the Inter-American Institute of Human Rights in the Convention on the Prevention, Punishment, and Eradication of Violence against Women (Convention of Belém do Pará, 1994)

According to the United Nations Women, the COVID-19 pandemic has stretched resources thin, leaving critical services like domestic violence shelters and helplines struggling to keep pace with the growing shadow pandemic, due to restrictions on movement and social interaction (Ostadtaghizadeh et al., 2023).

A considerable proportion of women and girls worldwide who tragically lost their lives in 2022 were victims of gender-motivated homicides. On average, more than 133 women or girls are killed daily by their intimate partners or family members. This statistic, with approximately 48,800 reported cases annually, highlights the pervasive nature of this issue (United Nations Office on Drugs and Crime, 2023)

2.2. FEMICIDE

The urgency of addressing gender-based violence is undeniable, as evidenced by its characteristics, various manifestations, and overwhelming statistics. This is particularly true for its most extreme form, femicide. (Narváez, 2022) Femicide, also known as feminicide, refers to the targeted killing of women based on misogyny and gender-related motives. This extends beyond the immediate loss of life, by exerting an enduring impact on the mental well-being and economic stability of both relatives and communities across generations (D'Ignazio et al., 2022).

According to UN Women and the Economic Commission for Latin America and the Caribbean (ECLAC), in Latin America and the Caribbean in 2022, a staggering 4050 women fell victim to femicide. Resulting in on average one case every two hours in the region(ECLAC, 2023). A

recent report from ECLAC studying 32 countries in the region found a concerning femicide rate, presented in Figure 1, in Ecuador of 1 per 100,000 women in 2022.

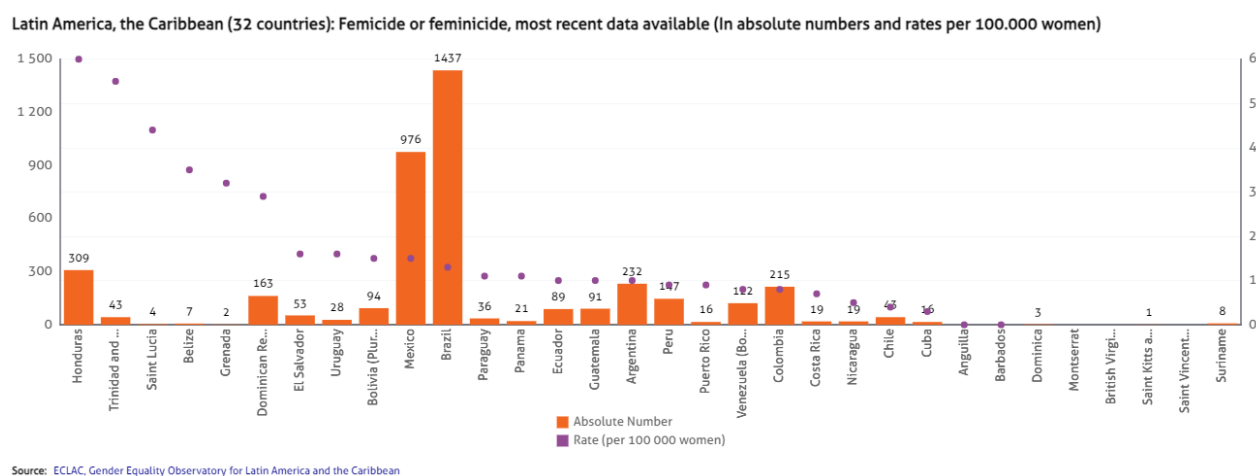


Figure 1- Femicide rate per 100 000 women.

Source: ECLAC, Gender Equality Observatory for Latin America and the Caribbean

The criminalization of femicide in Ecuador, defined as the murder of women motivated by gender hatred, marked a significant shift in addressing violence against women. Effective August 10, 2014, Article 141 of the Comprehensive Organic Criminal Code (COIP) established femicide as a distinct crime (Asamblea Nacional, 2014). Before 2014, the term was categorized as a female homicide, introduced in the homicide numbers.

Similar to its Latin American counterpart, Ecuador grapples with a severe issue of violence against women. Statistics from the Ecuadorian National Institute of Statistics (INEC) in 2019 paint a grim picture, with 65 out of 100 women experiencing some form of violence in their lifetime (INEC, 2019). Between January and September of 2022, non-governmental organizations and women's shelters documented a staggering 206 femicide cases, highlighting the critical need for comprehensive and effective strategies. (Narváez, 2022)

Data, from the Ecuadorian Council of the Judiciary, reveals a disturbing prevalence of femicide. Since the typification of femicide in 2014, a total of 1698 cases of femicide have been reported by Aldea Foundation, a non-governmental institution. However, the numbers differ from the official statistics, see Table 1.

Table 1- Number of Femicide Cases in Ecuador from 2020 to 2023. Source: Adopted from reports presented by the Judicial Council and Aldea Foundation

Year	Judicial Council	Aldea Foundation
2020	71	118
2021	69	197
2022	88	332
2023	111	321

There is a significant discrepancy between official femicide statistics, and the data compiled and analyzed by various civil society organizations (Narváez, 2022.). While Fundación Aldea reports all femicides, the Judicial Council track additionally “violent deaths of females”, not categorized as femicide with other causes such as murder, homicide, rape leading to death, abandonment of a person resulting in death, robbery leading to death, contract killing, kidnapping resulting in death. In 2020, the Judicial Council reported 94 violent deaths of females, rising to 157 in 2021, 336 in 2022, and a staggering 484 in 2023 (Consejo de la Judicatura, 2024)

While violent deaths of females are not the only statistic on the rise, Ecuador has been grappling with a broader security crisis marked by a surge in violent crime since 2018. The frequency of violent incidents and conflicts has been escalating, particularly in 2021. "Ecuador está sufriendo una ola de violencia que ha generado un profundo temor en la población." CNN Español. October 20, 2021.

According to Statista, the intentional homicide rate in Ecuador per 100,000 inhabitants experienced a significant upward trend from 2010 to 2023. A substantial rise in homicides from 7.8 per 100,000 people in 2020 to 14.04 in 2021, the highest increase since 2011. Ecuador's escalating security crisis reached a grim milestone in 2023, marking the deadliest year in the country's history with a homicide rate of over 40 per 100,000 inhabitants. This translates to one violent death every 69 minutes, according to data compiled by the National Police. The surge in violence represents a staggering 64.9% increase compared to 2022, and 4603 fatalities explained in Figure 2.

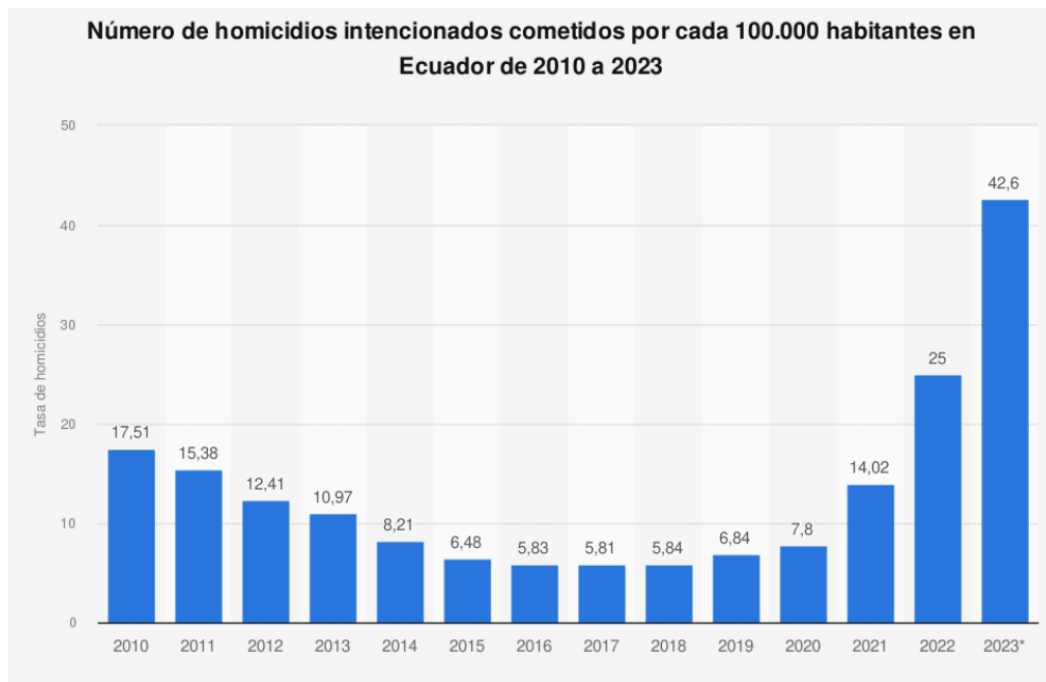


Figure 2 - Intentional homicides committed per 100,000 inhabitants in Ecuador from 2010 to 2023.

Source: Statista, 2024.

This rise is strongly linked to the growing power and territorial disputes of drug trafficking gangs, which have led to increased gang violence that spills over into civilian life. (Jerson Andres & Luis Mauricio, 2023). This creates a climate of insecurity and impunity in the population.

The overall breakdown of security and social order weakens societal protections for women and vulnerable populations, leaving them more exposed to violence in their homes, communities, and public spaces. This allows perpetrators of violence against women to act with less restraint.

2.3. SOCIAL MEDIA

"Social media plays a vital role in the day-to-day life" (Madhubala et al., 2020). According to DataReportal, 2024 Global report Overview, users spend 2 hours and 23 minutes on social media daily. Social media is an undeniable force in shaping public discourse and mobilizing collective action.(Carpio-Jimenez et al., 2021) Thus, positive and negative information can spread rapidly due to constant user engagement.

In this sense, social media can empower movements by providing a platform for expression, fostering online communities, and enabling outreach beyond these communities. However, it is crucial to acknowledge the challenges that also accompany this power, such as the spread of misinformation and the potential for online harassment (Rovira-Sancho & Morales-i-Gras, 2022). Web 2.0 has revolutionized the way citizens can engage with current events and share

information. Citizen-generated data often contains implicit intent, meaning the underlying sentiment or purpose behind the information expressed (Liu et al., 2015).

Data can be a powerful tool for mobilization and social movements. Additionally, data analysis can identify potential supporters, target messaging more effectively, and track the impact of their campaigns. Nevertheless, the vast collection of personal data also raises concerns about privacy and manipulation. (Chenou & Cepeda-Másmela, 2019). Anonymity also plays a big role on social media and acts as a shield, liberating users to express themselves more freely, and impacting online moral behavior. When users can hide behind a cloak of anonymity, they are less apprehensive about voicing dissenting opinions or challenging the status quo. This can lead to a more open and honest exchange of ideas on sensitive topics (Pan et al., 2023).

According to DataReport's DIGITAL 2024: ECUADOR report, there were an estimated 12.66 million social media users in Ecuador as of early 2024. This represents a significant penetration rate, with 69.2% of the population using social media. Over half, more than 50%, of social media users in Ecuador are female, with males making up around 47%. The most popular platforms include Facebook, YouTube, Instagram, TikTok, LinkedIn, and Snapchat, with X also seeing significant usage.

X exhibits a different gender makeup, with 38.2% female users and 61.8% male users, it is important to note that social media platforms often rely on signals like profile names and activity to infer gender, which may not always be accurate.

2.4. INFLUENCE OF SOCIAL MEDIA RELATED TO FEMICIDE TOPICS

The vast amount of social media data, a hallmark of Big Data, presents a double-edged sword. While it offers an unparalleled resource for understanding human behavior and societal trends, it also necessitates the development of advanced data analysis techniques to extract valuable insights (Subramani et al., 2017).

Social media has provided notable changes to feminist movements, fostering rapid global information sharing, personal story amplification, supportive online communities, and powerful calls to action. Social network tools fuel a global community where information, support, and demands for change can be shared by millions (Carpio-Jimenez et al., 2021). Consequently, feminist activism is increasingly utilizing social media to raise awareness and support survivors of sexual violence against women. This suggests a move towards online advocacy alongside traditional methods (Jean-Pierre, 2022).

Traditional media often fails to represent women adequately. However, online platforms create a more inclusive environment where women's perspectives can be heard (Jean-Pierre, 2022). Social media content offers a goldmine of insights for social welfare organizations; by identifying critical posts, these organizations can pinpoint areas with the greatest need and target their limited resources more effectively (Subramani et al., 2017).

The new wave of feminism activism has started by including the use of technologies in their strategies (Zimmerman, 2017), online mobilizations have become a new strategy for activism, creating a new type of actor known as the "cyber-activist" (Sorj & Fausto, 2016).

The protests in Argentina in 2015 sparked a wave of feminist activism that spread across the world, highlighting the interconnectedness of feminist movements. This transnational character is emphasized by terms like "global wave" and "transnational phenomenon" (Rovira-Sancho & Morales-i-Gras, 2022). Continuing this trend, we encounter the #NiUnaMenos movement, which led to the establishment of the first "National Index of Male Violence" in Argentina, where "male" or "machist" denotes the derogatory term for misogynistic behavior. Argentina stands out as one of the prominent countries in South America, renowned for its powerful mobilizations and innovative approaches, such as modern technologies and data activism (Chenou & Cepeda-Másmela, 2019).

The importance of feminist hashtags in mobilization campaigns emerges as a way to tell "herstory" (Rovira-Sancho & Morales-I-gras, 2023), as a different narrative from patriarchal power (MacDuffie & Ames, 2021). The combination of mobilization strategies is the key, public marches remain a prevalent strategy accompanied by concurrent digital initiatives, such as the dissemination of information via social media, as well as the issuance of calls to action through online platforms (Chenou & Cepeda-Másmela, 2019).

Data suggests a rise in online discussion about violence against women and femicide on specific dates, such as mobilizations for International Women's Day and the International Day for the Elimination of Violence against Women (Espinosa et al., 2023). Additionally, during high-profile femicide cases, media coverage can also trigger spikes in online discussions (Rovira-Sancho & Morales-I-gras, 2023).

2.5. RELATED WORK

Research on online discussions of social issues and gender equality has explored various aspects, including rape culture through social media analysis. For instance, Zaleski et al. (2016) examined the comment sections of news articles on platforms like Facebook. This study identified how rape culture is perpetuated through comments that normalize violence, victim-blame survivors, and express support for perpetrators. Additionally, the research examined attitudes toward legal systems and societal responses. The analysis involved coding comments within QSR NVivo 10 (2015), a qualitative data analysis software.

Building on this research, Xue et al. (2019) examined domestic violence discourse on X. Their study employed Latent Dirichlet Allocation (LDA) to analyze tweets containing "domestic violence." This approach allowed them to identify the most frequently used words and underlying themes within these discussions. Additionally, another thesis focused on understanding the communities and organizations related to femicide in Ecuador by analyzing the Tweets and hashtags used during the International Day for the Elimination of Violence against Women (Espinosa et al., 2023).

A text mining analysis (Gil et al., 2018), analyzed tweets to understand public sentiment toward femicide in Colombia and Mexico. Their findings indicated a predominantly negative perception of femicide, highlighting the social outrage and need for stricter legislation to address this critical issue.

Another approach was studied by Carpio-Jimenez et al. (2021), contributing to this area by using a quantitative approach to analyze the impact of feminist movements on Facebook, by examining variables like follower growth, content analysis, and other performance metrics.

Additional studies show how X facilitates hashtag activism and how platforms like Instagram raise awareness about gender-based violence. For instance, Chenou & Cepeda-Másmela (2019) explores the hashtag “#NiUnaMenos”. This study underlines the potential of data activism in the Global South, where communities leverage online platforms to collect and analyze data on critical issues, often outside of traditional institutional frameworks. This approach empowers citizens to advocate for social change and hold authorities accountable.

Rovira-Sancho & Morales-i-Gras (2022) analyze the use of femitags (feminist hashtags) on X, focusing on “#NiUnaMenos” in Argentina, “#Cuéntalo” (#TellIt) in Spain, and “#NiUnaMas” (#NotASingleWomanMore) in Mexico. This research highlights how these femitags function as rallying points, by applying social network analysis between the selected hashtags, leading to transnational solidarity and amplifying calls to action. Additionally, their study in 2023, analyzes the use of feminist hashtags in Latin American activism. The study identifies both global and local Mexican hashtags, further characterizing their role in social movements (Rovira-Sancho & Morales-I-gras, 2023).

On the other hand, when focusing on related work on Spanish text data, Subramani et al. (2017) demonstrate the use of Support Vector Machines (SVM) and Naive Bayes for classifying social media content related to violence against women. Here, they focused on platforms such as Facebook, X, and Reddit to conduct an intent classification of content that refers to abuse discourse.

Another research paper employed web scraping to gather violence against women (VAW) related news articles, to dive deeper into the characteristics of VAW events. Furthermore, topic modeling and classification algorithms identified the semantic structures within VAW news articles (Stephanie et al., 2023). Moreover, Madhubala et al. (2020) explored the potential of machine learning to combat online violence against women, by applying methods such as Naïve Bayes, SVM, Decision Tree, and Random Forest on X. This work highlights the growing interest in leveraging machine learning for online safety and provides insights into the challenges of sentiment analysis.

3. METHODOLOGY

3.1. DATA COLLECTION

We analyzed the discourse about Femicide in Ecuador on social media, by using information from X (formerly known as Twitter) as the main source, which serves as an effective platform for analyzing opinions (Madhubala et al., 2020). Additionally, in terms of tools for violent topics, X data is emerging as a powerful tool for sexual violence research, offering researchers a way to go beyond the limitations of traditional methods like surveys and interviews (Xue et al., 2023), and this method can be similarly applied to femicide.

The model used for exploring the content of the text is illustrated in Figure 4.

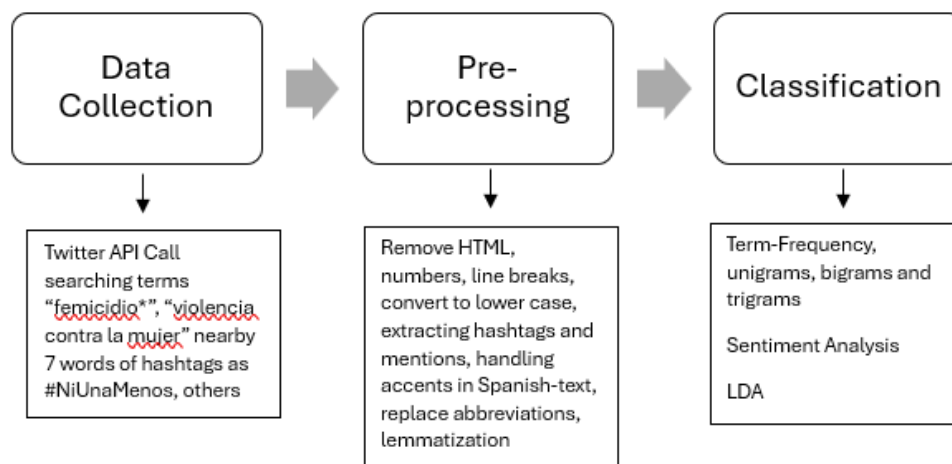


Figure 3 – The architecture of the classification models employed to the Tweets

We gathered the information from January 1st, 2020 to December 31st, 2023, collecting 244,000 Tweets. The collection was made by Brandwatch. This tool gathers information from a wide range of platforms, including social media (Sussman et al., 2023) (X, Facebook, Instagram, & others), news articles, forums, and blogs. Brandwatch presents the extracted data in a structured format, which typically is in table format. Structured data is significantly easier to analyze and manipulate compared to unstructured text, which streamlines the research process. Additionally, Brandwatch provides detailed information about the authors of the content, including demographics, location, and timestamps associated with the comments.

The comments were in Spanish and from Ecuador. The focus of the comments revolved around the terms "femicidio" and "feminicidio" (both meaning femicide) and the criteria are explained in Table 2.

Table 2 - Description of the query extraction introduced in Brandwatch

Query	Description	Focus
femicidio* OR feminicidio*	Searches for mentions containing terms related to the word femicidio (femicide), including variations in spelling (e.g., femicidios, feminicidios).	Core Topic: Femicide
OR #femicidio*	Searches for mentions containing hashtags related to femicide (e.g., #femicidioGuayaquil).	Hashtags related to femicide
OR #femicidiosEcuador AND engagingWith:@AldeaFundacion	Searches for mentions of "#femicidiosEcuador" that specifically mention or engage with the X handle "@AldeaFundacion"	Specific Organization engagement with Hashtag
OR ("violencia contra la mujer" NEAR/7 (#NiUnaMenos OR #VivasNosQueremos OR #NadieNosCalla OR #TodasLasVidasNosImporta OR #BastaDeFemicidios OR #EstadoFeminicida OR #MeToo OR #Time'sUp)	Searches for mentions containing the phrase "violencia contra la mujer" (violence against women) within 7 words of any of the listed hashtags related to women's rights movements (#NiUnaMenos, etc.).	Violence against women & related hashtags
NOT ("Lucio Gutierrez" OR "María Belén Domínguez Salazar")	Excludes mentions containing the names "Lucio Gutierrez" and "María Belén Domínguez Salazar". Considered Tweets not related to femicide.	Exclusion Criteria
NOT ("vilmatraca")	Excludes mentions containing the term "vilmatraca" Considered a fake account with false and negative political influence.	Exclusion Criteria

To gather more information related to femicide, we considered and analyzed the ALIANZA–Adea from Ecuador. This non-governmental organization was founded in 2017 and is composed of the following Ecuadorian organizations, that are dedicated to gender equality by raising awareness in the community:

ALDEA, Comisión Ecuménica de Derechos Humanos (CEDHU), Red Nacional de Casas de Acogida a Mujeres Víctimas de Violencia, CEPAM Guayaquil, Alianza por los Derechos Humanos de Ecuador, Movimiento de Mujeres del Oro (MMO), & Movimiento de Mujeres por la Justicia (MMJ).



Figure 4-Feminist Organizations for Mapping Femicides in Ecuador.

Source: Fundación Aldea

The analysis additionally considers relevant and widely used hashtags associated with femicide.

Latin America:

- **#NiUnaMenos (#NotASingleWomanLess):** This powerful hashtag emerged in Argentina in 2015 as a rallying cry against femicide. It demands an end to violence against women and serves as a call to action for justice (Chenou & Cepeda-Másmela, 2019).
- **#VivasNosQueremos (#WeWantOurselvesAlive):** This hashtag, often used alongside **#NiUnaMenos**, emphasizes the desire for women to live free from the threat of violence. It signifies a collective demand for a world where women can exist safely (Rovira-Sancho & Morales-I-gras, 2023).

Global Movements:

- **#MeToo:** This movement, originally started by Tarana Burke in 2006, gained widespread attention in 2017. It encourages women to share their experiences of sexual harassment and assault, breaking the silence surrounding these issues (Carpio-Jimenez et al., 2021).
- **#Time'sUp:** Launched in 2018 by Hollywood actresses, this movement aims to combat sexual harassment and assault in the workplace. It demands systemic change and accountability for perpetrators (Carpio-Jimenez et al., 2021).

Additional Latin American Hashtags, taking into consideration due to their importance in Fundacion ALDEA Report:

- **#NadieNosCalla (#NobodySilencingUs):** This hashtag emphasizes resistance against the silencing and censorship of women's voices. It signifies a refusal to be intimidated or silenced in the fight for justice.
- **#TodasLasVidasNosImporta (#AllLivesMatterToUs):** This broader hashtag recognizes that violence against women is one part of a larger struggle for social justice. It emphasizes the importance of all lives, particularly those who are marginalized and vulnerable.
- **#BastaDeFeminicidios (#EnoughFemicides):** This straightforward hashtag demands an end to femicide. It highlights the urgency of addressing this issue and the need for concrete action to prevent further violence.
- **#EstadoFeminicida (#FemicidalState):** This strong hashtag criticizes the role of the state in failing to protect women and prevent femicide. It holds authorities accountable for their response to gender-based violence.

3.2. DATA PROCESSING

In our analysis, we have considered that when performing an intent classification, two main challenges are identified (Subramani et al., 2017). Challenges of Informal Language, short messages on social media often use informal language, like abbreviations, emojis, and slang. This ambiguity makes it difficult to interpret the true meaning and intent behind the message.

As a result, the relationship between the words used (terms) and the intended meaning (class) becomes weaker, hindering accurate intent classification.

Data Imbalance and Limited Examples, specific types of user intent might be rare in the data corpus used for training intent mining models. This "sparsity of instances" creates data imbalance, with limited examples of a particular intent, the model struggles to learn and identify that intent accurately when it encounters new data (Subramani et al., 2017).

We have selected different columns, such as the full text of the Tweet, date, account type, engagement type, gender, city, and region/province of the user. We applied text preprocessing techniques and to clean the information we employed methods such as removing HTML, by removing digits, line breaks, and special characters, as well as converting all text to lowercase, ensuring consistency in how words are represented (Stephanie et al., 2023). Additionally, we removed multiple spaces, numbers, and special characters like punctuation marks, and symbols that can add noise to the data. Furthermore, we handled hashtags and mentions by removing the hashtags from the Tweets (Xue et al., 2020) and stored it in a new column, for further analysis, we removed emojis to focus on factual content and word usage (De Arriba et al., 2021).

For Term Frequency analysis, we normalized the data regarding accents. Additionally, we replaced abbreviations such as two-word abbreviations like "german c." with "German C  ceres" to showcase his significance in the study as the central character in the Maria Belen Bernal case. Lastly, a dictionary helped us find the correct forms of common Spanish abbreviations used in Ecuador, presented in the Appendix as recommended by De Arriba et al., 2021.

The last steps of pre-processing included removing stop words and lemmatization in Spanish. While stop word removal is a widespread practice in English text analysis, Spanish presents unique challenges due to the nature of its function words (Xue et al., 2019). We employed spaCy, which offers a compelling solution for lemmatization and stop word removal. spaCy comes pre-loaded with statistical language models specifically trained for Spanish, to handle the complexities of the language. This includes accurate lemmatization, which reduces words to their base form for improved analysis. Additionally, spaCy provides a comprehensive and evolving stop word list that removes familiar words with minimal meaning, streamlining the analysis and focusing on the most relevant content. SpaCy is also used for tokenization, as applied by Sharma, 2020 and Manzoor et al. 2022.

Furthermore, we have separated the hashtags and mentions with these symbols "# " @ users" from the Full Text Data, to apply further analysis in a different study as presented in Table 3. It is important to highlight that in our study we are keeping retweets when analyzing the volume of discussions per date, however, it is not employed for the study of hashtags and mentions.

Table 3 - Preprocessing of the Text including clean text, hashtags, and mentions.

Original Text	Preprocessed Text	Hashtag	Mentions
@FiscaliaEcuador #ATENCIÓN #FiscalíaEc cuenta con un Protocolo Nacional para Investigar Femicidios y Otras Muertes Violentas de Mujeres y Niñas, elaborado con apoyo de @SpotlightAmLat, la academia y la sociedad civil. Disponible en: https://t.co/hodDV5IB13 #FiscalíaConLasVíctimas https://t.co/u0NTXl7icN	cuenta con un protocolo nacional para investigar femicidios y otras muertes violentas de mujeres y ninas elaborado con apoyo de la academia y la sociedad civil disponible en	#ATENCIÓN, #FiscalíaEc, #FiscalíaConLasVíctimas	@FiscaliaEcuador, @SpotlightAmLat
@Silenciadasec No son números: eran vidas. Este 2020, desde que se declaró la emergencia sanitaria en #Ecuador, hemos registrado al menos 84 casos de #femicidio. El dato incluye a niñas, jóvenes, adultas y ancianas. #Silenciadas💜 https://t.co/qMmaLIKVBR https://t.co/NpVZlLtSXL	no son numeros eran vidas este desde que se declaro la emergencia sanitaria en hemos registrado al menos casos de el dato incluye a ninas jovenes adultas y ancianas	#Ecuador, #femicidio, #Silenciadas	@Silenciadasec

Once the text data was prepared, some methods were employed to delve deeper into the comment discourse, including term frequency, and sentiment analysis. This involved comparing different techniques to build a vocabulary of words from the entire dataset (corpus).

For Term Frequency, we created a vocabulary of unique words from the cleaned text. The core of the document-term matrix (DTM) was then constructed by calculating the term frequency (TF) of each comment. This was achieved using CountVectorizer, a function from the scikit-learn(Xue et al., 2019). CountVectorizer efficiently creates the TF matrix by considering the vocabulary of the corpus (preprocessed text), considering the size of the vocabulary equal to the size (preprocessed information) of the vector, and the dimension is the number of occurrences of the words appearing in the tweet (Gomez-Adorno et al., 2024).

The parameters were set as follows, N_gram range, tuple (min_n, max_n). This setting determines the range of n-gram sizes to be extracted from the text. N-grams are sequences of words or characters, where "n" represents the sequence length. Unigrams (n=1) are single words, bigrams (n=2) are pairs of consecutive words, and trigrams (n=3) are three consecutive

words. In the study, it explored a range of n-gram sizes: unigrams (single words), bigrams (word pairs), and trigrams (three consecutive words) to capture context within the text.

Additionally, we used the Min_df, Low-Frequency Word Filtering (Cutoff). This setting controls how often a word must appear in documents to be included in the analysis for bigrams and trigrams (sequences of two or three words, respectively), a higher minimum document frequency (min_df) of 10 has been applied. This means that bigrams and trigrams must appear in at least 10 documents within the corpus to be included in the analysis. This helps exclude non-meaningful phrases that occur rarely and focuses on terms that are more likely to be informative. These pairs, representing bigrams, might reveal important themes or concepts (Xue et al., 2019) related to femicide, such as "domestic violence," "legal system," or "victim support."

Several parameters were not used in the Term Frequency due to data preprocessing. The cleaning and preprocessing steps likely handled tasks like removing special characters or irrelevant information, making those specific parameters unnecessary.

Latent Dirichlet Allocation (LDA) is an unsupervised machine-learning method used for topic modeling, to uncover the thematic structures within each comment (Stephanie et al., 2023; Xue et al., 2019). To determine the optimal number of topics for the model, the Perplexity metric (RPC) has been used (Stephanie et al., 2023) with the highest coherence score. These metrics aid in selecting the most suitable number of topics.

For Sentiment Analysis, a pre-trained Spanish sentiment analysis model from the sentiment-analysis-Spanish (version 0.0.25) python library, was used, which also needs Keras and tensorflow package. This model estimates the likelihood of a Spanish tweet expressing positive sentiment (Lopez & Gallemore, 2021). Lower probabilities (closer to 0) suggest a negative sentiment, while higher probabilities (closer to 1) indicate a positive sentiment. Scores in between typically correspond to neutral sentiment.

We also conducted a deep dive into hashtags and mentions to identify trends and topics of interest. As well as an analysis of the use of more relevant feminist activism hashtags in Mexico (Rovira-Sancho & Morales-I-gras, 2023) and compared them with the use and occurrence in Ecuador. We also analyzed quantifiable user demographics, including gender and province.

4. RESULTS AND DISCUSSION

As a foundational component of our methodology, we conducted an initial analysis of gender distribution, geographic breakdown, and account type participation. This preliminary examination serves as the cornerstone upon which subsequent analyses are constructed, offering essential insights into the composition and dynamics of the online discourse under investigation.

The first step of the analysis involved examining the percentage breakdown of comments by the author's gender. Then, by discerning the gender distribution within the dataset, one can ascertain whether the conversation exhibits a discernible bias towards a particular gender or maintains a balanced representation. This initial exploration provides valuable insights into the multifaceted nature of the discourse surrounding femicide.

The dataset analyzed over 244,000 tweets from 39,560 unique users (authors). Among these users, 57 were identified as organizational accounts, including institutions like the National Assembly ("Asamblea Nacional"), Aldea Foundation ("Aldea Fundacion"), major news outlets ("elcomerciocom", "eluniversocom"), and the Attorney General's Office ("FiscaliaEcuador"). A complete list of these organizations is available in the Appendix. The remaining 39,510 users represent individual accounts.

As a starting point, the data exhibited a gender imbalance, with 37% of tweets originating from male accounts, 24% from female accounts, and 36% from accounts with unknown or undefined gender on the platform. A small proportion (3%) of tweets stemmed from organizational accounts that do not have a specific gender associated with them.

Following this, the geographic distribution of comments was analyzed to identify the locations of the most active participants in online discussions. This process was established to uncover regional engagement patterns and assess whether the conversation is centered around specific geographic areas, such as cities, or includes wider participation.

Quito and Guayaquil emerged as the cities with the most significant X activity. This finding aligns with national data on violent deaths, where Guayaquil has the highest number, followed by Quito. Notably, these two cities are also the most populous in Ecuador, suggesting a possible link between population size and X activity.

Overall, we compare the number of X discussions with the distribution of femicide cases across the provinces, using Aldea foundation values. To analyze this, we calculated the average number of femicide cases and discussions per province based on the yearly totals, in this observation, the logarithmic formula was applied to normalize the data points due to the high values in Guayas and Pichincha. Figure 5 represents the relationship between the number of tweets and femicide cases per province. The Pichincha province leads online conversations and is considered one of the provinces with the most cases of femicides, see the map of

Ecuador in the second figure in the annexes section. The high volume of online conversations in Pichincha might be linked to Ecuador's centralized power structure, with Quito, the capital and most populous city, located there. Notably, provinces like Guayas, Azuay, Manabí, and El Oro also show a significant online presence regarding femicide. However, Los Ríos and Esmeraldas, despite having higher increases in femicide rates, exhibit a lower propensity for online discussions and awareness campaigns on this critical issue. Esmeraldas is particularly concerned. While femicide cases there rose significantly between 2020 and 2021, this province lacks a strong online presence regarding this issue.

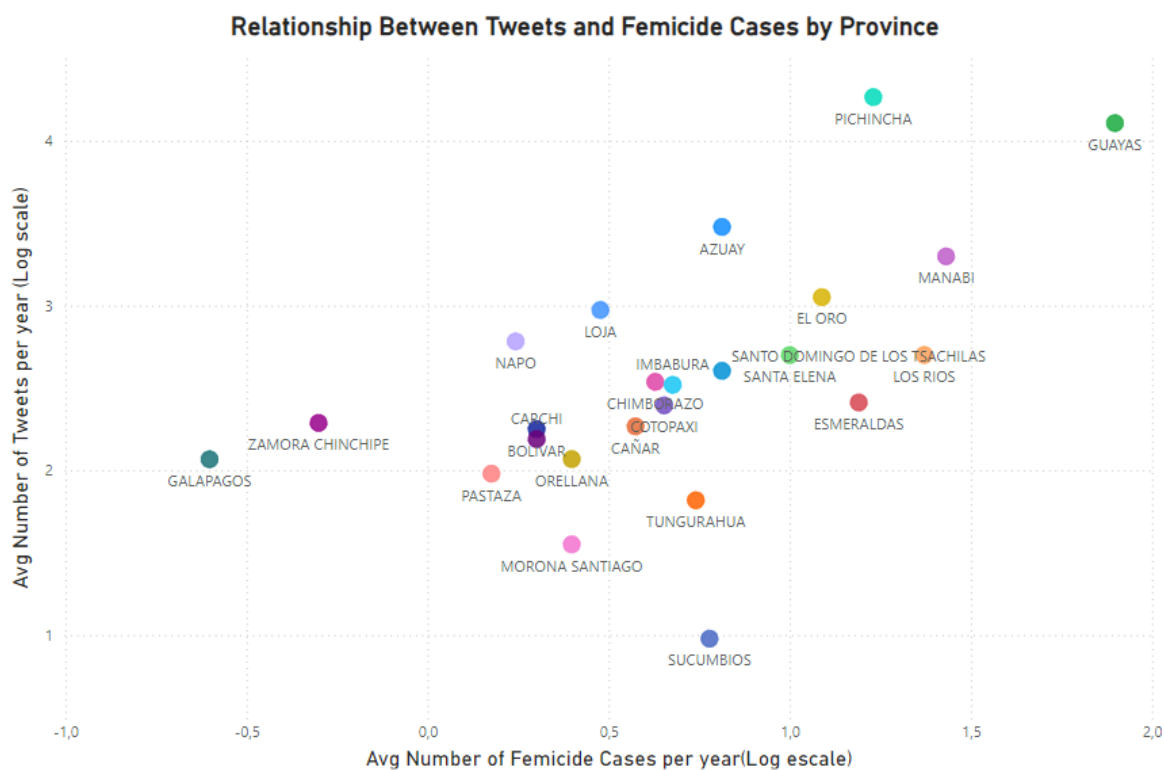


Figure 5 - Logarithmic Scale of Femicide Cases and Discussions per Province

In the study period, counting retweets, quotes, and replies, the year with the most Tweets, is 2022, with 87K, followed by 2023 with 66K, 2021 with 47K, and 2020 with 44K. This significant increase in 2022 of approximately 86% compared to 2021 can be attributed to a highly discussed case in September 2022, as represented in Figure 6. The case involved a police

officer, the police department, and a well-known lawyer who is the officer's spouse and the alleged victim.

Volume of Tweets per Month and Year

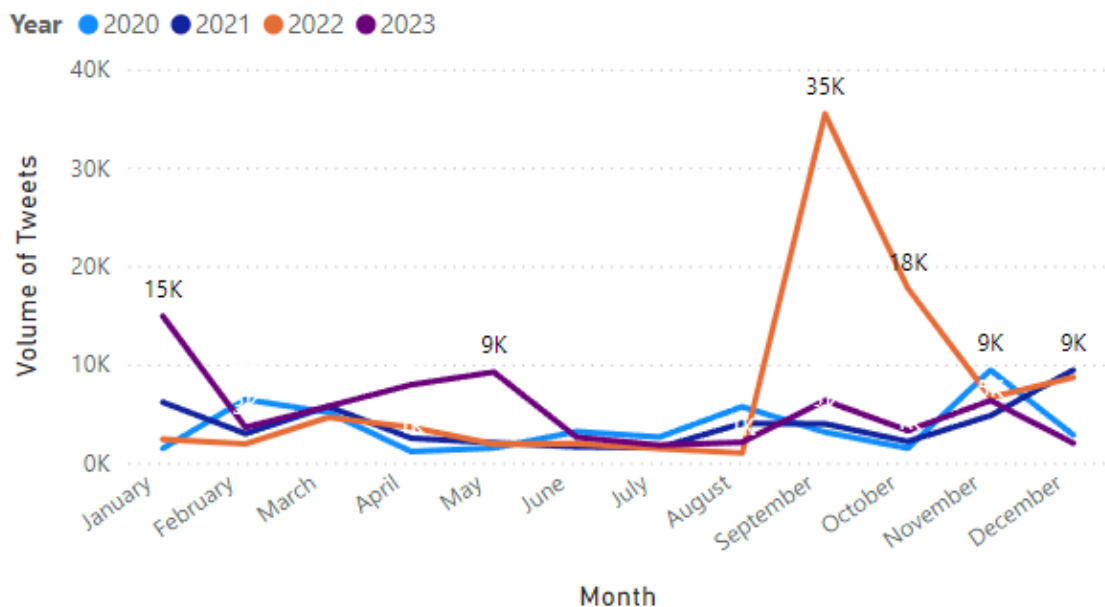


Figure 6 - Evolution of number of Tweets per month and compared per year

A spike in online discussions occurred on September 21st, the day the body of Maria Belen Bernal, a victim of femicide, was discovered. This was followed by a surge in December 2022, January, and May 2023, likely due to new developments or actions related to the case. In general, discussions peak in March and on November 25th (International Day for the Elimination of Violence against Women).

The study also analyzed the most active X accounts considering only the number of Tweets per account, categorizing them as organizations or individuals. This categorization relied on the account type definition provided by the user on the X platform. However, it appears that some major organizational accounts were not classified as such in the app. To address this issue, a dictionary was created to map out the most important Ecuadorian organizations related to media, the judiciary, government, and social movements, including those focused on feminism and femicide.

Then, the attention is turned to the participation patterns of different account types, distinguishing between individual and organizational accounts. By quantifying the proportion of comments originating from each account type, one can discern whether the discourse primarily features personal viewpoints or incorporates a significant presence of official statements from organizations.

The top 10 organizational accounts with the greatest number of Tweets consist of 7 media and communication accounts, 2 social organizations, and 1 governmental institution.

Table 4 - Top 10 Organizational Accounts with the most Tweets

Ranking	Author	No. of Tweets	Type of organization
1	@DesafioDerechos	886	Social – Human Rights
2	@radio_pichincha	685	Local Media
3	@MujeresConVojs	435	Social – Human Rights
4	@eluniversocom	423	Local Media
5	@revistavistazo	400	Local Media
6	@ecuabot	372	Local Media
7	@AldeaFundacion	358	Social – Human Rights
8	@DiarioExtraEc	325	Local Media
9	@elcomerciocom	299	Local Media
10	@EcuavisalInforma	298	Local Media

Among the top 20 individual accounts ranked by the number of tweets they posted, the first four are male. This breakdown reveals a gender disparity, with 9 male accounts, 6 female accounts, and 5 accounts for users whose gender is unknown. Interestingly, the data suggests that the male accounts in this sample tend to be more active tweeters and generate more discussion.

When analyzing the content, the analysis reveals that "femicidio" (femicide) is the most frequent word, followed by "mujer" (woman), "violencia" (violence), "víctima" (victim), and "caso" (case). Interestingly, terms related to the highly discussed case of María Belén Bernal in September 2022 appear frequently around the 7th position, including "maria," "belen," and "bernal." This indicates a significant focus on this specific case within the social media discourse on femicide. Additionally, the presence of words like "ecuador," "justicia" (justice), "país" (country), and "muerte" (death) highlight the broader conversation surrounding femicide and violence against women.

The study also analyzed bigrams and trigrams represented in Figures 7 and 8 accordingly (sequences of two or three words) to identify the most frequent n-grams in the discourse. Interestingly, phrases related to María Belén Bernal appeared at the top of both bigram and trigram analyses. This suggests that the online conversation heavily centered around this specific case.

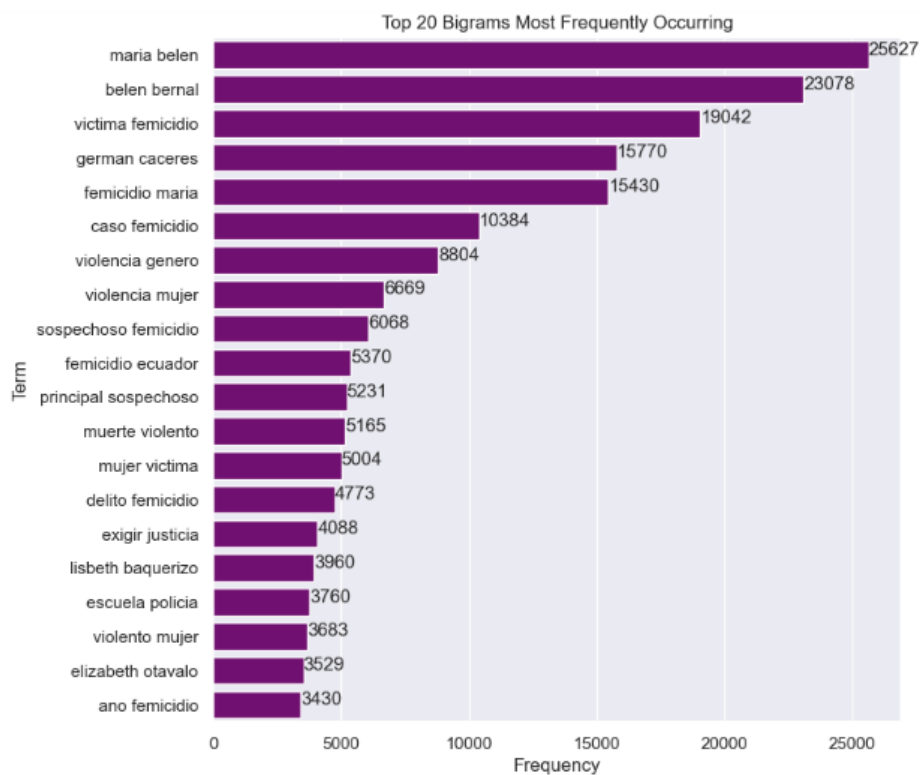


Figure 7 - Top 20 Bigrams Most Frequently Occurring

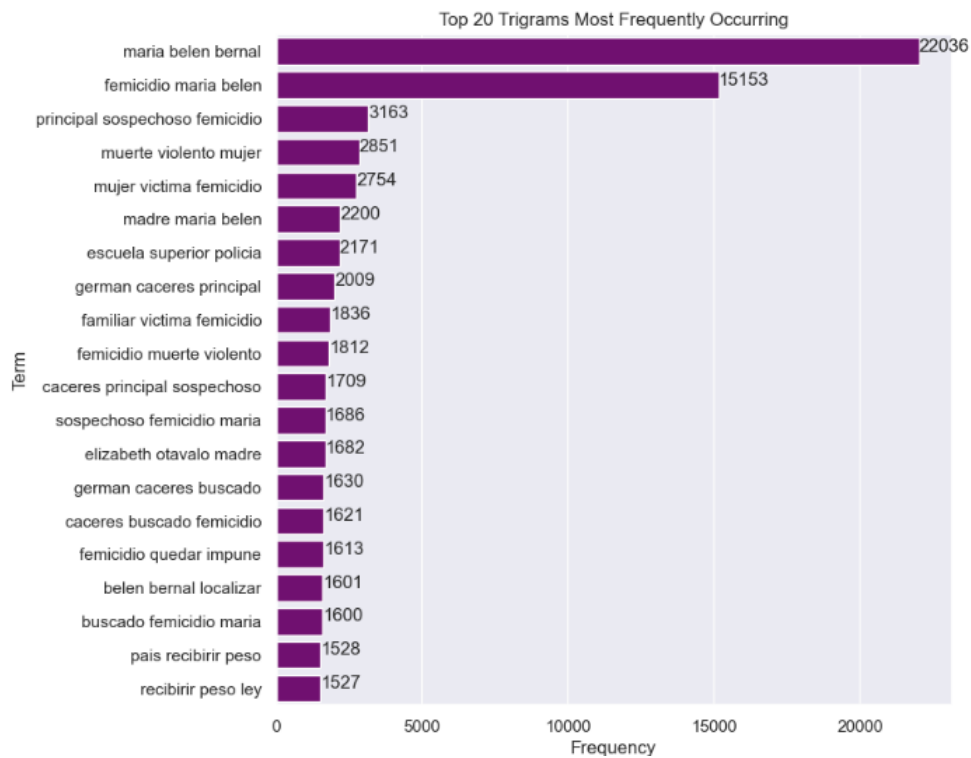


Figure 8 - Top 20 Trigrams Most Frequently Occurring

We performed Latent Dirichlet Allocation (LDA) modeling and identified an optimal classification of five topics. Topics 1 and 2 are similar, while the remaining three exhibit distinct themes, see Table 5. Our analysis of the identified topics reveals interesting thematic clusters within the data. Topic 1 appears to be centered around femicide and Ecuador, while Topic 2 delves into the complexities of justice and legal processes related to these cases. Topic 3 offers a more human perspective, focusing on the victim and their close family. In contrast, Topic 4 highlights words associated with gender-based violence, the legal system, and even corruption. Finally, Topic 5 is more specific, potentially related to a particular femicide case requiring further investigation. We also performed an analysis of topic modeling using bigrams. The results presented similar topics and included 2 related to femicide cases.

Table 5 - Classification of topics and their most relevant terms

Topic	Most-Relevant Terms for Topic
1	femicidio, mujer, ecuador, pais, hombre, vida, matar, seguir, quedar, querer
2	femicidio, caso, justicia, asesinato, presunto, exigir, proceso, fiscalia, hablar, judicial
3	victima, ano, muerte, familiar, hijo, nina, violento, persona, enero, registrar
4	violencia, genero, deber, delito, cifra, derecho, tipo, corrupcion, heramienta, sociedad
5	lisbeth, baquerizo, madre, pareja, familia, pena, luis, fiscal, sexual

Overall, the top 10 hashtags are composed of the single words (#femicidios, #feminicidios, #atencion, #atencion, #urgente, #quito). We can find hashtags related to locations such as the country or city, suggesting that discussions are not limited to a single region and encompass femicide cases from various places. We also noted the relevance of the #MariaBelenBernal hashtag, which indicates a high amount of femicide cases in the discourse since 2022. Besides the list of hashtags presented in Table 5, there are hashtags every year related to one specific case such as #JusticiaParaGaby, #JusticiaParaLisbethBaquerizo, #JusticiaParaAdrianaySantiago, #NaomiArcentales, #JusticiaParaNaomi, others, this showcases the prevalence of discussions focused on individual victims and using the word “JusticiaPara” to show mobilization or requesting action.

Table 6 – Top 5 Hashtags more times used per year.

Year	Hashtag	Occurrence count
2020	#NiUnaMenos	3578
	#Femicidio	3427
	#Ecuador	2053
	#Cuenca	1716
	#JusticiaParaGaby	1453

2021	#FemicidiosEC	4424
	#Femicidio	3093
	#Ecuador	3017
	#JusticiaparaLisbethBaquerizo	2835
	#NosotrasSinViolencia	2463
2022	#MariaBelenBernal	21640
	#Atencion	5905
	#Ecuador	3966
	#Femicidio	3597
	#Urgente	3338
2023	#MariaBelenBernal	4104
	#Atencion	4052
	#Femicidio	3242
	#Ecuador	2396
	#Urgente	2253

Table 5 illustrates the five hashtags and mentions with more occurrences per year, we observed that the accounts with the most mentions in the Tweets are @PoliciaEcuador (police official account), @LassoGuillermo (president during 2021 and 2023), and @FiscaliaEcuador (Judicial Function account). These represent public functions, followed by local media and personal accounts, we noticed the presence of an individual account, belonging to and named as one of the victims in 2020. The account is active on X, posting tweets to raise awareness and demand justice for all the victims. It has become a point of reference for justice in many femicide cases.

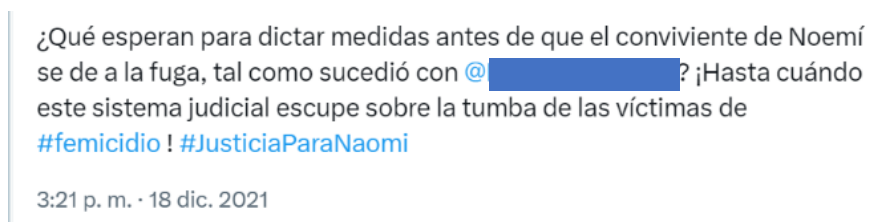


Figure 9 -Tweet mentioning an account belonging to one of the victims in 2020 as an example to support a different femicide case

We analyzed the top 50 Mexican hashtags for feminist activism in Latin America. Our analysis revealed connections between 34 of these hashtags, which were mentioned in the Tweets in varying proportions. The hashtags #NiUnaMenos and #VivasNosQueremos were highly cited, likely due to their inclusion in the data collection query. However, three other hashtags, #25N, #8M, and #NiUnaMas, were mentioned more than one thousand times each. Among the top 50 hashtags identified, #ViolenciaDeGenero and #8M2021 were frequently mentioned. The

following table showcases the top 50 hashtags with the number of mentions and overall ranking in Ecuador according to the Mexican study mentioned above.

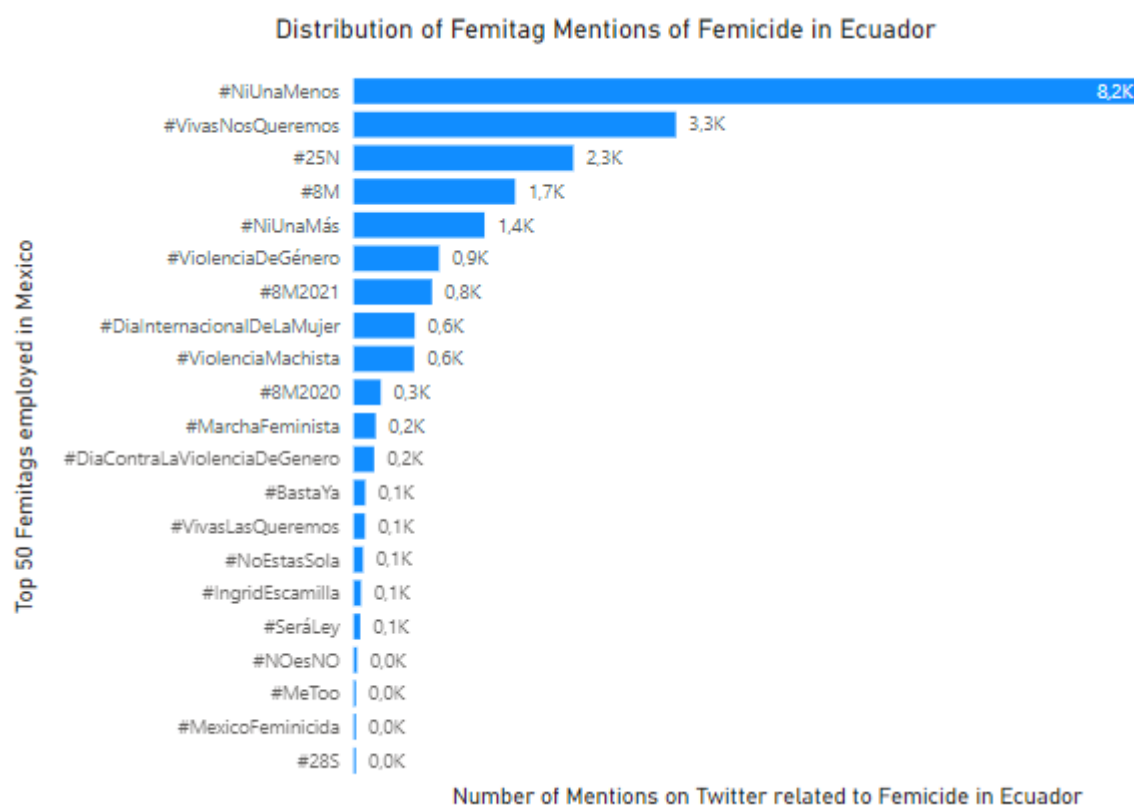


Figure 10 – Occurrence Count of the Top 50 Hashtags of Feminist Activism in Mexico mentioned in femicide content in Ecuador. Source: Adapted from Rovira-Sancho, Guiomar; Morales-i-Gras, Jordi (2023). “Femitags in the networks and in the streets: 50 hashtags for feminist activism in Latin America”.

Following the classification realized by Rovira Sancho and Morales, we find 18 hashtags identified as “against femicide” (#NiUnaMenos, #VivasNosQueremos, #8M, #MarchaFeminista, others), 10 represent a “Collective Identify” (#8M, #DiaInternacionalDeLasMujeres, #UnDiaSinNosotras, others), and 8 “Add cases” (#ViolenciaMachista, #BastaYa, #IngridEscadilla, #MeToo, others). These categorizations provide a nuanced understanding of the various themes and focal points within feminist activism on social media.

The tweets were further analyzed to determine their sentiment using the Sentiment-analysis-model-neural-network, the texts were classified into 3 categories Positive, Negative, and Neutral. We excluded retweets from this study because they are likely to share the sentiment of the original tweet. Over the four years analyzed, negative sentiment was the most prevalent, accounting for approximately 91% of the tweets. Neutral tweets comprised roughly 7%, and positive tweets made up the remaining 2%.

The figure on the right shows the volume of tweets categorized by sentiment over the years. This distribution is likely skewed because the negative category represents most tweets. Positive and Neutral trends show minimal fluctuations, indicating less prominence.

Table 7 - Percentage of Sentiment Analysis based on Tweets from 2020 to 2023

Sentiment	Percentage of the category	Tweet sample
Positive	2,24%	Gracias al gran trabajo de @PoliciaEcuador en coordinación con @PoliciaColombia fue capturado #GermanCaceres en Colombia. Estoy segura que caerá todo el peso de la ley, sobre el principal sospechoso del femicidio de #MaríaBelénBernal.
Negative	90,74%	Es increíble como nos imaginamos un mundo perfecto o no tan perfecto pero lleno de amor y paz, sin femicidio, sin sicariato, sin corrupción, sin que las personas inocentes mueran, pero es penoso como se llevan sus sueños a la tumba, sin haber tenido la oportunidad de luchar.
Neutral	7,03%	Varias organizaciones realizaron una marcha en contra de la violencia a la mujer en el Centro Histórico de Cuenca. Los colectivos piden justicia y seguridad a propósito de los femicidios ocurridos el pasado mes de marzo en la capital del Azuay. #NoticiasCuenca #Cuenca #UnisionTv https://t.co/JhkHD7C6tv

5. CONCLUSION

It is important to highlight the complex social roots of femicide in Ecuador. Deep-seated gender inequality, patriarchal norms, and a lack of access to justice create a breeding ground for femicide. This is further exacerbated by the security crisis within the country, which disproportionately endangers women and limits their ability to ensure safety. The COVID-19 pandemic likely compounded these issues, leading to the increase in violence against women, which culminated in femicide cases due to factors like social isolation and financial strain. Additionally, the relatively recent recognition of "femicide" as a legal term in Latin America, and in Ecuador (since 2014) likely plays a role in the increased acknowledgment of this phenomenon. This potentially explains the rise in reported cases, which may not necessarily reflect a surge in femicides themselves, but rather a heightened awareness and more accurate classification.

Overall, X (Twitter) discussions reached exceptionally high levels surrounding a specific case that occurred in September 2022, followed by November 25th and 8th March (both international days in the benefit of the women). This phenomenon highlights that engagement on this platform increases significantly whenever protests or cases emerge that resonate with society.

It is crucial to address the underlying social problems that fuel this violence. Text mining revealed the most common words used in discussions about femicide such as *mujer*, *femicidio*, *justicia*, *pais*, *violencia de genero*, *femicidio*, to gather sentiments and emotions from the users, such as the case of "Maria Belen" or "Elisabeth Baquerizo". Analyzing these words and the latent topics clarified the prevalent themes, and narratives surrounding this critical issue.

The analysis explored potential variations in femicide discussions across different provinces and demographics. Notably, Guayaquil, the city with the highest number of discussions over the four years, also exhibits the most femicide cases. However, this pattern is not universal. While other provinces with significant femicide rates, like (the capital city's) and others show online activity, a gap exists. Los Ríos and Esmeraldas, despite even higher femicide rates, have a lower online presence. This highlights a need to bridge this digital divide to raise awareness and combat femicide across all provinces.

Insights into common hashtag trends related to femicide discussions across Latin American countries whether users primarily leverage international hashtags or local ones specific to their regions. In this sense, the analysis revealed a strong preference for local hashtags that resonate with the local population. These hashtags often promote action or raise awareness. For instance, a common trend involves using "#JusticiaPara" (Justice for) followed by the victim's name. This serves a dual purpose: demanding legal action against the perpetrator and expressing solidarity with the families of other victims.

Interestingly, 34 hashtags used in Mexico were also employed in Ecuador, albeit with varying levels of popularity. These shared hashtags often pertained to activism and mobilizations. Notably, discussions in Ecuador even referenced specific Mexican cases as the #IngridEscamilla hashtag, for international hashtags used we found #NiUnaMenos, #VivasNosQueremos, #8M, #MeToo, #ViolenciaMachista, and others.

Additionally, our study highlighted a significant proportion of discussions involving male users who expressed support for the victims and a rejection of any acts of crime or violence against women. Additionally, we found that following the study made for Colombia and Mexico's populations (Gil et al., 2018), the percentage of negative sentiment shows similar behavior in Ecuador's discourse, indicating that the Ecuadorian population has a bad perception of femicide and rejects it.

Lastly, our exploration, of the Tweets using text mining, unfolded the multifaceted nature of public discourse surrounding femicide in Ecuador.

This study has some limitations. First, we relied primarily on the keyword "femicide" for our search, and the study only included a few hashtags related to "violencia de género". Users may discuss femicide without explicitly mentioning the word in their posts, relying solely on these hashtags. Additionally, our analysis was limited to text-based data from a single platform (X). This excludes potential discussions happening on other social media platforms such as Facebook or Instagram, and in other formats such as videos or images, potentially underestimating the overall population raising awareness about femicide.

In future studies, we suggest investigating the relevant aspects in which the security crisis in Ecuador disproportionately affects women's safety and contributes to femicide, especially over the last year. This could involve collaborating with security experts and analyzing crime data. Regarding geographical presence, one could conduct targeted research in Los Ríos and Esmeraldas to understand the reasons behind their lower online presence. This could involve surveys, focus groups, and interviews with residents and activists.

To gain a deeper understanding of the negative sentiment, text classification could be employed to differentiate tweets defending perpetrators and those advocating for victims. This would provide valuable insights into the sources of negativity and potential strategies to counter them.

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APPENDIX A

Dictionary employed in data pre-processing, to map abbreviations of spanish text into their full format.

Abbreviations	Full format	english description
dm	mensaje directo	Direct message
fb	facebook	facebook
lol	reírse a carcajadas	Laughing Out Loud
Pls	por favor	please
q	que	that
x	por	for
sra	senora	mister
xq	porque	because
xfa	por favor	why
dra	doctora	doctor
pq	porque	because
man	hombre	man
tb	también	also
d	de	of, from
tq	te quiero	love you
xd	por Dios	oh God
k	que	that
tbm	tambien	also
cm	como	how
dnd	donde	where
+	mas	plus
-	menos	menos
tkm	te quiero mucho	I love you

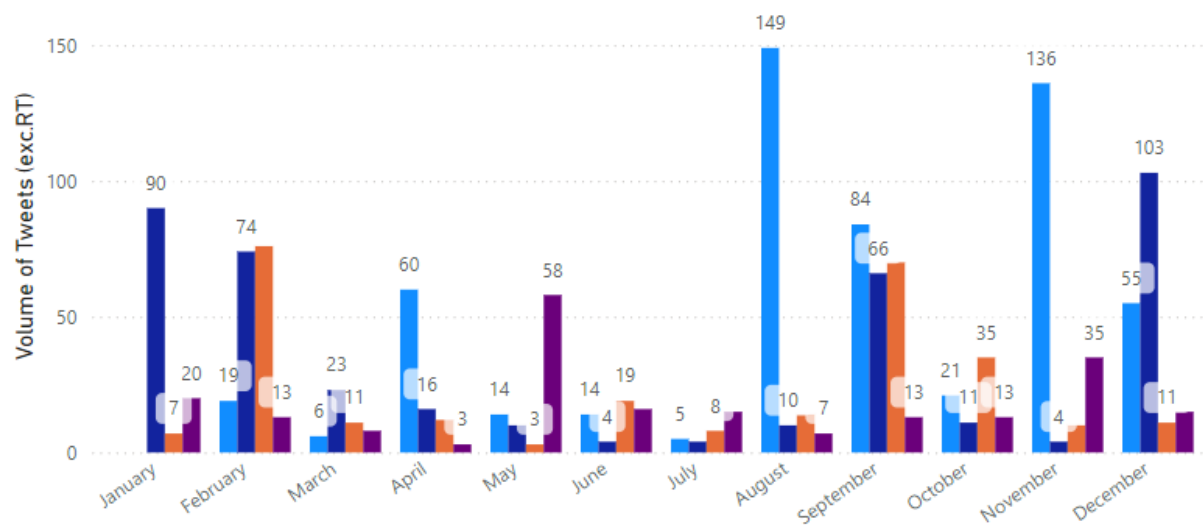
APPENDIX B

Visualizations to support the data results.

- Numbers of Tweets that contain hashtag “#JusticiaPara” in the body of the Tweet from 2020 to 2023

Volume of Tweets filtered by "JusticiaPara" per Month and Year

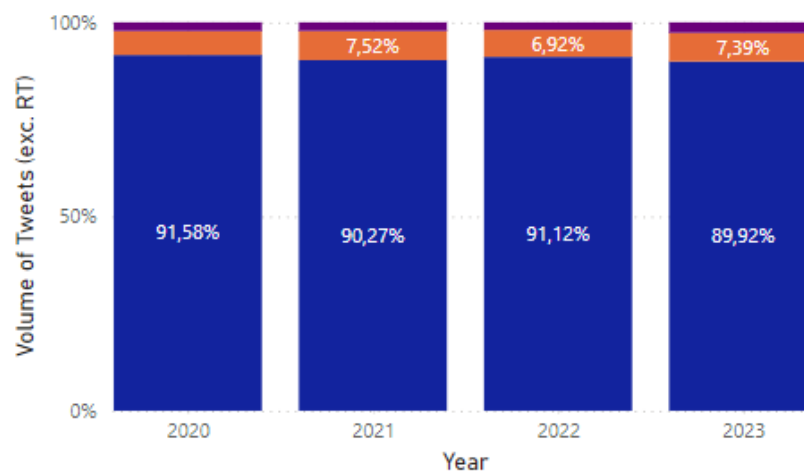
Year ● 2020 ● 2021 ● 2022 ● 2023



- Percentage Distribution of Sentiment Analysis from 2020 to 2023

Volume of Tweets by Sentiment Analysis

Sentiment Category ● Negative ● Neutral ● Positive



- The top 50 Femitags employed in Mexico with the related occurrence count founded in Ecuador Tweets. Source: Adopted from Rovira-Sancho, Guiomar; Morales-i-Gras, Jordi (2023). “Femitags in the networks and in the streets: 50 hashtags for feminist activism in Latin America”

50 Feminism Hashtags	Ecuador # of Mentions	Ecuador Ranking
#NiUnaMenos	8185	5
#VivasNosQueremos	3332	10
#25N	2271	17
#8M	1669	24
#NiUnaMás	1353	27
#ViolenciaDeGénero	883	42
#8M2021	809	47
#DiaInternacionalDeLaMujer	631	56
#ViolenciaMachista	623	58
#8M2020	280	114
#MarchaFeminista	227	134
#DiaContraLaViolenciaDeGenero	211	152
#BastaYa	119	261
#VivasLasQueremos	116	268
#NoEstasSola	96	297
#IngridEscamilla	75	354
#SeráLey	67	390
#NOesNO	34	656
#MeToo	22	893
#MexicoFeminicida	22	906
#28S	21	926
#UnDiaSinNosotras	21	938
#SeVaACaer	16	1101
#YoSiTeCreo	14	1210
#MachismoMata	7	1899
#3J	5	2232
#AbortoLegal	4	2678
#FuimosTodas	4	2860
#NosotrasParamos	3	3204
#AbortoLegalYa	2	3779
#MareaVerde	2	4609
#MeCuidanMisAmigas	1	5451
#HuelgaFeminista8M	1	5248
#MiraComoNosPonemos	1	5152

APPENDIX C

Ethics Committee Approval of this study.

From: Ethics Committee
Sent: 11 de julho de 2024 11:11
To: Flavio Luis Portas Pinheiro; Maria Jose Toaquiza Cedeno
Cc: Ethics Committee
Subject: RE: NOVA IMS | Ethics Committee - NEED REVIEW

Dear Maria Cedeno,
Dear Professor Flávio Pinheiro,

Thank you for filling in the Research Ethics Checklist. After reviewing your request, you can proceed with the study we do not foresee any major ethical concerns with the project.

Project No.: **DSCI2024-7-105005**

Project Title: **Examining the Public Discourse on Femicide in Ecuador: A Social Media Analysis from 2020 to 2023**

Principal Researcher: **Maria Jose Toaquiza Cedeno**

according to the regulations of the Ethics Committee of NOVA IMS and MagIC Research Center this project was considered to meet the requirements of the NOVA IMS Internal Review Board, being considered **APPROVED** on 11/07/2024.

It is the Principal Researcher's responsibility to ensure that all researchers and stakeholders associated with this project are aware of the conditions of approval and which documents have been approved.

The Principal Researcher is required to notify the Ethics Committee, via amendment or progress report, of

- Any significant change to the project and the reason for that change;
- Any unforeseen events or unexpected developments that merit notification;
- The inability of the Principal Researcher to continue in that role or any other change in research personnel involved in the project.

Lisbon, 11/07/2024

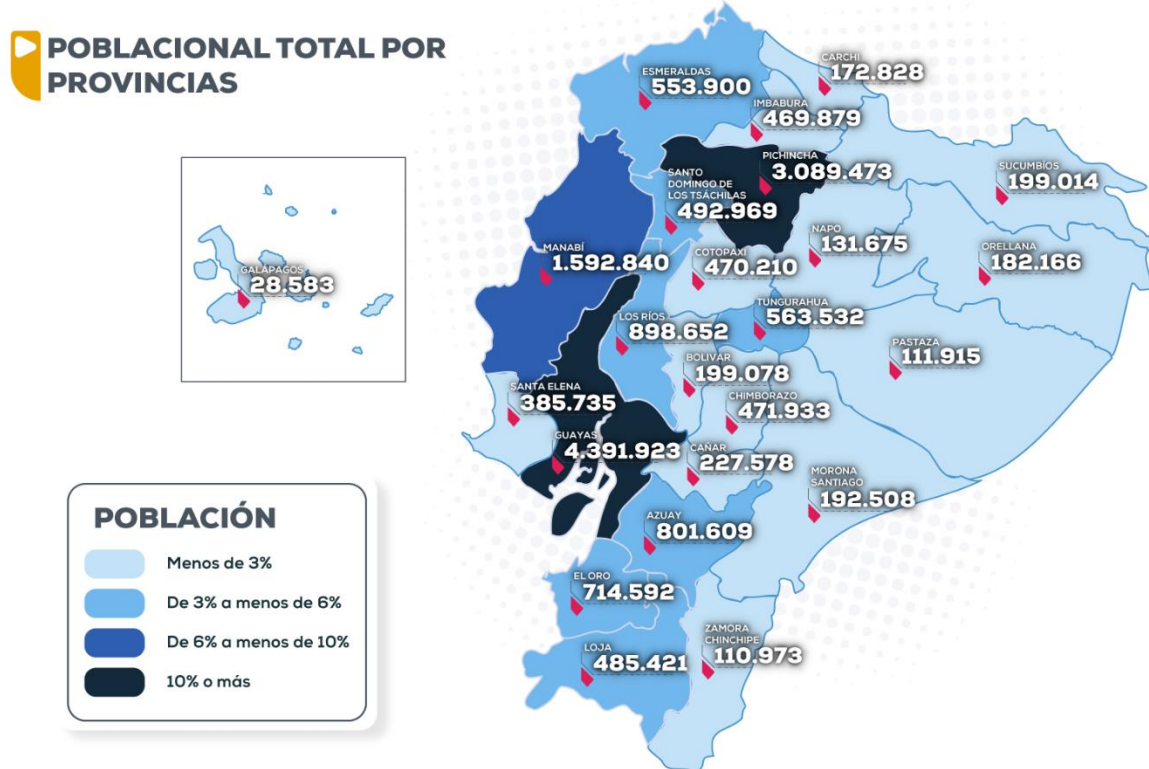
NOVA IMS Ethics Committee

ethicscommittee@novaims.unl.pt

ANNEXES



Example of Tweet on 25th of November 2020, for International Day for the Elimination of Violence against Women



Ecuador Provinces Map with the Population per Province in 2022 Source: INEC, 2023

