

The aesth-ethic science of visual data storytelling: Istat's experience

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sagepub.com/journals-permissionsDOI: [10.1177/18747655251366480](https://doi.org/10.1177/18747655251366480)journals.sagepub.com/home/sji**Daria Squillante, PhD¹** 

Abstract

In the contemporary techno-informational visual revolution, the Italian National Institute of Statistics (Istat) is advancing the technical-scientific synergies between multi-source, multi-dimensional statistical production and multi-target, multi-channel statistical communication. More specifically, Istat's communication envisions the harmonization of 'content' and 'container' not only as a Figure/Ground dialectic, but also as an interpenetration between statistical substance and the visual form of its phenomenological representation. Within this strategic approach, this paper presents Istat's growing infographization of its multi-thematic production, with a focus on video infographics as a case study, discussing its main challenges.

Keywords

statistical communication, visual data storytelling, cognitive processing of visuals

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I Statistical production and communication: A creative technical-scientific Pas de Deux

1.1 Statistical communication according to the Onlife paradigm

In today's information revolution, the Italian National Institute of Statistics (Istat)—just a breath away from its centenary—is performing a technical-scientific *pas de deux* between multi-source, multidimensional production and multi-target, multi-channel communication. It does so with an increasing level of expertise and creativity, by harmonizing content and container in statistical dissemination. This harmonization is no longer conceived solely as a Figure/Ground dialectic, but—when appropriate—as a fusion of statistical substance and the visual form of phenomena representation.

The contemporary socio-technological Onlife paradigm (Floridi, 2014)—already pervasive by the end of the last millennium and increasingly influential in the first twenty-five years of the twenty-first century—first challenges, and then ultimately deconstructs, both the general principles of the now-unstable hierarchical information era—characterized by the unidirectionality of the information process (i.e., sender-to-recipient) and the selectivity of information recipients (i.e., expert users)—and their specific application in shaping the mission and core

communication strategies of National Statistical Institutes (NSIs).

Indeed, as recently as 1993, the internet was used almost exclusively in scientific, research, and military settings. Web 1.0 still reflected a top-down communication model, where the needs and input of the audience remained peripheral to institutional communication strategies. By 2005—with the rise of Web 2.0—and even more so with the conceptual and structural leaps of 2007 and 2015 (Web 3.0), a visually oriented and pervasive Web began to sustain the progressive reengineering of NSI communication strategies.

This emerging, globalized information-identity structure of the *Onlife*, also grounded in the overarching ideal of “universal participatory knowledge,” challenges NSIs to reframe the civic ideal of official statistics as a *common good produced*, into one of official statistics as a *common good both produced and shared*.

In other words, the civic value of high-quality scientific production is now accompanied by the civic imperative of its communication—statistically reliable but

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also accessible and engaging not only for expert audiences, but also for broader, non-expert publics. These audiences are now easily reachable through both old and new media, which have become ubiquitous due to their broad availability and the active role users play in their use.

In this inclusive information era—where sharing, interaction, circulation, and reinterpretation of content are foundational practices of a hybrid space blurring the lines between producers and consumers of (statistical and other) information—NSIs statistical communicators becomes increasingly responsible for co-creating messages, in varying ways, rather than merely transmitting information.

This co-creation involves, albeit in different roles, both the inclusion of audience expectations in the initial design and production of information (i.e., incorporating the receiver's input at the sender's output stage), and the amplification of the original information's reinterpretation and reuse by the audience (i.e., the sender's output becoming input for the receiver's new content), across an ever-evolving range of sharing platforms. All authors cited in the references have been inspirational in the development of this contribution, without direct attribution to specific sections of the text.^{1–12}

1.2 Audience protagonism and the complexity of creating infographics and video infographics

To ensure the effectiveness of statistical communication in a world flooded by both reliable and unreliable content, NSIs are now more consciously and coherently attuned to the web and to their current and potential audiences. They are mastering the shift from a hierarchical perception of the information chain—distinguishing between “producer” and “consumer”—towards a model dominated by the *prosumer*: the consumer who also becomes a producer by extracting, manipulating, and reusing information.

Thanks to a creative convergence of technical and scientific expertise, Istat's attentiveness to this “new protagonism” of audiences is expressed through:

- a) Structured feedback and continuous optimization;
- b) Motivation analysis and audience engagement;
- c) Interdisciplinary integration and production capacities;
- d) The “3Es” framework in communication: effectiveness, efficiency, and economy.

The following sections briefly explore each of these four interconnected areas, highlighting how they contribute to the development of a more responsive, effective, and sustainable model of statistical communication grounded in infographics.

a) Structured feedback and continuous optimization

Responsiveness to direct and indirect user feedback is a cornerstone of Istat's strategy for shaping both the content and form of its visual data storytelling products.

This feedback is increasingly gathered through digital performance analytics, including metrics such as page views, time on page, click-through rates, social media engagement indicators (likes, shares, comments), and platform-specific insights from tools like Facebook Insights, X/Twitter Analytics, and LinkedIn metrics.

This operational model has guaranteed two main goals:

– Evidence-Based Evaluation of Statistic Communication Effectiveness

Data offer valuable, real-time proxies for user interest, comprehension, and interaction, allowing communication teams to monitor how content performs across different channels and audience segments.

For example, particularly high bounce rates or short viewing times on certain infographics may signal issues with visual clarity or narrative structure, prompting targeted redesign. Conversely, high shareability or extended viewing of a video infographic may inform future editorial choices;

– Data-Driven Optimization and Iterative Design

This operational model aligns with an evidence-based communication approach, where statistical outputs are not only published but also tested, measured, and iteratively improved. In other words, such insights feed into a cycle of continuous optimization, where user behavior actively informs the evolution of formats, layouts, themes, and dissemination timing.

In Istat, this data-driven feedback loop is supported by multidisciplinary expertise and human resources—including statistical experts, statistical communication specialists, graphic designers, psychologists, web specialists, and social media professionals—capable of interpreting not only the numbers, but also the underlying cognitive and motivational dynamics of diverse user groups, both expert and non-expert, as well as technical issues. This integrated approach reinforces the dual aim of scientific rigor and accessibility.

b) Motivation analysis and audience engagement.

Understanding the multifactorial motivational matrix that drives user preferences, reactions,

and levels of engagement or disengagement with various types of statistical communication products is essential for designing effective dissemination strategies.

This complex motivational landscape encompasses cognitive, emotional, and contextual factors that influence how diverse audiences interact with content. For instance, expert users may prioritize data accuracy and methodological transparency, while non-expert audiences often seek clarity, narrative coherence, and visual appeal.

To capture this complexity, Istat employs a mixed-methods approach that integrates both qualitative and quantitative research techniques. Quantitative data derive from large-scale surveys assessing user satisfaction, trust, and perceived usefulness of different formats, as well as from behavioral analytics tracking interaction patterns—such as time spent on pages, click rates, and social media sharing metrics. Less often, complementarily, qualitative insights are derived from focus groups and usability testing sessions (Usability testing is especially practiced in the development of statistical games, within the broader framework of gamification). In these cases, evaluating user experience is crucial not only to ensure comprehension and engagement, but also to balance educational goals with playability and motivational appeal.), which provide rich contextual understanding of users' needs, motivations, and barriers to engagement.

This combination enables granular identification of the narrative formats—ranging from static infographics and interactive dashboards to short-form video infographics—that are most effective in stimulating comprehension, retention, and trust across heterogeneous user groups.

Such evidence-based knowledge guides the iterative design and refinement process, ensuring that communication products are not only scientifically rigorous but also accessible and engaging for both expert and lay audiences.

Furthermore, the evaluation of (non)engagement patterns informs targeted adjustments in content complexity, visual language, and dissemination channels, optimizing reach and impact within the evolving Onlife paradigm.

c) Interdisciplinary integration and production capacities.

The interdisciplinary integration of statistics with fields such as information visualization and design, digital storytelling and marketing, neuroscience and communication psychology, AI, represents a critical evolution in the communication strategies of

National Statistical Institutes (NSIs). This multi-faceted integration aims to enhance the clarity, accessibility, and emotional resonance of statistical products, thereby fostering greater user engagement and trust across diverse audiences.

However, while conceptually powerful, this integration presents tangible organizational and operational challenges.

The production of high-quality visual communication outputs requires specialized technical skills including statistical competence, data visualization expertise, narrative crafting abilities, graphic excellence, user experience (UX) proficiency, among others.

Such competencies often span distinct professional domains, necessitating collaborative workflows and effective interdisciplinary coordination within the NSI. Moreover, these activities require appropriate technological infrastructure, software tools, and continuous investment in professional development. In this context, Istat face pressing strategic questions regarding the allocation and management of financial and human resources. Key considerations include determining which capabilities should be cultivated internally—through targeted recruitment, interdisciplinary team-building, and training programs—and which can be effectively outsourced to external agencies or freelance specialists.

Sometimes outsourcing may offer to Istat flexibility and access to cutting-edge expertise for complex or resource-intensive projects, such as large-scale digital campaigns.

For the communication of the new permanent Censuses — Population and Housing Census; Business Census; Census of Public Institutions; Census of Non-Profit Institutions; and Agricultural Census — Istat collaborates indeed with a communication agency for the development of selected institutional and statistical communication products. Nonetheless, the Institute retains full control and supervision over both the substantive content and the stylistic direction of all materials produced.

However, maintaining internal competencies remains essential for ensuring institutional knowledge, responsiveness to user feedback, and alignment with the NSI's mission and quality standards. Istat exemplifies this balanced approach by adopting a hybrid production model.

Internal teams, often formed through cross-disciplinary collaboration and continuous upskilling, manage the core phases of content design, data analysis, and initial visualization. External contributions complement these efforts, particularly for advanced multimedia products

requiring specialized creative skills or capacity surges.

This model allows Istat to optimize resource utilization while upholding the scientific integrity and communicative effectiveness of its statistical dissemination in a rapidly evolving information ecosystem, such as implemented, for example, for new permanent Census.

d) The “3Es” in communication: effectiveness, efficiency, and economy.

The sector-specific application of the “3Es” of public policy—effectiveness, efficiency, and economy—serves as a fundamental framework within the architecture of statistics-based communication. This framework ensures that the design, production, and dissemination of statistical outputs are aligned with both organizational objectives and public service mandates.

Effectiveness refers to the actual impact of communication efforts in achieving their intended outcomes, such as enhancing comprehension, fostering trust, and promoting the practical use of statistical information by both expert and non-expert audiences. This dimension is closely linked to the analyses of user motivation and engagement described in point (b), as well as to the responsive feedback mechanisms highlighted in point (a), which provide empirical evidence to assess and improve the communicative impact.

Efficiency pertains to the optimization of processes and resource utilization involved in producing statistic communication products. It encompasses the management of workflows, collaboration across interdisciplinary teams (point (c)), and the prudent application of technological tools and methodologies. Efficient workflows ensure that high-quality outputs are delivered in a timely manner, avoiding unnecessary duplication of effort and enabling swift adaptation to user feedback and evolving informational needs.

Economy, the third and equally critical “E,” addresses the cost-benefit considerations inherent in statistic communication production. As detailed in point (c), the creation of visually compelling and engaging formats such as infographics and video infographics demands significant investments in specialized personnel, software, and time. These resource-intensive formats, while potentially offering superior engagement and memorability, must be balanced against budget constraints and organizational priorities.

This triadic framework necessitates strategic decision-making to optimize the allocation of limited financial

and human resources without compromising the scientific integrity or communicative effectiveness of statistical dissemination.

For example, Istat’s hybrid model of combining in-house expertise with external contributions (point (c)) exemplifies how institutions can achieve a sustainable balance, leveraging specialized skills for complex productions while maintaining control over core functions.

Ultimately, the “3Es” principle guides Istat in navigating the trade-offs between high-impact communication and resource feasibility, ensuring that statistical information remains a common good, both rigorously produced and effectively shared, in alignment with the Onlife paradigm of participatory knowledge described earlier.

The following section provides an overview of the operational design process behind Istat’s infographics—illustrating how these principles are translated into practice through a structured and interdisciplinary workflow.

1.3 The process of designing and producing a statistical infographic

Istat’s infographics experiments represent a unique fusion of scientific art and artistic science, where creative design enhances informational accuracy in the science of visual data storytelling.

The aim is not merely to list data, but to tell structured visual stories crafted to capture attention and deepen understanding, while remaining faithful to the ideal and inspirational triangulation between scientific rigor, the performative power of experiential graphics, and the protection and enhancement of the Istat brand and visual identity.

To uphold this triangle of aesthetic-scientific infographic communication—an overarching principle guaranteed across all of Istat’s statistical communication products regardless of format, channel, or audience—the following core principles can be summarized:

- **Simplicity**

Istat’s designs strive for simplicity as the pinnacle of complexity, ensuring that data is intuitively understood and that user attention is enhanced rather than hindered by technical jargon or complexity.

- **Clarity and Consistency**

Information is always presented clearly and legibly, supported by a consistent style in terms of colors, fonts, and imagery, which also evocatively reflects the themes addressed.

- **Relevance**

The graphic architecture reinforces the intuitive hierarchy of content and guides its optimal sequence for consumption.

- **Balance**

To maximize visual impact, careful attention is paid to balancing textual elements—both numbers and words—with graphical components.

- **Originality**

Statistical communication products aspire to be unique and memorable experiences of statistical aesthetics, where the Istat brand strengthens and extends its reputation among both loyal and new target audiences, positioning itself as an indispensable source of statistics.

To operationalize these principles—while preserving the uniqueness of each infographic creation—a sequence of preparatory steps can be identified:

Phase 1 - Interdisciplinary Collaboration and Organizational Planning

- Assemble a multidisciplinary team including statisticians, communication experts, data visualization experts, graphic designers, user experience specialists, and communication psychologists.
- Clearly define roles and responsibilities to facilitate collaborative workflows and maintain alignment with scientific and communicative objectives.
- Evaluate and decide on internal production versus outsourcing of specific tasks, balancing expertise availability, cost considerations, and production timelines.

Phase 2 - Needs Assessment and Audience Analysis

- Identify and segment the target audience, ranging from expert users to the broader public.
- Analyze motivations, preferences, and potential barriers to engagement through qualitative and quantitative methods.
- Define the core message(s) and select statistical content that aligns with the civic mission of official statistics as a public good.

Phase 3 - Data Composition and Preparation

- Perform thematic, quantitative, and typological analysis of available data (the “data bouquet”) to establish the foundation for communication.
- Select high-quality, relevant, and timely statistical data to ensure scientific rigor and transparency.
- Clean and process data to facilitate effective visualization, taking into account complexity and multidimensionality.

Phase 4 - Format Selection and Conceptual Design

- Choose the communication format (card, infographic, video-infographic) based on the informational volume, audience needs, and engagement potential.
- Develop a narrative and storyboard that balance statistical substance with visual clarity and storytelling principles drawn from interdisciplinary

fields (statistics, communication psychology, digital storytelling).

- Design initial layouts that establish a clear visual hierarchy, guiding users through the content seamlessly and harmonizing textual and graphical elements.

Phase 5 - Prototype Development

- Produce a first draft or prototype, applying best practices in data visualization and graphic design.
- Utilize appropriate software tools and infrastructure tailored to the chosen format (static, interactive, video).

Phase 6 - Iterative Refinement and Optimization

- Adjust visual, narrative, and technical elements to enhance clarity, trust, and memorability, identifying comprehension challenges and design issues.
- Maintain an ongoing balance between effectiveness (user impact), efficiency (workflow optimization), and economy (resource allocation), adhering to the “3Es” framework.

Phase 7 - Final Production, Branding, and Quality Assurance

- Finalize the infographic or video infographic ensuring accuracy, visual consistency, and accessibility across formats and platforms.
- Ensure full compliance with the Istat visual identity guidelines—including use of institutional colors, logos, typographic systems, and graphic conventions—to maintain recognizability, institutional coherence, and public trust.
- Perform comprehensive quality control on data integrity, visual fidelity, and technical functionality across dissemination environments.

Phase 8 - Dissemination and Engagement Monitoring

- Launch and promote the product through strategic channels (website, social media, public events, conferences,...) to maximize reach and impact.
- Monitor real-time user engagement metrics—views, shares, comments, session duration—and social media analytics.
- Use engagement data to inform subsequent communication strategies and iterative content improvements.

Phase 9 - Post-Dissemination Evaluation and Reporting

- Conduct rigorous evaluation of the infographic’s impact on user comprehension and trust, through web analytics assessing whether users have correctly understood, remembered, and acted upon the information presented.
- Report evaluation outcomes internally for organizational learning and externally for transparency and accountability.

- Update institutional knowledge bases and training programs to foster ongoing capacity-building and interdisciplinary collaboration.

This structured process exemplifies how Istat responds to the demands of the Onlife paradigm by embedding user-centered design, interdisciplinary collaboration, and resource-aware management into the creation of statistically rigorous and publicly accessible infographics.

However, the growing relevance and communicative power of visual formats cannot be explained solely by contextual or technological shifts.

In fact, the success of infographics also reflects a deeper, evolutionary foundation: the structural and functional predisposition of the human species toward visual processing. Our brains are naturally wired to perceive, interpret, and retain visual information more efficiently than text alone—a principle that underscores the strategic value of visual storytelling in statistical communication. The next section explores this innate orientation in greater detail.

1.4 A visually-oriented Species

To navigate the futuristic wave of the 3.0 era—unprecedented in the acceleration and unpredictability of its trajectory—Istat, like other official statistical institutions around the world, draws on and actualizes a 35,000-year evolutionary legacy. Through its visual statistical products, Istat acknowledges the deeply rooted physical and psychological, individual and collective, human need and ingenuity for *visualizing the story of our species*—using forms and content at the intersection of image, word, number, and art.

The human brain's structural and functional predisposition for visual processing has never been questioned by adaptive strategies. In fact, it has inspired and guided, across centuries, everything from the earliest proto-statistical infographics drawn on cave walls—weren't the graphic marks enumerating hunted animals a form of statistical inscription?—to the official adoption of data visualization as a military strategy tool in the nineteenth century. From the global explosion of visualization software in the 1980s to the (quasi)omnipotent applications of artificial intelligence in today's visual domain, the visual has played a central role in human cognition.

Far from naïve, evolution has strategically concentrated most sensory receptors in the eyes among all external perception systems—nearly half of the human brain is continuously engaged in visual processing, and humans can process and grasp the meaning of a visual scene in under a second. Additionally, color enhances attention just as moving images aid long-term memory—both serving as emotional triggers that activate mirror neurons and foster stronger neural connections.

When it comes to the design and experience of statistical communication products, these species-specific structural and functional characteristics guide Istat's efforts to craft visuals that are scientifically designed to enhance memorability and retention of statistical information, while also preventing *cognitive overload*—a state in which disorganized visual input overwhelms working memory and impairs understanding.

The cognitive overload that Istat seeks to prevent in its visual data storytelling products stems from both *excessive input*—typified by today's so-called “data deluge,” a reality marked by unbounded sources and information volume—and *low-quality input*.

While overload from excessive input is more intuitive, low-quality input refers more specifically to stimuli—in this case, statistical information content and its graphic rendering—that fail to meet three key *cognitive expectations* embedded in our brain's wiring for optimal performance:

a) The expectation of high essential processing.

Essential processing refers to the cognitive activity required to make sense of both complex and simpler inputs such as texts, images, or their combinations. Neuroscience shows that successful visual essential processing depends on access to rigorously curated images and words, chosen for their synthesizing power and organized in a coherent, logical structure. This facilitates intuitive integration between textual and visual structures.

b) The expectation of low incidental processing.

Incidental processing refers to the cognitive “effort” needed to understand information, depending on the quality of its presentation. If excessive effort is required, it can overload cognitive resources, leading to poor comprehension, abandonment during consumption, or failed retention and learning.

c) The expectation of low representational processing.

Representational processing is the cognitive work needed to hold an input—such as a number, pictogram, or video frame—in working memory until enough information is available for complete meaning extraction. If accessing key content for full understanding takes too long, overuse of working memory may result in comprehension bias or deficits in attention, memory, and learning.

Within this theoretical and operational framework, Istat aims to produce infographic communications that:

- support essential processing while minimizing incidental and representational load, ensuring an overall optimized cognitive processing, also benefiting those less accustomed to ‘cognitive marathons’, by

- facilitating a full and rapid understanding of key informational messages;
- minimize cognitive fatigue by maximizing informational synthesis and avoiding redundancy;
- optimize content coherence and thematic segmentation/sequencing of visual-textual materials, facilitating structured information access;
- ensure rapid access to all information necessary for full comprehension, thereby reducing representational processing time.

But that's not all.

In line with our structurally and functionally wired architecture—a living, ultra-connected system both at the intra-cerebral and inter-organic levels—Istat, through its visual data storytelling products, is committed to designing technical-scientific layouts that foster synchrony and bi-hemispheric human integration in meaning-making processes, ultimately enabling an integrated and complex experience, even in the seemingly simple act of engaging with an infographic.

Indeed, If it is true, in fact, that when faced with a statistical infographic, hemispheric lateralization leads the left hemisphere to focus on more rational and analytical processing, while the right hemisphere engages its synthetic and imaginative capacities, it is only through their synergistic complementarity that a fully integrated experience of understanding and engagement—bridging logic and creativity—can be achieved (Figure 1).

In the visual statistical communication strategy using infographics and video infographics, this cerebral duality is specifically considered both *ex ante* during the design phase and *ex post* during consumption by the target audiences.

In other words, these products aim to facilitate hemispheric integration by offering a multi-code narrative that is compatible and harmonious, allowing the left hemisphere to efficiently process logical information and relationships presented in numerical, graphical, and tabular formats, while enabling the right hemisphere to engage with images, colors, animations, and music to abstract overall interpretations and assimilate concepts through emotional intuition and creative integration.

In light of the human species' visual predisposition—discussed above—and building on the principles previously explored, including the demands of the Onlife paradigm, the importance of emotional engagement, and the need to balance scientific rigor with communicative effectiveness, the next section introduces an original analogy between the design and production of video-infographics—within the broader family of infographics—and the phases of cinematic creation. This comparison offers a compelling framework for understanding how statistical content can evolve into immersive and meaningful visual narratives.

2 A cinematic infographic production house

2.1 Show, don't tell!

The Onlife Paradigm and the structural-functional aspect of the species-specific visual inclination allow us to play—in the noble Winnicottian sense of the term—by creatively transposing the Hitchcockian slogan “Show, don't tell!” from the realm of screenwriters, dialogue writers, and directors to that of copywriters in statistical communication.

In the design of animated statistical communication products, just as in cinematic production, what is skillfully “shown,” including its subtext, can inform in a way that differs from what might otherwise be “told.” Consider, for example, traditional statistical products such as press releases, notes, and reports.

To paraphrase the famous quote by master Alfred Hitchcock—“What is drama, but life with the dull bits cut out”—the goal of video-infographic communication products is to “cut the boring parts out of statistics,” fostering an inclusive and engaging information transfer experience. This mirrors the empathetic relationship between viewers and film protagonists, translated here into the empathetic relationship between users of statistical content and the socio-economic and environmental “protagonists” represented in the product.

How, then, can the steps of cinematic production be translated into the development process of video infographics containing statistical content? (Figures 2 and 3).

Step 1 - Inspiration

The tendency to draw inspiration from everywhere and everyone is a salient feature both in a cinematic production house—where an “idea” for a film may come from a screenwriter, a cinematographer, the director, or even an outsider—and in a “Statistical Communication Production House” like Istat, where inspiration can originate from internal professionals as well as external sources: public, private, international, individual, or collective.

Step 2 - Control Idea (Pitch session)

The inspiration for a statistical communication product is always followed by its conceptual development. Just as, before writing a screenplay, it is essential for a production team to clearly define the so-called “control idea” (i.e., the central concept of the film), which will later be expanded into a 90- to 120-page script, so too must the development of a statistical communication product begin with a solid understanding of its control idea—namely, the key statistical message. This message will guide the distillation of complex phenomena into content that is synthetic, rigorous, engaging, and well-targeted.

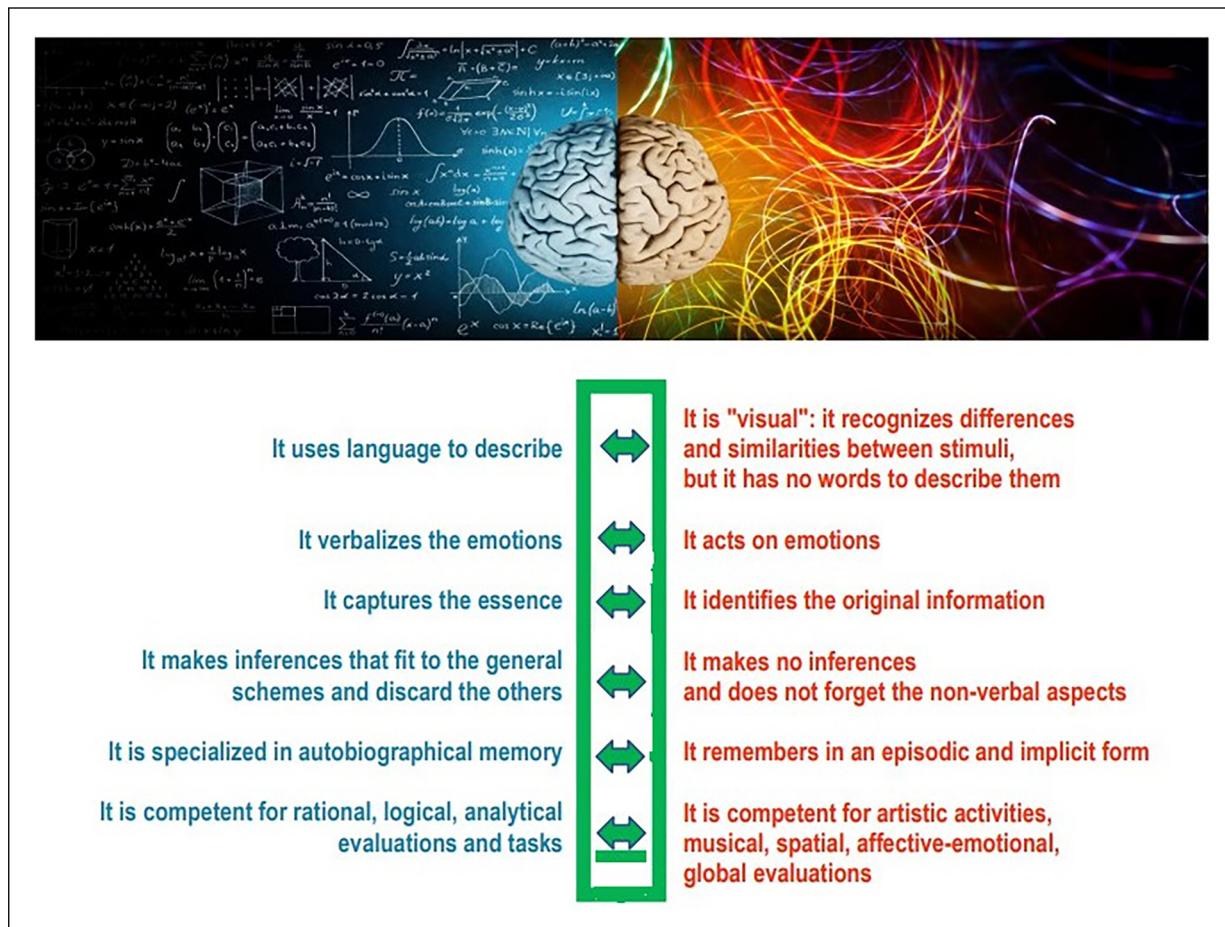


Figure 1. Hemispheric specialization and integration in meaning-making.
Source: content D. Squillante, brain image from Shutterstock.

If I can explain my control idea in five minutes—the standard duration of the dreaded pitch session—and convince the producer or director of the value of making my film or creating my video-infographic, then that project may still stand a chance of moving forward toward realization.

Step 3 - Ex-ante Evaluation

Whether it concerns a film or a statistical video-infographic, once the idea and its purpose are clear and well-defined, it is essential to evaluate its alignment with the broader vision of the organizational context—be it a major film studio or an institution like Istat.

This includes assessing how the project fits within short-, medium-, and long-term strategic planning; the feasibility and prioritization of investing limited and valuable resources—both financial and temporal; and conducting market analyses to anticipate expectations and reactions from target audiences. All of this must be considered within a cost-benefit framework to justify the required investment.

Step 4 - Product Type

If the feasibility assessment yields a positive outcome, the next crucial step is to select the most appropriate format for delivering the key message to which we are about to dedicate time, resources, passion, and creativity. This choice must consider not only what is deemed most suitable from a communicative standpoint, but also—perhaps more importantly—the degrees of freedom defined by the ex-ante evaluation in terms of available resources.

Just as professionals in a major film studio would evaluate whether to develop a short, medium, or full-length narrative (e.g., a short film, a medium-length film, or a feature film), Istat must decide whether to invest in producing, for example, a statistical card, an infographic, or a video-infographic.

Step 5 - Genre

Each format can then “host” different atmospheres and narrative tones. Just as a single control idea in cinema can

EPIC OF A (STATISTICAL) MOVIE – from inspiration to protagonists		
	AT A FILM COMPANY	AT A CENSUS-DROPPERS COMPANY (ISTAT COMMUNICATION)
INSPIRATION	Subject writer, screenwriter, Director, Producer,...	Inside Istat (Direction of Communication, Production Area), outside Istat (Institutions, schools, NGOs, Media, Partners,...)
PITCH SESSION	Control idea (= what's my movie about)	Subject (= what's my product about in a row)
ASSESSMENT	Vision and strategy of the major, opportunities, programming, target, times, costs	Vision and strategy of the Institute, opportunities, programming, target, times, costs
TYPE OF PRODUCT	Short, medium-length film, feature film	Card, infographic, video-pill, video
GENRE	Narrative stamp (= drama, comedy, fantasy,...)	Stylistic stamp (= methodological, informative)
PROTAGONISTS	Heroes and villains	Heroes and villains statistical phenomena

Figure 2. From inspiration to the selection of protagonists.

Source: D. Squillante.

EPIC OF A (STATISTICAL) MOVIE – from plot to awards		
	AT A FILM COMPANY	AT A CENSUS-DROPPERS COMPANY (ISTAT COMMUNICATION)
PLOT	Narrative architecture (= scenes, sequences, acts)	Conceptual architecture (=indicators, subdomains, domains)
CLIMAX	Narrative junctions of high intensity	Key numbers
PHOTOGRAPHY	Shots (long shot, medium-long shot, Medium-close shot, ...)	Graphic design, spatial organisation, graphic elements, colours, fonts, ...
DIRECTION	Conduction of the creative process	Conduction of the creative process
POST-PRODUCTION	Editing, audio synchronisation, test screenings, ...	Statistical and graphic refinement
DISTRIBUTION	Circulation of the film (= cinemas, tv, platforms)	Circulation of the product (=website, social networks, congress, press conferences)
ASSESSMENT	Box office, reviews, awards	Media coverage, performance on old/new media, reuse in books, magazines, ...

Figure 3. From plot to *Ex Post* evaluation.

Source: Daria Squillante.

be expressed through a comedy, a drama, or a science fiction film, the stylistic tone of a statistical key message can vary—ranging from informative to methodological, from educational to institutional—depending on, and in accordance with, the diverse and interconnected characteristics of the target audiences and communication objectives.

Step 6 - Protagonists

Just like in a film, a statistical video-infographic has its own irreplaceable “protagonists.” Clearly and coherently identifying these “protagonist phenomena” is essential to guide the audience in understanding and retaining the key messages conveyed by the product.

In designing the “statistical cast”—including positive and reassuring “protagonist” information, negative and concerning “villain” information, “secondary” information that may not be a key message but serves as a pivotal element in the infographic narrative, and “supporting roles” that enrich cognitive understanding—scientific rigor is central, crucial, and indispensable.

This rigor is exercised by the Istat Communication Service, both through its technical-scientific expertise in selecting the specific information to be communicated, and in designing the overall structure in which that information is presented.

Step 7 – Plot

The work on the “cast,” whether by screenwriters in a major film studio or by the “screenwriters” at Istat, is closely tied to the development of the narrative architecture—the “plot.” While in films this architecture is structured through scenes, sequences, and acts, in statistical communication products it unfolds through indicators, sub-themes, and thematic areas (Figure 3).

At this stage as well, scientific rigor is essential in “weaving” together the “characters/phenomena” and their interconnections, in order to effectively and engagingly convey either the control idea in a film or the key message in a communication product.

Just as a screenwriter must know every detail of each character’s “biography,” the Istat “screenwriter” must understand the full “statistical biography” of each indicator used—ranging from the source data and methodological choices to data processing—ensuring that the collective “statistical cast” becomes more than just the sum of its parts.

In this perspective—and drawing on insights from Gestalt theory, the Intersubjective Field, and even Epigenetics applied to statistical communication—each element acquires its full, complex, and contextual meaning only within the phenomenological framework in which its specific expression takes shape. In other words, each character/indicator must be interpreted in relation to the

“informational stories” of the other characters coexisting within the same narrative frame for its meaning to fully emerge.

For this reason, great care is taken not only in selecting the indicators for each synthetic statistical communication product on complex phenomena, but also in justifying their inclusion based on the specific target audiences and communication channels involved.

More specifically, and in alignment with the Quality Assurance Framework of the European Statistical System, the design of the “statistical plot” leverages technical-scientific expertise to ensure that the chosen “statistical characters” are both *relevant* and *useful* to users. This applies both to the robustness of representation—even when using information sparingly—and to the methodological rigor of any accompanying explanatory notes, all while maintaining aesthetic coherence and visual appeal.

Step 8 – Climax

As in film dramaturgy, not all “statistical transitions” within a communication product can—or should—carry the same level of “informational intensity.”

It is essential for the “screenwriter” to structure the narrative in a way that builds toward and highlights specific “statistical climaxes.” These moments, much like climactic scenes in film, are designed to significantly heighten the audience’s experience—whether through analytical depth, emotional resonance, surprise, or cognitive engagement.

Step 9 - Photography

Just as cinematography plays a crucial role in a film—shaping the perspective and atmosphere of the story at every moment—so too does “photography direction” in a statistical communication product.

This involves the graphic choices regarding the “framing” of the “on-stage” phenomena: spatial arrangement, positioning of information, sizing, font selection, colors, graphic elements, and images. Together, these design elements form a cohesive visual language that creates a distinctive atmosphere for the statistics being represented and organized visually.

In the context of Istat, these choices are not merely aesthetic but also serve a strategic function: they safeguard and express the institution’s visual identity. Consistency in style, color palettes, and typographic systems contributes to recognizability, credibility, and coherence across communication products, reinforcing public trust and the authority of the statistical message.

Step 10 – Direction

The complex process of cinematic or statistical storytelling requires a director capable of managing the

diverse professional skills involved in the art of visual data narration.

Just as a film director coordinates shots, camera movements, and scene editing to guide the audience's emotions, the "visual statistical director", i.e., Istat responsible of Statistical Communication, integrates and aligns various areas of expertise and production components, ensuring that each element contributes to a clear and compelling message.

The statistical director carefully selects and supervises data, colors, shapes, and layout to construct a visual narrative that enhances audience engagement and comprehension. This is done in harmony with the ultimate objective: to convey the initial control idea through every detail—from data presentation to lighting, opacity, transparency, music, illustrations, pictograms, and even the product's horizontal or vertical orientation.

Step 11 - Post-production

The finishing and refining phase characterizes the post-production stage in both cinematic and statistical communication. During this phase, footage—or the draft of the statistical product—is selected, cut, and assembled, with the addition of special effects, sounds, and music to create a coherent emotional and narrative experience that aligns with the control idea, tone, and target audience.

Similarly, in the post-production of a statistical communication product, careful attention is paid to optimizing every visual and auditory element—from font choices and data arrangement to background music and color schemes—to fully realize the complex intentions of the project, maximizing its impact and effectiveness.

Step 12 – Distribution

Once a film or statistical communication product is complete, its distribution becomes essential to reach the widest possible audience—both loyal followers and newcomers, experts and non-experts alike.

Depending on the genre and content, the distribution strategy targets the real and/or virtual spaces most frequented by the intended audience—ranging from theaters and film platforms to institutional websites and social media channels for video infographics.

Step 13 - Ex Post Evaluation

After the distribution phase of a film or statistical product, the evaluation stage begins—both for a film production company and for the "Production House of Statistical Communication."

Just as a major studio carefully analyzes box office performance, audience demographics, and viewing locations, the "director" of statistical communication at Istat assesses the strengths and weaknesses of its products.

This evaluation serves to restart, renew, and enhance the production cycle, continuously improving the ability to meet the needs and expectations of its audiences.

2.2 *The case study of "statistical films"*

The following case studies illustrate how Istat's video infographics have been conceived and distributed across institutional platforms, reflecting a variety of macro-objectives—from simplifying complex statistical concepts to increasing the public resonance of key publications.

Moreover, in an increasingly disintermediated communication environment, Istat's video infographics consumers initially act as "spectators" of the "phenomenal characters" presented by Istat but may evolve into "producers" and/or "directors" through the creation of "sequels" and/or "spin-offs" via reworkings and reshares.

Video infographics, in other terms, are not only designed for comprehension and engagement but also for circulation, reinterpretation, and reuse.

2.2.1 Simplified statistics. As part of the democratization of statistical knowledge, one of the primary objectives of Istat's Communication Department has been to make complex concepts accessible to a non-specialized audience through explanatory, simple, and engaging video infographics.

The inherent educational purpose of this type of video is to bring people closer to statistics by first breaking down barriers linked to its perceived "incomprehensibility" and then encouraging viewers to internalize statistics as a universal tool for situating their citizenship—both reflective and participatory.

Two cult videos with tens of thousands of views in the Italian version, "*GDP Explained in 2 Minutes*" and "*The Labor Market Explained in 2 Minutes*," exemplify this approach of simplifying and communicating key concepts that are both complex and pivotal within the socio-economic macro-thematic framework (Figures 4 and 5).

For instance, the GDP video uses playful graphics to explain what Gross Domestic Product is, how it is calculated, and why it remains one of the most widely used indicators to measure the economic health of countries over time and across regions. Meanwhile, the labor market video familiarizes viewers with fundamental concepts such as the classification of individuals as "employed," "unemployed," or "inactive."

The decision to produce these videos arose from the recognition that, although the public acknowledges GDP and labor market indicators as crucial dimensions in both public discourse and everyday life, the absence of targeted educational resources to properly interpret such frequently circulated data in the media can lead to misunderstandings at both the individual and collective levels.



Figure 4. Frame from the video “GDP explained in two minutes”.
Source: D. Squillante, Italian National Institute of Statistics, 2020.



Figure 5. Frame from the video “the labor market explained in two minutes”.
Source: D. Squillante, Italian National Institute of Statistics, 2020.

Here is the link to access the video, which has been shared on the official website, YouTube channel, and institutional social media profiles:

Link:

IT: https://www.youtube.com/watch?v=uSQuQCbv_Eo

EN: <https://www.youtube.com/watch?v=uI1-Q8-BbRI&t=2s>

Here is the link to access the video, which has been published on the official website, YouTube channel, and institutional social media profiles:

Link:

IT: <https://www.youtube.com/watch?v=o3Mm8HelxBc>

EN: <https://www.youtube.com/watch?v=z1Fy7HQ8tw0&t=3s>



Figure 6. Frame from the video “international day for the elimination of violence against women 2022”.
Source: D. Squillante, Italian National Institute of Statistics, 2022.

2.2.2 Commemorative days. Another strand of Istat’s video infographics is dedicated to celebrating official international and world days, aiming to raise awareness and inform general audiences about social, cultural, economic, and environmental topics of universal importance.

Often addressing complex themes—such as the International Day for the Eradication of Poverty—and sensitive issues—like World Suicide Prevention Day—these video infographics serve as case studies in the delicate art of visual data storytelling.

In such instances, solid statistical and graphic design foundations must be carefully combined with a heightened sense of ethics and sensitivity toward the phenomena being represented.

A particularly meaningful example of this careful balance is the video produced in 2022 for the International Day for the Elimination of Violence against Women. Through meticulous narrative and visual attention—balancing the delivery of information with the emotional depth of the message—it presents data on women’s victimization and highlights the vital role of anti-violence centers in supporting victims’ recovery (Figure 6).

Here is the link to access the video published on the official Istat website, YouTube channel, and social media profiles:

Link:

<https://www.youtube.com/watch?v=K-T1Z0853ec&t=16s>

Another example of a video created to “statistically celebrate” globally recognized commemorative days is the one produced in 2024 for International Women’s Day (Figure 7).

The decision to include this video in the contribution reflects Istat’s recent experimentation with artificial intelligence as an executive partner in the creation and

animation of graphic elements supporting visual data storytelling.

Specifically, after imagining what it would look like to see the Mona Lisa grow up and age, in order to represent some of the most significant gender disparities across “her” life stages, artificial intelligence was employed both to model younger and older versions of her, and to generate a male counterpart—also shown aging over time—placed alongside her as a point of comparison.



Figure 7. Frame from the video “international women’s day 2024”.
Source: D. Squillante, S. Barletta, Italian National Institute of Statistics, 2024.

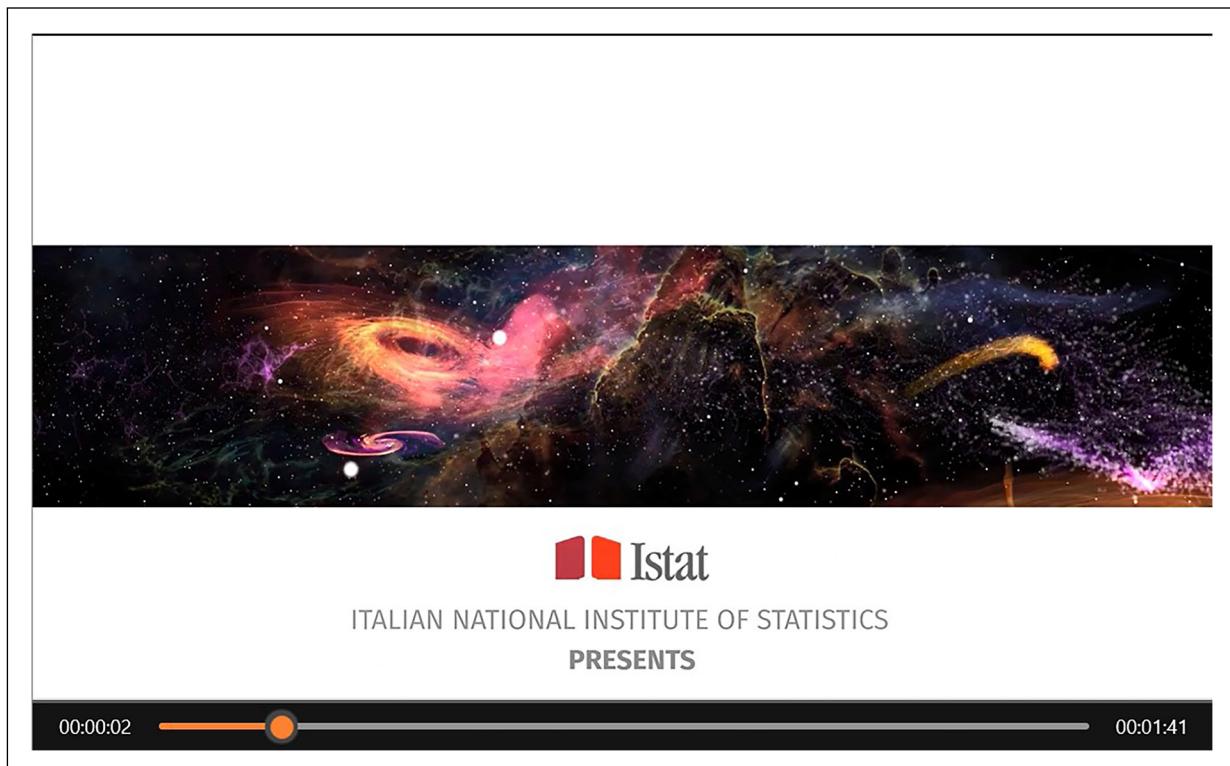


Figure 8. Frame from the video “if we were 100–2018 edition”.
Source: D. Squillante, Italian National Institute of Statistics, 2018.

Here is the link to access the video, which has been published on the official website, YouTube channel, and institutional social media profiles:

Link:

https://www.youtube.com/shorts/zY0u_9eHqLs

2.2.3 Mainstream statistical trailers. Another category of infographic videos that garners many views and interactions consists of mainstream statistical trailers: simple and visually lighthearted representations of broad thematic areas of general interest, designed to engage viewers and introduce them to the rich informational heritage of the Italian National Institute of Statistics.

Born from a creative process aimed at harmonizing statistical accuracy with sensory experience, great care is given to every detail—from data selection to framing, from music choice to the rhythmic editing of textual and visual elements.

The first example of this video type is the cult classic “*If We Were 100–2018 Edition*,” which condenses into less than two minutes the portrait of an imagined Italy composed of only 100 inhabitants—familiarizing viewers with the concept of “percentage”—while narrating characteristics that cut across territorial, demographic, and socio-cultural dimensions (Figure 8).

Here is the link to access the video, which has been published on the official website, YouTube channel, and institutional social media profiles:

Link:

IT: <https://www.youtube.com/watch?v=OSGs1FVhkpY>
 EN: <https://www.youtube.com/watch?v=qBe3o6vbYIQ>
 Aimed at bringing statistics closer to children, the video *If We Were 100 Children* adopts the same narrative logic to portray an imagined Italy made up of just 100 children.

With colorful imagery, dynamic animations, and cheerful, engaging music designed to maintain attention and make learning both enjoyable and stimulating, the video explores key aspects of children’s lives — from friendships to sports to internet use — presenting statistics as a tool to narrate children’s realities in a way that speaks directly to them (Figure 9).

Here is the link to access the video, which has been published on the official website, YouTube channel, and institutional social media profiles:

Link:

IT: <https://www.youtube.com/watch?v=awdHmoWyFuE&t=15s>
 EN: <https://www.youtube.com/watch?v=-zuOY9HHI2I>

2.2.4 Flagship reports. Since its foundation, Istat has recognized that the authority and enduring value of certain editorial products — such as the *Italian Statistical*

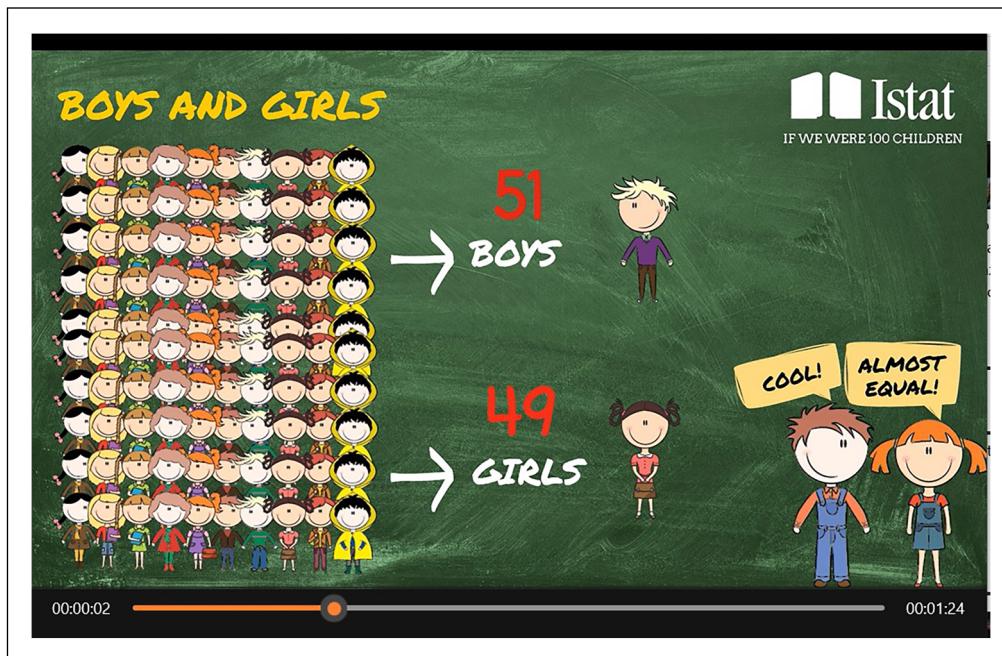


Figure 9. Frame from the video “if we were 100 children”.

Source: D. Squillante, Italian National Institute of Statistics, 2018.

Yearbook — make them not only essential tools for disseminating and communicating official statistics, but also strategic assets for strengthening institutional identity, visibility, and engagement with both the general public and national and international partners.

In an era increasingly characterized by fragmented and fast-paced information, Istat has progressively expanded its portfolio of “flagship reports” to provide the country with authoritative and accessible overviews on key macro-themes vital for interpreting the present and planning for the future — including the *Annual Report* and the *Report on Competitiveness*.

To promote and enhance the accessibility of these Reports —especially across communication channels not suited to presenting the full documents but highly effective at reaching broad and diverse audiences —a dedicated series of video infographics has been developed.

Two illustrative examples featured in this contribution are the videos created for the *Sustainable Development Goals (SDGs) Report* (Figure 10) and the *Equitable and Sustainable Well-being (BES) Report* (Figure 11).

The SDGs video, in particular, offers a simplified yet informative explanation of why and how the Sustainable Development Goals serve as a global reference framework for integrating economic growth with social justice and environmental sustainability. It also presents a concise summary of indicators across thematic domains, aiming to raise public awareness of the structure’s meaning, relevance, and strategic content.

Here is the link to access the video, which has been published on the official website, YouTube channel, and institutional social media profiles:

Link:

<https://www.youtube.com/watch?v=r4n0DwhrUR0>

Encouraging everyone to develop full awareness and to actively participate in social development, the video dedicated to the Equitable and Sustainable Well-being (BES) Report similarly explains —in an accessible and light tone— the complex structure of the BES domains and indicators, and its usefulness for development policies capable of planning and assessing beyond mere economic growth.

Here is the link to access the video, which has been published on the official website, YouTube channel, and institutional social media profiles:

Link:

https://www.youtube.com/watch?v=gV3w8_JcGHQ&list=PL0vceHDeWbohJQ-Ci_JfSnUW51-CXa5V0&index=2

3 Some (non-)conclusive considerations

In the global Onlife era—characterized by the accelerating and often imperceptible blurring of boundaries between analog and digital, physical and virtual realities—official statistics face the dual challenge of maintaining scientific rigor while adapting to a rapidly evolving communication landscape.



Figure 10. Frame from the video “sustainable development goals (SDGs) report 2020”.
Source: D. Squillante, Italian National Institute of Statistics 2020.

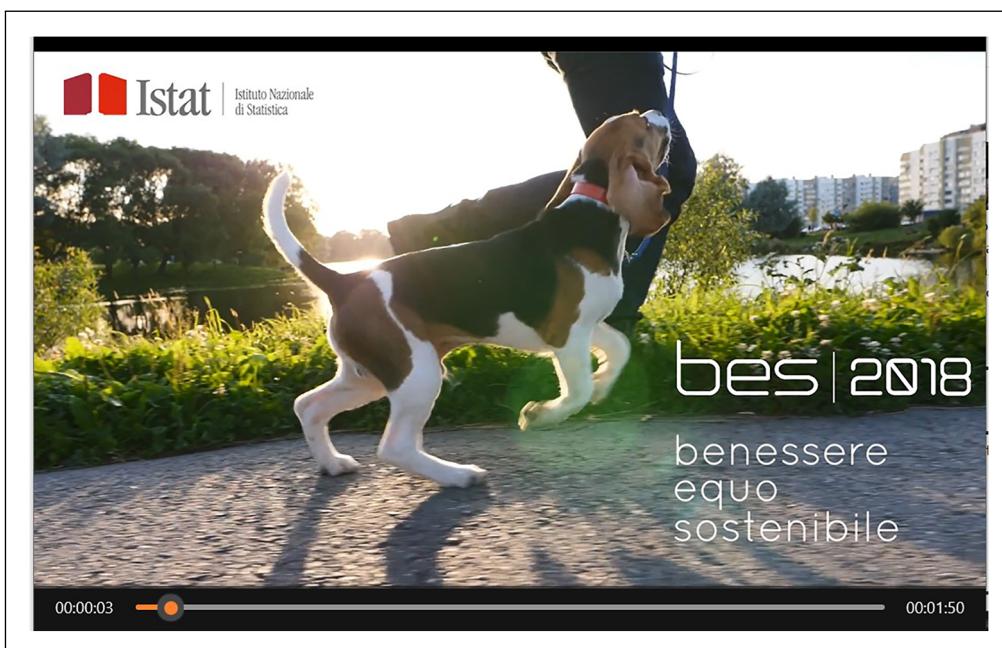


Figure 11. Frame from the video “equitable and sustainable well-being report 2018”.
Source: D. Squillante, Italian National Institute of Statistics 2018.

Within this context, visual data storytelling products have emerged not only as essential vehicles for rendering complex statistical information accessible and engaging but also as strategic instruments to counteract misinformation and public disengagement.

Istat’s ongoing commitment to the multidisciplinary development of infographics represents a forward-looking

response to these challenges, grounded in recent advances in digital storytelling, neuroscience, communication psychology.

This innovative approach aligns with the needs of a visually oriented society increasingly influenced by digital media consumption patterns, while striving to uphold the

democratic ideal of universally accessible and trustworthy information.

However, this dynamic evolution is accompanied by pressing organizational and resource-related considerations. The production of high-quality infographic and video-infographic content demands significant investments in specialized human capital, technical infrastructure, and collaborative workflows.

Balancing the principles of effectiveness, efficiency, and economy—collectively known as the “3Es”—is crucial for ensuring that these communication outputs deliver maximum impact without overextending limited institutional resources. The hybrid model employed by Istat, combining in-house expertise with strategic outsourcing, offers a replicable framework for other National Statistical Institutes (NSIs) facing similar constraints.

Moreover, the rise of artificial intelligence and automated content generation presents both unprecedented opportunities and challenges. AI tools can augment the creative and analytical capacities of statistical communicators, enabling faster prototyping and personalized user experiences. At the same time, reliance on automation risks oversimplification and loss of contextual nuance, emphasizing the need for careful oversight and ethical standards.

Looking ahead, future research and institutional practice should continue to explore the intersection of scientific rigor, technological innovation, and user-centered design in statistical communication. Ongoing evaluation of user engagement, comprehension, and trust metrics will be essential for refining methodologies and adapting to shifting audience expectations. By fostering interdisciplinary collaboration and investing in capacity-building, NSIs can enhance their resilience and relevance in an increasingly complex and data-saturated world.

Ultimately, the question remains: how will Istat and similar institutions sustain and amplify the performative aesthetic of statistics—where empirical rigor meets evocative storytelling—so as to promote informed citizenship, transparency, and democratic participation in the digital age?

This article contributes to that reflection by unpacking the multifaceted process of infographic and video-infographic production, highlighting both its scientific

foundations and practical realities, and offering insights that may guide the future of official statistical communication.

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References

1. Albers Szafir D, Borgo R, Chen M, et al. *Visualization Psychology*. Cham, Switzerland: Springer, 2024.
2. Bianconi F. *Data and Process Visualisation for Graphic Communication*. Cham, Springer: Switzerland, 2024.
3. Cairo A. *The Truthful Art: Data, Charts, and Maps for Communication*. San Francisco: New Riders, 2016.
4. Few S. *Show Me the Numbers: Designing Tables and Graphs to Enlighten*. Oakland, CA: Analytics Press, 2012.
5. Ionescu B, Bainbridge W and Murray N. *Human Perception of Visual Information*. Cham, Switzerland: Springer, 2022.
6. OECD. *Data Visualization in Practice: Communicating Data for Decision Making*. Paris: OECD Publishing, 2019.
7. Tufte ER. *The Visual Display of Quantitative Information*. Cheshire (CT): Graphics Press, 1983.
8. United Nations Economic Commission for Europe (UNECE). *Making Data Meaningful Part 1: A Guide to Writing Stories about Numbers*. Geneva: UNECE, 2018.
9. United Nations Economic Commission for Europe (UNECE). *Making Data Meaningful Part 2: A Guide to Communicating Statistics*. Geneva: UNECE, 2018.
10. Ware C. *Information Visualization*. San Francisco: Morgan Kaufmann, 2019.
11. Wilke CO. *Fundamentals of Data Visualization: A Primer on Making Informative and Compelling Figures*. Sebastopol, CA: O'Reilly Media, 2019.
12. Yau N. *Visualize This*. Hoboken, NJ: Wiley, 2024.