

## STATISTICS AND MASS MEDIA: "WRITING WITH NUMBERS"<sup>1</sup>

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**Abstract.** Istat carries out intense media activity using various channels. The project «Writing with numbers: research, processing and presentation of data» was born from the desire to offer journalists useful training to adequately carry out the delicate role of intermediaries in the dissemination of data. The aim of the project is to help media professionals navigate the "deluge of data" and transform it into clear and accessible news for the public. To ensure a targeted contribution to the needs of the profession, in collaboration with *forMedia*® - Institute for Training in Journalism and Multimedia Communication - a survey of statistical training needs was conducted, which was the basis for the design of the courses delivered, to date 16, with the involvement of more than 450 journalists. In this paper, after describing the objectives and goals of the project, the feedback provided by the participants at the end of the course will be presented. Thanks to the coding of open-ended responses through a text pre-processing and text-mining techniques, it was possible to conduct a thorough statistical analysis of the responses. This will allow to carry out operations of evolutionary maintenance of the functional contents to increase the already good results achieved and to promote the traditional dialogue between Istat and the world of the information, to ensure the dissemination of more and more complete and accurate statistical information.

### 1. Introduction

The project "*Writing with Numbers: Research, Processing, and Presentation of Data*" was created from the awareness that journalists and the media play a key role in how statistical information reaches the public. This made it clear that dedicated training and support are needed to help these professionals better understand and communicate statistics.

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<sup>1</sup> This article is the result of the joint contribution of all and, therefore, the individual contribution is considered equal and equivalent to that of the other co-authors.

The authors' points of view expressed in the article do not necessarily reflect the official opinions of the Italian National Institute of Statistics.

The idea behind the project had been developing over time, with the goal of helping improve how data and statistics are shared with the public in an accurate and understandable way.

What makes this project unique is its approach: instead of waiting for journalists to come to them, the Institute went out to meet them directly in their local areas. These sessions helped explain how official statistics are produced and what they really mean. The main goal of the project is to give journalists the tools they need to make sense of today's flood of data, and to turn complex numbers into clear, trustworthy news for their readers.

A key part of the method was to hold in-person sessions across the country or our Regions, especially targeting local newsrooms, where resources for data training may be limited. By connecting directly with journalists on the ground, the Institute was able to make statistical knowledge more practical and relevant to their daily work. Through this project, the Institute also fulfilled one of its main missions: making the results of statistical research accessible and easy to understand for everyone, citizens, businesses, and public institutions. This helps ensure that official statistics don't just stay in reports but become useful tools for society.

## **2. Context Analysis: The Role of Official Statistics**

The role of Istat and official statistics is defined in part by Legislative Decree No. 322/1989, later amended by Presidential Decree No. 166/2010, which assigns Istat the responsibility for guiding, coordinating, providing technical assistance, and training the entities that make up the National Statistical System (Sistan). In carrying out its functions, Istat follows what can be described as the process of generating official statistical information, which consists of three main stages or step:

- a) understanding the questions being asked and translating them into statistical information needs;
- b) producing the information;
- c) disseminating the information.

The first and third stages or step, identifying information needs and effectively disseminating information—are based on relationships with users, whether they are public decision-makers, key research partners, or entities responsible for sharing the information produced. The second stage, the actual production of official statistical information—is primarily guided by considerations related to the quality of the production process (Trivellato, 2022). In line with this mission, Istat has promoted numerous initiatives aimed at spreading statistical literacy, supporting public decision-makers in understanding statistical data, and providing training for users with varying levels of expertise.

In 2022, in response to the growing demand for territorial data and the increasing importance of the media as intermediaries in the dissemination of data, Istat recognized the need to systematically and continuously organize appropriate training initiatives for journalists.

The aim was to offer them a comprehensive overview of the Institute’s activities and provide the tools needed for informed and accurate use of statistical data.

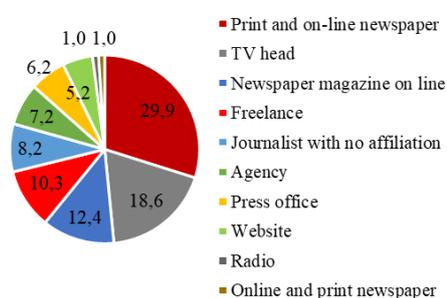
### 3. Analysis of training needs

To ensure a contribution according to needs of the journalistic profession, in agreement with *forMedia*® – Institute for Journalism and Multimedia Communication Training, a survey and analysis of training needs was carried out between September and October 2022. This was done through the administration of a Google Forms questionnaire (implemented on the *forMedia*® platform), which involved, voluntarily and anonymously, nearly 100 journalists from Campania and Basilicata (see Appendix). The Training Needs Survey Questionnaire consists of four sections:

1. Information about the affiliated (or collaborating) news outlet.
2. Knowledge of Istat/Sistan.
3. Training in the field of statistics.
4. Information needs: *In your professional activity, have you used, or do you need to use statistical data? If so, in which area?*

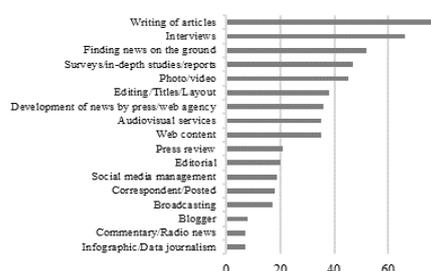
Analysis of the results showed that half of the participants in the survey are involved in collaborations with print, online, or television news organizations (Figure 1) and the main activity is in writing articles and conducting interviews (Figure 2).

**Figure 1 - Participants by affiliation category. Percentage values.**



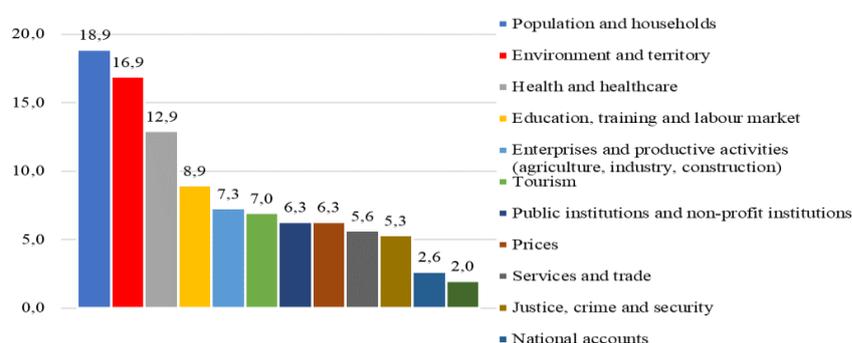
Source: Our data processing from Istat.

**Figure 2 - Main activity performed. Percentage values.**



For more efficient and effective training, respondents were also asked whether they had previously used statistical data in their professional practice and, if so, in which field. 71% of users reported that they knew and used statistical data, and more precisely, almost 19% of respondents said that they had used demographic data, 17% environmental and territory data and 13% health data (Figure 3).

**Figure 3**– *Field of use of statistical data. Percentage values.*



Source: *Our data processing from Istat.*

Having identified the activities carried out by journalists and the areas of data analysis, they were asked about the main difficulties encountered in using statistical data and which topics they would like to explore further. Difficulties in finding data, lack of timeliness, and unavailability of data represent the top three challenges reported by respondents. The sample indicated that it would be very useful to become familiar with the main surveys and to gain knowledge of descriptive statistics, in addition to exploring the tools made available by Istat for data consultation, such as the website, data warehouse, databases, etc. (Table 1).

**Table 1** – *Difficulties encountered by respondents in Data Analysis and topics considered useful for their professional activity. Percentage Values.*

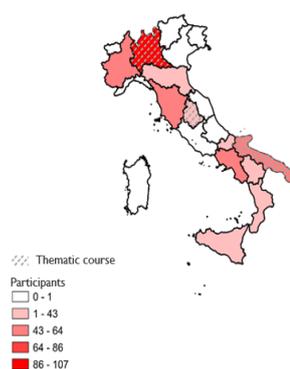
Difficulties encountered by respondents in Data Analysis	%	Topics considered useful for their professional activity	%
Difficulties in Accessing and Using Databases	35.0	Main Istat surveys (censuses, household surveys)	88.2
		Data processing and analysis	88.2
Outdated data	30.0	Website of ISTAT/Journalists' Desk	87.1
		Personal data protection regulations GDPR	78.5
Data not available	27.5	Other ISTAT databases	74.2
		Eurostat databases	74.2
		Data Warehouse I.Stat (General database of Istat)	73.1
No ability to synthesise and process independently	2.5	Publications Istat and Sistan	68.1
		Reference legislation for official statistics	64.5
Unclear data to interpret	2.5	Mission and organization of Istat and Sistan	61.3
Lack of availability of data with finer spatial detail	2.5		

Source: *Our data processing from Istat.*

#### 4. The design and delivery phase of the training course

The results of the training needs assessment confirmed the importance of designing a training course specifically for journalists, also helping to shape the selection of proposed topics. On March 9 and 10, 2023, the first training course was held at the *Sala Cirillo* of the Metropolitan City of Naples. The event was organized in collaboration with the Order of Journalists of Campania and provided the mandatory professional development credits required for regulated professions (Article 3, paragraph 5, letter b of Decree-Law No. 138 of August 13, 2011, converted with amendments by Law No. 148/2011). All editions of the course (15 in total at the time of drafting this report) involved colleagues from Istat as well as numerous representatives from local authorities, institutions, and organizations. Depending on the location, the training was delivered either as a full-day session or in two half-day sessions. The program covered the main tools for understanding, accessing, and researching data, key statistical sources, and various thematic insights. The objective of the training course—specifically designed for information and communication professionals—was to provide useful methods and tools to navigate the “data deluge,” a hallmark of today’s “infodemic,” and to support the transformation of data into clear and accessible news. The successful experience in Campania, both in terms of participation and positive feedback (with an average satisfaction rating of 8.4), encouraged the working group responsible for designing and delivering the courses to replicate the format in 14 additional locations. More than 450 journalists were involved, with thematic content adapted each time to the needs of the specific area. In the cities of Milan, Bari, and Perugia, in addition to the basic course, three advanced thematic modules were held, two of *Data Visualization* and a *Focus on the regional economy* (Figure 4).

**Figure 4—** Distribution of courses on the territory.



Source: Our data processing from Istat.

## 5. Presentation of evaluation results

At the end of each edition, participants were asked to complete a satisfaction/evaluation questionnaire regarding the activity provided, both in terms of the content and the organizational support. The questionnaire, completed on a voluntary and anonymous basis, is adapted from Istat's internal training process (DCRU/CRS), useful, also in this case, to assess the performance, know the topics of greatest interest, test the duration of activities, organizational aspects, the balance between theory and practice, and receiving input and proposals for future developments. The questionnaire proposed for the first nine editions in paper form (Figure 5), with subsequent imputation of the answers by the organizers, has undergone a technical revision in subsequent editions, while maintaining the same substance. Since the Bologna edition (May 6–7, 2024) it has been proposed in digital form, through the distribution of a QR code generated on Forms by Office365, which, framed also by a smartphone, allows to record the answers, by making them confluent in real time into a data base (Excel). This procedure has allowed for timely and accurate collection, analysis and processing.

Figure 5 – Satisfaction survey.

The figure displays two pages of a questionnaire titled 'QUESTIONARIO DI GRADIMENTO' (Satisfaction Questionnaire) for the course 'RICERCA, ELABORAZIONE E PRESENTAZIONE DEI DATI' (Research, Elaboration and Presentation of Data) held on March 22, 2024. The form is from Istat and is for the 'Formazione' (Training) section.

**Page 1 (Left):**

- 1. IDONEITÀ:** A table with three columns: 'Contenuti', 'Efficacia formativa', and 'Durata'. Each row lists 'Nome Cognome' and has three rating boxes (1, 2, 3).
- 2. PROGETTAZIONE FORMATIVA:** Includes a checkbox for 'Conoscenza del corso con l'obiettivo formativo dichiarato' and a text box for 'Miglioramenti fra teoria e pratica (esempi, studi di caso, esercitazioni, ecc.)'. There is also a checkbox for 'Supporti didattici (slide, documenti, link, video, ecc.)'.
- 3. ASPETTI ORGANIZZATIVI:** Includes a checkbox for 'Informazioni e supporto ricevuti'.
- 4. DURATA:** A checkbox for 'Basterebbe le ore più appropriate'.

**Page 2 (Right):**

- 5. APPLICABILITÀ:** 'al tuo contesto lavorativo' with a rating box.
- 6. GIUDIZIO COMPLESSIVO:** A rating box.
- 7. L'argomento che approfondisci:** A text box.
- 8. L'argomento che ridurrai:** A text box.
- 9. L'argomento che proponi:** A text box.
- 10. Osservazioni, suggerimenti e commenti:** A large text area for free-form input.

Source: Istat.

### 5.1. Evaluation results of the first training course

Before evaluating overall satisfaction with the training courses, it was deemed appropriate to focus on the results from the questionnaires of the first course held in Naples, considering it a benchmark both in terms of the topics covered and organizational aspects.

The evaluation of the course in Naples was very high: the pupils gave an overall rating of 8.4 (Table 2). On the one hand, such a high opinion has immediately pushed the Institute to continue with this experience in the area, on the other hand, efforts were made to understand the course's strengths and weaknesses. The course was found to be very consistent with the stated training objectives (8.5) and highly appreciated for the information support received (8.5). The most well-received topics were the more practical ones, such as *Transforming Data into Journalistic Information* (8.1) and *Sources of Official Statistics: Databases and Information Systems for Territorial Analysis* (8.0). Conversely, the topic with the lowest rating likely considered more challenging by participants due to the technical skills required—was *Data Visualization* (7.7). Based on the evaluations of the course design and organizational aspects, slightly lower scores were recorded for the teaching tools (slides, documents, links, videos, classroom, etc.) (7.8) and the balance between theory and practice (7.6) (Table 2). These aspects were also mentioned in the observations, suggestions, and final comments provided by the participants.

**Table 2** – Average score by topic and by organizational macro-areas – First course in Naples. Average values.

Topics	Mean	Macro-areas	Mean
Turning data into journalistic information	8.1	Information and support received	8.5
Sources of official statistics: databases and information systems for spatial analysis	8.0	Consistency of the course with the stated training objective	8.5
The sources of official statistics: the main Istat surveys	7.8	Overall opinion	8.4
The institutional site of Istat: a compass navigating to the information	7.8	Applicability to the work context	7.8
The basic statistical tools: from raw data to the product "that makes news"	7.8	Teaching materials (slides, documents, links, videos, etc.)	7.8
Data visualization: tools and techniques for data representation and communication	7.7	Course balance with stated training objective	7.6

Source: *Our data processing from Istat.*

Therefore, after a thorough analysis of the course satisfaction questionnaires, efforts were made to improve the course organization, aiming to foster greater interaction between instructors and participants by reshaping the course structure to resemble more of a collaborative workshop rather than a seminar-style event.

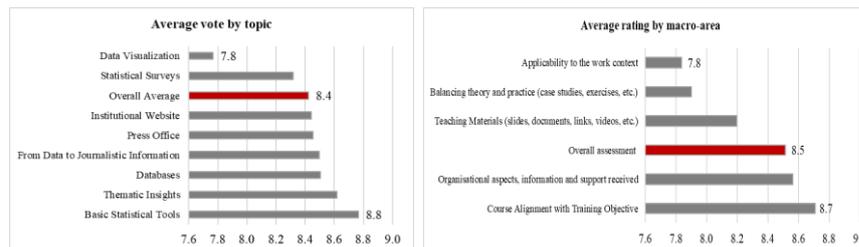
### 5.2. Results of the overall evaluation

In this paragraph, the main results arising from the analysis of the 200 completed questionnaires will be presented. At the end of the 15 courses, the results of the satisfaction questionnaires were harmonized in order to eliminate differences between the different structures of the questions, open responses were coded, and the information was organized into a single dataset suitable for analysis.

In general, regarding the first section of the questionnaire—which asks for an evaluation of the individual topics covered—respondents expressed a very high level of appreciation for the subjects addressed (overall average score of 8.4) (Figure 6).

The module that received the highest level of appreciation was the “methodological” one, related to the use of basic statistical tools (8.8). Special interest was also shown in the *specific studies* (projects designed to meet local needs) (8.6). Although the vote was largely positive, it is the Data Visualization course that has obtained the lowest score (7.8), but this is most likely due to the structure of the same, it would have required tools and computer skills to be fully exploited. To this is added a not insignificant aspect: for more than 80% of the cases the teaching was held at a distance and not in presence, therefore, despite the recognized competence and communicative effectiveness of the teacher (as reported in the final comments), the course would require the availability (in addition to basic knowledge) of support tools (PC, software), increased interaction and longer time frames, to ensure a balance between theory and practice.

**Figure 6**– Average vote by topic and average rating by macro-area.

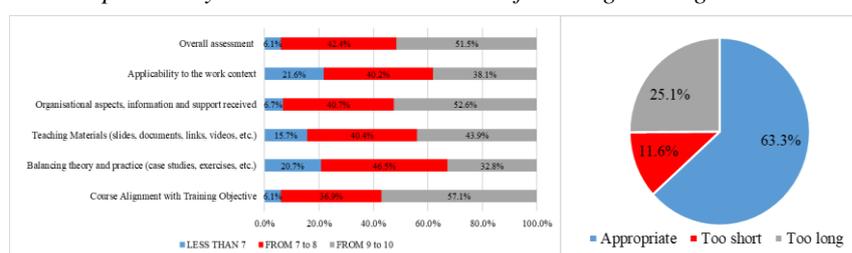


Source: *Our data processing from Istat.*

The success of the course is undoubtedly due to the high competence of the lecturers and the interest in the proposed topics (training design) but a decisive role is played by the organizational aspects, with the involvement from the beginning of the Human Resources Training area of the Institute. Overall, the course was considered highly consistent with its training objectives (8.7), and both the information provided, and the support received during its implementation were positively evaluated (8.6 and 8.2, respectively). A slightly lower score, and undoubtedly an aspect to work on, is the balance between theoretical and practical moments (7.9) that directly affects the real applicability of the received notions to one’s own working context (7.8) (Figure 6). Analyzing the distribution of the highest and lowest scores by organizational macro area (where 1 = completely unsatisfactory and 10 = completely satisfactory), it emerged that over 50% of respondents rated both the course’s consistency with the stated training objective (57.1%) and its organizational aspects (52.6%) with a 9 or 10.

One in three respondents considered the course to be perfectly balanced between theory and practice (32.8%). Conversely, one in five respondents gave a score below 7 regarding the applicability of the content to their work context and the balance between theory and practice (21.6% and 20.7%, respectively). In terms of duration, 63% of respondents thought the course was adequate, 25% too long and 12% too short (Figure 7).

**Figure 7**– Votes expressed by macro-area and duration of training. Average values.



Source: Our data processing from Istat.

### 5.3. Textual analysis of the responses

The final part of the satisfaction questionnaire was designed to give participants the opportunity to share their observations, asking which topics they would like to explore further, reduce, or suggest.

The textual analysis, carried out through word clouds of the responses, led to the identification of the most frequently recurring keywords. The first word cloud visually represents the main themes emerging from the open responses collected, highlighting the interests and priorities perceived by the participants. The larger words, such as data visualization and case studies, indicate a strong demand for concrete, application and related content to the representation of data and statistical deepening through the proposal of case studies (Figure 8).

We also note the importance given to tools such as databases, statistical analysis techniques and spatial analysis, indicating a widespread need to make statistical information more accessible and understandable. In line with the required insights are also the topics proposed: case studies, how to build journalistic information (competence that integrates journalistic professionalism with statistical knowledge), interpret the data and visualize it (Figure 9). The last word cloud represents the topics that participants consider should be reduced within the training path; concepts such as basic statistical tools, Istat history, census, and theory emerge more clearly.

Some comments refer to the length of the introductions or the perceived difficulty of some theoretical parts, suggesting the need for a slimmer, concrete and practice-oriented approach (Figure 10).

This feedback indicates a clear preference for more application-oriented, interactive, and up-to-date learning in line with interest in the use of data in journalism and communication.

**Figure 8** – *Topics to be explored further.*



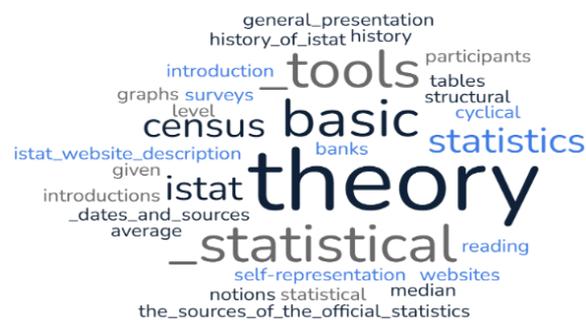
Source: Our data processing from Istat.

**Figure 9** – *The proposed topics.*



Source: Our data processing from Istat.

**Figure 10** – *Topics to be reduced.*



Source: Our data processing from Istat.

From the textual analysis (TAEHO, 2024) of the comments, instead, the request for thematic and methodological insights prevails.

The remaining comments were divided into positive and negative. 56% of the observations are pure appreciations for the course (positive and very positive sentiment), 44% instead highlights suggestions and criticalities mainly related to the widespread demand for breaks during the training day.

## 6. Prospects and future developments

Field experience and a thorough analysis of the questionnaires have led to envisioning several future developments:

- *Top priority is to ensure coverage of all Italian regions*, bringing the course to areas where it has not yet been offered, in order to provide all journalists with the same training opportunity.
- *An agreement is being considered with the National Council of the Order of Journalists (Cnog)*, aimed at better aligning the supply and demand of statistical training, with increasingly targeted initiatives that meet the real needs of the journalistic profession.
- *Implementation of a training needs questionnaire via LimeSurvey* (in partnership with Cnog) is under evaluation, to allow continuous monitoring of statistical training demand.
- *Enriching the evaluation questionnaire* by including additional information about the respondent, such as gender, age group, educational background, and professional status.
- *Increasing opportunities for meetings and dialogue at the local level*, with the goal of creating a sort of permanent territorial laboratory.
- *Promoting shorter, thematic, hands-on training sessions*, which are self-contained and use open-source software tools for real-time exercises with participants.
- *Encouraging ongoing dialogue with the information and media sector*.
- *Supporting the creation of accurate mailing lists*, inviting journalists to subscribe to Istat's distribution lists voluntarily and explicitly in order to receive updates and institutional information, including at the local level.

## Appendix

### *Tools & Links*

- 1) Survey of training needs
- 2) Program

## Acknowledgements

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