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Quality monitoring system for the European statistical business registers

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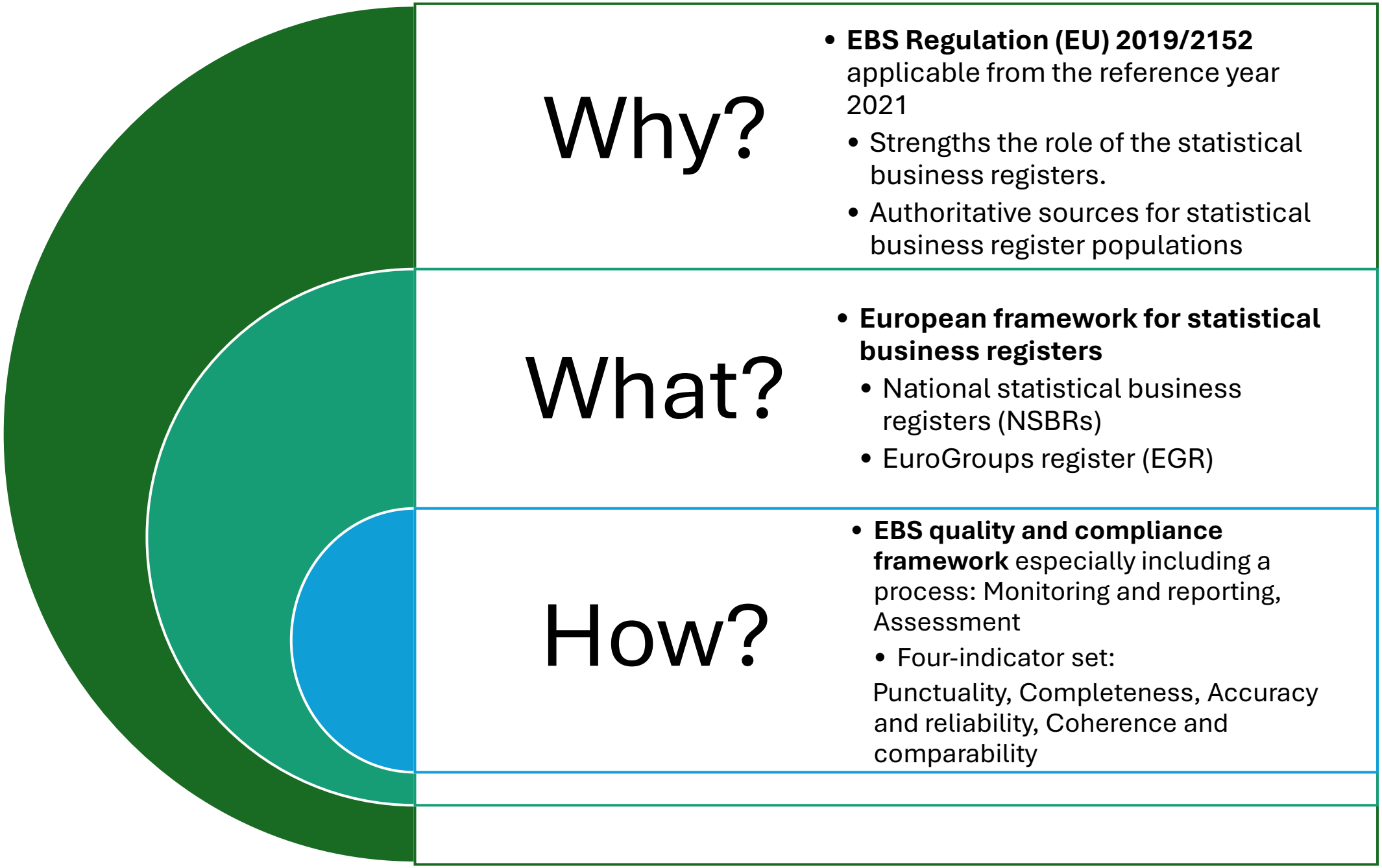
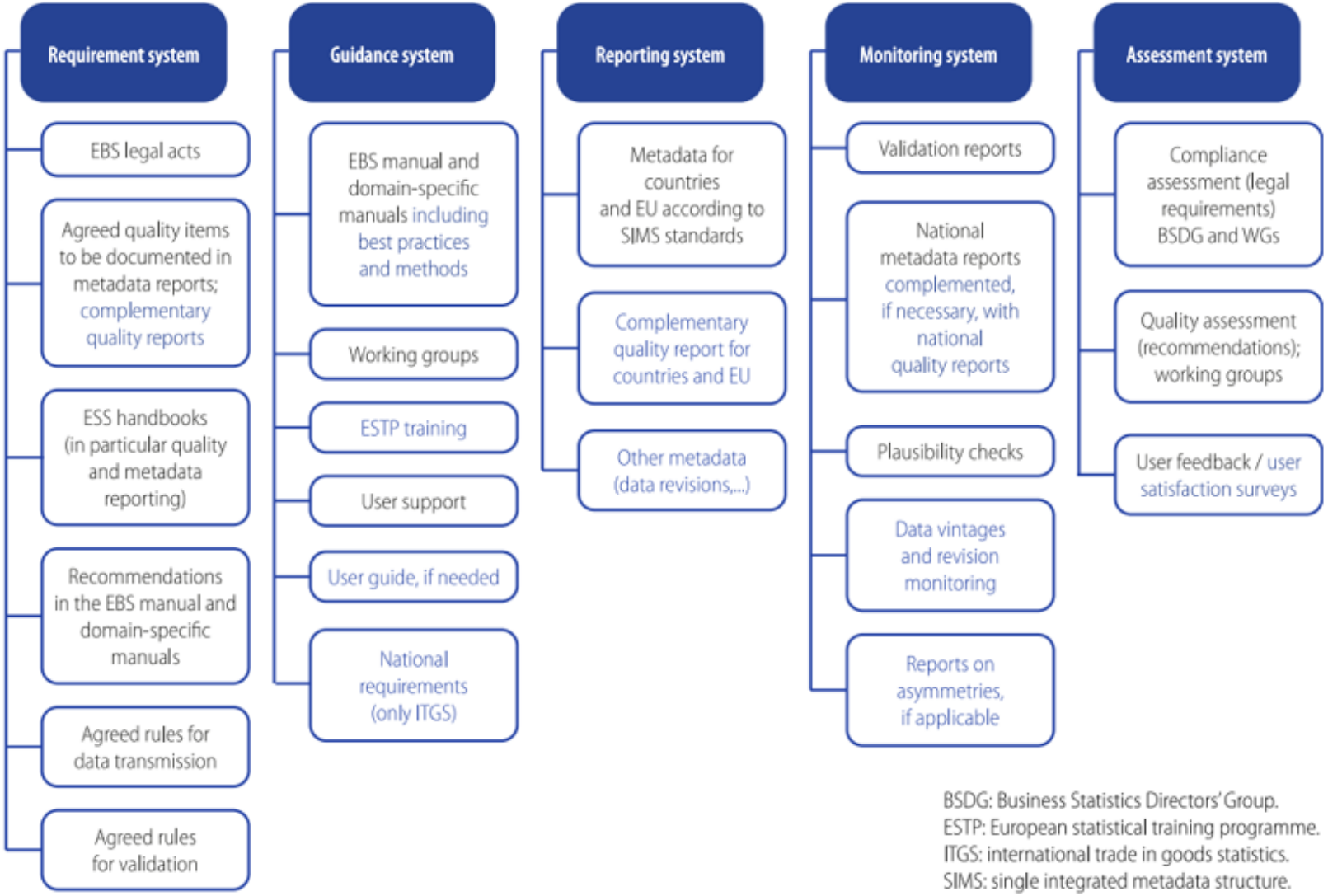

Why?
• **EBS Regulation (EU) 2019/2152** applicable from the reference year 2021
• Strengths the role of the statistical business registers.
• Authoritative sources for statistical business register populations
What?
• **European framework for statistical business registers**
• National statistical business registers (NSBRs)
• EuroGroups register (EGR)
How?
• **EBS quality and compliance framework** especially including a process: Monitoring and reporting, Assessment
• Four-indicator set:
Punctuality, Completeness, Accuracy and reliability, Coherence and comparability

EBS quality and compliance framework

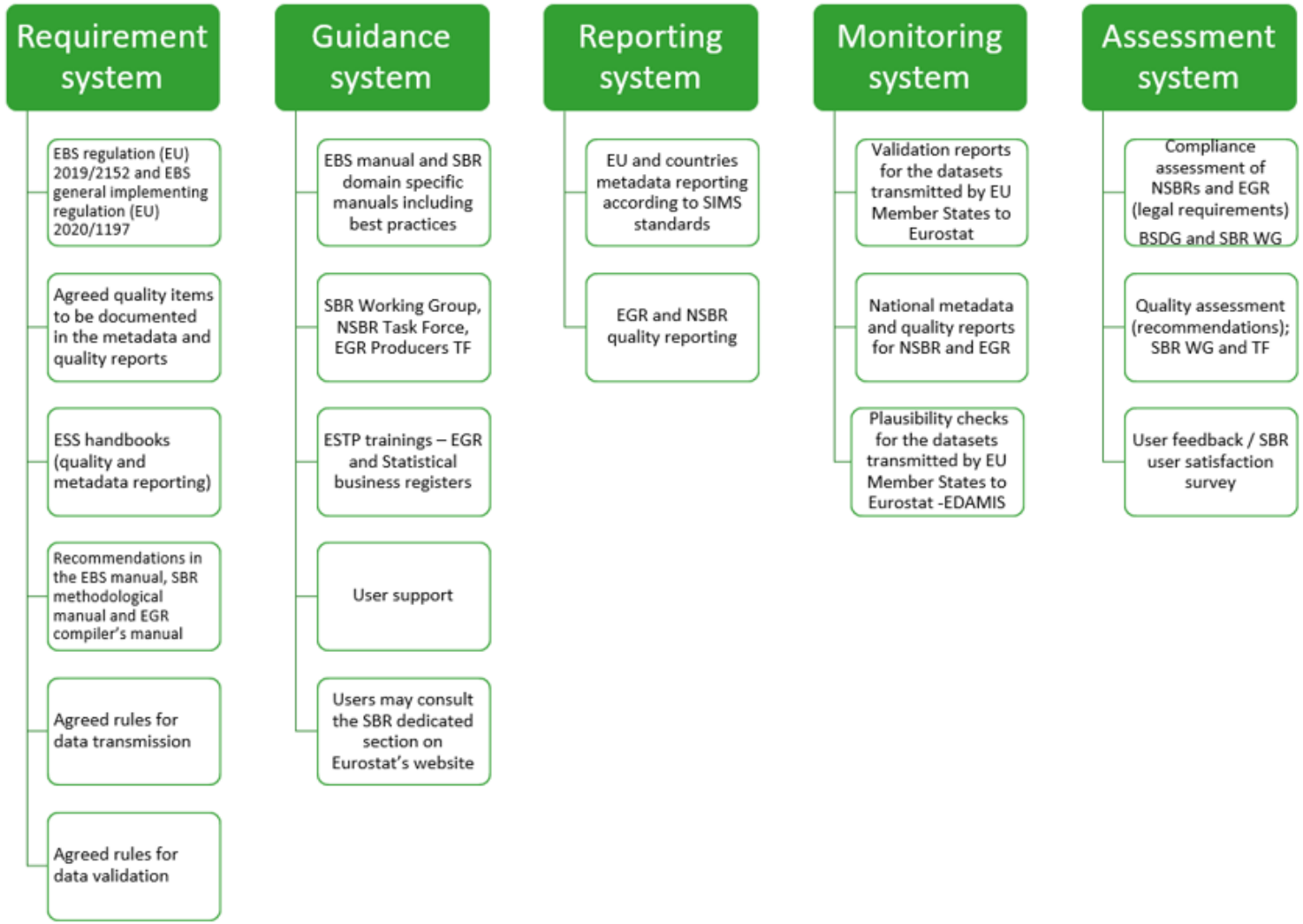
- A harmonized quality and compliance framework for all statistics produced under the EBS Regulation.
- Follows the principles set out in the *European statistics code of practice* and in the *Quality assurance framework of the European statistical system*



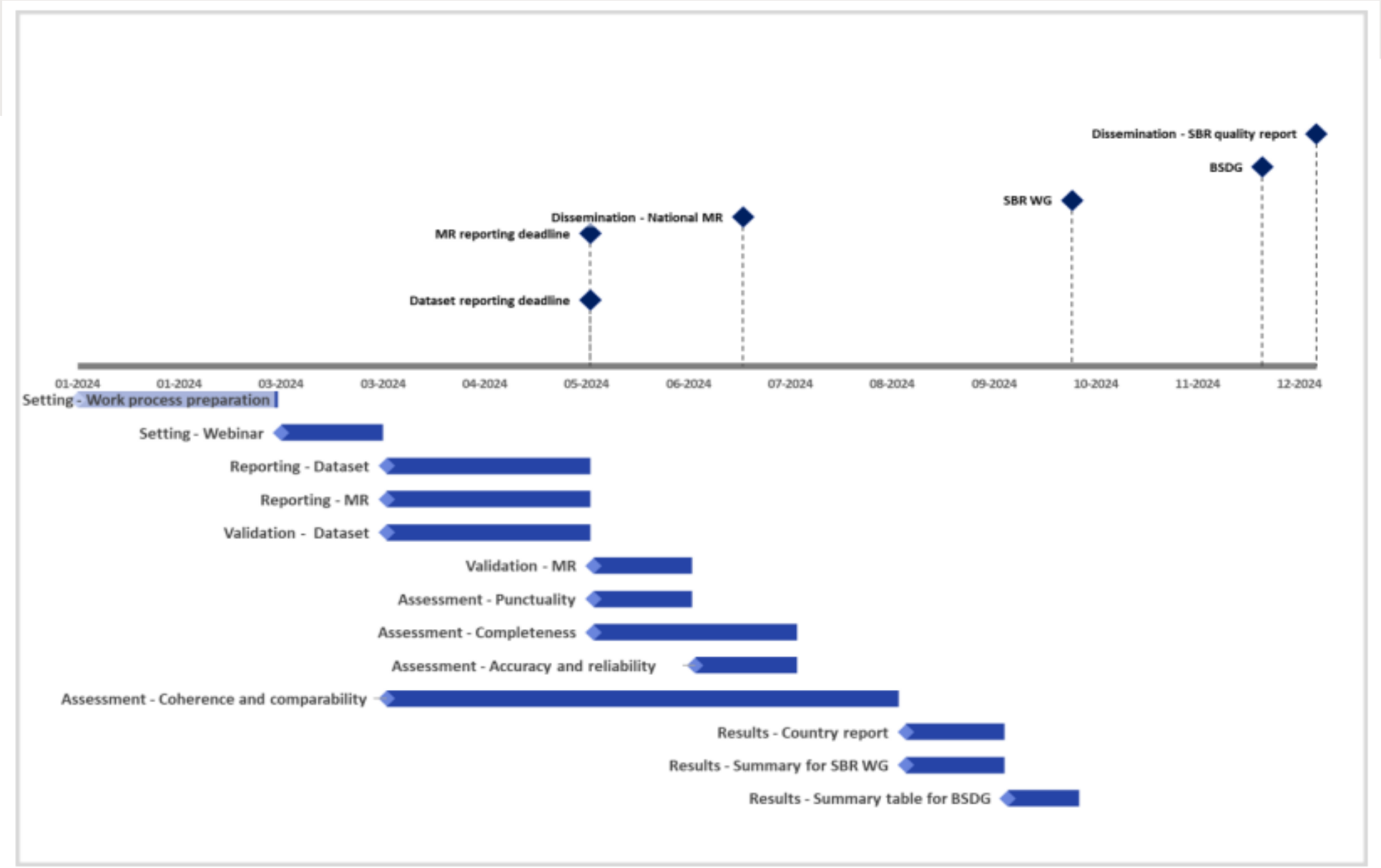
BSDG: Business Statistics Directors' Group.
ESTP: European statistical training programme.
ITGS: international trade in goods statistics.
SIMS: single integrated metadata structure.

European statistical business registers quality and compliance framework

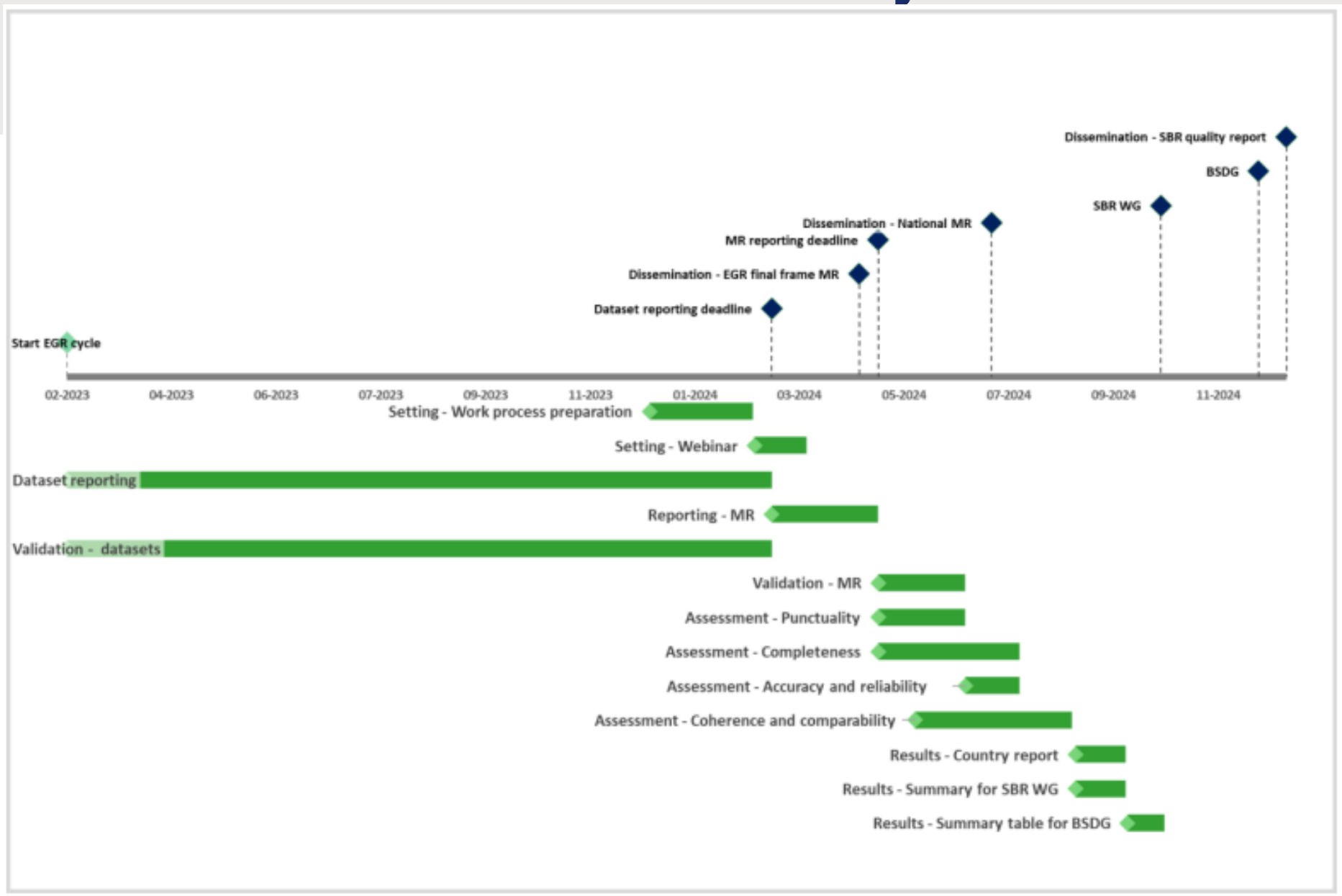
- **Systems** aligned with the EBS quality framework
- **Setting**
  - Requirements
  - Guidance
- **Process**
  - Monitoring
  - Reporting
  - Assessment



Quality and compliance process timeline for the national statistical business registers

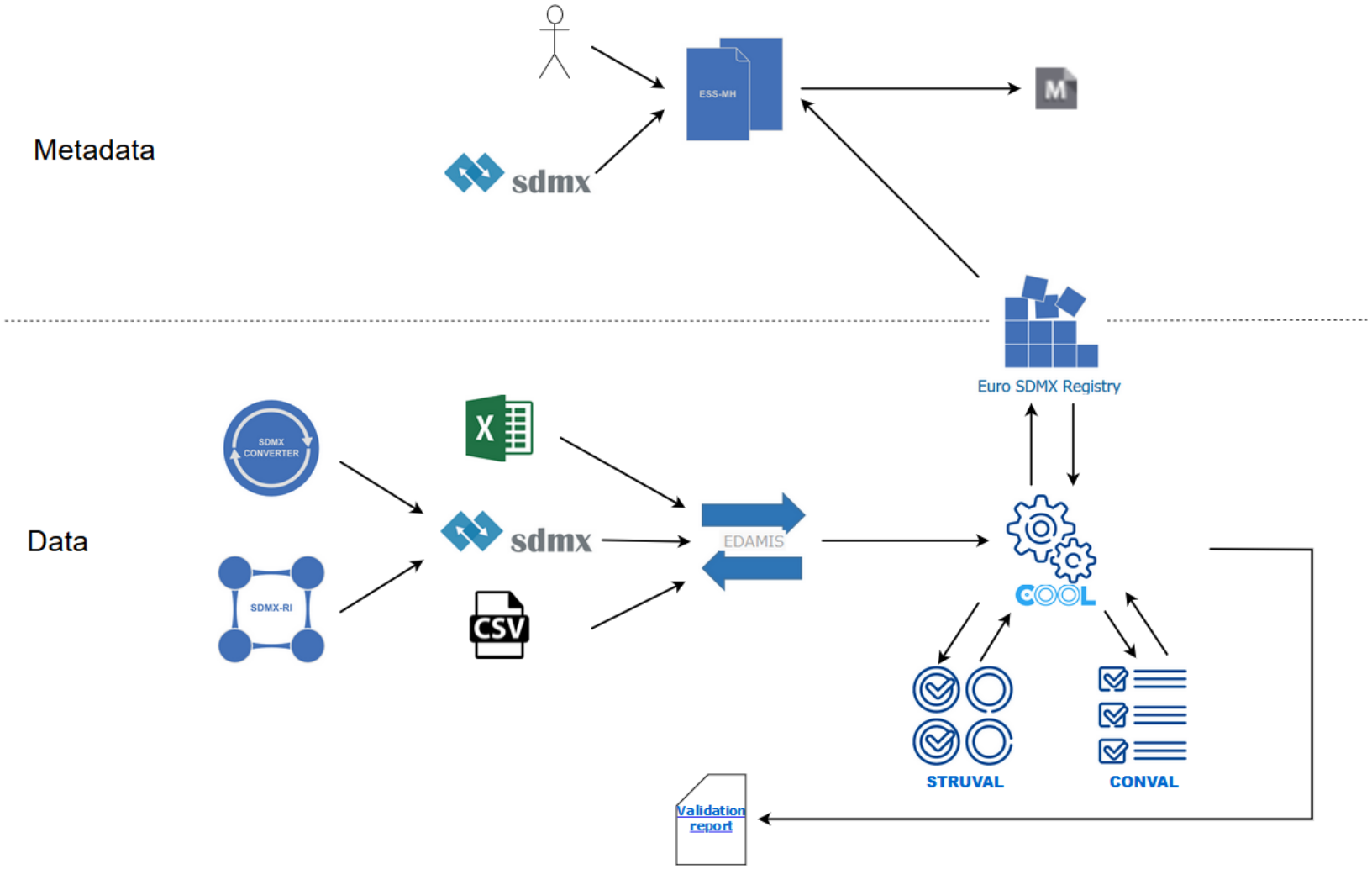


Quality and compliance process timeline of the data transmitted for EGR by NSIs



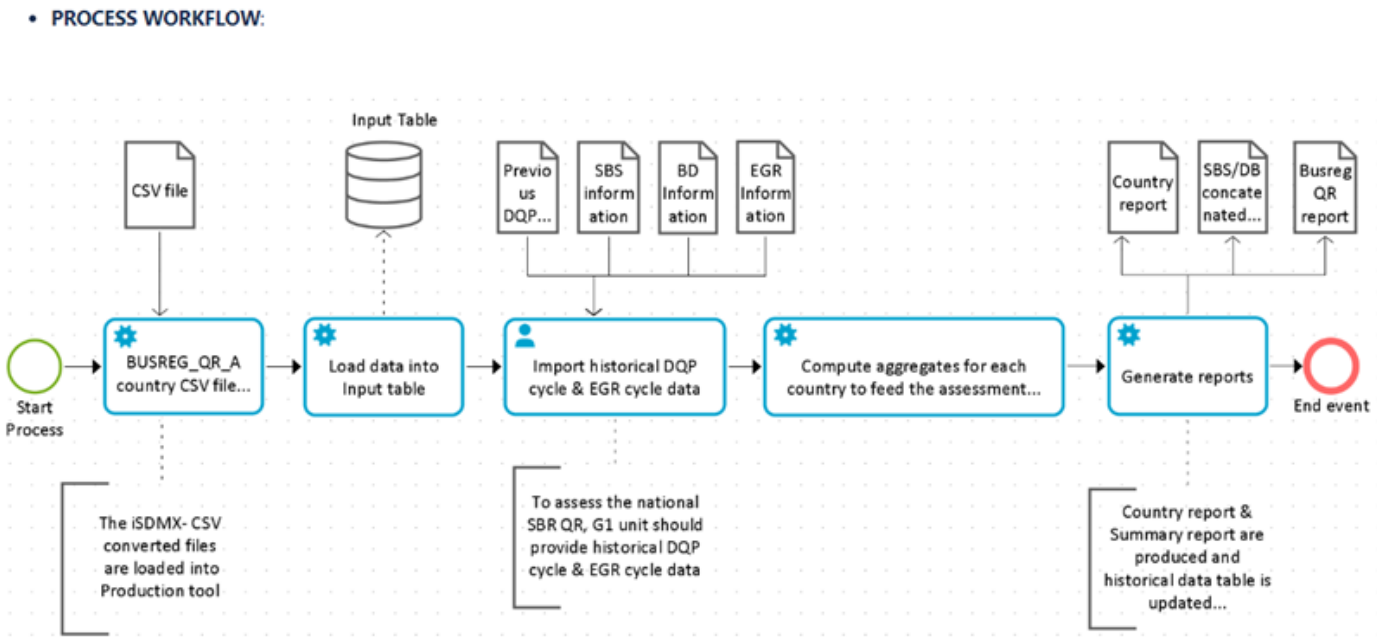
Reporting and monitoring

- Dataset transmissions, NSIs use SDMX format and EDAMIS secure channel, and accompany them by metadata according to SIMS
- Automated validation system
  - dataset structure validation (STRUVAL) and
  - the content validation (CONVAL).
- Metadata transmitted via ESS Metadata Handler



Assessment process workflow – NSBR example

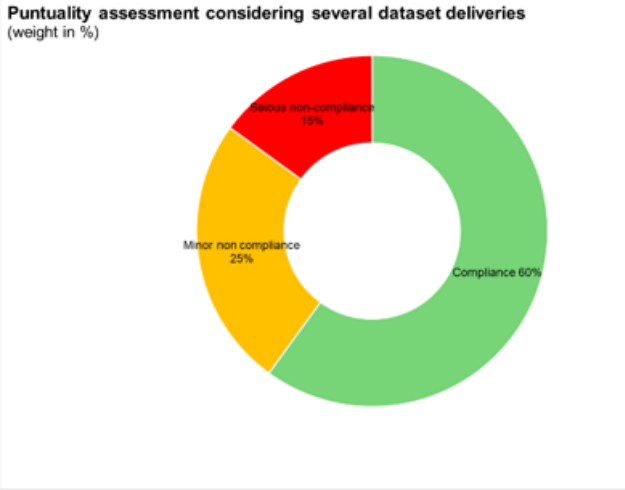
- Eurostat assesses the EBS compliance and quality of European SBRs based on the metadata and datasets received from the NSIs
- Automation of the assessment process for the NSBRs was introduced by Eurostat in 2023
- Validated datasets are loaded in the production system (SAS) that computes the four quality dimensions in an automized way and creates the national assessment reports
- Detailed assessment reports are sent to the national statistical business register coordinators
- The results of the compliance assessment are reported to the statistical business registers (SBR) working group and to the Business statistics directors' group (BSDG) at their annual meetings.
- Concerning the compliance and quality assessment of the data transmitted by the NSIs to the EGR an automation was initiated in 2023 and will need further development.



Quality dimensions

- **4 quality dimensions** considered for the quality and compliance assessment to the EBS regulation for the business and trade statistics domains:
  - *punctuality, completeness, accuracy and reliability, coherence and comparability*
- The classification includes **four classes**:
  - *(i) compliance, (ii) minor non-compliance, (iii) serious non-compliance and (iv) serious and persistent non-compliance*
- **Punctuality** indicator measures the delay between the data delivery date and the target date
- **Completeness** measures, in percentage from 0% to 100%, the availability of each of the mandatory, conditional, and optional variable in the datasets provided by the NSIs, according to the EBS Regulation requirements

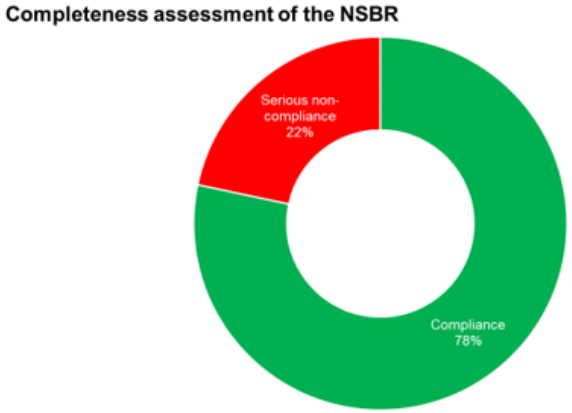
Completeness indicator: C = ∑ (availability of variable) / (Total number of variables)



In this example a dataflow includes 6 datasets to be delivered. The settings are as followed:

Dataset	weight	Days of delay	Assessment
Dataset N°1	30%	0	Compliance
Dataset N°2	20%	0	Compliance
Dataset N°3	10%	6	Minor non compliance
Dataset N°4	5%	5	Minor non compliance
Dataset N°5	15%	10	Seious non-compliance
Dataset N°6	20%	0	Compliance

The overall punctuality assessment considers that 60% of the dataflow comply with the punctuality request, 25% show minor non-compliance and 15% serious non-compliance.

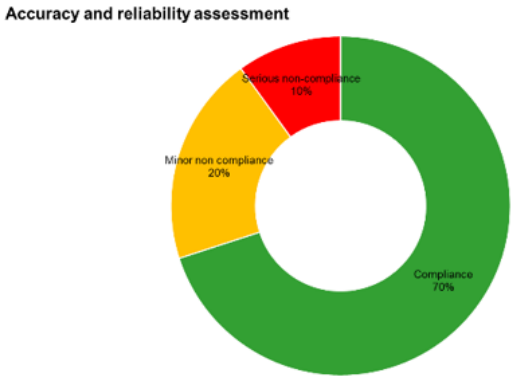


In this example, a NSBR includes 2 types of units, each of them having 3 recorded variables. 78% of the variable are available so comply but 22% are missing which is considered as serious non-compliance.

Unit	Variables	Availability
Legal unit	ID number	100%
	Name	90%
	Date of incorporation	30%
Enterprise	ID number	100%
	Name	90%
	NACE code 4-digits	60%
Indicator	**Value**	**Status**
Completenes	78%	Compliance
Missing	22%	Serious non-compliance

Quality dimensions

- **Accuracy and reliability** indicator is measured by a binary variable (Y/N) based on the information provided by the national statistical institutes in the metadata reports under this quality dimension.
  - Improving accuracy and reliability indicator by adding user survey and distribution comparisons
- **Coherence and comparability** measures the difference between the data transmitted by NSIs on NSBRs and other business statistics domains (cross-domain coherence) or between data sent in previous years (coherence over the time).
  - NSBR and SBS: indicator measures the difference between NSBRs and SBS figures in terms of employment
  - NSBR and BD: indicator measures the difference between number of enterprises and number of legal units reported in NSBR and in business demography
  - NSBR and EGR final frame: indicator measures the difference of number of multinational enterprise groups (MNEs) in NSBR and EGR.



In this example, the Accuracy and reliability considers 3 components as followed.

Accuracy components	Indicator	Assessment	weight
Metadata	Yes	Compliance	70%
EU SBR survey - %good+very good	60%	Minor non compliance	20%
Chi-square test Distribution identical SBR/SBS	N	Serious non-compliance	10%

Note: Depending on dependency hypothesis one may use either

Chi-square test statistic

$\chi^2 = \Sigma (O - E)^2 / E$

Where O = the observed frequency for each category E = the expected frequency for each category or

McNemar test statistic

$\chi^2 = (|b-c|-1)^2 / (b+c)$

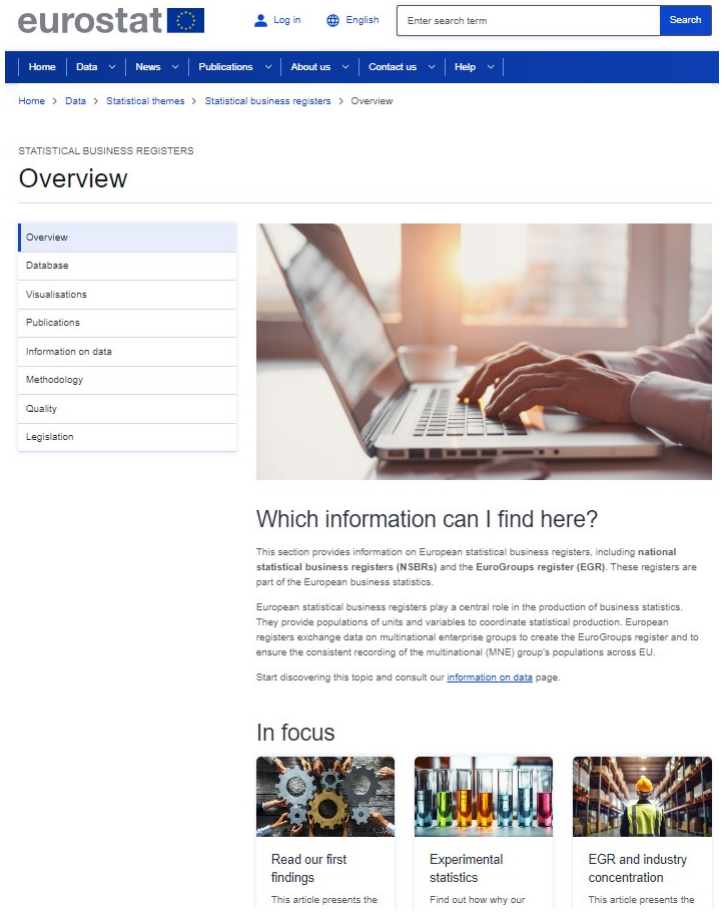
, with b = the number of discordant pairs c = the number of concordant pairs

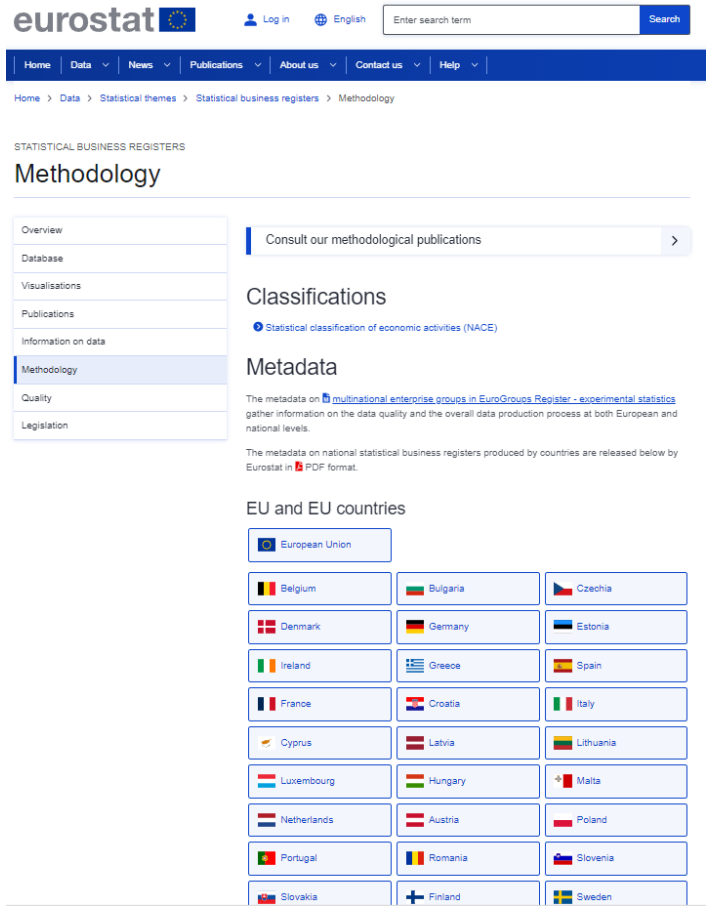
Dissemination of results

- **Quality and compliance assessment results**
  - At the conclusion of the assessment, each NSI coordinator receives two detailed assessment reports (NSBR assessment report and a report on the assessment of the datasets transmitted to the EGR)
  - Each report includes a set of tables. The first table presents the results and values of the four indicators, and the other tables provide a detailed evaluation of each indicator.
- **Dissemination**
  - Eurostat publishes all the validated national metadata reports of the national business registers and of the EuroGroups Register on the Eurostat website: Methodology - Statistical business registers - Eurostat (europa.eu)
  - Additionally, Eurostat disseminates the Statistical business registers quality report publication providing users comprehensive information on the quality of European statistical business registers (SBRs)
  - The SBR dedicated section Quality - Eurostat (europa.eu) provides different info on various aspects of BRs

SBR dedicated section on Eurostat website

Statistical business registers - Eurostat (europa.eu)





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Thank you

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