COMMON APPROACH
TO IMPACT MEASUREMENT

How the Common Impact Data Standard relates to other data standards

November 26 2020

Gillian Kerr, Ph.D., C.Psych.
gillian@logicaloutcomes.net
LogicalOutcomes Canada

Contributors:

Mark Fox, Arofan Gregory and Kate Ruff

Cite as Kerr, G. (2020, November). How the Common Impact Data Standard relates to other data standards [White paper]. The Common Approach to Impact Measurement. https://doi.org/10.5281/zenodo.4287536

How the Common Impact Data Standard relates to other data standards

Table of Contents

Forward

November 23, 2020

The Common Approach to Impact Measurement commissioned Dr. Gillian Kerr to prepare this White Paper. We asked her to situate the Common Impact Data Standard within existing data standards and provide some expert recommendations on the priorities for aligning the Common Impact Data Standard with prevailing standards as we prepare for Version 2.

As noted in the document, the Common Impact Data Standard has been built with an eye to re-using and augmenting existing work. Version 1.1 already aligns, builds on and reuses numerous standards, such as standards for date, time, measurement, activity, and indicator. However, the world of standards is massive. As a development team, we were aware that there were many standards we could align with; so much so that they would need to be prioritized. We also were aware that out own knowledge of available standards was limited and that a systemic review would allow us to be more thorough in that prioritization.

Dr. Kerr has provided us a clearly written and well thought through synthesis of the data standard universe as it related to the Common Impact Data Standard. She makes five recommendations:

a. Add data quality elements to the Common Impact Data Standard that can address fundamental issues of credibility and accuracy.
b. Demonstrate detailed and relevant examples of the Common Impact Data Standard in formats that are used by potential users so that they can understand how it works and how it can benefit them.
c. Ask funders and donors to adopt the use of the Common Impact Data Standard as the reporting (exchange) standard from fundees.
d. Apply for, and secure, web standard status from schema.org and W3C.
e. Identify key codelists and extensions that would encourage broader adoption and aggregation.

With these recommendations, Dr. Kerr has highlighted that standard adoption sits with three interconnected ideas: documentation, community (people, organizations, relationships, and their shared interests) and use. She has identified areas where the Common Impact Data Standard needs to build out documentation. Recommendations a and e both refer to extensions of the standard that will make the Common Impact Data Standard more useful. Recommendation b relates to documentation of instructions and examples that make the standard easier to use. Dr. Kerr has also identified areas where the Common Impact Data Standard should expand our community. She identified Schema and W3C as important bodies that the Common Approach should be working with to promote adoption. Finally, Dr. Kerr identified the importance securing use among funders and donors (to which we would add impact investors) to support the prevalence of the Common Impact Data Standard so that it becomes a *market* standard for the exchange of impact data, as well as a standardized representation of impact.

We at the Common Approach have already begun to implement these recommendations. We added a class related to data quality, which addresses recommendation (a). We have started the process of applying for web standard status from schema.org and W3C, in response to recommendation (d). We will implement the other recommendations over the year 2021 and beyond.

Sincerely,

Kate Ruff
Interim Executive Director
Common Approach to Impact Measurement

1 Executive summary

The Common Impact Data Standard provides a way to exchange information about impact by Social Purpose Organizations using open Web standards. If it is to be broadly accepted, it must communicate information in formats that are useful to its main audiences.

In practice, that means that the Common Impact Data Standard must be well situated among the standards that are used by funders, donors and other major stakeholders. Well-designed standards incorporate, extend, or complement other standards to increase functionality and minimize effort.

This paper identifies data standards that are relevant to the Common Impact Data Standard and recommends several that the Common Approach should incorporate or complement.

Specifically, this paper recommends that the Common Approach take the following steps:

f. Add data quality elements to the Common Impact Data Standard that can address fundamental issues of credibility and accuracy.

g. Demonstrate detailed and relevant examples of the Common Impact Data Standard in formats that are used by potential users so that they can understand how it works and how it can benefit them.

h. Ask funders and donors to adopt the use of the Common Impact Data Standard as the reporting (exchange) standard from fundees.

i. Apply for, and secure, web standard status from schema.org and W3C.

j. Identify key codelists and extensions that would encourage broader adoption and aggregation.

2 Background

The Common Approach to Impact Measurement is a Canadian initiative that is developing standards that will enable Social Purpose Organizations to demonstrate the impact of their work[1].

A major objective of the Common Approach is to reduce the burden of measurement on Social Purpose Organizations while increasing the usefulness of measurement data across the entire system – funders, governments, communities and organizations.

The Common Approach to Impact Measurement has four standards:

1. Common Impact Data Standard
2. Common Foundations
3. Common Framework for Social and Environmental Indicators
4. Common Form

This paper focuses on the Common Impact Data Standard, and specifically how it relates to existing *data* standards. A separate paper looks at existing *impact measurement* standards (Common Approach to Impact Measurement, 2019).

[1] See www.commonapproach.org for definitions and other information about the Common Approach initiative.

3 About data standards

The nice thing about standards is that you have so many to choose from (Tanenbaum, 1988). The world's main standards body, the International Standards Organization (ISO), publishes 23,300 standards (ISO, 2020b) covering every element of life from measuring time (ISO 8601) to defining the extent of social responsibility and sustainable development in the food chain (ISO 26030) and stakeholder involvement in the governance of organizations (ISO 37000) (ISO, 2020)

Data standards are defined as "the rules by which data are described and recorded. In order to share, exchange, and understand data, it's essential to standardize the format as well as the meaning."(USGS, n.d.) Data standards are hierarchical, acting in layers, building upon another. For example, the international standard for dates according to ISO 8601 (ISO, 2019a) is YYYY-MM-DD, which eliminates confusion between local conventions (otherwise, 07-10-20 can mean July 10 1920 or October 7 2020 or October 20 2007).

A new data standard, like the Common Impact Data Standard, does not need to invent standards for representing foundational elements like time or countries or languages. It can just incorporate ISO-8601, ISO-3166 and ISO-639 respectively. Many years of effort are required to fully specify an international data standard, no matter how narrow, and new standards never start from scratch. They always incorporate existing standards.

Standards can be loosely divided into:

- **Formal standards** that are developed by professional or industry associations, approved by a credible body using explicit procedures and criteria, maintained and updated, and are open, meaning that they can be adopted by anyone (Timmermans & Epstein, 2010).
- **De facto standards**, which may be proprietary or informal but are so widely used that new products must be able to comply with them (Botzem & Dobusch, 2012). In the world of information technology, de facto standards are often developed by consortia of professional associations and companies to create common platforms for innovation without going through the often-lengthy process of applying to a formal standards organization. Eventually major de facto standards may be adopted as formal standards, as with the PDF format (ISO, 2017).
- **Emerging standards**, which are not yet widely adopted or approved by standards bodies but are heading that way or attempting to. The Common Impact Data Standard is an emerging standard.

Both formal and de facto standards are relevant to the Common Impact Data Standard because both will affect whether an emerging standard will be widely adopted.

There is a great deal of overlap and movement between the different kinds of standards. Microsoft, for example, has been gradually moving towards formal open standards after a great deal of criticism for its proprietary formats in Office applications (Library of Congress, 2017).

4 Types and examples of data standards

Following is a vastly simplified list of data standard types and examples that are relevant to the Common Impact Data Standard. They are simplifications because definitions of standards and models are slippery and inconsistent unless they have been specified by a formal standards body. And even then, another domain will use the same terminology in other technically correct ways. 'Ontology' means something different in computer science (Gruber et al., 2009) than it does in psychology (APA, n.d.). [2]

Conversations between experts in different fields using identical vocabularies for different 'standards' can be intensely frustrating. The Common Approach is trying to solve some of these translation problems.

Type of data standard	Examples	Explanation
1.Data interchange format	csv, JSON-LD	A data interchange format is the basic, lowest level of data standard. It defines how information is sent and received. For example, a comma-separated values (csv) file is a plain text file that uses a comma to separate values. However, despite its simplicity, ubiquity and long history it has never been fully defined by a formal standards body. The World-Wide Web Consortium (W3C) has published recommendations for the precise modelling of tabular data which includes csv files (Tennison, 2016). All of which is to say that csv is a de facto standard for data interchange rather than a formal one. The three 'metaformats' defined by W3C for application-independent languages for exchanging data on the web are JSON, XML and RDF (W3C, n.d.) The Common Standard uses JSON-LD (JavaScript Object Notation for Linked Data) (W3C, 2020) which combines JSON and RDF and which can be converted into other formats like XML and csv. JSON-LD "was created for Web Developers who are working with data that is important to other people and must interoperate across the Web. … It starts at basics, assuming that the audience is a web developer with modest training."(W3C, 2013)
2.Schema	Organization, Address	Schemas are structured definitions of things, literally any kind of thing, tangible or intangible, from 'city' to 'concept' to 'number'. For example, 'Organization', in Schema.org, is a Thing with many properties including legalName, address and areaServed. (schema.org, 2020) 'Address' itself is another schema. Schemas can be linked together to form complex semantic models that are often called ontologies. (W3C, 2003) The Common Impact Data Standard is an ontology - a set of inter-related schemas - that can be adopted by Social Purpose

[2] See http://tomgruber.org/writing/ontology-definition-2007.htm vs https://dictionary.apa.org/ontology

		Organizations to label information on their web pages as 'outputs', 'outcomes' 'indicators' and so on.
3.Information model	Government Program Reference Model, Microsoft Common Data Model	An information model is a collection of "concepts, relationships, constraints, rules and operations"(Lee, 1999) that specify a given domain. An information model for impact measurement would include inputs, activities, beneficiaries, outputs, outcomes and impacts, and how they connect together. It might also include social context, policy environment, population demographics and so on, depending on the breadth of the model. As an example, the Government of Ontario Program Reference Model (2010) defines a standard set of programs, services and processes that can be provided by any government in Canada to any set of target groups. Another example is Microsoft's Common Data Model (CDM) which is a set of standard data definitions covering a massive range of business applications. The Nonprofit extension to the CDM includes concepts like theories of change, case management, fundraising, program delivery, objectives, results, indicators and so on. (Microsoft, 2018/2020)[3] An organization can use, and may need to use, several related information models. In the world of the web, an information model more specifically comprises a collection of schemas that represent concepts and activities and how they link. Complex information models that are defined using web standards may be called 'Knowledge Graphs'. (Ehrlinger & Wöß, 2016) The Common Impact Data Standard is an information model of the Impact Management Project's five dimensions of impact and 14 data categories (Impact Management Project, 2020). . It also includes a sixth dimension, How, representing the methods by which services are delivered, including Program, Service, and Activity.
4.Codelist	Sustainable Development Goals, ICHI activity codes	Codelists are controlled vocabularies that contain a list of options for a given variable. They can be embedded into schemas and information models. For example, Sustainable Development Goals (SDGs) can be used as a codelist under the Domain class in the Common Impact Data Standard. The goals comprise a codelist of 17 domains. Codelists can be very short ('Yes', 'No') or very large. The World Health Organization has an International Health Code for Interventions that includes thousands of codes. In that Codelist,

[3] The CDM can be described as an emerging de facto standard. It is open in the sense that it is available on Github and covered by an open source license, but it is controlled by Microsoft.

		SOA.AN.ZZ is the code for "Conducting an interview to obtain information in relation to the ability to plan, organize, cook and serve simple and complex meals for oneself and others". (World Health Organization, 2019) The WHO's ICHI overlaps with some of the taxonomies developed by the Impact Genome Project to describe program features (Impact Genome Project, 2020). The Common Impact Data Standard provides fields that allow Social Purpose Organizations to specify codelists.
5.De facto standard	PDF, QWERTY keyboard	De facto standards, by definition, are used because everyone else is using them. They may not be the best, but they are inescapable. When inferior de facto standards prevail for historical reasons they are sometimes called 'the QWERTY problem'. (Kay, 2013) PDF is an example of a format that began as a proprietary specification (by Adobe in 1993), became a major de facto standard and was eventually published as a formal standard (ISO 32000-1:2008 (ISO, 2008, p. 32).
6.Reporting standard	IATI	A reporting standard is a set of rules that define how data should be reported so that it can be aggregated and compared. The International Aid Transparency Initiative (IATI, 2019) is a great example. IATI comprises a set of schemas, codelists (IATI, 2020) and rules for describing how organizations should report on their international development activities. The fundamental schemas in IATI are 'Organization' and 'Activity'. IATI is used by hundreds of government donors, private sector organizations and non-governmental organizations to publish project descriptions, aid type, budget information and dates in an agreed electronic format (XML) linked to the IATI Registry[4]. The Common Impact Data Standard is designed to be used as a reporting standard that can be adopted by funders and Social Purpose Organizations to communicate outcomes in a structured, comparable way.
7. Formal standards body	W3C, ISO	Formal standards are, by definition, developed by standards setting organizations or bodies. They may be officially aligned with international bodies like the United Nations (e.g., WHO or ISO), or have national charters, or be industry associations or nonprofits. They are characterized by detailed rules and processes for acceptance and revision of standards along with wide recognition and credibility within their domains. The World Wide Web Consortium (W3C) is a formal international body that develops open technical standards for the web (www.W3C.org). It liaises with the International Standards

[4] https://www.iatiregistry.org/dataset

		Organization (ISO) on several web-related standards like database technologies (ISO, 2020a) Schema.org, on the other hand, is an industry collaboration between market leaders like Google, Microsoft, Yahoo, Pinterest and the like to provide a convenient collection of shared vocabulary items that can be used on the Web. It is not a formal standards body; it can be described as a semi-formal de facto standard. At the very least, having a schema approved on Schema.org provides discoverability and credibility. Over 10 million web sites use Schema.org to mark up their pages (schema.org, 2020). Publication on schema.org can be a way station towards formal acceptance by W3C. Formal standards can include almost any process, including privacy information management (ISO, 2019b), the use of race-based and indigenous identity data (Canadian Institute for Health Information, 2020) and the proper use of metadata for interoperability (Wilkinson et al., 2016). The Common Approach initiative is attempting to develop a set of open standards, including the Common Impact Data Standard, that will be maintained and updated by appropriate standards bodies.

5 Standards for funding and policy-making

The Common Impact Data Standard, as stated above, already incorporates many existing standards and schemas. It is designed to capture information about impact measurement in Social Purpose Organizations using a common vocabulary and concepts. And it is designed to work with formats that are understood by web developers.

However, additional elements are required in order to be useful to funders, policy-makers and donors [from now on they will all be referred to as funders]. Specifically, funders need to be able to combine data from many different fundees and to compare outcomes in meaningful and accurate ways.

There is something compelling about numbers. Once presented with clear numbers – like, 'Program A had a 32% improvement rate while Program B only had 9%' -- users rarely dig down to the original methodology and analyze the reasons for the difference, even assuming the methodology is available. The Common Impact Data Standard has the potential of causing harm based on misleading numbers unless it provides ways to allow the rating of datasets and indicators for acceptable quality in a format that can be easily understood.

This section proposes extensions to the Common Impact Data Standard that will enable data providers to describe data quality and to improve comparability for the purposes of funding and decision-making.

5.1 Data quality standards

Data quality can be defined as "fitness for use for a certain application or use case" (Zaveri et al., 2015). Data that is used to find the nearest restaurant has a different set of quality requirements from data that is used to decide whether a community program gets funding.

Poor data quality, meaning data that is not accurate, representative and relevant, can lead to systemic discrimination, racism and other bad decisions (Obermeyer et al., 2019).

There is growing recognition that data is not value free. It is biased by the ways it is funded, designed, collected and analyzed (Matsui et al., 2020). Structural racism affects the funding and design of data collection, which then furthers ongoing discrimination (fast.ai, 2020). The Common Impact Data Standard should provide a way to indicate whether these issues have been considered, and funders should place more reliance on results that are based on acceptable data quality.

The Common Impact Data Standard incorporates W3C standards, which is associated with a Data Catalog Vocabulary (DCAT (W3C, 2020)) and a Data Quality Vocabulary (Albertoni & Antoine, 2016) for datasets (W3C, 2020). The Data Catalog Vocabulary does not recommend any particular standard or rating scale, but does provide a structure for reporting characteristics like trustworthiness, relevance, or compliance with a data policy[5].

Data providers may choose not to publish information about data quality, and funders may choose to filter out data sources that do not include that information.

Data quality is a complex and highly technical topic. All datasets have errors (Viswanathan, 2005) and if quality has not been explicitly addressed at every stage of design, collection and analysis they will likely have a great deal of error. See Appendix B for a brief description of relevant measurement errors and their implications for Social Purpose Organizations as well as a list of practical resources.

This issue merits in-depth discussion from funders and other stakeholders to minimize the chances that the Common Impact Data Standard will contribute to social injustice and poor investment decisions.

5.2 FAIR Principles

One of the primary objectives of the Common Impact Data Standard is interoperability – enabling comparisons about outcomes between Social Purpose Organizations and their funders.

The FAIR Guiding Principles (Wilkinson et al., 2016) represent an international effort to encourage data producers to adopt standardized file formats, metadata, vocabularies and identifiers so that datasets can be broadly shared among researchers and policymakers. The FAIR principles are findability, accessibility, interoperability and reusability. FAIR Principles and the standards within the FAIRsharing Registry are recognized by the W3C DCAT standard[6].

FAIR interoperability principles require that metadata use a formal, accessible, shared, and broadly applicable language for knowledge representation, using vocabularies that support re-use, findability and accessibility.

Without those features, datasets are not interoperable.

---

[5] Data policies could be set by funders or sectors, e.g., the management of privacy and confidentiality, standards for race-based and indigenous identity data[5] and so on (see https://www.w3.org/TR/vocab-dqv/#dqv:QualityPolicy).

[6] W3C Data Catalog Vocabulary at https://www.w3.org/TR/vocab-dcat-2/

5.3 Standard vocabularies and codelists

Codelists are controlled vocabularies that contain a list of options for a given variable or concept. Whenever you select your country from a dropdown list starting with Afghanistan, or a language dropdown starting with Afrikaans you are probably dealing with a codelist defined by an ISO standard.

The FAIR principles require that, when possible, shared vocabularies be used to define data. They are referring to vocabularies, ontologies and codelists.

Codelists are important elements of implementing an information model like the Common Impact Data Standard. Without codelists, users must either make up their own vocabularies (including translating them into multiple languages) or use free text, both of which reduce the ability for aggregation across systems.

Codelists are primarily used to:

- *collect, disseminate, exchange and organise information;*
- *aggregate and disaggregate datasets in a meaningful way for complex analysis;*
- *present statistical information in a standard way;*
- *support policy and decision-making;*
- *standardise the measurement process.* (SDMX, 2018)

The Appendix suggests a few codelists for selected classes in the Common Impact Data Standard. It is important to emphasize that users can choose their own codelists, or even create their own. They can even select subsets of codelists that are relevant to their needs, leaving out options that don't apply (such as not including Afrikaans in their language lists).

The Common Impact Data Standard supports specification of codelists for Outcome via the forDomain property, and for Indicator via the hasIndicatorStandard property.

6 Extensions for Social Purpose Organizations

The Common Impact Data Standard has been designed to enable Social Purpose Organizations to tag outcome data on their web sites and reports in a way that can be identified in web searches and communicated to funders.

But how exactly would Social Purpose Organizations implement the Data Standard? What would an SPO give to their web developer, who uses Wordpress or Wix? (The author of this paper showed the Common Approach ontology documents to several professional web developers who said they were unable to understand them.) How would they compile the information in Excel files? What would it look like in combined form, and could it be useful for other purposes such as reporting to Board members and funders?

The Common Impact Data Standard, at present, is difficult for Social Purpose Organizations to understand and implement given their constraints in technical expertise.

6.1 Common data models

One way to reduce the cost of implementing the Common Impact Data Standard is to embed it in common data models that have wide adoption in the nonprofit sector. There are two promising

initiatives, both of which are industry consortiums that are developing open standards to promote interoperability between software platforms regarding the full range of business processes.

- Open Data Initiative (ODI)

  Microsoft, Adobe, SAP and other IT vendors launched an Open Data Initiative in 2018 (Foley, 2019). Microsoft's main contribution to the ODI is their Common Data Model, which underlies Dynamics and Power Apps and is making inroads into Office 365 and Teams.

  The Common Data Model has extensions for nonprofit organizations that enable them to track activities, funders, finances, clients and their other fundamental business processes (Microsoft, 2020). The Nonprofit extension includes linkages to the IATI publishing standard, allowing organizations to export data in a format that can be submitted to IATI.

  The Tech for Social Impact team at Microsoft Philanthropies has expressed interest in including the Common Impact Data Standard to the CDM[7]. The benefit would be a packaged and open source collection of templates that could be quickly implemented by Social Purpose Organizations. This approach might greatly facilitate adoption of the Common Approach if large numbers of Social Purpose Organizations adopt Microsoft solutions like Dynamics 365, Power Apps or Teams.

- Cloud Information Model (CIM)

  CIM is an upcoming competitor to the Open Data Initiative (Foundation, 2019), supported by the Linux Foundation and including AWS, Salesforce, Google, Twilio, Geneys and SurveyMonkey. The CIM is in an earlier stage of development than the ODI and has not started work on possible nonprofit extensions, though they may in the future.[8]

6.2 Samples and templates

One of the biggest challenges to adoption for the Common Impact Data Standard is to make it simpler and more understandable to users.

At present, it's not possible to see what the Common Approach output will look like, or how it can be disaggregated, examined, compared and presented.

The Common Impact Data Standard is currently described either in high level concepts (Common Approach to Impact Measurement, 2020) or in technical documents bristling with JSON and ontological diagrams (Fox, Chowdhury, Zhang, Gajderowicz, Abdulai, & Rosu, 2020; Fox, Chowdhury, Zhang, Gajderowicz, Abdulai, Ruff, et al., 2020). It is difficult to envision how the Data Standard will work in practice by anyone who is not both a web developer and a policy analyst.

Funders and Social Purpose Organizations use a variety of tools to analyze and compare data, but the de facto standard is either Excel or another program that can work with Excel files. The Common Data Standard would be far easier to understand and implement if the end product – the data that will be presented to the end users – can be shown in practice using Excel or another relevant format, to allow manipulation and visualization of sample data.

[7] Personal communication with Erik Arnold, Global CTO, Tech for Social Impact, Microsoft Philanthropies, August 25 2020.
[8] Personal communication with Seth Newberry, General Manager of Standards, Joint Development Foundation, July 2020.

7 Recommendations

The following recommendations would encourage broader adoption of the Common Impact Data Standard and also increase its usability and value.

7.1 Add data quality elements to the Common Impact Data Standard that can address fundamental issues of credibility and accuracy.

The Common Impact Data Standard should incorporate quality elements from the W3C Data Quality Vocabulary[9] so that users can identify the quality and similarity of data from different organizations.

Neither the W3C nor the Common Impact Data Standard stipulate specific data quality frameworks. However, funders and other stakeholders can be invited to adopt relevant standards like the FAIR guiding principles and ethical data practices.

7.2 Demonstrate detailed and relevant examples of the Common Impact Data Standard in formats that are used by potential users so that they can understand how it works and how it can benefit them.

The Common Approach initiative should provide templates and demonstrations of the Data Standard in action to help users decide whether and how to adopt it.

Social Purpose Organizations need to know how data can be exported from their current information systems and reported to funders. And funders need to see how data is aggregated from many organizations and meaningfully reported.

7.3 Ask funders and donors to adopt the use of the Common Impact Data Standard as the reporting (exchange) standard from fundees.

The main route for broad adoption by the Common Impact Data Standard is acceptance by funders as a publishing standard. In other words, if major funders request data from their funded agencies using the vocabulary of the Common Approach, the Common Approach will be implemented. Otherwise, there is not enough incentive for software developers and service providers to change their reporting systems.

Once used widely by major funders, the Common Impact Data Standard would become a de facto standard, taking advantage of the network effect to be adopted in increasing numbers of measurement platforms.

7.4 Apply for, and secure, web standard status from schema.org and W3C.

The Data Standard ontology includes several vocabulary items that are not included in the major directory of web schemas (Schema.org), such as ‘Indicator’ and ‘Outcome’. Inclusion in Schema.org would make them discoverable by web developers and add credibility to the definitions.

Eventually the entire ontology could be submitted to the W3C for approval, which would establish it as a formal Web standard.

---

[9] Data on the Web Best Practices: Data Quality Vocabulary (w3.org)

7.5 Identify key extensions and codelists that would encourage broader adoption and aggregation.

The Common Impact Data Standard is essentially a data exchange format. It is not intended to provide an information system that will enable organizations to collect data, analyze surveys, manage their programs, serve clients, monitor activities and so on. It summarizes data that have already been collected elsewhere, in other processes.

The Common Impact Data Standard would be easier to adopt if it could link easily with those other systems and processes, via the Cloud Information Model or the Open Data Initiative described above.

The other way to link the Common Impact Data Standard to other standards is by encouraging the use of relevant taxonomies and classifications via codelists. By recommending or incorporating major codelists, the Common Impact Data Standard would improve its ability to aggregate data.

8 References

Albertoni, R., & Antoine, I. (2016). *Data on the Web Best Practices: Data Quality Vocabulary*. W3C. https://www.w3.org/TR/vocab-dqv/

APA. (n.d.). *Ontology – APA Dictionary of Psychology*. Retrieved November 21, 2020, from https://dictionary.apa.org/ontology

Ber, P. R., Brodmann, R., Founda, H., Nardocci, M., Batal, M., Minh, T. H., Saville, N., & Greliche, N. (2020). *Maximizing use of existing data to strengthen program design, evaluation, and impact*. 48.

Botzem, S., & Dobusch, L. (2012). Standardization cycles: A process perspective on the formation and diffusion of transnational standards. *Organization Studies*, *33*(5–6), 737–762.

Canada Infoway. (2020). *Sex and Gender Working Group*. https://infocentral.infoway-inforoute.ca/en/collaboration/wg/sex-gender

Canadian Index of Wellbeing. (2012, June 28). *Domains and indicators*. Canadian Index of Wellbeing. https://uwaterloo.ca/canadian-index-wellbeing/what-we-do/domains-and-indicators

Canadian Institute for Health Information. (2020). *Proposed standards for race-based and Indigenous identity data collection and health reporting in Canada*. https://www.cihi.ca/en/proposed-standards-for-race-based-and-indigenous-identity-data

CanWach. (2020). Maximizing Use of Existing Data to Strengthen Program Design, Evaluation and Impact Lab. *CanWaCH*. https://canwach.ca/initiatives/canadian-collaborative-for-global-health/maximizing-use-existing-data-strengthen-program-design-evaluation-and-impact-lab/

CARE Principles of Indigenous Data Governance. (n.d.). Global Indigenous Data Alliance. Retrieved November 18, 2020, from https://www.gida-global.org/care

Carter, E. (2019). More than marketised? Exploring the governance and accountability mechanisms at play in Social Impact Bonds. *Journal of Economic Policy Reform*, 1–17. https://doi.org/10.1080/17487870.2019.1575736

Chu, L. F., Utengen, A., Kadry, B., Kucharski, S. E., Campos, H., Crockett, J., Dawson, N., & Clauson, K. A. (2016). "Nothing about us without us"—Patient partnership in medical conferences. *BMJ*, *354*. https://doi.org/10.1136/bmj.i3883

Codelists. (n.d.). IATI Standard. Retrieved August 18, 2020, from https:///en/iati-standard/203/codelists/

Common Approach to Impact Measurement. (2019). *The common foundations of impact measurement*. https://commonapproach.org/wp-content/uploads/2020/07/20200527-CommonFoundations.pdf

Common Approach to Impact Measurement. (2020). *Introduction to the Common Impact Data Standard*. https://commonapproach.org/wp-content/uploads/2020/09/Introduction_The-Common-Impact-Data-Standard.pdf

DDI. (2018). *Controlled Vocabularies—Overview Table of Latest Versions | Data Documentation Initiative*. https://ddialliance.org/controlled-vocabularies

Dudley-Marling, C., & Baker, D. (2012). The effects of market-based school reforms on students with disabilities. *Disability Studies Quarterly*, *32*(2). https://dsq-sds.org/article/view/3187/3072

Ehrlinger, L., & Wöß, W. (2016). Towards a Definition of Knowledge Graphs. *SEMANTiCS (Posters, Demos, SuCCESS)*, *48*, 1–4.

European Commission. (Undated). *INSPIRE glossary: Codelist*. https://inspire.ec.europa.eu, inspire.ec.europa.eu/glossary/CodeList

Eurostat. (2020). *Code lists*. https://ec.europa.eu/eurostat/data/metadata/code-lists

FAIRsharing Standards. (n.d.). Retrieved July 22, 2020, from https://fairsharing.org/standards/

fast.ai. (2020). *Practical Data Ethics*. https://ethics.fast.ai/

Foley, M. J. (2019). *What's next for the Open Data Initiative?* ZDNet. https://www.zdnet.com/article/whats-next-for-the-open-data-initiative/

Foundation, T. L. (2019, November 12). Amazon Web Services, Genesys, Salesforce Form New Open Data Model. *The Linux Foundation*. https://www.linuxfoundation.org/press-release/2019/11/amazon-web-services-genesys-salesforce-form-new-open-data-model/

Fox, M., Chowdhury, A., Zhang, J., Gajderowicz, B., Abdulai, T., & Rosu, D. (2020). *CAFO: The Common Approach Foundation Ontology*. 35.

Fox, M., Chowdhury, A., Zhang, J., Gajderowicz, B., Abdulai, T., Ruff, K., & Rosu, D. (2020). *CACO: The Common Approach Core Ontology for Representing Impact Models*. 21.

Gebru, T., Morgenstern, J., Vecchione, B., Vaughan, J. W., Wallach, H., Daumé III, H., & Crawford, K. (2020). Datasheets for Datasets. *ArXiv:1803.09010 [Cs]*. http://arxiv.org/abs/1803.09010

German Data Forum. (2015). *Quality Standards for the Development, Application, and Evaluation of Measurement Instruments in Social Science Survey Research*. 37.

Global Impact Investing Network. (2020). *IRIS Catalog of Metrics | IRIS+ System*. https://iris.thegiin.org/metrics/

Global Reporting Initiative. (2020). *GRI Standards by language*. https://www.globalreporting.org/how-to-use-the-gri-standards/gri-standards-by-language/

Government of Canada, S. C. (2015, December 15). *Census variables*. https://www.statcan.gc.ca/eng/census/census-variables

Government of Ontario. (2010). *GO-ITS 56.1 Defining Programs and Services in the Ontario Public Service Appendix A | Ontario.ca*. https://www.ontario.ca/document/go-its-561-defining-programs-and-services-ontario-public-service-appendix

Gruber, T., Ontology, I. L. L., & Özsu, M. T. (2009). Encyclopedia of database systems. *Ontology*.

HL7.org. (2019). *Resource PractitionerRole—FHIR v4.0.1*. https://www.hl7.org/fhir/practitionerrole.html

IATI. (2019). *IATI Standard*. IATI Standard. https:///en/iati-standard/

IATI. (2020). *Codelists*. IATI Standard. https:///en/iati-standard/203/codelists/

IATI. (2020). *DAC 5 Digit Sector*. IATI Standard. https:///en/iati-standard/203/codelists/sector/

IATI. (2020). *How to create your IATI organisation identifier*. IATI Standard. https://iatistandard.org/en/guidance/publishing-data/registering-and-managing-your-organisation-account/

Impact Genome Project. (2020). *Critical Human Needs*. https://impactgenome.org/critical-human-needs/#taxonomies

Impact Management Project. (2020). *A forum for building global consensus on how to measure and manage impacts*. Impact Management Project. https://impactmanagementproject.com/

Impact, P. for S. (2020, June 17). *Microsoft Nonprofit Accelerator deep dive v2.3*. https://vimeo.com/430090037

ISO. (2008). *ISO 32000-1:2008*. ISO. https://www.iso.org/cms/render/live/en/sites/isoorg/contents/data/standard/05/15/51502.html

ISO. (2017). *ISO 32000-2:2017 Document management—Portable document format—Part 2: PDF 2.0*. https://www.iso.org/cms/render/live/en/sites/isoorg/contents/data/standard/06/35/63534.html

ISO. (2019a). *ISO 8601-1:2019: Date and time—Representations for information interchange—Part 1: Basic rules*. ISO. https://www.iso.org/cms/render/live/en/sites/isoorg/contents/data/standard/07/09/70907.html

ISO. (2019b). *ISO/IEC 27701:2019(en), Security techniques—Extension to ISO/IEC 27001 and ISO/IEC 27002 for privacy information management—Requirements and guidelines*. https://www.iso.org/obp/ui/#iso:std:iso-iec:27701:ed-1:v1:en

ISO. (2020). *ISO 37000 Guidance for the Governance of Organizations*. https://committee.iso.org/sites/tc309/home/projects/ongoing/ongoing-1.html

ISO. (2020b). *ISO Standards Catalogue*. ISO. https://www.iso.org/standards-catalogue/browse-by-ics.html

ISO. (2020a). *Organizations in cooperation with ISO - W3C - World Wide Web Consortium*. https://www.iso.org/organization/10143.html

Kay, N. M. (2013). The QWERTY problem. *Paper to Be Presented at the 35th DRUID*.

Lee, Y. T. (1999). Information Modeling: From Design to Implementation. *Proceedings of the Second World Manufacturing Congress*, 315–321.

Library of Congress. (2017, January 18). *XLSX Strict (Office Open XML), ISO 29500-1:2008-2016* [Web page]. https://www.loc.gov/preservation/digital/formats/fdd/fdd000401.shtml

Matsui, E. C., Perry, T. T., & Adamson, A. S. (2020). An Antiracist Framework for Racial and Ethnic Health Disparities Research. *Pediatrics*. https://doi.org/10.1542/peds.2020-018572

Microsoft. (2020). *Dynamics 365 nonprofit accelerator—Common Data Model*. https://docs.microsoft.com/en-us/common-data-model/nfp-accelerator

Microsoft. (2020). *Microsoft/CDM* [Java]. Microsoft. https://github.com/microsoft/CDM (Original work published 2018)

Obermeyer, Z., Powers, B., Vogeli, C., & Mullainathan, S. (2019). Dissecting racial bias in an algorithm used to manage the health of populations. *Science*, *366*(6464), 447–453. https://doi.org/10.1126/science.aax2342

OECD. (2013). *Glossary of Statistical Terms—Code list Definition*. https://stats.oecd.org/glossary/detail.asp?ID=3371

OECD. (2020). *OECD Better Life Index*. http://www.oecdbetterlifeindex.org/#/11111111111

schema.org. (2020). *Home*. https://schema.org/

schema.org. (2020). *Organization—Schema.org Type*. https://schema.org/Organization

SDMX. (2018). *SDMX Guidelines for the creation and management of SDMX code lists v.3*.

Statistics Canada. (2012). *Postal code*. https://www150.statcan.gc.ca/n1/pub/92-195-x/2011001/other-autre/pc-cp/pc-cp-eng.htm

Tanenbaum, A. S. (1988). Computer Networks 2nd edition Prentice-Hall. *Inc., Englewood Cliffs, NJ*.

Tennison, J. (2016). *CSV on the Web: A Primer*. https://www.w3.org/TR/2016/NOTE-tabular-data-primer-20160225/

The Global Indigenous Data Alliance. (2019). *CARE Principles for Indigenous Data Governance*. https://static1.squarespace.com/static/5d3799de845604000199cd24/t/5da9f4479ecab221ce848fb2/1571419335217/CARE+Principles_One+Pagers+FINAL_Oct_17_2019.pdf

Timmermans, S., & Epstein, S. (2010). A World of Standards but not a Standard World: Toward a Sociology of Standards and Standardization. *Annual Review of Sociology*, *36*(1), 69–89. https://doi.org/10.1146/annurev.soc.012809.102629

United Nations. (2020). *SDG Indicators*. https://unstats.un.org/sdgs/indicators/indicators-list/

USGS. (n.d.). *Data Standards*. Retrieved August 17, 2020, from https://www.usgs.gov/products/data-and-tools/data-management/data-standards

Viswanathan, M. (2005). *Measurement error and research design*. Sage.

W3C. (n.d.). *Meta Formats—W3C*. Retrieved November 21, 2020, from https://www.w3.org/standards/webarch/metaformats

W3C. (2003). *SchemaVsOntology—W3C Wiki*. https://www.w3.org/wiki/SchemaVsOntology

W3C. (2013). *RDF AND JSON-LD UseCases—Data on the Web Best Practices*. https://www.w3.org/2013/dwbp/wiki/RDF_AND_JSON-LD_UseCases

W3C. (2020). *JSON-LD 1.1: A JSON-based Serialization for Linked Data*. https://www.w3.org/TR/json-ld11/

W3C. (2020). *Data Catalog Vocabulary (DCAT)—Version 2 W3C Recommendation*. W3C. https://www.w3.org/TR/vocab-dcat-2/

Waltman, E. (2020, September 24). *Operationalizing the CARE Principles for Indigenous Data Governance in Research Data Management | SEA Currents*. https://news.nnlm.gov/sea/2020/09/22/operationalizing-the-care-principles-for-indigenous-data-governance-in-research-data-management/

Wilkinson, M. D., Dumontier, M., Aalbersberg, Ij. J., Appleton, G., Axton, M., Baak, A., Blomberg, N., Boiten, J.-W., da Silva Santos, L. B., Bourne, P. E., Bouwman, J., Brookes, A. J., Clark, T., Crosas, M., Dillo, I., Dumon, O., Edmunds, S., Evelo, C. T., Finkers, R., … Mons, B. (2016). The FAIR Guiding Principles for scientific data management and stewardship. *Scientific Data*, *3*(1), 160018. https://doi.org/10.1038/sdata.2016.18

Wilkinson, M. D., Sansone, S.-A., Schultes, E., Doorn, P., Bonino da Silva Santos, L. O., & Dumontier, M. (2018). A design framework and exemplar metrics for FAIRness. *Scientific Data*, *5*(1), 180118. https://doi.org/10.1038/sdata.2018.118

World Health Organization. (2019). *ICHI: SOA.AN.ZZ*. https://mitel.dimi.uniud.it/ichi/#http://id.who.int/ichi/entity/612722357

World Health Organization. (2019a). *International Classification of Diseases, 11th revision (ICD-11)*. https://icd.who.int/en

World Health Organization. (2019b). *International Classification of Health Interventions (ICHI)*. https://www.who.int/standards/classifications/international-classification-of-health-interventions

World Health Organization. (2020). *International Classification of Functioning, Disability and Health (ICF)*. https://www.who.int/standards/classifications/international-classification-of-functioning-disability-and-health

Zaveri, A., Rula, A., Maurino, A., Pietrobon, R., Lehmann, J., & Auer, S. (2015). Quality assessment for Linked Data: A Survey: A systematic literature review and conceptual framework. *Semantic Web*, *7*(1), 63–93. https://doi.org/10.3233/SW-150175

Appendix A: Relevant codelists and categories

The main purpose of the Common Approach is to enable organizations to communicate their impact in a way that can be communicated and combined across organizations. This feature is called interoperability.

Interoperability is based entirely on metadata, which means data about data. Without metadata, it is not possible to know whether '42' is an address, somebody's age, a calculated sum, or the answer to life, the universe and everything.

When defining outcomes, there must be metadata to describe, at minimum, the object that is being measured (e.g., students), the concept (employment), the mathematical operation (percentage) and the indicator (number who were hired at the end of the course). The Common Impact Data Standard has classes that can define each of those elements.

To be as flexible as possible, the Data Standard specifies that classes are defined by text strings. Text strings are completely open. Users can decide, within their own systems, to restrict certain classes to numbers, mathematical calculations, time periods, geographic coordinates and/or categories, or to keep them as open-ended strings of text.

The problem with using open-ended text strings is that they are not easily interoperable when it comes to exchanging meaningful data. Imagine summarizing the age of participants when the values in your database contain '42', 'forty-two', '42 years, 5 months', and 'January 14, 1978'.

Interoperability requires that data should be defined using international standards that can be easily converted into other international standards. With age, it's simple. Just specify a positive integer field between 0 and 129. That is essentially a codelist with 130 values, which vastly reduces the effort to combine and aggregate results. One can further categorize with age groups (0-4, 5-12, etc.) and these age groups can be easily converted between systems by combining categories or by going back to the raw data.

Codelists (also spelled 'code lists' or 'code-lists') can be described as taxonomies or controlled vocabularies, but they are technically defined as a predefined list of values that belong to a controlled terminology (European Commission, Undated; OECD, 2013). A codelist can range from two items ('Yes', 'No'), to unimaginably large (Canadian postal codes comprising a relatively long codelist (Statistics Canada, 2012)).

The OECD and international statistical agencies like Statistics Canada use codelists to provide data interoperability for concepts (Eurostat, 2020). For example, the following table shows an excerpt from a Eurostat codelist for employment indicators[10]:

Codes	Labels
ERN	Gross earnings
E_F_M_PC	Gross earnings of women as a percentage of those of men
OPAY	Overtime pay
MEAN_B_SALC_EUR	Mean annual bonuses per employee concerned in euro

[10] There are about 570 codelists, available in English, French and German, at https://ec.europa.eu/eurostat/data/metadata/code-lists

Well-defined codelists enable data to be aggregated, compared and used as dimensions for cross-tabulations. At the same time, the use of codelists permits unlimited flexibility, because users can select codelists that meet their particular needs.

Take the idea of indicator registries, for example. Users may select from any indicator registry, or create an indicator codelist themselves, as long as the codelist (and by extension, each category) has a globally unique, persistent identifier.

At the same time, there's no point in creating a new codelist when there is a good one available. FAIR principles recommend the use of standard, well structured and validated vocabularies to improve data quality, accessibility and interoperability whenever possible, and standard codelists are a quick way to achieve this.

In some cases, it's necessary to create new codelists. The concepts and vocabularies related to 'Sex' and 'Gender' are evolving rapidly and require better categories than the old three-item 'Male', 'Female', 'No response'. Several Canadian initiatives (e.g., Canada Infoway, 2020) are engaged in generating a more inclusive and accurate list of sex and gender categories for health care organizations, and these new codelists will eventually be recognized as standards by bodies such as the Canadian Institute for Health Information (www.cihi.ca). By choosing or contributing to well constructed and thoughtful codelists, organizations can build on one anothers' work and share results across sectors.

The following table suggests a few codelists that may be relevant to Social Purpose Organizations as they collect and report outcome data, as examples only. They are categorized by the respective classes of the Common Impact Data Standard. The Common Impact Data Standard could reference them as examples without stipulating their use or, like the IATI publishing standard (*Codelists*, n.d.), provide a list of recommended codelists where appropriate.

Class	Suggested sources	Comments
Organization	Research Organization Registry (ROR) (www.ror.org) IATI approach to unique organizational IDs (IATI, 2020)	Organizational legal names change over time, may be written in multiple languages, and are often misspelled. Central organizational IDs allow results to be aggregated over time and between funders.
Domain, Impact, Outcome	Sustainable Development Goals and/or Targets (United Nations, 2020) Canadian Index of Well-being domains and indicators (Canadian Index of Wellbeing, 2012) The OECD Better Life Index (OECD, 2020)	Domains can also be created by users based on their own strategic priorities, such as the Ontario Trillium Foundation's six Action Areas (https://otf.ca/what-we-fund/action-areas) There are overlaps between Domain, Impact and Outcome, and some of the same codelists can be used for different classes.
Person, Stakeholder	ICD11, ICF to describe disease and level of functioning respectively. (World Health	There are many taxonomies for ethnicity, occupation, gender, roles,

Class	Suggested sources	Comments
	Organization, 2019a) (World Health Organization, 2020) HL7 FHIR (Fast Health Interoperability Resources) Practitioner role definitions (HL7.org, 2019)	etc. Refer to Statistics Canada for variable definitions used in the census (Government of Canada, 2015)
Program, Service, Activity	The OECD Development Assistance Committee (DAC) publishes annual updates to its Creditor Reporting System (CRS)[11] (IATI, 2020), which include detailed sector and purpose codes. The International Classification of Health Interventions (ICHI) (World Health Organization, 2019b) is expected to be released publicly in 2021	There is some conceptual overlap between Program, Service and Activity as defined in the Common Approach ontology, so the same codelist may be used in more than one class. DAC CRS, used by IATI, OECD, USAID and many other international agencies to track activities and investment sectors, can be used to define activities, purposes, services and targets, depending on which level and subset of the taxonomy is used.
IndicatorReport	DDI (Data Documentation Initiative) controlled vocabularies for research (DDI, 2018) including: Aggregation Method (https://ddialliance.org/Specification/DDI-CV/AggregationMethod_1.0.html) Summary Statistic Type (https://ddialliance.org/Specification/DDI-CV/SummaryStatisticType_2.1.html)	The DDI vocabulary for Aggregation Method identifies how a group of observations has been summarized, e.g., "PercentileRank: The percentile rank of an item is the percentage of items in its frequency distribution which are lower [cannot reach 100%]."

[11] See http://www.oecd.org/development/financing-sustainable-development/development-finance-standards/dacandcrscodelists.htm

Appendix B: Data ethics and data quality

Whenever data is used for decision-making, especially when it is compared across organizations, data quality becomes a critical issue.

There are many reasons that data can contain errors, starting with the initial choice of indicators through to the accuracy of calculations (Viswanathan, 2005). In fact, every dataset has errors, but some are more harmful than others. The Common Impact Data Standard should include measures of data quality to assure some reasonable level of comparability for users (like funders) that wish to compare results.

Sources of error that are particularly relevant to Social Purpose Organizations are:

- Creaming, cherry-picking and parking
- UnFAIR datasets
- Unethical data practices

Creaming, cherry-picking and parking

When an organization's funding is based on their outcomes, there is intense pressure to make those outcome results look good. Even ethical, responsible organizations may err on the side of optimism if the alternative is being de-funded in favour of another organization that is not so conscientious.

Put another way, economically rational providers can respond to financial incentives through 'gaming' practices, including:

- *"cherry-picking" easier to support individuals from within a wider pool of those eligible i.e. behaving selectively pre-referral in situations where there is a rationing of programme places;*
- *"creaming" participants who are closer to the labour market (post referral) and targeting services on them in the expectation that they are more likely to trigger an outcome payment (and that services required to facilitate this will be relatively low-cost)*
- *"parking" participants who are deemed unlikely and/or relatively expensive to generate outcome payments and who are therefore de-prioritised, receiving the minimum possible service. (Carter, 2019)*

Another method to accentuate the positive is to select indicators that make one's program look good. A couple of ways that employment outcomes can be chosen to maximize the demonstration of impact are:

- Employment rate measured at the hiring date rather than after 3 months' probation
- Employment rate using as denominator the number of clients who respond to a one-year followup survey sent to their employment address, leaving out clients who did not respond

Organizations using standard evidence-based indicators may show less impact in comparison.

People who have multiple disadvantages such as health conditions or disabilities – and thus are more expensive to serve – tend to be systematically excluded from programs with market-based funding (Dudley-Marling & Baker, 2012). The Common Approach, by implicitly allowing funders to compare cost-effectiveness between programs, may contribute to this sorry situation.

One way to prevent gaming behaviour is to use accountability mechanisms that include standard definitions and external scrutiny (Carter, 2019) such as case mixes, random assignments, audits, third party evaluations and so on. *These mechanisms are not necessary if outcome measures do not affect funding decisions.* However, if data based on the Common Impact Data Standard is used to compare effectiveness between programs, and influence funding decisions, anti-gaming mechanisms must be supported – not required -- by the Data Standard.

As stated in the paper above, the W3C Data Catalog Vocabulary can capture anti-gaming and data quality characteristics. Funders may choose whether to require some form of data quality reporting in order to use outcome data for decision-making.

UnFAIR datasets

As stated in the paper above, the FAIR Principles of data sharing[12] outline criteria that make a dataset 're-usable'. Before data is aggregated across datasets, data providers should address a number of quality criteria related to findability, accessibility, interoperability and reusability.

If a dataset is not documented with some minimum amount of information about method of data collection and definitions of variables, it should be treated with caution. In the world of data quality, no news is not good news.

The Common Impact Data Standard uses the W3C definition of dataset, which can support any quality frameworks, and users can match the relevant framework to the particular topic of a dataset (e.g., there are quality standards specifically for the development of measurement instruments in the social services (German Data Forum, 2015)).

Users of the Common Impact Data Standard could adopt any of the following strategies:

- Document datasets as described in 'Datasheets for Datasets':

  In the electronics industry, every component, no matter how simple or complex, is accompanied with a datasheet that describes its operating characteristics, test results, recommended uses, and other information. By analogy, we propose that every dataset be accompanied with a datasheet that documents its motivation, composition, collection process, recommended uses, and so on. Datasheets for datasets will facilitate better communication between dataset creators and dataset consumers, and encourage the machine learning community to prioritize transparency and accountability. (Gebru et al., 2020)

- Rate datasets according to W3C quality metrics (https://www.w3.org/TR/vocab-dqv) or FAIR metrics (Wilkinson et al., 2018) that have been selected for their relevance to the proposed uses of the data.

- Demonstrate the level of compliance with defined 'domain-relevant community standards' as described by FAIR Principle R1.3.

In some cases, measurement error will not lead to any meaningful difference in decisions. In those cases, data can be reported without any expectation that it be believed, and documentation is not necessary. A recent study sponsored by CanWach (2020) examined the issue of acceptable measurement error in data collected by NGOs. (Unfortunately it has not yet been published but the presentation is available as a recorded webinar[13]. The research team compared baseline statistics collected by NGOs against public statistics collected by formal Demographic and Health Surveys

[12] https://www.go-fair.org/fair-principles/
[13] https://canwach.ca/learning/maximizing-existing-data-to-strengthen-program-design-evaluation-and-impact/

(DHS) They found large differences between NGO and DHS estimates – only 30% of the paired indicators were within a 5% difference. They hypothesized that this difference was caused by:

- Not measuring the same underlying true value
- Not measuring the indicators in the same way
- Measuring the indicators with a high technical error of measurement) (Ber et al., 2020) (slide 18)

They concluded that if the measurement error is not important, it is fine to use less technically careful data, i.e., if the organization "has tolerance for estimates of low or unknown accuracy".

Unethical data practices

Data is not value-free. The way that data has been designed and collected reflects the power relationships between the people who measure and the people who are measured. This is a fundamental principle in the struggle of people with disabilities, indigenous peoples, people of colour and people living in poverty to take control over the data structures that have been used to oppress them.

As stated in the CARE Principles for Indigenous Data Governance, "Extractive and unethical research practices led to the accumulation of Indigenous collections in vast national repositories that have missing, incomplete, and impoverished records and metadata. These problems of inequity continue in the ways Indigenous Peoples' data is created, stored, accessed, and used."(Waltman, 2020)

Further: "The current movement toward open data and open science does not fully engage with Indigenous Peoples rights and interests. Existing principles within the open data movement (e.g. FAIR: findable, accessible, interoperable, reusable) primarily focus on characteristics of data that will facilitate increased data sharing among entities while ignoring power differentials and historical contexts." (The Global Indigenous Data Alliance, 2019)

The statements above apply to any group of people who have been labelled as problematic and studied by external actors in order to control the resources that go to them. Groups should be engaged in decisions about what and how gets measured, as summarized by disability and patient rights activists: "Nothing about us without us."(Chu et al., 2016). See the free online course on 'Practical Data Ethics (fast.ai, 2020) for a syllabus and other resources on this topic.

The Common Impact Data Standard can incorporate principles of data governance, equity and justice in the W3C Data Quality Vocabulary, either in reference to specific compliance guidelines like CARE Principles or to the FAIR Principle of Reusability "R1.3: (meta)data meet domain-relevant community standards".