

Distr.: General  
01 May 2023

English

---

## Economic Commission for Europe

Conference of European Statisticians

### Group of Experts on Gender Statistics

Geneva, Switzerland, 10-12 May 2023

Item E of the provisional agenda

Measuring violence against women

## Using big data to study violence against women and girls and its challenges online

Note by ISTAT (Italian National Institute of Statistics) \*

### *Abstract*

Social networks are the "modern agoras" and, during the pandemic, it has become a social space where violence against women increased by moving from real to virtual. Social media are the new source of data for understanding, along with other data sources, the changing nature of gender-based violence. Finding methodologies and techniques able to use these new sources of Big Data is essential to understanding and monitoring that phenomenon. Observing what is happening on social media, and measuring the sentiment of online conversations, however, is not the only goal. Indeed, we know that it is violence against women itself that has become virtual (online violence) and finds its channel of dissemination in social media. ISTAT has piloted an Index related to gender-based violence and a sentiment and emotion analysis based on social media content (Twitter, Facebook, Instagram, and web newspaper post) aimed at measuring how the users of social react to the violence against women and/or generates discussions around it. In addition, the adopted method helps to understand which are the messages that unleash the discussion, by providing a map of the topics (such as body-shaming, femicide, and rape) where the sentiment is most solicited (both positive and negative). The results of the experimentation are furthermore compared to another source of data, coming from the national helpline against violence and stalking against women (1522) that ISTAT has recently adopted (from 2020) as a new and timely administrative source of data in order to gather information during the pandemic period. The piloted method can help researchers in monitoring the future challenges of violence against women and girls online and opening a new way aimed at integrating different sources of data, as our study has attempted to provide.

\*Prepared by Alessandra Capobianchi, Maria Giuseppina Muratore, Claudia Villante.

NOTE: The designations employed in this document do not imply the expression of any opinion whatsoever on the part of the Secretariat of the United Nations concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries.

## I. On line Gender Based Violence, cyber-violence: different names and new tools of analysis

1. Online gender based violence is not a new phenomenon. In its 2018's report, Mapping study on cyber -violence, Cybercrime Convention Committee (T-CY)<sup>1</sup>, even acknowledging the challenge of the definition due to its ongoing modification, reached consensus on using "cyber-violence" as the most concise term to be used consistently throughout the study, defining it as follows: Cyber-violence is the use of computer systems to cause, facilitate, or threaten violence against individuals that results in, or is likely to result in, physical, sexual, psychological or economic harm or suffering and may include the exploitation of the individual's circumstances, characteristics or vulnerabilities (...) Considering "cyber" as an adaptation of the "cyber" context of the definition of violence against women of Article 3 of the Istanbul Convention. '... the landscape of gender-based violence has been transformed ... [but] rather than there being a dramatic reduction in violence against women, ... the challenges have become more complex, the resistance to change deeper, the backlash against the empowerment of women more blatant and the methods used to uphold the status quo more sophisticated and insidious'<sup>2</sup>.
2. An extensive literature, over the last decades on this topic has been animated the discussion on how to define violence against women and girls (VAWG) and, consequentially, how to study and measure it. Based on 2022's EIGE report<sup>3</sup> there is not commonly accepted definition of online violence against women' (European Commission, Advisory Committee on Equal Opportunities for Women and Men, 2020), but it is possible to identify some characteristics which helps to define its boundaries and mapping the forms. We can furthermore considers on line or cyber VAWG "as a burgeoning phenomenon on a global scale: an emerging new dimension of gender-based violence that is likely to result in physical, sexual or psychological harm or suffering to women and girls"<sup>4</sup>. On line VAWG is often referred to as a new form of violence, grounded in the increased use of new digital technologies and maximised by the constant connectivity of Web 2.0. Undoubtedly this form of new violence against women and men which is grounded in the increased use of new digital technologies, exploded during the pandemic. The Covid-19 pandemic deepened economic and social stress, enforcing restricted movement and social isolation measures, resulting in increased risks of gender-based violence, particularly in the domestic context. ISTAT has monitored this period using data of national helpline against violence against women and stalking (1522)<sup>5</sup>. During Covid-19, violence against women manifested in different, extended forms, including domestic violence, and online and ICT-facilitated violence. The growing reach of the internet, the rapid spread of mobile information and communications technologies (ICTs), and the wide diffusion of social media have presented

---

<sup>1</sup> Cybercrime Convention Committee (T-CY) Working Group on cyberbullying and other forms of online violence, especially against women and children, Mapping study on cyberviolence with recommendations adopted by the T-CY on 9 July 2018. Strasbourg, France

<sup>2</sup> Cyber Violence Against Women and Girls: A World-Wide Wake-Up Call. Report By The UN Broadband Commission For Digital Development Working Group On Broadband And Gender. Available online at: <https://en.unesco.org/sites/default/files/genderreport2015final.pdf>

<sup>3</sup> EIGE, 2022 ibidem

<sup>4</sup> EIGE, 2022 Ibidem p.36.

<sup>5</sup> ISTAT, Gender-based violence in the time of COVID-19: calls to the 1522 helpline, 30 June 2020, <https://www.istat.it/en/archivio/245001>

new opportunities and enabled various efforts to address online VAWG. The ICT is only a new tool to perpetuate gender-based violence against women and girls which takes place in a context of widespread systemic gender-based discrimination. In fact, internet is not just a communication tool. It is actually an environment that forces society to reorganize itself in relation to ICT technologies. We are constantly connected and most of our daily actions happen through the internet. The distinction between reality and virtual reality is obsolete, from a relationship point of view and from a violence point of view.

3. As the UN Women paper suggests<sup>6</sup> to prevent and respond to online and technology facilitated VAWG, new methods and tools of analysis has to be set up in order to catch this “extension” of the gender-based violence from offline to online, such us using Big Data.
4. ISTAT, is now pursuing the goal of producing data on the phenomenon by pursuing two parallel paths:
  - i. Introducing new questions specifically dedicated to cybercrime and online violence in the Citizen’s Security Survey (currently underway).
  - ii. By analysing Big Data, with reference to interactions on social media. In this paper only this second statistic is briefly reported.

## II. Using social media to detect online violence against women and girls

5. Social networks are the "modern agoras" to be adequately studied in order to draw from them valuable information that can provide insights to understand and predict the evolution of social phenomena; even the topic of gender violence must be studied from this perspective, observing what the users themselves think, say and share, with the aim of being able to monitor, constantly, what are the evolutions of the new forms of online violence and, more generally, of the sentiments and opinions spread on the web. It is precisely in this second area of research that Sentiment Analysis goes to position itself, that is, among those tools that make it possible to observe how people's opinions react to violence against women. As social media advances, discussions of gender-based violence provide a central source of information on the topic, making it possible to observe over time whether the ways in which gender-based violence is discussed have changed: have levels of aggression in conversations increased? What is the "climate" of these conversations? Is it positive? Negative? Angry? Sad?
6. Since 2021, Istat has launched an experimental study on social messages for the study of the phenomenon of gender-based violence, with the aim of providing, in real-time, information on the social image of gender-based violence and gender stereotypes, adding useful data to the VAWG information framework for monitoring and the mode of communication conveyed on social channels on this issue. Among the various sources of Big Data available, social media (Van den Brakel J., Söhler E., Daas P., Buelens B., 2017; Daas P., Puts M., 2014) is a particularly useful information resource for analyzing and monitoring the phenomenon of gender-based violence and the presence of stereotypes. Sentiment analysis

---

<sup>6</sup> UN WOMEN, Accelerating efforts to tackle online and technology-facilitated violence against women and girls, 2022 <https://www.unwomen.org/en/digital-library/publications/2022/10/accelerating-efforts-to-tackle-online-and-technology-facilitated-violence-against-women-and-girls>

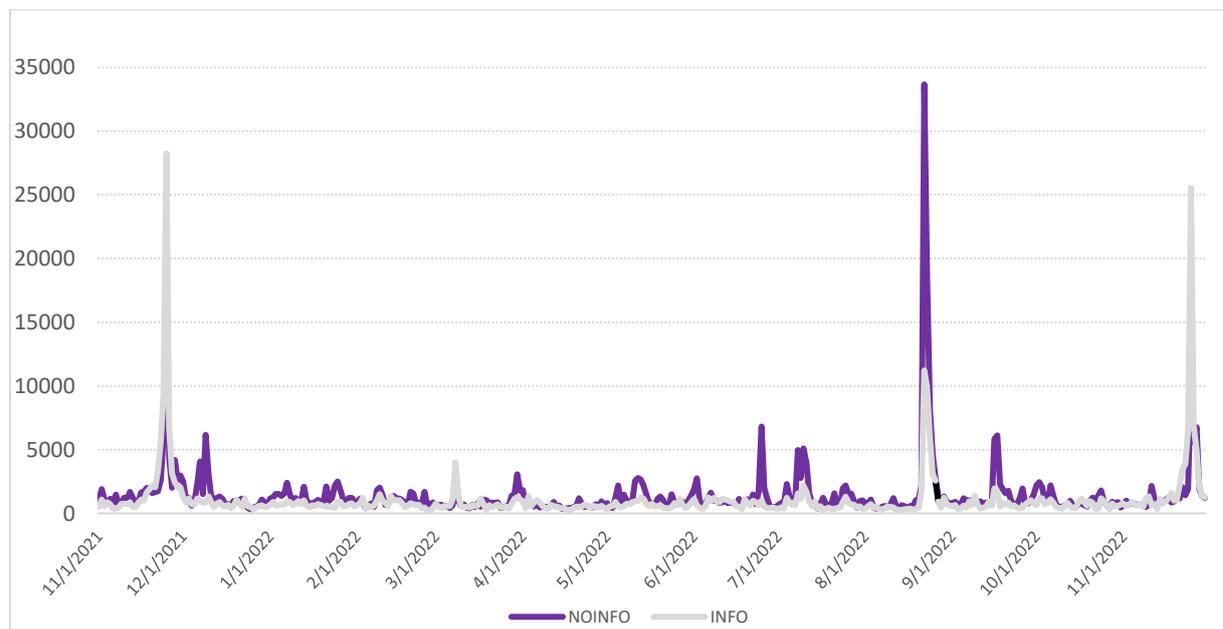
and emotion detection constitute a methodology of analysis that returns information on the themes and ways in which social media represent the phenomenon and, at the same time, allows its understanding to be extended to its digital dimensions (such as cyber-bullying and cyber-violence). The digitization of this phenomenon, like other social issues, requires the development of new methodologies and tools that can capture it. Through a process of capturing content conveyed by social, based on the presence of at least one word belonging to a set of filter words prepared by domain experts, it is possible to collect and observe the opinions and content of "posts," tweets and messages on which sentiment and emotion analysis can be applied. In this way, it is possible to measure how the phenomenon is represented on social media and whether they are used to counter, condemn and isolate the culture of gender stereotypes and gender-based violence or whether, on the contrary, by exalting the negative side of its use, they contribute to its persistence and spread. The following graphs show how much and how the phenomenon of gender-based violence is represented on social content (Twitter, Facebook, Instagram), through time graphs related to 1 year of observation. The period considered is from November 1, 2021 to November 30, 2022

7. In addition, a Topic Analysis on particular issues discussed on social media shows that social media amplifies typical effects that we can observe on VAWG, such as, for example, secondary victimization. Through machine learning techniques, it is possible to perform thematic analysis on content from news, facts, and events in the virtual context in which they are commented on and reprocessed within digital communities.

## A. First Results

8. Data from November 1, 2021 to November 30, 2022 covered a total of 1,231,385 messages on gender-based violence: predominantly 1,012,110 Twitters, followed by 103,442 Web messages, 55,358 Instagram posts, and 35,205 Facebook comments. Tweets absorb 82.2 percent of the messages.

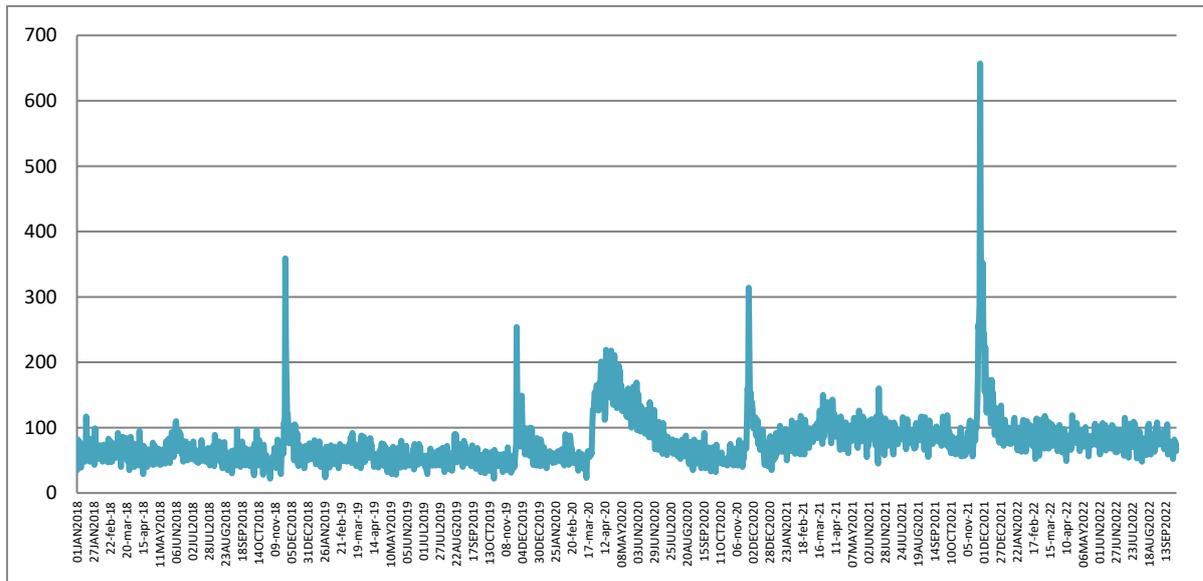
Chart 1 - Daily trend on social media of journalistic (info) and non-journalistic (no-info) posts (Period November 1, 2021 - November 30, 2022) Absolute values



Source, Istat 2023

9. The social message does not always contain personal opinions or experiences. Sometimes the content of a message represents objective information (references to news, promotional tweets, informative tweets, etc.). The algorithms and the methodology adopted makes it possible to isolate these messages from those that are not strictly related to the dissemination of the news alone. A binary classifier was then used to identify this type of content in order to select purely journalistic content (info) from non-journalistic content (no-info). In terms of analysis, this selection allows the analysis to focus on comments rather than content. Information content shows peaks of higher circulation on the days around November 25 in 2021 and 2022, reflecting the "pull" function that these moments of commemoration have on public opinion.
10. Below is a chart of calls received by the 1522 toll-free number against gender-based violence and stalking. As can also be seen from this graph, the celebratory event of November 25 also represents a peak moment for those who contact the helpline for support (both for themselves and others), despite the fact that the pandemic effect has generated an overall increase in call traffic. In general, therefore, awareness-raising campaigns, on the one hand and calls from institutions and civil society, on the other, provide a central opportunity to stimulate discussion and raise social awareness about the phenomenon of gender-based violence in our country.

Chart 2 - Daily trend of total calls to 1522 (Period January 1, 2018 - September 25, 2022) Absolute values

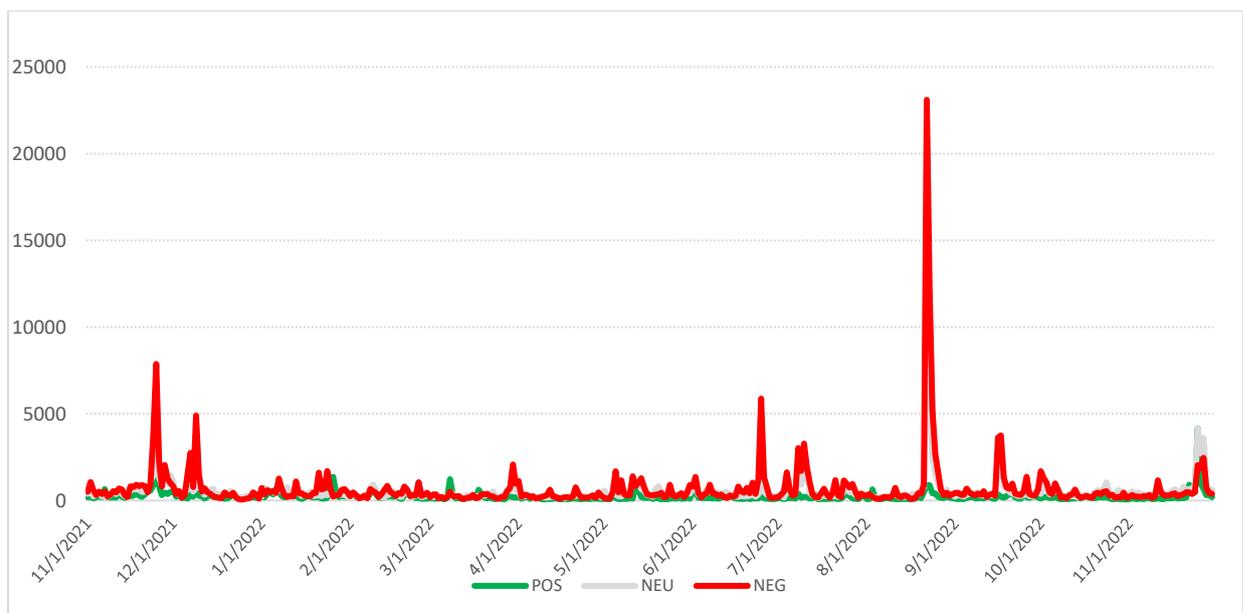


Source, ISTAT, Violence against women, 2023 <https://www.istat.it/en/violence-against-women>

1. Sentiment and emotional analysis

11. Chart 3, which reports sentiment analysis, shows that the peak on November 25 stimulates positive and neutral feelings and reactions. In contrast, the peak related to interactions generated by a news event related to rape (August 2022) is characterized by negative comments and, as better highlighted in the following graphs, emotionally related to anger, fear and sadness.

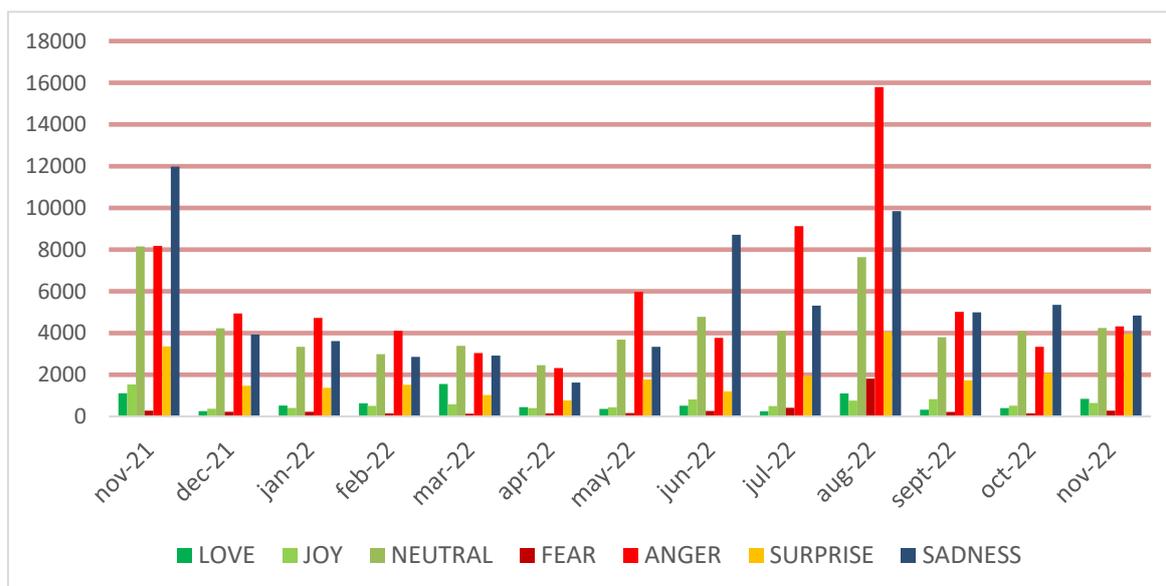
Chart 3- Daily trend on social media of sentiment expressed in posts with positive, negative, neutral comments (Period November 1, 2021 - November 30, 2022). Absolute Values



Source: ISTAT, 2023

12. Comments with positive sentiment corresponding to the November peaks report neutral emotions, surprise and joy; those in August (related to an episode of rape) anger and again neutral emotions. Social users who comment positively on both the news event and the November 25 celebratory event thus seem to refrain from providing additional emotional connotations. The annual anniversary that invites public opinion to reflect on gender-based violence connotes social interactions with a strong component of surprise.

Chart 4 - Monthly trend of emotional reactions on social media containing posts with negative comments (Period November 1, 2021 - November 30, 2022) Absolute Values



Source: ISTAT, 2023

13. In this chart it is anger and fear characterize the interactions. In the case of comments on the August act of violence (rape), a component of fear also emerges, which has never been recorded so strongly in previous months.

### III. Conclusion and next steps

14. The analysis based on the evidences of messages (buzzes) collected, underlines the importance of social media contents to better understand and monitor the opinion regarding some topics and to detect some emerging issues. More specifically,
- i. Focusing relevant themes linked to GBV such as femicide, body shaming, rape and sexual violence;
  - ii. Following up awareness campaign linked to helpline 1522;
  - iii. Profiling type of users (institutions and politicians, non-governmental associations, influencers, common users).
15. Moreover, in addition to the analyses of some specific “peaks” that drive the socials, a new category of analysis has been recently introduced: hate speech and outrage. Specifically, social content has been reclassified into two polarities: one group of words and expressions overall related to hate speech against VAWG and a second composed of a set of words and

expressions related to the feeling of "outrage." This polarity allows observing the volume of hate speech and aggression about VAWG events and those instead of awareness raising (expressed in indignation, compassion, rebellion) to VAWG events.

15. Finally, a Topic Analysis is underway to understand the extent to which specific episodes of rape convictions and legal sentences are linked to a social media "secondary victimization" reactions, when social media reacts with comments accusing victims of being partly responsible for the acts of violence they have suffered. This analysis is closely related to the level of acceptability of VAWG. In this sense, it will be very interesting and challenging, at the same time, to analyse online VAWG and the analysis of gender stereotypes and the social image of VAWG (a survey this one that ISTAT conducts every 3 years). Therefore, the next methodological step of this experimental statistics through Big Data will be to find the integration between different data sources, also to give linearity and robustness to the Big Data treatment process.