Quality improvement collaboratives: theory, design and effects

Prof Niro Siriwardena
Overview

• Theory
• Definitions
• Design
• Effects
• Examples
Unwarranted variation

Variation in effective safe care

Variation in preference sensitive care

Variation in supply sensitive care

Why do we need theory?

Check whether theory is logical

Compare competing/similar theories

Check against empirical observations

Four “theories” of improvement

1. Just set targets
2. Create better markets
3. Add resources to the current system
4. Redesign systems for better performance

(0 Education; audit and feedback)

Don Berwick International Forum for Quality and Safety in Healthcare 2008
Targets

• 8 minute urgent (75%) response

• 19 minute non-urgent (75%) response

• 60 seconds to decide on dispatch
Sick patients left stranded...

- ...a queue of a DOZEN ambulances pictured outside Cardiff hospital just hours before New Year
- Paramedics warn of 'fighting a losing battle' as huge line of emergency vehicles seen waiting outside
“That any sane nation, having observed that you could provide for the supply of bread by giving bakers a pecuniary interest in baking for you, should go on to give a surgeon a pecuniary interest in cutting off your leg, is enough to make one despair ...”

George Bernard Shaw
Resources vs. performance

Total Medicare spending per capita vs. Overall quality score

Quality-Spending Interactive, June 2017 Update
Systems

Plsek P. The challenge of complexity in healthcare. BMJ 2001;323:625


Theory of ‘profound knowledge’

- Appreciation of systems
- Knowledge of variation
- Theory of knowledge
- Psychology

W Edwards Deming 1900-1993
What is a Quality Improvement Collaborative?

A QIC is an organised, multifaceted approach to quality improvement involving five essential features:

• (1) specified topic (problem)
• (2) clinical experts and experts in quality improvement provide ideas and support for improvement
• (3) multi-professional teams from multiple sites participate
• (4) model for improvement (measurement, change, feedback)
• (5) collaborative process involves series of structured activities.

IHI: Model for improvement

Model for Improvement

- What are we trying to accomplish?
- How will we know that a change is an improvement?
- What change can we make that will result in improvement?

Act  |  Plan
---  |  ---
Study | Do
Are collaboratives effective?

220 QIC studies: 64 met design standards for inclusion

Improvement in 1 or more outcomes in 83% including 1 ambulance study (ASCQI)

Straightforward aspect of care, strong evidence, clear gap, accepted guideline.

Wells S, Tamir O, Gray J, et al. BMJ Qual Saf Published Online First:].
doi:10.1136/ bmjqs-2017-006926
Problem

• Inappropriate hypnotic prescribing
• Low use of psychological treatment of insomnia
• Poor user experience of treatment for insomnia
How can we improve primary care for insomnia

Problem: Insomnia

Population: Adults presenting to general practice with sleep problems

Priorities (aims): Improvement in care for insomnia

Inputs: QI methods

Outputs: Improved processes of care for insomnia

Improved patient outcomes for insomnia

Activities: Surveys
Collaborative
Tools
Education
QI methods
Feedback

Participants: General practices and patients

Anticipated outcomes

Unanticipated outcomes

Short term: Quality collaboratives for insomnia
Improved care processes for insomnia

Medium term: Increased utilization of CBTi
Reduced (inappropriate) hypnotic prescribing

Long term: Increased diffusion of QI methods
Improved care for other clinical areas

CaHRU
Community and Health Research Unit
General practice collaborative

ISI  Sleep Diary  PSQI
What patients needed

• Listening, empathy, taking the problem seriously

• Health beliefs: concerns about sleep tablets vs. need for help

• Previous self-help: what they have tried already: OTC, complementary

• Careful assessment

• Problem focused therapy: including CBT-i

Dyas JV et al. Patients' and clinicians' experiences of consultations in primary care for sleep problems and insomnia: a focus group study. BJGP 2010; 60: 329-333.
What practitioners needed to understand

• Don’t assume that patients would always want or need a prescription

• Many patients had tried non-drug treatments but not adequately or consistently

• Patients often open to alternatives

Effect on prescribing

Practice 2

Practice 7

Practice 3

Practice 1
Methods

Monthly prescribing expressed in STAR-PU units available over 6+ year period
Period of QIC separates the data into before/after segments
Modelling 2-segment intercept-trend regression
Test whether the intervention had been successful such that post-QIC prescribing was reduced.

Test $S$ based on mean prediction error into the post-QIC period.

Statistic $S$ approximately standard normal under the null hypothesis of no reduction, with rejection if $S$ is too small.

$S = -0.15$, $p$-value = 0.44
Results for **Intervention Practices**

**Z-drugs (aggregated)**

- Prescribing reductions in intervention practices were sustained over the post-QIC period:
  - 12 months; $S = -3.37$, $p < 0.01$
  - 24 months; $S = -3.63$, $p < 0.01$
  - 36 months; $S = -3.57$, $p < 0.01$
Results for Intervention Practices Benzodiazepines (aggregated)

- Significant reduction in prescribing over the shorter post-QIC term:
  - 12 months; $S = -2.83, p < 0.01$
- But not sustained over the longer post-QIC term:
  - 24 months; $S = -1.09, p = 0.14$
  - 36 months; $S = -0.01, p = 0.50$
Why did change occur?

- Interest in topic
- Funding
- High prescribing
- Concern re hypnotics
- Peer pressure
- Non-PCT initiative
- Non-QOF

Initial interest

Engagement and innovation

Changes in practice and feedback
How did change occur?

- Engagement of practice staff
- Willingness to innovate and initiate change
- Better understanding of patient expectations and staff preconceptions
- Commitment to address educational and learning needs for patients and practitioners
- Overcoming barriers to implementing new tools and techniques
- Response to feedback on new tools and techniques
- Approach tailored to practice
Problem: variations in ambulance care for AMI/stroke
How can we improve cardiovascular care in ambulance services?

Problem: CVD (AMI and stroke) presenting to ambulance services

Population: Adults aged 40 and over

Priorities (aims): Improvement in care bundles for CVD

Inputs: QI methods

Outputs: Improved care bundles for AMI and stroke

Activities: Collaborative approach
Identifying/overcoming barriers
QI methods: process maps, control charts, feedback

Participants
Ambulance NHS trusts

Anticipated outcomes

Unanticipated outcomes

Short term: Quality collaboratives for CVD
Improved care bundles for CVD

Medium: Increased utilization of QI methods
Improved care bundles for CVD

Long term: Use of QI methods for other areas
Improved/worse care (and bundles) for other clinical areas

Annotated control chart for AMI

EMAS % Rec'd Care Bundle for AMI

Wk Commencing
Annotated control chart for stroke

EMAS % Rec'd Care Bundle for Stroke

Wk Commencing
Key explanations

• 7 services had improvements in both AMI and stroke: 5 used checklists; 4 used feedback - 3 used individual feedback (1 with group feedback also) and 1 used group feedback alone.

• 5 had an improvement in AMI or stroke but not both: 2 used checklists (1 used it late), 2 used group feedback.
Phung VH, Essam N, Asghar Z, Spaight A, Siriwardena AN. Exploration of contextual factors in a successful quality improvement collaborative in English ambulance services: cross-sectional survey. JECP 2015
Problem: scaling up PINCER

- Prescribing errors
- 1 in 550 items containing a severe error
- Cause of around 1 in 25 hospital admissions
- Antiplatelet agents, diuretics, NSAIDs and anticoagulants - over 50% of preventable drug related admissions.
PINCER

• PINCER: pharmacist-led information technology intervention for reducing clinically important errors in medication management in general practices.

• PINCER trial:
  – 29% reduction in the proportion of patients with at least one prescribing error;
  – 44% reduction in the proportion of patients with at least one medication monitoring error;
  – Economic analysis showed PINCER was cost effective.

• Scaling Up PINCER
  – Aim to spread PINCER to at least 150 general practices in the East Midlands region
Logic model

**Problem:**
- Prescribing errors in primary care

**Population:**
- Patients receiving prescriptions from primary care currently or in future

**Priorities (aims):**
- Reduce prescribing /monitoring errors

**Inputs:** PINCER intervention

**Outputs:** reduced prescribing and monitoring errors

**Activities:**
- GP computer search for prescribing /monitoring errors
- Pharmacy advisor outreach visits
- Feedback to practices using annotated control charts
- Process mapping of prescribing
- Sharing learning across community

**Participants:**
- General practices and their staff, pharmacy advisors

**Evidence/analysis:**
- Changes in prescribing /monitoring
- Uptake of PINCER intervention
- Controlled trial: step wedge design
- Qualitative: acceptability etc.

**Anticipated outcomes**
- Short term: Identification and correction of prescribing and monitoring errors
- Learning in practice teams

**Unanticipated outcomes**
- Medium term: Process redesign of prescribing systems
- Sharing learning of successful redesign across collaborative

**Improved outcomes**
- Long term: Sustained reduced rates of prescribing and monitoring errors
- Reduced adverse drug reactions
- Reduced healthcare costs

**Cost-analysis, counterfactuals**
Funnel plots comparing CCGs

Indicator H: Prescription of a long-acting beta-2 agonist inhaler (excluding combination products with inhaled corticosteroid) to a patient with asthma who is not also prescribed an inhaled corticosteroid

COMPARING CCGS: INDICATOR H
Results

- 365 general practices in 12 CCGs
- 2.94 million patient records searched
- 17,177 cases of potentially hazardous prescribing identified
Indicator A: Prescription of an oral NSAID, without co-prescription of an ulcer healing drug, to a patient aged ≥65 years
Common features

- Logic model, theory of change
- Complex (pragmatic) contexts: intervention, setting, participants
- Learning: shared learning
- Intervention: can/will undergo transformation
- Change: variation in outcomes, unanticipated effects
Different types of collaborative intervention development:

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<tr>
<th>Type</th>
<th>Description</th>
<th>Scale/Outcome Measurement</th>
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<tbody>
<tr>
<td>1. Intervention development</td>
<td>Generating new or adapting interventions</td>
<td>Small scale, intervention design +/- outcome measurement</td>
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<td>2. Improving process reliability</td>
<td>Increasing reliable implementation of evidence based processes</td>
<td>Medium to large scale implementation and outcome measurement</td>
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<tr>
<td>3. Scaling up innovations</td>
<td>Evidence based intervention</td>
<td>Large scale, implementation and outcome measurement</td>
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Summary

• QIC aims vary: more than improving care
• Interventions may change during QICs: intended vs. unintended: this should be described
• Effects: vary by organisational unit and by indicator
• Should systematic reviews of their effectiveness/effects take these into account?
Reading


Gawande A. The checklist manifesto.

Senge P. The fifth discipline.
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Thanks for listening!

Email: nsiriwardena@lincoln.ac.uk
Web site: cahru@lincoln.ac.uk
Twitter: @nsiriwardena
@CaHRU_UoL
@LIH_UoL