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<td>Petr Holub, Outi Törnwall</td>
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Glossary

ELSI  Ethical, Legals, Societal Issues
IT   Information Technologies
KPI  Key Performance Indicator
NN   National Node

PI   Performance Indicator
PoM  Place of Measurement
QM   Quality Management

T.b.d.  to be defined
1 Introduction

The purpose of this document is to summarize a first set of performance indicators related to the vision, mission, and tasks of BBMRI-ERIC (Figure 1.1) expressed in the BBMRI-ERIC Statutes. It aims at providing ground for further discussions and consensus searching activities within the community and among its various stakeholders. After a consensus is reached, the performance indicators will be adopted and implemented on all levels (see Figure 1.2).

The current proposed set of performance indicators is excessive and serves only as a cookbook for selection of the appropriate ones, the most important of which will be established as key performance indicators.

Definitions. Performance measures are quantifiable and relevant to a specific goal and relate to an activity in BBMRI-ERIC. Performance measures can be either absolute numbers (e.g., number of users) or relative numbers (e.g., ratio of number of active users to all users). When performance measures are used to define goals for a given time period, they are used as a relative difference between the baseline value \( m_{\text{baseline}} \) at the beginning of the period and target value \( m_{\text{target}} \) at the end of period. The relative difference\(^1\) \( i \) is called a performance indicator – this can be e.g., \( \% \) (or 20\% expressed in percents) increase of number of users. Performance indicators are then used for performance evaluation as defined in ISO 9001.\(^2\)

In this document, we will describe performance measures, as each performance indicator can be constructed from the corresponding measure using the formula above. Performance measures, including their definition, are listed in the summary table in Chapter 4 and numbered at no particular order using symbols like #88. Performance measures attached to the Tasks are sorted based on decreasing order of importance and are provided with a reference to the definition and levels on which the measure is obtained. Each performance measure or indicator may be used for different Tasks possibly with different importance (hence no specific overall measure sorting).

\(^1\) Relative difference for the purposes of performance indicators is defined as

\[
i = \frac{m_{\text{target}} - m_{\text{baseline}}}{m_{\text{baseline}}} \times 100\% \]

and assuming \( m_{\text{baseline}} > 0 \) and \( m_{\text{target}} > 0 \), otherwise the performance indicator is not defined. Performance indicators can be given directly as unit-less numbers, or in percents (where \( +100\% \) applies).

\(^2\) ISO 9001.
Once the key performance indicators are selected out of the proposed pool of measures/indicators in Chapter 4, they will be defined in detail in a new section of future revision of this document. This is necessary to ensure consistent implementation of these key performance indicators.

**Definition of a “biobank”**. For the purposes of performance evaluation, only biobanks that have signed Partner Charter of BBMRI-ERIC should be included.

**Overview of the evolution towards BBMRI-ERIC performance measures**. Major events where performance measures have been discussed so far:

- BBMRI-ERIC Scientific Retreat #2 – June 1–3, 2015, Schloss Obermayerhofer, Austria
- BBMRI-ERIC Scientific Retreat #3 – May 23–25, 2016, Athens, Greece
- Reviewed by the BBMRI-ERIC Management Committee members – July – September, 2016

Furthermore, the key performance indicators is a deliverable of H2020 project ADOPT BBMRI-ERIC and are in line with the following deliverables/milestones:

- D2.6: "Performance indicators for biobanks" report of ADOPT BBMRI-ERIC– September 2017
- MS5: "Performance indicators for biobanks monitored in all Member States" milestone ADOPT BBMRI-ERIC to have performance indicators practically implemented – September 2018
Figure 1.1: Relation between vision, mission, performance indicators, and actions.

Figure 1.2: Process of designing and implementing performance indicators.

* Pan-European: Common Service IT, Common Service ELSI, Quality Management Service, Management Committee, Stakeholder Forum, Headquarters BBMRI-ERIC
2 Vision and Mission Statement

**BBMRI-ERIC Vision**

BBMRI-ERIC will increase efficacy and excellence of European bio-medical research.

*Business Plan v21.1 03.12.2012, p. 6*

**BBMRI-ERIC Mission**

BBMRI-ERIC shall establish, operate and develop a pan-European distributed research infrastructure of Biobanks and Biomolecular Resources in order to facilitate the access to resources as well as facilities and to support high quality biomolecular and medical research. BBMRI-ERIC shall implement its Work Programme as adopted by the Assembly of Members.

*Statutes of BBMRI-ERIC, 3 December 2013, L320/62-80, Article 3 (Rev 1, 19 June 2015)*

3 Tasks and Proposed Performance Measures

**BBMRI-ERIC Task**

(a) *grant effective access to its resources and services* in accordance with the rules defined in these Statutes to the European research community, composed of researchers from Members;

Relevant proposed performance measures for this task:

- Number of recognized individual users using services (a per service and aggregated) (#4, Pan-European, Nodes, biobanks)

*“Pan-European” stands for BBMRI-ERIC Common Services (ELSI, IT), Stakeholder Forum, and headquarters; “Nodes” stands for National and Organizational Nodes of BBMRI-ERIC; “biobanks” stands for biobanks and bioresources. Candidates for key performance indicators are marked in bold.*
• Number of biobanks connected to core BBMRI-ERIC CS IT services (#36, Nodes)
• Ratio between number of samples delivered to requesters and the total number of samples stored by the biobank (#37, biobanks)
• Ratio between number of accepted applications and number of received applications for samples and/or data. (#38, biobanks)
• Median time to access samples/data (#39, biobanks)
• Number of biobanks that signed Partner Charter (#32, Nodes)
• Number of published success stories related to the main mission and tasks of BBMRI-ERIC (#15, Pan-European, Nodes, biobanks)
• Number of papers where biobank was acknowledged as provider of samples, data, or expertise (#40, biobanks)
• Number of ELSI requests dealt with in relation to projects (#18, Pan-European)
• Number of ELSI requests dealt with in relation to biobanks (#19, Pan-European)
• Number of webinars related to ELSI education and training and experience sharing (#20, Pan-European)

**BBMRI-ERIC Task**

(b) improve the interoperability between Biobanks and Biological Resource Centres of Members;

Relevant proposed performance measures for this task:

• Number of recognized individual users using services (a per service and aggregated) (#4, Pan-European, Nodes, biobanks)
• Number of biobanks connected to core BBMRI-ERIC CS IT services (#36, Nodes)
• Number of new community standards, guidelines, policies as outcomes of the BBMRI-ERIC Working Groups and Common Services (#9, Pan-European)
• Number of domain experts involved (per service/working group and aggregated) (#7, Pan-European, Nodes)
• Number of countries involved in BBMRI-ERIC Working Groups (#8, Pan-European)
• Number of samples with quality label report attached (#10, biobanks)
• Number of data sets with complete provenance information available (#11, biobanks)
• Number of biobanks implementing certain quality standards (#35, Nodes)
• Number of biobanks connected to core BBMRI-ERIC CS IT services (#36, Nodes)

*Pan-European* stands for BBMRI-ERIC Common Services (ELSI, IT), Stakeholder Forum, and headquarters; *Nodes* stands for National and Organizational Nodes of BBMRI-ERIC; *biobanks* stands for biobanks and bioresources. Candidates for key performance indicators are marked in **bold**.
BBMRI-ERIC Task

(c) **implement quality management** including standardised procedures, best practices and appropriate tools to increase the quality of the resources collected and their associated data;

Relevant proposed performance measures for this task:

- Number of new community standards, guidelines, policies as outcomes of the BBMRI-ERIC Working Groups and Common Services (#9, Pan-European)
- Number of samples with quality label report attached (#10, biobanks)
- Number of data sets with complete provenance information available (#11, biobanks)
- Number of biobanks implementing certain quality standards (#35, Nodes)
- Number of biobanks that filled out the quality self-assessment surveys (#12, Pan-European)
- Number of biobanks supported for certification & accreditation (#14, Pan-European)

BBMRI-ERIC Task

(d) **promote continuous enrichment of resources in Biobanks and associated data** in order to maintain an adequate supply of specimens to **keep up with the demands of the scientific community** as well as to ensure continuous enrichment of the information associated with and generated by the analysis of biobanked samples. It shall contribute to increased use and dissemination of knowledge as well as optimisation of the results of biobank-based research activities throughout Europe;

Relevant proposed performance measures for this task:

- Number of projects that return data to biobanks (#41, biobanks)
- Number of Expert Centres (#5, Pan-European)
- Number of biobanks offering prospective collection service and capable of following custom SOPs (#33, Nodes)
- Number of members participating in the CS IT User Forum (#29, Pan-European)
- Response ratio for request sent to the CS IT User Forum (#30, Pan-European)

Additional relevant (K)PIs to be developed as a part of initialization of “biomolecular resources” (second “B” of BBMRI-ERIC).

*Pan-European* stands for BBMRI-ERIC Common Services (ELSI, IT), Stakeholder Forum, and headquarters; “Nodes” stands for National and Organizational Nodes of BBMRI-ERIC; “biobanks” stands for biobanks and bioresources. Candidates for key performance indicators are marked in **bold**.
BBMRI-ERIC Task

(e) establish and operate Common Services for the European biobanking community;

Relevant proposed performance measures for this task:

- Number of recognized individual users using services (a per service and aggregated) (#4, Pan-European, Nodes, biobanks)
- Number of commented recommendations, guidance documents, directives (#16, Pan-European)
- Number of ELSI requests dealt with in relation to projects (#18, Pan-European)
- Number of ELSI requests dealt with in relation to biobanks (#19, Pan-European)
- Number of webinars related to ELSI education and training and experience sharing (#20, Pan-European)
- Number of biobanks connected to core BBMRI-ERIC CS IT services (#36, Nodes)
- Number of domain experts involved (per service/working group and aggregated) (#7, Pan-European, Nodes)
- Number of countries involved in BBMRI-ERIC Working Groups (#8, Pan-European)

BBMRI-ERIC Task

(f) perform research services for public and private institutions;

Relevant proposed performance measures for this task:

- Number of Expert Centres (#5, Pan-European)

Additional relevant (K)PIs to be developed as a part of initialization of “biomolecular resources” (second “B” of BBMRI-ERIC).

BBMRI-ERIC Task

(g) establish and implement technological developments related to the resources and services;

Relevant proposed performance measures for this task:

- Number of services (#3, Pan-European)
- Technology development related to operation of biobanks (#42, biobanks)

Additional relevant (K)PIs to be developed as a part of initialization of “biomolecular resources” (second “B” of BBMRI-ERIC).

“Pan-European” stands for BBMRI-ERIC Common Services (ELSI, IT), Stakeholder Forum, and headquarters; “Nodes” stands for National and Organizational Nodes of BBMRI-ERIC; “biobanks” stands for biobanks and bioresources. Candidates for key performance indicators are marked in bold.
**BBMRI-ERIC Task**

(h) provide training and facilitate mobility of researchers to support the establishment of new Biobanks and Biomolecular Resource Centres to strengthen and structure the European Research Area;

**Relevant proposed performance measures for this task:**

- Number of recognized individual users using services (a per service and aggregated) (#4, Pan-European, Nodes, biobanks)
- Number of dissemination events related to QM and interoperability standards (#13, Pan-European)
- Number of dissemination events (#21, Pan-European)
- Number of projects focused on mobility (#23, Pan-European)
- **Number of Members and Observers of BBMRI-ERIC (#1, Pan-European)**

**BBMRI-ERIC Task**

(i) establish international relationships and launch joint activities with other European and non-European organisations concerned with its activities and in related fields, and when appropriate become a member of such organisations;

**Relevant proposed performance measures for this task:**

- Number of new community standards, guidelines, policies as outcomes of the BBMRI-ERIC Working Groups and Common Services (#9, Pan-European)
- Number of BBMRI-ERIC presentations in Europe (#24, Pan-European)
- Number of BBMRI-ERIC presentations outside of Europe (#25, Pan-European)
- Number of agreements between BBMRI-ERIC and learned societies (#26, Pan-European)
- Number of MoUs BBMRI-ERIC has signed with other research infrastructures and organisations (#27, Pan-European)
- Number of launched joint activities (#28, Pan-European)
- **Number of Members and Observers of BBMRI-ERIC (#1, Pan-European)**
- Number of ELSI requests dealt with in relation to projects (#18, Pan-European)

**BBMRI-ERIC Task**

(j) undertake any other activity necessary to fulfil its tasks.

**Relevant proposed performance measures for this task:**

- Number of subscribers in the e-newsflash (#31, Pan-European)

*Pan-European* stands for BBMRI-ERIC Common Services (ELSI, IT), Stakeholder Forum, and headquarters; *Nodes* stands for National and Organizational Nodes of BBMRI-ERIC; *biobanks* stands for biobanks and bioresources. Candidates for key performance indicators are marked in **bold**.
- **Number of users receiving outputs of dissemination activities from National or Organizational Node (#34, Nodes)**
- **Number of posts in social networks by BBMRI-ERIC or mentioning BBMRI-ERIC (#22, Pan-European, Nodes, biobanks)**

*Pan-European* stands for BBMRI-ERIC Common Services (ELSI, IT), Stakeholder Forum, and headquarters; *Nodes* stands for National and Organizational Nodes of BBMRI-ERIC; *biobanks* stands for biobanks and bioresources. Candidates for key performance indicators are marked in **bold**.
4 Overview of Candidates for Performance Measures

The following list of uses bold text to denote candidate performance measures that are candidates for turning into Key Performance Indicators (see Chapter 1 for relation between performance measures and indicators).

Point of Measurement can be: Pan-European (on the level of whole BBMRI-ERIC including its headquarters and common services) or BBMRI-ERIC national (organizational) node or biobank.

For the purposes of performance evaluation, only biobanks that have signed Partner Charter of BBMRI-ERIC should be included.

Once adopted, these measures will receive baseline value and the target value (see construction of performance indicators in Chapter 1).

<table>
<thead>
<tr>
<th>#</th>
<th>Name</th>
<th>Definition</th>
<th>Point of Measurement</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>Number of Members and Observers of BBMRI-ERIC</td>
<td>Number of countries and international organizations that were Members or Observers of BBMRI-ERIC (as defined in BBMRI-ERIC Statutes).</td>
<td>Pan-European</td>
<td>yearly</td>
</tr>
<tr>
<td>#2</td>
<td>Proportion of external sources to overall budget of BBMRI-ERIC.</td>
<td>Proportion of external sources to overall budget of BBMRI-ERIC. This includes all external sources, such as H2020 projects, IMI projects, etc., not including BBMRI-ERIC Core Budget.</td>
<td>Pan-European</td>
<td>yearly</td>
</tr>
<tr>
<td>#3</td>
<td>Number of services</td>
<td>Number of services deployed (made available for the users) by BBMRI-ERIC on Pan-European level. Each service must be declared as a service and must be clearly defined, also in terms of its target user group(s). <a href="http://www.bbmri-eric.eu/bbmri-eric-services/">Link</a></td>
<td>Pan-European</td>
<td>yearly</td>
</tr>
</tbody>
</table>

*Pan-European" stands for BBMRI-ERIC Common Services (ELSI, IT), Stakeholder Forum, and headquarters; "Nodes" stands for National and Organizational Nodes of BBMRI-ERIC; "biobanks" stands for biobanks and bioresources. Candidates for key performance indicators are marked in bold.
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<th>#</th>
<th>Name</th>
<th>Definition</th>
<th>Point of Measurement</th>
<th>Frequency</th>
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<tbody>
<tr>
<td>4</td>
<td>Number of recognized individual users using services (a per service and aggregated)</td>
<td>Number of recognized individual (e.g., authenticated) users using services collected per service, and then aggregated across all the services. The aggregation of per-service data into overall result will be done in two ways: (1) by counting individual users, i.e., one user should not be counted multiple times, (2) by summing up all the service-users. Examples of services include BBMRI-ERIC Negotiator and Locator, ELSI Helpdesk, or QM Consultancy.</td>
<td>Pan-European, Nodes, biobanks</td>
<td>quarterly</td>
</tr>
<tr>
<td>5</td>
<td>Number of Expert Centres</td>
<td>Number of Expert Centres established by BBMRI-ERIC.</td>
<td>Pan-European</td>
<td>yearly</td>
</tr>
<tr>
<td>6</td>
<td>Number of invited talks</td>
<td>Number of invited talks of BBMRI-ERIC personnel (presentations).</td>
<td>Pan-European</td>
<td>yearly</td>
</tr>
<tr>
<td>7</td>
<td>Number of domain experts involved (per service/working group and aggregated)</td>
<td>Number of domain experts involved (per service/working group and aggregated). The aggregation is done by counting physical persons (not multiple-counting).</td>
<td>Pan-European, Nodes</td>
<td>yearly</td>
</tr>
<tr>
<td>8</td>
<td>Number of countries involved in BBMRI-ERIC Working Groups</td>
<td>Number of countries involved in BBMRI-ERIC Working Groups and ELSI Task Forces.</td>
<td>Pan-European</td>
<td>yearly</td>
</tr>
<tr>
<td>9</td>
<td>Number of new community standards, guidelines, policies as outcomes of the BBMRI-ERIC Working Groups and Common Services</td>
<td>Number of new community standards, guidelines, policies as outcomes of the BBMRI-ERIC Working Groups and Common Services. Examples include MIABIS 2.0 Core and CoBRA guidelines.</td>
<td>Pan-European</td>
<td>yearly</td>
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</tbody>
</table>

"Pan-European" stands for BBMRI-ERIC Common Services (ELSI, IT), Stakeholder Forum, and headquarters; "Nodes" stands for National and Organizational Nodes of BBMRI-ERIC; "biobanks" stands for biobanks and bioresources. Candidates for key performance indicators are marked in bold.
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<th>Definition</th>
<th>Point of Measurement</th>
<th>Frequency</th>
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<tr>
<td>#10</td>
<td>Number of samples with quality label report attached</td>
<td>Number of samples with quality label report attached. (Quality label is now under development by BBMRI-ERIC.)</td>
<td>biobanks</td>
<td>yearly</td>
</tr>
<tr>
<td>#11</td>
<td>Number of data sets with complete provenance information available</td>
<td>Number of data sets with complete provenance information available. Complete provenance information includes link from the data via samples (if the data is generated from samples) to the research participant. The provenance information also includes “quality labels” of samples, if samples are involved.</td>
<td>biobanks</td>
<td>yearly</td>
</tr>
<tr>
<td>#12</td>
<td>Number of biobanks that filled out the quality self-assessment surveys</td>
<td>Number of biobanks that filled out the quality self-assessment surveys.</td>
<td>Pan-European</td>
<td>yearly</td>
</tr>
<tr>
<td>#13</td>
<td>Number of dissemination events related to QM and interoperability standards</td>
<td>Number of dissemination events (both physical or online – trainings, webinars, etc.) related to QM and interoperability standards.</td>
<td>Pan-European</td>
<td>yearly</td>
</tr>
<tr>
<td>#14</td>
<td>Number of biobanks supported for certification &amp; accreditation</td>
<td>How many biobanks were supported by Quality Service of BBMRI-ERIC in the process of obtaining certification &amp; accreditation.</td>
<td>Pan-European</td>
<td>yearly</td>
</tr>
<tr>
<td>#15</td>
<td>Number of published success stories related to the main mission and tasks of BBMRI-ERIC</td>
<td>Number of success stories related to the main mission and tasks of BBMRI-ERIC, published by the users of biobanks or about them, with a link to the biobanks.</td>
<td>Pan-European, Nodes, biobanks</td>
<td>yearly</td>
</tr>
<tr>
<td>#16</td>
<td>Number of commented recommendations, guidance documents, directives</td>
<td>Number of commented recommendations, guidance documents, directives, such as WHO, Council of Europe, OECD, GDPR, etc.</td>
<td>Pan-European</td>
<td>yearly</td>
</tr>
</tbody>
</table>

"Pan-European" stands for BBMRI-ERIC Common Services (ELSI, IT), Stakeholder Forum, and headquarters; "Nodes" stands for National and Organizational Nodes of BBMRI-ERIC; "biobanks" stands for biobanks and bioresources. Candidates for key performance indicators are marked in bold.
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<th>Definition</th>
<th>Point of Measurement</th>
<th>Frequency</th>
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<tbody>
<tr>
<td>#17</td>
<td>Ratio between number of ELSI requests accomplished and total number of ELSI requests</td>
<td>Ratio between number of ELSI requests accomplished and total number of ELSI requests</td>
<td>Pan-European</td>
<td>yearly</td>
</tr>
<tr>
<td>#18</td>
<td>Number of ELSI requests dealt with in relation to projects</td>
<td>Number of ELSI requests dealt with in relation to projects. Assistance and advise with ethical reviews, ethical assessments</td>
<td>Pan-European</td>
<td>yearly</td>
</tr>
<tr>
<td>#19</td>
<td>Number of ELSI requests dealt with in relation to biobanks</td>
<td>Number of ELSI requests dealt with in relation to biobanks, e.g., assistance with setting up material and data transfer agreement templates, governance structure, or particular ELSI issue such as across border issue or reuse of samples.</td>
<td>Pan-European</td>
<td>yearly</td>
</tr>
<tr>
<td>#20</td>
<td>Number of webinars related to ELSI education and training and experience sharing</td>
<td>Number of webinars related to ELSI education and training and experience sharing</td>
<td>Pan-European</td>
<td>yearly</td>
</tr>
<tr>
<td>#21</td>
<td>Number of dissemination events</td>
<td>Number of dissemination events, including courses, webinars, etc.</td>
<td>Pan-European</td>
<td>yearly</td>
</tr>
<tr>
<td>#22</td>
<td>Number of posts in social networks by BBMRI-ERIC or mentioning BBMRI-ERIC</td>
<td>Number of posts in social networks by BBMRI-ERIC or mentioning BBMRI-ERIC (currently Twitter and LinkedIn).</td>
<td>Pan-European, Nodes, biobanks</td>
<td>yearly</td>
</tr>
<tr>
<td>#23</td>
<td>Number of projects focused on mobility</td>
<td>Number of projects focused on mobility (such as COST), involving BBMRI-ERIC or at least participants related to the National or Organizational Nodes from two BBMRI-ERIC members or observers.</td>
<td>Pan-European</td>
<td>yearly</td>
</tr>
<tr>
<td>#24</td>
<td>Number of BBMRI-ERIC presentations in Europe</td>
<td>Number of BBMRI-ERIC presentations in Europe.</td>
<td>Pan-European</td>
<td>yearly</td>
</tr>
</tbody>
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*Pan-European* stands for BBMRI-ERIC Common Services (ELSI, IT), Stakeholder Forum, and headquarters; *Nodes* stands for National and Organizational Nodes of BBMRI-ERIC; *biobanks* stands for biobanks and bioresources. Candidates for key performance indicators are marked in **bold**.
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<th>Definition</th>
<th>Point of Measurement</th>
<th>Frequency</th>
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<tr>
<td>#25</td>
<td>Number of BBMRI-ERIC presentations outside of Europe</td>
<td>Number of BBMRI-ERIC presentations outside of Europe.</td>
<td>Pan-European</td>
<td>yearly</td>
</tr>
<tr>
<td>#26</td>
<td>Number of agreements between BBMRI-ERIC and learned societies</td>
<td>Number of agreements between BBMRI-ERIC and learned societies.</td>
<td>Pan-European</td>
<td>yearly</td>
</tr>
<tr>
<td>#27</td>
<td>Number of MoUs BBMRI-ERIC has signed with other research infrastructures and organisations</td>
<td>Number of MoUs BBMRI-ERIC has signed with other research infrastructures and organisations.</td>
<td>Pan-European</td>
<td>yearly</td>
</tr>
<tr>
<td>#28</td>
<td>Number of launched joint activities</td>
<td>Number of launched joint activities (projects, possibly other clearly documented activities), involving BBMRI-ERIC or at least participants related to the National or Organizational Nodes from two BBMRI-ERIC members or observers.</td>
<td>Pan-European</td>
<td>yearly</td>
</tr>
<tr>
<td>#29</td>
<td>Number of members participating in the CS IT User Forum</td>
<td>Number of User Forum members, representing various types of users and stakeholders (bio/medical and data-driven researchers requesting samples and data and/or requesting other services, biobankers, funders, citizens, software vendors, etc.).</td>
<td>Pan-European</td>
<td>yearly</td>
</tr>
<tr>
<td>#30</td>
<td>Response ratio for request sent to the CS IT User Forum</td>
<td>Average number of responses per request, based on the requests sent to the CS IT User Forum.</td>
<td>Pan-European</td>
<td>yearly</td>
</tr>
<tr>
<td>#31</td>
<td>Number of subscribers in the e-newsflash</td>
<td>Number of subscribers in the e-newsflash.</td>
<td>Pan-European</td>
<td>yearly</td>
</tr>
<tr>
<td>#32</td>
<td>Number of biobanks that signed Partner Charter</td>
<td>Number of biobanks that signed Partner Charter, either directly or indirectly via contract with a National or Organizational Node.</td>
<td>Nodes</td>
<td>yearly</td>
</tr>
</tbody>
</table>

*Pan-European* stands for BBMRI-ERIC Common Services (ELSI, IT), Stakeholder Forum, and headquarters; *Nodes* stands for National and Organizational Nodes of BBMRI-ERIC; *biobanks* stands for biobanks and bioresources. Candidates for key performance indicators are marked in bold.
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<td>Number of biobanks offering prospective collection service and capable of following custom SOPs</td>
<td>Number of biobanks offering prospective collection service and capable of following custom SOPs, hereby prepared for enriching their existing collections of samples and data by new resources.</td>
<td>Nodes</td>
<td>yearly</td>
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<td>Number of users receiving outputs of dissemination activities from National or Organizational Node</td>
<td>Number of users subscribed to receive outputs of dissemination activities from the National or Organizational Node via communication channels such as email distribution lists, social media, e-newsflash, webinars....</td>
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<td>Number of biobanks connected to core BBMRI-ERIC CS IT services</td>
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<td>Nodes</td>
<td>yearly</td>
</tr>
<tr>
<td>#37</td>
<td>Ratio between number of samples delivered to requesters and the total number of samples stored by the biobank</td>
<td>Ratio between number of samples delivered to requesters and the total number of samples stored by the biobank, based on the definition of the sample by ISO TC 276 outcomes.</td>
<td>biobanks</td>
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<td>#41</td>
<td>Number of projects that return data to biobanks</td>
<td>Number of formally approved and ongoing projects that return data to biobanks.</td>
<td>biobanks</td>
<td>yearly</td>
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<tr>
<td>#42</td>
<td>Technology development related to operation of biobanks</td>
<td>Technology development related to operation of biobanks, such as storage and processing of material and data. Countables are: number of publications, prototypes, patents, products delivered to market.</td>
<td>biobanks</td>
<td>yearly</td>
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*Pan-European* stands for BBMRI-ERIC Common Services (ELSI, IT), Stakeholder Forum, and headquarters; *Nodes* stands for National and Organizational Nodes of BBMRI-ERIC; *biobanks* stands for biobanks and bioresources. Candidates for key performance indicators are marked in **bold**.
5 Detailed Information on Performance Measures Suggested for Key Performance Indicators

5.1 Pan-European Level

- **Indicator: Number of Members and Observers of BBMRI-ERIC** (#1)
  
  **Definition:** Number of countries and international organizations that were Members or of Observers of BBMRI-ERIC (as defined in BBMRI-ERIC Statutes).
  
  **Levels:** Pan-European
  
  **Frequency:** yearly
  
  **Discussion:** Each country or international organization is counted once, even if they upgraded from an Observer to a Member in the given measurement period.

- **Indicator: Proportion of external sources to overall budget of BBMRI-ERIC.** (#2)
  
  **Definition:** Proportion of external sources to overall budget of BBMRI-ERIC. This includes all external sources, such as H2020 projects, IMI projects, etc., not including BBMRI-ERIC Core Budget.
  
  **Levels:** Pan-European
  
  **Frequency:** yearly

- **Indicator: Number of services** (#3)
  
  **Definition:** Number of services deployed (made available for the users) by BBMRI-ERIC on Pan-European level. Each service must be declared as a service and must be clearly defined, also in terms of its target user group(s). http://www.bbmri-eric.eu/bbmri-eric-services/
  
  **Levels:** Pan-European
  
  **Frequency:** yearly
  
  **Discussion:** BBMRI-ERIC website will contain a common catalogue of services, which will be used to declare the service and its target user group(s).

- **Indicator: Number of recognized individual users using services (a per service and aggregated)** (#4)
  
  **Definition:** Number of recognized individual (e.g., authenticated) users using services collected per service, and then aggregated across all the services. The aggregation of per-service data into overall result will be done in two ways: (1) by counting individual users, i.e., one user should not be counted multiple times, (2) by summing up all the service-users. Examples of services include BBMRI-ERIC Negotiator and Locator, ELSI Helpdesk, or QM Consultancy.
  
  **Levels:** Pan-European, Nodes, biobanks
  
  **Frequency:** quarterly
  
  **Discussion:** For services delivered directly by humans (such as ELSI legal advice), this may create substantial administrative overhead, particularly if service delivery is in small chunks.

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It is also to be discussed whether we want to distinguish between (a) primary users (using samples/data/expertise), (b) secondary users (using outcomes achieved by primary users – i.e., derived), (c) citizens in general. For simplicity reasons, the aggregation will be done by summing up, i.e., if a user uses three services, s/he will be counted 3 times.

- **Indicator: Number of Expert Centres (#5)**
  
  **Definition:** Number of Expert Centres established by BBMRI-ERIC.
  
  **Levels:** Pan-European
  
  **Frequency:** yearly

- **Indicator: Number of new community standards, guidelines, policies as outcomes of the BBMRI-ERIC Working Groups and Common Services (#9)**
  
  **Definition:** Number of new community standards, guidelines, policies as outcomes of the BBMRI-ERIC Working Groups and Common Services. Examples include MIABIS 2.0 Core and CoBRA guidelines.
  
  **Levels:** Pan-European
  
  **Frequency:** yearly

- **Indicator: Number of biobanks that filled out the quality self-assessment surveys (#12)**
  
  **Definition:** Number of biobanks that filled out the quality self-assessment surveys.
  
  **Levels:** Pan-European
  
  **Frequency:** yearly

- **Indicator: Number of subscribers in the e-newsflash (#31)**
  
  **Definition:** Number of subscribers in the e-newsflash.
  
  **Levels:** Pan-European
  
  **Frequency:** yearly

### 5.2 National or Organization Node Level

- **Indicator: Number of recognized individual users using services (a per service and aggregated) (#4)**
  
  **Definition:** Number of recognized individual (e.g., authenticated) users using services collected per service, and then aggregated across all the services. The aggregation of per-service data into overall result will be done in two ways: (1) by counting individual users, i.e., one user should not be counted multiple times, (2) by summing up all the service-users. Examples of services include BBMRI-ERIC Negotiator and Locator, ELSI Helpdesk, or QM Consultancy.
  
  **Levels:** Pan-European, Nodes, biobanks
  
  **Frequency:** quarterly
  
  **Discussion:** For services delivered directly by humans (such as ELSI legal advice), this may create substantial administrative overhead, particularly if service delivery is in small chunks. It is also to be discussed whether we want to distinguish between (a) primary users (using samples/data/expertise), (b) secondary users (using outcomes achieved by primary users – i.e., derived), (c) citizens in general.

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For simplicity reasons, the aggregation will be done by summing up, i.e., if a user uses three services, s/he will be counted 3 times.

- **Indicator: Number of biobanks that signed Partner Charter (#32)**
  - **Definition:** Number of biobanks that signed Partner Charter, either directly or indirectly via contract with a National or Organizational Node.
  - **Levels:** Nodes
  - **Frequency:** yearly
  - **Discussion:** national expertise and capacity building, we need to look into unification of interpretation of Partner Charter (FAQ?)

- **Indicator: Number of biobanks offering prospective collection service and capable of following custom SOPs (#33)**
  - **Definition:** Number of biobanks offering prospective collection service and capable of following custom SOPs, hereby prepared for enriching their existing collections of samples and data by new resources.
  - **Levels:** Nodes
  - **Frequency:** yearly
  - **Discussion:** national expertise and capacity building, reflects also adaptivity of the biobanks to changing demands by the users

- **Indicator: Number of users receiving outputs of dissemination activities from National or Organizational Node (#34)**
  - **Definition:** Number of users subscribed to receive outputs of dissemination activities from the National or Organizational Node via communication channels such as email distribution lists, social media, e-newsflash, webinars...
  - **Levels:** Nodes
  - **Frequency:** yearly

- **Indicator: Number of biobanks implementing certain quality standards (#35)**
  - **Definition:** Number certifications of biobanks implementing certain quality standards (ISO 9001, 15189, 17025). I.e., a biobank with certifications to 2 out of 3 standards counts as 2.
  - **Levels:** Nodes
  - **Frequency:** yearly

- **Indicator: Number of biobanks connected to core BBMRI-ERIC CS IT services (#36)**
  - **Definition:** Number of biobanks connected to core BBMRI-ERIC CS IT services (Directory, Locator, Negotiator, data harmonization services). Biobanks can be connected either directly or via its National or Organizational Node. One biobank is counted once per each service (i.e., 1 biobank connected to 4 services is counted as 4).
  - **Levels:** Nodes
  - **Frequency:** yearly

### 5.3 Biobank Level

- **Indicator: Number of recognized individual users using services (a per service and aggregated) (#4)**
**Definition:** Number of recognized individual (e.g., authenticated) users using services collected per service, and then aggregated across all the services. The aggregation of per-service data into overall result will be done in two ways: (1) by counting individual users, i.e., one user should not be counted multiple times, (2) by summing up all the service-users. Examples of services include BBMRI-ERIC Negotiator and Locator, ELSI Helpdesk, or QM Consultancy.

**Levels:** Pan-European, Nodes, biobanks

**Frequency:** quarterly

**Discussion:** For services delivered directly by humans (such as ELSI legal advice), this may create substantial administrative overhead, particularly if service delivery is in small chunks. It is also to be discussed whether we want to distinguish between (a) primary users (using samples/data/expertise), (b) secondary users (using outcomes achieved by primary users – i.e., derived), (c) citizens in general.

For simplicity reasons, the aggregation will be done by summing up, i.e., if a user uses three services, s/he will be counted 3 times.

- **Indicator:** Number of samples with quality label report attached (**#10**)
  
  **Definition:** Number of samples with quality label report attached. (Quality label is now under development by BBMRI-ERIC.)
  
  **Levels:** biobanks
  
  **Frequency:** yearly
  
  **Discussion:** Minimum requirements for quality label report needs to be clearly defined, referencing either CEN or ISO standards. It also assumes consensus is reached on the definition of a sample (ideally from ISO TC 276) so that there is unambiguous definition of how biological material is counted.

- **Indicator:** Number of data sets with complete provenance information available (**#11**)
  
  **Definition:** Number of data sets with complete provenance information available. Complete provenance information includes link from the data via samples (if the data is generated from samples) to the research participant. The provenance information also includes "quality labels" of samples, if samples are involved.
  
  **Levels:** biobanks
  
  **Frequency:** yearly
  
  **Discussion:** Requires acceptance of common provenance information standards and declaration of data sets (in the Directory or similar metadata repository service). Complete provenance information must link data all the way to the source, i.e., research participant. For privacy reason, the provenance information is likely be naturally distributed across multiple institutions, but must be linkable together.
  
  If samples are source of the data in the data set, the all used samples must have attached quality label report, in order to ensure the data set can be counted for as having complete provenance information – see **#10**.

- **Indicator:** Ratio between number of accepted applications and number of received applications for samples and/or data. (**#38**)
  
  **Definition:** Ratio between number of accepted applications and number of received applications for samples and/or data. The number of received applications is the total number of applications received by the biobank during the given measurement period. The accepted application means that the access to the samples/data has been granted.
  
  **Levels:** biobanks
  
  **Frequency:** yearly

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• **Indicator: Median time to access samples/data (#39)**
  
  **Definition:** Median time to access samples/data, from filing the official request for access to delivery. Rejected requests are not counted into this indicator.

  **Levels:** biobanks  
  **Frequency:** yearly  
  **Discussion:** separate categories for single-country and transnational requests.

• **Indicator: Number of papers where biobank was acknowledged as provider of samples, data, or expertise (#40)**
  
  **Definition:** Number of papers where biobank was acknowledged as provider of samples, data, or expertise.

  **Levels:** biobanks  
  **Frequency:** yearly

• **Indicator: Number of projects that return data to biobanks (#41)**
  
  **Definition:** Number of formally approved and ongoing projects that return data to biobanks.

  **Levels:** biobanks  
  **Frequency:** yearly