Dissemination of Official Statistics

Chapter 10

Dissemination is the phase in statistical processing in which data collected and compiled by national statistical offices (NSOs) and other producers of official statistics are released to the public. This Chapter focuses on making official statistics, statistical analyses, statistical services and metadata accessible to users. It discusses how users have changed the way they consume statistical products and how NSOs have reacted to this by adapting their communication channels and reaching out to users directly, often by using social media as a part of their dissemination strategy. This Chapter describes all aspects of the dissemination of official statistics, including dissemination strategy, methods and how to make data understandable for users without specialized statistical knowledge.

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10.1 Introduction

Dissemination is the phase in statistical processing in which data collected and compiled by statistical agencies are released to the public. It is defined in the *Guidance on modernising statistical legislation* (🔗)*, UNECE (2018)* as: '. the activity of making official statistics, statistical analyses, statistical services and metadata accessible to users'. The dissemination and use of its statistics that contribute to understanding and better decision-making should be considered the main objective of a national statistical system.

'Only statistics that are used are useful statistics', Petteri Baer (🔗)

As stated in the first UN Fundamental Principles of Official Statistics (UNFPOS), 'official statistics… are to be compiled and made available on an impartial basis by official statistical agencies to honour citizens' entitlement to public information'. These principles underline that official statistics are a public good, that access to statistical data should be provided simultaneously to all users, and that the means of access to and dissemination of statistical data take into account the convenience of users and their needs.

Official statistics should be sufficiently comprehensive and presented in such a way with appropriate metadata so that data can be understood without having specialised statistical knowledge. According to UNFPOS 3, "To facilitate a correct interpretation of the data, the statistical agencies are to present information according to scientific standards on the sources, methods and procedures of the statistics".

In recent years, the environment in which official statistics operate has changed significantly. There has been an explosion, not only in the volume of data available but also in the demand for it. This has increased the pressure on NSOs to produce more and better data and to improve its accessibility. To ensure that data users get what they need and to provide benchmark data and forecasts on achieving SDG targets and other reporting requirements, NSOs need new and diversified ways of disseminating statistical information.

How users consume statistical products has changed. In order to stay relevant, NSOs have reacted to this by adapting their dissemination and reaching out to users directly, often by using social media as a part of their dissemination strategy. In today's world, it is not enough to make statistical information available; it is also necessary to give it an edge in a highly competitive data environment. At the same time, NSOs have to make data accessible to better meet demand, while employing innovative technological solutions through various channels to make this process more efficient.

The topics concerning dissemination and communication discussed in this chapter are relevant and applicable to other producers of official statistics throughout the national statistical system (NSS). The NSO can play a leading role in promoting dissemination standards and coordinating efforts for an integrated and interoperable data dissemination platform for the whole national statistical system. This should be based around an exchange standard such as the Statistical Data and Metadata Exchange (SDMX) format (see *Chapter 14.4.5 — Statistical Data and Metadata Exchange (SDMX)*), facilitating a more efficient and timely flow of data from line ministries to the NSO.

10.2 Release schedule

Many (or most) NSO are committed to making statistical data available to the public according to a pre-defined release schedule (calendar). This is a significant commitment as the release calendar entails that key indicators and datasets have to be released on a given date. Advance release calendars (this term is more usual than schedule) are important for the prevention of manipulation of release dates for political purposes. In addition, reporting by NSOs to international monitoring agencies often follows specific reporting requirements and formats to satisfy national, regional and international reporting. A release calendar is thus a fundamental component and vital for the credibility of an NSO and should be a central part of an NSOs statistical website.

As part of a release schedule an NSO should ensure the following (from the *United Kingdom Code of Practice for statistics*) (🔗):

Organizations should commit to releasing their statistics openly and transparently which promotes public confidence.

- ■ The release of both regular and ad hoc official statistics should be pre-announced through a 12-month release schedule, giving a specific release date at least four weeks in advance where practicable.

! Links to guidelines, best practices and examples:

- Changes to pre-announced release dates or times should be agreed upon by the chief statistician/Head of Profession for Statistics. Any changes should be announced promptly, explaining the reasons for the change.

- Access to statistics before their public release should be limited to those involved in the production of the statistics and the preparation of the release, and for quality assurance and operational purposes. Accurate records of those who have access before they are finalised should be maintained.

- If the NSO grants access to their statistics ahead of their publication, such pre-release access should be restricted to few participants in line with international recommendations on pre-release access in line with the pre-release access rules and principles. The details of that granted access should be recorded, together with clear justifications for the access. No indication of the results should be made public, and the statistics should not be given to any other party without prior permission for access. The list of recipients should be reviewed regularly and kept to a minimum.

- Statistics and data should be released on a timely basis and at intervals that meet users' needs as far as practicable. The statistics should be released as soon as they are considered ready, under the guidance of the chief statistician/Head of Profession for Statistics.

- Statistics should be released to all users according to a pre-announced schedule.

- The name and contact information of the lead statistician or analyst responsible for production should be included in the published statistics.

- Policy, press, or ministerial statements referring to official statistics should be issued separately from, and contain a prominent link to, the source statistics. The statements should meet basic professional standards of statistical presentation, including accuracy, clarity and impartiality. The lead statistician or analyst should advise on the appropriate use of the statistics within these statements.

- Scheduled revisions or unscheduled corrections to the statistics and data should be released as soon as practicable. The changes should be handled transparently in line with a published policy.

- Statistics Norway - making a greater impact with an earlier release time (🔗).

- Ireland Central Statistics Office – the timeliness monitor (🔗).

10.3 Data accessibility

Providing easy access to official statistical data is a core responsibility of an NSO, as well as the commitment that the service meets user needs. The NSO website should strive to meet national and international requirements and guidelines related to accessibility by citizens with special needs as quoted below from the *W3C Web Content Accessibility Guidelines (WCAG) 2.0* (🔗):

- **Perceivable**

  - Provide text alternatives for any non-text content to be changed into other forms people need, such as large print, braille, speech, symbols or simpler language.

  - Provide alternatives for time-based media.

  - Create content that can be presented in different ways (for example, simpler layout) without losing information or structure.

  - Make it easier for users to see and hear content, including separating foreground from background.

- **Operable**

  - Make all functionality available from a keyboard.

  - Provide users with enough time to read and use the content.

  - Do not design content in a way that is known to cause seizures.

  - Provide ways to help users navigate, find content, and determine where they are.

- **Understandable**

  - Make text content readable and understandable.

  - Make Web pages appear and operate in predictable ways.

  - Help users avoid mistakes.

- **Robust**

  - Maximize compatibility with current and future user agents, including assistive technologies.

10.4 Metadata - providing information on the properties of statistical data

Statistical metadata is commonly defined as data about data and is critical to ensuring the quality, interpretability and usefulness of datasets.

The first and most fundamental purpose of metadata is to help users of statistical data to interpret, understand, and analyse statistical data.

It is vital that an NSO provides sufficient metadata to ensure quality and add value to statistics. Metadata provides information about the background, purpose, content, collection, processing, quality, and related information of a statistical dataset that a user needs to find, understand and manipulate statistical data. Simply put, the metadata for a statistical dataset increases the number of people who can successfully use a data source once it is released.

10.4.1 Types of metadata

The two main categories of metadata are reference metadata and structural metadata. These are described in the Eurostat 'statistics explained' glossary (⊖) in the text below:

- **Structural metadata**

  Structural metadata is used to identify, formally describe or retrieve statistical data, such as dimension names, variable names, dictionaries, dataset technical descriptions, dataset locations, keywords for finding data, etc. For example, structural metadata refer to the titles of the variables and dimensions of statistical datasets, as well as the units employed, code lists (e.g., for territorial coding), data formats, potential value ranges, time dimensions, value ranges of flags, classifications used, etc.

- **Reference metadata**

  Reference metadata (sometimes called explanatory metadata) describes the contents and the statistical data quality from a semantic point of view. They include explanatory texts on the context of the statistical data, methodologies for data collection and data aggregation as well as quality and dissemination characteristics.

  Metadata may appear alongside the data in the form of graph labels and footnotes or may be compiled as explanatory notes that contain information

such as a definition and description of the population, the source of the data, and the methodology used. Metadata can include documentation of definitions, relationships among variables, specifications, procedures, classification schemes, and instructions. It can be used to assist search and navigation on a website and assist post-processing such as downloading data and statistical tools for analysis. In a dissemination system, metadata can be present at all data collections levels, from footnotes at the individual record level, information at dimension level, and the dataset level.

Standards and guidelines for statistical metadata have been developed and are already applied in practice by national and international statistical organizations. These include:

(!) Links to guidelines, best practices and examples:

- *Data Documentation Initiative ([DDI](#)).*
- *Dublin core – metadata definitions (🔗).*
- *Eurostat Terminology on Statistical Metadata (🔗).*
- *Eurostat metadata guidelines, methodologies and definitions (🔗).*
- *Metadata: basic concepts and definitions and the role of the Statistical Data and Metadata Exchange (🔗).*
- *OECD Data and Metadata Reporting and Presentation Handbook (🔗).*
- *Statistical Data and Metadata Exchange (SDMX) Glossary (🔗).*
- *Statistics Botswana - the importance of sound metadata management (🔗).*
- *Statistics Canada - Metadata: An Integral Part of Data Quality Framework (🔗).*
- *UNECE Guidelines for statistical data on the internet (🔗).*
- *UNSD Statistical Metadata in a Corporate Context: A guide for managers (🔗).*

10.5 Types of statistics disseminated

This section covers the various types of data disseminated by an NSO. An NSO primarily disseminates macrodata although dissemination of geospatial data is becoming increasingly common. Microdata can also be disseminated, but this tends to be the exception.

10.5.1 Macrodata

Macrodata is a term used to describe data generated by aggregating microdata according to statistical methodology. Examples of such aggregated data include unemployment statistics, demographics and GDP. There are few specific technical or legal issues relating to disseminating macrodata as they do not, in general, have confidentiality or data volume concerns.

10.5.2 Geospatial data

An increasing number of NSOs are disseminating integrated geospatial information and statistics, including a geographic component. This means that the records in a geospatial dataset have implicit locational information such as Global Positioning System (GPS) (or geographic) coordinates. A geographic information system (GIS) is a system designed to capture, store, manipulate, analyse, manage, and present geospatial data (See. *Chapter 8.4 — Geospatial data*).

The challenges of disseminating integrated geospatial and statistical data mentioned in the GLOS guidance include:

"Official statistics typically disseminate statistical data free of charge according to open data principles. This may not always be the case for geospatial data provided by the national mapping agency or regional authorities. Therefore, access to geocoded data is not self-evident or could be costly for statistical authorities.

Statistical offices disseminate statistics in formats, such as tables, maps, graphs, infographics, news releases, public-use files, etc. The geospatial community uses traditional vector data and prepares large grids to disseminate their earth observations data. Publishing statistics on smaller areas and in an increasing number of formats makes the risk of disclosure higher. Very detailed aggregations pose risks to the privacy of individual data. Furthermore, the data protection methods used by mapping agencies and statistical offices differ, which can make the comparison of data difficult."

10.5.3 Microdata
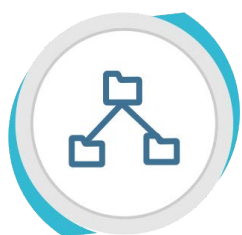
Microdata generally contains information on individual persons, households or business entities collected through a survey or interview. In these datasets, each row typically represents an individual and each column an attribute such as age, gender or address. Microdata can also be made up of data on individuals collected from governmental administrative systems and registers. Microdata is used in official statistics for the production of aggregate information.

Microdata provides the underlying data for addressing critical development challenges such as poverty, gender inequality, and food insecurity. They can be aggregated into macrodata or, more commonly, statistical indicators, providing counts and averages at the level of a group, a country, or region. Because it contains disaggregated information about small population groups or areas lost in the process of compiling statistics indicators, microdata can provide a more nuanced, multidimensional view of the needs of vulnerable population groups that is essential for validating previous analyses, testing new hypotheses, and designing programs.

Some NSOs provide microdata for research and analysis purposes. It generally requires significant effort to produce high-quality microdata and the associated creation and documenting of microdata files, creating access tools and safeguards, and supporting and authorising inquiries made by the research community.

Dissemination of microdata in official statistics needs to be done carefully because it may lead to indirect or direct identification of the reporting unit, and measures must be taken to ensure anonymity. The privacy of data collected is core in protecting respondents, particularly for sensitive data set on health, gender violence or victimisation, thus ensuring the quality of and the trust in official statistics. Direct and indirect identification of individuals should be impossible with microdata publication while for research purposes, indirect identification could be possible and therefore, such accesses strictly regulated (see *Chapter 14.2.17 — Data security*).

NSOs often charge researchers for such access to offset the extra costs of making the microdata available. There are also costs associated with the checking of outputs to ensure confidentiality.

For more information, see also *Annex 5 - Why Share Microdata? – A View from ODW*.

(!) Links to guidelines, best practices and examples:

- *Eurostat microdata reference guide (🔗).*

- *OECD expert group for collaboration on microdata access (🔗).*

- *FAO microdata catalogue (FAM) (🔗).*

- *Guidelines and good practices for managing statistical confidentiality and microdata (🔗).*

- *INSEE France Statistical confidentiality and data protection (🔗).*

- *UN Principles and Guidelines for Managing Statistical Confidentiality and Microdata Access (🔗).*

10.6 Dissemination strategy

A dissemination strategy should include agreed principles and guidelines for disseminating and communicating statistics and procedures for handling errors and revisions. It can also promote the development of a common platform of official statistics that includes data from all producers of official statistics. This can help an NSO to harmonize statistical releases, tables, graphs and analysis, and terminology applied across statistical domains. It can help avoid confusion and misinterpretation and can facilitate the comparison of statistics.

A dissemination strategy should take into account the following principles taken from *EU statistics code of practice* (🔗):

- **Principle 6 - Impartiality and Objectivity**

  • Statistical authorities develop, produce and disseminate statistics respecting scientific independence in an objective, professional and transparent manner in which all users are treated equitably.

  • Statistics are compiled on an objective basis determined by statistical considerations.

  • Choices of data sources and statistical methods, as well as decisions about the dissemination of statistics, are based on statistical considerations.

- Errors discovered in published statistics are corrected at the earliest possible date and publicised.

- Information on data sources, methods and procedures used is publicly available.

- Statistical release dates and times are pre-announced.

- Advance notice is given on major revisions or changes in methodologies.

- Statistical authorities independently decide on the time and content of statistical releases, while considering the goal of providing complete and timely statistical information. All users have equal access to statistical releases at the same time. Any privileged pre-release access to any outside user is limited, well-justified, controlled and publicised. In case of breach, pre-release arrangements are reviewed to ensure impartiality.

- Statistical releases and statements made in press conferences are objective and non-partisan.

■ **Principle 15 - Accessibility and Clarity**

- Statistics are presented in a clear and understandable form, released in a suitable and convenient manner, available and accessible on an impartial basis with supporting metadata and guidance.

- Statistics and the corresponding metadata are presented, and archived, in a form that facilitates proper interpretation and meaningful comparisons.

- Dissemination services use modern information and communication technology, methods, platforms and open data standards.

- Custom-designed analyses are provided when feasible, and the public is informed.

- Access to microdata is allowed for research purposes and is subject to specific rules or protocols.

- Metadata related to outputs are managed and disseminated by the statistical authority according to the European standards.

- Users are kept informed about the methodology of statistical processes, including the use and integration of administrative and other data.

- Users are kept informed about the quality of statistical outputs with respect to the quality criteria for statistics.

A dissemination and communication strategy will need to be in line with other policies, particularly confidentiality requirements. According to the *Generic Law of Official Statistics* ([GLOS 2016](#)), the strategy may include the following elements:

- the general dissemination principles and guidelines, in line with the statistical law;

- the use of different dissemination platforms and the pricing policy;

- procedures for handling errors;

- procedures for handling revisions;

- ways to facilitate users' access to all official statistics from different producers;

- the main contents and practices for releasing metadata;

- best practices for producing tables, graphs and written explanations;

- practices for archiving statistical releases for future use.

(!) Links to guidelines, best practices and examples:

- India Ministry of Statistics data dissemination policy (🔗);

- *National Statistics Institute (INE-Chile) data dissemination policy* (🔗);

- Open data standards directory (🔗);

- Open Data Watch "Measuring Data Use" (🔗);

- PARIS21 NSDS guidelines on data dissemination (🔗);

- *Statistics Botswana data dissemination policy* (🔗);

- Statistics Estonia data dissemination policy (🔗);

- *Palestinian Central Bureau of Statistics (PCBS) data dissemination policy* (🔗);

- *UNSD Principles for the dissemination policy of official statistics* (🔗).

10.7 Dissemination methods

10.7.1 Dissemination by websites and data portals

NSOs have provided access to data via their websites for many years. Data has been made available in pdf format, as downloadable datasets, and as interactive links to databases. The most important tool used by an NSO to disseminate statistical data and metadata is the data portal, a web-based, interactive data and metadata platform with

databases modelled for specific data types and domains such as microdata, macrodata or geospatial data.

Today many developing countries lack fully functional platforms for data dissemination and reporting and rely on less sophisticated dissemination methods on their websites. Solutions have come and gone, but none in the recent past have emerged that were sustainable over the long term for many countries. For example, DevInfo, was the data dissemination platform developed for the Millennium Development Goals (MDGs) and used in 120 countries but is now no longer supported. This issue was highlighted by the *PARIS21 study on national data portals* (🔗) published in 2016 which concluded that while there have been many well-intentioned efforts to make data portals available to countries, the outcomes have been mixed, particularly in the most aid-dependent countries. The report also notes that the increased adoption of data portals in NSOs of all capacity levels has had a particular impact on developing countries where data portals were often implemented by international agencies for monitoring purposes as well as to help NSOs to improve the dissemination of data to a broader public. In many cases, NSOs found themselves having to maintain multiple, non-integrated data portals focussed on specific domains. This confuses users who consult the various portals with often conflicting results, and such multiple portals have the consequence of overall high costs for low usage.

Data portals can help promote standards that can enable interoperability – this can be within an NSO, within an NSS, or at the international level. They can promote the exchange of data by leveraging standards such as SDMX to establish a coherent framework for transmitting data and metadata. Data portals can play a major role in reducing reporting burdens and improving the quality of reporting data and provide a single interface for accessing statistical data using standards of content and presentation.

Selecting the appropriate data portal for a national statistical office

It is important that an NSO seek impartial expert advice and can access the information needed to make an informed decision on selecting the appropriate data portal to meet their needs. An NSO should be aware of the advantages and shortcomings of each system, its use of international standards or proprietary formats, its sustainability, and the real costs of maintenance. Regional bodies and centres of expertise can play an important role in providing such guidance based on the latest available information in the international statistics community.

The *UNSD report on Principles of SDG Indicator Reporting and Dissemination Platforms and guidelines for their application* (🔗) provides a set of principles for selecting a national data reporting platform. These are summarised below:

A national reporting and dissemination platform can be understood as a means to report and disseminate national statistics including SDG indicators and descriptive metadata, and refers to a web site, database(s), and associated IT infrastructure, workflows and processes used to collect, store, secure, and ultimately disseminate data and related metadata and documentation in an easily accessible way to reach all target users.

- **Clear institutional arrangements and management**: The responsibility for the development, implementation and maintenance of a national reporting and dissemination platform, including the required coordination and cooperation within the national statistical system, as well as accountability and oversight, should be clearly established through adequate laws and/or regulations, mandates and standard operating procedures. The NSO, commonly tasked with coordinating the national statistical system, is typically assigned this responsibility. Information flows, and the role of each actor within the national statistical system should be clearly established.

- **Fitness for purpose**: National reporting and dissemination platforms should comply with the Fundamental Principles of Official Statistics and should address the priority needs and requirements of sub-national, national, regional and global monitoring and reporting, as well as reduce the reporting burden.

- **Sustainability**: The decision on the purpose, scope, features, development and implementation of the national reporting and dissemination platform needs to consider the availability of internal and external resources and capacities over the medium and long term.

- **Interoperability and statistical standards**: The components of national reporting and dissemination platforms should follow international and national statistical standards and best practices, to facilitate the integration, customization and further development of components and different solutions. In particular, standards should be supported to facilitate data harmonization and exchange across different stages of the statistical production and institutions including common data structure definitions and code lists, and the integration of data flows and processes within the national statistical system.

The report also lists the following guidelines for the implementation of an SDG Indicator Monitoring and Reporting Platform:
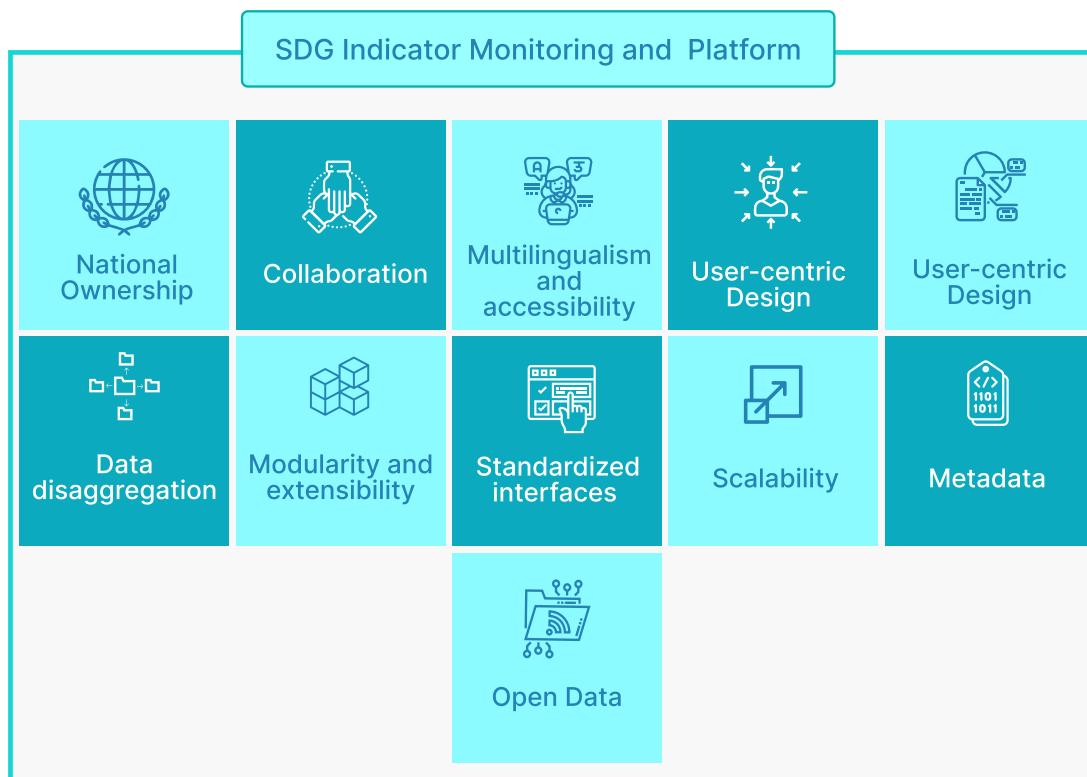
- **National ownership**: NSOs should have the ability to maintain, adapt, transform and customize their national reporting and dissemination platform to address their own and their users' needs, such as the management of sub-national administrative boundaries, country-specific ethnic and language groups, and additional indicator definitions related to national development priorities.

- **Collaboration**: National reporting and dissemination platforms should be designed, developed, improved and maintained based on a collaborative approach that leverages learning between various stakeholders of the national statistical system as well as technology developers, donors, policymakers, subject-matter experts, business partners, advocacy groups and both institutional and grassroots users.

- **Multilingualism and accessibility**: To leave no-one behind, to ensure national ownership, and to promote the use and impact of data for policy and decision making at the local level, national reporting and dissemination platforms should support national languages and implement national and international best practices in terms of accessibility to persons with disabilities, as well as full access across the range of browsers and devices, including mobile devices.

- **User-centric design**: National reporting and dissemination platforms should be designed for and with users (including both operational and end-users, such as

data consumers or NSO officers), and project owners should engage them in all phases of development.

- **Data communication**: National reporting and dissemination platforms should implement innovative strategies to improve the presentation, communication and use of sustainable development data.

- **Data disaggregation**: National reporting and dissemination platforms should support improved access to, and use of, disaggregated data to focus on all population segments, including the most vulnerable. In particular, data platforms should allow the management and dissemination of data disaggregated by sub-national geographic areas, sex, age group, residence, wealth and income group, disability, ethnicity, migrant status, and other important characteristics relevant to the national context.

- **Modularity and extensibility**: National reporting and dissemination platforms should be modular, composed of modules (sub-systems) and components that interoperate to service the different phases of the data life cycle. The data that these modules and components consume as inputs and produce as outputs should as much as possible be based on open standards and protocols such as Statistical Data and Metadata Exchange (SDMX) and Common Statistical Production Architecture (CSPA). The system should support extensibility through the addition of modules or components, upstream or downstream.

- **Standardized interfaces**: National reporting and dissemination platforms should provide standardized Application Programming Interfaces (APIs) in accordance with the industry best practices such as the OpenAPI Specification. This facilitates creating and sharing data across global, regional, national and sub-national data communities.

- **Scalability**: A National reporting and dissemination platform should have an architecture that enables an NSO to start with a limited scale implementation and iteratively progress towards a full-scale system.

- **Metadata**: National reporting and dissemination platforms should support statistical metadata at the appropriate level of granularity. This includes structural metadata such as codes and their descriptions; reference metadata such as methodology and quality aspects of published indicators; and other relevant information such as the date of last update.

- **Open Data**: National reporting and dissemination platforms should be consistent with Open Data best practices, summarized as 'Open data and content can be

freely used, modified, and shared by anyone for any purpose'. National reporting and dissemination platforms should include and follow a data license consistent with the Open Data principles, such as Creative Commons Attribution (4.0) or the Open Database License. Published datasets should be clearly attributed to the originating organization.

(!) Links to guidelines, best practices and examples:

- List of open data portals (🔗);
- Africa open data portal (🔗);
- CKAN data portals (🔗);
- Eurostat data portal (🔗);
- OECD data portal (🔗);
- UN data portal (🔗);
- Search for data portals (🔗);
- World Bank data portal (🔗).

Examples of NSO-specific data portals:

- Canada data portal (🔗);
- China data portal (🔗);
- India data portal (🔗);
- Ireland data portal (🔗);
- Mongolian data portal (🔗);
- Philippines data portal (🔗);
- Rwanda data portal (🔗);
- South Africa data portal (🔗);
- Turkey data portal (🔗).

National statistical system data portals

As well as the need for an NSO to have a data portal, there is also a wider requirement for a common integrated data portal that can be used across an entire national statistical system. This is especially important in the SDG context where a coordinated approach is necessary to provide indicators from multiple sources. National SDG reporting platforms

are usually separate from web portals intended for the dissemination of official statistics.

These data should feed in from the various ministries and other agencies that make up the national statistical system, coordinated by the NSO, in a standard format such as SDMX. The African Information Highway is an example of such an NSS-wide system that uses SDMX as the common exchange and dissemination format (see *Chapter 14.4.5 — Statistical Data and Metadata Exchange (SDMX)*)

Generic data portals

There are several generic data portals that aim to meet the common dissemination needs of NSOs of all capacity levels. This reiterates the need for commonly shared systems or interoperable home-grown solutions. A challenge is to adapt a generic portal to accommodate every data type that an NSO produces - and generic solutions may eventually need to be customized for specific NSO requirements.

Examples of generic data portals:

- Fusion Registry 9 (⊖) Enterprise Edition is an integrated management system for aggregated statistical data and metadata. It uses SDMX, the international standard for describing and exchanging official statistics.

- National Data Archive (NADA) dispenses survey documentation – questionnaires, technical documents and reports describing the surveys etc.; survey description – sampling frames and data collection information etc.; and data description – variables and counts etc. and anonymized microdata of surveys.

- Stat Suite (⊖) is a component-based, open-source set of tools for managing the full data life-cycle. The Data Explorer allows for searching, visualising and sharing of data through a fully open-source front-end set of components that can be adapted to specific needs and context.

- IMF Dissemination Standards Bulletin Board (⊖).

- African Information Highway (⊖).

10.7.2 The use of social media in dissemination

Social media are websites and applications that enable users to create and share content or to participate in social networking. In the last edition of the Handbook in 2003

social media barely existed – this indicates the rate of change in technology and human behaviour that has taken place during the intervening period that NSOs have to adapt to.

The use of social media by NSOs has been increasing rapidly in recent years, and this will most certainly continue in years to come given its pervasiveness. Social media has been used in various forms to disseminate and raise the profile of official statistics. Social media are mainly used to distribute information, announce new releases, promote the use of statistics, and increase statistical literacy. They can also be used to reach new audiences and improve user support and receive user feedback and for marketing purposes. Using social media can also promote the image of the NSO as a modern and dynamic organization. Social media can be a useful tool in disseminating and discussing official statistics, as it offers tailor-made solutions to reaching individuals interested in official data.

The main types of social media are listed below:
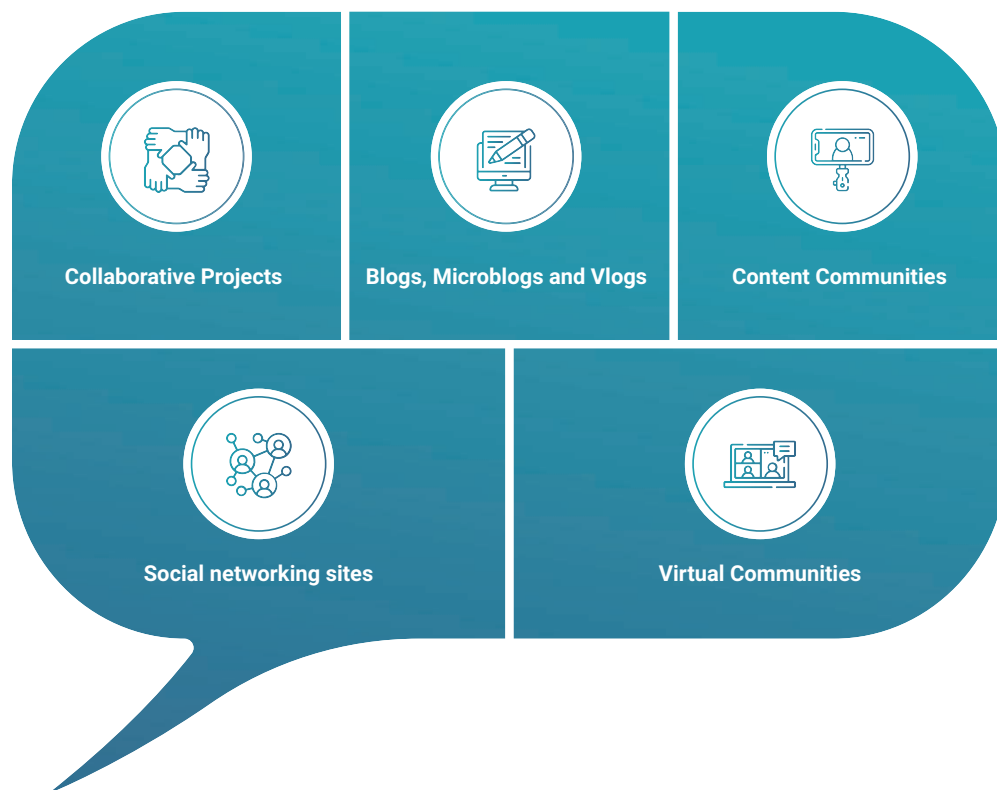
- **Collaborative projects** serve as an online database, allowing users to pool knowledge and information on particular topics to be viewed by other interested parties. Example: Wikipedia.

- **Blogs, microblogs and vlogs** are a type of website or part of a website maintained by an individual with regular entries of commentary, graphics or

video. Many blogs provide commentary or news on a particular subject; others function as more personal online diaries. Example: WordPress or Twitter.

- **Content communities** allow users to upload, share, and view multimedia content such as videos, pictures, music or presentations. Example: YouTube, Flickr, Soundcloud.

- **Social networking sites**, e.g., are online services, platforms or sites that focus on building and reflecting social networks or social relations among people who share interests or activities. Example: Facebook, LinkedIn.

- **Virtual communities** take the form of a computer-based simulated environment through which users can interact with each other through avatars and can explore, meet others, socialise, participate in individual and group activities, and create and trade virtual property and services with one another, or travel throughout the 'world'. Example: Second Life.

Social media can be of use to an NSO in the following ways:

- reaching and more people and people who normally do not look for statistics;

- providing a new way for users to find facts quickly;

- challenging the traditional ways of searching and accessing information;

- allowing quick and spontaneous reaction to issues raised;

- fostering reputation and strengthen the brand of NSOs;

- increasing information availability; and

- increasing the use and reputation of statistics in a positive way.

! Links to guidelines, best practices and examples:

- Eurostat microdata reference guide (🔗);

- Eurostat - Social media in statistical agencies (🔗);

- UK GSSr - Improving user engagement for official statistics (🔗);

- United Nations on social media (🔗);

- UNECE framework for communication on official statistics (🔗);

- Statistics Canada use of YouTube (🔗).

10.7.3 Machine-to-machine dissemination

Machine-to-machine access (commonly abbreviated as M2M) refers to computers exchanging data via application programming interfaces (APIs) as a means of opening up data to a wider variety of uses. It can also refer to communication within a system of networks that transmit data to personal appliances. The expansion of networks around the world and increased computing power has made M2M communication quicker and easier to implement.

M2M data transmission methods can reduce reporting lags and lower the reporting burden. Using a standard such as SDMX data structures and common IT building blocks, international information systems can communicate M2M as industrial production processes. Using SDMX makes it possible to interconnect remote dissemination databases to cut transmission delays, save resources, and improve the data quality in making global data more comparable.

(!) Links to guidelines, best practices and examples:

- Statistics Poland – API portal (🔗).

10.7.4 Hard-copy dissemination

The use of printed publications varies from NSO to NSO, but the overall trend is that producing large numbers of printed publications that are essentially a series of tables is declining and being replaced by online access to data or PDF files that can be printed on demand. There is still a need for paper publications in countries with scant access to digital systems and tools and undeveloped digital literacy.

Printed publications are also used for display purposes in conferences and events, or as gifts, but this is fairly small-scale production of well-designed infographics presented in small booklets. Ready-made-tables can provide a service to those who need material ready-made and simple to download. Many NSOs do this in PDF only, but machine-readable files in standard formats such as CSV or XLSX can be useful to many users.

(!) Links to guidelines, best practices and examples:

- *Albania National Statistics Institute – dissemination policy and guidelines* (🔗).

10.7.5 Multimedia dissemination

Other dissemination formats include CD-ROMS, DVDs and USB keys. These are mostly used where there is little internet access and are generally being phased out in most NSOs. They and have been replaced by online access to data.

10.7.6 Mobile apps

As a result of the continuing technological advances in smartphones, users now expect access to digital information anytime, anywhere, and on any device. Use of mobile devices by NSOs to provide data access has risen significantly in recent years, with more users accessing data on mobile devices. One concern is that such apps can quickly become obsolete if they are not maintained. It is important that existing web-based applications, in particular, data portals, should be adapted to be usable on multiple platforms of mobile devices.

10.7.7 GIS Portals

Geographic Information System (GIS) portals are specialised platforms for the dissemination and visualisation of geospatial data. Data is combined with maps from publicly available sources such as Google Maps.

- Central Statistical Bureau of Latvia thematic maps (🔗);

- The Environmental Systems Research Institute (Esri) ArcGIS platform for geospatial data processing and dissemination for NSOs (🔗);

- Eurostat – GISCO (Geographic Information System of the Commission) (🔗);

- National Institute of Statistics of Rwanda Geodata Portal (🔗);

- Statistics Korea - GIS, Maps and Statistics (🔗);

- Tool for visualisation and dissemination of geospatial statistics in Slovenia (🔗);

- World Resource Institute (WRI) portal of maps, charts, datasets, infographics, and other visual resources (🔗).

10.7.8 Statistical yearbook

The statistical yearbook is a compendium of statistical information dealing with a wide range of development pertinent topics. Printed yearbooks have the limitations of other paper publications in that people now read less and want clickable tools accessing live

databases - however, many NSOs at all capacity levels are still producing them. Merits of producing a yearbook include the following:

- The yearbook can be distributed to/is useful for users who do not have access to digital equipment and in regions with little or no digital network;

- It provides an occasion for a review of the relevant information that describes a country;

- It clarifies the need for integration in the statistics that will be selected for the yearbook;

- It reveals gaps in the available information, thereby suggesting the new initiatives that should be taken to complete the description of the country's social and economic fabric;

- In the case of decentralized systems, it is yet another means of promoting coordination among statistical units in different government departments;

- It is an ideal pedagogical device to introduce children to the physical, political and human geography of their country;

- It also acts as a timestamp for the data published on a specific date.

(!) Links to guidelines, best practices and examples:

- *Albania statistical yearbook* (🔗);
- *China statistical yearbook* (🔗);
- *India statistical yearbook* (🔗);
- *Jordan statistical yearbook* (🔗);
- *Maldives statistical yearbook* (🔗);
- *Mongolia statistical yearbook* (🔗);
- *Rwanda statistical yearbook* (🔗).

10.7.9 Dynamic visualisations

Dynamic visualisation refers to those representations that go beyond static forms, such as printed media. The defining characteristics of dynamic visualisation are animation, interaction and real-time data access. Visualisation tools play a key role in making complex data understandable and accessible to a wide audience (see *Chapter 14.2.6 —*

Data visualisation software). It can support and underscore messages to influence policy and evidence-based decision making. Visualisations can reveal compelling stories from complex underlying data and have become an important element of communication strategy. Until fairly recently data visualisations used by NSOs were mainly static images and simple graphics, but advances in technology have led to a wide range of visualisation methods and sophisticated graphics that border on artistic design that can be reused, linked to datasets and embedded in websites and via apps in social media.

10.8 Recovering dissemination costs

10.8.1 Free versus paid access

There has been much debate over the years on whether NSOs should provide all their statistical data free of charge. The trend today is to provide access to data for free with some exceptions. As previously noted, official statistics are considered to be a public good, which in itself seems a reason for an NSO to provide free access to its data. One should also note that if collecting a fee requires more resources than the fee brings in, it is economically inefficient. Operating complex paywalls may be beyond the capacity of many NSOs.

If charges for data are made, they should be based on data extraction costs or the costs of expert work in compiling additional aggregations and linking of data for new statistics requested. It should cover costs, IT, and infrastructure required for the tailored service, not for profit.

There are still several paying models which include (extracted from 'why people pay for data (🔗).
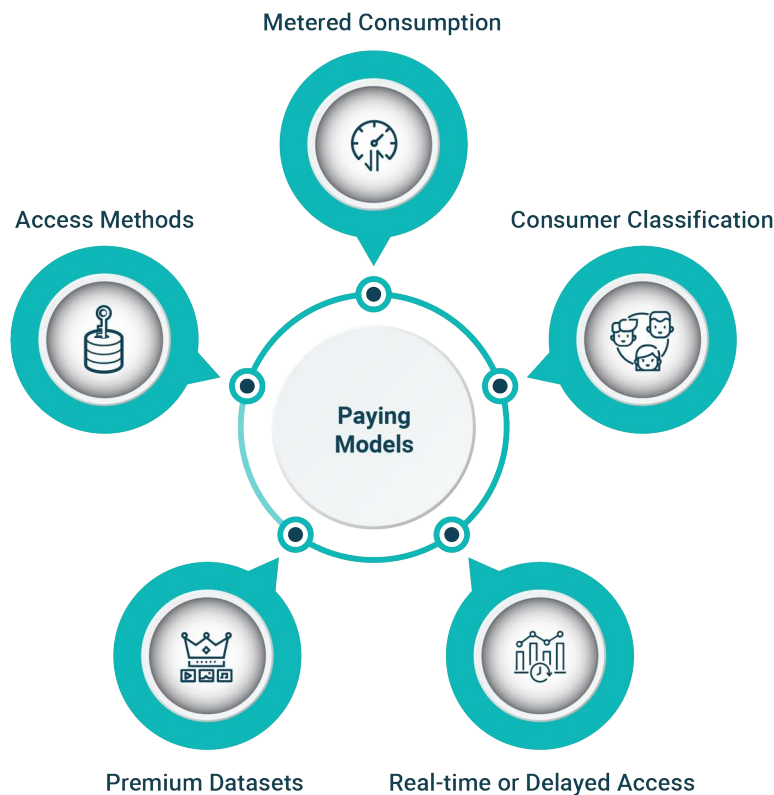
- **Metered consumption**: In this model, a certain amount of data is free, and when you need more, you must pay for it. Within this model, there are a couple of options: one where rates are measured on a per dataset basis, and one where rates are measured site-wide, regardless of the dataset(s) being accessed.

- **Consumer classification**: Charging different rates for various types of customers is a well-known business model. For government data, business consumers are most likely to be charged since they are probably using the data for revenue-generating purposes. Sometimes referred to as 'freemium', this model works by offering simple and basic services for free for basic users while more advanced or additional features are at a premium. The business consumers are paying customers that effectively subsidize free services for non-business customers.

- **Access methods**: Purely from a technology perspective (computer memory, processing, and connectivity), downloading an entire set of data is generally less costly than asking for small specific pieces of it. Bulk data could be made available for free while application programming interfaces (APIs) could be fee-based. Charging to push data to a subscriber as it becomes available (rather than pulling it using bulk downloads or APIs) is another option.

- **Premium datasets**: Similar to consumer classification, except instead of charging based upon who is accessing the data, costs are determined by what data they access.

- **Real-time or delayed access**: This scenario is useful for transactional data where extremely recent data has greater value, but value decreases over time until it's free. An example from the finance sector is stock market data, where companies pay a premium for real-time information (and invest millions of dollars to gain a millisecond lead over the competition), but within 15–20 minutes, the data is free and publicly available.

10.8.2 Role of data resellers

The NSO is a provider of high-quality data that others can profit from by adding value. As more and more NSOs adopt open data policies (see *Chapter 14.2.8 — Open data initiatives*), data resellers can simply pull the data from NSO websites, re-package and re-sell it without having to engage in any specific relationship with the NSO.

In many countries, the private sector is already engaged in the dissemination of statistical data and information. In some cases, these are basic statistical information, and in others, the vendor provides a value-added service such as conducting further analysis of the data or integrating the data with other sources of information. While an NSO may not disseminate all statistical data, it does have an obligation to ensure that essential statistical information is provided to all society segments on an equal basis. Depending on national practices, an NSO may provide the information itself or assist the vendor in doing so.

The involvement of data resellers can assist in the dissemination of statistical information in several ways. Their marketing skills relieve statisticians of the task of interacting with the end-users of information, and by subjecting the data to thorough analysis, data resellers can provide additional constructive criticism of quality and presentation. They can also help NSOs assess demand for various types of data.

Value-added features of data resellers include the following:

- High-frequency data delivery;

- Multiple data delivery methods and formats;

- Integrating multiple data sources into a single format;

- High availability of data;

- Adding on related data.

However, potential problems also exist in that resellers may misinterpret data without giving statisticians a chance to set the record straight.

10.8.3 Copyright and royalties

Copyright is an intellectual property right assigned automatically to the creator of an original work that aims to prevent unauthorised copying and publishing of the work and **gives the copyright holder legal recourse**. Copyright applies to statistical data and plays a role when creating, sharing and reusing data. Data itself cannot be copyrighted, but an NSO may own copyright of the compilation of the data.

A Creative Commons (CC) license is one of several public copyright licenses that enable the free distribution of an otherwise copyrighted work. A CC license is used when giving others the right to share, use, and build upon a work that the author has created. This lessens the restrictions on using that data considerably by changing the copyright from 'all rights reserved' to 'some rights reserved'.

For example, the Australian Bureau of Statistics (ABS) supplies the bulk of its free and customised data with Creative Commons Attribution (CC BY) licensing. In this way, the ABS only requests that it be acknowledged as the source of the data.

> (!) Links to guidelines, best practices and examples:

- Australian Bureau of Statistics - Creative Commons licensing (🔗).
- Creative Commons (🔗).
- WIPO principles of copyright (🔗).

10.9 Open data movement

Open data is defined by the Open Data Foundation (🔗) as "**Open data is data that can be freely used, shared and built on by anyone, anywhere, for any purpose**". If an NSO wants to comply with recommended standards for open data, then certain steps should be taken to make its data freely available in this way (see *Chapter 14.2.8 — Open data initiatives*). Openness is a concept common to open source, open government and open data. It responds to various political and economic issues. Democratic gains are expected from data openness (better transparency of public action, citizen participation,

response to the crisis of confidence towards politicians and institutions), and economic value creation through the development of new activities based on open data.

The benefits of open data can serve many groups, including the government.
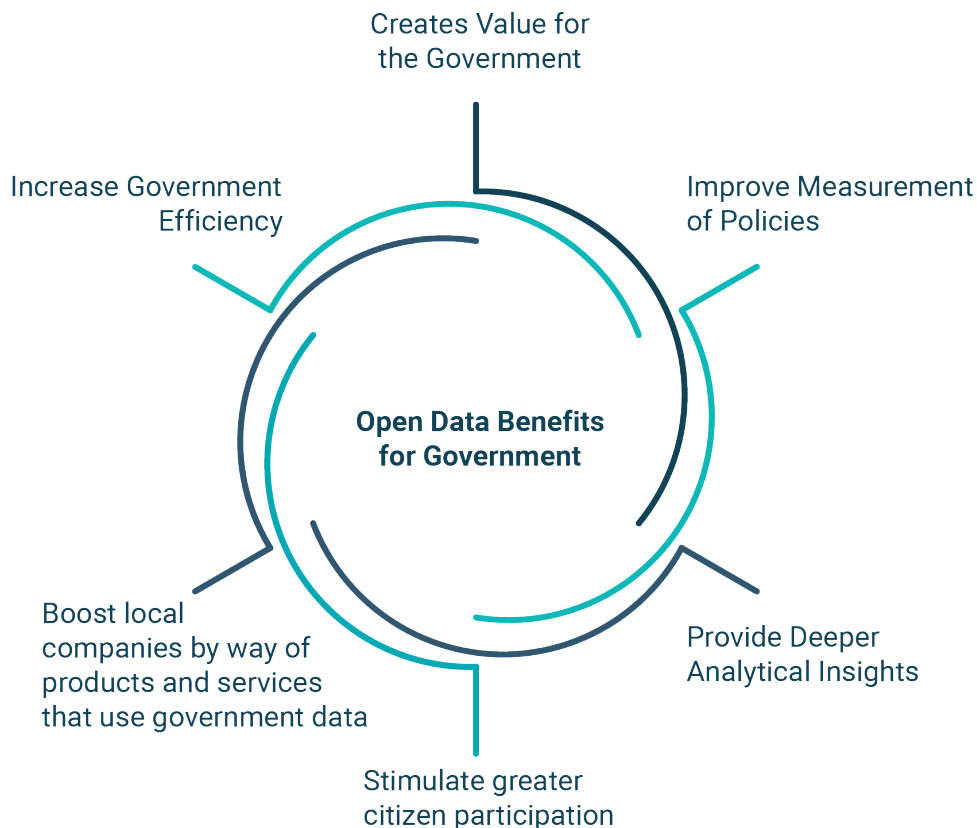
Open data creates value for the government; it can improve measurement of policies, increase government efficiency, provide deeper analytical insights, stimulate greater citizen participation, and boost local companies by way of products and services that use government data. In recent years, many national governments have implemented open data initiatives. Data quality, in turn, improves when data are well documented and open to public review.

A benefit for an NSO is that open data initiatives can provide incentives for improvement, including modernisation of statistical systems, upgraded IT infrastructure, and more responsive user services. By better responding to demand and improving the efficiency of the supply side, NSOs can reach a larger audience and raise their profile and influence, which can, in turn, help with resource mobilization to improve statistical systems. But moving to an open data model may remove a revenue stream that previously supported data production or dissemination.

The adoption rate of open data principles varies from NSO to NSO according to each country's culture and political climate. Reluctance to open public data sources can be due to concerns about data quality, costs, privacy and information technology capacity.

(!) Links to guidelines, best practices and examples:

- PARIS21 NSDS guidelines on open data (🔗).
- World Bank open data toolkit (🔗).

10.10 Moving to a modernised distributed digital system

The development of a modern distributed digital statistical information system and data dissemination platform as a basis for digital outputs is a major transformation project for an NSO. A project of this scale would need to be implemented in gradual phases and not be carried out in isolation. An NSO should not act alone but engage with other NSOs to reuse existing software solutions as far as possible. The project should follow the principles of the Common Statistical Production Architecture (CSPA) framework (see *Chapter 14.2.12 — Common Statistical Production Architecture (CSPA)*).

(!) Links to guidelines, best practices and examples:

- Strategy for information and dissemination (🔗) developments in the statistical office of the Republic of Serbia.

10.11 Statistical literacy

Statistical literacy is the ability to understand and reason with statistical data. It applies to all age groups and categories of society to better understand data presented to them in its various forms in daily life and, consequently, allow them to make better evidence-based and informed decisions. An NSO can play a major role in improving statistical literacy for the public benefit and ensuring that the value of statistical outputs is maximised.

NSOs use different strategies to improve statistical literacy in different target groups. Strategies such as improving the accessibility to statistics via easy-to-use, well-designed and understandable websites. Strategic questions that are relevant to the chief statistician include:

- What is the role of NSOs in developing numeracy and statistical literacy in society?

- Why is it important/crucial for the existence of official statistics?

- How much resources should be put on promoting statistical literacy?

- What innovative methods can be used to improve statistical literacy?

The *UNECE 'Making data meaningful handbook Part 4* (🔗) lists the following target groups for improving statistical literacy:

- **Opinion leaders** (the media, politicians, NGOs, academia): web-based tools tailored for specific key users; targeted training courses.

- **Decision-makers** (elected officials, government policymakers): web-based tools tailored for specific key users; targeted training courses; newsletters; social media; educational presentations.

- **The education community**: influencing the curriculum; provide educational material for teachers; web-based educational resources for children.

- **Respondents, businesses and the general public**: easily findable, accessible and clear data; animated stories, data displays and visualisations; educational website sections to explain statistics; social media.

- **Within statistical organizations**: structured development programmes for staff; training courses; educational leave; training by retirees.

(!) Links to guidelines, best practices and examples:

- The International Statistical Literacy Project ([ISLP](#)).

10.12 Skills needed by an NSO for dissemination and communication

Developing comprehensive communication strategies is a new approach for many NSOs and it is a challenge to build expertise in this area. This may require training staff across NSOs and the development of a network of professional communication experts.

A typical communication team would combine skills in dissemination, infographics and graphic design. Other skills include developing and maintaining communication tools such as videos, social media, blogs, data visualisations, and infographics/motion graphics. The communication team should be able to correspond on high-level issues,

organize events and product launches, run NSO social media accounts, manage the web site and other digital spaces, and finally assess the impact of NSO's communication initiatives. With the huge increase in social media use and its importance as a communication tool, it is becoming common practice for NSOs to recruit communication staff who specialise in the use of social media.