

HAD2005: Practical Skills in Quality Improvement for Health Care Leaders in Low Resource Settings

Version 2021 DRAFT v. 27 Oct 2020

Course Director:

Dr. Ben Chan, MD MPH MPA

Course Description:

This course provides participants with opportunities to strengthen their understanding of concepts of quality improvement (QI) in health care, and sharpen their skills in applying practical tools for measuring and improving quality. While these skills can be used in all settings, the emphasis will be on practical tools which do not require access to expensive technology or IT infrastructure and hence are most appropriate in low-resource settings such as developing countries or low-income communities within Canada. Furthermore, students will be exposed to scientific literature on attempts at applying QI science in such settings, and learn about frequently encountered barriers to implementing change in vulnerable populations.

The core QI skills to be covered in the course include the following:

Systems analysis tools:

- Process mapping and redesign
 - o Observing a process, conducting process-mapping exercises
 - o Identifying opportunities for improved process flow
 - o Basic concepts from LEAN on process flow
- Ishikawa (cause and effect) diagram
- Failure Modes Effects Analysis
- Defect check sheet
- Pareto chart
- Voice of the customer

Core QI project implementation tools to be covered in the course include:

- Model for improvement / project charter
- Establishing a QI team
- Planning and implementing PDSA cycles
- Creating a quality measurement plan
- Interpreting run charts

Presentation of Course:

Online sessions

The course will have ten 2.5 hour on-line sessions covering core skills described above. Each session will typically follow this format:

- Brief introduction to objectives
- Didactic lecturing
- Hands-on simulation exercises
- Debrief and follow-up assignments

The real benefit of this course is relentless practice drills on implementation of these tools and facilitation of team meetings with complex dynamics and resistance to change. All students will have multiple opportunities to lead simulated rough-and-tumble QI team sessions, complete with odd-ball personalities such as the skeptical doc, the cranky nurse, the over-theoretical academic, the non-engaged CEO and the busy bureaucrat. This will be an important chance to develop leadership skills. About 70% of class time will be devoted to practicing these skills and lecture-style teaching will be kept to a minimum.

Participants will also be exposed to a set of readings on evaluations of different QI projects in low-resource settings from around the world which have employed the techniques listed above, and will discuss the practicalities of using such tools in these settings.

Sessions will be conducted on Zoom. White boards will be used extensively to allow students to conduct activities such as process mapping or drawing Ishikawa diagrams during a virtual group session.

Field Session

Participants will go to a popular food service location and observe a process in action. They will practice skills in doing process observation, mapping, and calculation of basic statistics on process efficiency.

Simulation Exercise

Participants will undergo a four-hour exercise where they will examine a fictitious case study of problems with TB management in a foreign country. They will then work in small groups to find out the root cause of the quality problems using all of the tools taught in the course, and then write out a project charter for a quality improvement team that will tackle the root causes identified. At the end of the exercise, they will be given a list of what the actual root causes were and see whether or not they were able to accurately identify them.

Scheduling

Week of January 4 to March 8, 2021

Students will participate in ten sessions, one 2.5 hour session per week (scheduling to be determined; likely one evening per week, 7:00 to 9:30pm). Total course instruction time: 25 hours (workshops, simulation exercises) + 1 hour field observation exercise + 1 hour (one-on-one meeting time with instructor to discuss project).

Week of March 22, 2021

The final exam will take place during this week.

Student projects

Students are generally required to engage in a practicum where they can practice their newfound QI skills in a real-life environment. There are at least two options for such arrangements:

Option 1: students may take the HAD2011H Quality Improvement practicum course and devote a selective period to working on their project. Typically, students have spent about 50% of their time

on the practicum and 50% on clinical work. Students are responsible for ensuring that the clinical component of their work meets the Faculty's requirements for time spent in different clinical areas. The minimum duration of time for such a practicum is four weeks within the same location.

Option 2: students may incorporate some component of QI methods into an existing practicum or capstone project. He/she will receive mentorship and guidance from the course instructor, and the course instructor will provide comments which can be used as part of the student's overall evaluation. Such an arrangement requires prior approval from and coordination with the academic supervisor for the existing project.

Students may propose other options for meeting the project requirement. Exceptions to the requirement of completing a project may be considered under extenuating circumstances.

Time frame: flexible, but generally should take place as soon after HAD2005H as possible and should be completed by April. A special session will take place in April where students can present their projects to the class.

Course Credits

Participants who complete this course will receive a half-credit for the classroom teaching component and a half-credit for their practicum if option 1 is chosen.

Performance Objectives:

By the end of this course, participants should:

- Have a solid knowledge of definitions of quality and its different attributes
- Understand how system design issues lead to quality problems
- Understand common barriers to delivering good quality care to vulnerable populations in low-resource environments

Participants should be able to lead a QI team through the following activities:

- Conduct a process map
- Conduct a direct observation or audit of a process
- Do a cause & effect analysis
- Use a defect check sheet
- Establish a QI team
- Set QI project charter (aims, measures, change ideas)
- Use PDSA cycles

Required Textbook:

GJ Langley, KM Nolan, TW Nolan, CL Norman, LP Provost. The Improvement Guide: A practical approach to enhancing organizational performance. Jossey-Bass, San Francisco, 2009. (order on amazon.ca - \$34 on kindle, \$50 hardcover).

Required Pre-Requisites:

IHI Open school courses:

QI 101: Fundamentals of Improvement

- QI 102: The Model for Improvement: Your Engine for Change
- QI 103: Measuring for Improvement
- QI 104: The Life Cycle of a Quality Improvement Project
- QI 105: The Human Side of Quality Improvement
- QI 106: Mastering PDSA Cycles and Run Charts

To complement these six modules, please also read Chapters 1 and 2 of the Improvement Guide before the start of the course.

Student Evaluation:

Students will be evaluated according to the following grid:

Assignment	Grade Weight	Due Date
Homework assignments	35%	Throughout course
Examination	50%	Mid-March
Class participation	15%	Throughout course

1 Homework assignments and quizzes (35% of the grade).

Students will be assigned homework assignments and quizzes testing their knowledge of the content taught in workshops. (Penalties for late assignments will assessed at one letter grade per day late).

2 Examination (50% of the grade).

After completion of the workshop-based training, students will complete a one-hour examination covering core topics in the course.

3 Participation (15% of the grade).

Because of their interactive format, attendance and active participation in each session is important. Active participation in the discussion of the cases in each class will be worth 15% of the overall mark. *Students will be required to demonstrate the ability to lead a QI team through process mapping exercises, use systems analysis tools and development of a QI project charter.* They will be marked specifically on their ability to facilitate a group to successfully use these tools.

List of Sessions and Readings

Sessions will take place on an on-line basis once a week from week of January 4 to week of March 8 (exact dates TBA).

Session 1 – Introduction to Quality & Process Mapping (2.5 hours)

Topics covered include:

- Definition of quality and its attributes
- QI team building - basics

- Introduction to systems thinking
- Introduction to process mapping & process metrics

Readings: Quality Improvement Guide. Ontario Health Quality Council, Toronto, 2009. Chapters 1 and 2 and section 4.1.3.

Homework assignment 1: Complete template on process metrics using data collected.
Due 11 Feb 2020.

Session 2 – Process Measurement & Optimization (2.5 hours)

- Other process metrics, direct observation and data collection techniques
- Discuss options for process flow improvements
 - o Eliminating non-value-added tasks / waste, parallel processing, Heijunka / load rebalancing, synchronization, workspace design, optimal process order, batching, categorization & handoffs

Readings:

HBS Toolkit - Basic Operations Self-Instructional Workbook: www.hbswk.hbs.edu/archive/1460.html

Langley et al. The Improvement Guide. Appendix A.

Field Exercise (complete between sessions 1 & 2): Process Mapping and Measurement (1 hour)

- Observe a busy cafeteria line in progress
- Practice collecting data on cycle time, takt time, process times, queue times
- Look for bottlenecks, balking
- Consider opportunities for improvement

Homework assignment 2a: Complete template on process metrics using data collected as a group (this is the only group assignment; all others are individual). Due prior to session 3; zero marks for late submission as we will debrief the exercise on session 3.

Homework assignment 2b: Develop process measurement tool similar to what is described in the Malawi article by Jafry below. Refer to Workshop 2 readings if needed.

Jafry MA, Jenny AM, Lubinga SJ, Larsen-Cooper E, Crawford J, Matamba C, Babigumira JB. Examination of patient flow in a rural health center in Malawi. BMC Res Notes. 2016 Jul 25;9:363. doi: 10.1186/s13104-016-2144-x.

Session 3 - Root Cause Analysis Techniques – Ishikawa Diagrams, Five Whys (2.5 hrs)

- Practice group facilitation skills for identifying root causes of problems using Ishikawa diagrams and the Five Why's technique

Readings: Quality Improvement Guide. Ontario Health Quality Council, Toronto, 2009. Sections 4.1.1, 4.1.2.

Millennium Development Goals Report 2015: World Health Organization. Read the executive summary, pg 4-9. The rest of the article is optional but gives a great overview of the global agenda on health system improvement in the preceding 15 years.

G Yamey. What are the barriers to scaling up health interventions in low and middle income countries? A qualitative study of academic leaders in implementation science. *Globalization & Health* 2012; 8:11. Available at:

<https://globalizationandhealth.biomedcentral.com/articles/10.1186/1744-8603-8-11>

Homework assignment 3: Read the executive summary of the MDG report and the Yamey article. Fill out an Ishikawa diagram with the right-side box: “Challenges in implementing evidence-based interventions at large scale in LMICs to tackle MDGs.” Bonus points for identifying logical relationships between different causes (i.e. multiple levels of branches of potential causes).

Session 4 – Defect Check Sheets, Pareto Charts (2.5 hours)

- Learn how to “spot the defect” and use simple measurement techniques to observe the frequency of defects (defect check sheet, pareto chart)
- Special barriers to implementation in low-resource settings

Readings: Quality Improvement Guide. Ontario Health Quality Council, Toronto, 2009. Sections 4.1.4, 4.1.5.

Pneumonia: The forgotten killer of children. UNICEF & World Health Organization, Geneva, 2006. Read pages 15-27 for root causes & skim the rest.

Homework assignment 4: Design defect check sheet for acute respiratory infections in Tajikistan.

Session 5 – Failure Modes Effects Analysis & Voice of Customer (2.5 hours)

- Learn additional root-cause analysis techniques for anticipating and addressing problems due to relatively rare but serious defects
- Learn techniques to help identify how to clarify what aspects of quality are most important to the patient

Readings: SA Gaskin, A Griffin, JR Hauser et al. *Voice of the Customer*. Wiley International Encyclopedia of Marketing, Wiley & Sons, 2010.

<https://onlinelibrary.wiley.com/doi/pdf/10.1002/9781444316568.wiem05020>

Example of a Failure Modes Effects Analysis for Anticoagulants. Institute for Safe Medication Practices, Toronto, 2007.

Homework assignment 5: Complete a FMEA for a patient safety topic.

Session 6 - Model for Improvement (2.5 hours)

- Setting aim statements
- Developing a measurement plan (outcomes, processes, intermediate measures, balancing measures; sampling strategies; mini-surveys; defect check sheets)
- Change ideas and concepts
- Common barriers to best practice implementation & generic change concepts for improvement

Readings: Quality Improvement Guide. Ontario Health Quality Council, Toronto, 2009. Chapter 3.1-3.5

GL Langley et al. Improvement Guide. Chapter 5: Using the Model for Improvement.

Homework assignment 6: Receive sample data for the defect check sheet in assignment 4. Then, plot this data on a Pareto chart; complete a Cause-Idea Map; and propose a Project Charter / QI Plan.

Session 7 – Quality Measurement Techniques, Run Charts & PDSA Cycles (2.5 hours)

- Learn techniques for implementing and testing change using Plan-Do-Study-Act cycles
- Learn how to construct and Interpret run charts

Readings: Quality Improvement Guide. Ontario Health Quality Council, Toronto, 2009. Chapters 3.6, 4.2-4.4.

GL Langley et al. Improvement Guide. Chapter 6: Developing a Change. Chapter 7: Testing a Change.

Homework assignment 7: develop a measurement plan on a topic to be discussed in class.

Session 8 – Managing Resistance to Change (1.5 hours)

Participants will develop a systematic approach to anticipating resistance to change at the outset of a QI project. They will learn to identify key stakeholders and think of how a potential change can affect their remuneration, convenience, physical space, work and team environment and other factors. Participants will then practice how to use different techniques for building commitment and enthusiasm for change. Participants will also review the pros and cons of using financial incentives for performance.

Readings:

“The Social Aspects of Implementing a Change”. In GJ Langley, KM Nolan, TW Nolan, CL Norman, LP Provost. The Improvement Guide: A practical approach to enhancing organizational performance. Pages 186-194.

Challenges facing the introduction of the WHO surgical safety checklist: A short experience in African countries. African Health Monitor 2013.

Fourcade A, Blache JL, Grenier C, Bourgain JL, Mirvielle E. Barriers to staff adoption of a surgical safety checklist. BMJ Quality & Safety. (skim)

“Health Policy Brief: Pay-for-Performance,” Health Affairs, October 11, 2012 (skim).

Getting Started Kit: Surgical Site Infections. Canadian Patient Safety Institute. Skim pages 8-19.

Aranaz-Andrés JM1, Aibar-Remón C, Limón-Ramírez R, Amarilla A et al. Prevalence of adverse events in the hospitals of five Latin American countries: results of the 'Iberoamerican Study of Adverse Events' (IBEAS). *BMJ Qual Saf.* 2011 Dec;20(12):1043-51. (skim)

Workshop 8b: System Level Interventions for Improving Quality - Discussion (1/2 hour)

Is running a successful QI project within a single hospital or primary care clinic enough to bring change across an entire country or health system? Local efforts are often constrained by broader systems issues regarding capacity of facilities, human resources, accountability and patient engagement. This workshop explores common weaknesses in overall system design and ideas for improvement.

Reading: ME Kruk et al. High-quality health systems in the Sustainable Development Goal Era: time for a revolution. *Lancet Global Health Commission*, 2018. Read executive summary; Figure 1; Table 1; Figure 9. For students doing projects in low-income countries, please read the full article during your placement as it is the most current and comprehensive review of system-level problems and solutions in low-income country settings.

Workshop 8c – Practice Session: Critique of Student Proposals (1/2 hour)

- Student groups will present to the class their proposed projects, outlining how the quality problem identified, and how they will use the different systems analysis tools in the field. Students will critique each others' proposals. Students will prepare a one-page summary of their initiative and also take templates used in the course and customize them for their project.

Homework assignment 8: Anticipate sources of resistance to change in implementation of a surgical safety program in Honduras. Be prepared to pitch your idea for a QI project to a hostile audience in class.

Workshop 9a & b – Practice Session: QI Team Simulation Exercise (4 hours – split over two days)

Participants will take part a simulation exercise as described above., where they will be presented with a quality problem in a low-resource environment and consider all of the QI tools they will need to apply to identify root causes and system failures, and test ideas for improvement.

Readings (for context, as general preparation for the simulation exercise):

Orr P. Adherence to TB care in Canadian Aboriginal populations. Part 1: Definition, measurement, responsibility, barriers. *Int J Circumpolar Health* 2011: 70(2); 113-127. (note: focus on barriers section, page 199-124, skim the rest.)

