The Science of Stakeholder Engagement in Research: Development and Validation of Evaluation Metrics

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If you want to go fast, go alone.
If you want to go far, go together.

-African Proverb

Community Engagement Working Definition

"....the process of working collaboratively with and through groups of people affiliated by geographic proximity, special interest, or similar situations to address issues affecting the well-being of those people.

It is a powerful vehicle for bringing about environmental and behavioral changes that will improve the health of the community and its members.

It often involves partnerships and coalitions that help mobilize resources and influence systems, change relationships among partners, and serve as catalysts for changing policies, programs, and practices."

Source: Centers for Disease Control and Prevention. (1997). *Principles of community engagement* (1st ed.). Atlanta, GA: Author. As cited in Agency for Toxic Substances and Disease Registry. (2015). What is community engagement? Retrieved from https://www.atsdr.cdc.gov/communityengagement/pce_what.html

Why Do Stakeholder Engaged Research?

- Ensure research is patient/community centered
  - *Non-academic stakeholders provide unique perspectives on needs*
- Increase relevance to non-academic stakeholders
  - *patients, communities, policy makers*
- Supports sustainability of interventions post-funding
- Builds capacity and trust among all stakeholders
- Leverage existing resources within the community
- Reciprocal relationship between researchers and non-academic stakeholders
- Evidence-based approach for addressing health disparities

Source: Patient-Centered Outcomes Research Institute. (2013). Patient-centered outcomes research. Retrieved from https://www.pcori.org/research-results/patient-centered-outcomes-research

Why Measure Partner Engagement?

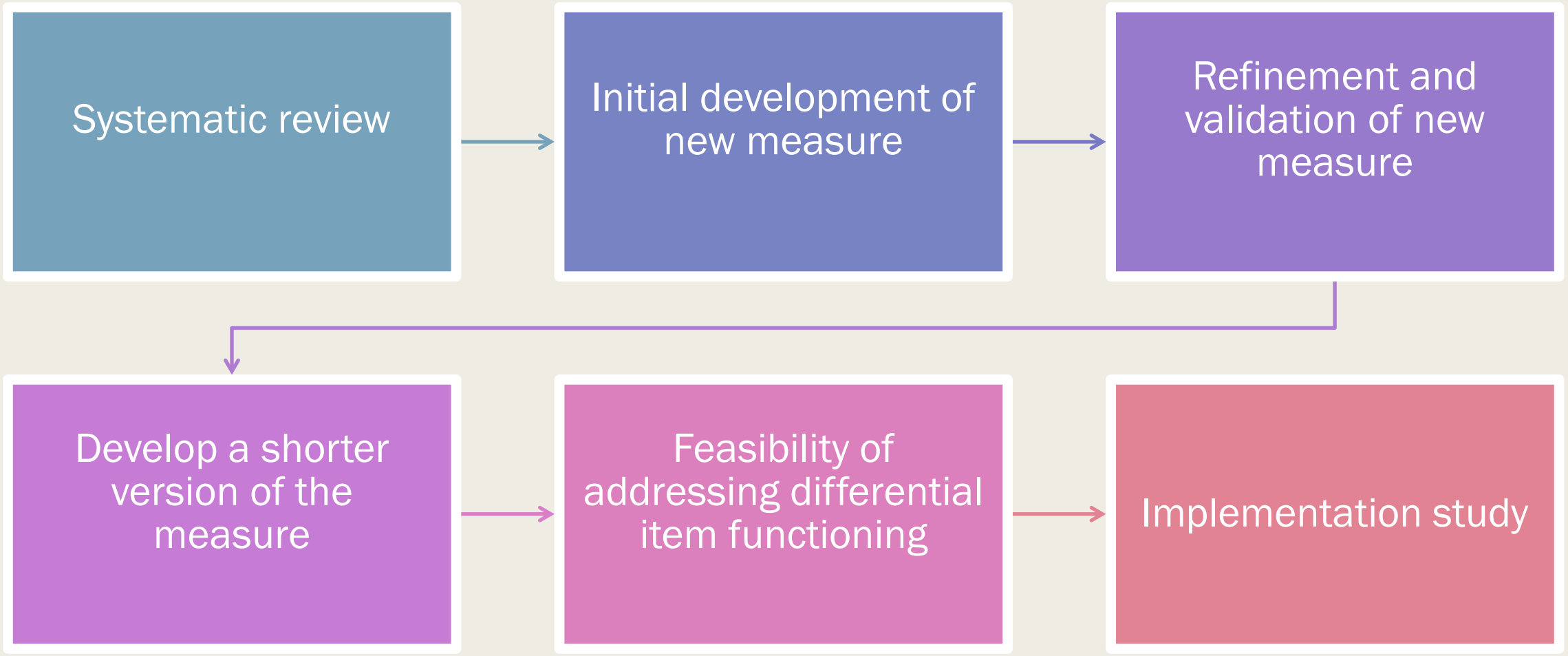
The extent to which stakeholders in research partnerships *feel engaged* has not received sufficient attention.

It is important to understand:

How engagement level in a partnership is developing.

To what extent engagement level is a predictor of outcomes in the larger study.

Elements of Our Approach



Citation: Clin Transl Sci (2017) 10, 314–336; doi:10.1111/cts.12474

REVIEW

Systematic Review of Quantitative Measures of Stakeholder Engagement

DJ Bowen[1,*], T Hyams[1], M Goodman[2], KM West[1], J Harris-Wai[3] and J-H Yu[4]

INTRODUCTION

Stakeholder engagement in research has received increasing attention in recent years.[1,2] The term "stakeholder engagement" refers to the process of meaningful involvement of those who are engaged in making decisions about programs.[3] Engaging members of the target population is often key to improving the relevance of the issues studied, the procedures used for study, and the interpretation of outcomes of research studies, health promotion activities, and disease prevention initiatives.[4–6] The utility of stakeholder engagement has been well established in the literature,[7–9] but there are few examples of measurement and evaluation of the degree to which stakeholders are engaged in these activities and the impact of engagement on positive outcomes. These types of evaluations have been limited in scope, and largely focused on qualitative approaches.[10–14] Qualitative methods cannot be easily compared across programs or institutions.[15]

drafting or revision of the article, and (3) approval of the final version.

Search methods

We searched the peer-reviewed literature using two electronic bibliographic databases: PubMed (web-based) and the Web of Science (web-based). These database searches for all years until 2013 were conducted between July and September 2014. The 2014 search was conducted in January 2016.

Phase I: Searching the literature

With assistance from a reference librarian, we generated a master list of search terms to use with both databases. The following Medical Subject Headings (MeSH) terms were selected: *stakeholder engagement, community engagement, community engaged research*. These terms were then

Source: Bowen DJD, Hyams T, Goodman M, West KMK, Harris-Wai J, Yu J-HJ-H. Systematic review of quantitative measures of stakeholder engagement. *Clin Transl Sci*. 2017;10(5).

Systematic Review to Identify Measures

Started by thinking that such measures existed and that they had properties that were understood

Found that lots of people had measured something

But really did not know what they had measured

Field was “not very strong methodologically”

Existing Measures Came in Two Camps

- One, in which investigators simply counted the attendance in various events and activities, and assumed engagement
  - *Example: Number of people who attended a board meeting or community meeting*
- Two, in which investigators measured some construct that was possibly related to engagement
  - *Example: Degree to which participants felt comfortable sharing their thoughts and opinions*
- Neither way has been validated or corroborated
- Mostly not examined in relation to outcomes or progress in project
- Not tracked over time

ARTICLE

EVALUATING COMMUNITY ENGAGEMENT IN RESEARCH: QUANTITATIVE MEASURE DEVELOPMENT

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Missouri Foundation for Health

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Although the importance of community engagement in research has been previously established, there are few evidence-based approaches for measuring the level of community engagement in research projects. A quantitative community engagement measure was developed, aligned with 11 engagement principles (EPs) previously established in the literature. The measure has 96 Likert response items; 3–5 quality items and 3–5 quantity items measure each EP. Cronbach's alpha is used to examine the internal consistency of items that measure a single EP. Every EP item group had a Cronbach's alpha > .85, which indicates strong internal consistency for

Source: Goodman MS, Sanders Thompson VL, Arroyo Johnson C, et al. Evaluating community engagement in research: quantitative measure development. J Commun Psychol, 2017; 45(1): 17-32.

Community Engagement Measure

New community engagement measure based on 11 engagement principles previously developed in the literature.

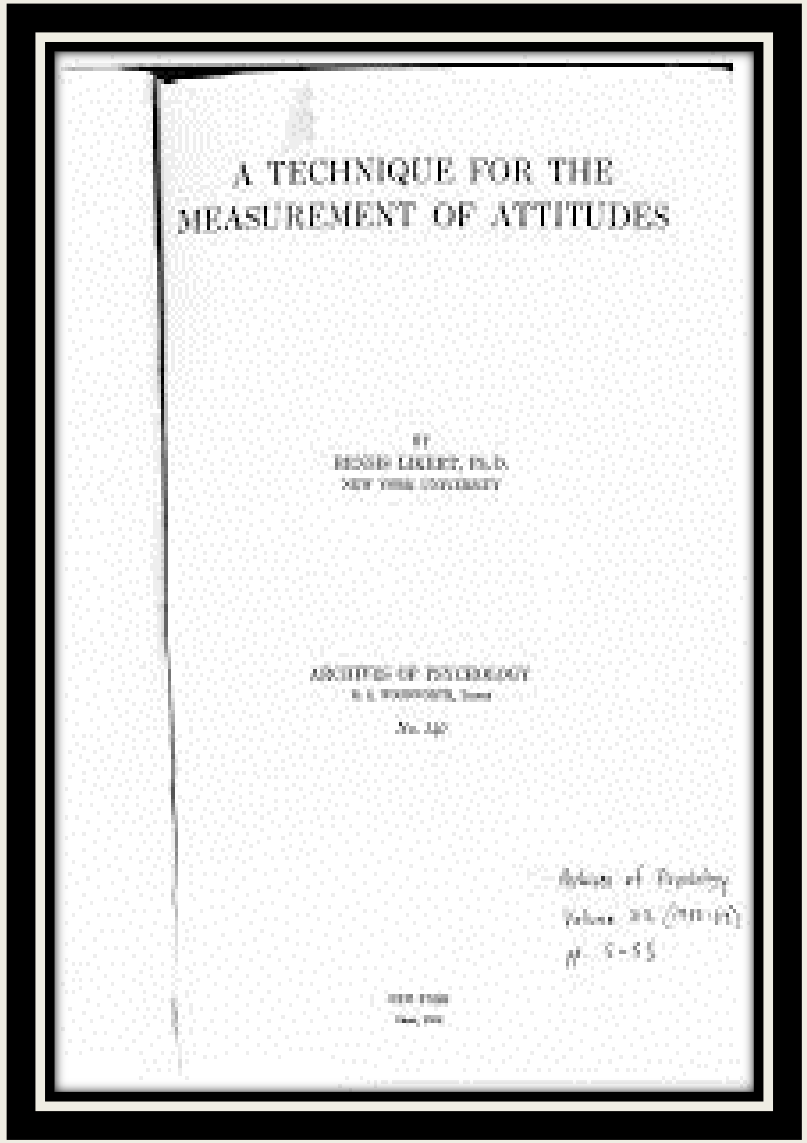
- **11 Engagement Principles**
  1) Focus on local relevance and determinants of health
  2) Acknowledge the community
  3) Disseminate findings and knowledge gained to all partners
  4) Seek and use the input of community partners
  5) Involve a cyclical and iterative process in pursuit of objectives
  6) Foster co-learning, capacity building, and co-benefit for all partners
  7) Build on strengths and resources within the community
  8) Facilitate collaborative, equitable partnerships
  9) Integrate and achieve a balance of all partners
  10) Involve all partners in the dissemination process
  11) Plan for a long-term process and commitment

Source: Goodman, M. S., Sanders Thompson, V. L., Arroyo Johnson, C., Gennarelli, R., Drake, B. F., Bajwa, P., . . . Bowen, D. (2017). Evaluating community engagement in research: Quantitative measure development. *American Journal of Community Psychology, 45*(1), 17–32.

Items measured on two scales

- 3-5 items to assess each engagement principle
- Likert response options
- Quantity (how much)
  - *Never, rarely, sometimes, often, always*
- Quality (how well)
  - *Poor, fair, good, very good, excellent*

Rensis Likert, PhD


A TECHNIQUE FOR THE MEASUREMENT OF ATTITUDES

BY
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ARCHIVES OF PSYCHOLOGY
R. S. WOODWORTH, Editor
No. 140

Archives of Psychology
Volume XX (1932-33)
pp. 5-55

NEW YORK
June, 1932

- 1903-1981
- He taught psychology at NYU
  - *1930–35*
- Development of Likert Scale 1932
- American Statistical Association
  - *Fellow -1949*
  - *President-1959*
- Demonstrated that a single streamlined question with a scaled set of answers was ideal for standardized questions

Sources: https://www.britannica.com/biography/Rensis-Likert https://en.wikipedia.org/wiki/Rensis_Likert

TBM

COMMENTARY/POSITION PAPER

The science of stakeholder engagement in research: classification, implementation, and evaluation

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doi: 10.1007/s13142-017-0495-z

Abstract

In this commentary, we discuss the science of stakeholder engagement in research. We propose a classification system with definitions to determine where projects lie on the stakeholder engagement continuum. We discuss the key elements of implementation and evaluation of stakeholder engagement in research posing key questions to consider when doing this work. We commend and critique the work of Hamilton et al. in their multilevel stakeholder engagement in a VA implementation trial of evidence-based quality improvement in women's health primary care. We also discuss the need for more work in this area to enhance the science of stakeholder engagement in research.

Keywords

Stakeholder-engaged research, Evaluation, Implementation science, Community engagement

With the uptake of implementation and translational

Implications

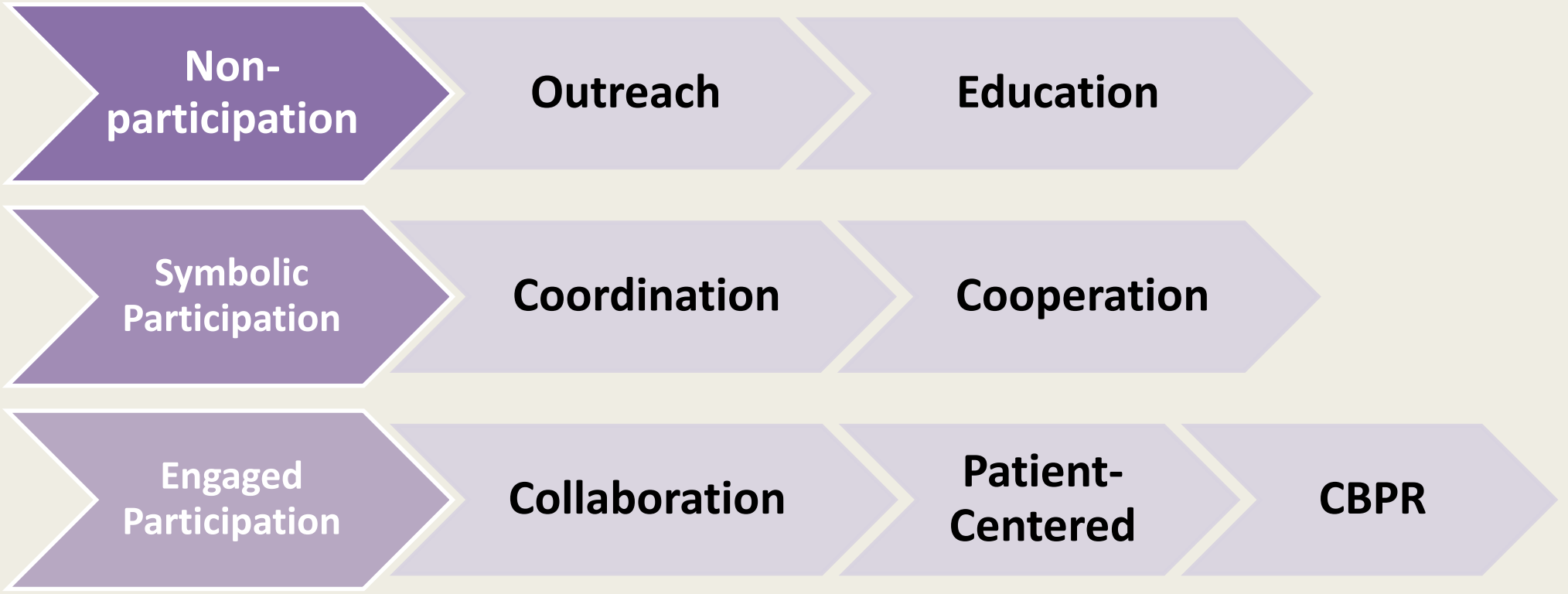
Research: Future research should evaluate stakeholder engagement in research to determine the association between the level (quality and quantity) of engagement and research outcomes.

Practice: Practitioners interested in engaging multilevel stakeholders in service evaluation and quality improvement should consider where the project lies on the stakeholder engagement continuum and create processes for shared decision-making that respect diverse perspectives and interests.

Policy: Meaningful stakeholder engagement with shared decision-making is a key component to evidence-based quality improvement initiatives.

Source: Goodman MS, Sanders Thompson VL. The science of stakeholder engagement in research: classification, implementation, and evaluation. Transl Behav Med. 2017 Sep;7(3):486-491

Categories and Classifications of Stakeholder Engagement



Source: Goodman, M. S., & Sanders Thompson, V. L. (2017). The science of stakeholder engagement in research: Classification, implementation, and evaluation. *Translational Behavioral Medicine, 7*(3), 486–491. Retrieved from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5645283/

Specific Aims

I. Examine the construct validity of each engagement principle on both scales (quality/quantity) and use a standardized Delphi process for expert validation, advocacy group/patient/family feedback and prioritization of domains.

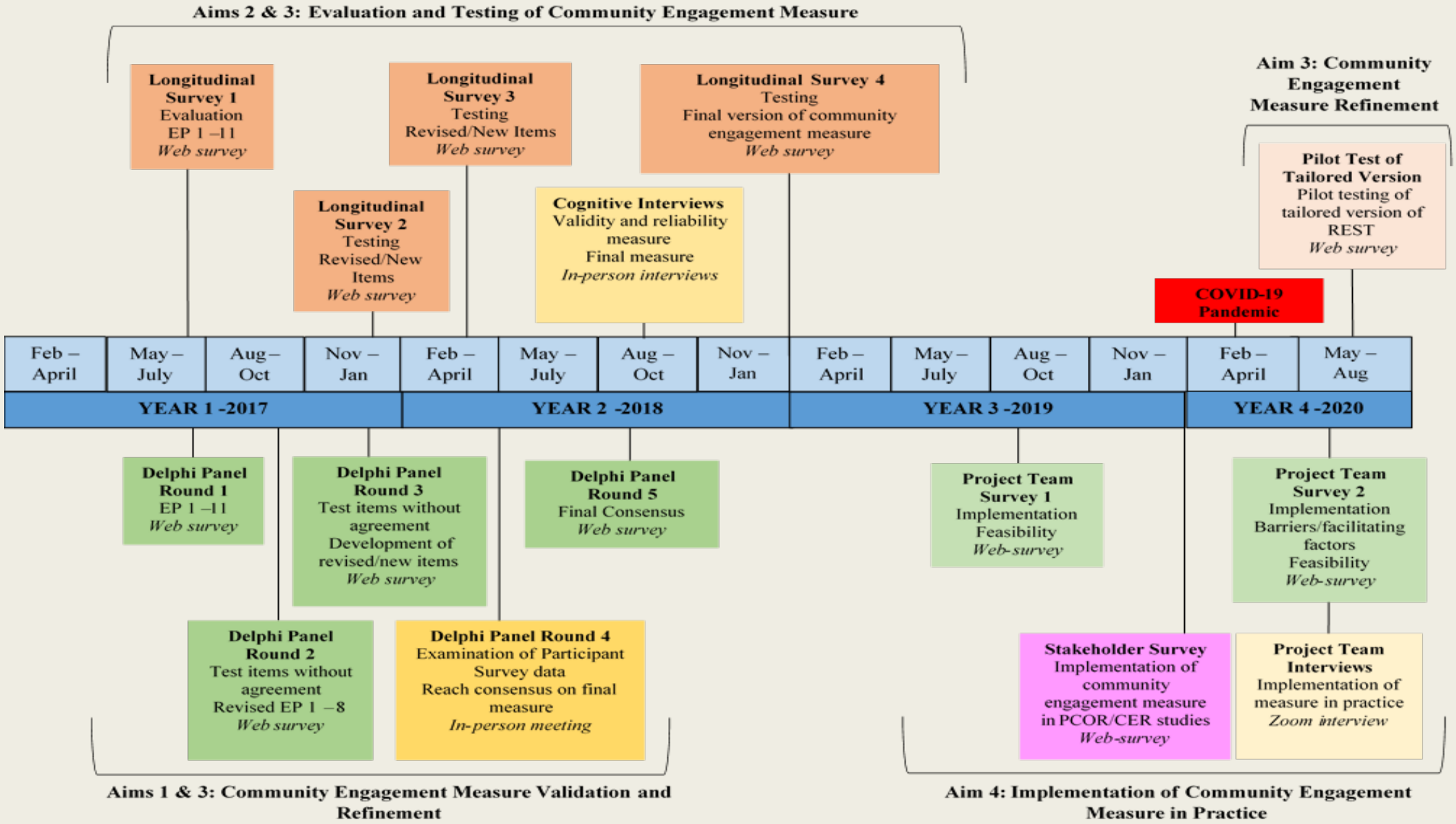
II. Examine the psychometric properties (reliability and sensitivity to change), correlative validity with the trust in medical researchers scale, and determine appropriate categorization cut-off for community engagement scores.

III. Develop a shorter (condensed) version of the community engagement measure and revise the comprehensive community engagement measure.

IV. Evaluate uptake and implementation of community engagement measure is PCOR/CER trials

Funded by the Patient-Centered Outcomes Research Institute Award (ME-1511-33027).

Project Timeline



Legend:
EP = Engagement Principle; PCOR=Patient Centered Outcomes Research; CER=Community-Engaged Research

Phase I: Delphi Process

What is the Delphi Technique?

- The Delphi technique is a method for collecting and organizing informed opinions from a group of experts using an iterative process
  - *often used in survey instrument development*
- This approach is most appropriate to ensure that feedback is obtained from all stakeholders
  - *with all experts being treated equal and everyone's voices being heard*
- Delphi Technique afforded a stakeholder engaged measure development and validation (construct validity) process
- Web-based surveys used in rounds 1-3, 5; round 4 an in-person meeting with polling software
- The responses to surveys were analyzed by the investigator team and returned to the Delphi panelist for further consideration and response

More about the Delphi Process

- Subsequent rounds include items where consensus was not previously reached accompanied with anonymous feedback from previous iterations.
- Panelists are encouraged to reconsider their previous responses, and if appropriate, to change their previous response in light of replies and comments from other panelists.
- The eventual outcome of the Delphi process is to obtain consensus with ≥80% agreement among experts.
- Consensus was not forced; items for which consensus could not be reached were discussed at the in-person meeting.
- On day 2 of the in-person meeting, live voting reached over 80% agreement on all items.

Content Validation: Five Round Delphi Process

Round 1	Round 2	Round 3	Round 4	Round 5
Kick-off Webinar June 28, 2017 -Introduction to the project -Preparation for Round 1	Webinar 2 October 4, 2017 - Review of Round 1 results -Preparation for Round 2	Webinar 3 January 31, 2018 -Review of Round 2 results -Preparation for Round 3	In-person meeting April 26-27, 2018 - Review of round 3 results - Facilitated discussion N=10	No webinar
Survey 1 Demographics, EP titles, items, other measures July 2017 N=19	Survey 2 EP titles, definitions, items, case scenarios, levels of CER October - November 2017 N=18	Survey 3 EP titles, definitions, items, case scenarios, levels of CER February - March 2018 N=18	Survey of those unable to attend in person EP titles, definitions, items, case scenarios, levels of CER April 17-25, 2018 N=6	Final consensus survey EP titles, definitions, items, case scenarios, levels of CER July - August 2018 N=18
Individualized reports with round 1 results October 5, 2017	Individualized reports with round 2 results January 31st, 2018	Individualized reports with round 3 results April 9th, 2018	No individualized reports	No individualized reports

Source: Goodman, M. S., Ackermann, N., Bowen, D. J., Members of the Delphi Panel, & Thompson, V. L. S. (2020). Reaching Consensus on Principles of Stakeholder Engagement in Research. Progress in Community Health Partnerships: Research, Education, and Action, 14(1), 117–127. https://doi.org/10.1353/cpr.2020.0014

Delphi Round 1 Changes

Original Engagement Principles	Number of Items				
	Total	Not Changed	Dropped	Added	Modified
1. Focus on local relevance and social determinants of health	4	2	0	0	2
2. Acknowledge the community	4	0	4	-	-
3. Disseminate findings and knowledge gained to all partners	5	0	3	-	2[a]
4. Seek and use the input of community partners	5	0	1	1	4
5. Involve a cyclical and iterative process in pursuit of objectives	5	1	0	1	4
6. Foster co-learning, capacity building, and co-benefit for all partners	5	0	1	1	4
7. Build on strengths and resources within the community	4	0	0	1	4
8. Facilitate collaborative, equitable partnerships	5	0	2	3	3
9. Integrate and achieve a balance of all partners	4	1	1	-	2
10. Involve all partners in the dissemination process	4	0	1	2[a]	3
11. Plan for a long-term process and commitment	3	0	3	-	-
Newly Added EP – Build Trust[b]	-	-	-	4	-
Total	**48**	**4**	**16**	**13**	**28**

[a]Two items were moved to EP10 (new EP7 in the subsequent versions) and modified from the previous round.
[b]Four items were added to a new EP that did not exist in the original measure, “Build Trust.”

Delphi Round 2 Changes

Revised Engagement Principles	Number of Items			
	Total	Not Changed	Dropped	Modified
1. Focus on local relevance and social determinants of health.	4	3	0	1
2. (was #4) Seek and use the input of all partners.	5	0	0	5
3. (was #5) Involve a cyclical and iterative process in pursuit of objectives.	6	2	2	2
4. (was #6) Foster co-learning, capacity building, and co-benefit for all partners.	5	1	1	3
5. (was #7) Build on strengths and resources within the community/target population.	5	1	1	3
6. (was #8, 9) Facilitate collaborative, equitable partnerships.	9	4	2	3
7. (was #10) Involve all partners in the dissemination process.	5	0	1	4
8. (new) Build trust.	4	2	0	2
Total	**43**	**13**	**7**	**23**

Note. No items were added after Round 2.

Delphi Round 3 Changes

Final Engagement Principles	Number of Items				
	Total	Not Changed	Dropped	Added	Modified
1. Focus on community perspectives and determinants of health	4	3	0	0	1
2. Partner input is vital	5	1	1[a]	0	3
3. Partnership sustainability to meet goals and objectives	4	2	0	0	2
4. Foster co-learning, capacity building, and co-benefit for all partners	4	2	0	0	2
5. Build on strengths and resources within the community or patient population	4	3	1	0	0
6. Facilitate collaborative, equitable partnerships	7	4	1	0	2
7. Involve all partners in the dissemination process	4	1	2	1	1
8. Build and maintain trust in the partnership	4	4	0	1[a]	0
Total	**36**	**20**	**5**	**2**	**11**

[a]One item from EP2 moved to EP8

Delphi Rounds 4 & 5

Final Engagement Principles	Number of Items Changes Made During Round 4					Final (Round 5)
	Total	Not Changed	Dropped	Added	Modified	Total Items
1. Focus on community perspectives and determinants of health	4	3	0	0	1	4
2. Partner input is vital	4	1	1	1[b]	2	4
3. Partnership sustainability to meet goals and objectives	4	4	0	1	0	5
4. Foster co-learning, capacity building, and co-benefit for all partners	4	4	0	0	0	4
5. Build on strengths and resources within the community or patient population	3	1	0	0	2	3
6. Facilitate collaborative, equitable partnerships	6	3	2[b]	0	1	4
7. Involve all partners in the dissemination process	3	2	0	0	1	3
8. Build and maintain trust in the partnership	5	5	0	0	0	5
Total	**33**	**23**	**3**	**2**	**7**	**32**

[b]One item from EP6 moved to EP2

Delphi Panelist

Reaching Consensus on Principles of Stakeholder Engagement in Research

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Submitted 10 October 2018, revised 27 March 2019, accepted 28 August 2019

Abstract

Background: Stakeholder-engaged research is an umbrella term for the types of research that have community, patient, and/or stakeholder engagement, feedback, and bidirectional communication as approaches used in the research process. The level of stakeholder engagement across studies can vary greatly, from minimal engagement to fully collaborative partnerships.

Objectives: To present the process of reaching consensus among stakeholder and academic experts on the stakeholder engagement principles (EPs) and to identify definitions for each principle.

Methods: We convened 19 national experts, 18 of whom remained engaged in a five-round Delphi process. The Delphi panel consisted of a broad range of stakeholders (e.g., patients, caregivers, advocacy groups, clinicians, researchers). We used web-based surveys for most rounds (1–3 and 5) and an in-person meeting for round 4. Panelists evaluated EP titles and definitions with a goal of reaching consensus (>80% agreement). Panelists' comments guided modifications, with greater weight given to non-academic stakeholder input.

Conclusions: EP titles and definitions were modified over five Delphi rounds. The panel reached consensus on eight EPs (dropping four, modifying four, and adding one) and corresponding definitions. The Delphi process allowed for a stakeholder-engaged approach to methodological research. Stakeholder engagement in research is time consuming and requires greater effort but may yield a better, more relevant outcome than more traditional scientist-only processes. This stakeholder-engaged process of reaching consensus on EPs and definitions provides a key initial step for the content validation of a survey tool to examine the level of stakeholder engagement in research studies.

Keywords

Community health partnerships, evaluation studies, outcome and process assessment (health care), community-based participatory research, process issues

Source: Goodman, M. S., Ackermann, N., Bowen, D. J., Members of the Delphi Panel, & Thompson, V. L. S. (2020). Reaching Consensus on Principles of Stakeholder Engagement in Research. Progress in Community Health Partnerships: Research, Education, and Action, 14(1), 117–127. https://doi.org/10.1353/cpr.2020.0014

Research Engagement Survey Tool (REST)

- 8 Engagement Principles
  1) Focus on community perspectives and determinants of health
  2) Partner input is vital
  3) Partnership sustainability to meet goals and objectives
  4) Foster co-learning, capacity building, and co-benefit for all partners
  5) Build on strengths and resources within the community or patient population
  6) Facilitate collaborative, equitable partnerships
  7) Involve all partners in the dissemination process
  8) Build and maintain trust in the partnership

Sources: Goodman, M. S., Ackermann, N., Bowen, D. J., Members of the Delphi Panel, & Thompson, V. L. S. (2020). Reaching Consensus on Principles of Stakeholder Engagement in Research. Progress in Community Health Partnerships: Research, Education, and Action, 14(1), 117–127. https://doi.org/10.1353/cpr.2020.0014

Goodman, M. S., Ackermann, N., Bowen, D. J., & Thompson, V. (2019). Content validation of a quantitative stakeholder engagement measure. Journal of Community Psychology, 47(8), 1937–1951. https://doi.org/10.1002/jcop.22239

Received: 29 January 2019 | Revised: 15 August 2019 | Accepted: 16 August 2019

DOI: 10.1002/jcop.22239

RESEARCH ARTICLE

JOURNAL OF COMMUNITY PSYCHOLOGY WILEY

Content validation of a quantitative stakeholder engagement measure

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Funding information
Patient-Centered Outcomes Research Institute, Grant/Award Number: ME-1511-33027

Abstract

Aim: Using a stakeholder-engaged approach, this study conducted content validation and item reduction of a quantitative measure of research engagement.

Methods: A five-round modified Delphi process was used to reach consensus on items. Rounds 1–3 and 5 were conducted using web-based surveys. Round 4 consisted of a 2-day, in-person meeting. Delphi panelists received individualized reports outlining individual and aggregate group responses after rounds 1–3.

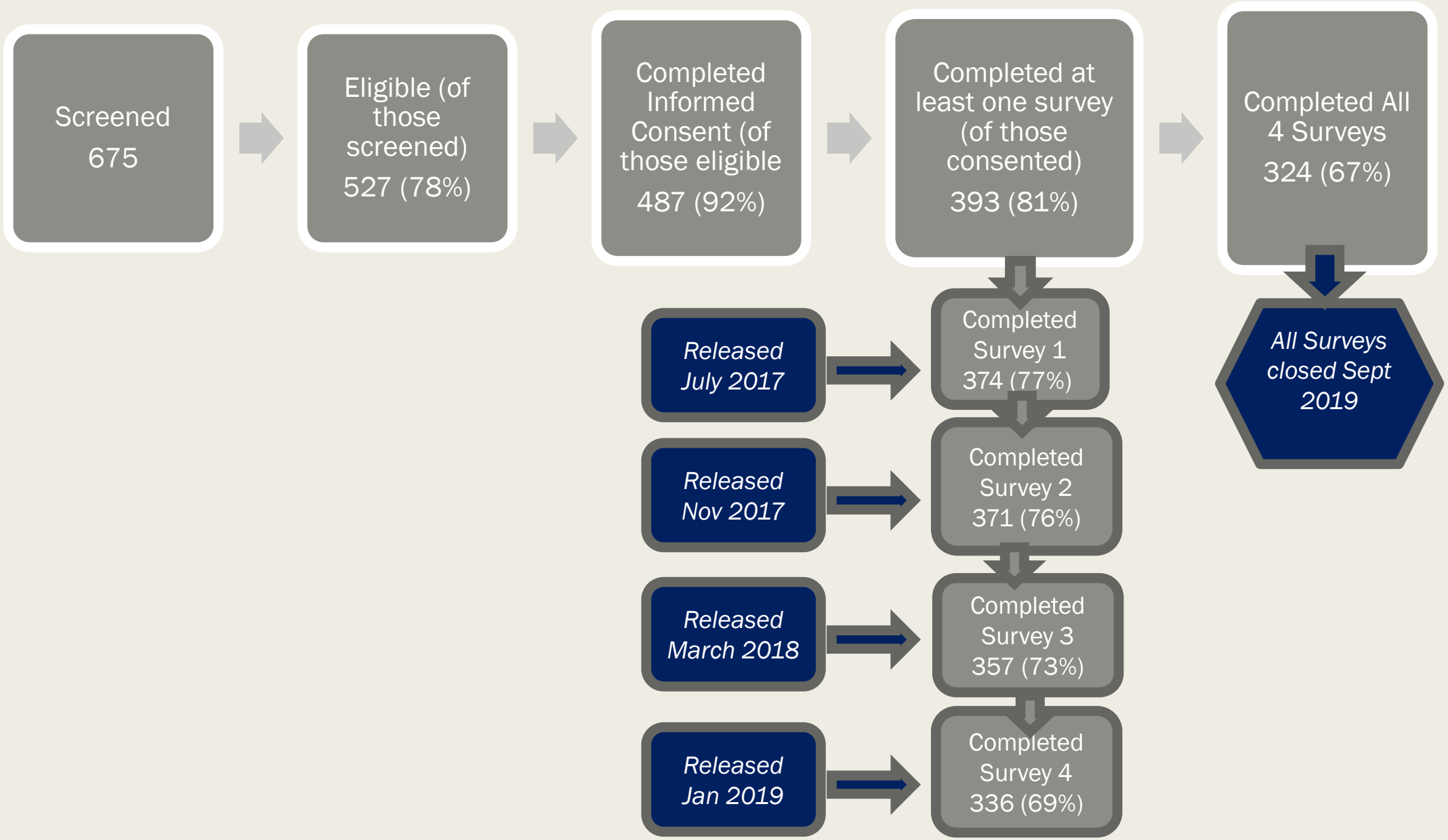
Results: Over the five-round process, items were added, dropped, modified, and moved from one engagement principle to another. The number of items was reduced from 48 to 32, with three to five items corresponding to eight engagement principles.

Conclusions: Research that develops standardized, reliable, and accurate measures to assess stakeholder engagement is essential to understanding the impact of engagement on

Source: Goodman MS, Ackermann N, Bowen, DJ, Thompson, V. Content validation of a quantitative stakeholder engagement measure. *J Community Psychol*. 2019 Nov;47(8):1937-1951.

Phase II: Community Engaged Research Participant Surveys

Longitudinal Participant Surveys



PLOS ONE

RESEARCH ARTICLE

Community partners' responses to items assessing stakeholder engagement: Cognitive response testing in measure development

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☯ These authors contributed equally to this work.
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OPEN ACCESS

Citation: Thompson VLS, Leahy N, Ackermann N, Bowen DJ, Goodman MS (2020) Community partners' responses to items assessing stakeholder engagement: Cognitive response testing in measure development. PLoS ONE 15(11): e0241839. https://doi.org/10.1371/journal.pone.0241839

Editor: Rosanna Morais Rios, Norwegian University of Science and Technology, NORWAY

Received: February 18, 2020

Accepted: October 21, 2020

Published: November 23, 2020

Peer Review History: PLOS recognizes the benefits of transparency in the peer review process; therefore, we enable the publication of all of the content of peer review and author responses alongside final, published articles. The editorial history of this article is available here: https://doi.org/10.1371/journal.pone.0241839

Data Availability Statement: Data are available in ICPSR: (https://www.icpsr.umich.edu/icpsrweb/)

Abstract

Background

Despite recognition of the importance of stakeholder input into research, there is a lack of validated measures to assess how well constituencies are engaged and their input integrated into research design. Measurement theory suggests that a community engagement measure should use clear and simple language and capture important components of underlying constructs, resulting in a valid measure that is accessible to a broad audience.

Objective

The primary objective of this study was to evaluate how community members understood and responded to a measure of community engagement developed to be reliable, valid, easily administered, and broadly usable.

Method

Cognitive response interviews were completed, during which participants described their reactions to items and how they processed them. Participants were asked to interpret item meaning, paraphrase items, and identify difficult or problematic terms and phrases, as well as provide any concerns with response options while responding to 16 of 32 survey items.

Results

The results of the cognitive response interviews of participants (N = 16) suggest concerns about plain language and literacy, clarity of question focus, and the lack of context clues to facilitate processing in response to items querying research experience. Minimal concerns were related to response options. Participants suggested changes in words and terms, as well as item structure.

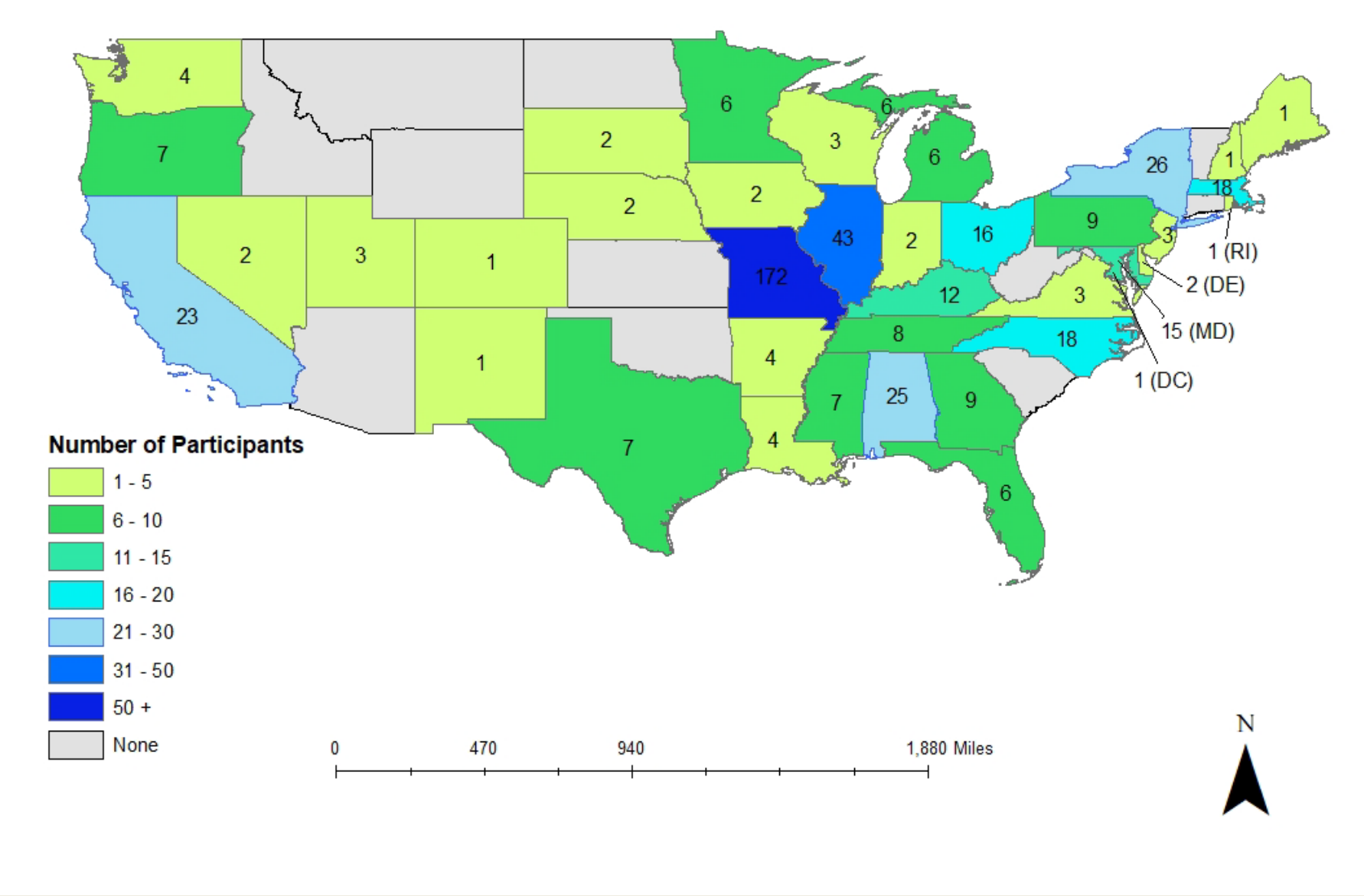
Source: Thompson VLS, Leahy N, Ackermann N, Bowen DJ, Goodman MS (2020) Community partners' responses to items assessing stakeholder engagement: Cognitive response testing in measure development. PLOS ONE 15(11): e0241839. https://doi.org/10.1371/journal.pone.0241839

Cognitive Response Testing (n=16)

- Completed October 2018, between participant surveys 3 & 4
- Purpose
  - *To ensure readability & understandability of the measure*
- Preliminary results
  - *Literacy & interpretation concerns on certain words (ex: dissemination, governance, intellectual property, capacity)*
  - *Confusion on question stem*
  - *Complex questions*
  - *Add unsure [not applicable] option to responses*
- Measure was modified based on cognitive response testing results

Demographic Characteristics		N (%)
Race	Non-Hispanic/Latino(a) Black	201 (41.3%)
	Non-Hispanic/Latino(a) White	206 (42.3%)
	Hispanic	31 (6.4%)
	Asian	21 (4.3%)
	Other/ Multiracial/ Unknown	28 (5.8%)
Gender	Male	92 (19.2%)
	Female	386 (80.4%)
	Other/Unknown	9 (1.8%)
Education	Less than HS	5 (1.0%)
	HS degree or GED	17 (3.5%)
	Some college or Associate degree	98 (20.4%)
	College Degree	133 (27.7%)
	Graduate Degree	227 (47.3%)
		Mean (SD)
	Age	41.6 (14.4)

Participants who Enrolled (N=487)



- One participant from Virgin Islands, one from Puerto Rico, & one from Alaska not displayed on map
- 12 states have 0 participants
  - AZ, CT, HI, ID, KS, MT, ND, OK, SC, VT, WV, WI

Participant Survey - Universities

- 177 universities are represented among the research participants who have completed the survey
- Universities listed have 15 or more participants reporting.

University	Number of Participants
Washington University in St. Louis (WUSTL)	165
New York University (NYU)	28
University of Alabama	21
Northwestern University	21
Mayo Clinic	19
Saint Louis University	17
University of Washington (UW)	17

Internal Consistency of EPs

- Examined using Cronbach's Alpha

A statistic calculated from the pairwise correlations between items

Measures whether several items that propose to measure the same general construct produce consistent responses

Measured on a 0 to 1 scale

Cronbach's alpha	Internal consistency
$\alpha \geq 0.9$	Excellent
$0.9 > \alpha \geq 0.8$	Good
$0.8 > \alpha \geq 0.7$	Acceptable
$0.7 > \alpha \geq 0.6$	Questionable
$0.6 > \alpha \geq 0.5$	Poor
$0.5 > \alpha$	Unacceptable

Values above 0.7 are considered acceptable in many fields

Source: https://www.statisticshowto.datasciencecentral.com/cronbachs-alpha-spss/

Internal Consistency

Engagement Principle	N Items	Quality		Quantity	
		N	Alpha	N	Alpha
EP1	4	301	0.88	306	0.82
EP2	4	306	0.88	311	0.85
EP3	5	291	0.92	298	0.90
EP4	4	313	0.91	324	0.87
EP5	3	309	0.88	319	0.83
EP6	4	292	0.90	296	0.87
EP7*	3	283	0.83	296	0.79
EP8	5	301	0.92	304	0.91

- Alpha increases to 0.84 (quality scale) and 0.81 (quantity scale) if item EP7.3 removed
  - *Ep7.3: All partners have the opportunity to be coauthors when the work is published.*
- Results show strong internal consistency

Convergent Validity

- Measure correlations
- Spearman's correlation coefficient and p-values comparing REST to other measures of engagement

Interpreting the Correlation Coefficient	
Absolute Value of Correlation Coefficient	**Interpretation**
0.90 to 1.00	Very high correlation
0.70 to 0.90	High correlation
0.50 to 0.70	Moderate correlation
0.30 to 0.50	Low correlation
0.00 to 0.30	Negligible correlation

Source: Mukaka MM. Statistics corner: a guide to appropriate use of correlation coefficient in medical research. Malawi Med J. 2012;24(3):69-71. doi:10.1016/j.cmpb.2016.01.020.

Convergent Validity

Other Measures	Our Measure – Quality			Our Measure – Quantity		
	N	Spearman's R	P-Value	N	Spearman's R	P-Value
Medical Mistrust[1]	322	0.11 (negligible)	0.05	325	0.12 (negligible)	0.03
Trust in Medical Researchers[2]	322	0.18 (negligible)	<0.001	324	0.21 (negligible)	<0.001
Community Engagement in Research Index (CERI)[3]	320	0.19 (negligible)	0.001	323	0.25 (negligible)	<0.001
Partnership Assessment in community-based Research (PAIR) Measure[4]	322	0.34 (low)	<0.001	325	0.44 (low)	<0.001
Coalition Self-Assessment Survey – Trust[5]*	323	0.40 (low)	<0.001	328	0.42 (low)	<0.001

*Correlation with EP8 (trust)

Convergent Validity

Other Measures	Our Measure – Quality			Our Measure – Quantity		
	N	Spearman's R	P-Value	N	Spearman's R	P-Value
Kagan Measure[6]	319	0.50 (moderate)	<0.001	322	0.56 (moderate)	<0.001
Partnership Self-Assessment Tool (PSAT) – Synergy[7,8]	325	0.61 (moderate)	<0.001	328	0.62 (moderate)	<0.001
PSAT - Satisfaction[7,8]	324	0.61 (moderate)	<0.001	327	0.65 (moderate)	<0.001
Wilder Collaboration[9,10]	325	0.54 (moderate)	<0.001	328	0.54 (moderate)	<0.001

TBM

ORIGINAL RESEARCH

Strategies of community engagement in research: definitions and classifications

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Cite this as: *TBM* 2019;XX:XX–XX
doi: 10.1093/tbm/ibaa042

Abstract

Engagement activities are defined along a continuum that analyzes and represents nonacademic stakeholder activities and interactions with academic researchers. Proposed continua begin with none to limited stakeholder inclusion and input into research and continue with descriptions of increasing presence, input, and participation in decision-making. Despite some agreement in the literature, development of consistent terminology and definitions has been recommended to promote the common understanding of strategies in engaged research. This paper sought to develop and understand classifications and definitions of community-engaged research that can serve as the foundation of a measure of engaged research that permits comparisons among engagement strategies and the outcomes that they produce in health- and healthcare-related research studies. Data on academic and stakeholder perceptions and understandings of classifications and definitions were obtained using Delphi process ($N = 19$) via online and face-to-face survey and cognitive response interviews ($N = 16$). Participants suggested the need for more nuanced understanding of engagement along portions of the continuum, with active involvement and decision-making as engagement progressed. Cognitive interview responses suggested that outreach and education is a more advanced

Implications

Practice: It is possible for researchers and stakeholders to clarify terminology so that roles, participation, and benefits are clear at each level of community engagement along the continuum.

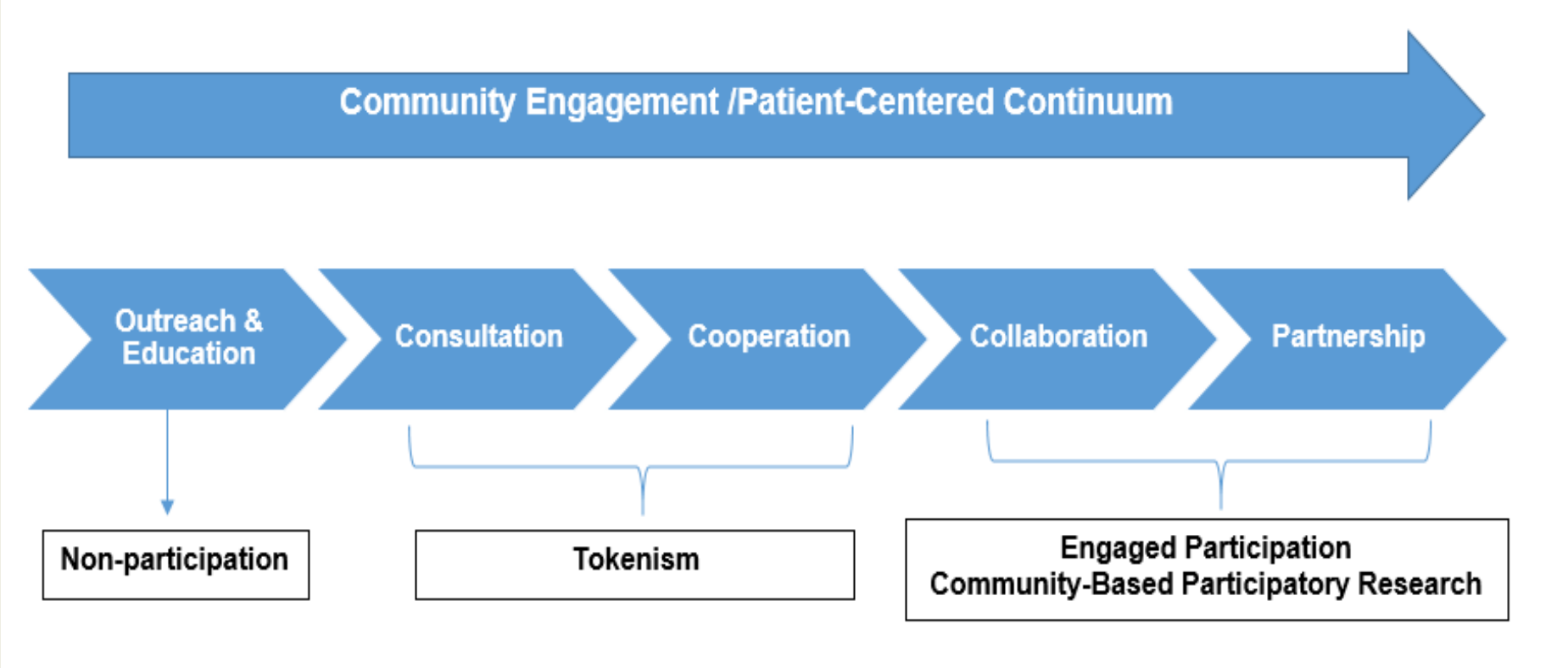
Policy: Policymakers who want to encourage community-engaged research must consider similarities and differences that may emerge in community and academic perceptions of community-engaged research.

Research: Future research is needed to clarify the understanding and depiction of community engagement activities and strategies that guide measure development.

was formed, composed of individuals from the

Source: Sanders Thompson, VL., Ackermann N, Bauer, KL, Bowen, DJ, Goodman MS. Strategies of community engagement in research: definitions and classifications, *Translational Behavioral Medicine*, , ibaa042, https://doi.org/10.1093/tbm/ibaa042

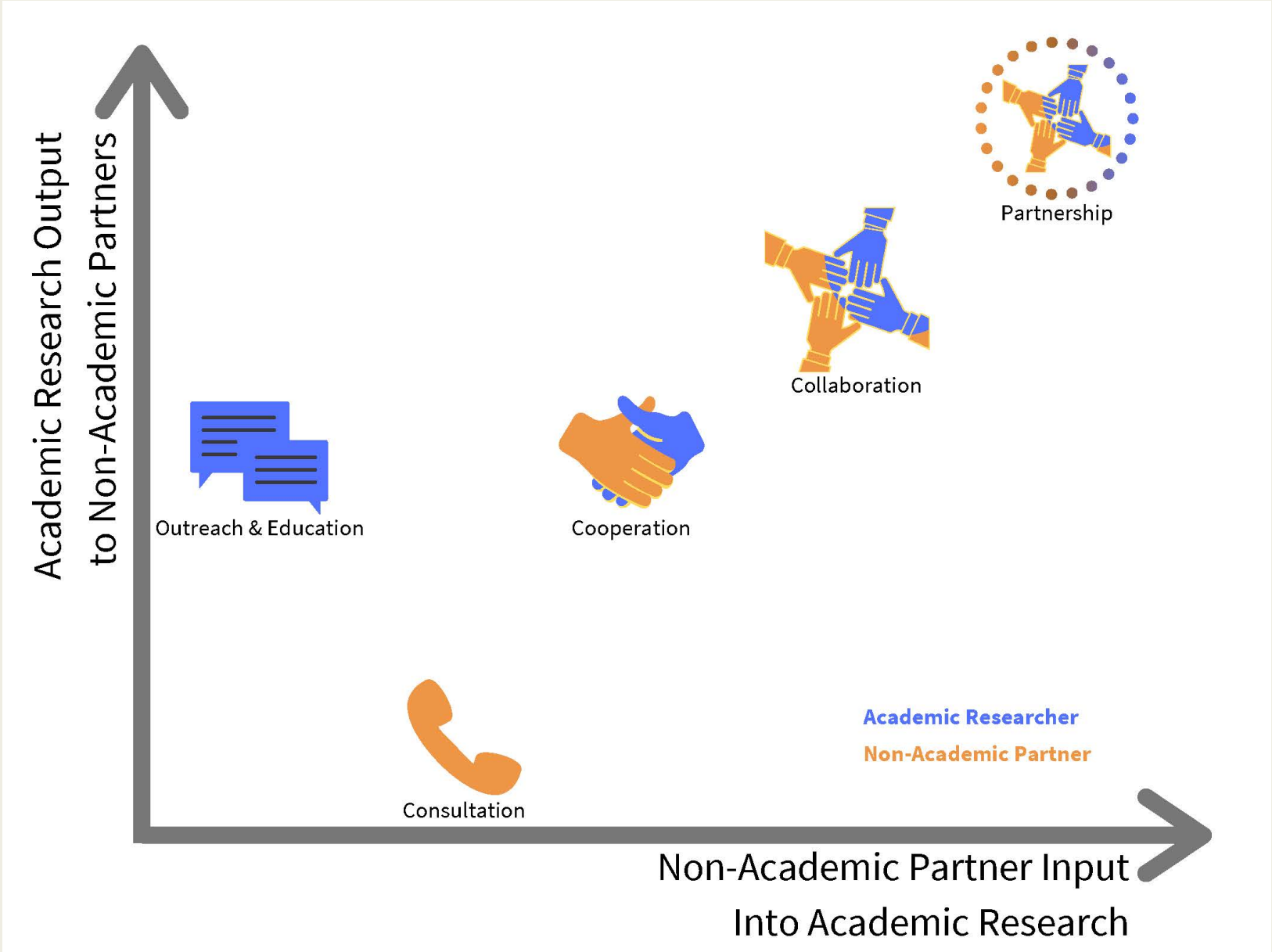
Categories and Classifications of Stakeholder Engagement - Revised



Project Classifications – Survey 4

Community Engagement in Research Level	Quality		Quantity	
	N	Mean (SD)	N	Mean (SD)
Outreach & Education	131	3.6 (1.0)	132	3.9 (0.8)
Consultation	41	3.3 (0.9)	41	3.7 (0.8)
Cooperation	59	3.7 (0.8)	61	3.8 (0.6)
Collaboration	60	3.9 (0.8)	61	4.0 (0.6)
Partnership	41	4.1 (0.9)	41	4.3 (0.8)

Categories of Partner Engagement in Research



Source: Sanders Thompson, VL., Ackermann N, Bauer, KL, Bowen, DJ, Goodman MS. Strategies of community engagement in research: definitions and classifications, *Translational Behavioral Medicine*, , ibaa042, https://doi.org/10.1093/tbm/ibaa042

Condensed Measure

- To reduce partner burden, developed a condensed version of the measure

- Considered several methods in determining which items to cut including:
  - *Amount of 'not applicable' and missing responses*
  - *Factor analysis results (cross/non/low loading items)*
  - *Distribution of responses*
  - *Item response theory results (slopes and threshold ranges)*
  - *Item importance and difficulty rankings on cognitive interviews*
  - *Delphi panel final agreement and EP importance rankings*

Condensed Measure

- Results show promise for a 9-item version of the measure (reduced from 32 item full measure):
  - *Condensed versions highly correlated with full version*
  - *Overall and EP specific means similar between versions of measure*

Condensed Measure & Full Measure Comparison									
Variable	N	# of Items	Cronbach's alpha	Mean	SD	Median	Min	Max	Spearman Correlation with Full Version
Quality									
Condensed Version	332	9	0.94	3.7	0.9	3.9	1	5	0.97 (p<0.001)
Full Version	332	32	0.98	3.7	0.9	3.8	1	5	--
Quantity									
Condensed Version	336	9	0.92	4.0	0.8	4.1	1.3	5.0	0.97 (p<0.001)
Full Version	336	32	0.97	3.9	0.7	4.0	1.5	5.0	---

Condensed Measure & Full Measure Comparison of EP Means – Quality Scale*

Comparison	Condensed Mean (SD)	Full Mean (SD)
EP1	3.8 (1.1)	3.7 (0.9)
EP2	3.6 (1.1)	3.7 (1.0)
EP3	3.6 (1.2)	3.6 (1.0)
EP4	3.8 (1.1)	3.7 (1.0)
EP5	3.7 (1.1)	3.8 (1.0)
EP6	3.7 (1.0)	3.6 (1.0)
EP8	3.8 (1.1)	3.8 (1.0)

*Quantity results similar, with means all consistently higher than quality

Phase III: Implementation Study

Implementation Phase

To evaluate the stakeholder engagement measure in practice we examined the implementation and performance in PCOR/CER studies

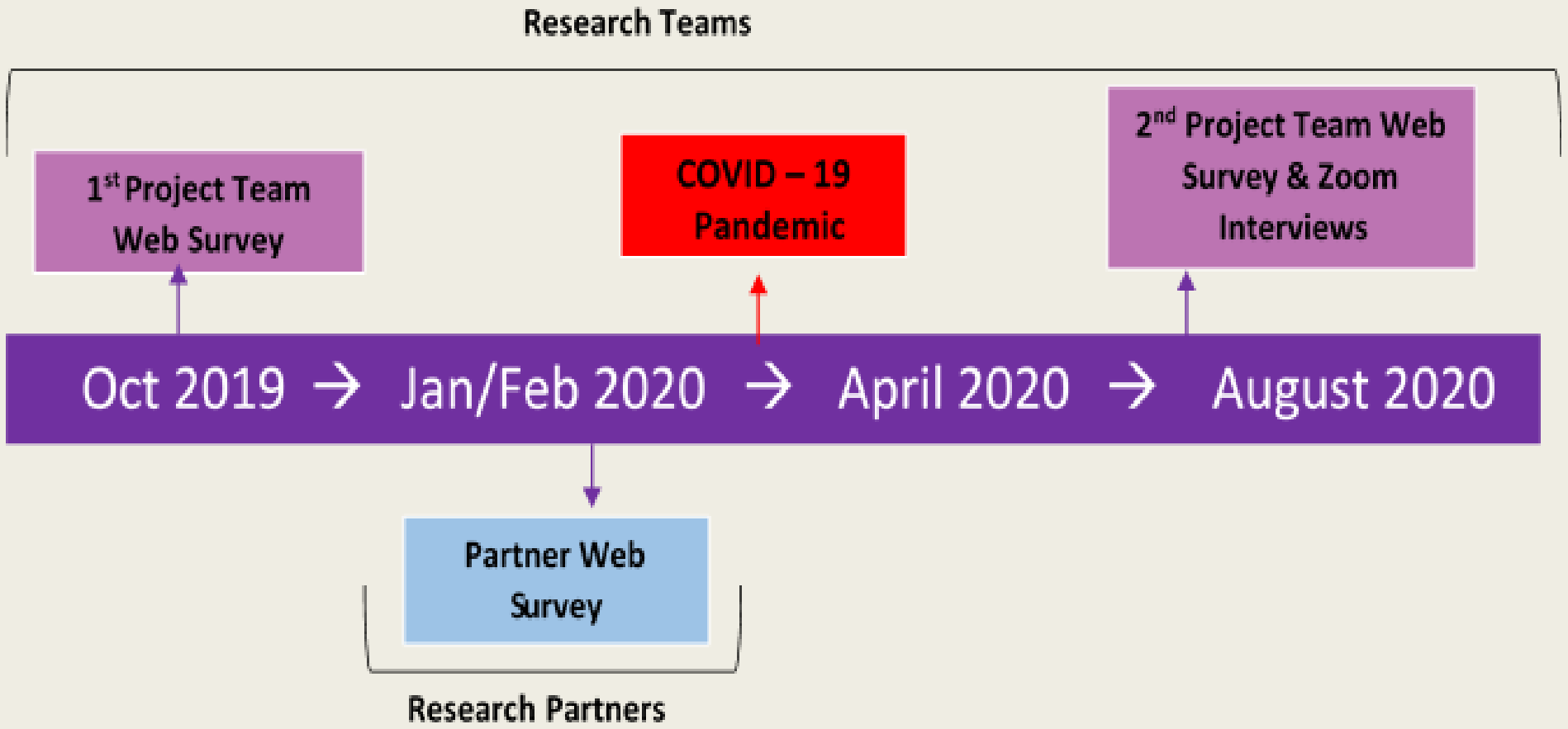
Examine uptake among research teams, barriers and facilitating factors for use of the research engagement survey tool in practice, and best practices for implementation

Using the Consolidated Framework for Implementation Research (CFIR) which is comprised of five domains

Intervention characteristics, outer setting, inner setting, characteristics of the individuals involved and the process of implementation

This information will be used to refine tool administration guidelines, procedures for implementation of the tool in practice, and how the tool will be packaged and disseminated to research teams.

Implementation Study Timeline



Implementation Phase

PCOR/CER trials project teams

86 completed project team baseline surveys

41 teams indicated interested in implementing REST

20 teams (26 projects) implemented REST

- Median of 5 partners per team (range 1 to 26)

Stakeholder/partner survey for project teams that agree to implement measure

178 partner surveys (from 173 partners) were completed across all teams

Project Team Baseline Survey– Barriers and Feasibility of Implementing REST

Variable	Category	All Completions (n=86) – N (%)	Implementing Only (N=21) – N (%)
Have capacity to survey partners	Yes	84 (97.7%)	21 (100%)
	No	2 (2.3%)	0
Currently administer partner evaluation/ satisfaction survey	Yes	31 (36.1%)	9 (42.9%)
	No	55 (63.9%)	12 (57.1%)
Ever sent web survey[1]	Yes	22 (71.0%)	8 (88.9%)
	No	9 (29.0%)	1 (11.1%)
Barrier of PI/Staff Time Commitment	Yes	24 (28.6%)	2 (9.5%)
	No	60 (71.4%)	19 (90.5%)
Barrier of PI/Staff Workload	Yes	26 (31.0%)	3 (14.3%)
	No	58 (69.1%)	18 (85.7%)
Prefer to send the engagement survey to partners	Study Investigators	15 (18.3%)	4 (19.1%)
	Their Own Project Team	58 (70.7%)	16 (76.2%)
	Either/Unsure[2]	9 (11.0%)	1 (4.8%)

[1] Asked only of those who currently administer surveys; [2] Responded that either is fine or unsure

Project Team Baseline Survey– Barriers and Feasibility of Implementing REST

Variable	All Completions (n=86)		Implementing Only (N=21)	
	Mean (SD)	Range	Mean (SD)	Range
Percentage of Partners that have regular internet access	93.0 (14.3)	12 – 100	95.2 (9.8)	60 - 100
Percentage of people that participate in currently administered surveys (n=30, n=8)	67.2 (27.2)	5 - 100	68.8 (24.3)	20 - 100
Feasibility of Intervention Measure[1]				
The Research Engagement Survey Tool (REST) seems implementable	3.8 (0.8)	2 – 5	4.3 (0.6)	3 – 5
The REST seems possible.	3.9 (0.7)	2 - 5	4.3 (0.5)	4 – 5
The REST seems doable.	3.8 (0.8)	2 – 5	4.3 (0.5)	4 – 5
The REST seems easy to use.	3.6 (0.8)	2 – 5	4.1 (0.6)	3 – 5

[1]Scale ranges from 1 (completely disagree) to 5 (completely agree)

Implementation Phase

Project teams indicated whether they would like:

- A detailed project specific report on REST
- A project comparison report (comparing to all other teams in study)
- Raw project specific de-identified data

12 teams (with 14 total projects) had more than five partners completing the REST implementation survey,

- Not able to provide requested results for eight of the teams - were given a full project summary report with all teams averaged
- We were able to provide (as requested):
  - Nine teams with all three form of results
  - Two teams with raw de-identified project specific data and a project specific report
  - One team with a comparison report

For example report, see our REST website:

https://tinyurl.com/RESTtool

Details of Projects in which REST was Implemented (n=26 projects)

Characteristic	Category	N (%)
Project Role	Principal Investigator	13 (50%)
	Community/partner engagement lead	1 (3.9%)
	Project manager/coordinator	9 (34.6%)
	Other	3 (11.5%)
Type of Stakeholders	Community Advisory Board (CAB)	14 (53.8%)
	Patients	19 (73.1%)
	Healthcare Organizations	20 (76.9%)
	Study Participants	12 (46.2%)
	Community Members	19 (73.1%)
	Local Community Organizations	16 (61.5%)
	Health Departments	10 (38.5%)
	Other	11 (42.3%)
Years Stakeholders Engaged	Less than 1 year	2 (7.8%)
	1-2 years	9 (34.6%)
	3-5 years	11 (42.3%)
	Over 5 years (max=10)	4 (15.4%)

	Mean (SD)	Range	Sum
Estimated Number of Stakeholders - Individuals	40.3 (43.9)	3 - 150	1,048
Actual Number of Stakeholders – Individuals	6.8 (6.3)	1 – 26	178

Project Team Follow-Up Web Survey Results (n=20 participants, 26 projects)

Variable	Category	N (%)
Did they watch information video	Yes	9 (47.4%)
	No	10 (52.6%)
If so, did they find is useful	Yes	8 (88.9%)
	No	1 (11.1%)
Where they able to understand results given	Yes	18 (94.7%)
	No	1 (5.3%)
Did they feel project was correctly classified?[1]	Yes	12 (92.3%)
	No	1 (7.7%)
Did staff have to take off work or reduce schedule due to COVID-19	Yes	4 (22.2%)
	No	14 (77.8%)
Partnership been impacted by COVID-19	A great deal	3 (15.8%)
	Somewhat	7 (36.8%)
	In a limited way	5 (26.3%)
	Not at all	4 (21.1%)

[1]Only asked of projects with 5 of more partners completing survey (n=14, 1 missing response)

- All teams who implemented REST completed the follow up web survey
  - *65% of teams (n=13) completed a qualitative interview via Zoom*
- All but one team reported being able to understand the results they were given on REST
  - *This team said the report was academic oriented, could use more text explanation (vs. tables); perhaps using infographics could help*
- Most (n=12 projects; 92% of non-missing responses) reported they agreed with their project classification
  - *This team did not suggest anything to improve the classification system, but reported they suspected the classification may be due to a few individuals they have a strained relationship with*

Implementation Phase – Follow Up Qualitative Interviews - Impression of REST

Team members indicated that they liked that the measure was comprehensive and that this made it an attractive tool

Described the REST as a straightforward tool to administer and complete

Positive reactions to the results presented in the categories along the continuum of engagement

Permitted them to think about what they were doing and how they might do it better in new projects or the ongoing project

DISCLAIMER

Part of this work was supported through a Patient Centered Outcomes Research Institute (PCORI) Award (ME-1511-33027). All statements in this presentation, including its findings and conclusions, are solely the authors' and do not necessarily represent the views of PCORI, its Board of Governors, or its Methodology Committee.

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NAME	DOMAIN	LONGITUDINAL SURVEY	NUMBER OF ITEMS	SCORING/ INTERPRETATION	VALIDATION (IF APPLICABLE)
Mainous Trust in Medical Researchers [10]	Trust in medical researchers	1	12	Score ranging from 0 to 48; higher values indicate higher trust	Cronbach's alpha = 0.84
Hall Trust in Medical Researchers [11]	Trust in medical researchers	1	12	Score ranging from 0 to 100; higher values indicate higher trust	Cronbach's alpha = 0.87. Factor model consists of 1 factor.
Survey of community engagement [12]	Community engagement	1	3 categories; 25 items	Average score ranging from 1 to 7; higher scores indicate higher engagement	n/a
Partnership Assessment In community-based Research (PAIR) [13]	Evaluates key dimensions of researchers and community member partnerships	1	5 dimensions; 31 items	Average score ranging from 1 to 5; higher scores indicate higher engagement	Content validation (literature review, experts, cognitive interviews)
Community Engagement Research Index (CERI) [14]	Community engagement in research	2	12	Sum score ranging from 4 to 12; higher scores indicate higher engagement	Face validity (items identified by interview participants), content validity (items based on previously collected qualitative data)
Coalition Self-Assessment Survey (CSAS) trust sub-scale	Trust within coalition	2	7	Average score ranging from 1 to 4; higher scores indicate higher trust	No validation data, but used across several projects

Name	Domain	Longitudinal survey	Number of items	Scoring/ interpretation	Validation (if applicable)
Partnership Self-Assessment Tool (PSAT) – Synergy	Partnership synergy	3	9	Average score ranging from 1 to 5, rounded to 0.1; higher scores indicate higher synergy	According to the National Collaborating Centre for Methods and Tools (NCCMT), the PSAT tool has been evaluated, validity properties meet accepted standards, and reliability properties meet accepted standards. They gave the tool a 'strong' methodological rating.
Partnership Self-Assessment Tool (PSAT) – decision making	Partnership decision making	3	3	Average score ranging from 1 to 5, rounded to 0.1; higher scores indicate better decision making	
Partnership Self-Assessment Tool (PSAT) – benefits	Partnership benefits	3	11	Percentage score (out of nonmissing items); higher score indicates more benefits	
Partnership self-assessment tool (PSAT) – Drawbacks	Partnership drawbacks	3	6	Percentage score (out of nonmissing items); higher score indicates more drawbacks	
Partnership Self-Assessment Tool (PSAT) – comparing benefits and drawbacks	Comparing benefits and drawbacks	3	1	1='Drawbacks greatly exceed the benefits' to 5='Benefits greatly exceed the drawbacks'	
Partnership Self-Assessment Tool (PSAT) – satisfaction	Partnership satisfaction	3	5	Average score ranging from 1 to 5, rounded to 0.1; higher scores indicate higher satisfaction	

NAME	DOMAIN	LONGITUDINAL SURVEY	NUMBER OF ITEMS	SCORING/ INTERPRETATION	VALIDATION (IF APPLICABLE)
Partnership Self-Assessment Tool (PSAT) – Leadership	Partnership leadership	3	11	Average score ranging from 1 to 5, rounded to 0.1; higher scores indicate better leadership	According to the National Collaborating Centre for Methods and Tools (NCCMT), the PSAT tool has been evaluated, validity properties meet accepted standards, and reliability properties meet accepted standards. They gave the tool a 'strong' methodological rating.
Partnership Self-Assessment Tool (PSAT) – Efficiency	Partnership Efficiency	3	3	Average score ranging from 1 to 5, rounded to 0.1; higher scores indicate better efficiency	
Partnership Self-Assessment Tool (PSAT) – Administration/ Management	Partnership administration/ management	3	9	Average score ranging from 1 to 5, rounded to 0.1; higher scores indicate better administration/ management	
Partnership Self-Assessment Tool (PSAT) – nonfinancial resources	Partnership nonfinancial resources	3	6	Average score ranging from 1 to 5, rounded to 0.1; higher scores indicate has resources	
Partnership Self-Assessment Tool (PSAT) – financial other capital resources	Partnership financial other capital resources	3	3	Average score ranging from 1 to 5, rounded to 0.1; higher scores indicate has resources	
Wilder Collaboration Factors Inventory	Collaboration evaluation	3	6 dimensions, 20 factors, 40 items	Average score ranging from 1 to 5 with dimensions equally weighted; higher scores indicate higher collaboration	Reliability varied for dimensions (alpha 0.50 – 0.93) [19]

Questions?

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