International Journal of Pediatrics and Adolescent Medicine (2015) 2, 7—11

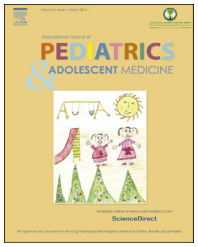
HOSTED BY

ELSEVIER

Available online at www.sciencedirect.com

ScienceDirect

journal homepage: http://www.elsevier.com/locate/ijpam



QUALITY IMPROVEMENT

How (and why) do quality improvement professionals measure performance?

Donald E. Lighter*

The University of Tennessee, The Institute for Healthcare Quality Research and Education, 2120 River Sound Dr., Knoxville TN 37922, United States

Received 29 October 2014; accepted 20 December 2014
Available online 27 March 2015

KEYWORDS
Quality improvement;
Measurement;
Performance improvement;
Medicare;
Shared savings;
Payment

Abstract The era of value-based care has engulfed healthcare delivery systems around the world. Pediatricians are especially challenged by constrained resources for providing care to our vulnerable population, and methods for achieving value for children through improved quality and reduced cost of care are crucial for success. This paper examines the use of measures to determine the two components of the value proposition: quality and cost. The implications for adopting Lean Six Sigma as an improvement paradigm are reviewed, and the case for using these concepts is detailed with examples of measures used in health systems in the United States and several other countries.

1. Measurement in healthcare

Pediatricians in nearly every country around the world are becoming even better at managing patients with fewer financial resources, and Lean Six Sigma (LSS) is approach that has been shown to be effective at increasing efficiency while concurrently improving quality. The first paper in this series [1] described the paradigm of LSS and how the approach simultaneously addresses the cost and quality of care. This paper describes the metrics that quality professionals use to determine performance and how these measures have been translated into practice in the United States.

2. Background

A maxim in quality improvement (QI) that has been attributed to many iconic figures in the field is "You can't manage what you don't measure". For physicians, that axiomatic statement is almost intuitive because one of the goals for diagnosis and treatment is to have accurate test results to determine a patient's clinical condition and to determine what therapeutic interventions might be effective. Quality improvement professionals have the same

* Tel.: +1 865 974 1772.
E-mail address: dlightermd@cyberce.net.
Peer review under responsibility of King Faisal Specialist Hospital & Research Centre (General Organization), Saudi Arabia.

http://dx.doi.org/10.1016/j.ijpam.2015.03.003

goal: to understand a process quantitatively so that worthwhile interventions might be applied to discern and improve performance. Once those interventions are applied, the QI professional uses the metric to determine the effect of the intervention, just as physicians measure the effect of therapeutic interventions by repeating a test after treatment. Then, to ensure that a process does not deteriorate into its previous state of poor performance, the QI professional monitors the measure over time and tracks the performance trend. The role of measurement in quality improvement is every bit as important as lab and imaging studies in clinical medicine.

Avedis Donabedian (1919–2000) was a Lebanese-born physician and health policy researcher at the University of Michigan's School of Public Health who is credited with the earliest work in health care quality management. The Donabedian model [2] was published in 1980 and provided the early framework for performance measurement and improvement in health care. As shown in Fig. 1, the model divided healthcare services into three major categories: Structure, Process, and Outcomes. Nearly every quality measure can be characterized by one of these classifications. Table 1 provides some examples of each of these types of measures. The measurement systems that have been developed in the United States and many other countries are organized into these three categories.

A fundamental principle in the development of effective measures can be represented as SMART criteria, which are shown in Fig. 2. These criteria provide the basis for development of effective measures for each of the Donabedian model categories and are important to ensuring that a measure will be acceptable to both providers and payers. Developing measures using the SMART criteria involves the following:

- *Specific* — the measure must address a specific goal or process step and be as narrowly defined as possible. Thus, a process metric should endeavor to encompass a single step in the process, e.g., giving a child an immunization at a well-child visit. An outcome measure is usually broader, but typically is designed to quantify an important result of care, e.g., return to full function in activities of daily living.

Table 1 Measures categorized into Donabedian model groups.

Donabedian category	Standardized metric
Structure	Availability of a computerized tomography scanner
	Number of hospital beds
	Number of examining rooms in a clinic
	Medication availability
	Staffing availability
	Emergency medical services equipment
Process	Beta blockers after a myocardial infarction
	Assessment of pediatric body mass index (BMI)
	Percentage of two-year old children with completed vaccinations
	Human Papillomavirus vaccination for female adolescents
	Lead screening in children
	Appropriate treatment for children with viral upper respiratory infection
Outcome	Death or mortality rate
	Quality adjusted life years
	Activities of daily living
	Complications of diagnosis or treatment
	Patient satisfaction

- *Measurable* — the metric must have an operational definition that clearly states the data to be collected and how that data are analyzed to create the final measure. If no data are available, then this criterion cannot be met.
- *Achievable* — any measure must have an achievable level of performance. If providers do not control a particular process, then for them, the measure and its related performance goals may not be achievable, leading only to frustration and a sense of unfairness.
- *Relevant* — metrics used in performance improvement must be relevant to those involved in the process, most often the physician and the patient or family. If the measure is deemed trivial by stakeholders, then the

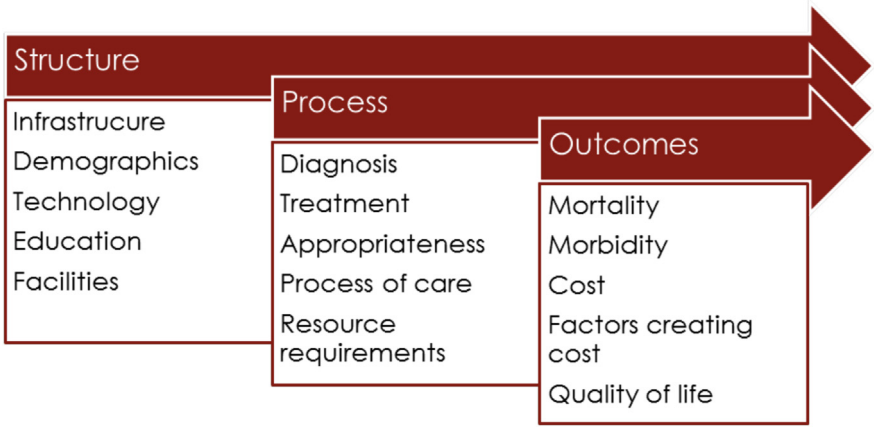


Figure. 1 The Donabedian model.