

Standardised Data on Initiatives – STARDIT: Beta Version

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Research article

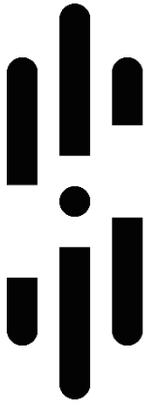
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STARDIT

1
2 **Standardised Data on Initiatives – STARDIT:**
3 **Beta Version**

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7 Plain English summary

8 All major problems, including complex global problems such as air pollution and pandemics, require
9 reliable data sharing between disciplines in order to respond effectively. Such problems require
10 evidence-informed collaborative methods, multidisciplinary research and interventions in which the
11 people who are affected are involved in every stage. However, there is currently no standardised way to
12 share information about initiatives and problem-solving across and between fields such as health,
13 environment, basic science, manufacturing, education, media and international development.

14 A multi-disciplinary international team of over 100 citizens, experts and data-users has been involved in
15 co-creating STARDIT to help everyone in the world share, find and understand information about
16 collective human actions, which are referred to as 'initiatives'.

17 STARDIT is an open access data-sharing system to standardise the way that information about initiatives
18 is reported, including information about which tasks were done by different people. Reports can be
19 updated at all stages, from planning to evaluation, and can report impacts in many languages, using
20 Wikidata. STARDIT is free to use, and data can be submitted by anyone. Report authors can be verified
21 to improve trust and transparency, and data checked for quality.

22 STARDIT can help create high-quality standardised information on initiatives trying to solve complex
23 multidisciplinary global problems. Among its main benefits, STARDIT offers those carrying out research
24 and interventions access to standardised information which enables well-founded comparisons of the
25 effectiveness of different methods. This article outlines progress to date; information about submitting
26 reports; planned next steps and how anyone can become involved.

27

28 Abstract

29 Background

30 There is currently no standardised way to share information across disciplines about initiatives,
31 including fields such as health, environment, basic science, manufacturing, media and international
32 development. All problems, including complex global problems such as air pollution and pandemics
33 require reliable data sharing between disciplines in order to respond effectively. Current reporting
34 methods also lack information about the ways in which different people are involved in initiatives,
35 making it difficult to collate and appraise data about the most effective ways to involve different
36 people.

37 Objective

38 STARDIT (**Standardised Data on Initiatives**) was created to help everyone in the world find and
39 understand information about collective human actions, which are referred to as 'initiatives'. STARDIT
40 enables multiple categories of data to be reported in a standardised way across disciplines, facilitating
41 appraisal of initiatives and aiding synthesis of evidence for the most effective ways for people to be
42 involved in initiatives.

43 Method

44 STARDIT is an open access web-based data-sharing system which standardises the way that information
45 about initiatives is reported across diverse fields and disciplines, including information about which
46 tasks were done by which stakeholders. STARDIT data is licensed as public domain (CC0) and integrated
47 into Wikidata; it works across multiple languages and is both human and machine readable. Reports can
48 be updated throughout the lifetime of an initiative, from planning to evaluation, allowing anyone to be
49 involved in reporting impacts and outcomes.

50 STARDIT development is guided by participatory action research (PAR) paradigms, and has been co-
51 created with people from multiple disciplines around the world in multiple ways, working with
52 Indigenous people, cancer patients, health researchers, environmental researchers, economists,
53 librarians and academic publishers.

54 Results

55 Over 100 people from multiple disciplines have been involved in co-designing STARDIT. STARDIT reports
56 have been created for peer-reviewed research in multiple journals. A working Beta version was publicly
57 released in February 2021 (ScienceforAll.World/STARDIT).

58 Keywords

59 Data, open, standardised, participatory, democracy, evidence, systematic, genomics, health, indigenous

60

61 Introduction

62 Background

63 Many problems facing life on earth transcend the capacity of any single discipline to address. For
64 example, problems such as pandemics, air pollution and biodiversity destruction cannot be
65 characterised solely as ‘public health’, ‘environment’ or ‘education’ problems.^{1,2} Solving such problems
66 calls for holistic approaches³ and will require governments, industry, research organisations and people
67 around the world to work in partnership.

68 People need access to valid and reliable information to make informed decisions⁴, which typically
69 requires evidence. Depending on the context, this evidence-informed approach is called ‘research’,
70 ‘evaluation’⁵, ‘international development’, ‘education’ or an ‘initiative’. Hereafter all of the above will
71 be referred to as ‘initiatives’. For example, when deciding a response to a pandemic, standardised data
72 can improve retrieval of relevant information which can be used to inform which affected individuals or
73 organisations could be involved in the design of the response and which outcomes are most important.
74 This can include deciding which stakeholders should be involved in which tasks, such as prioritising
75 outcomes.

76 In this article we explain how **Standardised Data on Initiatives (STARDIT)** builds on work to date by
77 standardising a wide variety of data in a format applicable across multiple sectors, disciplines and
78 languages. It is hoped that the creation of this evidence base will add to understanding and evaluating
79 what works, for whom, why, and in what circumstances.⁶⁻⁹ Hereafter, data generated by an initiative
80 (including raw data), information about the data (meta-data) and information about the initiative will all
81 be referred to as ‘data’ unless otherwise specified.

82 In 2020, the United Nations Secretary-General stated that ‘*purposes that involve data and analytics*
83 *permeate virtually all aspects of our work in development, peace and security, humanitarian, and human*
84 *rights*’, encouraging ‘*everyone, everywhere*’ to ‘*nurture data as a strategic asset for insight, impact and*
85 *integrity – to better deliver on our mandates for people and planet*’¹⁰. Similarly, the United Nation’s Paris
86 Agreement highlighted the critical role of ‘sharing information, good practices, experiences and lessons’
87 in response to preventing irreversible climate change¹¹. While organisations such as Cochrane (health)
88 and The Campbell Collaboration (social sciences) are working to create high-quality systematic reviews
89 of medical, social and economic initiatives, there remain limitations to the data available for such
90 reviews. After a recommendation from the Organisation for Economic Co-operation and Development
91 (OECD), successful data sharing initiatives in biodiversity exist, such as the Global Biodiversity
92 Information Facility (GBIF)¹², however there also remain limitations and accessibility issues in sharing
93 and standardising biodiversity data^{13,14}.

94 It is often essential to include those affected by initiatives in the design and delivery of those
95 initiatives¹⁵. For example, with an initiative to respond to a pandemic, those creating and delivering an
96 initiative, and those affected by the outcome may be the same people. Forms of participatory action
97 research where anyone can be involved in any aspect of research (including amorphous terms such as
98 ‘citizen science’) are increasingly recognised as crucial paradigms for solving such global problems such,
99 as they can help ensure that initiatives are aligned with the priorities of those affected^{16,17}. However,
100 while the importance of involving people is clear,⁶ evidence-informed methods of doing so are
101 lacking.^{8,18-22}

1:02 A recent statement defined a role for the public in ‘data intensive’ health research.²³ While in the health
1:03 research disciplines there are over 60 different tools for reporting or supporting public involvement,
1:04 most published tools are not used beyond the groups that developed them, and none work across
1:05 multiple disciplines.²⁴ Current reporting methods also lack information about the ways in which
1:06 different people are involved in initiatives, making it difficult to collate and appraise data about the
1:07 most effective ways to involve different people. In addition, ‘citizen science’ and ‘participatory action
1:08 research’ are blurring the lines between concepts such as ‘researcher’, ‘public’, ‘patient’ and ‘citizen’.
1:09 8,25–29

1:10 In addition to providing new standardised data categories for describing who was involved in which
1:11 tasks of an initiative, STARDIT can also incorporate the many existing data standards (see the
1:12 supplementary resources ‘Using Standardised Data on Initiatives (STARDIT): Beta Version Manual’), thus
1:13 creating a unifying system for data hosting, linking and analysis. STARDIT can also report any different
1:14 ‘interests’ of stakeholders and the ways power is shared between different stakeholders. The word
1:15 ‘stakeholders’ here includes the public, those who have important knowledge, expertise or views that
1:16 should be taken into account and others with a ‘stake’ in an initiative^{30,31}.

1:17 Stakeholders can also include people who have financial, professional, social or personal ‘interests’. An
1:18 ‘interest’ can include a kind of commitment, goal, obligation, duty or sense of connection which relates
1:19 to a particular social role, practice, profession, experience or medical diagnosis and may³². These can
1:20 include financial or other interests which may compete or conflict with ‘public interest’.³³ For example, a
1:21 systematic review found that industry funded research is more likely to have outcomes favouring those
1:22 with financial interests who are sponsoring the research^{33,34}. Other examples include people from
1:23 certain sub-populations (including those from populations more likely to be exploited³⁵), Indigenous
1:24 peoples, or people affected by rare diseases may have a personal interest in initiatives relevant to those
1:25 specific populations, separate to the ‘general public’.^{8,36–38} For example a person with a rare disease may
1:26 have a personal ‘interest’ in research into a treatment for that disease³⁸. STARDIT allows standardised
1:27 reporting of stakeholders and any interests.

1:28 Sharing data in a consistent way may help ensure that benefits of initiatives are shared more equitably
1:29 (for example, by improving accountability).⁸ In addition sharing information about who ‘owns’ or
1:30 controls access to data and how such data access decisions are made can help people make informed
1:31 decisions about participating in research³⁸. By reporting involvement in initiatives, STARDIT also allows
1:32 acknowledgement of people otherwise excluded from the public record – such as patients, people
1:33 donating personal data, medical writers, laboratory assistants, citizen scientists collecting or analysing
1:34 data, custodians of traditional or Indigenous knowledge, translators, interviewers, coders and code
1:35 reviewers.

1:36 Objective

1:37 The objective of STARDIT is to address current limitations and inconsistencies in sharing data about
1:38 initiatives. The STARDIT system features standardised data reporting about initiatives, including who has
1:39 been involved, what tasks they did, and any impacts observed. STARDIT is designed to support a culture
1:40 of partnership across disciplines and is, wherever possible, aligned and interoperable with existing
1:41 reporting models and frameworks such as those used in health, environment, manufacturing ,
1:42 publishing, government policy, education, arts and international development (see Table 1). In addition,
1:43 the STARDIT Preference Mapping (STARDIT-PM) tool provides a standardised way to report information
1:44 about different stakeholders’ preferences, including preferences for power-sharing and methods of
1:45 involving people during an initiative. STARDIT data is licensed as public domain (CC0) and integrated

1:46 into Wikidata, which is collaboratively edited structured data³⁹. The working Beta Version of STARDIT
1:47 uses Wikidata to enable definitions to be co-created by contributors anywhere in the world, and
1:48 therefore works across human languages, with interoperability with other platforms planned for future
1:49 versions. A link to the working Beta version can be found at: ScienceforAll.World/STARDIT/Beta⁴⁰

1:50 Current usage

1:51 The STARDIT provides a way to report data about who did which tasks in an initiative. STARDIT reports
1:52 have also been used to describe a number of research projects, including data about who did which
1:53 tasks, ethics approval, funding, methods and outcomes^{37,41,42}. In health research, projects which have
1:54 used STARDIT reports include participatory action research projects involving a large cohort study of
1:55 >15,000 healthy, elderly research participants⁴³, a protocol for precision medicine for Aboriginal
1:56 Australians⁴⁴, and a group of patients and families affected by a rare immunological disorder³⁸, and a
1:57 project involving extended family of donor-siblings who share the same sperm-donor father³⁷. An
1:58 environmental research project has also used STARDIT to report the initiative, which works with citizen
1:59 scientists to locate critically endangered species using eDNA^{45,46}. In medicine, STARDIT is already being
1:60 used by the Wikipedia-integrated open access peer reviewed WikiJournals, which has articles which are
1:61 integrated into Wikidpedia.⁴⁷ For example, a STARDIT report has been created to share information
1:62 about a Wiki Journal of Medicine article about systematic reviews (with an associated integrated
1:63 Wikipedia page)⁴⁷, including information about authors, editors and peer-reviewers⁴⁸. This allows
1:64 readers to critically appraise the source before deciding whether to use or share it.

1:65 Potential applications

1:66 STARDIT's potential applications are summarised in Table 1. Among the principal applications, STARDIT
1:67 offers public access to standardised information which enables the comparison of methods with the
1:68 most impacts, such as ways of involving stakeholders in initiatives. The United Nations defines assessing
1:69 impact as 'establishing cause and effect chains to show if an intervention has worked and, if so, how'.⁴⁹
1:70 With more data being shared, STARDIT could support decision making when planning stakeholder
1:71 involvement in initiatives, and enable more people to assess the rigour of impact assessments.⁴⁹

1:72 For example, many industries use self-regulatory processes to govern industry practices, with examples
1:73 including the Forest Stewardship Council (FSC), Marine Stewardship Council (MSC)⁵⁰, Certified B
1:74 Corporations,⁵¹ and multiple Good Manufacturing Practice (GMP) guidelines. STARDIT could be used to
1:75 improve public awareness of, and access to the data already reported by such self-regulatory standards.
1:76 Increased transparency could, for example, support people to make informed decisions when investing
1:77 or buying products; automate analysis of data to facilitate such decisions, and improve accountability
1:78 overall.

1:79 In addition, STARDIT could be used to share information which makes research more reproducible^{52,53},
1:80 improving accessibility to the information required to critically appraise research and evidence and thus
1:81 improving trust in processes such as the scientific method^{54,55}, and facilitate an appraisal of different
1:82 knowledge systems, including Indigenous knowledge systems⁵⁶. Such data sharing could also improve
1:83 the translation of trusted, quality research and data, by empowering people to both access and appraise
1:84 relevant data. For example, improved access to more standardised information (in multiple languages)
1:85 about data and outcomes, could help to facilitate more informed collaborations between researchers
1:86 and those monitoring and protecting critically endangered species, particularly where there is no
1:87 common language⁵⁷⁻⁵⁹.

1:88 Defining ‘initiative’ and ‘involvement’

1:89 As STARDIT is designed to report data across disciplines, distinctions between concepts such as
1:90 ‘intervention’, ‘research’, ‘project’, ‘policy’, ‘initiative’ (and similar terms) are of secondary importance
1:91 compared with communicating ‘the aims or purposes of specified actions’; ‘who did which tasks or
1:92 actions’; ‘are there competing or conflicting interests’, and the ‘outcomes from a specific action’.

1:93 In this way, STARDIT can be used to report on any kind of collective action, which can include
1:94 interventions, projects or initiatives – including a clinical study, education interventions or any kind of
1:95 evaluation^{5,60,61}. In this article, we use the word ‘initiative’ to describe any intervention, research or
1:96 planned project which is a kind of collective human action. We define ‘involving’ people as the process
1:97 of carrying out research, initiatives or interventions with people, rather than on them.⁶² Involvement
1:98 occurs when power is shared by researchers, research participants, and other relevant stakeholders
1:99 (such as the public, industry representatives and experts). While meanings of these terms are often
2:00 imprecise and can be used interchangeably, ‘involvement’ here is distinct from ‘engagement’, which is
2:01 where which information and knowledge about initiatives is shared, for example, with study
2:02 participants who remain passive recipients of interventions^{63–65}.

2:03 Using and developing data standards

2:04 The current Beta Version of STARDIT maps terms and concepts using the Wikidata initiative (part of the
2:05 Wikimedia Foundation)³⁶, which includes definitions (taxonomy), a way of describing relationships
2:06 between concepts (ontology)³⁷, and a system to translate definitions and ontology between many
2:07 languages. Examples of existing taxonomies include the National Library of Medicine’s Medical Subject
2:08 Headings (MeSH), which are used extensively in multiple kinds of literature reviews³⁸.

2:09 How to involve people in combining or merging overlapping taxonomies for different subsets of data
2:10 has been identified as an important question in the process of taxonomy^{66,67}. By using Wikidata,
2:11 STARDIT can be used by anyone to store both publicly accessible data and meta data (data about
2:12 data), and link to hosted structured linked data. While STARDIT is a novel element set, where possible it
2:13 will also incorporate element sets from established data standards and map them where possible (see
2:14 **Table 5** in appendix for examples of data standards which could be incorporated). This includes standard
2:15 elements and value sets and controlled vocabularies⁶⁸. The terms used in this paper are working terms,
2:16 which will be progressively standardised over the lifetime of the project.

2:17 Structured Wikidata can help define terms and concepts clearly and unambiguously, in a transparent
2:18 and open way. For example, colours in the spectrum are described by a standard numerical code in
2:19 Wikidata, whereas the names of colours change according to different languages. Also, people with
2:20 different DNA variations will also experience some colours differently. Similarly, the Wikidata entry for
2:21 ‘patient’ has the human-readable definition of ‘person who takes a medical treatment or is subject of a
2:22 case study’ (translated into 54 other languages) and a machine-readable definition consisting of dozens
2:23 of semantic links to and from other Wikidata entries³⁹. The terms ‘[participant](#)’ and ‘[research participant](#)’
2:24 are similarly coded, defined and translated. For terms that do not currently exist in Wikidata (for
2:25 example, ‘biobank participant’), a definition can be contributed by anyone in any language, refined by
2:26 other users, then coded and translated into multiple languages by Wikidata. Developing taxonomies and
2:27 ontologies will be an ongoing process facilitated by the current Wikidata infrastructure, and may require
2:28 creating additional tools to create more inclusive ways of involving people in developing taxonomies.⁴⁰

229 Methods and paradigms

230 Participatory action research

231 STARDIT development is guided by participatory action research (PAR) paradigms, which guides
232 initiatives by aiming to involve all stakeholders in every aspect of the development and evaluation of an
233 initiative^{69,70}. Participatory research is a form of collective, self-reflective enquiry undertaken by people
234 in order to understand their situation from different perspectives⁷¹. Development has also been
235 influenced by existing work in health research, including the multidisciplinary area of public health,
236 which incorporates social, environmental and economic research. In a health context, participatory
237 research attempts to reduce health inequalities by supporting people to be involved in addressing
238 health issues that are important to them, data collection, reflection and ultimately in action to improve
239 their own health⁷². At the core of participatory research is ‘critical reflexivity’. The process asks people
240 involved to reflect on the causes of problems, possible solutions, take any actions required which might
241 improve the current situation, and evaluate the actions⁷⁰.

242 Rights-based paradigm

243 The United Nations (UN) Universal Declaration Human Rights states everyone should be able to ‘receive
244 and impart information and ideas’⁷³. The UN also states that democracy, development and respect for
245 all human rights and fundamental freedoms are interdependent and mutually reinforcing⁷⁴. To uphold
246 human rights and ‘environmental rights’⁷⁵, and for ‘the maintenance of peace’, people require ‘media
247 freedom’ in order to ‘seek, receive and impart information’⁷⁴, free of unaccountable censorship.
248 STARDIT has been created in order to help anyone uphold these universal rights, by providing a way to
249 share open access information in a structured way with a transparent process for quality checking.

250 Cultural neutrality

251 Values, assumptions, ways of thinking and knowing are not shared universally. The participatory process
252 used for developing STARDIT required and will continue to require that it attempts to map cultural
253 variations, in an attempt to avoid unconsciously reinforcing particular (often ‘dominant’)⁷⁶ values.
254 Transparent acknowledgement of differing values and perspectives is critically important, in particular
255 when mapping if different stakeholders’ values are complimentary or opposing. A participatory process
256 requires mapping all of these perspectives and, where possible, involving people in labelling different
257 perspectives and values. For example, STARDIT has already been used to map the varying perspectives
258 of multiple stakeholders when planning a multi-generational cohort study⁷⁷.

259 Many problems facing humans are shared by non-human life forms and ecosystems, including rapid
260 climate change, air pollution and sea-level rise. If initiatives are to operate in inclusive, culturally-neutral
261 ways, reconsideration of the language used to describe relationships between humans, non-human life
262 and the environment is essential.⁷⁸ Environmental and social sciences are challenging and redefining
263 colonial-era concepts of what can be ‘owned’ as property or who ‘owns’^{78,79}. As a result, ecosystems
264 such as rivers and non-human animals, are being assigned ‘personhood’^{80–82}. For example, a public
265 consultation by a ‘dominant’ group might ask, ‘who owns the rights to the water in a river system?’⁷⁶
266 This question imposes the dominant group’s values on people who may not share the same concept of
267 ‘ownership’. In this way, Western European legal and economic traditions are frequently incompatible
268 with those of some Indigenous peoples’.^{78,83,84}

269 The participatory process used for developing STARDIT has attempted to be transparent about how
270 different stakeholders have been involved in shaping it in order to improve how the system can be used
271 to map values and provide more culturally neutral guidance for planning and evaluating involvement in
272 initiatives. However, it is acknowledged that it will be a challenging process to ‘de-colonialise’ and ‘de-
273 anthropocise’ language and action^{85,86}, as this may be perceived as a challenge to some people’s cultural
274 attitudes which may not align with the United Nation’s universally enshrined principles of democracy,
275 human rights and environmental rights. In addition, ongoing co-design will be required to ensure
276 STARDIT is as accessible and inclusive as possible.

277 Development phases and methods

278 Both the STARDIT Alpha version (0.1) and the Beta version (0.2) have already involved many people
279 from diverse disciplines and backgrounds in the development, as this is integral to its effectiveness
280 (Figure 1). It has been co-created using methodologies informed by PAR and other health research
281 reporting guidelines.⁸⁷ PAR describes related approaches which involve experts (such as researchers),
282 the public and other stakeholders “working together, sharing power and responsibility from the start to
283 the end of the project”.^{88,89}

284 The Alpha version of STARDIT (version 0.1) followed the recommendations of a 2019 scoping review led
285 by Nunn et al, which mapped public involvement in global genomics research.⁸ This review stated that
286 ‘without a standardized framework to report and transparently evaluate ways people are involved, it
287 will be difficult to create an evidence base to inform best-practice’.⁸ This review was followed by an
288 additional review conducted in 2020 led Nunn et al, which mapped international guidance for planning,
289 reporting and evaluating initiatives across multiple disciplines⁹⁰. STARDIT was also informed by a
290 number of PAR projects,^{37,41,42} and a report for the Wikimedia Foundation by the charity Science for
291 All.⁹¹

292 The charity Science for All has hosted the co-creation process since 2019. Science for All is a charity
293 based in Australia which support everyone to get involved in shaping the future of human knowledge,
294 with co-created values guiding their work⁹². Development was informed by a number of literature
295 reviews and guidelines, with methods of involving people in the development of STARDIT guided by the
296 Enhancing the Quality and Transparency of Health Research (EQUATOR) network’s approach to
297 developing reporting guidelines.^{87,93} Methods of involving people included public events, online
298 discussions and a consultation process.

299 The co-creation process is being supported pro-bono by Science for All, and has also received in-kind
300 support from the EPPI-Centre and individuals from multiple organisations worldwide. A modified Delphi
301 technique was used at some stages, with this method to be reviewed when co-creating future
302 versions.^{94,95} Many people were invited to provide feedback on all aspects of STARDIT, including its
303 feasibility, design and implementation. They could comment anonymously using online forms and
304 shared documents, in online discussion forums, via email or during face-to-face or video meetings.

305 Science for All hosts an online working group which continues to guide the development of STARDIT
306 according to the terms of reference⁹⁶. Anyone is welcome to join the working group, contribute to
307 discussions and vote on decisions and ensure alignment with other initiatives. More detailed
308 information about the consultation process for the Alpha and Beta versions up to May 2021 can be
309 found in a 2020 and 2021 report^{97,98}. Further information about who was involved in the Beta Version
310 development and proposed future development phases can be found in the supplementary
311 information. STARDIT and all associated work and logos are currently published under the Creative
312 Commons Attribution-ShareAlike 4.0 International license (CC BY-SA 4.0)⁹⁹, with the quality of any

313 future iterations being the responsibility of not-for-profit host organisations and future licensing
314 decisions to be made transparent, with anyone invited to be involved.

315 Figure 1: STARDIT development

316 Insert file 'Figure 1 STARDIT development'

317 Version One implementation

318 Once STARDIT Beta (version 0.2) has been submitted for publication, work will begin on the next version
319 (version 1.0). Those involved with STARDIT development will disseminate information, gather feedback
320 and recruit more people and organisations to participate as project partners and potentially funders.

321 This stage is estimated to take between 2 to 3 years, at which point a working group will formally invite
322 other appropriate partner organisations (such as the UN and WHO) to adopt the STARDIT framework. A
323 Steering Group will be established to oversee and continually improve the STARDIT system. STARDIT will
324 require continued working with publishers, research funders and governments to encourage adoption
325 of the reporting tool. More detail on the proposed next stages can be found in the [supplementary](#)
326 [materials in the section 'Development phases'](#).

327 Scope and applications

328 STARDIT is the first and only data-sharing system that enables standardised sharing of data about how
329 people are involved in any type of initiative, across any discipline, including involvement in the planning,
330 evaluation and reporting of initiatives. In addition it allows comparison of both evaluation methods and
331 any impacts or outcomes in relation to standardised terminology. Table 1 summarises the proposed
332 scope and potential applications of the STARDIT.

333 Table 1: Example applications of STARDIT

334 [Insert Table 1: Example applications of STARDIT]

335 Further examples of how STARDIT can be used are provided in the supplementary information,
336 including; using STARDIT in genomic research for mapping phenotypes and reporting who was involved
337 in helping define and describe them; providing data to critically appraise information sources (including
338 public videos); report data about case studies consistently; creating 'living systematic reviews' and
339 training machine learning from STARDIT data.

340 Using STARDIT

341 Across all disciplines, 'plan', 'do' and 'evaluate' are recognised as distinct stages of initiatives¹⁰⁰. While
342 there are many ways to involve different people in these stages, standardised reporting and thus
343 evidence-informed methods of doing so are lacking.^{6,8,101} Figure 2 describes how STARDIT can be used to
344 map how people might be involved in designing, doing, reporting and evaluating initiatives, starting
345 with 'idea sharing'.

346 Figure 2: Planning and evaluating initiatives using STARDIT

347 Insert file 'Figure 2 Planning and evaluating initiatives using STARDIT'

348 **Reporting initiative design in STARDIT**

349 Questions such as, ‘Who decides how people are involved?’ and, ‘Who is involving whom?’ and ‘what
 350 are people’s preferences for ways of working’ can be difficult to answer and is an active area of
 351 research^{38,102}. For example, planning a healthcare initiative requires input from experts as well as from
 352 the people the initiative is intended to help¹⁰¹. Figure 3 summarises a way of using STARDIT to report
 353 the design process of initiatives, with Table 2 providing details about how involvement from different
 354 stakeholders can be reported at different stages. The section ‘Detailed reporting of design using
 355 STARDIT’ in the supplementary resource ‘STARDIT Manual Beta Version’ provides more comprehensive
 356 information.

357 **Figure 3: Reporting initiative design in STARDIT**

358 Insert file ‘Figure 3 Reporting initiative design in STARDIT’

359

360 **Table 2: Summary of reporting initiative design in STARDIT**

Initiative stage	Data reported
Stage 1: Idea identified: An idea for an intervention, project or research is identified and articulated	 Report planned initiative
Stage 2: Idea refined The idea is refined with a small group of stakeholders ^{6,25,103–108}	
Stage 3: Stakeholder mapping: Existing stakeholders attempt to map who is included and who might currently be excluded from the process ^{25,109}	 Preference Mapping
Stage 4: Co-create communication plan Develop a communication plan to invite people to co-create involvement ^{25,103,110}	
Stage 5: Share plan: Share the idea (according to the communication plan) and ask for feedback on it (including the involvement plan) ^{108,111,112}	 Report updated plan
Stage 6: Analyse feedback: Collect and analyse feedback, share results. ^{110(p1)}	
Stage 7: Finalise idea and involvement plan: Co-create the plan (including the plan for involving people), seek relevant permissions and ethics ^{113,114}	 Report final plan
Do initiative (see ‘Planning and reporting initiatives using STARDIT’)	
Stage 8: Evaluate involvement: Evaluate the process and the impact of both the initiative and involving people in the initiative	 Report end of initiative

361

362 Mapping preferences for involvement

363 Involving multiple stakeholders in designing how people should be involved in initiatives is considered
364 best practice, as it may facilitate power sharing and improve the process overall.^{8,115} Current
365 explanations of participatory research methods, and the language used to describe them, vary
366 considerably. There is no agreed, consistent way to describe how people have been involved in a
367 research initiative, or to report the impacts of their involvement.

368 The STARDIT Preference Mapping (STARDIT-PM) tool provides a standardised way to report the
369 preference of multiple stakeholders. Anyone can be involved in creating a STARDIT report, which means
370 that data on the impacts and outcomes of participation can be contributed by diverse stakeholders.
371 Such reports will help researchers make informed decisions when planning participation in research.

372 For example, a recent study showed how a charity for people affected by a rare disease involved a small
373 number of people affected by the rare disease in discussing preferences for how best to involve the
374 wider community of people affected in future research prioritisation and planning³⁸. Those involved had
375 a good understanding of any specific needs or preferences for involvement, and shared preferences for
376 the tasks (such as overseeing data access), method (facilitated discussions) and mode of involvement
377 (online text-based discussion). The STARDIT-PM data about this processes showed a preference for
378 being involved using online discussions, and the STARDIT report stated that involving people influenced
379 the way the charity planned to involve people prioritising research in the future.⁴¹

380 Examples of completed STARDIT-PM can be found in the additional files of a number of research
381 projects^{37,41,43}. Table 3 summarises questions which can be asked to map stakeholder preferences with
382 respect to involvement in initiatives.

383 The first stage of preference mapping requires individuals to self-identify as belonging to a specific
384 grouping of people. People from that grouping then share views on how people from other groupings
385 could be involved (or which groupings should not be involved). For example, labels for such groupings
386 could include:

- 387 • only people with a professional role in the initiative
- 388 • everyone (any member of the public who is interested)
- 389 • anyone who might be indirectly affected by the initiative
- 390 • only people who are directly affected by the initiative
- 391 • only people who are participating in the initiative
- 392 • only people with a financial interest in the initiative.

393
394 As a consistent mapping tool for use across all initiatives, STARDIT would allow both comparison of
395 diverse stakeholder views and exploration of similarities and variations in relation to preferences for
396 involvement. Used alongside other planning tools, this information could help align initiatives with
397 stakeholders' preferences. In this way, how stakeholders are involved throughout an initiative could be
398 co-designed from the outset. Analysis of the data about preferences should involve stakeholders from
399 multiple groupings to ensure that a diversity of perspectives are involved in assigning meaning to any
400 data.

401

402 Table 3: Questions for mapping preferences for involvement

Question	Rationale for question
Which stakeholder group does this person align with?	To establish which grouping(s) the person identifies as being part of – for example ‘researcher’ or ‘participant’ (noting any groupings should be co-defined)
Describe any financial relationship or other interest this person has to this project	To provide a public record of any potential conflicting or competing financial interest
Views on the purpose and values of the research	To establish the purpose of the research, and the motivations and values of the initiative from multiple perspectives
Describe how you think the learning from this initiative could be used	To establish views about knowledge translation and application of learning
Views on who data from this project should be shared with and how	To establish that person’s view about data sharing and ownership
Views on who should be involved (which ‘groups’ of people) – including who should not be involved – <i>following answers may be categorised depending on the stakeholder group</i>	To establish that person’s views on which ‘groups’ of people they think should be ‘involved’ in research – that is, having a role in shaping the research design, direction and outcomes <i>Note: Answers may require sub-categories if there are multiple categories for who should be involved (see Figure 4)</i>
Views on specific tasks of this person or group	To establish that person’s views on the tasks of the specific stakeholders who they think should be involved.
Preferred modes of communication	To establish that person’s preferences on communication modes with stakeholder groups
Views on what methods should be used	To establish that person’s views on which methods should be used to involve people – for example ‘online survey’
Views on facilitators of involvement	To explore that person’s perceptions of what might facilitate involving specified groups of people and help inform the design of involvement
Views on barriers of involvement	To explore that person’s perceptions of what might be a barrier to involving specified groups of people and help inform the design of involvement
Views on what the outcome or output of the involvement could be	To ascertain the expectations of that person about what involving the specified groups of people might achieve
Views on which stage of the research this group should be involved?	To establish that person’s views on which stage of the research the specified groups of people should be involved in

404 Beta Version interface

405 The data fields in the STARDIT system are summarised in Tables 4. Table 4 presents the full version
406 of the data fields. The ‘**Minimum Contribution Reporting Form**’ (MICRO) specifies the minimum
407 information required to make a STARDIT report and these fields are highlighted in the table and
408 marked with an asterisk (*).

409 Authorship

410 Acknowledging those involved in reporting ensures accountability for accuracy and increases trust in
411 report content. STARDIT reports must be completed by named people who are accountable for the
412 data being reported. Ideally, a public persistent digital identifier (for example, an ORCID number)¹¹⁶
413 or an institutional email address will be linked to authors’ names using Wikidata.

414 Reports cannot be completed anonymously, but STARDIT editors can redact author details from
415 publicly accessible reports for ethical reasons (such as privacy or risks to safety).

416 Report authorship can be led by any stakeholder, including people associated with, or affected by,
417 the initiative such as employees, researchers, participants, or members of the public. The affiliations
418 of people formally associated with the initiative can be shared in a report.

419 Submission and Editorial process

420 Reports can currently be submitted to STARDIT via a simple online form or emailed as a document
421 file. Editors review content for quality control (for example, checking that publicly accessible URLs
422 align with the data in the report), but will not critically appraise the initiatives or methods. The
423 Editorial process is currently parallel to the WikiJournal process, involving selected Editors from
424 these journals. While Editors will not approve the ethics of the initiative, a transparent process for
425 considering ethical issues will be considered before publishing a report. The Editors may consider
426 questions such as, ‘Does data need to be redacted in order to prevent harm and protect or preserve
427 life?’ or, ‘Is personal information being shared without consent?’ For more information about the
428 Editorial process for reviewing data quality and ethical considerations, see the section ‘Editorial and
429 peer review of STARDIT reports’ of the supplementary resource ‘STARDIT Manual Beta Version’.

430 Once approved by the Editors, the STARDIT data will be entered into the database in a machine-
431 readable format using structured data, based on the widely used Resource Description Framework
432 (RDF) developed by the World Wide Web Consortium (W3C), which is used by Wikidata.¹¹⁷ Each
433 STARDIT report is assigned a unique Wikidata item number and all previous versions are navigable in
434 a transparent history.

435 In future versions, it is proposed that stakeholders will be able to submit reports directly via an
436 application programming interface (API) which will facilitate machine automation of STARDIT report
437 creation). In addition, machine learning algorithms could be programmed to generate STARDIT
438 reports from existing databases. As humans and machines submit reports, categories or meta-tags
439 will be suggested (such as ‘patient’, ‘member of the public’), with the option of adding, or co-
440 defining, new categories using the Wikidata system for structured data.¹¹⁸

441 The database will generate a unique version number for the report with a Digital Object Identifier
442 (DOI). To create an immutable version, the report will also be using the Internet Archive (a charity

443 which allows archives of the World Wide Web to be created, searched and accessed for free)¹¹⁹.
444 Finally, the report will be assigned a status, with the data quality checking being described as:

- 445 • manually added, no human review (low quality checking – no DOI assigned)
- 446 • machine added, no human review (low quality checking – no DOI assigned)
- 447 • human review (medium quality checking – DOI assigned pending Editorial decision)
- 448 • peer or expert reviewed, with publicly accessible sources for indicators and references
- 449 checked (higher quality checking – DOI assigned pending peer or expert review).

450 Processes for data checking and assigning report status need to be further developed and agreed by
451 the STARDIT working group. For example, developing a transparent process if a report has been
452 created about an initiative with no involvement from anyone associated with the project, or only
453 one subset of stakeholders. In such cases, the Editorial team might give a short period of time for
454 any other stakeholders to be involved in checking and editing any information.

455 Updating reports

456 STARDIT will enable reports to be updated as initiatives progress over time. Updates will be
457 reviewed by the STARDIT Editors. Once an update is approved, the system generates a new version
458 number, while also preserving the original report. Updates might include, for example, information
459 about involvement in the initiative, or about dissemination, translation, co-creation of new metrics
460 to assess impacts, or longer-term outcomes.¹²⁰

461 Table 4: Summary of STARDIT Beta Version data fields

462 A minimum dataset is required for a STARDIT report. This is called the Minimum Contribution Report
463 (MICRO) and the required categories are highlighted and marked with an asterisk (*). Relevant
464 Wikidata items and qualifiers for these fields are provided in the supplementary materials in the
465 section [‘Developing taxonomies and ontologies’](#) and on the Science for All STARDIT Beta webpage ⁴⁰.

466 [insert Table 4: Summary of STARDIT Beta Version data fields]

Discussion and future versions

468 STARDIT is the first system that enables sharing of standardised data about initiatives across disciplines. By
469 using Wikidata, STARDIT will make use of existing infrastructure capable of co-defining types of data in
470 multiple languages^{121–123}. The co-design process (hosted by the charity Science for All) ensured people from
471 multiple organisations and countries were involved in both creating and refining STARDIT, ensuring it is
472 usable and relevant in multiple disciplines. Consultation with experts, and source materials from around
473 the world, have informed the design of STARDIT. Co-authors come from disciplines including health
474 research and services, environmental research and management, economics, publishing with over 20
475 different institutions represented. Future versions should be informed by a regular, systematic search,
476 review and appraisal processes, using the Preferred Reporting Items for Systematic Reviews and Meta-
477 Analyses (PRISMA) data set¹²⁴, used for reporting in systematic reviews and meta-analyses.

478 STARDIT enables reporting of who was involved, any impacts of stakeholders' involvement, and outcomes
479 of initiatives over time. This functionality addresses a serious limitation of the current peer-reviewed
480 publication process in which articles are not easily updated. However, there is no single process for making
481 decisions that would improve and refine the processes, language and taxonomies associated with reporting
482 initiatives, including who was involved in which tasks.¹²⁵ Similarly, based on feedback from Indigenous
483 community leaders, patient representatives and others, it is essential to ensure access to learning and
484 development opportunities is available to support people to both access and create STARDIT reports. The
485 STARDIT project therefore needs to continually appraise the inclusiveness and effectiveness of its
486 multidisciplinary, multilingual system, including accessibility of interfaces. To achieve this, the project will
487 continue to work with its partner organisations, including the Wikimedia Foundation, a global leader in this
488 field.

489 While there are multiple methods for mapping values,^{126,127} there is currently no agreed, standardised way
490 to map the values (beliefs and personal ethics) of those involved in initiatives and those creating reports in
491 STARDIT. Further research is needed to facilitate mapping of values and detect whether certain
492 perspectives are being consciously or unconsciously excluded.

493 STARDIT seeks to be an easy-to-use way for people from multiple disciplines to share data about initiatives.
494 However, amassing sufficient reports to create a useful database is estimated to take at least 5 years, and
495 will likely require machine learning. For example, adversarial machine learning may be used in parallel with
496 humans (for verifying data) to generate STARDIT reports from existing publicly accessible data at a scale
497 and speed otherwise impossible for humans alone to achieve¹²⁸. Similarly, the process of creating 'living
498 systematic reviews' from STARDIT reports is currently theoretical and would require significant
499 development and rigorous testing to realise.

500 It is important to note that access to Wikidata is actively blocked by governments or internet service
501 providers in some countries. While such censorship limits people's ability to contribute or critically appraise
502 data, STARDIT has been designed to be both interoperable with existing standards, and 'future proofed' to
503 allow interoperability with existing and emerging data systems beyond Wikidata.

504 Science for All will continue to host the co-creation process and to monitor and evaluate the project.
505 However, an open, transparent governance process that enables anyone to be involved in decision making
506 and ongoing co-design of STARDIT will need to be established, and is proposed in the supplementary
507 resources.

508 Ensuring that the STARDIT development process is inclusive and ethical, and that the database is quality
509 assured, is paramount to ensuring that STARDIT is credible, useful and trustworthy. STARDIT currently
510 relies on volunteers and pro-bono services from not-for-profit organisations. In the future, people should

511 be paid for certain tasks, especially if the project is to avoid excluding the involvement of those from lower
 512 socio-economic backgrounds who may not be able to afford to volunteer their time. For the success and
 513 longevity of this project, a sustainable, transparently decided funding model needs to be established, which
 514 ensures both the independence of the data, the hosting process and the governance.

515 Conclusion

516 This article summarises work to date on developing **Standardised Data on Initiatives (STARDIT)**, an open
 517 access web-based data-sharing system for standardising the way that information about initiatives is
 518 reported across diverse fields and disciplines. It outlines ways it has currently been used by different
 519 initiatives, and the next stages of development in detail. In accordance with the principles of transparent
 520 participatory action research, the authors invite the involvement of any interested persons in developing
 521 and improving the next version of STARDIT, Version 1.0. Detailed and up-to-date information about
 522 STARDIT is available on the Science for All website.¹²⁹

523 Tables

524 Table 1: Example applications of STARDIT

Area	Sub-Area	Relevant data categories
Research	Health research	Reporting: Funding, conflicting or competing interests, co-design, experts involved, people affected involved, methods, process for deciding and measuring outcomes, protocols, who is accountable for ensuring protocol is followed, information about data storage, sharing, ownership and custodianship, information about data security practices and standards, information about consent and withdrawal processes evaluation of entire research process, ethical review, information about data analysis and data validation
	Social research	
	Genomics research	
	Environmental research	
Policy	Health and social policy	Reporting: Values of people involved, sources of data and evidence, data on past and current initiatives and spending ¹³⁰ , process for policy (or proposed policy) creation, process for deciding and measuring outcomes, experts involved, people affected involved, policy or manifesto writers, conflicting or competing interests of people involved, purpose of policy (what needs have been identified, how and by who), outcomes from policy (including outcomes measured by those affected by policy), policy evaluation (reporting if it achieved what was intended)
	Other government policy (transport, arts, education, environment etc)	
	Foreign policy	
	Proposed policy (including draft policy and manifestoes)	
	International development	
Education and learning	Educational initiatives	Reporting: Sources of data and evidence for intervention, purpose of intervention, process for educational intervention creation, funding, conflicting or competing interests, experts involved, people affected involved, conflicting or competing interests, process for deciding and

Area	Sub-Area	Relevant data categories
		measuring outcomes, outcomes from intervention, evaluation of intervention, ethical review
Arts	Community arts projects	Reporting: Purpose of project, process for project design and implementation, experts involved, people from communities intended to benefit involved, funding, conflicting or competing interests, process for evaluating project, project evaluation, project outcomes.
	Arts funding	Reporting: People involved in deciding funding process, purpose of funding, people allocating funding (funding sources), funding amount, conflicting or competing interests, process for deciding outcomes of funding, evaluating the funding allocation process
Information, media and cultural heritage	Health and medical information	Reporting: People involved in researching, writing (including medical writers), creating, reviewing (including peer reviewers), disseminating and funding, information about any potential risks (to human health or lifeforms, natural or cultural heritage), information about who assessed those risks and how (for example, medical information standards ¹²¹), information about consent to appear in images and verified appearances of public figures, information about ownership of data or knowledge (including concepts of intellectual property, copyright and license information, relevant blockchains and non-fungible tokens), evaluating knowledge translation, reporting impacts and outcomes. ⁹¹
	Disaster and emergency communication	
	Public interest, factual information commentary, documentaries and other informative media	
	Intangible cultural heritage (including folklore, traditions, language), traditional, local and Indigenous knowledge and wisdom	Reporting: who created any content containing the Indigenous or traditional knowledge, what tasks they had, how this knowledge was shared and any relevant concepts of 'owning' or 'property'; reporting who knows certain things (for example, people who are recognised as 'Preservers of Important Intangible Cultural Properties' ¹³¹); reporting who is recognised as an Elder, community leader, Indigenous elders or leaders (and by who); reporting who does or does not have permission to verify, share, redact or edit content (including stories, beliefs, cultural practices and medicine) ¹³² ; information about data custodianship ⁵⁶ , information about any potential risks (to human health or lifeforms, natural or cultural heritage); information about who assessed those risks and how, information about informed consent process, information about any cultural sensitivities or restrictions (including relevant information about gender, clan, tribe or other culturally constructed groupings) ¹³³⁻¹³⁵ , information about relevant laws and lore ⁵⁶ , ethics processes (including who was involved and

Area	Sub-Area	Relevant data categories
		how), reporting impacts and outcomes from dissemination. ⁹¹
	Tangible cultural heritage (including cultural property ¹³⁶)	Reporting: Who was involved in creating the property, any concepts of ownership or guardianship in relation to the property, data about ongoing management (including monitoring, exhibiting, restoring or moving), data about cultural significance and stakeholders involved in defining this
	Hardware designs (including hardware architecture, device designs or other abstract representations)	Reporting: Who was involved in creating the designs and how, who reviewed them and how (including relevant safety, regulation or standards information), what formats are the designs shared as and in what medium, information on license(s), outcomes and impact of the hardware
	Code and algorithms	Reporting: who created code (including algorithms), who is involved in reviewing and scrutinising code (including who is involved in which ethical review processes), what code is part of which distinct projects or forks, what language the code is in, what medium (for example, machine or DNA), information about ownership of data or knowledge (including concepts of intellectual property and copyright), information on license(s), purpose of code, outcomes and impact of the code
Management and monitoring	Environmental and natural heritage, natural resource management	Reporting: data about who was involved in service design, monitoring and management processes, data about funding for monitoring or management (for example, funding for pollution monitoring), data about how information will be stored and shared (including what will be redacted and data security), data about who decides what data will be redacted and how this decision is made, information about how data will be analysed (including relevant code and algorithms) and how learning from data will be shared, information about relevant data privacy legislation and regulation
	Public and private essential services management (health, infrastructure, waste and recycling, water and sewage, electricity)	
	Data management and monitoring	
Evaluation	Process evaluation	Reporting: data about processes (industrial, public health, organisational) ⁵ , people involved, outcomes
	Evaluation of participatory methods (co-design)	Reporting: data about participatory research methods and compare outcomes.
	Transparent rating	Reporting: Processes of transparency rating (or ‘scoring’) data quality about initiatives based on how much information about the initiatives is shared in a publicly accessible way (or reasons for redaction, including Indigenous knowledge).

Area	Sub-Area	Relevant data categories
Production, consumerism and business	Industry standards	Reporting: Internal processes and data sharing practices of self-regulating industry standards (for example, the Forest Stewardship Council, Marine Stewardship Council ⁵⁰ and Certified B Corporations ⁵¹), data sharing principles, process evaluation (including by those affected).
	'Green' industries and eco-tourism	Reporting: Transparent process for defining 'green' and 'eco', experts involved, people affected involved, process for deciding and measuring outcomes, outcome measures, evaluation of process.
	Infrastructure, construction and interiors	Reporting: Transparent reporting of sources of building and furniture materials, such as wood (including relevant DNA information to verify sources of timber), metals and other materials (including information verifying the supply chain is slavery free), data from building and structural assessments
	Finance and financial services	Reporting: who is involved in decision making (including investment and divestment), who scrutinises decision making, who is involved in holding individuals to account and who scrutinises this process, competing or conflicting interests of people involved in decision making, data about how concepts such as 'ethical investments' are defined, impacts or outcomes from investments or donations, data sharing practices and security practices, data about who scrutinises security practices.
	Donation and philanthropy	Reporting: Any stated purposes or caveats for donation, organisations or individuals donating, how money was spent, who was involved in deciding how it was spent, what was the method for deciding this, who is accountable for overseeing this, any outcomes or impacts.
	Other products (medical devices, electronics)	Reporting: Experts involved in production, other people involved in production process, resources involved in production process (including relevant DNA information to verify products from plants, animals and fungi), ingredients, funding for resources (for example demonstrating it is 'slavery free'), process reporting (including Good Manufacturing Practice), regulation and authorisation processes (for example medicines and medical devices), code and algorithm checking (for example, autonomous vehicles) process for designing impact assessment, impact assessment (including human and environmental), experts involved in dismantling process (including recycling), other people involved in dismantling process and disposal, evaluation of product according to transparently decided outcome measures
	Products for human use or ingestion	Food
Medicines		
Products for non-human lifeforms	Food	ingredients, funding for resources (for example demonstrating it is 'slavery free'), process reporting (including Good Manufacturing Practice), regulation and authorisation processes (for example medicines and medical devices), code and algorithm checking (for example, autonomous vehicles) process for designing impact assessment, impact assessment (including human and environmental), experts involved in dismantling process (including recycling), other people involved in dismantling process and disposal, evaluation of product according to transparently decided outcome measures
	Medicines	
	Other products	

Area	Sub-Area	Relevant data categories
Health Technology assessment	Assessment process for pharmaceuticals, devices, procedures and organisational systems used in health care	Reporting: Process for deciding health technology assessment (oversight and scrutiny), sources of data and evidence, process for deciding and measuring outcomes, experts involved, people affected involved, conflicting or competing interests, outcomes from assessment decisions (including outcomes measured by those affected by assessment decisions), collation of adverse event reports from Governments and reputable sources, assessment evaluation (did it achieve what was intended?), results of economic evaluations
Health and social care and services	Health care and services	Reporting: Process for assessing needs (including who was involved, the method and budget), process for prioritisation of services (including budgets and 'rationing' decisions), process for designing and implementing service or care (including who was involved, the method and the budget), process for evaluating service or care (including impacts), patterns for evaluating service improvement initiatives, process for reporting adverse events and malpractice (including the overview and scrutiny of this process), process for identifying patterns of sub-optimal service, process for responding to malpractice or other identified issues, process for identifying impact indicators (including geolocation data)
	Social care and services	
Other services		

525

526

Table 4: Summary of STARDIT Beta Version data fields

Section	Data category	Data field
Core: Initiative context - This information locates the initiative within a clear context.	Identifying information	Initiative name*
		Geographic location(s)*
		Purpose of the initiative (aims, objectives, goals)*
		Organisations or other initiatives involved (list all if multi-centre)*
		Relevant publicly accessible URLs/URIs
		Other identifiers (e.g. RAiD ¹³⁷ , clinical trial ID ^{138,139})
		Keywords or metatags – including relevant search headings (e.g. MeSH ¹⁴⁰)
	Other relevant information (free text)	
	Status of initiative	What is the current state of the initiative?*
		Select from: <ol style="list-style-type: none"> 1. Prospective– this report is prospective or describes planned activity 2. Ongoing – the initiative is still taking place 3. Completed – the initiative has finished (<i>evaluation and impact assessment may be ongoing</i>)
Methods and paradigms	Date range (start and end dates of initiative)	
	Methods of the initiative (what is planned to be done, or is being reported as done). Include information about any populations or eco-systems being studied, any ‘interventions’, comparators and outcome measures (qualitative or quantitative)* <i>If appropriate, include a link to a publicly accessible document (such as a research protocol or project plan)</i>	
Report authorship – Information about who completed the report and how	Identifying information for each author (<i>authors can be anonymised in the public report but at least one verified identity</i>)	Name*
		Publicly accessible profiles, institutional pages*

Section	Data category	Data field
<p><i>Please note this section can be completed multiple times if there are multiple authors</i></p>	<p><i>will need to be sent to STARDIT Editors to attempt to prevent falsified reports)</i></p>	Open Researcher and Contributor ID (orcid.org) *
		Tasks in report completion
		Other information
	Accountability	Key contact at initiative for confirming report content (include institutional email address)*
	Date	Date of report submission (<i>automatically generated</i>)
Input: Ethics assessment	Ethics approval information (if applicable)	Assessing organisation or group*
		Approval date and approval ID - <i>include any relevant URL</i>
<p>Input: Human involvement in initiative</p> <p>Who is involved in this initiative and how?</p> <p>Editors assessing involvement may need to use the STARDIT 'Indicators of involvement' tool</p>	<p>Details about how each group or individual was involved in the initiative</p>	Who was involved or how would you label those involved (select from group labels or submit new group label name in free-text)*
		<i>You can name individuals or use 'labels' to describe groups of people such as 'professional researchers', 'service users' or 'research participants'. Additional 'labels' or 'meta-tags' to describe people may be added if appropriate.</i>
		How many people were in each grouping label?
		Tasks of this person or group (list as many as possible)* – <i>including any information about why certain people were included or excluded in certain tasks (such as data analysis)</i>
		Method of doing task? How did these people complete these tasks? (what methods were used) – <i>for example 'group discussion' or 'reviewing documents'</i>
		Communication modes? What modes of communication were used – <i>for example, 'group video calls', 'telephone interviews' or 'postal survey'</i>
		How were people recruited, contacted or informed about these tasks?
		Involvement appraisal
	Methods of appraising and analysing involvement (assessing rigour, deciding outcome measures, data collection and analysis)	
	Enablers of involvement (what do you expect will help these people get involved – or what helped them get involved)	

Section	Data category	Data field
		<i>Examples of enablers</i>
		Barriers of involvement (what do you expect will inhibit these people from getting involved – or what inhibited them from getting involved). Are there any known equity issues which may contribute? <i>Examples of barriers, and any attempts to overcome them</i>
		How did the initiative change as a result of involving people? <i>For example, did the initiative design or evaluation plan change?</i> <i>Note: this can be answered separately for different individuals or groupings of people</i>
	Involvement outcomes, impacts or outputs	Were there any outcomes, impacts or outputs from people being involved? * <i>When describing these, attempt to label which groupings were affected and how. These can include impacts on people, organisations, processes or other kinds of impacts.</i>
	Learning points from involving people	What worked well, what could have been improved? Was anything learned from the process of involving these people?
	Stage	Which stage of the initiative were these people involved? <i>(please provide information about any distinct stages of this initiative, noting some may overlap)</i>
	Financial or other interests (including personal or professional interests)	Describe any interests (financial or otherwise), conflicting or competing interests, or how anyone involved may be personally, financially or professionally affected by the outcome of the initiative* <i>Including any relevant information about authors of this report.</i>
Input: Material involvement in initiative Mapping financial or other 'interests'	Financial	What was the estimated financial cost for the initiative.
		Funding information (link to publicly accessible URL if possible) - <i>this may include the project funder, funding agreements, grants, donations, public ledgers, transaction data or relevant block(s) in a blockchain</i>
	Time	How much time was spent on this project

Section	Data category		Data field
			<i>Note: this can be answered separately for different individuals or groupings of people</i>
	Other		Describe any costs or resources that cannot be measured financially or quantitatively - <i>this may include expertise, traditional or Indigenous knowledge, volunteer time or donated resources</i>
Outputs: Data including code, hardware designs or other relevant information	Sensitive data	Secure criteria	Data adheres to relevant industry/discipline data security requirements
		Repository	How is data entered, changed or removed within a repository?
		Usage	Who is the data from this initiative shared with?
			Who has access to sensitive data and how is this decided?
	Safety	Is data encrypted? Is it anonymised or de-identified? What methods are used for re-identification? What is the risk of unauthorised re-identification?	
	Open data	FAIR criteria	Data adheres to FAIR criteria ¹⁴¹
		Findable	Describe relevant metadata, how the data is machine readable and other relevant information
		Accessible	How can data be accessed – <i>include any information about authentication and authorisation</i>
		Interoperable	How is data interoperable or integrated with other data? <i>Include information about applications or workflows for analysis, storage, and processing, and resulting file formats or other outputs</i>
		Reusable	How can data be replicated and/or combined?
	Indigenous data	CARE principles	Data adheres to CARE principles ^{142,143}
		Collective Benefit	How will Indigenous Peoples derive benefit from the data
		Authority to Control	How will Indigenous Peoples and their governing bodies determine how relevant data are represented and identified
		Responsibility	How will those using the data provide evidence of these efforts and the benefits accruing to Indigenous Peoples

Section	Data category		Data field
		Ethics	How have Indigenous Peoples' rights and wellbeing been centred during the data life cycle
	All data	Hosting	Where is it data stored and hosted - <i>share any location data if appropriate</i>
		Owner	Who 'owns' the data or claims any kind of copyright, patent(s), or other specific types of intellectual property - <i>include relevant open licensing information</i>
		Analysis methods	Describe methods used to analyse the data (including a link to any relevant code and information about validity)
		Usage	How can data be used? <i>Include information about license and attribution</i>
		Dissemination	How is information about this data disseminated? <i>For example, how are results from analysis shared?</i>
		Impact	impact/effect of the output
		Data control	Who controls access to the data? How are decisions about data access made? Is data anonymised or de-identified? What methods are used for re-identification? What is the risk of unauthorised re-identification? How is this risk managed?
		Management and quality	Which person (or organisation) is responsible for managing (or 'curating') the data?
			Who is accountable for ensuring the quality and integrity of the data? (this may be an individual or organisation)
Impacts and outputs: Publications, events, changes, learning items etc.	What was learned		What new knowledge has been generated? (if appropriate, include effect size, relevant statistics and level of evidence)*
	Knowledge translation		Describe how the learning or knowledge generated from this initiative has or will be used
	Impacts		Have there been any outcomes, or has anything changed or happened as a result of this initiative that isn't captured in previous answers?*
	Measurement and evaluation		How has or how will this be measured or evaluated?
			Who is involved in measuring or evaluating this?

Section	Data category	Data field
		Who was or is involved in deciding on the outcomes used to evaluate any impacts or outcomes? How were they involved?
Information completed by Editors		
	STARDIT report version number (assigned)	Report number assigned to distinguish it from any future updated reports
Indicators completed by Editors and/or peer reviewers Editors and peer reviewers assessing the report will need to look for indicators in the following categories on publicly accessible URLs*	Indicators of involvement	Use the STARDIT 'Indicators of involvement' tool
	Indicators of data practice compliance	Use the relevant criteria
	Indicators of translation and impact	
	Other indicators	

528

529 **Declarations**

530 **Ethics approval and consent to participate**

531 Not applicable

532 **Consent for publication**

533 All authors, people named in acknowledgements and people identified in supplementary materials have
534 given consent for this to be published.

535 **Availability of data and materials**

536 Supplementary data can be found in the supplementary files, with further data available in the associated
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538 **Competing interests**

539 No authors have declared any competing or conflicting interests

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544 **Authors' contributions**

545 Jack Nunn conceived of STARDIT, conceived of and led the co-design process, facilitated face to face
 546 events, facilitated online discussions and decision making processes, analysed data, designed and carried
 547 out the evaluation of the process and the reporting (including STARDIT and GRIPP2 reports), wrote the
 548 manuscript and collated and integrated feedback from public consultations.

549 Thomas Shafee provided critical input and feedback on early versions of STARDIT, built the working
 550 STARDIT Beta version in WikiData and provided feedback on multiple versions of STARDIT.

551 Steven Chang provided insight into early versions of STARDIT and provided feedback on multiple versions
 552 of STARDIT.

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555 Pen-Yuan provided expert advice on terminology to describe legal and licencing information, including use
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557 All other authors provided detailed feedback on the STARDIT manuscript.

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Figures

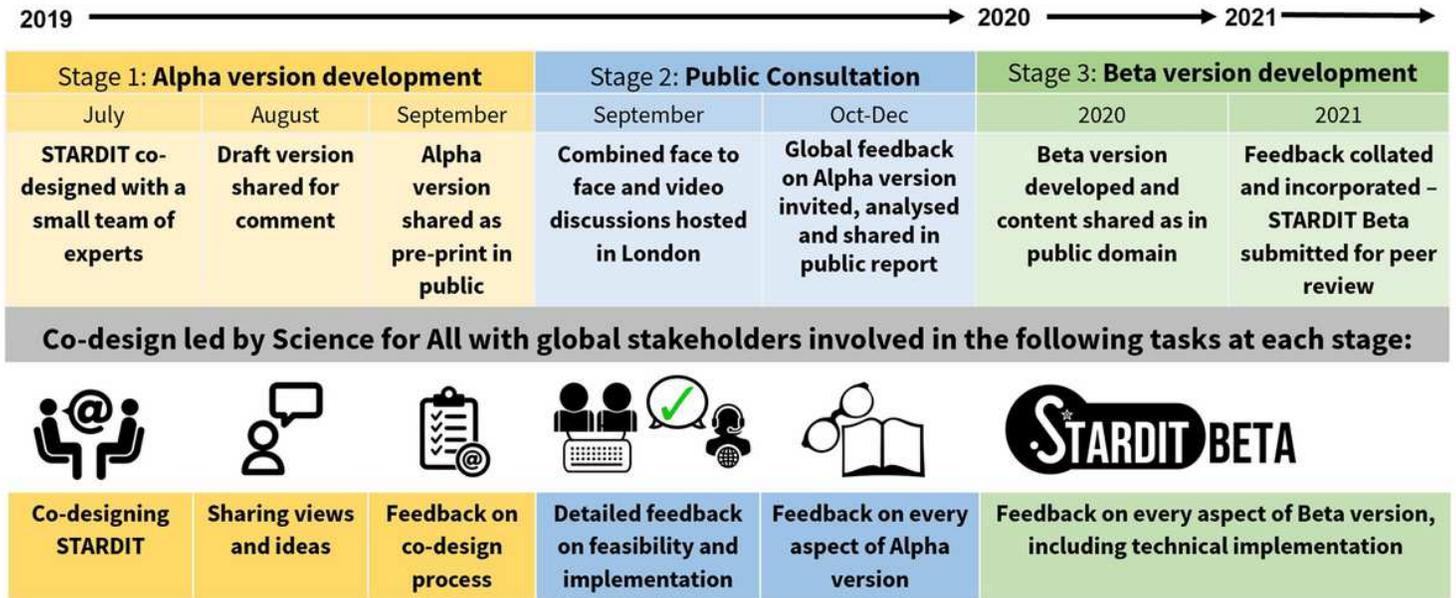


Figure 1

STARDIT development

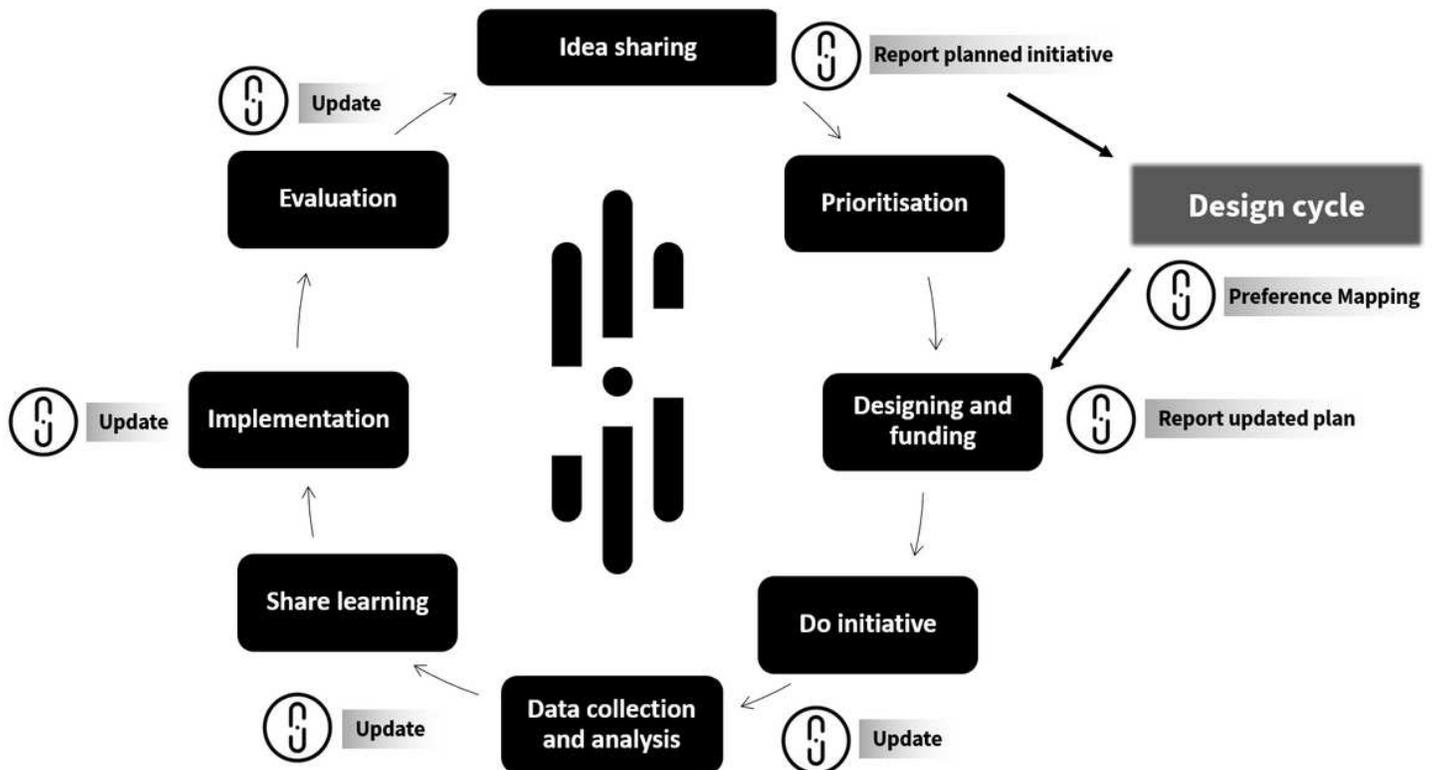


Figure 2

Planning and evaluating initiatives using STARDIT

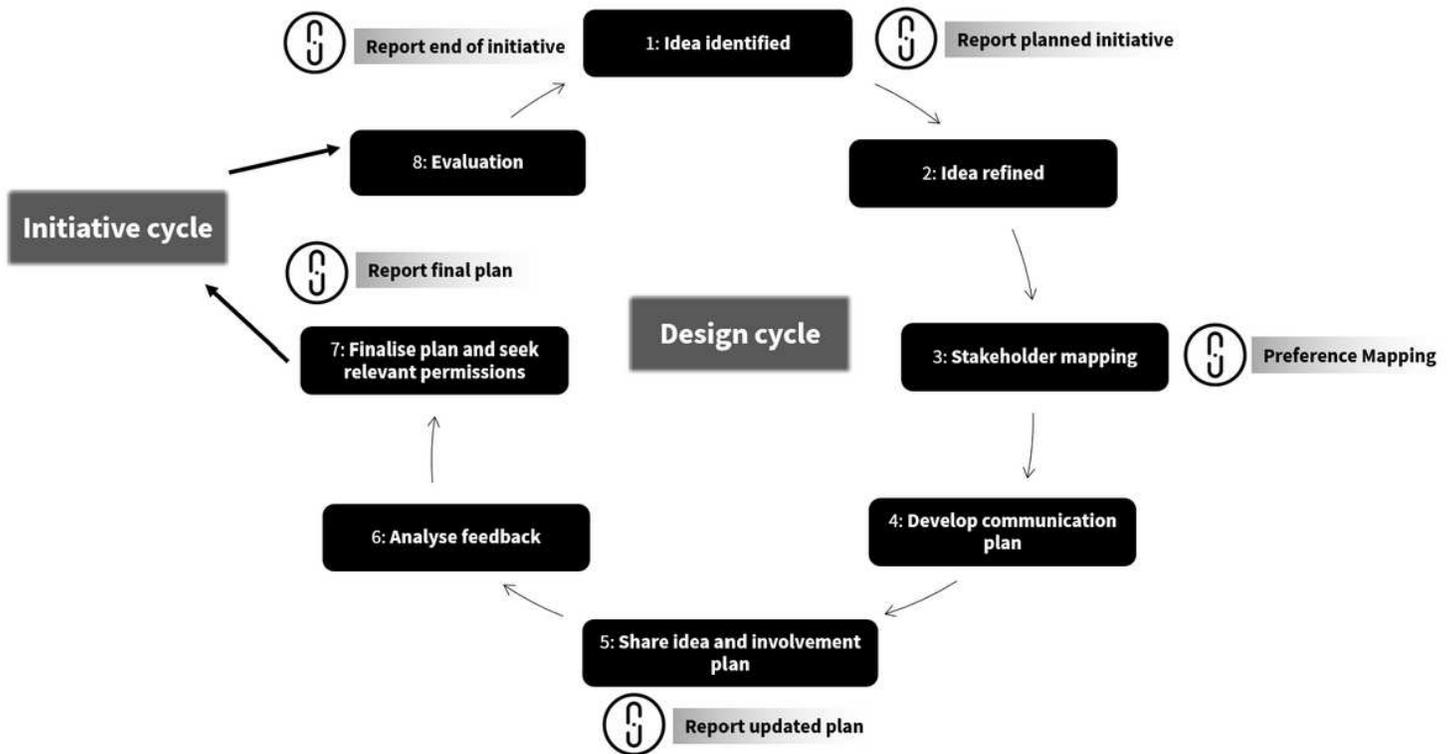


Figure 3

Reporting initiative design in STARDIT

Supplementary Files

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- [SupplementaryFile1STARDITBetaRIEV30.12021.09.24.pdf](#)
- [SupplementaryFile2STARDITReportSTARDITBetaRIEV30.pdf](#)
- [SupplementaryFile3GRIPP2ReportSTARDITBetaRIEV30.pdf](#)
- [SupplementaryFile4STARDITPublicconsultationreport.pdf](#)