**Overview of Sustainability Measurement Tools**

The first table in this document summarises published reviews of sustainability measures, which may be of most interest to researchers. The second table is an overview of sustainability measures themselves. Both tables include Education and Health Settings, and readers may note the large overlap between sustainability factors as reported in these domains. To our knowledge, the degree of overlap has not been tested. Full references appear at the end of this document.

#### Taken together with our interview data, this information has informed our development of a new measure which we are currently pilot testing: **the Sustainability of Effective Educational Initiatives - Site Improvement Self-Assessment Tool.** This online tool is designed to assist schools/organisations in considering the broadest range of factors that are likely to impact on long term success of education initiatives. Please email Helen Askell Williams [helen.askell-williams@flinders.edu.au](mailto:helen.askell-williams@flinders.edu.au) if your organisation would like to take part in trialling our measure.

**Table 1: Recommendations from Published Reviews of Sustainability Measures**

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| **Reference** | **Setting** | **Study findings & recommendations** |
| Scheirer (2005) | Health settings | Few of the empirical studies reviewed differentiate between the three types of sustainability proposed by Shediac-Rizkallah & Bone (1998): outcomes, program continuation, capacity. Continuation most studied; often single question of one respondent; outcomes where also measured often not sustained although program was – important to include measures of both. Need to define at what level of intensity/proportion of original activity is a program considered sustained, and feedback evaluation findings earlier in the funding cycle |
| Scheirer and Dearing (2011) | Public health (externally funded) | The field currently lacks a uniform set of operational definitions, variables, methods and analyses. Diverse domains likely to have overlap. Data collection may need to be multilayered (external, internal, program). Lists a range of outcomes and predictors to consider measuring; also need to examine and understand the relationships between these processes |
| Wiltsey-Stirman (2012) | Medical, public health, mental health, education | Few studies employed rigorous methods of evaluation; eg self-report measures nearly all developed specifically for the project – therefore difficult to make judgements on factors influencing sustainability at this early stage. Studies with qualitative designs were more likely to identify processes and interactions between factors (e.g., mutual adaptation between program and organisation; negotiation between stakeholders to overcome competing demands) but there is a lack of interview guides to improve interpretability/replicability. **Recommend**: choose outcome(s) specific to project; assess sustainability over several time points as it is a dynamic phenomenon; self-report of fidelity imprecise – need development of efficient measures of observation/monitoring that assess nature and consequences of adaptation; two promising sustainability measures based on sound theory (Mancini & Marek, 2004 – 29 item Program Sustainability Index; Maher & Gustafson, 2007 – NHS Sustainability Model and Guide). Both surveys assess factors and processes at multiple levels; can be used to examine interactions, further research on their validity and applicability to across setting/programs warranted; need validated measures; prospective designs. |
| Lewis et al (2015) | Mental/behavioural health settings | Oversupply of single use/adapted instruments with uncertain psychometric properties. 11 instruments related to sustainability directly/indirectly. Best rating according to these authors were Level of Institutionalisation Scale for Health Promotion (LoIS; Goodman, 1993) and Self-Assessment and Action Planning Tool for School Teams (SUBSIST; McIntosh, 2011) |
| Francis et al (2018) | Chronic disease health programm in primary care and community settings | Methodology varies according to definition and outcome indicators. Use of mixed methods over multiple time points recommended especially if assessing broad scale system change. Need standardisation of measurement and methodology including how programs adapt to contexts and changing needs; and to capture spread into new areas and difficulties thus encountered. Need to quantify *a priori* what sustainability will look like |

**Table 2: Review of Sustainability Measures**

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| **Measure** | **Setting** | **Roll-out**  **Stage** | **Theoretical basis** | **Factors assessed** | **Validation** | **Length & Interpretability** |
| **LOIS**  *Level of Institutionalisation Scale*  (Goodman, Steckler & Hoyle, 1993)  <http://www.lphi.org/LPHIadmin/uploads/LoIn%20Scales.pdf> | Health Promotion programs (schools, community) | Any | Goodman & Steck’s (1989) model | Four domains: Production (written goals/procedures/schedules/local adaptations/formal evaluation), Maintenance (admin level advocate, permanent staff assigned, contribution of other staff), Support/institutionalisation (permanent status/space/funding),  Measured by length of time in place (years) and optimal spread within each system (saturation), Managerial (Leader assigned to manage/staff have written job description re program/evaluation reports on a regular schedule) | Internal consistency (subscales α = .44-.86; item-total correlation >.28); CFA: 8 factor model supported (TLI = .90) although not supported by Barab 1998 who found two factor model was better fit. | Administrator completes;  15 x 3 part questions (45)  Scoring of questionnaire provides overview of which domains require attention; few questions per domain may not give fine-grained analysis of all factors to consider within each domain |
| **PSI**  Program Sustainability Index  (Mancini & Marek, 2004)  <https://militaryfamilies.extension.org/wp-content/uploads/2017/03/Module-9-Program-Sustainability-Index.pdf> | Community-based programs for families | Any | Model of Community-based Program Sustainability (based on mixed qualitative and quantitative research (Mancini & Marek, 1998; Betts et al., 2001; plus unpublished survey data 2003) | Leadership competence, Effective collaboration, Understanding the community, Demonstrating program results, Strategic funding, Staff involvement and integration, Program responsivity | Structural (EFA) supports 6 factor model (*Understanding the Community* items did not load clearly onto a factor). Internal consistency of retained factors α=.67 - .88; Construct validity – weak correlations (r ≤ .2) with single-item questions relating to three preliminary outcomes: Meeting current needs, Early sustainability planning, & Confidence in survival. Most consistent correlations with following three sustainability factors: Leadership competence, Strategic funding and Staff involvement. | 53 item survey became 29 item survey during structural validation (authors suggest continuing to use full survey until validation in larger, heterogenous sample).  Fill out survey individually and then discuss as a team to appraise areas of strength and growth. Form a sustainability plan by group decisions regarding *What needs to be done? Who by? Date? KPI?* |
| NHS Sustainability Model and Guide  (Maher & Gustafson, 2007)  <https://improvement.nhs.uk/resources/Sustainability-model-and-guide/> | Health care settings | Any | Based on Authors’ model of sustainability | 3 domains; 10 factors  Process (benefits beyond participants, credibility of benefits, adaptability, outcomes monitoring and dissemination)  Staff (involvement, training, attitudes, senior leadership involvement)  Organisation (infrastructure, fit) | Developed with contributions via frontline, senior admin and clinical staff; academic experts. Validation information N/A. Tested in practice by Doyle et al. (2013) who found diversity of opinions across 19 teams who tested the tool. 12 reported acceptability to some degree, although reports of usefulness reduced over time, and many reported difficulty understanding and applying the tool. Concerns re number of questions, terminology difficult to grasp/complex ideas unfamiliar to frontline staff, perceived lack of relevance until later in implementation process. Authors suggest the following modifications: stronger emphasis on political/economic environment; simplify structure and refine wording to reduce cognitive load; facilitate use through novel methods such as mapping team discussions onto tool rather than didactic presentations of theory. | 10 questions with 4 choices. Although CD guide with practical tools to address gaps is no longer available, questionnaire highlights priority gaps for action clearly. |
| **Measure** | **Setting** | **Implementation Stage** | **Theoretical basis** | **Factors assessed** | **Validation** | **Length & Interpretability** |
| **SUBSIST**  *School-wide Universal Behavior Sustainability Index – School Teams*  (McIntosh et al., 2011))  <https://kentmcintosh.files.wordpress.com/2011/04/subsist-checklist-1-1.pdf> | Schools. (Developed for a specific positive behaviour intervention but applicable to any school-wide intervention) | Any | McIntosh, Horner and Sugai’s (2009) model | Priority, Leadership, External Support, Effectiveness (e.g., evidence based, skilled staff, impacts visible outcomes), Efficiency (e.g., cost effective, ease of use increases over time, materials adaptable), Data based decision making, Capacity building (e.g., refresher courses, external networks of support) | Extensive.  Content validity (CVI .95), inter-rater reliability (.97), internal consistency (α.77-.94), test-retest (2 weeks; .96), concurrent validity r = .68 with fidelity of implementation measures (McIntosh et al., 2011); structural validity (EFA fit indices good (RMSEA = .04; CFI/TLI > .92) for two factor school level solution (School priority, team use of data) and two factor district level solution (Priority, capacity building (McIntosh et al., 2013); Invariance testing of 4-factor model strong across stage of implementation, SES, ethnicity; however, relative perceived importance of factors in model may vary according to stage (e.g., staff buy even more important during implementation; Mercer et al., 2014) | Internal or external evaluator.  Later studies delete items 26, 41-45 as redundant = 39 items.  Scoring provides detailed overview of activities requiring attention with an action plan for responsibility, target dates and review dates |
| **Measure** | **Setting** | **Implementation Stage** | **Theoretical basis** | **Factors assessed** | **Validation** | **Length & Interpretability** |
| Schools Implementing Towards Sustainability (SITS)  (Moceri, Elias et al., 2012)  Tool is not open access, but available as appendix in this paper | School | All (items flagged that may relate to phases) | Elias’ (2007) 7 factors impacting sustainability; Greenberg (2005) ecological levels (class, school, district, community) | Leaders: Present initiative to staff as serious commitment (not add-on); Clear leadership message that staff are expected to implement/reinforce; specific staff planning time allowed.  Active committee (not single coordinator) that supports and troubleshoots staff implementation issues; core group beyond this that are supportive and involved; systematic opportunities for staff to reflect and decide future action; outcome data tracked; ongoing PD, move towards in-house training; active collaboration with external experts; partnership with community agencies for funding | Internal consistency high (>.85)  Construct validity – higher SITS scores associated with better staff and student climate, greater external support by experts | Brief and easy to use – 15 items, 4 point scale (false – very true) |
| 3 Bold Steps: Develop partnerships, implement evidence based programs, use data to guide.  (PromotePrevent, Education Development Center, 2013)  A number of resources:   * Capacity framework * Implementation & Sustainability checklist * Sustainability Self-Assessment, links below   <http://www.promoteprevent.org/content/three-bold-steps-toolkit-capacity-framework>  <http://www.promoteprevent.org/sites/www.promoteprevent.org/files/resources/How%20Do%20We%20Build%20for%20Success%20-%20Implementation%20and%20Sustainability%20Checklist.pdf>  [http://3boldsteps.promoteprevent.org/tools?f[0]=sm\_vid\_Site\_Based%3A3%20Bold%20Steps&f[1]=sm\_vid\_Resource\_Type%3ATool&f[2]=sm\_vid\_Content\_Related%3ASustainability](http://3boldsteps.promoteprevent.org/tools?f%5b0%5d=sm_vid_Site_Based%3A3%20Bold%20Steps&f%5b1%5d=sm_vid_Resource_Type%3ATool&f%5b2%5d=sm_vid_Content_Related%3ASustainability)  <http://3boldsteps.promoteprevent.org/> | Schools/communities working together | Any | Derived from experiential working with schools and communities in implementing evidence based programs: Complex issues facing youth best addressed when schools and communities work together; systemic change in organisations required to create positive, lasting impact; collecting and using data essential. | * Capacity framework:   9 domains (Professional Development, Communications and Marketing, Cultural competence, Evaluation, Finance, Implementation, Leadership & Partnership, Systems change and sustainability, with benchmarks for each stage of roll-out (start up, implementation and full operation)   * Implementation & Sustainability checklist   Checklist for success over 3 phases: Preparation, Implementation and Sustainability   * Sustainability self-assessment   Questions to explore key concepts of 3 bold steps, 5 domains (Partnership and leadership, Implementation, Evaluation, Communications/marketing, Financing) | Nil reported | Website has many excellent resources including examples in action; some lack of clarity navigating how it all fits together   * Capacity framework:   9 domains/3 stages, each has a checklist of between 1 and 10 benchmarks (45 page document). Lengthy but finegrained guide   * Implementation & Sustainability checklist: 43 questions * Sustainability self-assessment:   27 questions |
| **Measure** | **Setting** | **Implementation Stage** | **Theoretical basis** | **Factors assessed** | **Validation** | **Length & Interpretability** |
| Program sustainability Assessment Tool  (Luke et al., 2014;  Calhoun et al., 2014)  Website <https://sustaintool.org/>  Pdf version  <https://sustaintool.org/wp-content/uploads/2016/12/Sustainability-ToolV2_w-scoring_12.11.13.pdf> | Designed for public health (community and state-level programs) but authors deem it relevant for clinical and social service programs | Any | Based on Schell et al. (2013) framework; determined by combination of literature review and concept mapping by expert practitioners, scientists, funders | 8 domains (Strategic planning, Organisational capacity, Program adaptation, Program evaluation, Communication, Funding stability, Environmental support, Partnerships) | CFA model fit acceptable (RMSEA .07; CFI .89; SRMR .06); internal consistency good (subscales α = .79 - .92); preliminary construct validity against single item “perception of sustainability”:  (Strategic planning (.63), Organisational capacity(.58), Program adaptation(.32), Program evaluation(.45), Communication(.55), Funding stability(.67), Environmental support(.48), Partnerships (.44) | 40 items, easy to score and see domains requiring attention. Website version also allows up to 12 Participants in a group to take survey online free, and receive a prepared summary report. |
| **ABISS**  *Assessment of Barriers to Implementation and Sustainability in Schools* (Turri, Mercer, McIntosh et al., 2016) | Schools. (Developed for a specific positive behaviour intervention but applicable to any school-wide intervention) | Any | Brief measure based on longer SUBSIST; focused on barriers | Program fit with staff values, competing school/district initiatives, level of turnover of administrators, champions and general school personnel | Internal consistency (α > .75 across phases); Structural (EFA) supports unidimensionality of scale; Partial invariance of model indicates that scale operates slightly differently during sustainability phase compared to initial implementation and full operation stages – factor loadings for competing initiatives question are higher for former); external validity: correlates well with fidelity of implementation measures up to 5 years of implementation; less related with longer term sustainability phases. Norms indicate that schools in sustainability stage (>5 years) report lower mean scores (fewer barriers) | Brevity is a plus – 5 items. Heavily weighted to staff turnover (doesn’t assess factors such as administrator support, staff buy-in, resources) |
| **Measure** | **Setting** | **Implementation Stage** | **Theoretical basis** | **Factors assessed** | **Validation** | **Length & Interpretability** |
| Sustained implementation support scale (SISS)  (Hodge et al., 2017)  Tool is not open access, but available in paper | Community healthcare | Any | Literature review; modification of two existing tools focusing on elements of inner contextual factors (participant/organisation), expert opinion to refine scope | Five factors (program benefits/burdens, workplace support/cohesion, leadership style)  Doesn’t measure external contexts | Internal consistency good for subscales and total (>.81); all factors relate to sustained implementation explaining 8.3% of variance; workplace cohesion less clear; supervision/peer support moderates effect of program burden and leadership style on sustained implementation | 40 items across five factors; four point scale |
| Long Term Success Tool  (Lennox et al., 2017)  Paper version available  <http://www.qihub.scot.nhs.uk/media/1090174/6eauc%20-%20improvement%20team%20network%20-%2005.12.16%20-%20long%20term%20success%20tool%20-%20clahrc.pdf>  Need access to published paper for full interpretation and analysis | Healthcare settings | Any – designed to be used multiple times (every 3 months) | Based on scoping review, consultation with experts and consumers | 3 domains/12 factors:  People (Commitment to the improvement, Involvement, Skills & Capabilities, Leadership, Team functioning)  Practice (Resources in place, Progress monitored for feedback and learning, Evidence of benefits, Robust and adaptable processes)  Setting (Alignment with organisational culture and priorities, Support for improvement, Alignment with external political and financial environment | No psychometric validation; but tested for usability and interpretability with stakeholders (N = 106) | 12 questions, 10-15 minutes to complete, developed in collaboration with stakeholders to address concerns about useability and interpretability (designed to address reported concerns using NHS guide) |

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