APPENDIX A. SEARCH STRATEGY

TOPIC 1 – SCALING/SPREAD OF HEALTH INTERVENTIONS
TOPIC 2 – IMPROVING LOW-PERFORMING ORGANIZATIONS
TOPIC 3 – LEARNING HEALTHCARE SYSTEMS

SEARCH TOPIC 1 – SCALING/SPREAD:

DATABASE SEARCHED & TIME PERIOD COVERED:
PubMed – From inception to 1/4/2018

LANGUAGE:
English

SEARCH STRATEGY:

DATABASE SEARCHED & TIME PERIOD COVERED:
PubMed – From inception to 1/4/2018

LANGUAGE:
English

SEARCH STRATEGY:
SIMILAR ARTICLE SEARCHES –
Aarons, Gregory A.
"Scaling-out" evidence-based interventions to new populations or new health care delivery systems.

Yano, Elizabeth M
Implementation and spread of interventions into the multilevel context of routine practice and policy: implications for the cancer care continuum.

DATABASE SEARCHED & TIME PERIOD COVERED:
WorldCat – From inception to 1/3/2018

LANGUAGE:
English
SEARCH STRATEGY:
ti: scale-out OR ti: scaling-out OR ti: scaling OR ti: scaling-up OR ti: scale-up OR ti: spread* OR ti: large-scale OR ti: large w scale OR ti: system-wide OR ti: system w wide OR ti: system w wide OR ti: system w wide OR ti: multi-institutional w system OR ti: multi-institutional w systems)) or (su: scale-out OR su: scaling-out OR su: scaling OR su: scaling-up OR su: scale-up OR su: spread* OR su: large-scale OR su: large w scale OR su: system-wide OR su: system w wide OR su: multi-institutional w system OR su: multi-institutional w systems)) not mt: juv) not mt: fic and (dt= "bks" or dt= "ser" or dt= "url")
AND
ti: medical OR ti: health* OR ti: hospital OR ti: hospitals
AND
(ti: chang* OR ti: innovat* OR ti: implement* OR ti: initiative* OR ti: interven* OR ti: cultur* or su: chang* OR su: innovat* OR su: implement* OR su: initiative* OR su: interven* OR su: cultur*
AND
ti: quality OR ti: improv* or su: quality OR su: improv*

DATABASE SEARCHED & TIME PERIOD COVERED:
Web of Science – From inception to 1/3/2018

LANGUAGE:
English

SEARCH STRATEGY:
ti=(scale-out OR scaling-out OR scaling OR scaling-up OR scale-up OR spread* OR large-scale OR large near scale OR system-wide OR system near wide OR multi-institutional near system OR multi-institutional near systems)
AND
ts=(medical OR health* OR hospital OR hospitals)
AND
ts=(chang* OR innovat* OR implement* OR initiative* OR interven* OR culture*)
AND
ti=(quality OR improv*)
Refined by: [excluding] WEB OF SCIENCE CATEGORIES: (FOOD SCIENCE TECHNOLOGY OR GREEN SUSTAINABLE SCIENCE TECHNOLOGY OR URBAN STUDIES OR ENVIRONMENTAL SCIENCES OR VETERINARY SCIENCES OR BIOCHEMICAL RESEARCH METHODS OR BIOCHEMISTRY MOLECULAR BIOLOGY OR BIOLOGY OR EDUCATION SCIENTIFIC DISCIPLINES OR BIOPHYSICS OR ENERGY FUELS OR BUSINESS OR ENVIRONMENTAL STUDIES OR BUSINESS FINANCE OR METEOROLOGY ATMOSPHERIC SCIENCES OR CELL BIOLOGY OR MULTIDISCIPLINARY SCIENCES OR CHEMISTRY MULTIDISCIPLINARY OR COMPUTER SCIENCE ARTIFICIAL INTELLIGENCE OR AGRICULTURE DAIRY ANIMAL SCIENCE OR COMPUTER SCIENCE HARDWARE ARCHITECTURE OR AGRICULTURE MULTIDISCIPLINARY OR COMPUTER SCIENCE INFORMATION SYSTEMS OR AUDIOLOGY SPEECH LANGUAGE PATHOLOGY OR COMPUTER SCIENCE SOFTWARE ENGINEERING OR SPORT SCIENCES OR BIOTECHNOLOGY APPLIED MICROBIOLOGY OR CONSTRUCTION BUILDING TECHNOLOGY OR CHEMISTRY PHYSICAL OR CRYSTALLOGRAPHY OR COMPUTER SCIENCE INTERDISCIPLINARY APPLICATIONS OR EDUCATION SPECIAL OR COMPUTER SCIENCE THEORY METHODS OR ELECTROCHEMISTRY OR DEMOGRAPHY OR ENGINEERING CIVIL OR WATER RESOURCES OR ENGINEERING ELECTRICAL ELECTRONIC OR EDUCATION EDUCATIONAL RESEARCH OR ENGINEERING MANUFACTURING OR ECOLOGY OR ENGINEERING MECHANICAL OR GEOGRAPHY OR
ETHICS OR EVOLUTIONARY BIOLOGY OR MARINE FRESHWATER BIOLOGY OR FORESTRY OR MATHEMATICS INTERDISCIPLINARY APPLICATIONS OR GENETICS HEREDITY ) 

OR

ts=(implementation science) AND ts=(system* near chang*)
Refined by: WEB OF SCIENCE CATEGORIES: (NEUROSCIENCES OR HEALTH CARE SCIENCES SERVICES OR IMMUNOLOGY OR HEALTH POLICY SERVICES OR MEDICINE GENERAL INTERNAL OR PSYCHOLOGY CLINICAL OR PSYCHOLOGY DEVELOPMENTAL OR PSYCHOLOGY EDUCATIONAL OR PSYCHOLOGY MULTIDISCIPLINARY OR ONCOLOGY OR PHARMACOLOGY PHARMACY OR SOCIAL SCIENCES BIOMEDICAL OR CLINICAL NEUROLOGY OR MEDICAL INFORMATICS OR SOCIAL SCIENCES INTERDISCIPLINARY OR HEMATOLOGY OR INFECTIOUS DISEASES OR SOCIAL ISSUES OR MEDICINE RESEARCH EXPERIMENTAL )

DATABASE SEARCHED & TIME PERIOD COVERED:
Web of Science – From inception to 1/4/2018

LANGUAGE:
English

SEARCH STRATEGY:
“Forward” search on the following article:
Yano, Elizabeth M
Implementation and spread of interventions into the multilevel context of routine practice and policy: implications for the cancer care continuum.

SEARCH TOPIC 2 – LOW-PERFORMING ORGANIZATIONS

DATABASE SEARCHED & TIME PERIOD COVERED:
PubMed – From inception to 11/21/2017

LANGUAGE:
English

SEARCH STRATEGY #1 (ORIGINAL VERSION)
organization* AND perform*[ti]
AND
low OR lower OR lowest OR low-perform* OR poor* OR substandard
AND
interven* OR improv*

DATABASE SEARCHED & TIME PERIOD COVERED:
PubMed – From inception to 1/3/2018
SEARCH STRATEGY #2 (REVISED VERSION)
low perform* OR low-perform* OR lower perform* OR lower-perform* OR lowest perform* OR lowest-perform* OR perform* poor*
AND
"organizational culture"[ti] OR "organizational culture"[mh] OR "organisational culture"[ti] OR organizational chang*[ti] OR organisational chang*[ti] OR organizational innovat* OR "diffusion of innovation"

DATABASE SEARCHED & TIME PERIOD COVERED:
Business Source Complete – From inception to 11/21/2017

SEARCH STRATEGY:
SU organizational performance
AND
TI ( low OR lower OR lowest OR low-perform* OR poor* OR substandard )
AND
interven* OR improv*
Search modes - Find all search terms

SEARCH TOPIC 3 – LEARNING HEALTHCARE SYSTEMS

DATABASE SEARCHED & TIME PERIOD COVERED:
PubMed- From inception to 1/10/2018

SEARCH STRATEGY:
learning health system* OR learning healthcare system* OR "learn from every patient"
OR
("learn from every patient" OR lfep) AND ("nationwide children's hospital" OR "nationwide childrens hospital"
OR
"SIMILAR ARTICLE" SEARCHES ON THE FOLLOWING ARTICLES:
Scaling Beyond Early Adopters

OR

JOURNAL - "Hospitals and Health Networks" for all issues in 2017

DATABASE SEARCHED & TIME PERIOD COVERED:
WorldCat: - From inception to 1/10/2018

LANGUAGE:
English

SEARCH STRATEGY:
kw: learning w health w system* OR kw: learning w healthcare w system* OR kw: learn w1 every w1 patient
AND

DOCUMENT TYPE= BOOKS OR SERIALS OR ARTICLES OR URL

NOT

SUBJECT= education OR MEDIA TYPE=juvenile OR MEDIA TYPE=fiction

DATABASE SEARCHED & TIME PERIOD COVERED:
Web of Science - From inception to 1/10/2018

LANGUAGE:
English

SEARCH STRATEGY #1:
ts=("learning health system" OR "learning health systems" OR "learning healthcare system" OR "learning healthcare systems" OR "learn from every patient")

SEARCH STRATEGY #2:
Forward searches on Grumbach, Lowes, & Smoyer articles

DATABASE SEARCHED & TIME PERIOD COVERED:
Scopus - From inception to 1/10/2018

LANGUAGE:
English

SEARCH STRATEGY #1:
TITLE-ABS-KEY ("learning health system" OR "learning health systems" OR "learning healthcare system" OR "learning healthcare systems" OR "learn from every patient")

SEARCH STRATEGY #2:
Forward searches on Grumbach, Lowes, & Smoyer articles
DATABASE SEARCHED & TIME PERIOD COVERED:
IEEE XPLORE - From inception to 1/10/2018

LANGUAGE:
English

SEARCH STRATEGY:
"learning health system" OR "learning health systems" OR "learning healthcare system" OR "learning healthcare systems" OR "learn from every patient"

DATABASE SEARCHED & TIME PERIOD COVERED:
Embase - From inception to 1/10/2018

LANGUAGE:
English

SEARCH STRATEGY:
'learning health system' OR 'learning health systems' OR 'learning healthcare system' OR 'learning healthcare systems' OR 'learn from every patient'
AND
Humans

DATABASE SEARCHED & TIME PERIOD COVERED:
ACM Digital Library - From inception to 1/10/2018

SEARCH STRATEGY:
"learning health system" OR "learning health systems" OR "learning healthcare system" OR "learning healthcare systems" OR "learn from every patient"

DATABASE SEARCHED & TIME PERIOD COVERED:
CINAHL - From inception to 1/10/2018

LANGUAGE:
English

SEARCH STRATEGY:
TI ("learning health system" OR "learning health systems" OR "learning healthcare system" OR "learning healthcare systems" OR "learn from every patient") OR AB ("learning health system" OR "learning healthcare systems" OR "learning healthcare system" OR "learning healthcare systems" OR "learn from every patient") OR MW ("learning health system" OR "learning health systems" OR "learning healthcare system" OR "learning healthcare systems" OR "learn from every patient")

DATABASE SEARCHED & TIME PERIOD COVERED:
PsycINFO - From inception to 1/10/2018
LANGUAGE:
English

SEARCH STRATEGY:
TI ("learning health system" OR "learning health systems" OR "learning healthcare system" OR "learning healthcare systems" OR "learn from every patient") OR AB ("learning health system" OR "learning health systems" OR "learning healthcare system" OR "learning healthcare systems" OR "learn from every patient") OR ("learning health system" OR "learning health systems" OR "learning healthcare system" OR "learning healthcare systems" OR "learn from every patient")

NOTE: RESULTS OF ORIGINAL PUBMED AND BUSINESS SOURCE COMPLETE SEARCH VERSIONS WERE REVIEWED AND ONLY SELECTED RELEVANT ITEMS WERE INCLUDED IN FINAL SET
APPENDIX B. INTERVIEW GUIDE QUESTIONS

INTERVIEW GUIDE QUESTIONS – QUERI Interviewees

[QUESTIONS FOLLOW INTERVIEW GUIDE INTRODUCTORY SECTION]

We understand you were the Principal Investigator for the QUERI project [PROJECT NAME]. We are particularly interested in this project because it was an example of spreading an existing project.

1. Please tell us about your experience with this project.

2. Can you describe the strategy for the spread of [INITIATIVE/PRACTICE]?  
   a. Who was involved in making the decision to spread beyond the earlier sites?  
   b. Who was involved in the spread effort itself?

3. What factors [national/regional/local/site specific] facilitated the spread of the project?

4. What factors [national/regional/local/site specific] impeded the spread of the project?

5. Were certain sites more difficult to engage?  
   a. If so, what factors contributed to this?  
   b. Potential factors to probe: leadership, resources, lines of reporting/authority to make changes, structural factors  
      i. Was low performance a factor?  
      ii. Were there specific challenges?  
   c. Were there specific strategies used for engaging or working with this group of sites?

6. During spread efforts, was fidelity of implementation monitored?  
   a. If so, how?  
   b. During spread, was fidelity to original model strong?  
   c. Were modifications made to the model or strategy?  
      i. If so, why?  
      ii. What changes to the strategy were most successful?  
      iii. Which were less successful?

7. From the time the idea for [INITIATIVE/PRACTICE] was first conceived, could you briefly describe the key time points in the process?  
   E.g., initial idea, first piloting/demo, early spread, full/national roll-out

Is there anything else you would like to share with us, particularly about working with hard-to-engage sites? Please feel free to draw on other experience you may have had.

Thank you for your time!
INTERVIEW GUIDE QUESTIONS – SAIL Improvers

The [SITE] facility had improved its overall SAIL score around [YEAR]. We are particularly interested in your site because it was able to make these improvements and maintain them. We understand that you were there during these changes, and would like to hear, from your perspective, more about how this improvement happened.

1. Can you describe your role?

2. From your perspective, what is the story of the improvement during [BEGINNING YEAR] until now? How did the improvement happen?

3. What were one or 2 underlying approaches that were necessary to make the change happen?

4. What factors at your site contributed to the improvement? Leadership changes, leadership support/engagement, structure, lines of reporting, analytics/data, etc.

5. Did you specifically focus on any particular metrics? Did this change over time?

6. Did you have specific interventions or tools your site used during this improvement process? Where did they come from?

7. When did the SAIL improvement begin and what motivated it?

8. What role has the VISN played over the course of these improvements? What types of SAIL-related resources or interactions have you shared?

Is there anything else you would like to share with us?

Thank you for your time!
### APPENDIX C. SAIL DATA EXEMPLARS

<table>
<thead>
<tr>
<th>Fiscal year Quarter</th>
<th>'11</th>
<th>'12</th>
<th>'13</th>
<th>'14</th>
<th>'15</th>
<th>'16</th>
<th>'17</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td><strong>Low quintile examples</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td><strong>High quintile examples</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td><strong>Improving scores (n=16)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>5</td>
<td>5</td>
</tr>
</tbody>
</table>

*Data were only collected once in FY2011*
APPENDIX D. QUERI AND SAIL TEMPLATES USED IN ANALYSIS

### QUERI

<table>
<thead>
<tr>
<th>Project/Transcript ID</th>
<th>What makes sites hard to engage?</th>
<th>Strategies/facilitators to engagement (or lack thereof, include mandates and other external factors, changes over time to implementation strategy)</th>
<th>Description of intervention (how much effort on part of sites, fidelity of practice/changes over time)</th>
<th>Timeline (How long different steps took, and was full scale/spread achieved?)</th>
<th>Other stuff</th>
</tr>
</thead>
</table>

### SAIL

<table>
<thead>
<tr>
<th>Project/Transcript ID</th>
<th>Why started/what motivated/initial catalyst?</th>
<th>Overall approach over time? <em>Key strategies used, changes over time, specific metrics focused on, where did they find materials or resources (eg homegrown or from a group or person)</em></th>
<th>How used analytics/data/coding in process</th>
<th>Who is involved? <em>Leadership role/activities, autonomy of people involved to make decisions, stability of personnel</em></th>
<th>Other stuff/activities</th>
</tr>
</thead>
</table>

Evidence Synthesis Program
### APPENDIX E. PEER REVIEW COMMENTS/AUTHOR RESPONSES

<table>
<thead>
<tr>
<th>Reviewer</th>
<th>Comment</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reviewer #1</td>
<td>Multiple objectives, unclear which is highest priority; discussion focuses primarily on the interview data, which does not fully reflect what has been learned from the literature. Mismatch between literature review objectives and interview objectives, not fully addressed or described. I would strongly advise providing clear synthesis of what was learned from the literature before going into the interview data. Primary bias is towards internal VA information, which is not from published literature, but comes from interviews. As I note above, the objectives of the literature review and those of the interviews do not seem well meshed, and the presentation is not very clear as a result. I would strongly recommend dividing into 2 sections: the review of the literature, and the interviews. The 2 seem only somewhat related, with the interviews focusing on issues of hard to engage sites, and other issues which are not well covered in the literature, but not really with the central questions of the literature review.</td>
<td>Both the literature and interview data were used to address the same research aim, which is now broken into 2 sections rather than the 4 original sections. This change was made for clarity and to align with other reviewer comments related to re-organizing the content. We have clarified the objectives of the report and we have described more explicitly how both the literature review and interviews contributed to each section and the relevant findings therein. We also describe the bias towards internal VA information in the limitations section.</td>
</tr>
<tr>
<td>Reviewer #2</td>
<td>As indicated by the authors, by nature of the topic, there are potentially projects/studies missed because of either different search terms or simply because of the work, projects of spread may not be reported in the literature. The other bias as indicated by the authors is the VA-centricity of the report which is fine to ensure an appropriate scope, but there may other lessons/experiences learned that may be beneficial and generalizable to the VA. In general, I would not recommend add anything different to the report, but ensuring these limitations are clear and possibly making some recommendations for future research on authors should report results regarding disseminating and spreading best practices.</td>
<td>We have revised the limitations section to emphasize these points and ensured that the recommendations for future research describe ways reporting could be strengthened (eg, describing adaptations/tailoring or how efforts work with hard to engage sites specifically).</td>
</tr>
<tr>
<td>Reviewer #3</td>
<td>The focus on “late adopters” (or low performing?) sites needs to be more explicitly stated up front – including in the executive summary. The authors present the Rogers Diffusion of Innovations’ curve of adoption and in some places use that language (eg, late adopters, etc)</td>
<td>We have added language to emphasize our focus on hard-to-engage sites in the executive summary and discuss in more detail the late adopter/hard-to-engage site terminology in the introduction.</td>
</tr>
</tbody>
</table>
but in other places use the term “low performers.” These are not necessarily the same sites or contexts. Late adopters are in this category simply because they are slow to adopt a particular innovation and may be in this category for quite rational reasons, some of which the authors acknowledge (e.g., sites have already “invented” a solution in place of the targeted innovation). Low performers, on the other hand, are low performers on a particular quality metric or cluster of metrics (and could be a “high performer” on other metrics) and need “solutions” which a particular innovation may or may not align with; e.g., a low performer may need innovations targeted to reducing hospital-acquired infections but a particular innovation may address a topic that is less important for them to address. This distinction needs to be clarified…including both is ok but the authors need to be careful not to conflate the terms. It may be best to focus on the term “late adopter”… where one reason for late adoption may be because the topic that a particular innovation is designed to address is not aligned with quality gaps experienced by “low performers.” Another reason for late adoption might be a general inability or incapacity to implement innovations, often seen in pervasively low performing sites. Who is hard to engage? This question is unclear…is the focus on characterizing ‘late adopters’? “Hard-to-engage” is yet another term for late adopters/low performers

We agree that low performers are a distinct, if potentially overlapping group. We have rephrased all instances where we conflate them with the other group, so that they are more distinct and intentionally described as low performers where applicable, rather than lumping them with the adopter categories.

Reviewer #3

The authors highlight the need to define terms, stating that the terms “scale-up” and “spread” are often used interchangeably (I would go further and say, “conflated”) and then suggest a definition that continues conflation of these terms. In fact, these are distinctly different terms. E.g., Ilot et al. 2013 ([https://implementationscience.biomedcentral.com/articles/10.1186/1748-5908-8-128](https://implementationscience.biomedcentral.com/articles/10.1186/1748-5908-8-128)) suggest distinct definitions with citations. It is important to distinguish these terms because these topics are a central focus of this synthesis. If the definitions adopted by Ilot et al. are used, scale-up typically relies on a planned top-down strategy to diffuse innovation while “spread” is related to horizontal diffusion of innovations. The distinctions are nuanced but important when attempting to identify strategies and moderators of increasing use of an innovation. The authors, in fact, seem to recognize these as

We have reviewed and updated our own use of terminology related to scaling/spreading throughout the report and have added more discussion in the limitations about the conflation and our use of terms in the report.
distinct terms on p 11, where they introduce IHI and QUERI frameworks and position that innovations may be first tested for “scale-up before moving to full scale/spread.”

The authors “sought to define what forms large magnitude spread take (what do you mean by “forms”) and what should be considered prior to engaging in large magnitude spread take (is this the same as large-scale? scale-up? spread? Be consistent in use of terms), and what should be considered prior to engaging in large magnitude spread …

**Reviewer #3**

Is this a “rapid review?” If so, this needs to be specifically stated. If not, then this synthesis needs a much deeper description of methods and demonstration that the content of the included articles was methodically abstracted using a defined/described process and template (eg, were both qualitative and quantitative findings used? If so, how were they integrated? Also, how was interview data integrated with published articles). As it is, it reads as a “rapid review” meaning that findings are presented as relatively high level with less in-depth and systematic analysis of themes derived from findings.

This is not a rapid review, and we have revised our data abstraction description in the methods section to add more details of our process.

We have also revised our description in the methods section of our integration of the interview and literature synthesis findings to provide more clarity here as well.

**Reviewer #3**

Figure 3 shows “macro models” that “describe the organization…of spread efforts.” This diagram can be simplified by taking out the circle with 52 publications. “Eg,” needs to be added to the examples to make clear that eg, Geisinger Learning Health System is an example

The brief bullets describing the 3 models are not clearly described – especially in relation to how successful they are. These seem to be purely descriptive. It would be more useful to characterize success within each type of model with reflections on their applicability as an intentional strategy

We have added “eg” into the figure, but kept the 52 publications circle to provide the denominator for the smaller circles.

While we would have liked to include information about how successful these different models are, the original articles often did not provide this information, and we were not able to draw conclusions that compared these models in terms of success.

**Reviewer #3**

Page 21, 2nd paragraph is quite awkwardly worded with reference to Figure 4 that needs more explanation. I imagine that these preconditions may differ depending on the “macro model” context…or do these principles apply regardless of model?

We have revised this text to be more descriptive, and to clarify that these seemed to be principles that apply regardless of the model.

**Reviewer #3**

Figure 5 lists “potential benefits” first but the text describes “common challenges first.” Order in text versus figure order needs to be aligned. The characterization of “benefits” is unclear and unexpected. An overall description of the meaning of this term here is needed.

This figure has been updated to reflect the correct order of the text and we provide clarification about the term benefit.
| Reviewer #3 | It is hard to know what to do with the information offered related to each benefit – can these insights be leveraged intentionally and strategically to turn these into earlier adopting sites?
Regarding “challenges” – reflections on how to overcome and/or whether the presence of these challenges means that efforts to force use of an innovation should be abandoned, would be helpful. For example, if a site has created a “local innovation” that addresses a quality gap, should that site be “forced” to use the new innovation? | In the later section with Figure 7 and the corresponding text these benefits are connected to suggested strategies that may help with engagement. While these sites may not become early adopters, a better understanding of the variety of hard-to-engage sites may help with tailoring strategies and approaches, rather than treating all hard-to-engage sites the same. More discussion of this has been added to the text in this section to presage the later discussion. |
| Reviewer #3 | Figure 6 would be better understood within the “macro model” section of findings. “re-personalize” is confusing… the authors state it is something used in earlier phases and yet the earlier phases do not discuss “personalization.” | We have moved this Figure earlier in the report.
We now emphasize the personalized nature of the early phases to justify our later use of the re-personalize term. |
| Reviewer #3 | Figure 7 is very hard to understand. Linkages are made that do not make sense, nor do the explanations help to make these linkages more clear. Eg, the Figure shows that Low bandwidth is linked to external facilitation. The text refers to “facilitation” (not “external facilitation”) and needs to describe what “low bandwidth” is and how facilitation addresses this. These linkages each need to be described in text. | We have worked to be more consistent with our terminology in this section (eg, using external facilitation throughout) and have clarified the connections between our earlier description of types of hard-to-engage sites and this section.
We have also added more language describing how these linkages were made, either by literature or interviewees. |
<p>| Reviewer #3 | What about the “pull” perspective? This question is meaningless on its own. “Pull” must be defined more clearly with explanation about why it is an important question to answer. Figure 8 doesn’t relate to text and needs better explanation. Eg, how does “deep dive- to understand local needs” relate to “pull?” | This has been re-organized to a new section of the report and more language has been added to explain the figure (now “VA preconditions and networks for spread”). The “Pull” terminology has been removed, as we determined it was distracting from the purpose of the content. |
| Reviewer #3 | The Summary should include more concrete recommendations derived from findings presented. | Recommendations for future work have been highlighted with bullets in the abstract and end summary sections. |
| Reviewer #3 | It is not clear how data from interviews were integrated with findings from published literature. Findings from literature (based on the 52 articles) should be presented within each section and then clearly and separately extended or further explicated by the | We have described more explicitly how both the literature review and interviews contributed to each section and the relevant findings therein. |
| Reviewer #3 | The QUERI and IHI “models” should be characterized as frameworks – they are high-level, conceptual processes. I’m not sure of the appropriateness of combining these to guide this synthesis. QUERI is very much focused on moving research evidence to practice; characterizing the process as a “pipeline.” This pipeline has a core premise that innovations must be “evidence-based” – a top-down process is then assumed to get that innovation broadly implemented. IHI, on the other hand, is very much focused on grassroots process improvement. Scientific evidence is not germane, rather, local demonstration of improvement is necessary (through piloting and initial testing as the authors state) before scaling up and/or spreading more broadly. It is important to highlight these distinctions and to clarify whether this synthesis truly draws on both scenarios or is focused on a more “QUERI pipeline” approach to identifying evidence-based innovations which then need to be scaled up and spread more broadly. |
| Reviewer #3 | We have highlighted this key distinction in our discussion of these frameworks and have noted that while there is a fundamental difference between the evidence-based approach and the grassroots process improvement approach, the similarities in the later stages of these frameworks is the key factor we wanted to emphasize in this report, and that in many cases it was not clear from published reports which approach had been used, so we chose to draw from both scenarios. We also now refer to these as frameworks. |
| Reviewer #4 | Methods section (p.13), included mention of the TEP. Although this was defined earlier, it was not immediately clear who this was. It is recommended that the authors use the full term “Technical Expert Panel,” especially since this seems to be the main place that the TEP was references. |
| Reviewer #4 | This has been updated |
| Reviewer #4 | Methods section (p.13), guiding question #3 (How can you work with hard-to-engage sites?) ends in a question but is a statement. |
| Reviewer #4 | We have revised our framing of the questions and this question no longer appears here. |
| Reviewer #4 | In Search Strategy (p.13), you reference the &quot;Error! Reference source not found&quot; which I had difficulty locating in the document. Could you perhaps include a page number to help others locate this (and other appendices) more easily? This is especially important when your search approach/search terms are not presented in the body of the document but instead as an appendix. It would be nice to make it easier for readers to access this information while reading the body of the document, perhaps by including page numbers in the text. |
| Reviewer #4 | We have fixed the error message and also added page numbers for all referenced appendices throughout the report. |</p>
<table>
<thead>
<tr>
<th>Reviewer #4</th>
<th>In Study Selection (p.14), you might consider offering some additional information to support your decisions related to studies that were rejected from your sample. More specifically, why were low-income country settings excluded? What was the basis of excluding studies that spread to less than 10 sites?</th>
<th>We now describe the rationale for excluding low-income countries and studies that spread to less than 10 sites.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reviewer #4</td>
<td>In the SAIL Improvers section (p.15), you state the some sites were non-responsive and that site interviews were still ongoing. This suggests that data collection and analysis were not complete for the version of this report that was reviewed. Is this a concern? Will there be additional edits/expansions to this report after review by myself and the other reviewers?</td>
<td>At the time of the report drafting, all interviews had been conducted and notes from these interviews were taken into account, but some later interviews were not transcribed and formally analyzed. We have now conducted our process as described in the methods section and found no grounds for changing any of our findings or conclusions. However, we had wanted to be transparent about this issue at the time of draft report. We have also now included more specific information in the methods section, as described by the COREQ guidelines, about the non-responsive sites.</td>
</tr>
<tr>
<td>Reviewer #4</td>
<td>The Preconditions for Large Magnitude Spread (p.21) section was a bit confusing. Is the figure presenting a tool to be used by sites hoping to support spread? Areas that need to be assessed prior to beginning a spread effort? The presentation of this information seemed to introduce this topic for later exploration, but then left it without providing findings or recommendations. Again, there seemed to be a lack of continuity, as the topic of &quot;Preconditions for Spread&quot; appears to encompass all sites, while the later discussion mainly focuses on Hard-to-Engage sites. It felt as if there needed to be more exploration of the concept of &quot;Spread Preconditions&quot; and/or more of a transition to a focus on hard-to-engage sites.</td>
<td>The organization of the sections has been updated and more language to help with flow has been added. We have also added language to better contextualize this figure/section.</td>
</tr>
<tr>
<td>Reviewer #4</td>
<td>I wonder if it might be helpful to more explicitly link these strategies to challenges in the text by creating some sub-headers within the text that would mirror the organization presented in Figure ?? The current write-up does a nice job of focusing on the strategies but could use more emphasis on the ways that these strategies could be used to address the specific challenges, and build from the benefits, characteristics of hard-to-engage sites.</td>
<td>Sub-headers in this section have been added and brief descriptions have been added to summarize the links between characteristics of sites and strategies.</td>
</tr>
<tr>
<td>Reviewer #4</td>
<td>In the &quot;What About the 'Pull' Perspective?&quot; section (p.33), it might be helpful to briefly talk about how these local/&quot;pull&quot; approaches interact/relate to &quot;push&quot; or spread approaches. As this is currently written, it feels a bit too reductionistic and missed opportunities for explanation/big picture views of these 2 forces that I fear would not be available to your average reader naïve to QI methods.</td>
<td>This has been re-organized to a new section of the report and more language has been added to explain the figure (now “VA preconditions and networks for spread”). The “Pull” terminology has been removed, as we determined it was distracting from the purpose of the content.</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Reviewer #4</td>
<td>In the &quot;What About the 'Pull' Perspective?&quot; section (p.33), it might be helpful to briefly talk about how these local/&quot;pull&quot; approaches interact/relate to &quot;push&quot; or spread approaches. As this is currently written, it feels a bit too reductionistic and missed opportunities for explanation/big picture views of these 2 forces that I fear would not be available to your average reader naïve to QI methods.</td>
<td>This has been re-organized to a new section of the report and more language has been added to explain the figure (now “VA preconditions and networks for spread”). The “Pull” terminology has been removed, as we determined it was distracting from the purpose of the content.</td>
</tr>
<tr>
<td>Reviewer #4</td>
<td>In the &quot;What About the 'Pull' Perspective?&quot; section (p.33), it might be helpful to briefly talk about how these local/&quot;pull&quot; approaches interact/relate to &quot;push&quot; or spread approaches. As this is currently written, it feels a bit too reductionistic and missed opportunities for explanation/big picture views of these 2 forces that I fear would not be available to your average reader naïve to QI methods.</td>
<td>This has been re-organized to a new section of the report and more language has been added to explain the figure (now “VA preconditions and networks for spread”). The “Pull” terminology has been removed, as we determined it was distracting from the purpose of the content.</td>
</tr>
<tr>
<td>Reviewer #4</td>
<td>In the &quot;What About the 'Pull' Perspective?&quot; section (p.33), it might be helpful to briefly talk about how these local/&quot;pull&quot; approaches interact/relate to &quot;push&quot; or spread approaches. As this is currently written, it feels a bit too reductionistic and missed opportunities for explanation/big picture views of these 2 forces that I fear would not be available to your average reader naïve to QI methods.</td>
<td>This has been re-organized to a new section of the report and more language has been added to explain the figure (now “VA preconditions and networks for spread”). The “Pull” terminology has been removed, as we determined it was distracting from the purpose of the content.</td>
</tr>
<tr>
<td>Reviewer #4</td>
<td>In the &quot;What About the 'Pull' Perspective?&quot; section (p.33), it might be helpful to briefly talk about how these local/&quot;pull&quot; approaches interact/relate to &quot;push&quot; or spread approaches. As this is currently written, it feels a bit too reductionistic and missed opportunities for explanation/big picture views of these 2 forces that I fear would not be available to your average reader naïve to QI methods.</td>
<td>This has been re-organized to a new section of the report and more language has been added to explain the figure (now “VA preconditions and networks for spread”). The “Pull” terminology has been removed, as we determined it was distracting from the purpose of the content.</td>
</tr>
<tr>
<td>Reviewer #4</td>
<td>In the &quot;What About the 'Pull' Perspective?&quot; section (p.33), it might be helpful to briefly talk about how these local/&quot;pull&quot; approaches interact/relate to &quot;push&quot; or spread approaches. As this is currently written, it feels a bit too reductionistic and missed opportunities for explanation/big picture views of these 2 forces that I fear would not be available to your average reader naïve to QI methods.</td>
<td>This has been re-organized to a new section of the report and more language has been added to explain the figure (now “VA preconditions and networks for spread”). The “Pull” terminology has been removed, as we determined it was distracting from the purpose of the content.</td>
</tr>
<tr>
<td>Reviewer #4</td>
<td>In the &quot;What About the 'Pull' Perspective?&quot; section (p.33), it might be helpful to briefly talk about how these local/&quot;pull&quot; approaches interact/relate to &quot;push&quot; or spread approaches. As this is currently written, it feels a bit too reductionistic and missed opportunities for explanation/big picture views of these 2 forces that I fear would not be available to your average reader naïve to QI methods.</td>
<td>This has been re-organized to a new section of the report and more language has been added to explain the figure (now “VA preconditions and networks for spread”). The “Pull” terminology has been removed, as we determined it was distracting from the purpose of the content.</td>
</tr>
<tr>
<td>Reviewer #4</td>
<td>In the &quot;What About the 'Pull' Perspective?&quot; section (p.33), it might be helpful to briefly talk about how these local/&quot;pull&quot; approaches interact/relate to &quot;push&quot; or spread approaches. As this is currently written, it feels a bit too reductionistic and missed opportunities for explanation/big picture views of these 2 forces that I fear would not be available to your average reader naïve to QI methods.</td>
<td>This has been re-organized to a new section of the report and more language has been added to explain the figure (now “VA preconditions and networks for spread”). The “Pull” terminology has been removed, as we determined it was distracting from the purpose of the content.</td>
</tr>
<tr>
<td>Reviewer #4</td>
<td>In the &quot;What About the 'Pull' Perspective?&quot; section (p.33), it might be helpful to briefly talk about how these local/&quot;pull&quot; approaches interact/relate to &quot;push&quot; or spread approaches. As this is currently written, it feels a bit too reductionistic and missed opportunities for explanation/big picture views of these 2 forces that I fear would not be available to your average reader naïve to QI methods.</td>
<td>This has been re-organized to a new section of the report and more language has been added to explain the figure (now “VA preconditions and networks for spread”). The “Pull” terminology has been removed, as we determined it was distracting from the purpose of the content.</td>
</tr>
<tr>
<td>Reviewer #4</td>
<td>In the &quot;What About the 'Pull' Perspective?&quot; section (p.33), it might be helpful to briefly talk about how these local/&quot;pull&quot; approaches interact/relate to &quot;push&quot; or spread approaches. As this is currently written, it feels a bit too reductionistic and missed opportunities for explanation/big picture views of these 2 forces that I fear would not be available to your average reader naïve to QI methods.</td>
<td>This has been re-organized to a new section of the report and more language has been added to explain the figure (now “VA preconditions and networks for spread”). The “Pull” terminology has been removed, as we determined it was distracting from the purpose of the content.</td>
</tr>
<tr>
<td>Reviewer #4</td>
<td>In the &quot;What About the 'Pull' Perspective?&quot; section (p.33), it might be helpful to briefly talk about how these local/&quot;pull&quot; approaches interact/relate to &quot;push&quot; or spread approaches. As this is currently written, it feels a bit too reductionistic and missed opportunities for explanation/big picture views of these 2 forces that I fear would not be available to your average reader naïve to QI methods.</td>
<td>This has been re-organized to a new section of the report and more language has been added to explain the figure (now “VA preconditions and networks for spread”). The “Pull” terminology has been removed, as we determined it was distracting from the purpose of the content.</td>
</tr>
</tbody>
</table>
provide a little more information about the value of distinguishing between these 2 types of sites. You mention that "while there may (be) substantial overlap, some distinctions were also made, particularly in the QUERI interviews." Can you briefly summarize these distinctions in this section? Keep in mind this may be the only section that some readers read.

**Reviewer #5**

I think there are 2 problems with applying the Diffusion of Innovations adopter groups in this setting.

The most important problem is that Rogers may have misunderstood the association between innovation adoption and the group characteristics. Instead of those in the early adopter group being generally more innovative and those in the late adopter group being generally skeptical and slow to change, it may be that those found in the early adopter group are generally higher status (e.g., more educated, more metropolitan, wealthier) and are more likely to be copied than those in the late adopter group. It calls into question the idea some people are (in many/most aspects of life) generally more innovative and some generally more resistant to change. See John Henrich’s paper Henrich, J. (2001). Cultural transmission and the diffusion of innovations: Adoption dynamics indicate that biased cultural transmission is the predominate force in behavioral change. American Anthropologist, 103(4), 992-1013.

Another conceptual problem is that Rogers’ adopter groups were based on observations about individuals, and many of the defining characteristics of those individuals do not translate or translate imperfectly to organizations, e.g., innovators being more metropolitan and educated than late adopters.

I don’t think this critique is a serious one in terms of the validity of the findings, but as a conceptual guiding model I think it’s probably important to point out that it has some potential flaws. The authors might bring this up in the discussion of who is hard to engage (page 22).

**Reviewer #5**

I think there needs to be greater emphasis and discussion about allowing sites to say no to a change initiative. The authors do an excellent job of acknowledging and describing how late adopters were observed to have some beneficial characteristics. But other than the observation about taking the long view (page...
24), there doesn’t seem to be an acknowledgement that the best decision for a given site might be to say no to the change initiative, particularly in situations where there is low bandwidth, large sets of competing demands, or a homegrown solution that works. Virtually any change initiative is stressful and disruptive. I can understand that it may be that this was not a finding (i.e., the wisdom of declining to adopt/participate did not emerge in interviews or the literature), and therefore it is not appropriate to interject it with empirically-grounded findings. But perhaps the authors could note in the limitations or elsewhere in the discussion that a key assumption here was that a given initiative was broadly desirable or necessary, and we all know that there are initiatives and programs that don’t work well for every site.

Reviewer #5  
I would like to see more concrete examples. I like the use of the quotes, but they’re often too vague to really illustrate the findings for the reader. For example, page 29, on creating a web of support, it would be helpful to know what the setting was that the quotes come from; who the team leader was; who the other team members in the web were, etc. Another example is on page 31, with the quote about evidence-based quality improvement. It would be very helpful to provide some details about the project and how sites shaped the project to their needs and context.

Reviewer #5  
Page 5, line 38, I’m not sure I understand why findings from low income settings wouldn’t be applicable in high-income settings. There may be resource issues, but many of the dynamics in my experience are similar, eg, issues of planning, competing priorities, clarity about roles and goals.

Reviewer #5  
Page 6, line 42. The sentence, “these included spread efforts that were embedded spread within a system of care” is hard to understand. I think I understand after reading it 4 or 5 times.

Reviewer #5  
Page 6, line 48-49. The sentence, “for sites spread initiators intend to work with,” is another very difficult to understand phrase.

Reviewer #5  
Page 13, line 56. There’s an error note from citation software (Error! Reference source not found).

Reviewer #5  
Page 13, line 53-54. The number of non-responsive sites still has the XX placeholder

We have added specific examples to the first quote described, but we went back to the interview and unfortunately we did not have more site-specific information to give about the evidence-based quality improvement work.

We now describe the rationale for excluding low-income countries.

We have clarified this wording.

We have clarified this wording.

This has been corrected.

At the time of the report drafting, all interviews had been conducted and notes from these interviews were
and there’s an editorial note in brackets to fill it in.

<table>
<thead>
<tr>
<th>Reviewer #2</th>
<th>there were terms like 'hard to engage' used that lacked clear operationalization</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>taken into account, but some later interviews were not transcribed and formally analyzed, so we wanted to wait to finalize these last parts of the report. We had wanted to be transparent about this issue at the time of draft report.</td>
</tr>
<tr>
<td>Reviewer #2</td>
<td>why were articles that evaluated spread in 10 or more used? were there a lot of studies under 10 excluded? did this impact the potential conclusions</td>
</tr>
<tr>
<td></td>
<td>We have now added a justification for this exclusion code, we excluded 20 such studies and felt that, when looking at them as a group, they were not discussing large-scale spread, but more focused on a regional or first-iteration scale-up effort. Thus, they did not address the objectives of this report and would not change the conclusions we reached.</td>
</tr>
<tr>
<td>Reviewer #2</td>
<td>would recommend considering a section or in the conclusion, some potential recommendations that may be gathered from the review.</td>
</tr>
<tr>
<td></td>
<td>We have now added recommendations to the summary section.</td>
</tr>
<tr>
<td>Reviewer #2</td>
<td>page 6 - not sure what is meant by similar articles. also would be helpful to confirm if these are mesh term and if not, how were the terms confirmed - that is, where possible terms missed?</td>
</tr>
<tr>
<td></td>
<td>“Similar articles” search is a type of search available in several databases. In the appendix that describes the full search strategy those terms that are MeSH terms are noted, however almost none of the terms we used were MeSH terms. As we note in the limitations section, this is definitely an issue with searches of this nature.</td>
</tr>
<tr>
<td>Reviewer #2</td>
<td>page 7 - it states that 16 stakeholders were invited to participate, did all agree to participate? if not what percentage? any characteristics you can provide?</td>
</tr>
<tr>
<td></td>
<td>We now describe in further detail our interviewees and non-respondents within the methods section.</td>
</tr>
<tr>
<td>Reviewer #2</td>
<td>page 16 - how was the one person closely involved in the SAIL improvement activities identified?</td>
</tr>
<tr>
<td></td>
<td>This is now described.</td>
</tr>
<tr>
<td>Reviewer #2</td>
<td>page 18 - why is discussion of spread not relevant? clarify what constitutes piloting or initial testing and why not included - less than 10 sites?</td>
</tr>
<tr>
<td></td>
<td>Both of these exclusion criteria are now discussed further in the report.</td>
</tr>
</tbody>
</table>
APPENDIX F. CITATIONS FOR EXCLUDED STUDIES

Learning health system but not spread (n=62)

34. Nahm ES. Mental Health Nurses: Are We Ready for a "Learning Health System"?


Discussion of spread (n=45)


17. Herbert I, de Lusignan S. Further changes are needed if the National Care Record Service (NCRS) implementation is to succeed. *Informatics in primary care.* 2009;17(3):161-164.


20. Kolodner R. At the helm. ONCHIT’s chief talks about his plans for spreading the HIT gospel, as well as plans for the organization's future. Interview by Anthony Guerra. *Healthcare informatics : the business magazine for information and communication systems.* 2007;24(9):26-28, 30.


25. Malcarney MB, Horton K, Seiler N, Hastings D. Advancing the Public's Health by


**Small rollout (n=20)**


5. DiGiorgio K, Anderson WG, Cannesson M, Gleason N, O'Neill-Page E, Ong MK. University of California Center for Health Quality and Innovation: experiences from a system approach to scaling up effective interventions. [Internet Resource; Article]. 2015; http://www.implementationscience.com/content/10/S1/A16


Full text unavailable (n=22)

1. Grant Furthers Quest for 'Learning Health System Model'. *Journal of AHIMA.* 2013;84(4).


11. Hou JXAWJSJKMGIGJCGWAVSLMJMTQCJCDM. P-129 CCFA Quality of Care Breakthrough Series Collaborative. [Internet Resource; Article; Computer File]. 2017; 1 online resource. Available at: https://nls.ldls.org.uk/welcome.html?ark:/81055/vdc_100048835393.0x000008


14. Melmed GMAKBHCJDJHGJMLMLDRDSSHJTATQYZ. P-043 Feasibility of a Multicenter, Collaborative, Longitudinal, Quality Improvement Learning Health System for Adult IBD Care. [Internet Resource; Article; Computer File]. 2017; 1 online resource. Available at: https://nls.ldls.org.uk/welcome.html?ark:/81055/vdc_100048835340.0x00003b


Not healthcare delivery (n=7)


Low income country (n=3)


3. Renju J. A detailed review of how scaling-up a sexual and reproductive health intervention to improve young people's health can affect the coverage and quality of its implementation. Amsterdam: Rozenberg; 2011.

Duplicate (n=1)


Otherwise not relevant to the topic of spread (n=95)

Piloting or initial testing of interventions (n=53)


13. Greene J, Hibbard JH, Overton V. Large performance incentives had the greatest impact on providers whose quality metrics were lowest at baseline. Health affairs (Project Hope). 2015;34(4):673-680.


Scaling Beyond Early Adopters


scaling beyond early adopters.


52. Wise J. Hospitals and GPs are offered incentives to reduce antibiotic prescribing. *BMJ (Clinical research ed)*. 2016;352:i1499.


Pre-implementation analyses with no implementation component (n=38)


9. Cherry JC. Focus less on technology, more on workflow and people. Intel-GE care innovations has developed a four-phase approach to help healthcare organizations prepare...
27. McIntyre K, Shojania KG. The challenges of quality improvement reports and the urgent


36. Terry KD. Clinical integration sets the stage for positive change. Goal is to promote higher-quality, more cost-efficient patient services by better coordinating care across a continuum of conditions, providers, settings and time. *Health management technology.* 2012;33(9):16-17.


Other topics not relevant to spread (eg, medical education programming, n=4)


## APPENDIX G. EVIDENCE TABLES

<table>
<thead>
<tr>
<th>Author, year</th>
<th>Focus area/topic</th>
<th>Size of rollout Setting</th>
<th>Described hard-to-engage sites?</th>
<th>Hard-to-engage strategies?</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SYSTEM (n=29)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VA</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blue-Howells 2013&lt;sup&gt;67&lt;/sup&gt;</td>
<td>Veterans Justice Programs (VJP) to address the needs of justice-involved veterans by offering services to veterans at multiple points in their involvement in the criminal justice system</td>
<td>National VA</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Box 2009&lt;sup&gt;68&lt;/sup&gt;</td>
<td>Implementation of EMR for cardiac catheterization procedures called the Cardiovascular Assessment, Reporting and Tracking (CART) system</td>
<td>77 hospitals, national VA</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Damschroder 2013&lt;sup&gt;61&lt;/sup&gt;</td>
<td>MOVE! w8 management program</td>
<td>55 medical centers &amp; 872 community-based outpatient clinics VA</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Goetz 2008&lt;sup&gt;69&lt;/sup&gt;</td>
<td>A system-wide intervention to improve HIV-testing in the Veterans Health Administration</td>
<td>18 sites within southern Nevada, California VA</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Mills 2003&lt;sup&gt;70&lt;/sup&gt;</td>
<td>Quality Interagency Coordination Task Force (QuIC) initiative to reduce medical errors</td>
<td>22 hospitals VA</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Resnick 2007&lt;sup&gt;71&lt;/sup&gt;</td>
<td>Supported employment for veterans</td>
<td>21 sites across the VA VA</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Resnick 2009&lt;sup&gt;72&lt;/sup&gt;</td>
<td></td>
<td>166 VA medical centers VA</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Rubenstein 2010&lt;sup&gt;73&lt;/sup&gt;</td>
<td>Implementation of Translating Initiatives in Depression into Effective Solution (TIDES) aimed to translate research-based collaborative care for depression</td>
<td>Medium-sized primary care practices within the VA VA</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Author, year</td>
<td>Focus area/topic</td>
<td>Size of rollout Setting</td>
<td>Described hard-to-engage sites?</td>
<td>Hard-to-engage strategies?</td>
</tr>
<tr>
<td>-------------</td>
<td>----------------------------------------------------------------------------------</td>
<td>-------------------------</td>
<td>--------------------------------</td>
<td>---------------------------</td>
</tr>
<tr>
<td>Curran 2011</td>
<td>Implementation of collaborative care for depression in HIV clinics (HIV Translating Initiatives for Depression into Effective Solutions, HITIDES)</td>
<td>3 sites VA</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Luck 2009</td>
<td>Implementation of Translating Initiatives in Depression into Effective Solution (TIDES) aimed to translate research-based collaborative care for depression</td>
<td>National VA</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Sherman 2007</td>
<td>Implementation of Translating Initiatives in Depression into Effective Solution (TIDES) aimed to translate research-based collaborative care for depression</td>
<td>National VA</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Smith 2008</td>
<td>Development of a national dissemination plan for collaborative care for depression</td>
<td>National VA</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Yano 2015</td>
<td>The Collaborative Research to Advance Transformation and Excellence (CREATE) Initiative for comprehensive care for women veterans</td>
<td>National VA</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td><strong>Non-VA</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Best 2016</td>
<td>British Columbia Ministry of Health's Clinical Care Management (CCM) initiative, with particular focus on sepsis; surgical checklist and surgical site infection; and venous thromboembolism (VTE)</td>
<td>British Columbia National</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Cheyne 2013</td>
<td>Keeping Childbirth Natural and Dynamic (KCND), a maternity care program that aimed to support normal birth by implementing multi-professional care pathways and making midwife-led care for healthy pregnant women the national norm</td>
<td>NHS, Scotland Scotland</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Clarke 2014</td>
<td>The National Dementia Strategy for England</td>
<td>40 NHS sites UK</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Author, year</td>
<td>Focus area/topic</td>
<td>Size of rollout Setting</td>
<td>Described hard-to-engage sites?</td>
<td>Hard-to-engage strategies?</td>
</tr>
<tr>
<td>--------------</td>
<td>------------------</td>
<td>-------------------------</td>
<td>-------------------------------</td>
<td>---------------------------</td>
</tr>
<tr>
<td>Hendrich 2007(^{80})</td>
<td>Ascension Health's &quot;Healthcare That Works, Healthcare That is Safe, and Healthcare That Leaves No One Behind&quot; with goal of zero preventable injuries or deaths</td>
<td>Ascension Health hospitals (65 sites) USA</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Hung 2017(^{81})</td>
<td>LEAN redesign in clinic</td>
<td>All primary care in Sutter Health (13 sites) USA</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Kellogg 2017(^{82})</td>
<td>Tested a new method of intra-organizational process development and spread of quality improvement innovations</td>
<td>10 sites within North Shore Physicians Group USA</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Lennon 2017(^{83})</td>
<td>Delivering Assisted Living Lifestyles at Scale (dallas), a national digital health program</td>
<td>NHS UK</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Liu 2016(^{48})</td>
<td>Quality of sepsis care</td>
<td>Kaiser Permanente Northern California (21 hospitals) USA</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Lorig 2004(^{49})</td>
<td>The six-week peer-led Chronic Disease Self-Management Program</td>
<td>10 of 12 regions within Kaiser Permanente USA</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Marshall 2014(^{54})</td>
<td>Chronic obstructive pulmonary disease (COPD) quality improvement program</td>
<td>189 general practices in 4 Northeast London boroughs UK</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Noyes 2014(^{85})</td>
<td>Nurse-led implementation, optimization, and evaluation of a complex children’s continuing-care policy</td>
<td>12 sites within the NHS UK</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Ovseiko 2014(^{86})</td>
<td>Health Innovation and Education Clusters (HIECS)</td>
<td>NHS UK</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Author, year</td>
<td>Focus area/topic</td>
<td>Size of rollout Setting</td>
<td>Described hard-to-engage sites?</td>
<td>Hard-to-engage strategies?</td>
</tr>
<tr>
<td>-------------</td>
<td>------------------</td>
<td>-------------------------</td>
<td>-------------------------------</td>
<td>--------------------------</td>
</tr>
<tr>
<td>Penna 2009&lt;sup&gt;49&lt;/sup&gt;</td>
<td>Implementation of a consultative model of interdisciplinary, inpatient-based palliative care (IPT)</td>
<td>7 of 8 regions, Kaiser Permanente USA</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Psek 2015&lt;sup&gt;50&lt;/sup&gt;</td>
<td>Operationalizing the learning health care system (LHCS) in an integrated delivery system</td>
<td>Geisinger Health System (8 hospitals) USA</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Robert 2011&lt;sup&gt;37&lt;/sup&gt;</td>
<td>The “Productive Ward,” a national quality improvement program</td>
<td>10 strategic health authorities (SHA), NHS UK</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>SchmittdieI 2017&lt;sup&gt;87&lt;/sup&gt;</td>
<td>The Delivery Science Rapid Analysis Program (RAP)</td>
<td>Kaiser Permanente in Northern California USA</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td><strong>COLLABORATIVE (n=14)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Azar 2015&lt;sup&gt;88&lt;/sup&gt;</td>
<td>Indiana University Center for Healthcare Innovation and Implementation Science (IU-CHIIS)</td>
<td>Indiana Clinical and Translational Sciences Institute, Regenstrief Institute, Inc., Indiana University School of Medicine, and their clinical healthcare partners USA</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Boustani 2012&lt;sup&gt;53&lt;/sup&gt;</td>
<td>Indianapolis Discovery Network for Dementia (IDND)</td>
<td>5 health care systems in Indiana, including Regenstrief Institute, Inc., and Indiana University School of Medicine USA</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Author, year</td>
<td>Focus area/topic</td>
<td>Size of rollout</td>
<td>Setting</td>
<td>Described hard-to-engage sites?</td>
</tr>
<tr>
<td>--------------</td>
<td>-----------------</td>
<td>----------------</td>
<td>---------</td>
<td>-------------------------------</td>
</tr>
<tr>
<td>Cyr 200989</td>
<td>Intervention to reduce door-to-balloon (D2B) time for myocardial infarction</td>
<td>12 community hospitals within University of Massachusetts Memorial Health Care’s service area USA</td>
<td>USA</td>
<td>No</td>
</tr>
<tr>
<td>Duckers 201490</td>
<td>Quality improvement collaboratives (QIC) involvement to predict dissemination of projects within hospitals</td>
<td>24 hospitals the Netherlands</td>
<td>USA</td>
<td>No</td>
</tr>
<tr>
<td>Elson 201392</td>
<td>Athena Breast Health Network</td>
<td>5 University of California health systems and cancer centers USA</td>
<td>USA</td>
<td>No</td>
</tr>
<tr>
<td>Harris 201691</td>
<td>Pediatric Rheumatology Care and Outcomes Improvement Network</td>
<td>17 sites USA &amp; Canada</td>
<td>USA</td>
<td>No</td>
</tr>
<tr>
<td>Johnson 201791</td>
<td>Inflammatory Bowel Disease (IBD) Qorus learning health system</td>
<td>20 adult IBD care USA</td>
<td>USA</td>
<td>No</td>
</tr>
<tr>
<td>Kwon 201292</td>
<td>Washington State's Surgical Care and Outcomes Assessment Program (SCOAP)</td>
<td>60 of 65 hospitals in State of Washington USA</td>
<td>USA</td>
<td>No</td>
</tr>
<tr>
<td>Lannon 201393</td>
<td>Pediatric Collaborative Improvement Networks to improve pediatric subspecialty care</td>
<td>Multi-institution USA</td>
<td>USA</td>
<td>No</td>
</tr>
<tr>
<td>Nolan 20054</td>
<td>Advanced Clinic Access (ACA) initiative to reduce waiting times for patients</td>
<td>National VA</td>
<td>USA</td>
<td>Yes</td>
</tr>
<tr>
<td>Ramsey 201794</td>
<td>ImproveCareNow Network to facilitate personalized medicine for children and adolescents with inflammatory bowel disease (IBD)</td>
<td>92 care centers USA, England, Qatar</td>
<td>USA</td>
<td>No</td>
</tr>
<tr>
<td>Author, year</td>
<td>Focus area/topic</td>
<td>Size of rollout Setting</td>
<td>Described hard-to-engage sites?</td>
<td>Hard-to-engage strategies?</td>
</tr>
<tr>
<td>-------------</td>
<td>-----------------</td>
<td>--------------------------</td>
<td>-------------------------------</td>
<td>--------------------------</td>
</tr>
<tr>
<td>Rocker 2017&lt;sup&gt;95&lt;/sup&gt;</td>
<td>INSPIRED COPD outreach program</td>
<td>19 teams in 10 provinces Canada</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Rogers 2014&lt;sup&gt;60&lt;/sup&gt;</td>
<td>The Society of Hospital Medicine's Glycemic Control Mentored Implementation (GCMI)</td>
<td>114 sites within Society of Hospital Medicine’s network USA</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>van Schendel 2017&lt;sup&gt;96&lt;/sup&gt;</td>
<td>Non-invasive prenatal testing (NIPT) for aneuploidy in prenatal healthcare</td>
<td>National (8 medical centers) the Netherlands</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

**INITIATIVE-SPECIFIC (n=9)**

<table>
<thead>
<tr>
<th>Author, year</th>
<th>Focus area/topic</th>
<th>Size of rollout Setting</th>
<th>Described hard-to-engage sites?</th>
<th>Hard-to-engage strategies?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clark 2014&lt;sup&gt;55&lt;/sup&gt;</td>
<td>State-wide clozapine management system</td>
<td>Adelaide metropolitan area South Australia</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Gardner 2010&lt;sup&gt;62&lt;/sup&gt;</td>
<td>The Audit and Best Practice for Chronic Disease (ABCD) project</td>
<td>12 indigenous primary health care services in the Northern Territory of Western Australia</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Grayson 2011&lt;sup&gt;97&lt;/sup&gt;</td>
<td>Australian National Hand Hygiene Initiative (NHHI); infection control initiatives</td>
<td>521 hospitals Australia</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Lustig 2016&lt;sup&gt;63&lt;/sup&gt;</td>
<td>Measure Up/Pressure Down hypertension control campaign</td>
<td>Summit Medical Group (SMG) and Cornerstone Health Care (CHC) USA</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>McMullen 2015&lt;sup&gt;98&lt;/sup&gt;</td>
<td>HIV testing</td>
<td>40 of 45 practices in a London borough the UK</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Author, year</td>
<td>Focus area/topic</td>
<td>Size of rollout</td>
<td>Setting</td>
<td>Described hard-to-engage sites?</td>
</tr>
<tr>
<td>--------------</td>
<td>------------------</td>
<td>-----------------</td>
<td>---------</td>
<td>-------------------------------</td>
</tr>
<tr>
<td>Parv 2016</td>
<td>A national e-prescription service</td>
<td>National</td>
<td>Estonia</td>
<td>Yes</td>
</tr>
<tr>
<td>Patel 2016</td>
<td>HPV vaccination program</td>
<td>23 provinces</td>
<td>Argentina</td>
<td>Yes</td>
</tr>
<tr>
<td>Pearce 2014</td>
<td>Personally controlled electronic health record (PCEHR)</td>
<td>74 practices</td>
<td>across metro Melbourne</td>
<td>Yes</td>
</tr>
<tr>
<td>Septimus 2016</td>
<td>Implementation of universal decolonization to reduce healthcare associated Central line-associated bloodstream infections (CLABSI)</td>
<td>136 ICUs in 95 hospitals affiliated with Hospital Corporation of America</td>
<td>USA</td>
<td>No</td>
</tr>
</tbody>
</table>