



INSPIRE Monitoring and Reporting 2020: Process, results and way forward

JRC INSPIRE Team

13th MIG meeting – June 17-18, 2021

INSPIRE Monitoring and Reporting 2020

- Based on [Commission Decision 2019/1372](#):
 - **19 indicators** calculated from the metadata of spatial data sets & spatial data services published by Member States through discovery services

DECISIONS

COMMISSION IMPLEMENTING DECISION (EU) 2019/1372

of 19 August 2019

implementing Directive 2007/2/EC of the European Parliament and of the Council as regards monitoring and reporting


(notified under document C(2019) 6026)

(Text with EEA relevance)

Indicators for Monitoring and Reporting 2020

- Same set of indicators as of 2019, one important difference in the calculation:
 - only MD encoded according to **TG 2.0** will be considered!

MD TG 1.3



INSPIRE
Infrastructure for Spatial Information in Europe

INSPIRE Metadata Implementing Rules: Technical Guidelines based on EN ISO 19115 and EN ISO 19119

Title	INSPIRE Metadata Implementing Rules: Technical Guidelines based on EN ISO 19115 and EN ISO 19119
Creator	Drafting Team Metadata and European Commission Joint Research Centre
Creation date	2007-10-26
Date of last revision	2013-10-29
Subject	INSPIRE Implementing Rules for Metadata
Status	V. 1.3
Publisher	European Commission Joint Research Centre
Type	Text
Description	Guidelines based on EN ISO 19115 and EN ISO 19119 for Commission Regulation (EC) No 1205/2008 of 3 December 2008 implementing Directive 2007/2/EC of the European Parliament and of the Council as regards metadata
Contributor	See Acknowledgements
Format	PDF
Source	European Commission Joint Research Centre
Rights	Public
Identifier	MD_IR_and_ISO_20131029.doc
Language	EN
Revision	Not applicable
Language coverage	Not applicable




INSPIRE
Infrastructure for Spatial Information in Europe

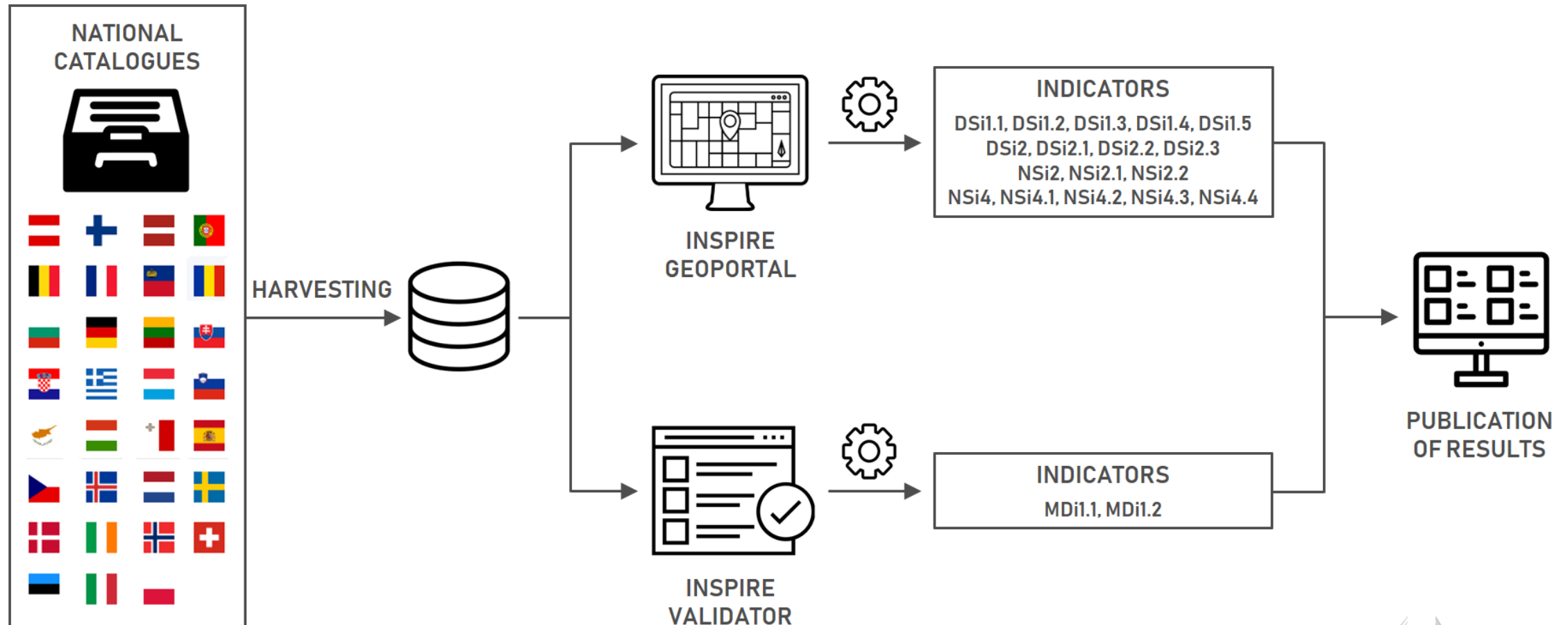
MD TG 2.0

Technical Guidance for the implementation of INSPIRE dataset and service metadata based on ISO/TS 19139:2007

Title	Technical Guidelines for implementing dataset and service metadata based on ISO/TS 19139:2007
Creator	Temporary MIG subgroup for action MIWP-8
Date of publication	2017-03-02
Subject	Technical Guidance for INSPIRE metadata for datasets and services
Status	Version 2.0.1
	This document has been endorsed by the INSPIRE maintenance and implementation group (MIG) in its meeting on 30/11-1/12/2016 (see meeting minutes at https://ies-svn.irc.ec.europa.eu/projects/mig-p/wiki/5th_MIG-P_meeting).
Publisher	INSPIRE Maintenance and Implementation Group (MIG)
Type	Text
Description	Implementation specification for defining metadata for INSPIRE datasets and services in ISO/TS 19139 based XML format in compliance with the INSPIRE Implementing Rules for metadata.
Format	PDF
Licence	Creative Commons Attribution (cc-by) 4.0 (https://creativecommons.org/licenses/by/4.0/)
Identifier	http://inspire.ec.europa.eu/id/document/tg/metadata-iso19139/2.0 (latest bugfix version of v2.0) http://inspire.ec.europa.eu/id/document/tg/metadata-iso19139/2.0.1 (this bugfix version)
Corrigenda	http://inspire.ec.europa.eu/id/document/tg/metadata-iso19139/2.0/corrigenda
Language	EN

Monitoring and Reporting 2020 – Process

- Overall process:



INSPIRE Monitoring and Reporting 2020

INSPIRE Geoportal

- v.1.4.0 released on September 16th
 - including support for metadata TG v.2.0
- v.1.5.0 released on November 16th (used for Monitoring and Reporting 2020)
 - including bugfix from the testing period (September 16th to October 23rd)

INSPIRE Reference Validator

- v.2020.3 (used for Monitoring and Reporting 2020) released on September 16
 - **bugfix version** adding non-breaking changes to v.2020.2 (June 2020)

Calculation of indicators using the Validator

- Indicator MDi1.1:
 - percentage of metadata for spatial data sets conformant with Commission Regulation (EC) No 1205/2008 as regards metadata
 - metadata filtered as:
 - `<gmd:hierarchyLevel>/<gmd:MD_ScopeCode>` with codelist value `dataset` or `series`

Metadata (TG version 2.0) - BETA

<input checked="" type="checkbox"/> Common Requirements for ISO/TC 19139:2007 based INSPIRE metadata records.	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> Conformance Class 1: INSPIRE data sets and data set series baseline metadata.	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> Conformance Class 2: INSPIRE data sets and data set series interoperability metadata.	<input type="checkbox"/> use
<input checked="" type="checkbox"/> Conformance Class 2b: INSPIRE data sets and data set series metadata for Monitoring	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> Conformance Class 3: INSPIRE Spatial Data Service baseline metadata.	<input type="checkbox"/> use
<input checked="" type="checkbox"/> Conformance Class 4: INSPIRE Network Services metadata.	<input type="checkbox"/> use
<input checked="" type="checkbox"/> Conformance Class 5: INSPIRE Invocable Spatial Data Services metadata.	<input type="checkbox"/> use
<input checked="" type="checkbox"/> Conformance Class 6: INSPIRE Interoperable Spatial Data Services metadata.	<input type="checkbox"/> use
<input checked="" type="checkbox"/> Conformance Class 7: INSPIRE Harmonised Spatial Data Services metadata.	<input type="checkbox"/> use
Interoperable data sets in GML (Guidelines for the Encoding of Spatial Data version 3.3)	
<input checked="" type="checkbox"/> Conformance class: Data consistency, General requirements	<input type="checkbox"/> use

Calculation of indicators using the Validator

- Indicator MDi1.2:
 - percentage of metadata for spatial data services conformant with Commission Regulation (EC) No 1205/2008 as regards metadata
 - metadata filtered as:
 - `<gmd:hierarchyLevel>/<gmd:MD_ScopeCode>` with codelist value `service`
 - `<srv:serviceType>/<gco:LocalName>` with value `view`, `download`, `discovery` or `transformation` for Network Services, `other` for Invocable Spatial Data Services

Metadata (TG version 1.3)

- + Conformance class: INSPIRE Profile based on EN ISO 19115 and EN ISO 19119 use
- + Conformance class: Metadata for interoperability use

Metadata (TG version 2.0) - BETA

- + Common Requirements for ISO/TC 19139:2007 based INSPIRE metadata records. use
- + Conformance Class 1: INSPIRE data sets and data set series baseline metadata. use
- + Conformance Class 2: INSPIRE data sets and data set series interoperability metadata. use
- + Conformance Class 3: INSPIRE Spatial Data Service baseline metadata. use
- + Conformance Class 4: INSPIRE Network Services metadata. use
- + Conformance Class 5: INSPIRE Invocable Spatial Data Services metadata. use
- + Conformance Class 6: INSPIRE Interoperable Spatial Data Services metadata. use
- + Conformance Class 7: INSPIRE Harmonised Spatial Data Services metadata. use

Bulk validation tool for metadata

- Allows to perform **massive validation of metadata** using any instance of the INSPIRE Reference Validator:
 - used to **automate validation** using the INSPIRE Reference Validator API
 - **v.2020.2** released on September 23 with the new rules (focus on metadata TG v.2.0)
 - to be used with **your own instance of the Validator** (NOT the central INSPIRE one)!

Bulk processing tool for the INSPIRE Reference Validator

This software tool allows for validation of large numbers of metadata records using the API of the **INSPIRE Reference Validator**. It was developed to support INSPIRE Monitoring & Reporting activities. The tool was built with **Pentaho Data Integration Community Edition** platform which is required to use it.

<https://github.com/inspire-eu-validation/monitoring-bulk-validation-tool>

Monitoring and Reporting 2020 – Indicators

- Indicators grouped into 5 categories:

- availability of spatial data and services
 - DSi1.1, DSi1.2, DSi1.3, DSi1.4, DSi1.5

absolute values

- conformity of metadata
 - MDi1.1, MDi1.2
- conformity of spatial data sets
 - DSi2, DSi2.1, DSi2.2, DSi2.3
- accessibility of spatial data sets
 - NSi2, NSi2.1, NSi2.2
- conformity of network services
 - NSi4, NSi4.1, NSi4.2, NSi4.3, NSi4.4

relative values
(percentages)

Monitoring and Reporting 2020 – Indicators

- Indicators grouped into 5 categories:

- availability of spatial data and services

- DSi1.1, DSi1.2, DSi1.3, DSi1.4, DSi1.5

- conformity of metadata

- MDi1.1, MDi1.2

- conformity of spatial data sets

- DSi2, DSi2.1, DSi2.2, DSi2.3

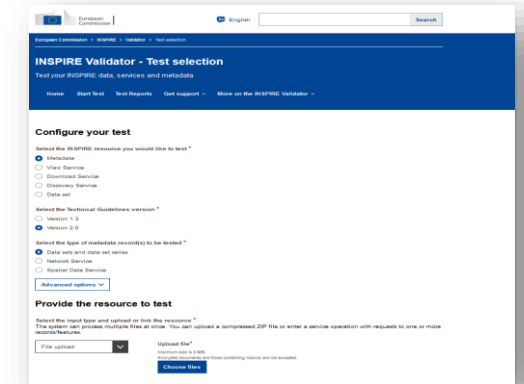
- accessibility of spatial data sets

- NSi2, NSi2.1, NSi2.2

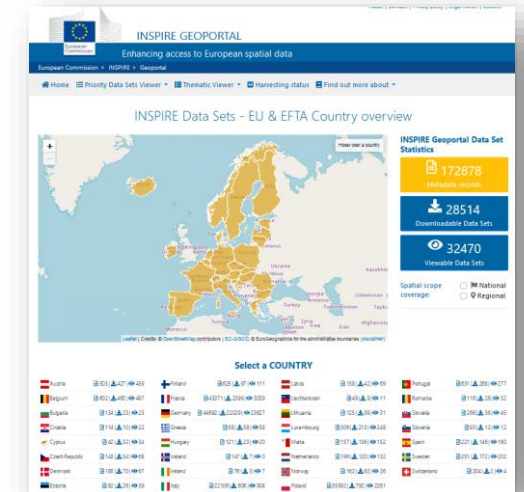
- conformity of network services

- NSi4, NSi4.1, NSi4.2, NSi4.3, NSi4.4

**INSPIRE
Reference
Validator**
(metadata
validation)



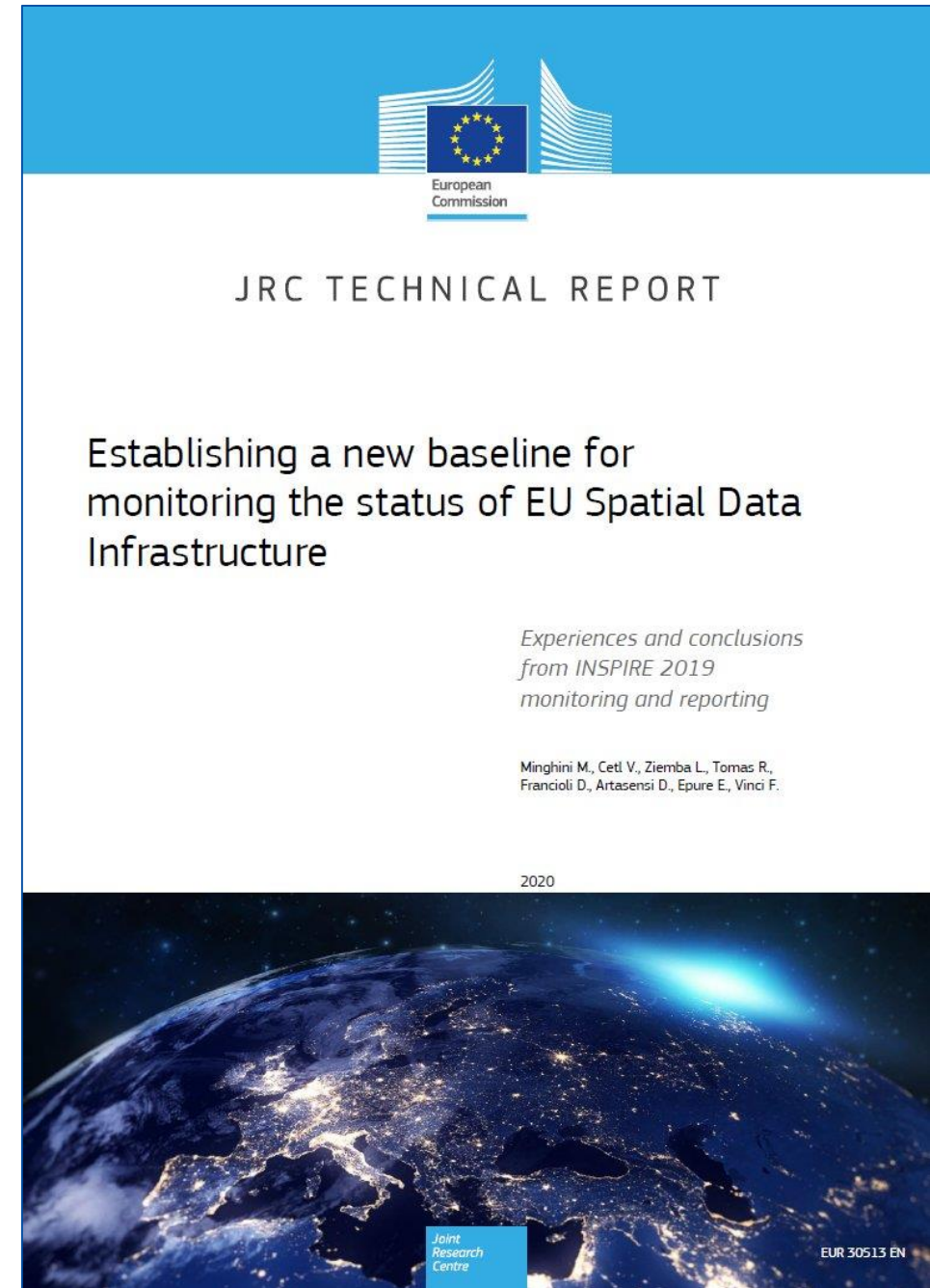
**INSPIRE
Geoportal**
(linkages check)



Technical Report on 2019 Monitoring and Reporting

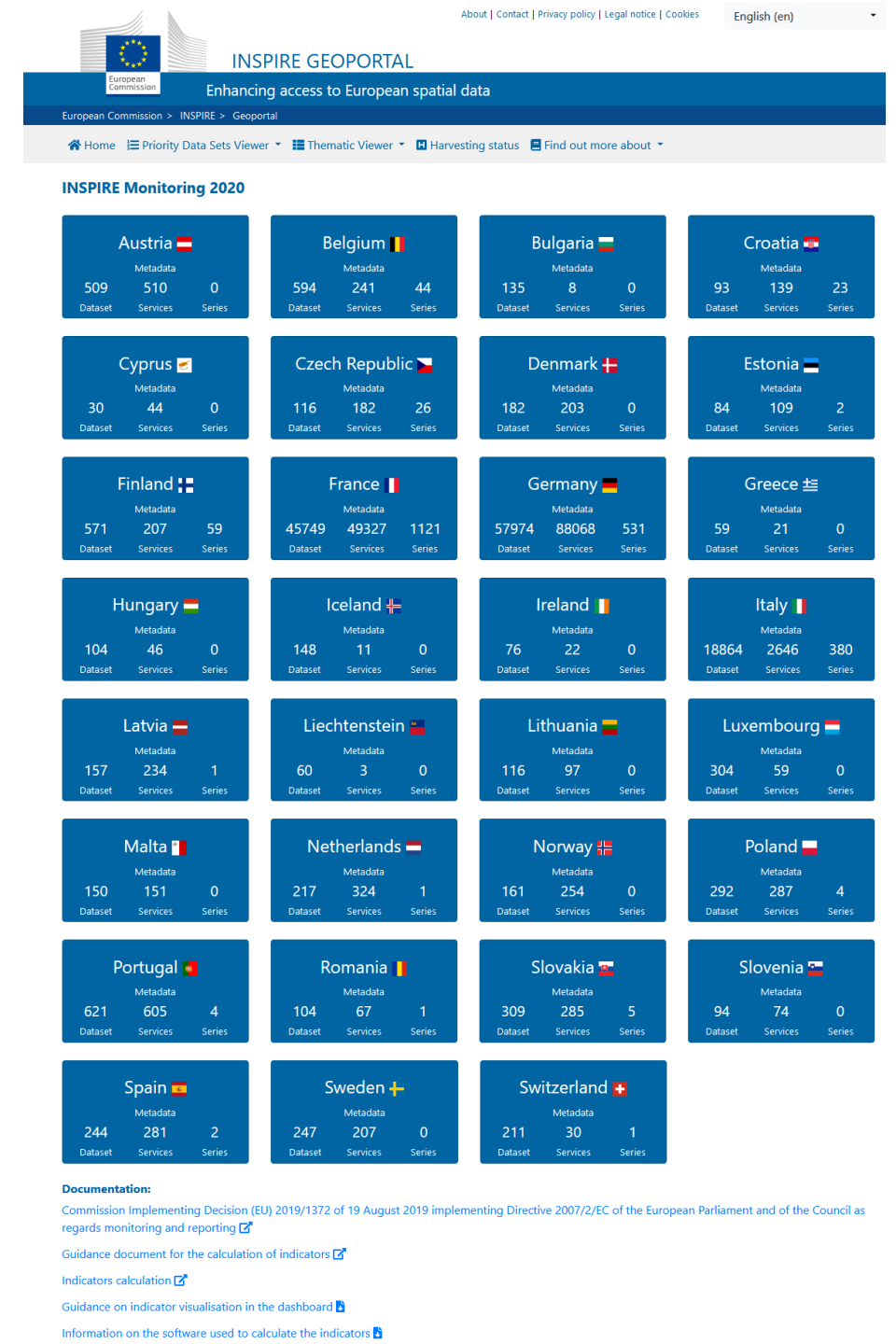
- Published in December 2020:
 - description of **process, results & lessons learnt**
- 2020 results **compared against 2019 results** in the following

<https://europa.eu/!VX83UY>



Monitoring and Reporting 2020 – Dashboard

- Landing page:
 - number of data sets, data set series & services for all countries
 - documentation to help understand the results



<https://inspire-geoportal.ec.europa.eu/mr2020.html>

Monitoring and Reporting 2020 – Dashboard

- Country-specific page:
 - overview statistics: number of data sets, data set series & services, number of conformant & non conformant metadata
 - values of Monitoring and Reporting 2020 indicators

<https://inspire-geoportal.ec.europa.eu/mr2020.html>

Finland +

INSPIRE-f670705f-f4e9-11e6-81e4-52540023a883

MD Catalogue URL: <https://www.paikkatietohakemisto.fi/geonetwork/srv/fin/csw>

Endpoint ID: INSPIRE-f670705f-f4e9-11e6-81e4-52540023a883

The date of harvest metadata: Sun, 17 Jan 2021 23:03:02 GMT

Overview statistics of the harvested metadata

Dataset: 571

Series: 59

Services: 207

Results of evaluation using INSPIRE Reference Validator

Metadata Dataset

Conformant: 253

NOT Conformant: 377

[Click to download the test reports of failed records](#)

Metadata Services

Conformant: 36

NOT Conformant: 171

[Click to download the test reports of failed records](#)

Summary of metadata failing validation in [this endpoint](#) (batch file identifier, metadata identifier, metadata type, total number and ids of failed test assertions)
Summary of metadata failing validation in [all endpoints](#) (see "readme" sheet for details)

Monitoring Indicators 2020

Availability

Monitoring of the availability of spatial data and service

586

DSi1.1

=

204

DSi1.2

↑

19

DSi1.3

=

49

DSi1.4

↑

231

DSi1.5

↑

Monitoring of the accessibility of spatial data sets through view and download services

★★★★☆

NSi2

↓

★★★★☆

NSi2.1

=

★★★★☆

NSi2.2

↓

Conformity

Monitoring of the conformity of metadata

★★★★☆

MDi1.1

↑

★★★★☆

MDi1.2

↑

Monitoring of the conformity of spatial data sets

★★★★☆

DSi2

↑

★★★★☆

DSi2.1

↑

★★★★☆

DSi2.2

↑

★★★★☆

DSi2.3

↑

Monitoring of the conformity of the network services

★★★★☆

NSi4

=

★★★★☆

NSi4.1

=

★★★★☆

NSi4.2

=

★★★★☆

NSi4.3

=

Not available

NSi4.4

NSi4.4

Monitoring and Reporting 2020 – Dashboard

- New visualization of indicators

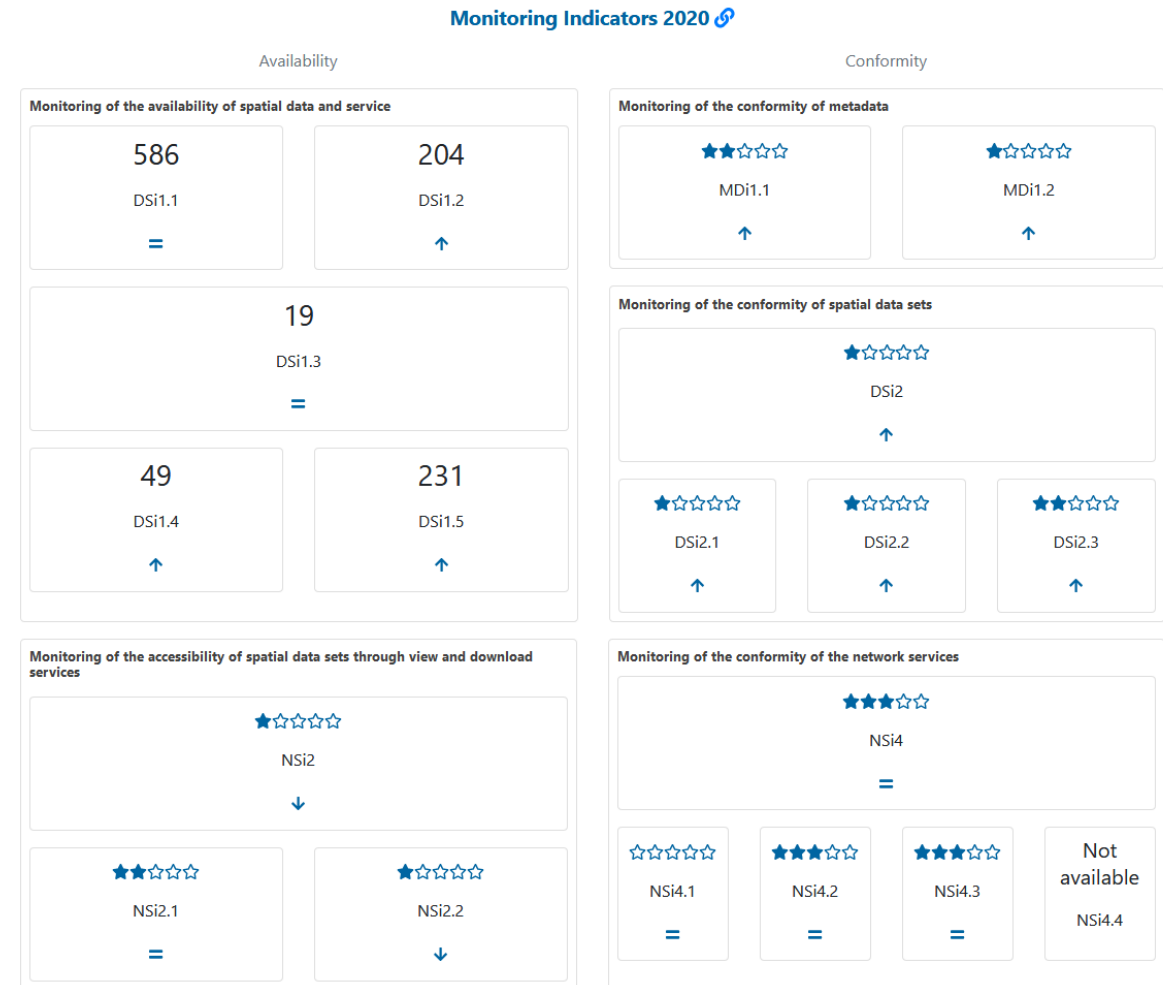
- star-based scoring system (for percentage indicators):

- ☆☆☆☆☆ $0 \leq X < 10\%$
- ★☆☆☆☆ $10\% \leq X < 30\%$
- ★★☆☆☆ $30\% \leq X < 50\%$
- ★★★☆☆ $50\% \leq X < 70\%$
- ★★★★☆ $70\% \leq X < 90\%$
- ★★★★★ $90\% \leq X \leq 100\%$

- comparison against 2019 results:

- for relative number indicators:
 - ↑ increase of at least 10%
 - ↓ decrease of at least 10%
 - = increase or decrease of less than 10%
- for absolute number indicators:

same rule but considering 10% of the 2019 values



Monitoring and Reporting 2020 – Dashboard

- Documentation

- ▼ Notes on MDi1.1 and MDi1.2 evaluation

The evaluation of these indicators involves a validation of the collected metadata through the [Reference Validator \(v2020.3\)](#).

In case of a metadata document aligned with the *INSPIRE MD TG v2.0*:

- ✓ if the recognized INSPIRE Resource Type is "**dataset**" or "**series**" the applied executable test suite is "**Conformance Class 2b: INSPIRE data sets and data set series metadata for Monitoring**".
- ✓ if the recognized INSPIRE Resource Type is "**service**" the applied executable test suite is:
 - ✔ "**Conformance Class 4: INSPIRE Network Services metadata**", if the service is a Network Service (service type equal to "view", "download", "discovery" or "transformation")
 - ✔ "**Conformance Class 5: INSPIRE Invocable Spatial Data Services metadata**", if the service is an Invocable Spatial Data Service (service type equal to "other")

Implementing Decision

Documentation:

Commission Implementing Decision (EU) 2019/1372 of 19 August 2019 implementing Directive 2007/2/EC of the European Parliament and of the Council as regards monitoring and reporting [↗](#)

Guidance document for the calculation of indicators [↗](#)

Indicators calculation [↗](#)

Guidance on indicator visualisation in the dashboard [↓](#)

Information on the software used to calculate the indicators [↓](#)

explanation of how indicators are calculated

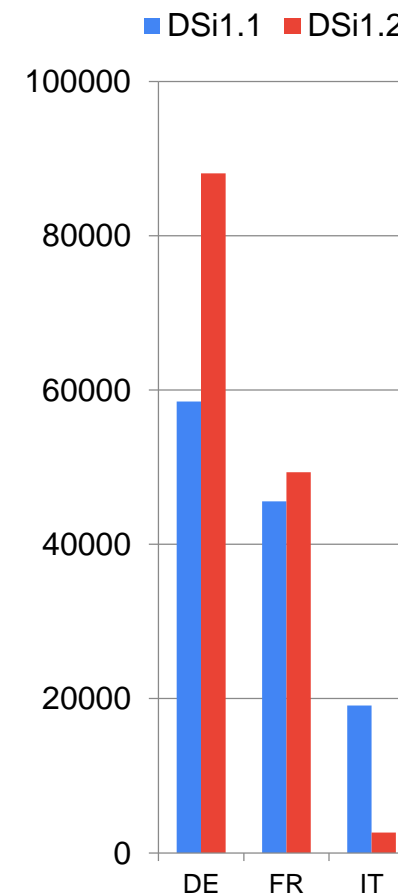
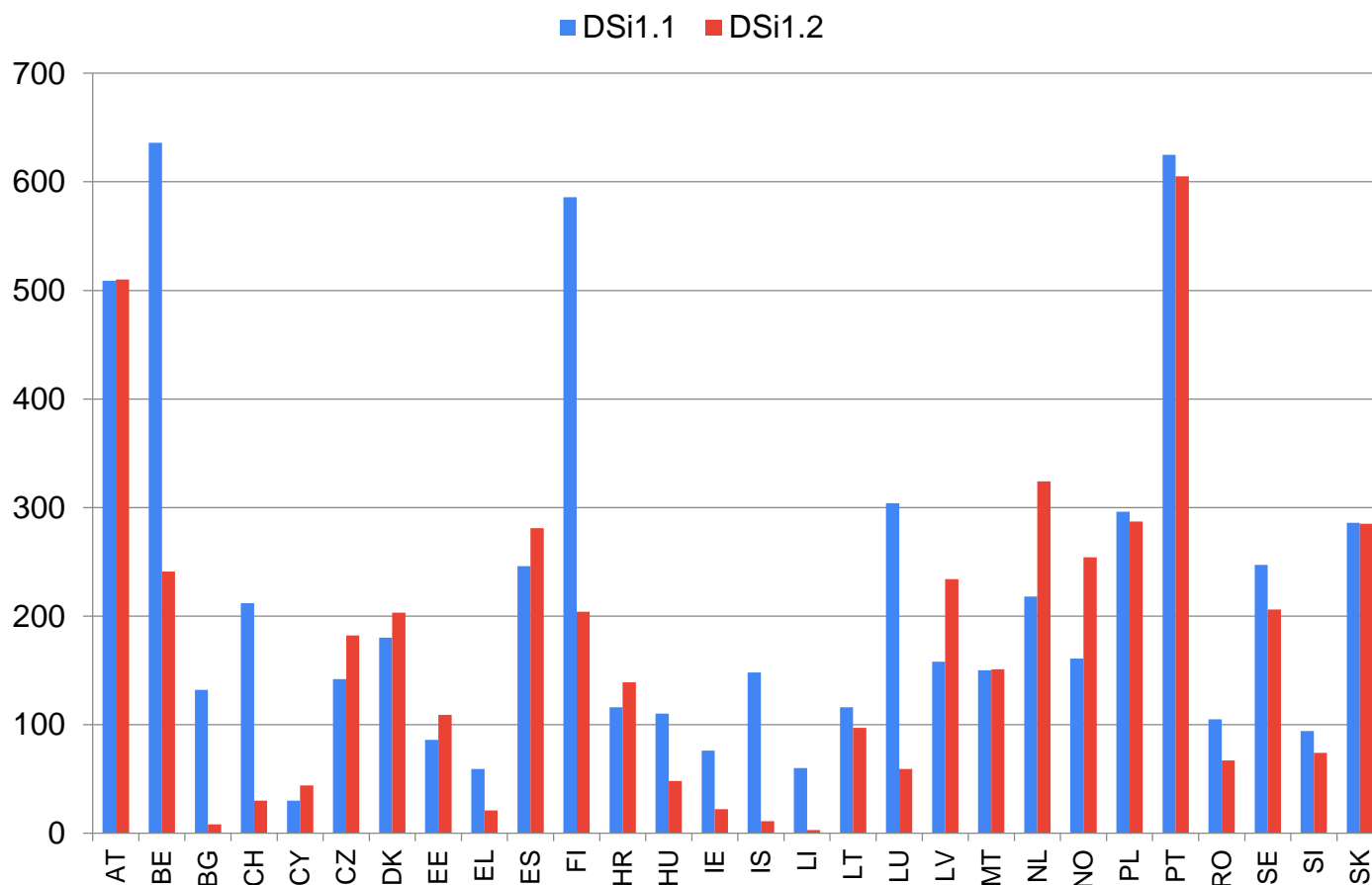
explanation of indicator visualisation

info on the versions of Geoportal & Validator used

Availability of spatial data & services

	DSi1.1	DSi1.2
Median	161	182

increase of at least 10% compared to 2019
 increase/decrease of less than 10% compared to 2019
 decrease of at least 10% compared to 2019

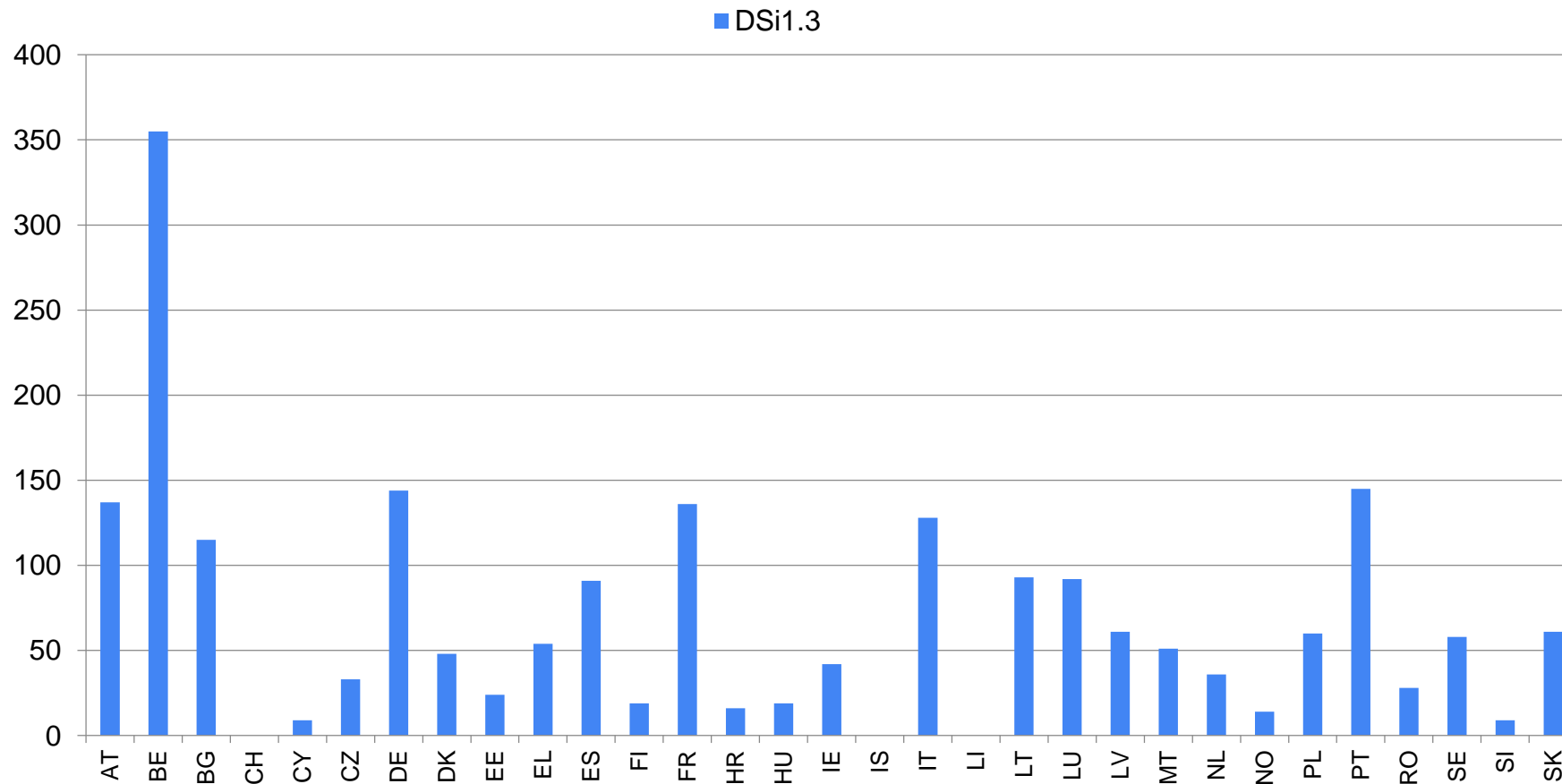


	DSi1.1	DSi1.2
AT	509	510
BE	636	241
BG	132	8
CH	212	30
CY	30	44
CZ	142	182
DE	58504	88068
DK	180	203
EE	86	109
EL	59	21
ES	246	281
FI	586	204
FR	45587	49326
HR	116	139
HU	110	48
IE	76	22
IS	148	11
IT	19122	2645
LI	60	3
LT	116	97
LU	304	59
LV	158	234
MT	150	151
NL	218	324
NO	161	254
PL	296	287
PT	625	605
RO	105	67
SE	247	206
SI	94	74
SK	286	285

Availability of spatial data & services

	DSi1.3
Median	51

- increase of at least 10% compared to 2019
- increase/decrease of less than 10% compared to 2019
- decrease of at least 10% compared to 2019

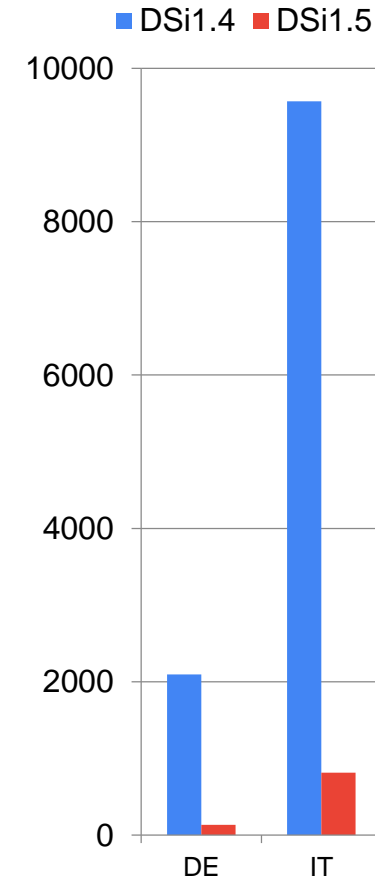
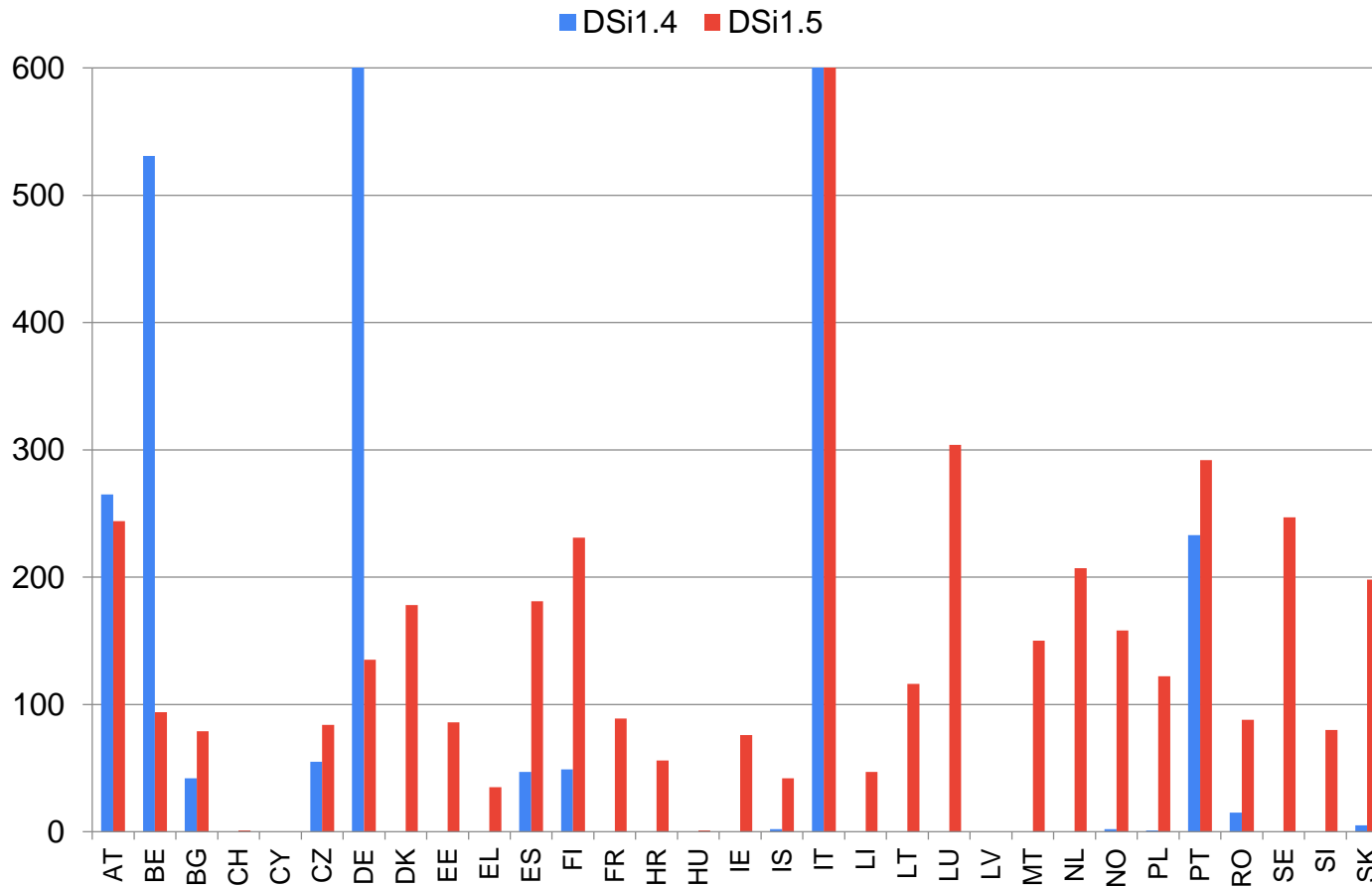


	DSi1.3
AT	137
BE	355
BG	115
CH	0
CY	9
CZ	33
DE	144
DK	48
EE	24
EL	54
ES	91
FI	19
FR	136
HR	16
HU	19
IE	42
IS	0
IT	128
LI	0
LT	93
LU	92
LV	61
MT	51
NL	36
NO	14
PL	60
PT	145
RO	28
SE	58
SI	9
SK	61

Availability of spatial data & services

	DSi1.4	DSi1.5
Median	0	94

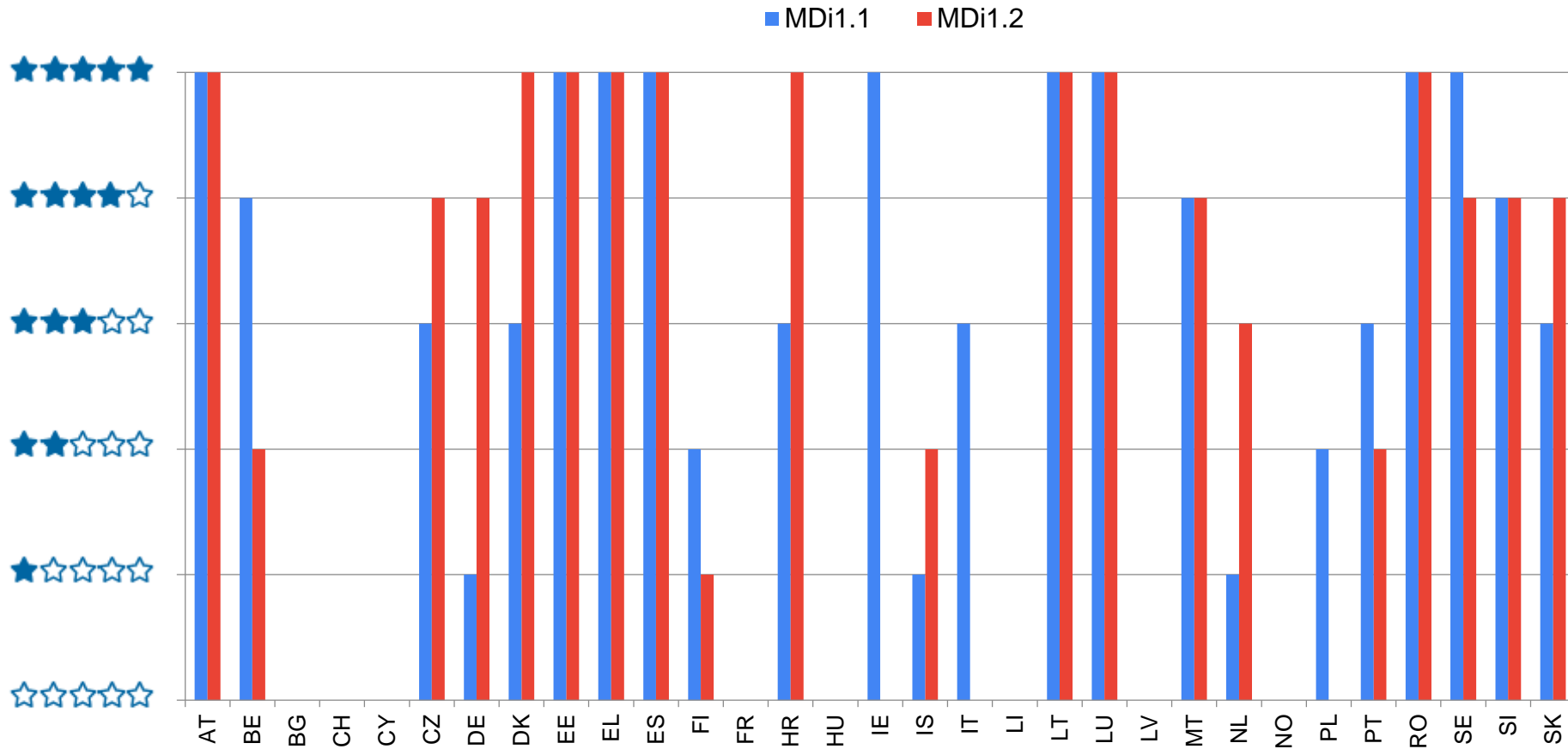
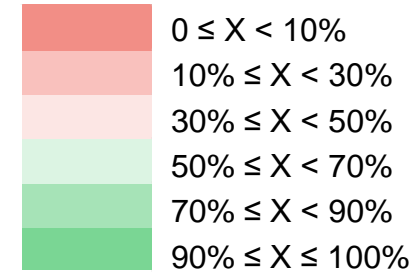
■ increase of at least 10% compared to 2019
■ increase/decrease of less than 10% compared to 2019
■ decrease of at least 10% compared to 2019



	DSi1.4	DSi1.5
AT	265	244
BE	531	94
BG	42	79
CH	0	1
CY	0	0
CZ	55	84
DE	2098	135
DK	0	178
EE	0	86
EL	0	35
ES	47	181
FI	49	231
FR	0	89
HR	0	56
HU	0	1
IE	0	76
IS	2	42
IT	9572	813
LI	0	47
LT	0	116
LU	0	304
LV	0	0
MT	0	150
NL	0	207
NO	2	158
PL	1	122
PT	233	292
RO	15	88
SE	0	247
SI	0	80
SK	5	198

Conformity of metadata

	MDi1.1	MDi1.2
Median	67%	43%



	MDi1.1	MDi1.2
AT	95%	92%
BE	86%	49%
BG	0%	0%
CH	0%	0%
CY	0%	0%
CZ	58%	79%
DE	19%	80%
DK	63%	99%
EE	100%	100%
EL	98%	100%
ES	96%	98%
FI	43%	18%
FR	0%	0%
HR	51%	100%
HU	0%	0%
IE	96%	5%
IS	27%	36%
IT	51%	5%
LI	0%	0%
LT	96%	100%
LU	99%	98%
LV	0%	0%
MT	70%	89%
NL	22%	67%
NO	1%	0%
PL	36%	6%
PT	55%	41%
RO	93%	97%
SE	91%	75%
SI	70%	89%
SK	60%	75%

Results from the metadata validation

Results of evaluation using [INSPIRE Reference Validator](#)

Metadata Dataset	
Conformant: 253	NOT Conformant: 377
Click to download the test reports of failed records	

Metadata Services	
Conformant: 36	NOT Conformant: 171
Click to download the test reports of failed records	

Summary of metadata failing validation in [this endpoint](#) (batch file identifier, metadata identifier, metadata type, total number and ids of failed test assertions)

Summary of metadata failing validation in [all endpoints](#) (see "readme" sheet for details)

ZIP files including failed reports in HTML and JSON

Results from the metadata validation

Results of evaluation using [INSPIRE Reference Validator](#)

Metadata Dataset

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Summary of metadata failing validation in [all endpoints](#) (see "readme" sheet for details)

	A	B	C	D	E
1	file_id	md_id	type	error_count	errors
2	1-20/12	ac9bd95a-0063-4157-95ec-dd91e22c1eed	dataset	8	C.1 C.5 C.14 C.17 C.22 1.4 1.5 1.6
3	1-20/14	70c8c42a-9344-462b-b50c-21960aa808ef	dataset	10	C.1 C.5 C.6 C.14 C.15 C.17 C.18 C.22 1.6 1.10
4	1-20/10	48c955c8-70bd-451b-af94-c5069d3b54f6	dataset	3	C.5 C.17 1.6
5	1-20/1	af0a8b4f-acf0-4e0f-8552-feb23b94f835	service	4	C.5 C.17 3.1 3.8
6	1-20/11	15298bed-01ca-45b0-8ec7-e0960e88626b	service	6	C.1 C.5 C.6 C.17 3.1 3.8
7	1-20/15	24460d92-e93a-486c-9144-b4b6b5a71f88	dataset	5	C.5 C.15 C.17 C.18 1.6
8	1-20/16	7f3cba03-842f-405c-9f10-7725f0f01d14	service	6	C.1 C.17 1.1 1.3 1.4 1.6
9	1-20/2	f17fc16c-ad08-4880-92f2-7d8fe2fad07b	service	4	C.5 C.17 3.1 3.8
10	1-20/5	763d5253-09ba-4b97-9836-ce93e945d3f2	dataset	5	C.5 C.6 C.17 C.18 1.6
11	1-20/17	e7cba4f8-6de9-468d-8ca4-453995f0e357	dataset	8	C.5 C.17 1.3 1.4 1.6 1.8 1.10 1.11
12	1-20/7	dda3c903-04d6-4af5-b3a6-9f2a489f6c46	dataset	6	C.5 C.6 C.15 C.17 C.18 1.6
13	101-120/10	39979b2f-e7aa-4177-9a9d-69b563f00f91	service	5	C.5 C.17 C.18 3.1 3.8
14	101-120/12	f6c316aa-283a-4621-a50f-e3ff4f2ddb83	dataset	5	C.1 C.5 C.17 C.22 1.6
15	1-20/4	a905569b-1c8b-4291-9e68-c90c39b9ec63	service	5	C.5 C.17 3.1 3.6 3.8
16	1-20/9	0bb3167b-084e-4e36-a51a-f01a5ac8a1ad	service	5	C.5 C.17 3.1 3.6 3.8
17	101-120/14	0adc3a08-0a5a-40a9-a6d0-a7979d7522fc	dataset	5	C.5 C.6 C.14 C.17 1.6
18	101-120/16	a8f60c18-168d-475b-9d0d-fc9ea17dc31b	service	6	C.10 C.17 1.1 1.3 1.4 1.10
19	1-20/8	5c8c4f0-8612-4c63-c245-742620b17875	dataset	8	C.1 C.5 C.14 C.17 C.22 1.5 1.6 1.10

Results from the metadata validation

Results of evaluation using [INSPIRE Reference Validator](#)

Metadata Dataset

Conformant: **253** NOT Conformant: **377**

[Click to download the test reports of failed records](#)

Metadata Services

Conformant: **36** NOT Conformant: **171**

[Click to download the test reports of failed records](#)

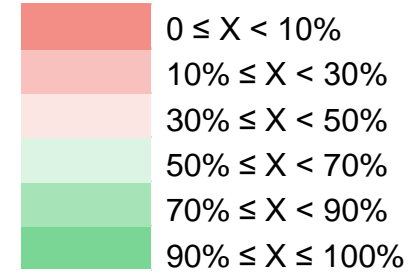
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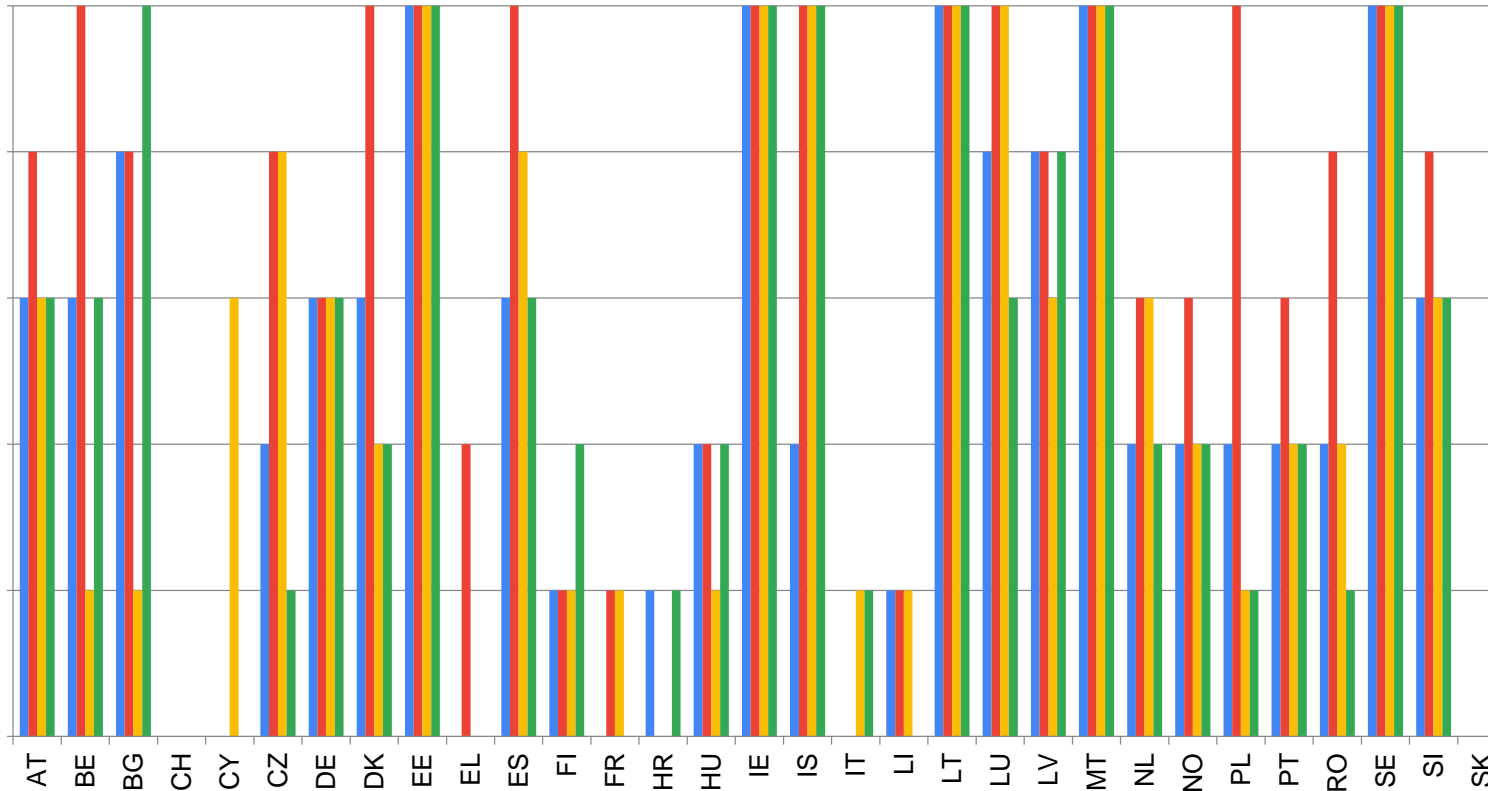
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
1	Country	Endpoint ID	md_failed	C.1	C.2	C.5	C.6	C.7	C.8	C.9	C.10	C.11	C.12	C.13	C.14	C.15	C.16	C.17	C.18	C.19	C.20	C.21
2	AT	INSPIRE-61494	43	0	0	5	0	0	0	0	0	0	0	0	0	0	0	16	4	0	0	0
3	BE	INSPIRE-21055	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	BE	INSPIRE-b285fc	28	14	0	0	0	0	0	0	0	0	0	0	0	2	0	10	13	0	11	0
5	BE	INSPIRE-f0c917	76	0	0	0	0	0	0	0	0	0	0	0	0	0	0	72	1	0	0	0
6	BE	INSPIRE-f5201e	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	BG	INSPIRE-e61d4	8	3	0	0	0	0	0	0	1	0	0	0	0	0	0	8	2	0	1	0
8	CH	INSPIRE-7a076	30	0	0	2	20	0	0	0	3	0	0	0	0	0	1	30	30	0	27	0
9	CY	INSPIRE-db3ec	44	0	0	44	0	0	0	0	0	0	0	0	0	0	0	44	0	0	0	0
10	CZ	INSPIRE-16542	38	9	0	0	0	0	0	0	0	0	1	0	0	10	4	6	0	0	3	0
11	DE	INSPIRE-4fed3e	18017	30	0	15257	4	0	2	2	2	1	2	20	20	815	47	17372	384	0	20	0
12	DK	INSPIRE-6e835	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0
13	EE	INSPIRE-608e4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	EL	INSPIRE-b4838	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	ES	INSPIRE-c6f329	7	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16	FI	INSPIRE-f67070	171	34	0	148	53	0	3	3	10	0	0	2	3	8	4	158	35	0	4	0
17	FR	INSPIRE-5145fa	49313	682	0	3557	876	0	42	351	446	150	8	0	211	307	48	49312	1049	0	3292	0

Conformity of spatial data sets

	DSi2	DSi2.1	DSi2.2	DSi2.3
Median	43%	75%	47%	38%



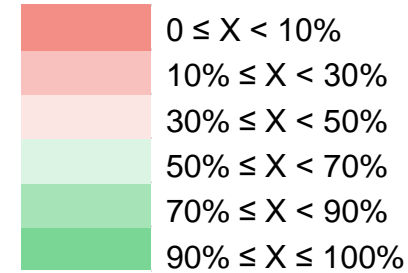
■ DSi2 ■ DSi2.1 ■ DSi2.2 ■ DSi2.3



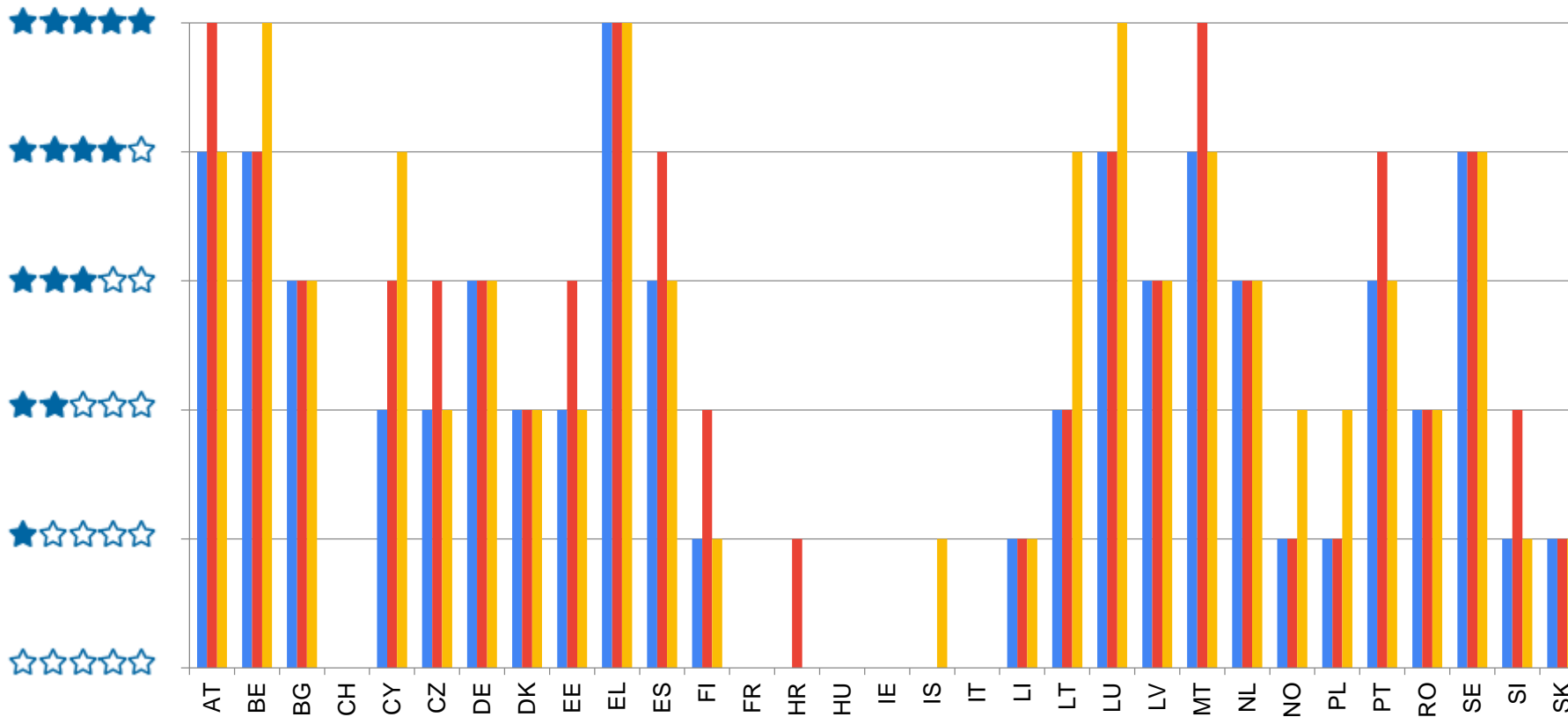
	DSi2	DSi2.1	DSi2.2	DSi2.3
AT	66%	75%	69%	61%
BE	62%	95%	22%	65%
BG	85%	82%	11%	97%
CH	2%	7%	2%	0%
CY	3%	0%	50%	0%
CZ	39%	87%	73%	24%
DE	55%	58%	50%	55%
DK	52%	95%	38%	48%
EE	100%	100%	100%	100%
EL	3%	40%	#N/A	0%
ES	68%	93%	89%	61%
FI	25%	16%	15%	33%
FR	9%	10%	12%	9%
HR	13%	6%	7%	13%
HU	31%	36%	28%	35%
IE	100%	100%	100%	100%
IS	34%	94%	100%	93%
IT	8%	6%	11%	12%
LI	15%	11%	17%	9%
LT	98%	97%	100%	99%
LU	70%	100%	92%	59%
LV	73%	76%	63%	79%
MT	95%	93%	100%	94%
NL	47%	67%	64%	38%
NO	43%	68%	43%	37%
PL	40%	91%	13%	29%
PT	41%	65%	41%	38%
RO	38%	70%	31%	29%
SE	100%	99%	100%	100%
SI	61%	75%	57%	62%
SK	3%	5%	3%	1%

Accessibility of spatial data sets

	NSi2	NSi2.1	NSi2.2
Median	32%	44%	42%



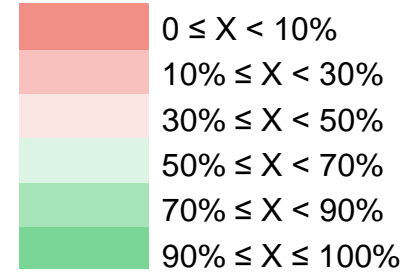
■ NSi2 ■ NSi2.1 ■ NSi2.2



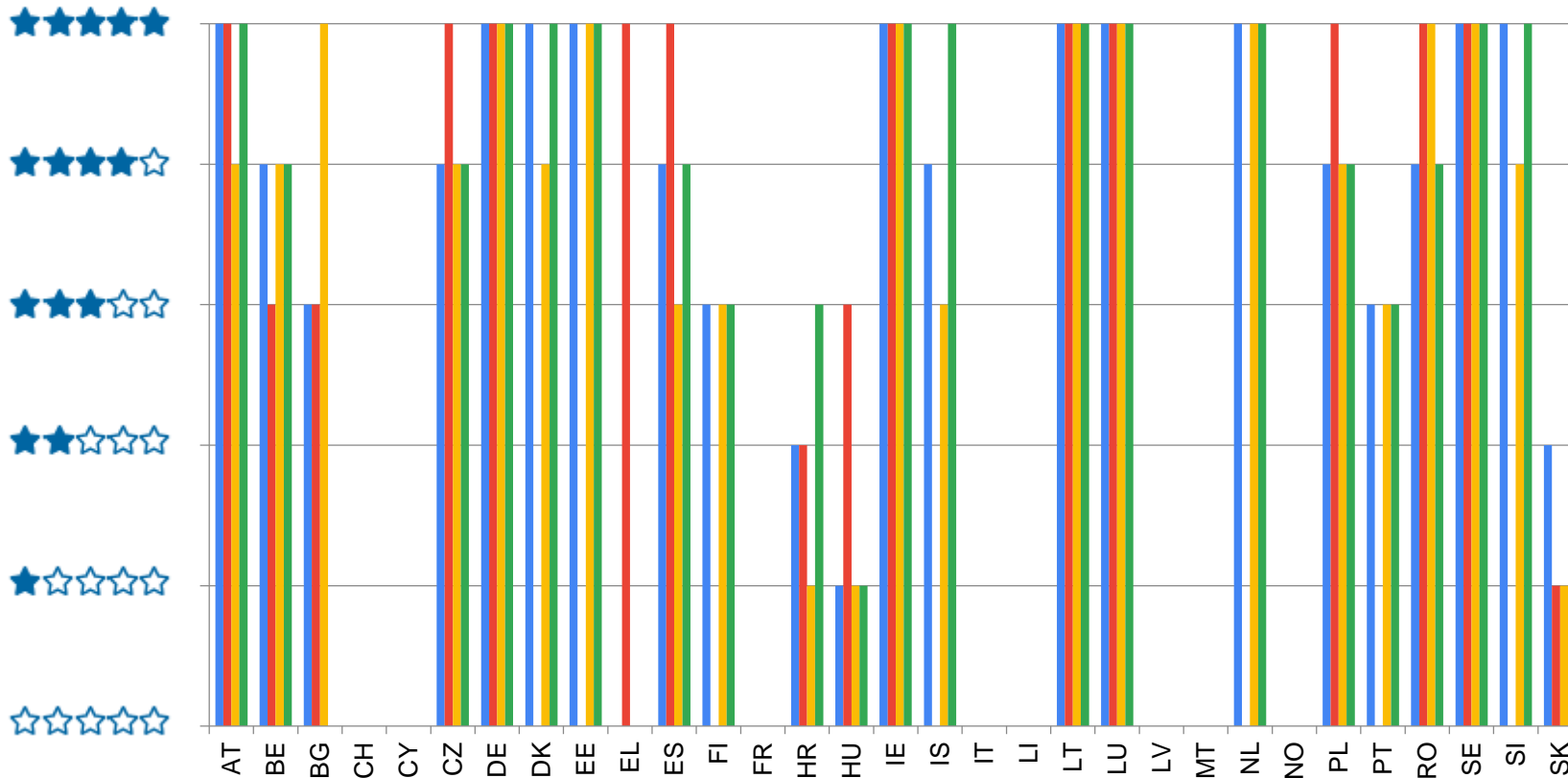
	NSi2	NSi2.1	NSi2.2
AT	83%	93%	85%
BE	86%	89%	90%
BG	58%	60%	58%
CH	1%	2%	1%
CY	40%	53%	80%
CZ	37%	62%	40%
DE	61%	64%	63%
DK	32%	44%	40%
EE	42%	56%	42%
EL	100%	100%	100%
ES	65%	76%	68%
FI	15%	40%	20%
FR	0%	5%	1%
HR	2%	16%	6%
HU	4%	5%	8%
IE	0%	0%	0%
IS	0%	0%	21%
IT	1%	3%	1%
LI	15%	20%	17%
LT	31%	31%	89%
LU	84%	88%	94%
LV	53%	59%	55%
MT	81%	98%	83%
NL	57%	63%	61%
NO	14%	17%	42%
PL	16%	17%	34%
PT	56%	80%	64%
RO	30%	33%	30%
SE	72%	81%	81%
SI	12%	40%	16%
SK	21%	27%	24%

Conformity of network services

	NSi4	NSi4.1	NSi4.2	NSi4.3	NSi4.4
Median	71%	67%	67%	83%	0%

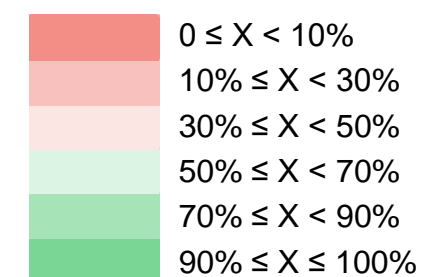


■ NSi4 ■ NSi4.1 ■ NSi4.2 ■ NSi4.3






	NSi4	NSi4.1	NSi4.2	NSi4.3	NSi4.4
AT	93%	100%	89%	97%	#N/A
BE	88%	67%	89%	88%	#N/A
BG	50%	50%	100%	0%	#N/A
CH	0%	0%	0%	0%	#N/A
CY	0%	#N/A	0%	0%	#N/A
CZ	80%	100%	75%	84%	100%
DE	98%	100%	98%	99%	#N/A
DK	91%	#N/A	89%	92%	#N/A
EE	96%	0%	94%	100%	#N/A
EL	5%	100%	0%	0%	#N/A
ES	71%	100%	67%	85%	#N/A
FI	54%	0%	53%	58%	#N/A
FR	1%	6%	2%	0%	0%
HR	37%	33%	28%	53%	#N/A
HU	17%	60%	10%	15%	#N/A
IE	100%	100%	100%	100%	#N/A
IS	83%	#N/A	67%	100%	#N/A
IT	1%	0%	2%	0%	0%
LI	0%	#N/A	0%	0%	#N/A
LT	94%	100%	90%	98%	#N/A
LU	100%	100%	100%	100%	#N/A
LV	4%	#N/A	6%	2%	#N/A
MT	0%	0%	0%	0%	#N/A
NL	92%	#N/A	93%	92%	#N/A
NO	0%	0%	0%	0%	#N/A
PL	83%	100%	72%	88%	#N/A
PT	55%	#N/A	56%	53%	#N/A
RO	89%	100%	93%	83%	#N/A
SE	100%	100%	99%	100%	#N/A
SI	92%	#N/A	86%	100%	#N/A
SK	31%	14%	29%	34%	0%

Overall results – 2020 performance



	DSi1.1	DSi1.2	DSi1.3	DSi1.4	DSi1.5	MDi1.1	MDi1.2	DSi2	DSi2.1	DSi2.2	DSi2.3	NSi2	NSi2.1	NSi2.2	NSi4	NSi4.1	NSi4.2	NSi4.3	NSi4.4
AT	509	510	137	265	244	95%	92%	66%	75%	69%	61%	83%	93%	85%	93%	100%	89%	97%	#N/A
BE	636	241	355	531	94	86%	49%	62%	95%	22%	65%	86%	89%	90%	88%	67%	89%	88%	#N/A
BG	132	8	115	42	79	0%	0%	85%	82%	11%	97%	58%	60%	58%	50%	50%	100%	0%	#N/A
CH	212	30	0	0	1	0%	0%	2%	7%	2%	0%	1%	2%	1%	0%	0%	0%	0%	#N/A
CY	30	44	9	0	0	0%	0%	3%	0%	50%	0%	40%	53%	80%	0%	#N/A	0%	0%	#N/A
CZ	142	182	33	55	84	58%	79%	39%	87%	73%	24%	37%	62%	40%	80%	100%	75%	84%	100%
DE	58504	88068	144	2098	135	19%	80%	55%	58%	50%	55%	61%	64%	63%	98%	100%	98%	99%	#N/A
DK	180	203	48	0	178	63%	99%	52%	95%	38%	48%	32%	44%	40%	91%	#N/A	89%	92%	#N/A
EE	86	109	24	0	86	100%	100%	100%	100%	100%	100%	42%	56%	42%	96%	0%	94%	100%	#N/A
EL	59	21	54	0	35	98%	100%	3%	40%	#N/A	0%	100%	100%	100%	5%	100%	0%	0%	#N/A
ES	246	281	91	47	181	96%	98%	68%	93%	89%	61%	65%	76%	68%	71%	100%	67%	85%	#N/A
FI	586	204	19	49	231	43%	18%	25%	16%	15%	33%	15%	40%	20%	54%	0%	53%	58%	#N/A
FR	45587	49326	136	0	89	0%	0%	9%	10%	12%	9%	0%	5%	1%	1%	6%	2%	0%	0%
HR	116	139	16	0	56	51%	100%	13%	6%	7%	13%	2%	16%	6%	37%	33%	28%	53%	#N/A
HU	110	48	19	0	1	0%	0%	31%	36%	28%	35%	4%	5%	8%	17%	60%	10%	15%	#N/A
IE	76	22	42	0	76	96%	5%	100%	100%	100%	100%	0%	0%	0%	100%	100%	100%	100%	#N/A
IS	148	11	0	2	42	27%	36%	34%	94%	100%	93%	0%	0%	21%	83%	#N/A	67%	100%	#N/A
IT	19122	2645	128	9572	813	51%	5%	8%	6%	11%	12%	1%	3%	1%	1%	0%	2%	0%	0%
LI	60	3	0	0	47	0%	0%	15%	11%	17%	9%	15%	20%	17%	0%	#N/A	0%	0%	#N/A
LT	116	97	93	0	116	96%	100%	98%	97%	100%	99%	31%	31%	89%	94%	100%	90%	98%	#N/A
LU	304	59	92	0	304	99%	98%	70%	100%	92%	59%	84%	88%	94%	100%	100%	100%	100%	#N/A
LV	158	234	61	0	0	0%	0%	73%	76%	63%	79%	53%	59%	55%	4%	#N/A	6%	2%	#N/A
MT	150	151	51	0	150	70%	89%	95%	93%	100%	94%	81%	98%	83%	0%	0%	0%	0%	#N/A
NL	218	324	36	0	207	22%	67%	47%	67%	64%	38%	57%	63%	61%	92%	#N/A	93%	92%	#N/A
NO	161	254	14	2	158	1%	0%	43%	68%	43%	37%	14%	17%	42%	0%	0%	0%	0%	#N/A
PL	296	287	60	1	122	36%	6%	40%	91%	13%	29%	16%	17%	34%	83%	100%	72%	88%	#N/A
PT	625	605	145	233	292	55%	41%	41%	65%	41%	38%	56%	80%	64%	55%	#N/A	56%	53%	#N/A
RO	105	67	28	15	88	93%	97%	38%	70%	31%	29%	30%	33%	30%	89%	100%	93%	83%	#N/A
SE	247	206	58	0	247	91%	75%	100%	99%	100%	100%	72%	81%	81%	100%	100%	99%	100%	#N/A
SI	94	74	9	0	80	70%	89%	61%	75%	57%	62%	12%	40%	16%	92%	#N/A	86%	100%	#N/A
SK	286	285	61	5	198	60%	75%	3%	5%	3%	1%	21%	27%	24%	31%	14%	29%	34%	0%

Overall results – Comparison vs. 2019

 increase of at least 10% compared to 2019
 increase/decrease of less than 10% compared to 2019
 decrease of at least 10% compared to 2019

	DSi1.1	DSi1.2	DSi1.3	DSi1.4	DSi1.5	MDi1.1	MDi1.2	DSi2	DSi2.1	DSi2.2	DSi2.3	NSi2	NSi2.1	NSi2.2	NSi4	NSi4.1	NSi4.2	NSi4.3	NSi4.4
AT	509	510	137	265	244	95%	92%	66%	75%	69%	61%	83%	93%	85%	93%	100%	89%	97%	#N/A
BE	636	241	355	531	94	86%	49%	62%	95%	22%	65%	86%	89%	90%	88%	67%	89%	88%	#N/A
BG	132	8	115	42	79	0%	0%	85%	82%	11%	97%	58%	60%	58%	50%	50%	100%	0%	#N/A
CH	212	30	0	0	1	0%	0%	2%	7%	2%	0%	1%	2%	1%	0%	0%	0%	0%	#N/A
CY	30	44	9	0	0	0%	0%	3%	0%	50%	0%	40%	53%	80%	0%	#N/A	0%	0%	#N/A
CZ	142	182	33	55	84	58%	79%	39%	87%	73%	24%	37%	62%	40%	80%	100%	75%	84%	100%
DE	58504	88068	144	2098	135	19%	80%	55%	58%	50%	55%	61%	64%	63%	98%	100%	98%	99%	#N/A
DK	180	203	48	0	178	63%	99%	52%	95%	38%	48%	32%	44%	40%	91%	#N/A	89%	92%	#N/A
EE	86	109	24	0	86	100%	100%	100%	100%	100%	100%	42%	56%	42%	96%	0%	94%	100%	#N/A
EL	59	21	54	0	35	98%	100%	3%	40%	#N/A	0%	100%	100%	100%	5%	100%	0%	0%	#N/A
ES	246	281	91	47	181	96%	98%	68%	93%	89%	61%	65%	76%	68%	71%	100%	67%	85%	#N/A
FI	586	204	19	49	231	43%	18%	25%	16%	15%	33%	15%	40%	20%	54%	0%	53%	58%	#N/A
FR	45587	49326	136	0	89	0%	0%	9%	10%	12%	9%	0%	5%	1%	1%	6%	2%	0%	0%
HR	116	139	16	0	56	51%	100%	13%	6%	7%	13%	2%	16%	6%	37%	33%	28%	53%	#N/A
HU	110	48	19	0	1	0%	0%	31%	36%	28%	35%	4%	5%	8%	17%	60%	10%	15%	#N/A
IE	76	22	42	0	76	96%	5%	100%	100%	100%	100%	0%	0%	0%	100%	100%	100%	100%	#N/A
IS	148	11	0	2	42	27%	36%	34%	94%	100%	93%	0%	0%	21%	83%	#N/A	67%	100%	#N/A
IT	19122	2645	128	9572	813	51%	5%	8%	6%	11%	12%	1%	3%	1%	1%	0%	2%	0%	0%
LI	60	3	0	0	47	0%	0%	15%	11%	17%	9%	15%	20%	17%	0%	#N/A	0%	0%	#N/A
LT	116	97	93	0	116	96%	100%	98%	97%	100%	99%	31%	31%	89%	94%	100%	90%	98%	#N/A
LU	304	59	92	0	304	99%	98%	70%	100%	92%	59%	84%	88%	94%	100%	100%	100%	100%	#N/A
LV	158	234	61	0	0	0%	0%	73%	76%	63%	79%	53%	59%	55%	4%	#N/A	6%	2%	#N/A
MT	150	151	51	0	150	70%	89%	95%	93%	100%	94%	81%	98%	83%	0%	0%	0%	0%	#N/A
NL	218	324	36	0	207	22%	67%	47%	67%	64%	38%	57%	63%	61%	92%	#N/A	93%	92%	#N/A
NO	161	254	14	2	158	1%	0%	43%	68%	43%	37%	14%	17%	42%	0%	0%	0%	0%	#N/A
PL	296	287	60	1	122	36%	6%	40%	91%	13%	29%	16%	17%	34%	83%	100%	72%	88%	#N/A
PT	625	605	145	233	292	55%	41%	41%	65%	41%	38%	56%	80%	64%	55%	#N/A	56%	53%	#N/A
RO	105	67	28	15	88	93%	97%	38%	70%	31%	29%	30%	33%	30%	89%	100%	93%	83%	#N/A
SE	247	206	58	0	247	91%	75%	100%	99%	100%	100%	72%	81%	81%	100%	100%	99%	100%	#N/A
SI	94	74	9	0	80	70%	89%	61%	75%	57%	62%	12%	40%	16%	92%	#N/A	86%	100%	#N/A
SK	286	285	61	5	198	60%	75%	3%	5%	3%	1%	21%	27%	24%	31%	14%	29%	34%	0%

Aggregated results

≥ 90% or increase of at least 10% compared to 2019
 increase/decrease of less than 10% compared to 2019
 < 10% or decrease of at least 10% compared to 2019

	DSi1.1	DSi1.2	DSi1.3	DSi1.4	DSi1.5	MDi1.1	MDi1.2	DSi2	DSi2.1	DSi2.2	DSi2.3	NSi2	NSi2.1	NSi2.2	NSi4	NSi4.1	NSi4.2	NSi4.3	NSi4.4
AT	509	510	137	265	244	95%	92%	66%	75%	69%	61%	83%	93%	85%	93%	100%	89%	97%	#N/A
BE	636	241	355	531	94	86%	49%	62%	95%	22%	65%	86%	89%	90%	88%	67%	89%	88%	#N/A
BG	132	8	115	42	79	0%	0%	85%	82%	11%	97%	58%	60%	58%	50%	50%	100%	0%	#N/A
CH	212	30	0	0	1	0%	0%	2%	7%	2%	0%	1%	2%	1%	0%	0%	0%	0%	#N/A
CY	30	44	9	0	0	0%	0%	3%	0%	50%	0%	40%	53%	80%	0%	#N/A	0%	0%	#N/A
CZ	142	182	33	55	84	58%	79%	39%	87%	73%	24%	37%	62%	40%	80%	100%	75%	84%	100%
DE	58504	88068	144	2098	135	19%	80%	55%	58%	50%	55%	61%	64%	63%	98%	100%	98%	99%	#N/A
DK	180	203	48	0	178	63%	99%	52%	95%	38%	48%	32%	44%	40%	91%	#N/A	89%	92%	#N/A
EE	86	109	24	0	86	100%	100%	100%	100%	100%	100%	42%	56%	42%	96%	0%	94%	100%	#N/A
EL	59	21	54	0	35	98%	100%	3%	40%	#N/A	0%	100%	100%	100%	5%	100%	0%	0%	#N/A
ES	246	281	91	47	181	96%	98%	68%	93%	89%	61%	65%	76%	68%	71%	100%	67%	85%	#N/A
FI	586	204	19	49	231	43%	18%	25%	16%	15%	33%	15%	40%	20%	54%	0%	53%	58%	#N/A
FR	45587	49326	136	0	89	0%	0%	9%	10%	12%	9%	0%	5%	1%	1%	6%	2%	0%	0%
HR	116	139	16	0	56	51%	100%	13%	6%	7%	13%	2%	16%	6%	37%	33%	28%	53%	#N/A
HU	110	48	19	0	1	0%	0%	31%	36%	28%	35%	4%	5%	8%	17%	60%	10%	15%	#N/A
IE	76	22	42	0	76	96%	5%	100%	100%	100%	100%	0%	0%	0%	100%	100%	100%	100%	#N/A
IS	148	11	0	2	42	27%	36%	34%	94%	100%	93%	0%	0%	21%	83%	#N/A	67%	100%	#N/A
IT	19122	2645	128	9572	813	51%	5%	8%	6%	11%	12%	1%	3%	1%	1%	0%	2%	0%	0%
LI	60	3	0	0	47	0%	0%	15%	11%	17%	9%	15%	20%	17%	0%	#N/A	0%	0%	#N/A
LT	116	97	93	0	116	96%	100%	98%	97%	100%	99%	31%	31%	89%	94%	100%	90%	98%	#N/A
LU	304	59	92	0	304	99%	98%	70%	100%	92%	59%	84%	88%	94%	100%	100%	100%	100%	#N/A
LV	158	234	61	0	0	0%	0%	73%	76%	63%	79%	53%	59%	55%	4%	#N/A	6%	2%	#N/A
MT	150	151	51	0	150	70%	89%	95%	93%	100%	94%	81%	98%	83%	0%	0%	0%	0%	#N/A
NL	218	324	36	0	207	22%	67%	47%	67%	64%	38%	57%	63%	61%	92%	#N/A	93%	92%	#N/A
NO	161	254	14	2	158	1%	0%	43%	68%	43%	37%	14%	17%	42%	0%	0%	0%	0%	#N/A
PL	296	287	60	1	122	36%	6%	40%	91%	13%	29%	16%	17%	34%	83%	100%	72%	88%	#N/A
PT	625	605	145	233	292	55%	41%	41%	65%	41%	38%	56%	80%	64%	55%	#N/A	56%	53%	#N/A
RO	105	67	28	15	88	93%	97%	38%	70%	31%	29%	30%	33%	30%	89%	100%	93%	83%	#N/A
SE	247	206	58	0	247	91%	75%	100%	99%	100%	100%	72%	81%	81%	100%	100%	99%	100%	#N/A
SI	94	74	9	0	80	70%	89%	61%	75%	57%	62%	12%	40%	16%	92%	#N/A	86%	100%	#N/A
SK	286	285	61	5	198	60%	75%	3%	5%	3%	1%	21%	27%	24%	31%	14%	29%	34%	0%

Monitoring and Reporting 2020 - Conclusions

- Process prepared well in advance:
 - clear **release plans** and **changelogs** for the software used
 - clear **communication** on testing periods
 - availability of **tools** for Member States to pre-calculate the indicators
- **Results:**
 - on average, **implementation improved** compared to 2019
 - improved **conformity of metadata** (including transition to TG v.2.0)
 - improved **accessibility of data sets**
 - full implementation still to be achieved
 - implementation still **heterogeneous across Member States**

Thank you!



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