From pilot to rollout

How to measure improvement in new models of care

pwc

Healthcare systems are "bound by invisible fabrics of interrelated actions, which often take years to fully play out their effects on each other."[1]

When trying to improve health systems we often focus on isolated component parts – a hospital, a department, a service, a condition – losing sight of the interdependencies between them. Yet if we truly want to improve outcomes for people and patients who will need support from many different parts of the system, we must view care systems as a whole, beyond their component parts.

Improving the whole system requires change. And with change, we must ask ourselves:

1. What are we trying to achieve?
2. How will we know that "change" has made an improvement?
3. What changes can we make that will lead to improvement?[2]

Health system designers should answer the first question by defining the aim of the healthcare system at all levels, including:

- The whole system (the macrosystem)
- Integrated patient pathways within the whole system (the mesosystems)
- The role of different clinical delivery units in delivering those pathways (the microsystems)

To achieve the best possible outcomes for people and patients within resource constraints, any health system will need to aim for value by balancing the Triple Aim framework identified by the Institute for Health Improvements:
- Improving the experience of care
- Improving the health of populations
- Reducing per capita costs of health care[3]

This overarching aim should trickle down to the mesosystem and microsystem design and improvement work.

## Measuring change at the mesosystem level

In cases of whole system transformation, implementing change often requires running small scale pilots. Without clear measurement, we can never know if a pilot is actually an improvement that is ready to be scaled up.

That said, measuring the impact of pilots in whole system transformation is challenging: measuring at the microsystem level will miss out on the impact of pathway integration, while measuring at the macrosystem level will dilute their impact within the whole system.

When piloting small scale patient pathways during the process of whole system transformation, measures should be developed to focus on the mesosystem level and to "provide a view of performance that reflects care provided in different sites and across the continuum of care."[4]

Figure 1 - Pathway measures in relation to the three levels of a healthcare system

Effectively assessing patient pathway pilots requires measures at the mesosystem level
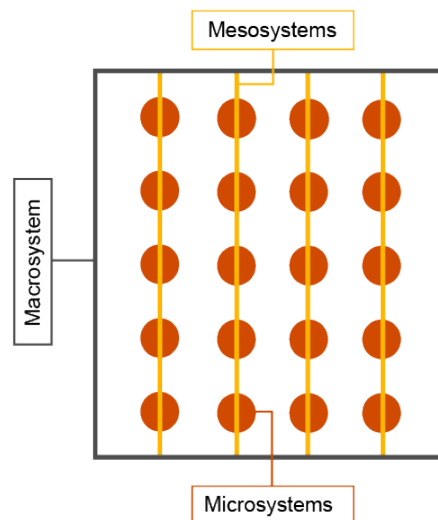
This paper focuses on answering the question:

How will we know that change is an improvement?

[1] Senge, P. M. (2006). The Fifth Discipline: The Art and Practice of Learning Organization. London: Random House.
[2] Langley, G., Nolan, K., Nolan, T., Norman, C., & Provost, L. (2009). The Improvement Guide: A Practical Approach to Enhancing Organizational Performance. San Francisco: Jossey-Bass Publishers.
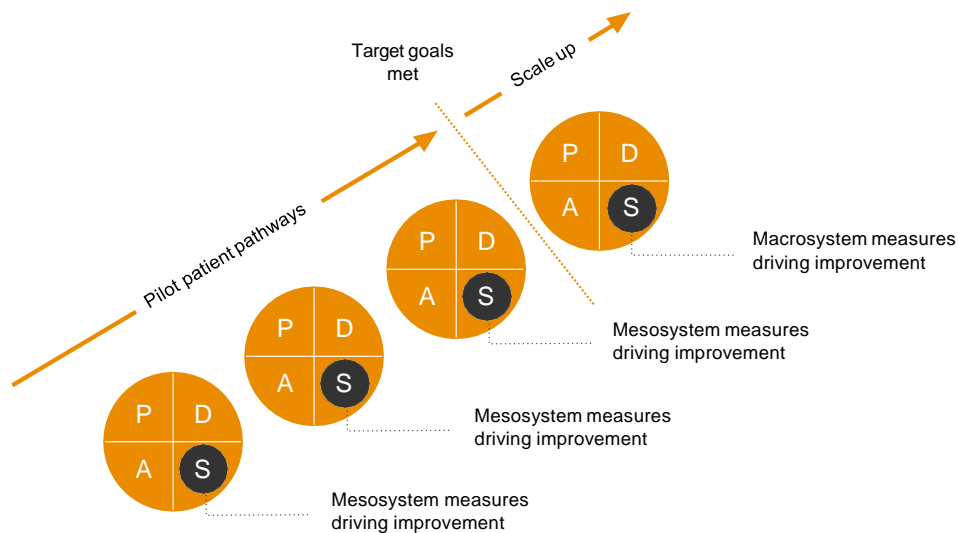[3] Berwick, D. M., Nolan, T. W., & Whittington, J. (2008). The Triple Aim: Care, Health, and Cost. Health Affairs, 759-769.
[4] Martin, L. A., Nelson, E., Lloyd, R., & Nolan, T. W. (2007). Whole System Measures. IHI Innovation Series White Paper. Cambridge, Massachusetts: Institute for Health Improvement. Retrieved from Institute for Health Improvement Innovation Series.

As new patient pathways are piloted, a core question comes to mind: "How do we know that the pilot was successfully complete, and are we ready to scale up?"

The answer is: "A pilot for a pathway is complete when it achieves "target goals" for key measures."

Figure 2 - Mesosystem measures feed into PDSA cycles to drive the improvement of pathways

Target goals met

Scale up

Pilot patient pathways

| P | D |
| A | S |

Macrosystem measures driving improvement

Mesosystem measures driving improvement

Mesosystem measures driving improvement

Mesosystem measures driving improvement

Inspired by Deming's Methodology for Improvement, implementation teams can use mesosystem measures to study the impact of implementing small scale pilots, and use findings to feed into Plan - Do- Study- Act (PDSA) cycles of improvement. PDSA cycles should be embedded into refining system design before rolling out to the whole system, building trust in the required change, and creating a culture of system thinking and continuous improvement.[5]

[5] Langley, G., Nolan, K., Nolan, T., Norman, C., & Provost, L. (2009).

Mesosystem measures framework

Inspired by the Institute for Health Improvement's Triple Aim and the Institute of Medicine's domains of healthcare quality and whole system measures, we developed a measures framework that facilitates assessing the impact of piloting small scale patient pathways as part of a specific mesosystem. The framework is used to develop measures that assess implementation against two dimensions:

- Patient experience
- Workforce experience

Patient pathways under four care categories that cover the various health needs of people: planned care, chronic care, urgent/emergency care, and last phase of life. We then identified core mesosystem measures that are few enough to be frequently and manually collected but broad enough to allow for providing a big picture view on the success of a pathway pilot in improving the experience of care in each category.[6]

Table 2 - Mesosystem measures and their applicability to different care categories

Dimension	Sub-dimension	Measure	Care Categories			
			Planned	Chronic	Urgent	Last Phase
Care Experience	Safe	Standardised rate of adverse events	✔	✔	✔	✔
	Effective	Standardised mortality ratio	✔	✔	✔	
		Percentage of hospital readmissions	✔	✔		✔
		Rate of ambulatory sensitive hospitalisations and ED visits		✔		
		Percentage of ED patients that are CTAS 4-5			✔	
	Equitable	Average number of hospital days per decedent in the last three months of life				✔
	Efficient	Average length of stay	✔			
		Average number of patient visits prior to scheduling a procedure	✔			
	Patient-centered	Patient satisfaction and experience score	✔	✔	✔	✔
	Equitable	Variability in care experience and satisfaction rate based on demographics	✔	✔	✔	✔
	Timely	Average number of days to third next available appointment for doctor visits	✔	✔	✔	✔
Workforce Experience	Occupational health	Workforce awareness of guidelines	✔	✔	✔	✔
		Incidence of nonfatal occupational injuries and illnesses	✔	✔	✔	✔
	Joy at work	Job satisfaction and experience score	✔	✔	✔	✔
		Variability in workforce experience and satisfaction rate based on demographics	✔	✔	✔	✔
	Engagement	Care delivery engagement score	✔	✔	✔	✔

These mesosystem measures were tailored to feed into whole system measures that support promoting improvements in capacity and capability for frontline staff and leadership. While these measures currently only focus on the "experience of care" aspect of the Institute for Health Improvement's Triple Aim framework (population health, experience of care, and costs), they may be expanded to cover all dimensions and provide an overview of the value the whole system is achieving. (Berwick, Nolan, & Whittington, 2008)

[6] Martin, L. A., Nelson, E., Lloyd, R., & Nolan, T. W. (2007).

Applying mesosystem measures in practice

To study change at the mesosystem level, we propose the following eight step approach:

1. Agree measures to assess impact.
   - Confirm which core measures are applicable to the pathway you are trying to study. The implementer can add or adjust the suggested measures, keeping in mind that ideally measures should not be more than five to focus on what matters most.
   - Measures should be presented and agreed with implementation teams. Measures should be reflective of the improvement work that is being done.
   - Hold a Delphi process to finalise the list of measures with implementation teams, if required.

2. Agree standardised data processes.
   - Assess what data is already being collected.
   - Conduct site visits and work with staff to agree the most efficient way to collect data.
   - Create templates and develop a standerdised data collection process. This mitigates risks around "claims about the source of the difference".[7]

3. Train staff on the data processes.
   - Identify all frontline and analytics staff that will be involved in collecting the data and provide them with live training and take-home material. Further build confidence in data processes by training and auditing frontline staff on standardised data processes.
   - Print out standardised data processes and ensure they are visually available where data is being collected.

4. Begin collecting data.
   - Start collecting data for whole patient cohorts, or for agreed sample sizes. Data will need to be collected from pilot sites and from control sites to allow for a comparative analysis.

5. Audit data collection for consistency.
   - Appoint a data process auditor to randomly visit different sites being studied, and ensure that data processes adhere to standards.

6. Analyse and socialise baseline data.
   - Analyse all collected data and present it in run charts or control charts as appropriate.
   - Socialise data with all implementation team members.
   - Share data visually on whiteboards in selected frontline staff workspaces.
   - Ensure data reporting transparency and availability to the whole implementation team.

7. Set target goals for each piloted pathway.
   - Based on the baseline data, and based on international benchmarks, each pilot should set their own target goals for each whole system measure.

8. Establish a rhythm of study sessions to continuously refine processes and improve measures.
   - Identify measures champions and develop a professional network to keep them connected.
   - Schedule study sessions to ensure that measures champions come together on a regular basis to share knowledge and refine processes.
   - Two types of study sessions should be arranged: sessions for champions within the same pathway, and sessions for champions across different pathways.

How will this methodology support the implementation of new models of care in the GCC region?

Many of the GCC countries have ambitious visions and are embarking on national healthcare transformation journeys, with new models of care and patient pathways at the core. To do so, they need to mobilise great numbers of healthcare professionals to change the way they work together. GCC countries are guided by the goodwill, the experience of hundreds of clinicians, and somewhat similar experiences of international health systems. A good start, but not a science.

As we begin to implement new models of care, we want to back our art with science. We therefore recommend applying the methodology detailed in this paper to study the impact of new pathways and ensure they are achieving their aim in the piloting stage, prior to fully rolling them out.

[7] Lee, T. H. (2010). Turning Doctors into Leaders. Harvard Business Review.

Appendix - Defining the mesosystem measures

The table below provides a definition for each of the mesosystem measures.

Table 2 - Defining mesosystem measures

Dimension	Sub-dimension	Measure	Definition
Care Experience	Safe	Standardised rate of adverse events	(Number of adverse events / total number of patients) * 100
	Effective	Standardised mortality ratio	(Observed deaths / expected deaths) * 100 Expected deaths should be based on age group benchmarks.
		Percentage of hospital readmissions	(Number of discharged patients readmitted to the hospital within 30 days of their discharge / number of patients discharged) * 100
		Rate of ambulatory sensitive hospitalisations and ED visits	(Number of ambulatory sensitive hospitalizations + ED visits / total number of hospitalizations + ED) * 100
		Percentage of ED patients that are CTAS 4-5	(Number of CTAS Level 4 and 5 ED visits / total number of ED visits) * 100
		Average number of hospital days per decedent in the last three months of life	(Number of hospital days for all decedents in their last three months of life / total number of decedents)
	Efficient	Average length of stay	(Total patient days / total patients)
		Average number of patient visits prior to scheduling a procedure	(Number of appointments prior to procedure / total number of procedures)
	Patient-Centred	Patient satisfaction and experience score	Average patient score from 0 to 10 (where 0 is the worst and 10 is the best) when answering each of the following questions: • When you think about your health care, how much do you agree or disagree with this statement: «I receive exactly what I want and need exactly when and how I want and need it? • What number would you use to rate all your health care in the last 12 months?
	Equitable	Variability in care experience and satisfaction rate based on demographics	Difference in patient satisfaction and experience scores for different demographic groups
	Timely	Average number of days to third next available appointment for doctor visits	(Number of days between the request for appointment and the third available appointment for all available doctors / total number of available doctors) for each of: • Primary care doctors • Specialty care doctors Average may be sampled once a week on the same day for all doctors.

Workforce Experience	Safe	Workforce awareness of guidelines	Average workforce score from 0 to 10 (where 0 is the worst and 10 is the best) when answering each of the following questions: • What number would you use to rate your awareness of the clinical guidelines being used? • What number would you use to rate the relevance of the guidelines to the service you are providing?
		Incidence of nonfatal occupational injuries and illnesses	(Number of injuries and illnesses / total hours worked by all FTEs in a calendar month) * 200,000
	Joy at work	Job satisfaction and experience score	Average workforce score from 0 to 10 (where 0 is the worst and 10 is the best) when answering each of the following questions: • What number would you use to rate your satisfaction with your job? • What number would you use to rate your work experience?
		Variability in workforce experience and satisfaction rate based on demographics	Difference in workforce satisfaction and experience and engagement scores for different demographic groups
	Engagement	Care delivery engagement score	Average workforce score from 0 to 10 (where 0 is the worst and 10 is the best) when answering each of the following questions: • What number would you use to rate your role in contributing to the change that is happening?

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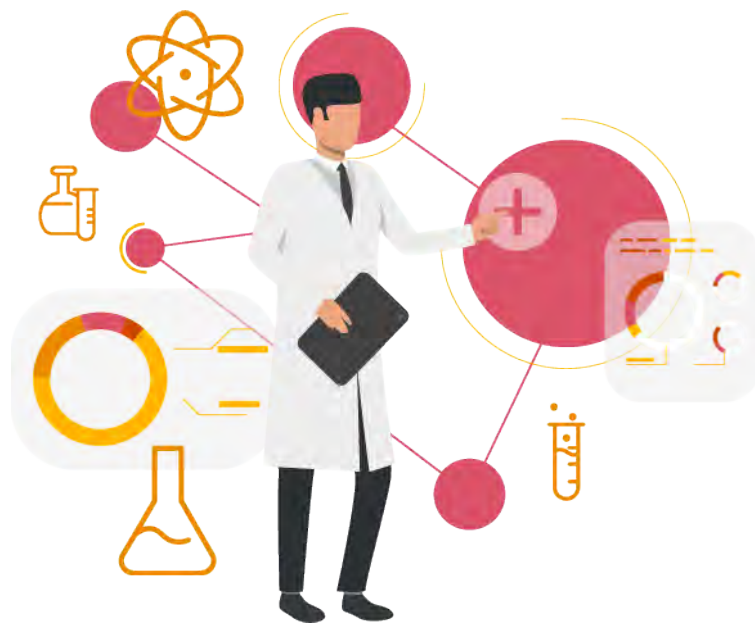
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