

Online supplementary files

Appendix 1: Questions to expert panel

Summary of users and users of health care performance data

Through our exploratory literature review we have identified a range of data uses that transcend the levels of a health care system. This list is not exhaustive, nor does it intend to be. Importantly, it is also limited to the use of data for the purposes of clinical care rather than a broader population health perspective. Nonetheless, it does attempt to capture a minimum or core set of purposes for use and actors that resonate across different health care systems. Similarly, the listing of actors is not exhaustive and is to the exclusion of other actors that may carry out multiple functions. The classification has attempted to illustrate a unique user by each managerial function and actors that are explicitly assigned a mandate to improve quality of care and made directly accountable to a health care system. As such, actors such as professional and patient associations, academia and other research groups are excluded.

This listing of distinct uses has been distinguished at the micro- (clinical practice), meso- (institutions/organizations) and macro- (policy) level as shown by the nested sub-levels of the figure below and listed again in the table that follows for an editable version.

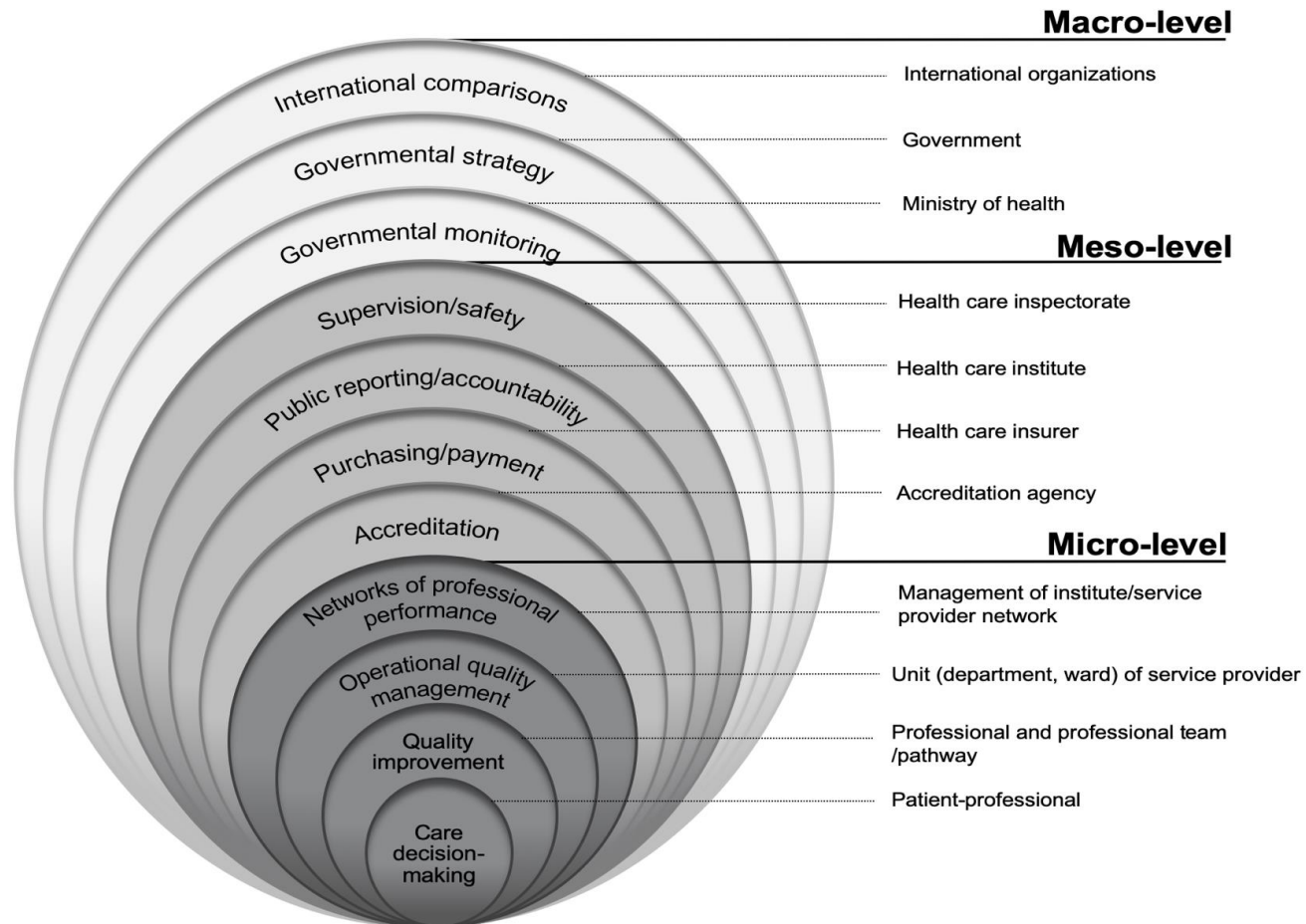
At each sub-level, a unique user can be identified – characterized as the primary actor with the responsible authority for a specific function (purpose of use). These purposes of use form different layers to decision-making; each embedded within one another. The interactions between layers signal the ways in which the users are related and co-dependent on the use and transfer of information, or as other authors have referred to as a ‘data food chain’, as some may reuse data collected and used by others.

- Is the list of purposes for use complete and accurate? If not, what is missing? Are there purposes for use that appear overlapping?
- Is the list of users complete and accurate? If not, what is missing?
- Is the cascading of users and uses accurate? If not, how can it be improved?

Table A1. Uses and users of health care performance indicators: listed

Level	Managerial function (uses)	User
Macro <i>Policy</i>	International comparisons	International organizations
	Governmental strategy	Government
	Governmental monitoring	Ministry of health
Meso <i>Institutional/ organizations</i>	Supervision/safety	Health care inspectorate
	Public reporting/accountability	Health care institute
	Purchasing/payment	Health care insurer
	Accreditation	Accreditation agency
Micro <i>Clinical practice</i>	Networks of professional performance	Management of institute/service provider network
	Operational quality management	Unit (department, ward) of service provider
	Quality improvement	Professional and professional team/pathways
	Care decision-making	Patient-professional

<i>Other</i>
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Figure A1. Uses and users of health care performance indicators across the health system: visualized

Methodological considerations

For each purpose for use, a range of methodological consequences (data requirements) can be anticipated. For example, the type of measure (e.g. more process measures at the micro-level vs more outcome measures at the macro-level) or confidence intervals (e.g. narrow for precision decisions of health practitioners vs wide for policy-makers). We have consolidated a range of methodologically relevant considerations (features of data) that has been highlighted in the literature as potentially relevant depending on the intended purpose of use. Examples to illustrate the variation for each of these considerations are listed in the table.

To further illustrate these considerations in practice, we have mapped existing indicators for measuring the performance of breast cancer services to different users and uses. The mapping serves to demonstrate the variability in information needs by user/use.

- Are the listed considerations meaningful? What is missed? What would you phrase differently? How can this list be expanded upon to serve its intended purpose of supporting users based on their intended purpose of use?
- How do you expect these considerations to vary based on specific uses and users from the table above?

Table A2. Fitness for use considerations and examples

Relevant considerations	Examples of variations
Type of measure	process, outcome, patient-reported
Sources	administrative, medical records or clinical, registries, patient
Reference group	unit or department, types of units, region, province, country etc.
Reference period	previous 1–6 quarters; 1–12 months; 1–6 years; previous year, etc.
Comparators	past performance, targets, reference group
Compounds (composites)	selection of indicators, weights
Calculation of values	standard deviation, means, median, other percentiles (75th), rank, top 10% mean (ABC method), individual peer scores, ranges
Statistical chart options	funnel plot, Shewhart chart, scan statistics, moving average, sets method
Types of analysis	benchmarking, time trend, international comparison
Confidence intervals	narrow for precision decisions (practitioners) vs wide for policy-makers
Risk adjustments	variable specification (demographic, clinical factors, socio-economic, health related, patient preferences), source, weighting scheme
Others...	...

General reflections

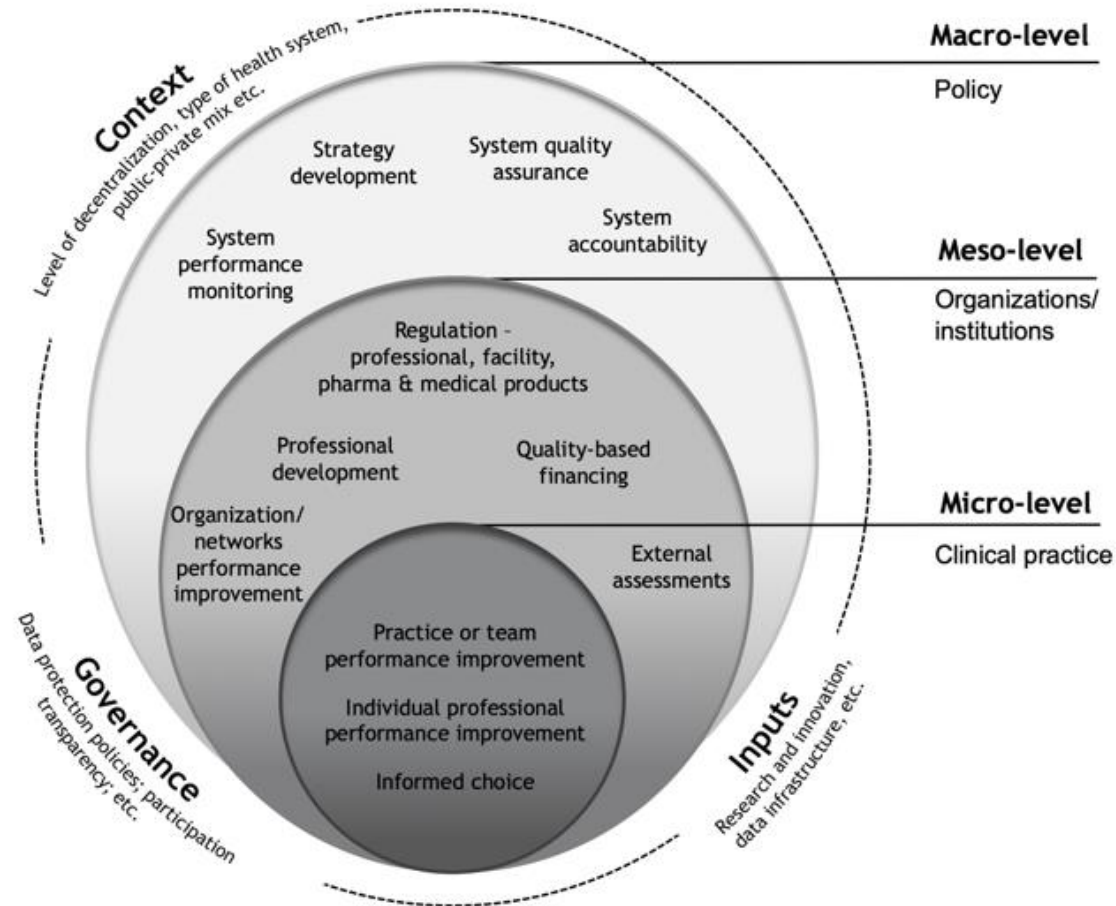
- Do you agree with the construction and approach to exploring fitness for use of health care performance data as pursued in this study?
- Are you aware of any existing studies that should be consulted in the scope of this work?

Appendix 2: Questions to user panel

Purposes of use of health care performance indicators

Uses of health care performance indicators can be differentiated at the micro- (clinical practice), meso- (institutions/organizations) and macro- (policy) level of health systems. Methodologically relevant distinctions by the purposes for using health care performance indicators are shown in the nested sub-levels of the figure below. For example, at the micro-level, uses of health care performance indicators include for informed choice (e.g. by patients), individual professional performance improvement and practice or team performance improvement. Cross-cutting these uses are factors that ultimately weigh on the extent to which a specific purpose of use can be met. These feed-in factors can be clustered around the specific country context, governance and inputs (e.g. research, data infrastructure).

1. Based on the figure (A2), how would you describe your most predominate purpose for using health care performance indicators?
2. For this purpose, what in your opinion constitutes a good indicator? That is, what information do you need? Can you give examples?
3. Can you describe how you make use of health care performance indicators? Who is your target end-user? What specific strategies or mechanisms are relied on (e.g. public reporting, licensing or accreditation, financial incentives, etc.)?

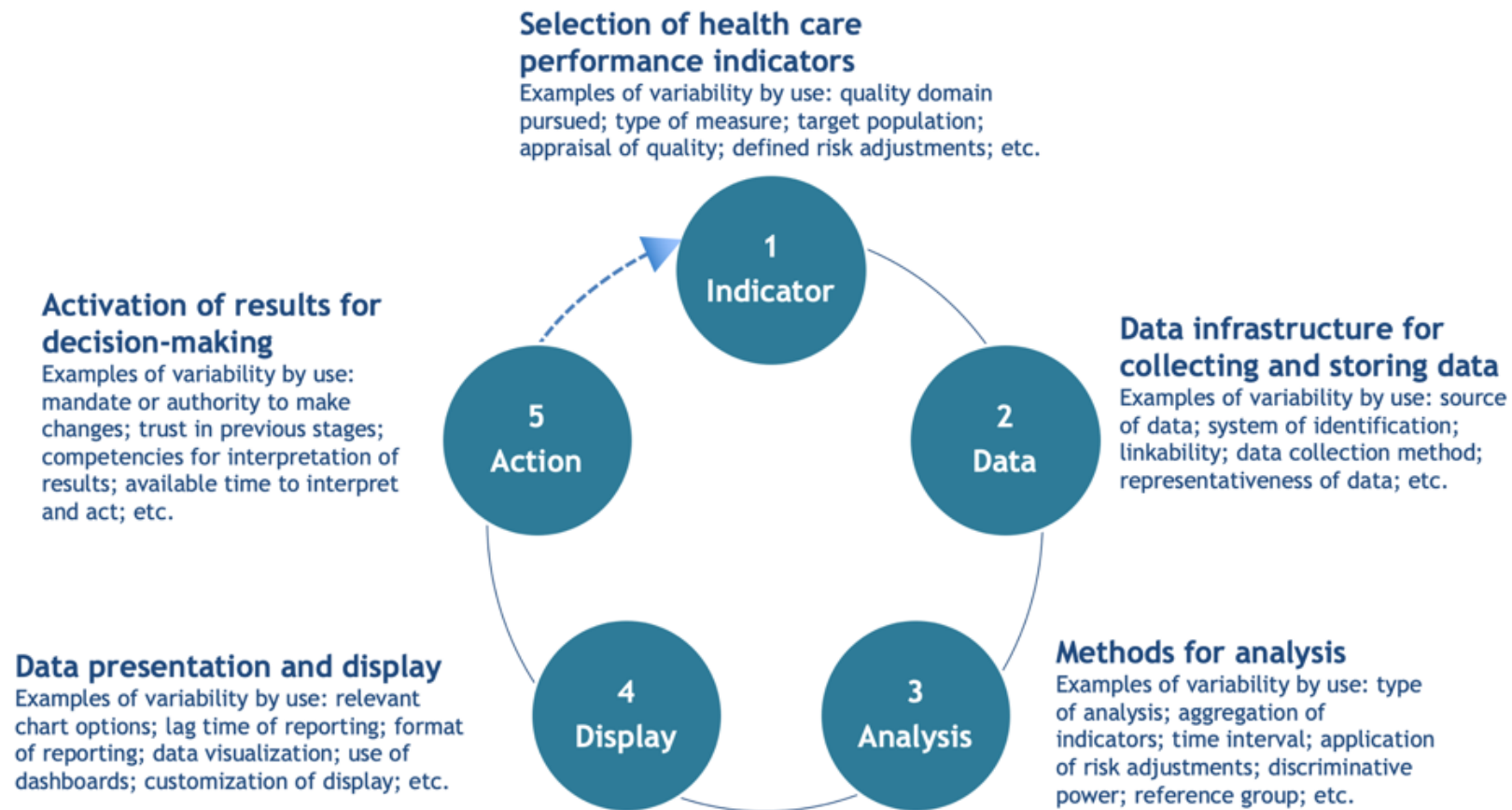
Figure A2. Uses and users of health care performance indicators across the health system: visualize

Considerations for the use of health care performance indicators

We recognize that depending on the purpose of use, each user has different information needs. The type of indicator (e.g. process, structure outcome), sources of data (e.g. administrative, clinical, survey data), timeliness (e.g. weekly, quarterly, annually) or type of analysis (e.g. benchmarking, time trend, international comparison), are among some of these differences.

Given this variability, there are a range of both practical and methodological considerations that may potentially affect the use of health care performance indicators. These considerations cannot be reduced solely to the analysis of indicators. For example, if an indicator is well-defined, collected and analyzed but is not presented optimally, what it signals may not be clear to the intended user for decision-making purposes. In other instances, it may be the data itself that is the main issue, because it cannot be linked, is of poor quality or incomplete. We have clustered five key factors and potentially relevant considerations depending on the intended purpose of use of an indicator that have been highlighted in the literature and by the first round of panelists.

1. Based on your use of health care performance indicators, what are your critical needs across the indicator cycle shown in Fig.A3? That is, for each stage in the cycle as shown, what would make the ideal conditions for your purposes?
2. Which stage in your opinion is most important for the actionability of an indicator?
3. Is the information currently used by your organization or practice useful for your purposes? That is, are you able to make decisions and learn from the information? How could it be better?
4. In your opinion, what are the main obstacles users face to make health care performance data actionable?

Figure A3. Use cycle of health care performance indicators

Appendix 3: Panelists

Expert panelists				User panelists			
#	Expertise (key words)	Literature consulted	Country	#	Organization type	Level	Country
1	Quality of care	[1-6]	Australia	1	Standards	Macro	United States
2	Performance measurement	[7-10]	United States	2	Governmental	Macro	Belgium
3	Performance measurement	[11-16]	Germany	3	Research/academia	Micro	United Kingdom
4	Quality of care	[1,2,5,6,17]	Australia	4	Standards	Meso	Canada
5	Governance	[18-20]	Canada	5	Governmental	Macro	Ireland
6	Performance measurement	[21-23]	Denmark	6	Governmental	Macro	Canada
7	Data/information	[24-26]	Netherlands	7	Health services	Meso	Germany
8	Management	[27-29]	Italy	8	Improvement	Macro	United States
9	Data/information systems	[30-32]	Canada	9	Governmental	Macro	Canada
10	Performance measurement	[33-36]	United Kingdom	10	Health services	Micro	Netherlands
11	Management	[37-39]	Netherlands	11	Research/academia	Meso	Netherlands
12	Quality of care	[40-42]	United States	12	Health services	Meso	United States
13	Performance measurement	[33,35,36,43]	United Kingdom	13	Standards	Meso	Netherlands
14	Governance	[44-46]	Denmark	14	Health services	Micro	Netherlands
15	Governance	[23,47,48]	Canada	15	Improvement	Macro	Netherlands
16	Data/information systems	[49-51]	Netherlands	16	Governmental	Macro	Canada

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