Integrating Quality Improvement and Implementation Science
A Practical Introduction

Rohit Ramaswamy
June 2, 2022
Our unifying goal: Changing systems

- Every system is perfectly designed to achieve the outcomes it gets
- All improvement is change... but not all change is improvement

How do we bring about sustainable improvements to the systems we work in?
Achieving system change: Key ingredients

Tested Change Solutions x Effective Implementation = Successful Outcomes
QI as a process for effective interventions
Three QI Questions from the Model for Improvement

<table>
<thead>
<tr>
<th>Question</th>
<th>Key Component</th>
</tr>
</thead>
<tbody>
<tr>
<td>What are we trying to accomplish?</td>
<td>Improvement goal</td>
</tr>
<tr>
<td>How will we know a change is an improvement?</td>
<td>Improvement measures</td>
</tr>
<tr>
<td>What change can we make that will result in improvement?</td>
<td>Improvement theory</td>
</tr>
</tbody>
</table>
Improvement Measures

OUTCOME MEASURES
Reflect the impact on a patient and demonstrate the end result of doing things. This measure should directly link to and “prove” if your overall aim has been achieved. Examples are mortality, hospital acquired infection or falls rates.

PROCESS MEASURES
Reflect the things that you do (processes) and how systems are operating. They show how well you are delivering a change that you want to make. Examples are % of hand-

BALANCING MEASURES
Measure whether unintended consequences have been introduced elsewhere in the system. E.g. A balancing measure is readmission rates when measuring length of stay as an outcome. Knowing potential risks as a consequence of change will help you determine what needs to be measured
Improvement Theory

What’s Your Theory?

Driver diagram serves as tool for building and testing theories for improvement

by Brandon Bennett and Lloyd Provost
Generating and testing solutions

**Plan:** Plan the test, including a plan for collecting data.

**Do:** Run the test on a small scale.

**Study:** Analyze the results and compare them to your predictions.

**Act:** Based on what you learned from the test, make plan for your next step.
Using QI Methods in MCH: Ethiopia Example

18-month Prototype Learning Collaboratives
Implementation in 4 woredas (districts)

- QI training for Facility Leaders
- Conduct Baseline Assessment
- Address gaps in clinical and QI skills and supplies

Action Period 1
- Learning Session 1
- Learning Session 2

Action Period 2
- Learning Session 3
- Learning Session 4

Action Period 3

On-site coaching to support teams to improve system and clinical skills gaps

Improved Processes

Improved maternal and neonatal health outcomes

Hagaman, A.K., Singh, K., Abate, M., et al. The impacts of quality improvement protcols on maternal and newborn health: findings from a health system...
Reflection Exercise – Part 1

During the Covid-19 pandemic, you are working in a large chain store. There is a need to develop a **hand hygiene policy** for staff in the store to help prevent infection.

You are part of a QI team that has been tasked with using the Model for Improvement to **develop a store hand hygiene using the theory of WHO’s “5 Moments for Hand Hygiene” as a guide**

https://pixabay.com/photos/grocery-store-market-supermarket-2619380/
5 Moments for Hand Hygiene – Improvement Theory

Your 5 moments for HAND HYGIENE

1. Before patient contact
2. Before aseptic task
3. After body fluid exposure risk
4. After patient contact
5. After contact with patient surroundings
## Applying the MFI to Hand Hygiene

<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
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</thead>
<tbody>
<tr>
<td>What is the improvement goal?</td>
<td></td>
</tr>
<tr>
<td>What is an outcome and process measure?</td>
<td></td>
</tr>
<tr>
<td>What is the improvement theory based on adapting the WHO guidelines for a grocery store?</td>
<td></td>
</tr>
</tbody>
</table>
Implementing change solutions: IS and the Model for Implementation

Part 2
Achieving system change: Key ingredients

What happens if we don’t have implementation?
Introduction of Surgical Safety Checklists in Ontario, Canada

David R. Urbach, M.D., Anand Govindarajan, M.D., Refik Saskin, M.Sc., Andrew S. Wilton, M.Sc., and Nancy N. Baxter, M.D., Ph.D.

RESULTS

During 3-month periods before and after adoption of a surgical safety checklist, a total of 101 hospitals performed 109,341 and 106,370 procedures, respectively. The adjusted risk of death during a hospital stay or within 30 days after surgery was 0.71% (95% confidence interval [CI], 0.66 to 0.76) before implementation of a surgical checklist and 0.65% (95% CI, 0.60 to 0.70) afterward (odds ratio, 0.91; 95% CI, 0.80 to 1.03; P=0.13). The adjusted risk of surgical complications was 3.86% (95% CI, 3.76 to 3.96) before implementation and 3.82% (95% CI, 3.71 to 3.92) afterward (odds ratio, 0.97; 95% CI, 0.90 to 1.03; P=0.29).

Results

Reactions

“We hope that these findings from Ontario will lead to greater attention not just to the intervention but also to the implementation process”

“The authors neither evaluated the validity of reported claims of checklist use nor collected process measures to assess trends in compliance with known standards of care, even though the difference between reported compliance and actual adherence can frequently be vastly divergent.”

“The diligence with which the checklist is developed and applied is critical to its effectiveness.”
From *Knowing to Doing*

“When it comes to implementation, what is worth doing is worth doing well.”

Joseph Durlak
Implementing solutions: The Model for Implementation

- What implementation goals are we trying to accomplish?
- How do we know we have accomplished them?
- What strategies are needed to achieve the implementation goals?
## Three Implementation Questions

<table>
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<th>Key Component</th>
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<tr>
<td>What implementation goals are we trying to accomplish ?</td>
<td>Implementation goal</td>
</tr>
<tr>
<td>How do we know we have accomplished them ?</td>
<td>Implementation measures</td>
</tr>
<tr>
<td>What strategies are needed to achieve the implementation goals ?</td>
<td>Implementation theory</td>
</tr>
</tbody>
</table>
Implementation goals ("outcomes")

Implementation goals are the results of implementation activities
Implementation goals are pre-conditions for achieving the desired results from the solutions
## Common implementation goals

<table>
<thead>
<tr>
<th>Goal</th>
<th>Question</th>
</tr>
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<tr>
<td>Acceptability</td>
<td>Do stakeholders find the change solution agreeable / satisfactory?</td>
</tr>
<tr>
<td>Feasibility</td>
<td>Is the solution feasible to implement given resources?</td>
</tr>
<tr>
<td>Adoption</td>
<td>Are the organization/recipients using the change solution?</td>
</tr>
<tr>
<td>Fidelity</td>
<td>Is the solution being implemented as intended?</td>
</tr>
<tr>
<td>Penetration</td>
<td>Is the solution reaching all those targeted?</td>
</tr>
</tbody>
</table>

Adapted from Proctor 2011
Factors ("determinants") affecting implementation goals

<table>
<thead>
<tr>
<th>Category</th>
<th>Factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental factors</td>
<td>Policy factors, incentives, competing priorities</td>
</tr>
<tr>
<td>Organizational factors</td>
<td>Change tolerance, organizational culture, staffing and resources</td>
</tr>
<tr>
<td>Provider factors</td>
<td>Knowledge, confidence, motivation, timing</td>
</tr>
<tr>
<td>Recipient factors</td>
<td>Knowledge, belief, access, resources</td>
</tr>
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</table>
Implementation Measures

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PROCESS MEASURES
Reflect the things that you do (processes) and how systems are operating. They show how well you are delivering a change that you want to make. Examples are % of hand-

BALANCING MEASURES
Measure whether unintended consequences have been introduced elsewhere in the system. E.g. A balancing measure is readmission rates when measuring length of stay as an outcome. Knowing potential risks as a consequence of change will help you determine what needs to be measured.
### Implementation strategies based on Implementation theories

<table>
<thead>
<tr>
<th>Potential barrier</th>
<th>Strategy</th>
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<tbody>
<tr>
<td>Community knowledge</td>
<td>Community outreach, communication sessions</td>
</tr>
<tr>
<td>Beliefs and preconceptions</td>
<td>Community engagement, opinion leaders</td>
</tr>
<tr>
<td>Patient resources</td>
<td>Community volunteers, community collective funds</td>
</tr>
<tr>
<td>Provider confidence</td>
<td>Coaching, supportive supervision, team delivery</td>
</tr>
<tr>
<td>Provider motivation</td>
<td>Incentives, supportive supervision, audit and feedback</td>
</tr>
<tr>
<td>Leadership support</td>
<td>Communication plan, leadership roles, incentives</td>
</tr>
<tr>
<td>Change tolerance</td>
<td>Implementation plan, milestones, collaborative processes</td>
</tr>
<tr>
<td>Staffing and resources</td>
<td>Sustainability planning, advocacy</td>
</tr>
<tr>
<td>Competing priorities</td>
<td>Process simplification, advocacy</td>
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Generating and testing implementation strategies

Plan: Plan the test, including a plan for collecting data.

Do: Run the test on a small scale.

Act: Based on what you learned from the test, make plan for your next step.

Study: Analyze the results and compare them to your predictions.
Implementation Strategies for the Surgical Safety Checklist

White, Michelle C. MB, ChB; Peven, Kimberly MPH; Clancy, Olivia MB, ChB; Okonkwo, Ijeoma BM, BS; Bakolis, Ioannis PhD; Russ, Stephanie PhD; Leather, Andrew J. M. MS; Sevdalis, Nick PhD Implementation Strategies and the Uptake of the World Health Organization Surgical Safety Checklist in Low and Middle Income Countries, Annals of Surgery: June 2021 - Volume 273 - Issue 6 - p e196-e205 doi: 10.1097/SLA.0000000000003944
Reflection Exercise – Part 2

**Change solution:** One of the change solutions has been to increase staff knowledge on how to wash or rub hands. Your team is using the Model for Implementation to develop additional approaches to facilitate successful implementation.

https://www.who.int/gpsc/tools/5momentsHandHygiene_A3.pdf?ua=1
### Applying the Model for Implementation to Hand Hygiene

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<tr>
<td>What is an implementation goal ?</td>
<td>Acceptability, feasibility, adoption, fidelity</td>
</tr>
<tr>
<td>What is an implementation measure ?</td>
<td></td>
</tr>
<tr>
<td>What is the implementation theory ?</td>
<td></td>
</tr>
<tr>
<td>What are some implementation strategies?</td>
<td></td>
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Integrating improvement and implementation

“An integration of systematic implementation with quality improvement approaches is likely to enhance the quality of healthcare delivery by increasing the ability of practitioners to improve as well as to implement well.”

Wandersman, Alia, Cook & Ramaswamy, 2017
The Model for Improvement and Implementation

What are we trying to accomplish?

How do we know that a change is an improvement?

What change can we make that will result in improvement?

What implementation goals are we trying to accomplish?

How do we know we have accomplished them?

What strategies are needed to achieve the implementation goals?
Questions?