Collaborative on Administrative Data

United Nations | DESA Statistics Division

Quality of statistics and quality management

Photo by Markus Spiske, unsplash

Why do we care about the quality of official statistics?

International standards and statistical quality

To assure the users that statistics are **reliable**, can be **trusted** at the national level, and **can be compared** across countries.

The challenges posed by the enlarged data ecosystem and the 2030 Agenda for Sustainable Development (and threats like fake news) led to the development of quality guidelines by a UN group in 2012.

The official quality definition among statisticians

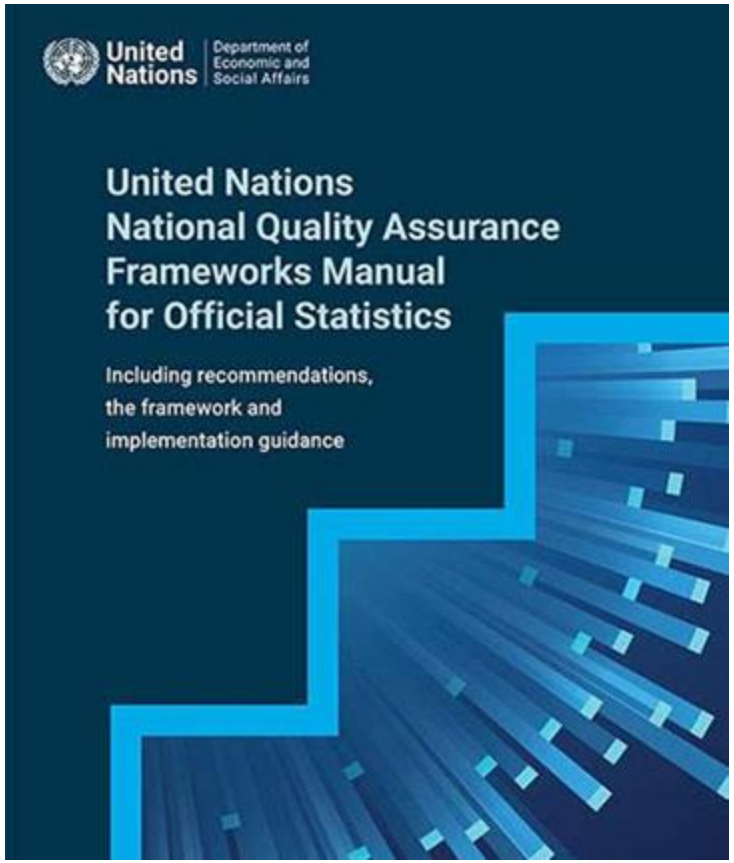
The simple definition of quality is “**fit for use**” or “**fit for purpose**”.

The concept of “quality of statistical information” is **multidimensional**, and there is **no one single measure of quality.**

For a statistical product, the general definition of quality is operationalized by specifying **a set of factors or dimensions** that characterize it: relevance; accuracy and reliability; timeliness and punctuality; accessibility and clarity; and coherence and comparability.

The dimensions of quality are **interrelated**, and there are **trade-offs** between some of them.

International Guidelines



- UN National Quality Assurance Framework first adopted in 2012
  - Updated in 2019
- European Statistical System developed Quality Assurance Framework of the European Statistical System
  - Latest update 2019
- Additionally, several sector and region-specific guidelines exist (for example: IMF)

NQAF Quality Dimensions

Relevance: the extent to which the statistics satisfy the needs of the users.

Accuracy : the closeness of estimates to the exact or true values that the statistics were intended to measure.

Reliability : the closeness of the initially estimated value(s) to the subsequent estimated value(s) if preliminary figures are disseminated.

Timeliness : the length of time between the end of a reference period (or date) and the dissemination of the statistics.

Punctuality: the time lag between the release date and the target date by which the data or statistics should have been delivered.

Accessibility: the ease and conditions with which statistical information can be obtained.

Clarity: the availability of appropriate documentation relating to the statistics and the additional assistance that producers make available to users.

Coherence: the ability to reliably combine statistics and data sets in different ways and for various uses. Consistency is often used as a synonym for coherence.

Comparability: the extent to which differences in statistics from different geographical areas, non-geographical domains, or over time, can be attributed to differences between the true values of the statistics.

In practice...

Countries take the recommendations from the NQAF and develop their own national quality assurance framework tailored to the national needs.

Benefits of a National Quality Assurance Framework

It provides a generic model for **the members of the NSS** to adopt, develop or revisit their own quality assurance framework

It offers a mechanism for the systematic monitoring and ongoing identification of risks and quality issues across the NSS to develop timely corrective measures, supporting quality improvements and their maintenance over time

It supports NSS coordination by providing common guidance on quality assurance and reference materials for training

It gives greater transparency to data production processes and reinforces the credibility of statistics producers and coordinating agencies within the NSS.

It serves as a common ground to promote dialogue on quality challenges and opportunities at the national, regional and international levels.

It provides a basis for creating and maintaining a culture of quality within the NSS.

Question

How is a focus on statistical quality beneficial for you?

Benefits – our take on it

Systematic quality assurance is enhancing the relevance, consistency and comparability of official statistics – both nationally and internationally.

Unified guidelines are good to have both as a producer and also as a user of official statistics, to have a clear and unified framework to use for orientation.

However, in the end, "**good quality**" is the statistical product being "**fit for purpose**". What it takes for it to be that, needs to be decided together by the **user** and **producer,** ideally following the set of unified guidelines.

Discussion

Who defines quality?

The users!

Quality is defined by user needs

Users' needs define what "good quality" means.

Statistics can be of good quality according to user A's perspective because the needs are met, while user B thinks of it as bad quality because they are not.

Different users often have different needs.
These must be balanced against each other to the best quality for most users.

Tailor the quality management to your situation and needs

The **first step** in any quality assessment is **deciding what quality looks like for your scenario**. What does the data need to do and have to cover the needs identified?

To know that you need to have a good understanding of **who** your users are and **what** they need.

Knowing what high quality is to you and your user, you should also factor in the **time and information** you have, as well as any **costs** associated with conducting assessments or improving aspects of quality.

With all the resources available and the needs that are there, what is **the best product** that can be produced?

Example

COVID-19 statistics early on during the pandemic

- Policy-makers needed fast information on number of infections, ideally for smaller than national geographic areas.
- Quality in this case: Timeliness was more important than complete accuracy.

What's different when assessing quality of administrative data?

Administrative data differs from a survey…

- Administrative data is not recorded/collected with statistics in mind
- The statistics producer is often not in control of the collection and potentially some processing of the source data
- Classifications, concepts and definitions might vary from the ones used in statistics
- When producing statistics from admin data you do not design the questions or sample – instead you receive a dataset and need to work from there
- What is collected might not exactly match the variables needed for statistics production
- Quality of data might not be strongly in focus/ no system in place to assess it

Challenges in using admin data for statistics

- Variables can be missing, and the data can be incomplete. This can affect quality as can the treatment of the missing items and units.
- Administrative data is in theory a complete set of data on those population units. However, there can be coverage issues with both under- and over-reporting, systematic or not.
- Absent or incomplete metadata can make it difficult to understand the data for statistical production
- The data holder typically has a different focus from the statistical producer.

Challenges (continued)

Lack of timestamps/ updating of timestamps can make it hard to know when data is from

Inconsistent entry and collection methods can make it hard to combine data/impact accuracy

Population units are not always linked to a unique identifier, or the data includes only aggregate data. This makes linking complicated

There needs to be dialogue between the owner of the administrative data and the statistics producer to prevent data breaks/ errors

Sources of errors during the admin data lifecycle

CREATION ERRORS

Data capture

Data can be captured on paper and/or electronically; by a government official or individual interacting with Government.

01

Population

The population can be over- or under-represented.

DATA MANIPULATION/PROCESSING ERRORS

Data verification and editing

The data owner or NSO verify the data and modify as needed. Missing values are imputed.

03

02

Data transfer

Data is transferred from one administrative unit to another or from paper into electronic media.

04

Data exchange

Data is exchanged between different MDAs/entities.

ANALYSIS AND REPORTING ERRORS

05

Analysis and reporting

The data owner or NSO verify the data and modify as needed. Missing values are imputed.

So how do these factors affect quality management?

Communication between all stakeholders is key to:

- Understanding the data and data flow.
- Learning about each other's needs and constraints.
- Harmonizing concepts and definitions.
- Remaining aware of changes in collection and processing that can affect the data.

Quality dimensions when working with administrative data

Accuracy
the closeness of estimates to the exact or true values that the statistics were intended to measure.

Reliability
the closeness of the initially estimated value(s) to the subsequent estimated value(s) if preliminary figures are disseminated.

Relevance
the extent to which the statistics satisfy the needs of the users.

Clarity
the availability of appropriate documentation relating to the statistics and the additional assistance that producers make available to users.

Coherence
the ability to reliably combine statistics and data sets in different ways and for various uses. **Consistency** is often used as a synonym for coherence.

Comparability
the extent to which differences in statistics from different geographical areas, non-geographical domains, or over time, can be attributed to differences between the true values of the statistics.

Timeliness
the length of time between the end of a reference period (or date) and the dissemination of the statistics.

Punctuality
the time lag between the release date and the target date by which the data or statistics should have been delivered.

Accessibility
the ease and conditions with which statistical information can be obtained.

Proposed additions

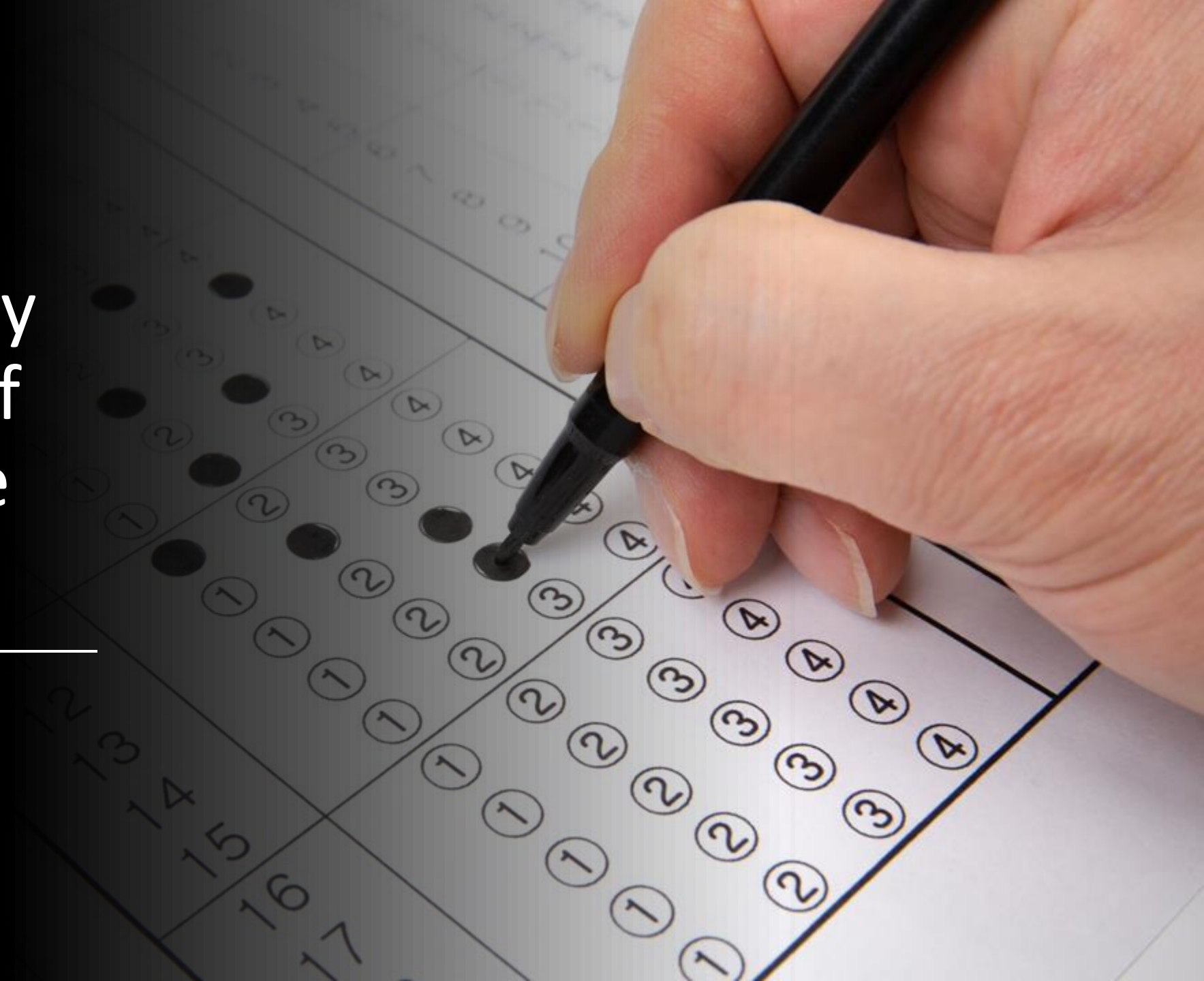
Unique ID
refers to whether the data can be tracked back to an individual population unit.

Completeness
refers to the degree to which a data source includes the data needed to describe what is wanted by the user of the statistical product.

Validity
the extent to which data conforms to the expected format, type, and range e.g. dates are written in a certain format.

Questions?

Steps in quality assessment of administrative data



Steps

1. Background information on the source
2. Institutional arrangements
3. Input/source data quality
4. Data quality during processing
5. Quality of the final output

Understanding the data source

- Background on the source
- Institutional arrangements
- Input/source data quality
- Data quality during processing
- Quality of the final output

Getting to know the source

This is the very first step in assessing the quality of a potential source

It is a first gathering of basic information about the source and understanding why the data is reported and collected in the first place.

Questions to look at could be:

- What is the purpose of the data collection?
- How often is it being collected?
- Is it collected at individual level?

Does the institutional environment support the quality?

- Background on the source
- Institutional arrangements
- Input/source data quality
- Data quality during processing
- Quality of the final output

What are the institutional arrangements like?

- Working with administrative data typically involves more than one institution and potentially sensitive data.
- This is why it's important to have clarified t**he legal situation** and have agreements in place between the institutions involved to ensure the regular transfer of data
- These should address issues of **confidentiality** and **data security.**
- Lastly, and this is not specific to administrative data, there need to be **enough qualified staff** to ensure the work can be completed.

Assessing the quality of the source

- Background on the source
- Institutional arrangements
- Input/source data quality
  - Why is it collected?
  - Where does it go from there?
- Data quality during processing
- Quality of the final output

Quality of input (source) data

The quality of an administrative data source is crucial for the overall quality of a statistical product.

This is under the control of the Ministry, Department or Agency collecting and managing the data.

So it's you in the MDAs that can check and improve the data.

Ideally, this happens in a standardised way and in dialogue with the NSO, who can support with statistical analysis of the data.

Questions to look at together when assessing input data quality

Why is the data collected? What is its purpose?

Where does the data go from its first point of collection?

What data processing is happening? e.g., aggregation, transfer from paper to electronic, etc.

Where could errors arise?

Have you performed statistical analysis to learn more about the data and find potential patterns that may impact data quality?

The rest of the data journey

- After being collected in the ministry, department or agency (MDA), administrative data typically undergoes a few steps before becoming a statistical output.
- Depending on the country and thematic area, this happens at the MDA or in the NSO.
- To become a statistical product, the admin data is being processed and then the statistical output is published. This is probably very relevant for you as well as you might be a user of the final statistical product too – or your colleagues in a different part of the ministry.

Quality during processing

- Background on the source
- Institutional arrangements
- Input/source data quality

- Data quality during processing
  - Which processing does the data undergo?
  - How can the processing impact the overall quality?
  - Is the data being checked for errors using statistical methods?

- Quality of the final output

Quality of the data processing and checking of documentation

During data processing, errors in the data can be detected and if possible corrected, and concepts and definitions are aligned

More specific questions could be:

- Are quality controls carried out on the coverage of the data? Which?
- Could there be bias in the data (systematic over/under-representation)?
- Are there rules for invalid and missing data and procedures to check?
- Are concepts and definitions aligned, how is that done and documented?

A chance for better data quality in the future

When different actors in the data value chain work together there is a greater chance to improve the quality of the original data.

The improvement process is a continuous feedback loop or circle.

Even if statistics are being produced in a ministry, the NSO can be included to share their methodological expertise.

The process of quality improvement benefits all actors involved and the users as well.

Output quality

- Background on the source
- Institutional arrangements
- Input/source data quality
- Data quality during processing

- Quality of the final output
  - Does the statistical product meet the user (could be your!) needs?
  - Is it presented in a transparent and accessible way?

Does the final product match what users need?

- As we have learned, quality in statistics means "fit for purpose." So, regularly consulting the users about their needs and feedback is essential to evaluate quality – and whether needs have changed.
- Quality assessment starts and ends with the users – ideally the process is a loop of continuous feedback and improvement.

Is the statistical product accessible and easy to understand?

- In addition to meeting the needs of users, the statistics should be presented in a way that is **easy for users to understand**.
- Statistics and metadata (Information on the statistics and its production) should be **easy for users to access.**

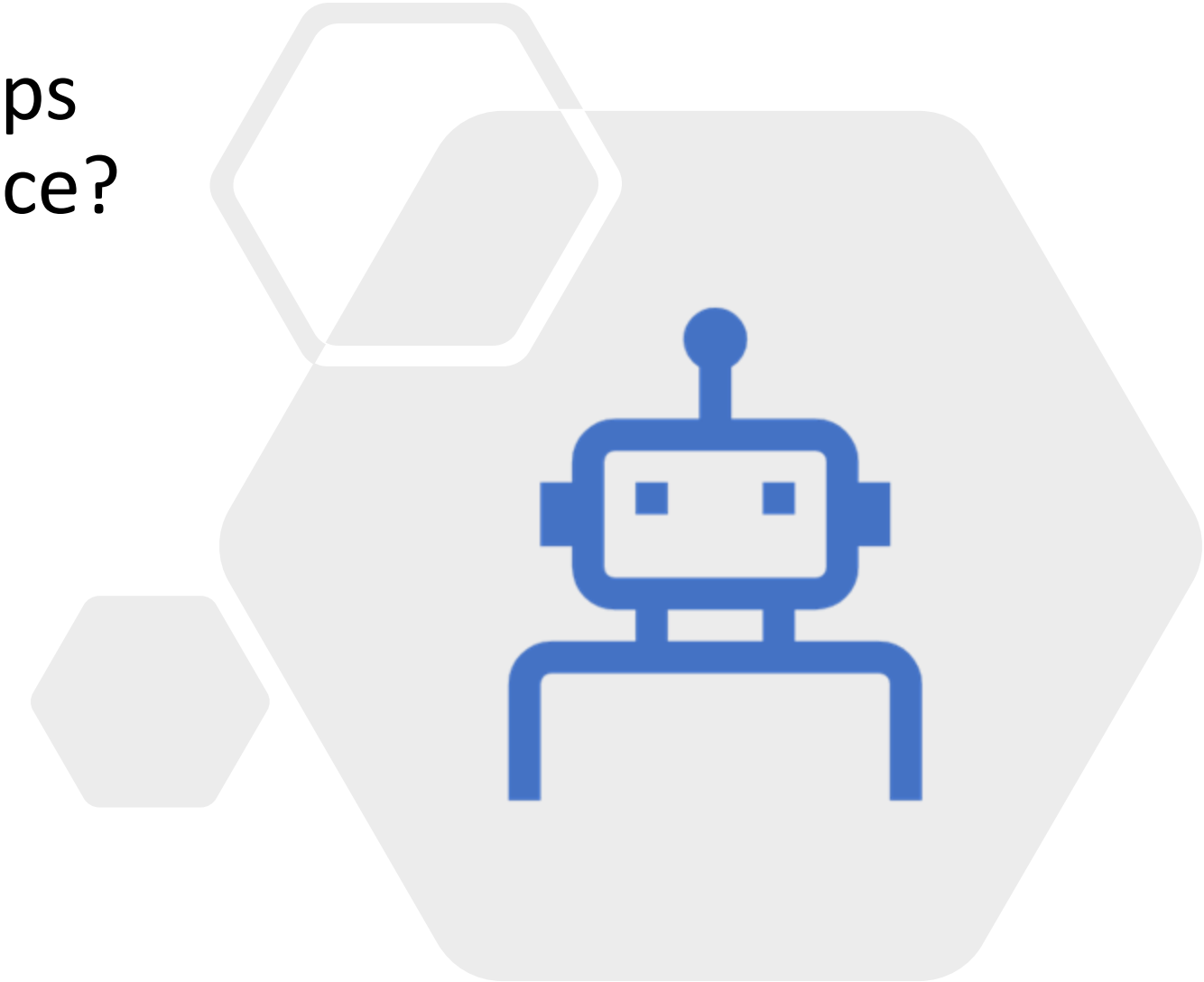
Values in data quality assessment and assurance

- **Honesty**: Adherence to the facts, refusing to deceive others or oneself in any way.
- **Openness**: Willingness to engage with others and to hear and consider different opinions.
- **Courage**: Self-confidence and moral strength to relentlessly expose any type of organizational dysfunction and to learn from failure.
- **Respect**: Recognition and appreciation of the intrinsic worth of the opinions and contributions of every stakeholder.
- **Focus**: Continuous effort to avoid low-value distractions and direct attention and energy to what matters most.
- **Trust**: Reliance on the good faith, truthfulness, knowledge and skills of team members.
- **Empowerment**: Ability of self-organizing teams to ask and answer their own questions and to define for themselves how to do the work necessary to meet project goals.
- **Collaboration**: Capacity of team members to effectively cooperate and assist each other in achieving a common goal.

The assessment questionnaire

And how would the steps discussed look in practice?

Let’s try it out! You can test the beta version of the toolkit and share your feedback!



Questionnaire for Assessing the Quality of Administrative Data

- What is it?
  - A workbook for assessing the quality of administrative data sources.
  - The CAD's existing Quality Assessment Toolkit (created by the CAD based on requests from members) – updated to include considerations from the NQAF sub-group on administrative data.
- How has it been revised?
  - A hearing took place and a large number of countries provided feedback which is now integrated into a final "beta" structure.
  - The existing CAD questionnaire (part of set of quality assessment tools published in) has undergone updates and adjustments to simplify after country testing and be more aligned with the NQAF admin data module.

Date of quality assessment:	
Name of publication/s, if specific for this assessment:	
Name of the administrative data source:	
Name of data holder and contact details:	
Short description of the administrative data source including its purpose, variables, mode of collection:	

Instructions | Basic information | Preconditions | Confidentiality, data security | Input data quality | Statistical needs + data select | Cooperation with data providers

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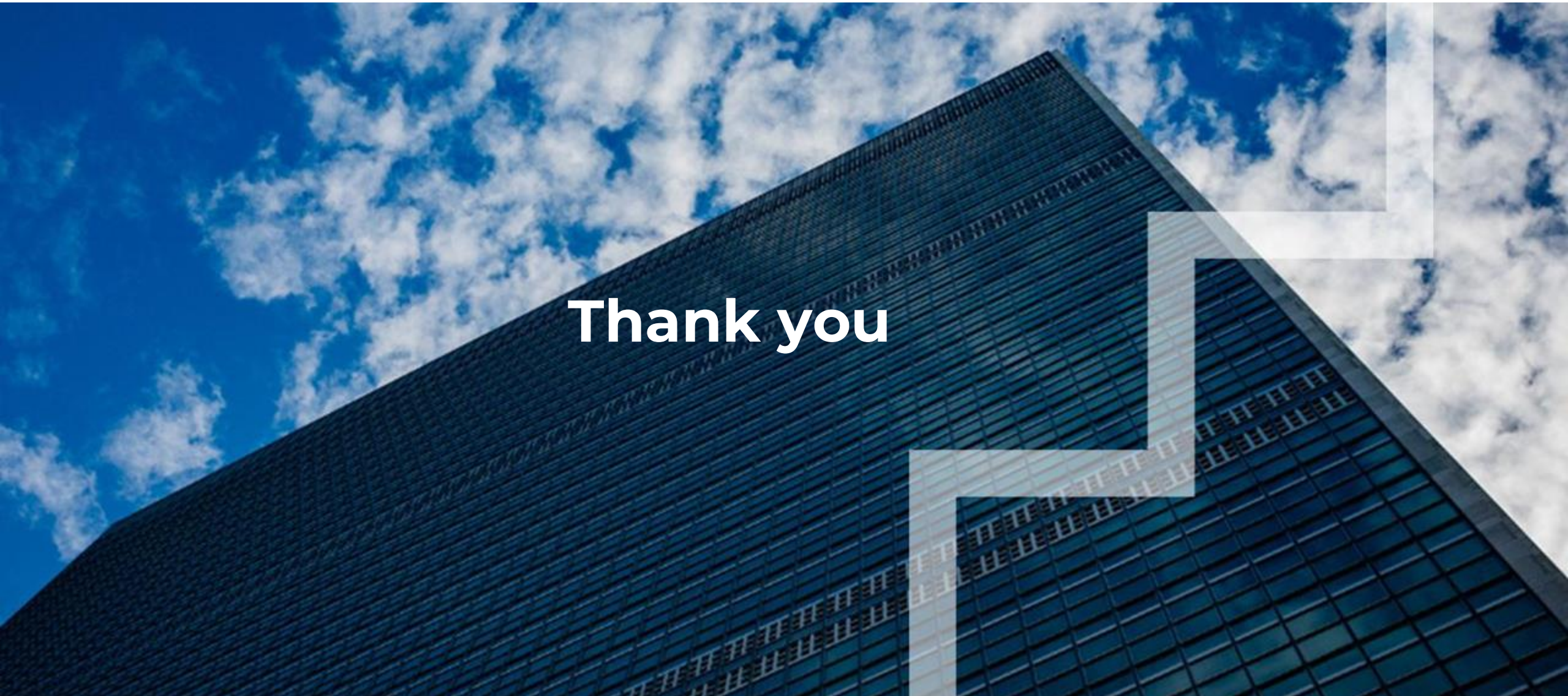
on Administrative Data



Thank you